Appendices

Appendix A

Initial Study, Notice of Preparation (NOP), and NOP Comment Letters

Appendix A.1

Initial Study

LOS ANGELES
DEPARTMENT OF CITY
PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

INITIAL STUDY

130 College Project

Case Number: ENV-2023-2307-EIR

Project Location: 110–130 West College Street, 117–119 West Bruno Street, and 943–973 North Main Street, Los Angeles, CA 90012

Community Plan Area: Central City North

Council District: 1—Hernandez

Project Description: The 130 College Project (Project) proposes the removal of the existing surface parking lot, to construct a new five-story with one mezzanine parking level, 232,802-square-foot commercial development consisting of 224,597 square feet of office, 4,095 square feet of restaurants, and 4,110 square feet of retail on an approximately 2.2-acre site, resulting in a Floor Area Ratio (FAR) of 2.42:1. The Project would have a maximum height of 88 feet and includes parking in one subterranean level, one at-grade level, and one above-grade mezzanine level.

PREPARED FOR:
The City of Los Angeles
Department of City Planning

PREPARED BY:
Eyestone Environmental, LLC

APPLICANT:
S&R Partners, LLC

June 2024

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1 INTRODUCTION

An application for the proposed 130 College Project (Project) was submitted to the City of Los Angeles (City) Department of City Planning for discretionary review. The City, as Lead Agency, has determined the Project is subject to the California Environmental Quality Act (CEQA) and that the preparation of an Initial Study is required.

This Initial Study evaluates the potential environmental effects that could result from the construction, implementation, and operation of the Project. This Initial Study has been prepared in accordance with CEQA (Public Resources Code [PRC] Section 21000 et seq.), the State CEQA Guidelines (Title 14, California Code of Regulations Section 15000 et seq.), and the 2006 L.A. CEQA Thresholds Guide. The City uses Appendix G of the State CEQA Guidelines as the thresholds of significance unless another threshold of significance is expressly identified in the document. Based on the analysis provided within this Initial Study, the City has concluded the Project may result in significant impacts on the environment, and the preparation of an Environmental Impact Report (EIR) is required. This Initial Study and the forthcoming EIR are intended as informational documents, which are ultimately required to be considered and certified by the decision-making body of the City prior to approval of the Project.

1.1 PURPOSE OF AN INITIAL STUDY

CEQA was enacted in 1970 with several basic purposes, including: (1) to inform governmental decision makers and the public about the potential significant environmental effects of proposed projects; (2) to identify ways that environmental damage can be avoided or significantly reduced; (3) to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of feasible alternatives or mitigation measures; and (4) to disclose to the public the reasons behind a project's approval even if significant environmental effects are anticipated.

An Initial Study is a preliminary analysis conducted by the Lead Agency, in consultation with other agencies (responsible or trustee agencies, as applicable), to determine whether there is substantial evidence that a project may have a significant effect on the environment. If the Initial Study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, the Lead Agency shall prepare a Negative Declaration. If the Initial Study identifies potentially significant effects but revisions have been made by or agreed to by the applicant that would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, a Mitigated Negative Declaration is appropriate. If the Initial Study concludes that neither a Negative Declaration or Mitigated Negative Declaration is appropriate, an EIR is normally required.[1]

[1] CEQA Guidelines Section 15063(b)(1) identifies the following three options for the Lead Agency when there is substantial evidence that the project may cause a significant effect on the environment: "(A) Prepare an EIR, or (B) Use a previously prepared EIR which the Lead Agency determines would adequately analyze the project at hand, or (C) Determine, pursuant to a program EIR, tiering, or another appropriate process, which of a project's effects were adequately examined by an earlier EIR or negative declaration.

1.2 ORGANIZATION OF THE INITIAL STUDY

This Initial Study is organized into sections as follows:

1. INTRODUCTION

Describes the purpose and content of the Initial Study and provides an overview of the CEQA process.

2. EXECUTIVE SUMMARY

Provides Project information, identifies key areas of environmental concern, and includes a determination whether the project may have a significant effect on the environment.

3. PROJECT DESCRIPTION

Provides a description of the environmental setting and the Project, including project characteristics and a list of discretionary actions.

4. EVALUATION OF ENVIRONMENTAL IMPACTS

Contains the completed Initial Study Checklist and discussion of the environmental factors that would be potentially affected by the Project.

1.3 CEQA PROCESS

Below is a general overview of the CEQA process. The CEQA process is guided by the CEQA statutes and guidelines, which can be found on the State of California's website (http://resources.ca.gov/ceqa).

1.3.1 Initial Study

At the onset of the Project's environmental review process, the City has prepared this Initial Study to determine if the Project may have a significant effect on the environment. This Initial Study has determined that the Project may have a significant effect(s) on the environment and an EIR will be prepared.

A Notice of Preparation (NOP) is prepared to notify public agencies and the general public that the Lead Agency is starting the preparation of an EIR for the proposed project. The NOP and Initial Study are circulated for a 30-day review and comment period. During this review period, the Lead Agency requests comments from agencies and the public on the scope and content of the environmental information to be included in the EIR. After the close of the 30-day review and comment period, the Lead Agency continues the preparation of the Draft EIR and any associated technical studies, which may be expanded in consideration of the comments received on the NOP.

1.3.2 Draft EIR

Once the Draft EIR is complete, a Notice of Completion and Availability is prepared to inform public agencies and the general public of the availability of the document and the locations where the document can be reviewed. The Draft EIR and Notice of Availability are circulated for a 45-day review and comment period. The purpose of this review and comment period is to provide public agencies and the general public an opportunity to review the Draft EIR and comment on the adequacy of the document, including the analysis of environmental effects, the mitigation measures presented to reduce potentially significant impacts, and the alternatives analysis. After the close of the 45-day review and comment period, responses to all comments on environmental issues received during the comment period are prepared.

1.3.3 Final EIR

The lead agency prepares a Final EIR, which incorporates the Draft EIR or any revisions to the Draft EIR, comments received on the Draft EIR and list of commenters, and responses to significant environmental points raised in the review and consultation process.

The decision-making body then considers the Final EIR, together with any comments received during the public review process, and may certify the Final EIR and approve the Project. In addition, when approving a project for which an EIR has been prepared, the Lead Agency must prepare findings for each significant effect identified, a statement of overriding considerations if there are significant impacts that cannot be mitigated, and a mitigation monitoring and reporting program.

2 EXECUTIVE SUMMARY

PROJECT TITLE	**130 College Project**
ENVIRONMENTAL CASE NO.	ENV-2023-2307-EIR
RELATED CASES	CPC-2023-2306-GPA-VZC-HD-MCUP-SPR; VTT-84059-CN

PROJECT LOCATION	110–130 West College Street, 117–119 West Bruno Street, and 943–973 North Main Street, Los Angeles, CA 90012
COMMUNITY PLAN AREA	Central City North
GENERAL PLAN DESIGNATION	Regional Commercial
ZONING	[Q]C2-2-RIO and [T][Q]C2-2-RIO
COUNCIL DISTRICT	1—Hernandez

LEAD CITY AGENCY	**City of Los Angeles**
CITY DEPARTMENT	Department of City Planning
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APPLICANT	**S&R PARTNERS, LLC C/O GRANITE PROPERTIES**
ADDRESS	5601 Granite Parkway, Suite 1200 Plano, TX 75024-6746
PHONE NUMBER	(214) 205-4255

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION

On the basis of this initial evaluation:

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

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

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

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

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

Michael Gatheru, Planning Assistant	June 4, 2024
PRINTED NAME, TITLE	**DATE**

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less that significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of a mitigation measure has reduced an effect from "Potentially Significant Impact" to "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analysis," as described in (5) below, may be cross referenced).

5) Earlier analysis must be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR, or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated

7) Supporting Information Sources: A sources list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whichever format is selected.

9) The explanation of each issue should identify:

   a) The significance criteria or threshold, if any, used to evaluate each question; and

   b) The mitigation measure identified, if any, to reduce the impact to less than significance.

3 PROJECT DESCRIPTION

3.1 PROJECT SUMMARY

The 130 College Project (Project) proposes the demolition of an existing surface parking lot to construct a new five-story with one mezzanine parking level, 232,802-square-foot commercial development consisting of 224,597 square feet of office uses, 4,095 square feet of restaurant use, and 4,110 square feet of retail uses, with a floor area ratio (FAR) of approximately 2.42:1 and a maximum height of 88 feet from grade to the top of the mechanical penthouse on an approximately 2.2-acre site (Project Site) in the Central City North Community Plan area of the City of Los Angeles (City). The Project would also include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in Sections 12.03 and 12.21.1-A(5) of the Los Angeles Municipal Code (LAMC), but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis.[2] As such, for the purpose of this environmental analysis, the Project would include the 1,799 square feet of the outdoor uncovered dining area which would total 5,894 square feet of ground floor restaurant space. The Project would have a maximum height of five stories, comprised of a podium with one level of at-grade parking and one mezzanine level of above-grade parking (both podium levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages and new street trees along College Street where primary vehicle access would be provided), and four levels of office uses above, and with a height of approximately 88 feet measured from grade to the top of the mechanical penthouse consistent with LAMC Sections 12.03 and 12.21.1.B.3. The Project would include approximately 52,716 square feet of outdoor areas.

3.2 ENVIRONMENTAL SETTING

3.2.1 Project Location

The Project Site is located at 110–130 West College Street, 117–119 West Bruno Street, and 943–973 North Main Street within the City's Central City North Community Plan, approximately 15 miles east of the Pacific Ocean. As shown in Figure 1 on page 8 of this Initial Study, the Project Site is bounded by West College Street to the north, North Main Street to the east, Bruno Street to the south, and North Alameda Street to the west.

Local access to the Project Site is provided by West College Street located north of the Project Site, North Main Street located west of the Project Site and North Alameda Street located west of the Project Site. Regional access to the Project Site is provided by the Arroyo Seco Parkway/Harbor Freeway (I-110), the Hollywood Freeway (US-101), and the Golden State Freeway (I-5), which are within approximately one mile of the Project Site. The Project Site is served by a variety of public

[2] LAMC Section 12.03 defines floor area as "[t]he area in square feet confined within the exterior walls of a Building, but not including the area of the following: exterior walls, stairways, shafts, rooms housing Building-operating equipment or machinery, parking areas with associated driveways and ramps, space dedicated to bicycle parking, space for the landing and storage of helicopters, and Basement storage areas." LAMC Section 12.21.1-A(5) further states that: "In computing the total floor area within a building, the gross area confined within the exterior walls within a building shall be considered as the floor area of that building, except for the space devoted to bicycle parking, stairways, elevator shafts, light courts, rooms housing mechanical equipment incidental to the operation of buildings, and outdoor eating areas of ground floor restaurants."



Figure 1
Project Location Map

Source: ArcGIS, 2023; Eyestone Environmental, 2023.

transit options, including a number of local and regional bus lines serviced by the Los Angeles County Metropolitan Transit Authority (Metro) and the Los Angeles Department of Transportation (LADOT) that provide connections to Downtown subway stations. In particular, the Project Site is located 0.15 miles southwest of the Metro A Line, which is served by the Chinatown Station located directly across the street from the Project Site on the northwestern corner of the intersection of West College Street and North Spring Street. The Project Site is also located adjacent to stops for Metro Lines 70 and 76, DASH Lincoln Heights/Chinatown route, DASH Downtown Routes A, B, D, and E, and Santa Clarita Transit Lines 794 and 799. Moreover, the Project Site is located approximately 0.5 miles north of Union Station along Alameda Street, which is a hub for all major public transit lines for the region.

3.2.2 Existing Conditions

As shown in the aerial photograph provided in Figure 2 on page 10, the Project Site is currently developed with a surface asphalt parking lot used for bus storage. There are no buildings or landscaping within the Project Site but there is a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. The Project Site is relatively flat. There are no trees on the Project Site. There are two street trees surrounding the Project Site, both of which are located along Alameda Street. The two street trees consist of various non-native species. Based on the Tree Inventory Report included in Appendix IS-1 of this Initial Study, none of the street trees are "significant" or protected trees as defined by the City of Los Angeles Protected Tree and Shrubs Ordinance No. 186,873.[3,4]

The Project Site is located within the Central City North Community Plan area. On May 3, 2023, the City Council adopted the first reading of the Downtown Community Plan Update (DTLA 2040) Plan, which is a combined update to the Central City and Central City North Community Plans. The City Attorney will review and finalize the implementing ordinances to ensure clarity of regulations and consistency with State law. After the City Attorney review process is complete, the City Council will consider and vote on the DTLA 2040 Plan implementing ordinances, which if adopted, will then go into effect. As such, the Central City North Community Plan is still the operative land use document for the Project Site, and therefore, DTLA 2040 is not applicable to the Project or Project Site. The Project Site is designated as Regional Commercial and is zoned as [Q]C2-2-RIO and [T][Q]C2-2-RIO (Qualified Classification, Commercial Zone, Height District 2, River Improvement Overlay District; and Tentative Zone Classification, Qualified Classification, Commercial Zone, Height District 2, River Improvement Overlay District, respectively).

The C2 Zone allows for a wide range of commercial land uses, including, but not limited to, the Project's proposed office, restaurant, and retail uses. The "2" in the Project Site's zoning designation refers to the Project Site's location in Height District No. 2. Height District No. 2 allows a 6:1 FAR and

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[3] Dudek, 130 West College Street Project, City of Los Angeles, California 90012—City of Los Angeles Tree Inventory Report, January 2023. See Appendix IS-1 of this Initial Study.

[4] Pursuant to City Ordinance No. 186,873 and as defined in LAMC Section 17.02, a protected tree or shrub includes any of the following Southern California indigenous tree species, which measure four inches or more in cumulative diameter, four and one-half feet above the ground level at the base of the tree, or any of the following Southern California indigenous shrub species, which measure four inches or more in cumulative diameter, four and one-half feet above the ground level at the base of the shrub: Oak tree; Southern California Black Walnut tree; Western Sycamore tree; California Bay tree; Mexican Elderberry shrub; and Toyon shrub.

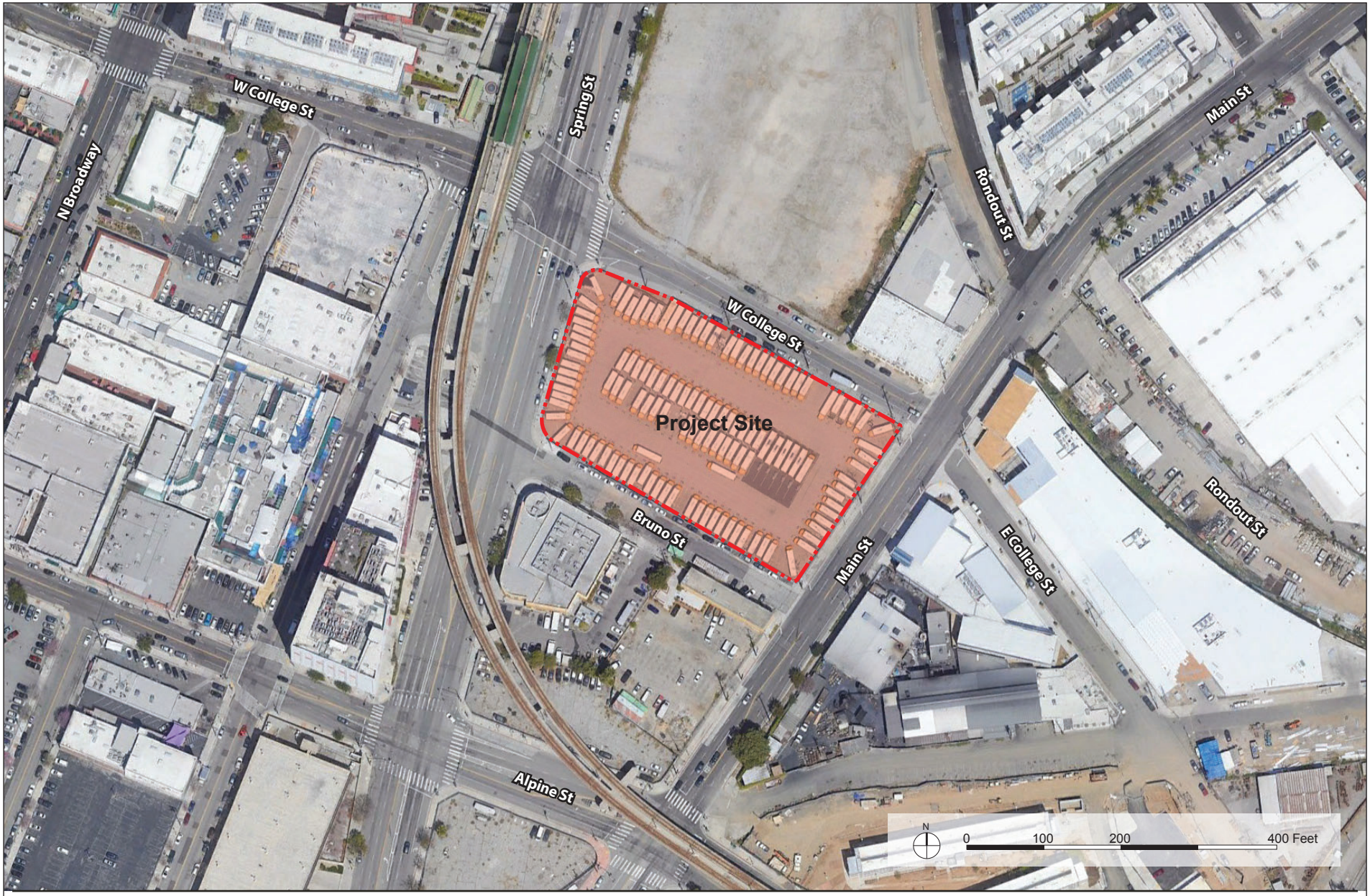


Figure 2

Aerial Photograph of the Project Vicinity

Source: Google Earth Pro, 2023; Eyestone Environmental, 2023.

does not limit building height;[5] however, the Property's "Q" Condition in Ordinance No. 163,510, which applies to the eastern portion of the Property, and Ordinance No. 164,855, which applies to the western portion of the Property, limit the FAR for commercial projects to 1.5:1. The "T" Condition in Ordinance No. 163,510 identifies certain on- and off-site improvement requirements that were imposed as part of, and specific to, a proposed hotel development that was never built, associated with City Planning Case Nos. CPC-1987-350-ZC, ZA-1986-974-CUB, and MND-86-441-CUZ-CU-ZV.

The "RIO" in the Project Site's zoning designation refers to the Project Site's location in the Los Angeles River Improvement Overlay Zone. The RIO does not impose any use, FAR, height, or setback restrictions or standards. Pursuant to LAMC Section 13.17, projects in the Los Angeles River's Outer Core that are not adjacent to the river, including the Project, are required to comply with various screening standards and required to utilize native California plant species in all landscaped areas. As such the the Project would comply with the requirements set forth in LAMC Section 13.17.

The Project Site is also identified by the City in the Zoning Information and Map Access System (ZIMAS) as being in a Transit Priority Area (TPA) as defined by Senate Bill (SB) 743 and the City Zoning Information File (ZI) No. 2452.[6] As described above, the Project Site is located within 0.5 miles of a variety of existing and planned public transit options including the Metro A Line Chinatown Station located directly across the street from the Project Site, and Union Station along Alameda Street served by Amtrak, Metrolink, Metro, LADOT and other local and regional transit agencies.

3.2.3 Surrounding Land Uses

The area surrounding the Project Site is urbanized and includes a mix of low to mid rise buildings containing a variety of industrial, commercial, and residential uses. The surrounding properties are generally zoned C2, which is consistent with the zoning of the Project Site. Directly north of the Project Site, across College Street, includes several parcels zoned as (T)(Q)C2-2-UC(CA) and UC(CA) that are developed with a surface level parking lot with proposals for future mixed-use development and an existing low-rise industrial building, respectively. To the east of the Project Site, across Main Street, are additional properties zoned as UC(CA) and includes existing industrial buildings and a multi-level self-storage facility. To the west of the Project Site, across Almeda Street, are land zoned as C2-2 and comprised of the Metro Light Rail Overpass, which includes the Metro A Line, along with office and residential developments. To the south of the Project Site is land zoned as [Q]C2-2-RIO, and includes additional industrial buildings and another surface parking lot. Additionally, the Granite Block Paving, City Historic Cultural Monument (HCM) #211, is located on Bruno Street adjacent to the Project Site.[7]

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5 FAR and height restrictions can be found at LAMC Section 12.21.1.A.1.

6 SB 743 established new rules for evaluating aesthetic and parking impacts under CEQA for certain types of projects. Specifically, PRC Section 21099(d) states: "Aesthetic and parking impacts of a residential, mixed-use residential, or employment center on an infill site within a TPA shall not be considered significant impacts on the environment." TPAs are areas within 0.5 miles of a major transit stop that are existing or planned. The Project is an employment center project on an infill site within a TPA. Thus, in accordance with SB 743 and the City's ZI No. 2452, the Project's aesthetic and parking impacts are not considered significant as a matter of law.

7 The historical road segment known as the Granite Paving Block (HCM No. 211) was originally designated as an HCM on March 7, 1979. The designation recognizes the significance as a rare example of hand-hewn granite block paving dating from the early 1900s in Los Angeles.

3.3 DESCRIPTION OF PROJECT

3.3.1 Project Overview

As noted in Section 3.1 of this Initial Study, above, the Project proposes the demolition of an existing surface parking lot to construct a new five-story infill commercial project. As detailed in Table 1, on page 13 of this Initial Study, the Project would develop approximately 232,802 square feet of new uses, comprised of 224,597 square feet of office uses, 4,095 square feet of restaurant uses, and 4,110 square feet of retail uses, resulting in a FAR of approximately 2.42:1. As also described in Section 3.1 of this Initial Study, above, the Project would include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the LAMC, but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for the purpose of this environmental analysis, the Project would include 5,894 square feet of ground floor restaurant space. The Project would have five stories comprised of a podium with one level of at-grade parking and one mezzanine level of above-grade parking (both podium levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages and new street trees along College Street where primary vehicle access would be provided), and four levels of office uses above, and 88 feet measured from grade to the top of the mechanical penthouse. The Project would include a total of 52,716 square feet of outdoor areas. Approximately 440 vehicular parking spaces would be provided for the Project's proposed uses. Additionally, utility lines for water, sewer, and electric services will require as many as seven trenches be excavated to complete installations that tie-into the nearest existing lines, which are located beneath roads and sidewalks that are outside the direct footprint of the Project Site. For the electrical circuits, Project construction may require existing overhead lines to be placed below ground in trenches. The Project Site is currently occupied by a surface asphalt parking lot, billboard, shipping container, lighting, six electric bus chargers, and fencing, all of which would be demolished to accommodate the Project. A ground floor plan is provided in Figure 3 on page 14 of this Initial Study.

3.3.2 Design and Architecture

The Project includes a five-story building, conceived as a series of three stacked massings that progressively step back from Bruno Street as it rises. As illustrated in Figure 4 through Figure 6 on pages 15 through 17, the Project's architectural concept is a series of cascading terraces that recede into the Project Site from the Bruno Street frontage, by which each terrace provides more open air exposure as the building increases in height.

The Project's proposed retail and restaurant uses would be located on the ground floor to improve the pedestrian environment, and the ceilings within these uses would extend to take up the floor above the ground level. Specifically, the Project's proposed restaurant uses would be located along the corner of Alameda Street and College Street and the retail uses would be located along Main Street near the corner of Main Street and College Street. Pedestrian access to these uses would be provided via two entries on Alameda Street and two entries on Main Street.

Most of the 224,597 square feet of office uses would be located on the Project's upper levels consisting of Levels 2 through 5. The office uses would include a lobby on the ground floor with pedestrian access from Alameda Street and Bruno Street and both interior and exterior work spaces

Table 1
Summary of Existing and Proposed Floor Area[a]

Land Use	Floor Area
Existing (All to Be Removed)	
Surface Parking Lot	0 sf
Total Existing Floor Area to Be Removed	*0 sf*
New Construction (per LAMC)	
General Office	224,597 sf
Restaurant	4,095 sf
Retail	4,110 sf
Total New Construction	*232,802 sf*
Total Floor Area Upon Completion (LAMC)	**232,802 sf**
New Construction (Non-LAMC)[b]	
Restaurant (Outdoor Uncovered Seating)	1,799 sf
Total Square Footage Upon Completion (Non-LAMC)	**234,601 sf**

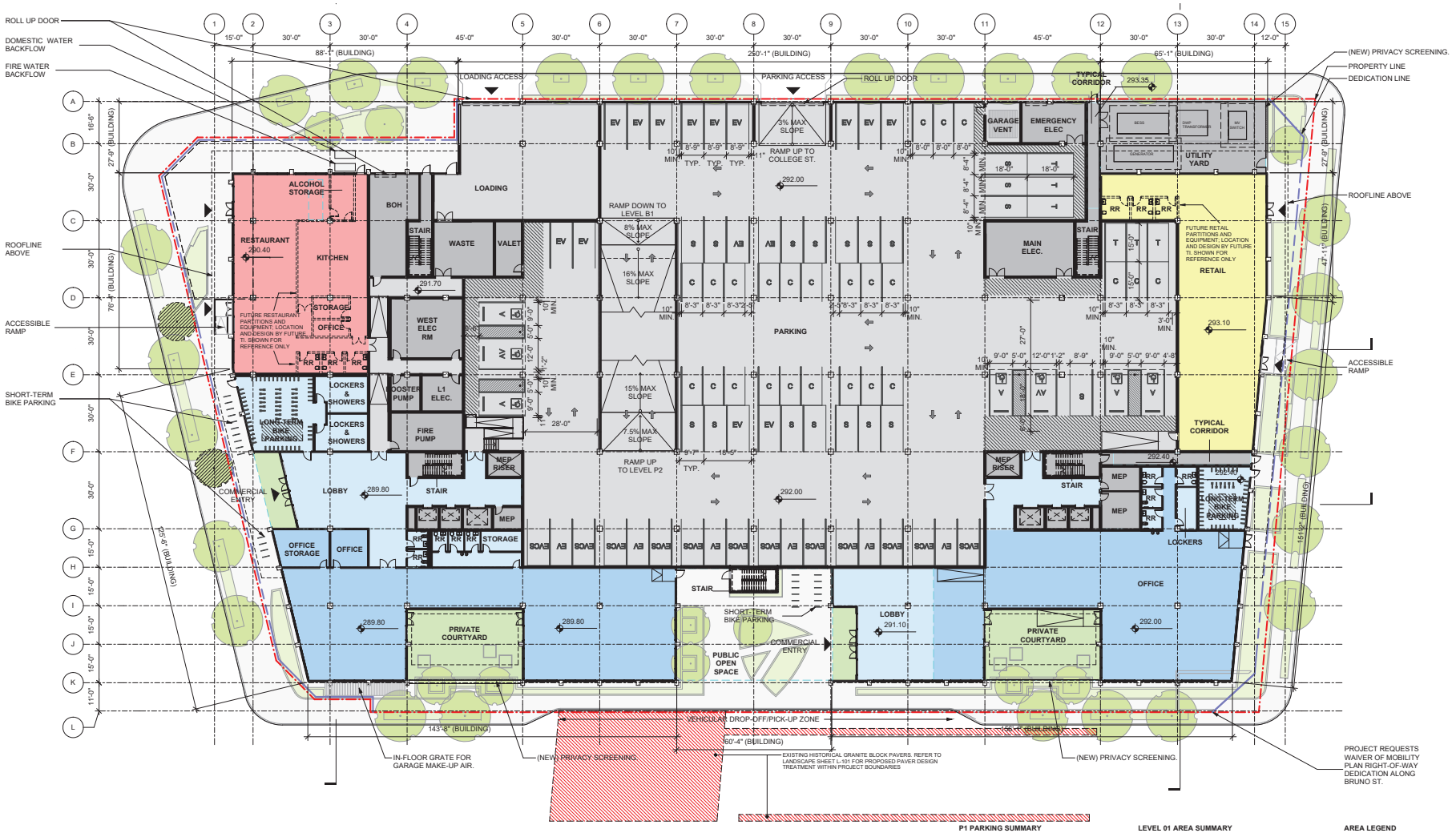
sf = square feet

[a] *Square footage is calculated pursuant to the LAMC definition of floor area for the purpose of calculating FAR. In accordance with LAMC Section 12.03, floor area is defined as "[t]he area in square feet confined within the exterior walls of a building, but not including the area of the following: exterior walls, stairways, shafts, rooms housing building-operating equipment or machinery, parking areas with associated driveways and ramps, space for the landing and storage of helicopters, and basement storage areas."*

[b] *The Project would include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the LAMC, but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of this environmental analysis, the Project would include 5,894 square feet of restaurant space.*

Source: Eyestone Environmental, 2024.

totaling approximately 20,018 square feet, programmed along Bruno Street between Alameda and Main Streets. These exterior work spaces include tenant courtyard spaces that would incorporate privacy screening. The office use would also include an outdoor amenity terrace for visitors and occupants totaling 6,243 square feet that would separate the Project into two different sections on Level 2. Floors above Level 2 would continue to be divided leaving a gap in the middle of the Project. Levels 2 and above include exterior covered workspaces that face Bruno Street. Solar panels would be provided within a rooftop structure (the area beneath this rooftop structure would not be occupiable) and a landscaped green roof would be provided over a portion of the proposed parking structure along College Street.



P1 PARKING SUMMARY

TYPE	STALLS
CAR ACCESSIBLE (A)	5
COMPACT (C)	24
EV CAPABLE (EV)	21
EV CHARGING STALLS (EVCS)	12
STANDARD (S)	18
TANDEM (T)	6
VAN ACCESSIBLE (AV)	2
TOTAL STALLS	88

LEVEL 01 AREA SUMMARY

TYPE	AREA
EXTERIOR COVERED SPACE	3,398 SF
OFFICE	17,498 SF
RESTAURANT	4,113 SF
RETAIL	4,132 SF
TOTAL FLOOR AREA	29,141 SF

AREA LEGEND

- OFFICE
- EXTERIOR COVERED SPACE
- RETAIL
- RESTAURANT
- BACK OF HOUSE/PARKING

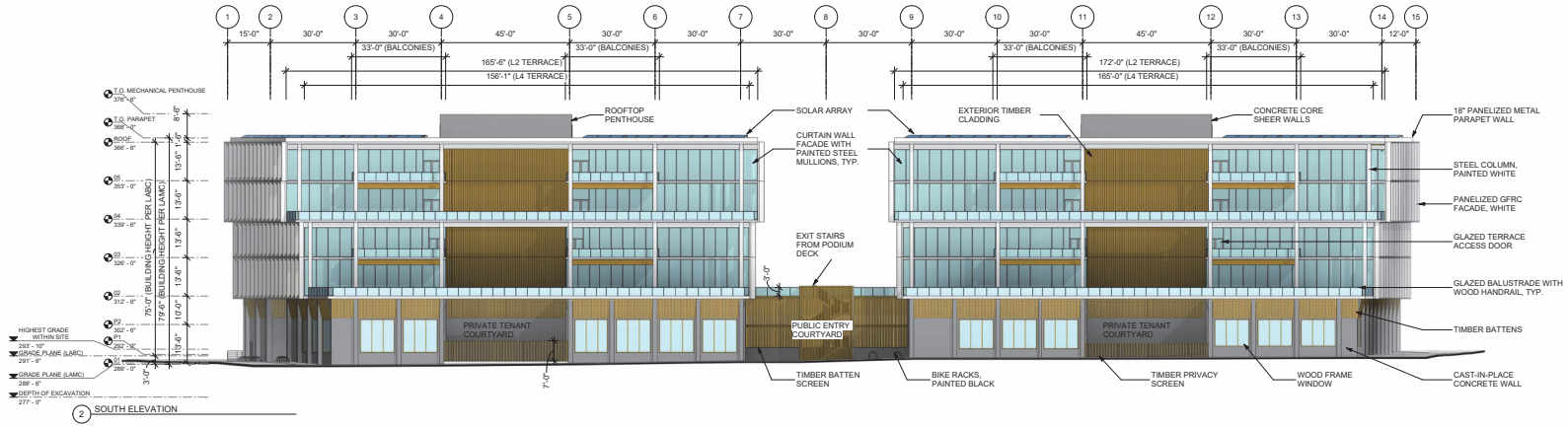
Figure 3
1st Floor Site Plan

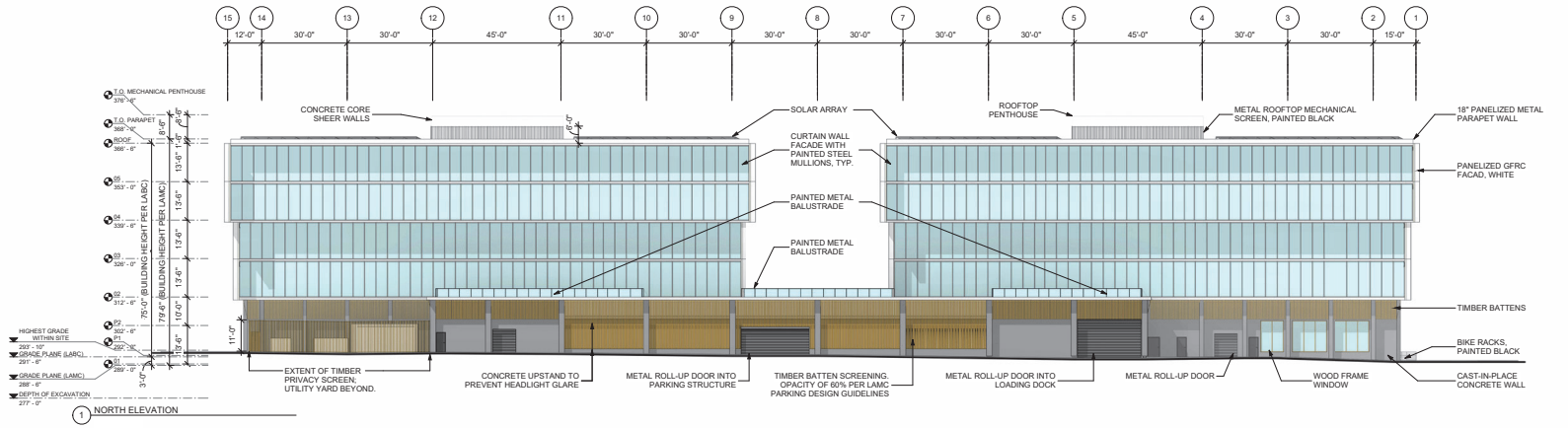
Source: Grimshaw Architects LLC, 2024.



Figure 4
Conceptual Rendering

Source: Grimshaw Architects LLC, 2024.





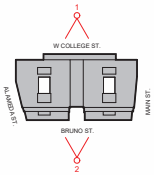
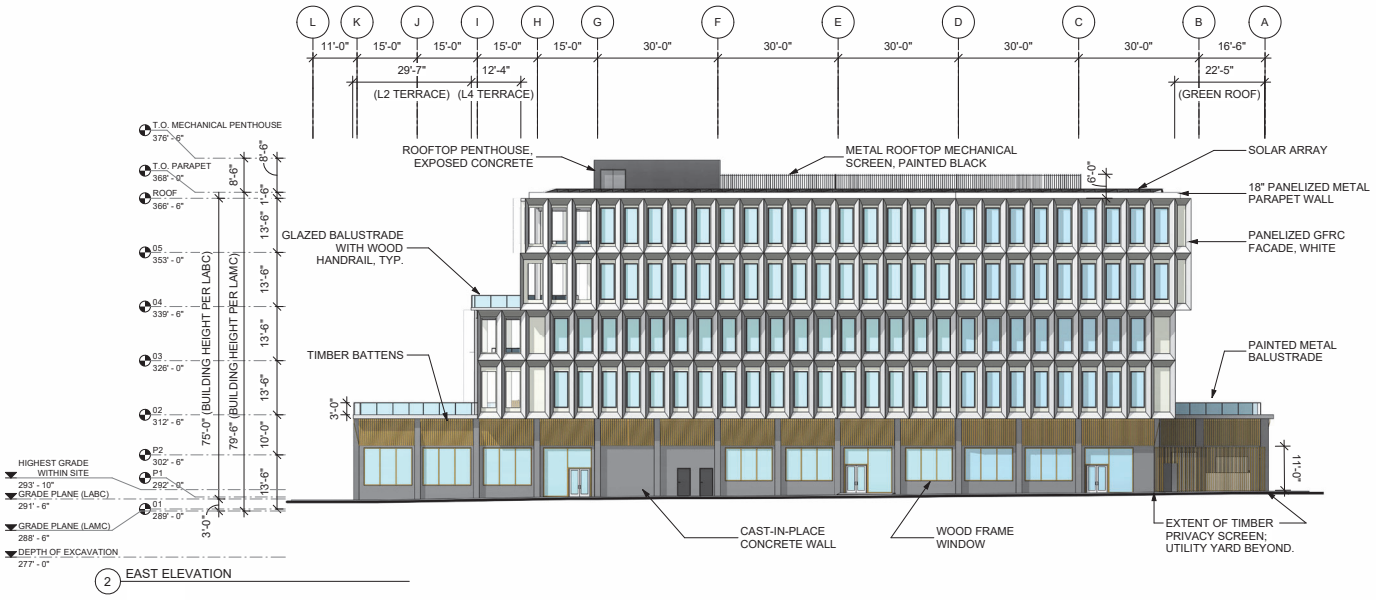
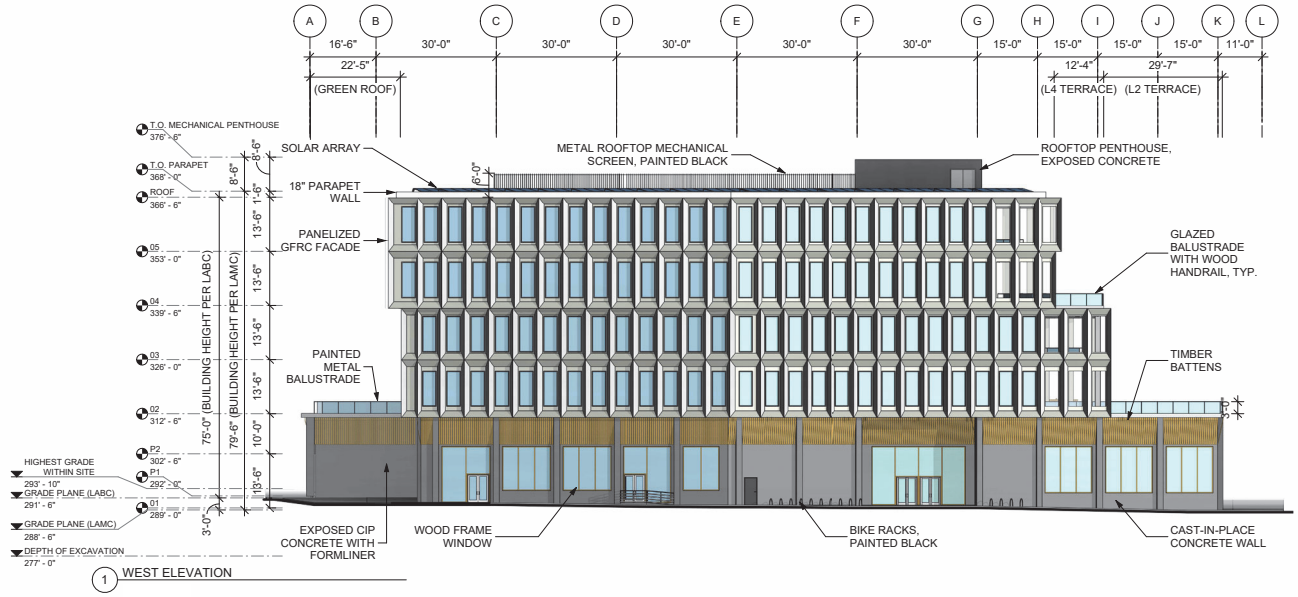


Figure 5
North-South Elevations

Source: Grimshaw Architects LLC, 2024.





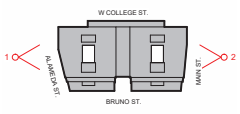


Figure 6
East-West Elevations

Source: Grimshaw Architects LLC, 2024.

Figure 4 on page 15 of this Initial Study provides a conceptual rendering of the Project. As shown, the Project's proposed design provides variable massing, materiality, and texture on the public facing street façades. Materials that are used in the Project's façades include glazed panels, timber battens, textured concrete, and planted green walls. Internally, the Project would utilize a hybrid mass timber structural approach, specifically with cross laminated timber floor and ceiling, along with ample provision for biophilic design including the integration of native plantings and lush landscaping in both the interior workspace as well as the various exterior communal terraces facing the public realm.

3.3.3 Outdoor Areas and Landscaping

As a commercial development, the Project is not required to provide open space in accordance with the LAMC. However, the Project would nonetheless provide landscaping and outdoor areas to enhance the public realm, create more effective transitions between off-site and on-site uses, and provide useable outdoor areas on-site. The Project would have approximately 52,716 square feet of outdoor areas on-site with 33,776 square feet of hardscaping and 18,940 square feet of landscaping. Additionally, the Project proposes approximately 13,575 square feet of exterior space, of which 11,217 square feet is hardscape accessible to the public and 2,358 square feet of landscaping within the public right-of-way at the sidewalk areas adjacent to the Project Site. In total, the Project would provide approximately 28,126 square feet of publicly accessible hardscape and landscape area on- and off-site.

The Project would also enhance the public realm through streetscape improvements that would create a cohesive visual identity for the Project Site. Specifically, the Project would include new landscaping along North Alameda Street, West College Street, North Main Street, and Bruno Street. These perimeter areas would include landscaping such as street trees and shrubs. In addition, the Project would include a landscaped amenity terrace at the second level of the office building, which would create a building break, create a connection between the office levels above the podium, and provide pedestrian circulation, as well as ample open space for use by employees. Additionally, a portion of the terraces provided on Level 3 through 5 facing Bruno Street would be covered.

As mentioned above, exterior covered workspace would be located throughout the Project's office levels and facing Bruno Street. Other outdoor amenities within the Project would include a street plaza and garden which would both be located on the ground floor. The street plaza would be located on the corner of North Alameda Street and West College Street. The street plaza would include an entrance to the Project, outdoor seating, a raised planter, and bicycle parking. The garden would be located near the entrance of the Project along Bruno Street with egress stairs, raised planters, and architectural screening. The Level 2 amenity terrace will contain a valley garden with more raised planters and lounge and movable seating.

The Project would include a cohesive plant palette to be used along the streetscape, within the valley garden, and within the exterior covered workspaces. Plantings would include resilient, drought-tolerant native and adaptive tree, shrub, and groundcover species, including shade trees. The two existing street trees along Alameda Street would be retained as part of the Project. In addition, the Project would plant a total of 67 trees, of which 38 would be located within the Project Site and 29 would be located within the adjacent right-of-way.

3.3.4 Access, Circulation, and Parking

Vehicular and loading access to the Project Site would be provided by two driveways located along West College Street. The driveway closer to the western section of the Project Site along West College Street would be exclusively for loading access, while the other driveway would be the only entrance that would serve to access the Project's parking garage. A passenger drop-off and pick-up area would also be provided along Bruno Street, which is designed to preserve the Granite Block Paving (HCM #211) along Bruno Street consistent with City Planning policy.[8]

The Project is not required to provide a minimum amount of parking pursuant to Assembly Bill (AB) 2097, which is a State law that prohibits public agencies or cities from imposing a minimum automobile parking requirement on most development projects, including commercial developments like the Project, located within a half-mile radius of a major transit stop.[9] However, the Project would provide approximately 440 vehicle parking spaces within one subterranean level, one ground level, and one above ground (mezzanine) level (the at-grade and above-grade parking levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages and screened with timber battens along College Street).

Additionally, the Project is required to provide 75 bicycle parking spaces pursuant to the LAMC 12.21 A.16(a)(2) for the Project's uses, however the Project would provide approximately 149 bicycle parking spaces, comprised of 123 long-term spaces and 26 short-term spaces, to meet the LAMC 12.21 A.16(a)(2)requirement.

3.3.5 Lighting and Signage

All Project lighting would comply with current energy standards and codes (i.e., California Code of Regulations, Title 24, Part 11; referred to as the CALGreen Code) in effect at the time of construction while providing sufficient light levels to accent signage, architectural features, and landscaping elements. Light sources would be shielded and/or directed toward the Project Site to minimize light spill-over to neighboring properties and the surrounding area while utilizing low-level exterior lights at the site perimeter, as needed, for aesthetic, security, and wayfinding purposes. Additionally, new street and pedestrian lighting within the public right-of-way would provide appropriate and safe lighting levels on both sidewalks and roadways, while minimizing light and glare on adjacent properties, in compliance with applicable City regulations and with approval by the City's Bureau of Street Lighting. Glass in building façades would be selected for qualities such as low reflectivity to reduce glare; energy efficiency to limit solar heat gain; and high visibility for adequate light transmission.

New Project signage would be integrated with and complement the overall aesthetic character of the proposed on-site development and surroundings. Project signage could include general ground-level and wayfinding pedestrian signage around the Project Site perimeter, building identification signs, marquee and monument signs, pillar and pole signs, banners, and other sign types such as on-site

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8 A City Planning memorandum to the City's Department of Public Works, dated August 14, 2007, states that: "Under no circumstances, is the granite paving to be removed or covered in asphalt."

9 City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

wall signs, internal digital on-site signage, and mural. Project signage may include both externally and internally lit signs, and LAMC illumination regulations would apply.

3.3.6 Sustainability Features

The Project would support environmental sustainability by incorporating sustainable building features and construction protocols required by the Los Angeles Green Building Code (LAMC Chapter IX, Article 9), the CALGreen Code, and the California Building Energy Efficiency Standards (California Code of Regulations, Title 24, Part 6; referred to as the California Energy Code). Both in compliance with and, in some cases, in exceedance of the aforementioned Code requirements, a number of specific sustainable design components would be incorporated into the Project, such as: Energy Star appliances; solar panels; plumbing fixtures and fittings that comply with the performance requirements specified in the Los Angeles Green Building Code; weather-based irrigation systems; water-efficient plantings with drought-tolerant species; shade trees in public areas; green walls in some outdoor areas; vegetated roofs to help reduce energy use; short- and long-term bicycle parking; storm water capture; pedestrian-first design, employment and commercial activity center near various public transit stops, use of daylighting where feasible; and energy-efficient lighting. For example, the Project would include a 500 kilowatt (kw) solar system with two 250 kw inverters. Such measures would address energy conservation, water conservation, and waste reduction and will be further defined in the EIR to be prepared for the Project.

3.3.7 Anticipated Construction Schedule

Project construction would begin with the demolition of the existing surface parking lot. The next phase would include grading and excavation for the subterranean parking level, which would extend to a depth of up to 17 feet below ground surface as measured from the north-east corner of the Project Site where the grade elevation is the highest. The foundation would then be laid, followed by building construction, and then finally paving and landscaping installation. Project construction is anticipated to be complete in 2028. It is estimated that approximately 67,686 cubic yards of soil would be excavated and would be hauled off the Project Site. Haul trucks would exit the Project Site from the Main Street, Alameda Street, or College Street frontages (haul trucks would not exit the Project Site, or travel along, Bruno Street) and either (1) turn left onto Main Street and continue on Main Street, turn right on Daly Street, then turn right onto Mission Road, turn left onto the I-5 South (San Bernadino Freeway) on-ramp, or (2) turn right onto Main Street, turn left onto Vignes Street, left onto Cesar Chavez Avenue, turn left onto Mission Road to access the I-5 South (San Bernadino Freeway) on-ramp. Empty trucks would take the I-10 West's Vignes Street exit (Exit 2A), then continue north on Vignes Street, then turn right on Main Street, turn into the Project Site from the Main Street, Alameda Street, or College Street frontages (empty trucks would not enter the Project from, or travel along, Bruno Street).

3.4 REQUESTED PERMITS AND APPROVALS

The list below includes the anticipated requests for approval of the Project. The EIR will analyze impacts associated with the Project and will provide environmental review sufficient for all necessary entitlements and public agency actions associated with the Project. The discretionary entitlements, reviews, permits and approvals required to implement the Project include, but are not necessarily limited to, the following:

- Pursuant to LAMC Section 11.5.6, a General Plan Amendment to amend Central City North Community Plan Footnote No. 7 to allow the FAR for commercial development at the Project Site to exceed 1.5:1;

- Pursuant to LAMC Sections 12.32 F and 12.32 Q a Vesting Zone and Height District Change to change the zoning for the Project Site from [Q]C2-2-RIO and [T][Q]C2-2-RIO to (T)(Q)C2-2D-RIO;

- Pursuant to LAMC Section 12.24 W.1, a Main Conditional Use Permit for the sale and dispensing of a full-line of alcohol beverages for on-site and off-site consumption within up to three (3) establishments, in connection with the proposed restaurant and retail spaces;

- Pursuant to LAMC Section 16.05, Site Plan Review for a development which creates, or results in an increase of, 50,000 gross square feet or more of nonresidential floor area;

- Pursuant to LAMC Sections 17.03 and 17.15, a Vesting Tentative Tract Map for the merger and re-subdivision of 14 lots into one (1) ground lot and 16 airspace lots, and approval of a haul route for 67,791 cubic yards of soil export; and

- Other discretionary and ministerial permits that may be deemed necessary, including, but not limited to, temporary street closure permits, grading permits, excavation permits, foundation permits, building permits, off-site or right-of-way encroachment permits, on-site and off-site tree removal permits, and sign permits.

3.5 RESPONSIBLE PUBLIC AGENCIES

A Responsible Agency under CEQA is a public agency with some discretionary authority over a project or a portion of it, but which has not been designated the Lead Agency (State CEQA Guidelines Section 15381). No responsible agency has been identified for the Project.

3.6 TRUSTEE AGENCIES

A Trustee Agency under CEQA is a State agency that has jurisdiction by law over natural resources affected by a project, that are held in trust for the people of the State of California (PRC Section 21070). To be considered a Trustee Agency for a project, the project must affect natural resources within the agency's jurisdiction (State CEQA Guidelines Section 15386).

According to ZIMAS, the Project Site is located within the Santa Monica Mountains Zone (SMMZ), as mapped by the Santa Monica Mountains Conservancy (SMMC) (PRC Section 33105). During environmental review for discretionary projects, the SMMC is considered a CEQA Trustee Agency over projects that will have an effect on natural resources found within the SMMZ boundaries.[10] As explained in Section II (Agriculture and Forest Resources), Section IV (Biological Resources), and Section X (Hydrology and Water Quality) of this Initial Study, below, the Project Site is located in an urbanized area and is currently developed with asphalt surface parking a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing, and, as such, does not contain any

[10] State of California, Department of Justice, Attorney General Advice Letter re Santa Monica Mountains Conservancy (SMMC) as Trustee Agency, July 26, 2021.

natural resources nor would the Project affect any natural resources over which the SMMC has jurisdiction.

Therefore, the Project would not have an effect on natural resources over which the SMMC has jurisdiction, and as such, the SMMC is not considered a Trustee Agency for the Project.

Nonetheless, in order to ensure that the SMMC agreed that the Project would not have an effect on natural resources over which the SMMC has jurisdiction, the Department of City Planning consulted with the SMMC, and the SMMC confirmed that they should not be considered a Trustee Agency for the Project.[11]

[11] E-mail message from Garrett Weinstein (SMMC) to Jason McCrea (Department of City Planning) on April 10, 2024, Subject: 130 College Street Project.

4 ENVIRONMENTAL IMPACT ANALYSIS

I. AESTHETICS

Senate Bill (SB) 743 (PRC Section 21099(d)) sets forth new guidelines for evaluating project transportation impacts under CEQA, as follows: "Aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area (TPA) shall not be considered significant impacts on the environment." PRC Section 21099 defines a "transit priority area" as an area within 0.5 miles of a major transit stop that is "existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations." PRC Section 21064.3 defines "major transit stop" as "a site containing an existing 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 periods." PRC Section 21099 defines an "employment center project" as "a project located on property zoned for commercial uses with a floor area ratio of no less than 0.75 and that is located within a transit priority area. PRC Section 21099 defines an "infill site" as a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses. This state law supersedes the aesthetic impact thresholds in the 2006 L.A. CEQA Thresholds Guide, including those established for aesthetics, obstruction of views, shading, and nighttime illumination.

The related City's Department of City Planning ZI File No. 2452 provides further instruction concerning the definition of transit priority projects and that "visual resources, aesthetic character, shade and shadow, light and glare, and scenic vistas or any other aesthetic impact as defined in the City's CEQA Threshold Guide shall not be considered an impact for infill projects within TPAs pursuant to CEQA."[12]

PRC Section 21099 applies to the Project as an employment center project on an infill site within a TPA. The Project is considered an employment center project because it is located on property that is zoned to permit commercial uses with a maximum FAR greater than 0.75. In addition, the Project Site is an infill site, as the term is defined in PRC Section 21099(a)(4), because the Project Site includes lots located within an urban area that has been previously developed. Lastly, the Project is located within a TPA, as that term is defined in PRC Section 21099(a)(7), because it is located within 0.5 miles of an existing "major transit stop." In particular, the Project Site is located within 0.5 miles of the Metro A Line, which is served by the Chinatown Station located directly across the street from the Project Site on the Northwestern corner of the intersection of West College Street and North Spring Street. The Project Site is also located adjacent to stops for Metro Lines 70 and 76, the DASH Lincoln Heights/Chinatown stop, DASH Downtown Routes A, B, D, and E, and Santa Clarita Transit Lines 794 and 799. Moreover, the Project Site is located approximately 0.5 miles north of Union Station along

[12] City of Los Angeles Department of City Planning, Zoning Information File ZA No. 2452, Transit Priority Areas (TPAs)/Exemptions to Aesthetics and Parking Within TPAs Pursuant to CEQA.

Alameda Street, which is a hub for all major public transit lines for the region. Therefore, in accordance with PRC Section 21099(d)(1), the Project is exempt from an analysis of aesthetic impacts. The analysis in this Initial Study (or in the EIR, if any aesthetic impact discussion is included), is for informational purposes only and not for determining whether the Project will result in significant impacts to the environment. Any aesthetic impact analysis in this Initial Study (or the EIR) is included to discuss what aesthetic impacts would occur from the Project if PRC Section 21099(d) was not in effect. As such, nothing in the aesthetic impact discussion in this Initial Study (or the EIR) shall trigger the need for any CEQA findings, CEQA analysis, or CEQA mitigation measures.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

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

Less Than Significant Impact. Pursuant to PRC Section 21099, the Project is an employment center project that would be located on an infill site within a TPA. Therefore, in accordance with PRC Section 21099(d)(1), the Project's aesthetic impacts shall not be considered significant impacts on the environment and therefore do not have to be evaluated under CEQA. As such, Project impacts to aesthetic resources would be less than significant and no further analysis is required.

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

Less Than Significant Impact. The Project Site is not located along a state scenic highway. The nearest eligible state scenic highway is Interstate 210 (I-210) between Interstate 5 and State Route (SR) 134, located approximately 7 miles northeast of the Project Site and the nearest designated state scenic highway is SR-2 north of Interstate 210, which is located outside the City, approximately

10 miles north of the Project Site.[13] Thus, the Project would not substantially damage scenic resources within a designated scenic highway as there are no scenic highways along the Project Site. Notwithstanding, as described above, pursuant to PRC Section 21099, the Project is an employment center project that would be located on an infill site within a TPA. Therefore, in accordance with PRC Section 21099(d)(1), the Project's aesthetic impacts shall not be considered significant impacts on the environment and therefore do not have to be evaluated under CEQA. As such, Project impacts to aesthetic resources would be less than significant and no further analysis is required.

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

Less Than Significant Impact. Pursuant to PRC Section 21099, the Project is an employment center project that would be located on an infill site within a TPA. Therefore, in accordance with PRC Section 21099(d)(1), the Project's aesthetic impacts shall not be considered significant impacts on the environment and therefore do not have to be evaluated under CEQA. As such, Project impacts to aesthetic resources would be less than significant and no further analysis is required.

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

Less Than Significant Impact. Pursuant to PRC Section 21099, the Project is an employment center project that would be located on an infill site within a TPA. Therefore, in accordance with PRC Section 21099(d)(1), the Project's aesthetic impacts shall not be considered significant impacts on the environment and therefore do not have to be evaluated under CEQA. As such, Project impacts to aesthetic resources would be less than significant and no further analysis is required.

II. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

[13] Caltrans, List of Designated and Eligible State Scenic Highways, August 2019.

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

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The Project Site is located in an urbanized area of the City. As discussed in Section 3, Project Description, of this Initial Study, the Project Site is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. No agricultural uses or operations occur on-site or in the vicinity of the Project Site. The Project Site and surrounding area are also not mapped as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency Department of Conservation.[14] As such, the Project would not convert farmland to a non-agricultural use. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

[14] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

No Impact. The Project Site is zoned as [Q]C2-2-RIO and [T][Q]C2-2-RIO. Pursuant to the LAMC, the C2 Zone permits a wide range of commercial uses including, but not limited to, the proposed office, restaurant, and retail uses.[15] The Project Site is not zoned for agricultural use. Furthermore, no agricultural zoning is present in the surrounding area. The Project Site and surrounding area are also not enrolled under a Williamson Act contract.[16] Therefore, the Project would not conflict with any zoning for agricultural uses or a Williamson Act contract. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. As discussed in Section 3, Project Description, of this Initial Study, the Project Site is located in an urbanized area and is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. The Project Site does not include any forest land or timberland. In addition, the Project Site is currently zoned for commercial uses and is not zoned for forest land and is not used as forest land.[17] Therefore, the Project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland as defined by the PRC. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. As discussed above, the Project Site is located in an urbanized area and does not include any forest land. Therefore, the Project would not result in the loss or conversion of forest land to non-forest use. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. As discussed above, the Project Site is located in an urbanized area of the City and does not include farmland or forest land. The Project Site and surrounding area are also not mapped as farmland or forest land, are not zoned for farmland/agricultural use or forest land, and do not contain any agricultural or forest uses.[18] As such, the Project would not result in the conversion of farmland to

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15 City of Los Angeles, Department of City Planning, Generalized Summary of Zoning Regulations, Table 1, Generalized Development Standards, updated March 2020.

16 California Department of Conservation, The Williamson Act Status Report 2020-2021.

17 City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

18 City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

non-agricultural use or in the conversion of forest land to non-forest use. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

III. AIR QUALITY

Where available, the significance criteria established by the South Coast Air Quality Management District (SCAQMD) may be relied upon to make the following determinations.

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

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

Potentially Significant Impact. The Project Site is located within the 6,700-square-mile South Coast Air Basin (Air Basin). Within the Air Basin, the South Coast Air Quality Management District (SCAQMD) is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the Basin is in non-attainment (i.e., ozone, particulate matter less than 2.5 microns in size [$PM_{2.5}$], and lead[19]). SCAQMD's 2022 Air Quality Management Plan (AQMP) contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, based on regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG). SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial Counties, and addresses regional issues relating to transportation, the economy, community development and the environment.[20] With regard to future growth, SCAG has prepared the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which provides population, housing, and employment projections for cities under its

[19] Partial Nonattainment designation for lead for the Los Angeles County portion of the Basin only.

[20] SCAG serves as the federally designated metropolitan planning organization (MPO) for the Southern California region.

jurisdiction. The growth projections in the RTP/SCS are based on growth projections in local general plans for jurisdictions in SCAG's planning area. Construction and operation of the Project would result in an increase in stationary and mobile source air emissions. As a result, development of the Project could have a potential adverse effect on SCAQMD's implementation of the AQMP. Therefore, the EIR will provide further analysis of the Project's consistency with SCAQMD's AQMP.

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

Potentially Significant Impact. As discussed above, construction and operation of the Project would result in the emission of air pollutants in the Air Basin, which is currently in non-attainment of federal air quality standards for ozone, $PM_{2.5}$ and lead, and state air quality standards for ozone, particulate matter less than 10 microns in size (PM_{10}), and $PM_{2.5}$. Construction related pollutants are typically associated with sources such as construction worker vehicle trips, trucks exporting debris or soil, operation of construction equipment, removal of the surface parking lot, site grading and preparation activities, and the application of architectural coatings. During Project operation, air pollutants would be emitted on a daily basis from motor vehicle travel, energy consumption, and other on-site activities. Therefore, implementation of the Project could potentially contribute to air quality impacts, which could cause a cumulative impact in the Air Basin. The EIR will provide further analysis of cumulative air pollutant emissions associated with the Project.

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

Potentially Significant Impact. According to the California Air Resources Board, sensitive receptors include children, the elderly, asthmatics, and others who are at a heightened risk of negative health outcomes due to exposure to air pollution. The locations where these sensitive receptors congregate are considered sensitive receptor locations. As discussed above, the Project could result in increased short- and long-term air pollutant emissions from the Project Site during construction (short-term) and operation (long-term). Sensitive receptors located in the vicinity of the Project Site include residential uses to the west and a proposed mixed-use development to the north. Therefore, the Project could expose sensitive receptors to additional pollutant concentrations and the EIR will provide further analysis of the Project's potential to result in substantial adverse impacts to sensitive receptors.

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

Less Than Significant Impact. No objectionable odors are anticipated as a result of either construction or operation of the Project. Specifically, construction of the Project would involve the use of conventional building materials typical of construction projects of similar type and size. Any odors that may be generated during construction would be localized and temporary in nature and would not be sufficient to affect a substantial number of people. With respect to Project operation, according to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. As a commercial development with office, restaurant, and retail uses, the Project would not involve the operation of uses typically associated with odor complaints. Additionally, on-site trash receptacles would be contained, located, and maintained in a manner that promotes odor control, and would not result in substantially adverse

odor impacts. Furthermore, construction and operation of the Project would comply with SCAQMD Rules 401, 402, and 403 which would reduce impacts related to visible emissions, public nuisance, and fugitive dust, respectively. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

IV. BIOLOGICAL RESOURCES

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

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

No Impact. The Project Site is located in an urbanized area and is currently developed with asphalt surface parking a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. There is no landscaping within the Project Site, though two street trees are located on N. Alameda Street adjacent to the Project Site. Due to the urbanized and disturbed nature of the Project Site and the surrounding areas, and lack of large expanses of open space areas, species likely to occur on-site are limited to small, common terrestrial and avian species typically found in urbanized developed settings. Based on the lack of habitat on and immediately surrounding the Project Site, as evidenced by the Project Site being currently developed with a surface parking lot and located in an urban setting, there is no evidence of any special status species listed by the California Department of Fish and Wildlife (CDFW)[21] or by the U.S. Fish and Wildlife Service (USFWS)[22] being present on-site. Furthermore, the Project Site is not located in or adjacent to a Biological Resource Area as defined by the City.[23] Therefore, the Project would not have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the CDFW or USFWS. No impact would occur, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

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

No Impact. The Project Site is located in an urbanized area and is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. No riparian or other sensitive natural community exists on the Project Site or in the surrounding area.[24,25] Furthermore, the Project Site and surroundings are not located in or adjacent to a Biological Resource Area or Significant Ecological Area as defined by the City or County of Los Angeles.[26,27] In addition, there are no other sensitive natural communities identified by the CDFW or the USFWS.[28,29,30] Therefore, the Project would not have a substantial adverse effect on any riparian

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21 California Department of Fish and Wildlife, California Natural Diversity Database, Special Animals List, August 2019.

22 United States Fish and Wildlife Service, ECOS Environmental Conservation Online System, Listed species believed to or known to occur in California, https://ecos.fws.gov/ecp0/reports/ad-hoc-species-report, accessed June 14, 2023.

23 City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, P. 2-18-4.

24 City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

25 United States Environmental Protection Agency, NEPAssist, https://nepassisttool.epa.gov/nepassist/nepamap.aspx, accessed June 14, 2023.

26 City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, P. 2-18-4.

27 Department of Regional Planning, Figure 9.3 Significant Ecological Areas and Coastal Resource Areas Policy Map, February 2015.

28 California Department of Fish and Wildlife, Biogeographic Information and Observation System (BIOS), https://apps.wildlife.ca.gov/bios/, accessed June 14, 2023.

29 California Department of Fish and Wildlife, CDFW Lands, https://apps.wildlife.ca.gov/lands/, accessed June 14, 2023.

30 United States Fish and Wildlife Service, National Wetlands Inventory, www.fws.gov/wetlands/data/Mapper.html, accessed June 14, 2023.

habitat or other sensitive natural community. No impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. As discussed above, the Project Site is located in an urbanized area and is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. No water bodies or State and federally protected wetlands exist on the Project Site.[31] In addition, construction of the Project would not result in the removal, filling, or other means of hydrological interruption since the Project Site is currently developed with surface parking and does not contain any surface hydrological features. As such, the Project would not have an adverse effect on State or federally protected wetlands. No impact would occur, and no mitigation measures are required. Therefore, no further evaluation of this topic in an EIR is required.

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

Less Than Significant Impact. As described above, the Project Site is located in an urbanized area and is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. In addition, the areas surrounding the Project Site are fully developed, and there are no large expanses of open space areas within and surrounding the Project Site that provide linkages to natural open spaces areas that may serve as wildlife corridors. Furthermore, the Project Site is not located in or adjacent to a Biological Resource Area or Significant Ecological Area as defined by the City or the County of Los Angeles.[32,33]

According to the Tree Inventory Report prepared for the Project by Dudek in January 2023 and included in Appendix IS-1 of this Initial Study, there are no trees located within the Project Site, and there are two non-protected street trees (i.e., Chinese flame trees) along the Project Site's Alameda Street frontage. The two street trees would be retained as part of the Project. Although they would be retained, the two street trees could potentially provide nesting sites for migratory birds which may be disturbed by Project construction. The Project would comply with the Migratory Bird Treaty Act, which prohibits the take, possession, import, export, transport, sale, purchase, barter, or offer for sale, purchase, or barter, of any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. Additionally, California Fish & Game Code Section 3503 (Section 3503) states that "[i]t is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." No exceptions are provided in the code and the CDFW has not promulgated

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31 United States Environmental Protection Agency, NEPAssist, https://nepassisttool.epa.gov/nepassist/nepamap.aspx, accessed June 14, 2023.

32 City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, P. 2-18-4.

33 Department of Regional Planning, Figure 9.3 Significant Ecological Areas and Coastal Resource Areas Policy Map, February 2015.

regulations interpreting these provisions. Regulatory compliance with the Migratory Bird Treaty Act and California Fish and Game Code would require that tree removal activities take place outside of the nesting season (February 1–August 31), to the extent feasible. In addition, should vegetation removal activities occur during the nesting season, a biological monitor would be present during the removal activities to ensure that no active nests would be impacted. If active nests are found, a buffer would be established until the fledglings have left the nest. Therefore, with compliance with the Migratory Bird Treaty Act, the Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (e.g., oak trees or California walnut woodlands)?

Less Than Significant Impact. The City's Protected Tree and Shrub Ordinance (Ordinance 186,873, LAMC Chapter IV, Article 6) regulates the relocation or removal of all Southern California native oak trees (excluding scrub oak), California black walnut trees, Western sycamore trees, California Bay trees, Mexican Elderberry shrubs, and Toyon shrubs of at least 4 inches in diameter at breast height or 4.5 feet above the ground level at the base of the tree or shrub. These tree and shrub species are defined as "protected" by the City. Trees or shrubs that have been planted as part of a tree planting program are exempt from the City's Protected Tree and Shrub Ordinance and are not considered protected. The City's Protected Tree and Shrub Ordinance prohibits, without a permit, the removal of any regulated protected tree, including "acts which inflict damage upon root systems or other parts of the tree or shrub…" The protected tree or shrub must be replaced within the property by at least four specimens of a protected variety, except where the protected species is relocated pursuant to the LAMC. In addition, a protected tree shall only be replaced by other protected tree varieties and shall not be replaced by shrubs. A protected shrub shall only be replaced by other protected shrub varieties and shall not be replaced by trees, to the extent feasible as determined by the Advisory Agency, Board of Public Works, or a licensed or certified arborist.

According to the Tree Inventory Report included in Appendix IS-1 of this Initial Study, there are no trees located within the Project Site, and there are two non-protected street trees (i.e., Chinese flame trees) along the Project Site's Alameda Street frontage. The two street trees would be retained as part of the Project. Therefore, the Project would not conflict with any local policies or ordinances protecting biological resources. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. As described above, the Project Site is located in an urbanized area and is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. There is no landscaping within the Project Site, and the Project

Site does not support any habitat or natural community[34,35] Moreover, no Conservation Plan, Natural Community Conservation Plan, or other approved habitat conservation plans apply to the Project Site.[36] Thus, the Project would not conflict with the provisions of any such plans. No impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

V. CULTURAL RESOURCES

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

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

Potentially Significant Impact. CEQA Guidelines Section 15064.5 generally defines a historical resource as a resource that is: (1) listed in, or determined to be eligible for listing in the California Register of Historical Resources (California Register); (2) included in a local register of historical resources (pursuant to PRC Section 5020.1(k)); or (3) identified as significant in a historical resources survey (meeting the criteria in PRC Section 5024.1(g)). Additionally, any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register. The California Register automatically includes all properties listed in the National Register of Historic Places (National Register) and those formally determined to be eligible for listing in the National Register. The local register of historical resources is managed by the Los Angeles Office of Historic Resources, which

[34] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

[35] United States Environmental Protection Agency, NEPAssist, https://nepassisttool.epa.gov/nepassist/nepamap.aspx, accessed June 14, 2023.

[36] California Department of Fish and Wildlife, California Natural Community Conservation Plans, April 2019.

established SurveyLA, a comprehensive program to identify potentially significant historic resources throughout the City. As stated above, there are no buildings on the Project Site, but HCM #211, Granite Block Paving, is located on Bruno Street adjacent to the Project Site. As such, the EIR will include an analysis of potential direct and indirect impacts to historical resources.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines §15064.5?

Potentially Significant Impact. CEQA Guidelines Section 15064.5(a)(3)(D) generally defines archaeological resources as any resource that "has yielded, or may be likely to yield, information important in prehistory or history." Archaeological resources are features, such as tools, utensils, carvings, fabric, building foundations, etc., that document evidence of past human endeavors and that may be historically or culturally important to a significant earlier community. The Project Site is located within an urbanized area of the City and has been subject to previous ground disturbance. Therefore, surficial archaeological resources that may have existed at one time have likely been previously disturbed. The Project would require grading, excavation for the subterranean parking level, which would extend to a depth of up to 17 feet below the existing ground surface; trenching within the public right-of-way for utility connections; and other construction activities that could have the potential to disturb existing but undiscovered archaeological resources. Thus, the Project could have the potential to disturb previously undiscovered archaeological resources. Therefore, the EIR will provide further analysis of the Project's potential impacts to archaeological resources.

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

Less Than Significant Impact. As discussed above, the Project Site is located within an urbanized area and has been subject to previous ground disturbance. Therefore, the potential for uncovering human remains on the Project Site is low. Nevertheless, the Project would require grading, excavation up to 17 feet below ground surface, trenching within the public right-of-way for utility connections, and other construction activities that could have the potential to disturb existing but undiscovered human remains. If human remains are discovered during construction of the Project, work in the immediate vicinity of the construction area would be halted, the County Coroner, construction manager, and other applicable entities would be notified per California Health and Safety Code Section 7050.5. In addition, disposition of the human remains and any associated grave goods would occur in accordance with PRC Section 5097.98 and CEQA Guidelines Section 15064.5I, which require that work stop near the find until a coroner can determine that no investigation into the cause of death is required and if the remains are Native American. Specifically, in accordance with CEQA Guidelines Section 15064.5(e), if the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission who shall identify the person or persons it believes to be most likely descended from the deceased Native American. The most likely descendent may make recommendations regarding the treatment of the remains and any associated grave goods in accordance with PRC Section 5097.98. Therefore, due to the low potential that any human remains are located on the Project Site, and because compliance with the regulatory standards described above would ensure appropriate treatment of any potential human remains unexpectedly encountered during grading and excavation activities, the Project's impact related to human remains would be less than significant, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

VI. ENERGY

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

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

Potentially Significant Impact. As discussed above, in Section 3, Project Description, the Project Site is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. The Project would construct a new 234,802-square-foot commercial building (inclusive of the approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the LAMC), comprised of 224,597 square feet of office uses, 5,894 square feet of restaurant uses and 4,110 square feet of retail uses. Due to the construction of a new building, the Project would generate an increased demand for electricity and natural gas services provided by the Los Angeles Department of Water and Power (LADWP) and the Southern California Gas Company, respectively. While development of the Project would not be anticipated to cause wasteful, inefficient, and unnecessary consumption of energy resources, further analysis of the Project's demand on existing energy resources will be provided in the EIR.

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

Potentially Significant Impact. First established in 2002 under SB 1078, California's Renewable Portfolio Standard (RPS) required retail sellers of electric services to increase procurement from eligible renewable energy resources to 20 percent of total retail sales by 2017.[37] The program was accelerated in 2015 with SB 350 which mandated a 50 percent RPS by 2030. In 2018, SB 100 was signed into law, which again increases the RPS to 60 percent by 2030 and requires all the state's electricity to come from carbon free resources by 2045. LADWP provides electrical service throughout the City. LADWP generates power from a variety of energy sources, including hydropower, coal, gas, nuclear sources, and renewable resources, such as wind, solar, and

[37] CPUC, Renewables Portfolio Standard (RPS) Program, www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/rps, accessed June 14, 2023.

geothermal sources. In accordance with SB 100, LADWP is required to procure at least 60 percent of its energy portfolio from renewable sources by 2030.

Regarding energy efficiency, the California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were adopted to ensure that building construction, system design, and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The current California Building Energy Efficiency Standards (Title 24 standards) are the 2022 Title 24 standards, which became effective on January 1, 2023.[38] The 2022 code update encourages efficient electric heat pumps, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more.[39]

As discussed above, the Project Site is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. The Project would construct a new 234,601-square-foot commercial building comprised of 224,597 square feet of office uses, 5,894 square feet of restaurant uses and 4,110 square feet of retail uses. The Project Site does not include any renewable energy sources used by LADWP. The Project has been designed and would be constructed to incorporate environmentally sustainable building features and construction protocols required by the Los Angeles Green Building Code and CALGreen. While the Project would not be anticipated to conflict with or obstruct a state or local plan for renewable energy or energy efficiency, the Project's compliance with LADWP's plans for renewable energy as well as the Project's compliance with California Building Energy Efficiency Standards will be further evaluated in the EIR.

VII. GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map is*sued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐

[38] CEC, 2022 Building Energy Efficiency Standards, www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency, accessed June 14, 2023.

[39] CEC, 2022 Building Energy Efficiency Standards, www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency, accessed June 14, 2023.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

The following analysis is based in part on the Geotechnical Investigation prepared for the Project by Langan Engineering and Environmental Services, Inc. dated February 17, 2023. The report was approved by the Los Angeles Department of Building and Safety (LADBS) on March 1, 2024. All specific information on geologic and soils conditions in the discussion below is from this report unless otherwise noted. This report and LADBS approval letter are included as Appendix IS-2 of this Initial Study.

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. Fault rupture occurs when movement on a fault deep within the earth breaks through to the surface. Based on criteria established by the California Geological Survey (CGS), faults can be classified as active, potentially active, or inactive. Active faults are those having historically produced earthquakes or shown evidence of movement within the past 11,000 years (during the Holocene Epoch). Potentially active faults have demonstrated displacement within the last 1.6 million years (during the Pleistocene Epoch) while not displacing Holocene Strata. Inactive faults do not exhibit displacement within the last 1.6 million years. In addition, buried thrust faults, which are faults with no surface exposure, may exist in the vicinity of the Project Site; however, due to their

buried nature, the existence of buried thrust faults is usually not known until they produce an earthquake.

CGS establishes regulatory zones around active faults, called Alquist-Priolo Earthquake Fault Zones (previously called Special Study Zones). These zones, which extend from 200 feet to 500 feet on each side of a known fault, identify areas where a potential surface fault rupture could prove hazardous for buildings used for human occupancy. Development projects located within an Alquist-Priolo Earthquake Fault Zone are required to prepare special geotechnical studies to characterize hazards from any potential surface ruptures. In addition, the City designates Fault Rupture Study Areas along the sides of active and potentially active faults to establish areas of potential hazard due to fault rupture.

The Project Site is not located within an Earthquake Fault Zone as mapped by CGS.[40] As noted in Appendix 2, Geotechnical Investigation, dated February 17, 2023, although the nearest fault is the Upper Elysian Fault approximately 0.12 miles north of the Project Site, the closest Alquist-Priolo Fault Rupture Hazard Zone is associated with the Hollywood Fault located approximately 3.6 miles north of the Project Site. Additionally, the Geotechnical Investigation did not identify active surface faulting within or directly adjacent to the Project Site. Therefore, the Project Site is not susceptible to surface fault rupture hazards, and impacts would be less than significant. No further evaluation of this topic in an EIR is required.

ii. Strong seismic ground shaking?

Less Than Significant Impact. The Project Site is located in the seismically active region of Southern California, which would potentially experience moderate to strong seismic ground shaking in the event an earthquake occurs on a local or regional fault. As discussed above, no active faults are known to pass directly beneath the Project Site and the Project Site is not located in an Alquist-Priolo Earthquake Fault Zone. According to the Geotechnical Investigation, the closest active fault is the Upper Elysian Fault located approximately 0.12 miles north of the Project Site, and the closest Alquist-Priolo Fault Rupture Hazard Zone is associated with the Hollywood Fault located approximately 3.6 miles north of the Project Site. In addition, State and local code requirements ensure that buildings are designed and constructed in a manner that, although the buildings may sustain damage during a major earthquake, would reduce the substantial risk that buildings would collapse. Specifically, the State and City mandate compliance with numerous rules related to seismic safety, including the Alquist-Priolo Earthquake Fault Zoning Act, Seismic Safety Act, Seismic Hazards Mapping Act, the City's General Plan Safety Element, and the Los Angeles Building Code. Pursuant to those laws, the Project must demonstrate compliance with the applicable provisions thereof before permits can be issued for construction of the Project. Accordingly, the design and construction of the Project would comply with all applicable existing regulatory requirements, the applicable provisions of the Los Angeles Building Code relating to seismic safety, and the application of accepted and proven construction engineering practices. The Los Angeles Building Code incorporates current seismic design provisions of the 2022 California Building Code, with additional City provisions, to minimize seismic impacts. The 2022 California Building Code incorporates the latest seismic design standards

[40] State of California, California Geological Survey, Earthquake Zones of Required Investigation, https://maps.conservation.ca.gov/cgs/eqzapp/app/, accessed June 13, 2023.

for structural loads and materials, as well as provisions from the National Earthquake Hazards Reduction Program to mitigate losses from an earthquake and maximize earthquake safety. LADBS is responsible for implementing the provisions of the Los Angeles Building Code, and the Project would be required to comply with the plan review and permitting requirements of LADBS, including the recommendations provided in a final geotechnical report for the Project, which will be subject to review and approval by LADBS.

Based on the above, through compliance with regulatory requirements and site-specific geotechnical recommendations, the Project would not directly or indirectly cause potential substantial adverse effects involving strong seismic ground shaking. Therefore, the Project's impact related to strong seismic ground shaking would be less than significant, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction occurs when loose, saturated, granular soils lose their strength due to excess water pressure that builds up during repeated movement from seismic activity. Liquefaction usually results in horizontal and vertical movements from lateral spreading of liquefied materials and post-earthquake settlement of liquefied materials. Factors that contribute to the potential for liquefaction include a low relative density of granular materials, a shallow groundwater table, and a long duration and high acceleration of seismic shaking. The effects of liquefaction include the loss of the soil's ability to support footings and foundations which may cause buildings and foundations to buckle.

According to the CGS map of Earthquake Zones of Required Investigation for the Hollywood Quadrangle and the County of Los Angeles Seismic Safety Element, the Project Site is located within an area identified as having a potential for liquefaction. In addition, the Project Site is mapped as a liquefaction area by the City.[41] Additional liquefaction analysis was therefore performed as part of the Geotechnical Investigation. Based on the results of that analysis, there are potentially liquefiable soil layers ranging from around 27 to 39 feet below ground surface and liquefaction-induced settlements are anticipated to range from approximately 0.2 to 1.5 inches. As such, the soils underlying the Project Site are characterized as Site Class D and the corresponding seismic design criteria are applicable. In addition, as noted above, the Project would be subject to current building codes. LADBS is responsible for implementing the provisions of the Los Angeles Building Code, and the Project would be required to comply with the plan review and permitting requirements of LADBS, including the recommendations provided in a final geotechnical report for the Project, which will be subject to review and approval by LADBS.

Based on the above, with regulatory compliance, impacts related to liquefaction would be less than significant. No further evaluation of this topic in an EIR is required.

[41] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

iv. Landslides?

No Impact. Landslides generally occur in loosely consolidated, wet soil and/or rocks on steep sloping terrain during precipitation, soil disturbance, changes in groundwater, or seismic activity. The Project Site and surrounding area are fully developed and the Project Site is generally characterized by relatively level topography. Large areas of exposed soil and/or rocks that could fall onto the Project Site are not present, since the majority of the Project Site is covered in pavement and landscaping is confined to two ornamental street trees that would remain as part of the Project. In addition, the Project Site is not located in a landslide area as mapped by the State,[42] nor is the Project Site mapped as a landslide area by the City.[43] Therefore, the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. As such, no impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

Less Than Significant Impact. The Project Site is currently fully developed with surface parking. As such, there are no open spaces with exposed topsoil. However, development of the Project would require grading, excavation, and other construction activities that have the potential to disturb existing soils underneath the Project Site and expose these soils to rainfall and wind during construction, thereby potentially resulting in soil erosion. This potential would be reduced by implementation of standard erosion controls imposed by applicable regulations during site preparation and grading activities. Specifically, all grading activities would require grading permits from LADBS, which would include requirements and standards designed to limit potential effects associated with erosion to acceptable levels. In addition, on-site grading and site preparation would comply with all applicable provisions of Chapter IX, Article 1 of the LAMC, which addresses grading, excavations, and fills. Furthermore, the Project would be required to comply with the City's Low Impact Development (LID) ordinance and implement standard erosion controls to limit stormwater runoff, which can contribute to erosion. Regarding soil erosion during Project operations, the potential would be negligible since the Project Site would mostly remain fully developed. Therefore, with compliance with applicable regulatory requirements, impacts regarding soil erosion or the loss of topsoil would be less than significant, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

c. Would the project be located on a geologic unit that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact. As discussed above, the Project Site is not located near slopes or geologic features that would result in on- or off-site landslides. Moreover, the Project Site is not located in a landslide area as mapped by the State or by the City. Upon buildout of the Project, the existing topography of the Project Site would not be substantially altered. Specifically, the Project Site

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[42] State of California, California Geological Survey, Earthquake Zones of Required Investigation, Hollywood Quadrangle, Seismic Hazard Zones, March 25, 1999.

[43] City of Los Angeles Department of City Planning, ZIMAS, Parcel Profile Report for 130 W. College Street, January 15, 2024.

would remain relatively flat and would not cause landslides. As such, no impacts related to landslides would occur, and no mitigation measures related to landslides are required.

Liquefaction-related effects include lateral spreading. As discussed above, while the Project Site is located in an identified liquefiable area, with adherence to applicable seismic design standards and current building codes, impacts related to liquefaction would be less than significant, and no mitigation measures are required.

Collapsible soils, or soils susceptible to hydroconsolidation, are geologically young, unconsolidated, low-density, loose, dry soils commonly present in arid to semi-arid regions, such as Southern California. Based on the Project Site geology and the results of the subsurface investigation included in the Geotechnical Investigation, soils potentially susceptible to collapse are not present at the Project Site and impacts would be less than significant.

Ground surface subsidence generally results from the extraction of fluids or gas from the subsurface that can result in the gradual lowering of the overlying ground surface. Subsidence can also occur when subsurface peat deposits oxidize and undergo volume loss. As there are no known ongoing extractions of oil or water that would lead to subsidence at the Project Site, and the subsurface soils are not known to contain significant quantities of peat, the potential for subsidence at the Project Site is low. Impacts would be less than significant, and no mitigations are required. No further evaluation of this topic in an EIR is required.

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

Less Than Significant Impact. Expansive soils are typically associated with fine-grained clayey soils that have the potential to shrink and swell with repeated cycles of wetting and drying. As noted in the Geotechnical Investigation, the soils at or near the Project's foundation level are predominantly granular (non-plastic), and therefore, the potential for expansive soils to be present at the Project Site is very low. In addition, Project design and construction would comply with all applicable requirements of LADBS as well as site-specific design recommendations set forth in the Geotechnical Investigation. Therefore, with adherence to existing regulations and site-specific design recommendations, impacts related to expansive soils would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The Project Site is located within a community served by existing wastewater infrastructure.[44] As such, the Project would not require the use of septic tanks or alternative wastewater disposal systems. Therefore, the Project would not have an impact related to the ability of

[44] Langan Engineering and Environmental Services, Inc., Utility Report for 130 W College Street, April 14, 2023. Refer to Appendix IS-4 of this Initial Study.

soils to support septic tanks or alternative wastewater disposal systems. No impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

Potentially Significant Impact. Paleontological resources are the fossilized remains of organisms that have lived in a region in the geologic past and whose remains are found in the accompanying geologic strata. This type of fossil record represents the primary source of information on ancient life forms, since the majority of species that have existed on earth from this era are extinct. Although the Project Site has been subject to previous ground disturbance, the Project would require grading, excavation, trenching within the public right-of-way for utility connections, and other construction activities that could have the potential to disturb existing but undiscovered paleontological resources. Therefore, the EIR will provide further analysis of the Project's potential impacts to paleontological resources.

VIII. GREENHOUSE GAS EMISSIONS

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

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

Potentially Significant Impact. Gases that trap heat in the atmosphere are called greenhouse gases since they have effects that are analogous to the way in which a greenhouse retains heat. Greenhouse gases are emitted by both natural processes and human activities. The accumulation of greenhouse gases in the atmosphere affects the earth's temperature. The State has undertaken initiatives designed to address the effects of greenhouse gas emissions, and to establish targets and emission reduction strategies for greenhouse gas emissions in California. Nevertheless, activities associated with the Project, including construction and operational activities, could result in greenhouse gas emissions that may have a significant impact on the environment. Therefore, the EIR will provide further analysis of the Project's greenhouse gas emissions.

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

Potentially Significant Impact. As the Project would have the potential to emit greenhouse gases, the EIR will include further evaluation of project-related emissions and associated emission reduction strategies to determine whether the Project conflicts with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (e.g., Assembly Bill [AB] 32, SCAG RTP/SCS).

IX. HAZARDS AND HAZARDOUS MATERIALS

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

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

Less Than Significant Impact. The Project would not involve the routine transport of hazardous materials to and from the Project Site. During demolition, excavation, on-site grading, and building construction, hazardous materials such as fuel and oils associated with construction equipment, as well as coatings, paints, adhesives, and caustic or acidic cleaners could be routinely used on the Project Site through the duration of construction. While some hazardous materials used during construction could require disposal, such activity would occur only for the duration of construction and would cease upon completion of the Project. As such, construction of the Project would not involve the routine disposal of hazardous materials. Notwithstanding, all potentially hazardous materials used during construction of the Project would be used and disposed of in accordance with manufacturers' specifications and instructions, thereby reducing the risk of hazardous materials use. In addition, there are regulations aimed at establishing specific guidelines regarding risk planning and accident prevention, protection from exposure to specific chemicals, and the proper storage of hazardous materials. The Project would be in full compliance with all applicable federal, State, and local requirements concerning the use, storage, and management of hazardous materials, including, but not limited to the Resource Conservation and Recovery Act, California Hazardous Waste Control Law, Federal and State Occupational Safety and Health Acts, SCAQMD rules, and permits and associated conditions issued by LADBS. Such requirements include obtaining material safety data sheets from chemical manufacturers, making these data sheets available to employees, labeling chemical containers in the workplace, developing and maintaining a written hazard communication program, and developing and implementing programs to train employees about hazardous materials. Consequently, Project construction activities would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Operation of the Project would involve the routine use of small quantities of potentially hazardous materials typical of those used in commercial office, restaurant, and uses, including cleaning products, paints, and those used for maintenance of landscaping. Such use would be consistent with that currently occurring on the Project Site and other nearby developments. As a commercial office, restaurant, and retail development, the Project would not involve the routine transport, use, and disposal of large quantities of hazardous materials. The Project's limited use of common hazardous materials can typically be disposed of at Class II or III landfills, which accept most common waste materials, such as those identified above. In addition, all hazardous materials used on the Project Site during operation (if any) would be used, stored, and disposed of in accordance with all applicable federal, state, and local requirements.

Based on the above, with compliance with all applicable local, State, and federal laws and regulations relating to environmental protection and the management of hazardous materials, the Project's impact associated with the routine transport, use, or disposal of hazardous materials during construction and operation of the Project would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

Potentially Significant Impact. While operation of the Project is not expected to involve hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste, construction would require demolition of the existing parking lot and excavation activities. The Project is also

located within a City-designated methane hazard zone. Therefore, further evaluation of this topic will be included in the EIR.

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

Potentially Significant Impact. There is two existing schools within 0.25 miles of the Project Site. Castelar Elementary School and Ann Street Elementary School are located approximately 0.2 and 0.23 miles northwest of the Project Site, respectively. While the Project is not expected to involve hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste, further evaluation of this topic will be included in the EIR due to the proximity of the school.

d. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment?

Potentially Significant Impact. The Project Site is currently developed with surface parking and has the potential to be included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. In addition, properties in the surrounding area also have the potential to be listed on various environmental databases. Therefore, further evaluation of this issue will be included in the EIR.

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

No Impact. The Project Site is not located within an airport land use plan or within 2 miles of a public airport or public use airport. The nearest airport is the Hollywood-Burbank Airport located approximately 10 miles northwest of the Project Site. Therefore, no impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

Less Than Significant Impact. The nearest emergency/disaster route to the Project Site is Alameda Street adjacent to the Project Site to the west.[45] While the majority of construction activities for the Project would be confined to the Project Site, the Project would include trenching within the public right-of-way for utility connections, which could potentially require temporary lane closures. However, if lane closures are necessary, both directions of travel would continue to be maintained in accordance with standard construction traffic management plans that would be implemented to ensure adequate circulation and emergency access. With regard to operation, the Project would not require the permanent closure of any local public or private streets and would not impede emergency vehicle access to the Project Site or surrounding area. In addition, the Project would comply with Los Angeles Fire Department (LAFD) access requirements and applicable LAFD regulations regarding

[45] City of Los Angeles, Geohub, Disaster Routes, https://geohub.lacity.org/datasets/lacounty::disaster-routes-1/explore?location=34.062986%2C-118.234620%2C18.63, accessed June 14, 2023.

safety. Therefore, the Project would not impede emergency access within the Project Site or vicinity that could cause an impediment along City designated disaster routes such that the Project would impair the implementation of the City's emergency response plan. As such, the Project's impact related to the implementation of the City's emergency response plan would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. The Project Site is located in an urbanized area of the City and there are no wildlands located on or in the vicinity of the Project Site. The Project Site is not located within a City-designated Very High Fire Hazard Severity Zone.[46,47] In addition, the Project Site is not located within Fire District No. 1, which consists of areas identified by the City that are required to meet additional development regulations to reduce fire hazard-related risks.[48] Accordingly, the Project would not expose people or structures to a risk of loss, injury, or death involving wildland fires. Furthermore, the Project would be developed in accordance with LAMC requirements pertaining to fire safety, specifically LAMC Section 57.118 establishes LAFD's fire/life safety plan review and safety inspection for new construction projects; and LAMC Section 57.507.3.1 establishes fire water flow standards. Therefore, no impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

X. HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

[46] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

[47] Los Angeles Safety Element of the General Plan, General Plan Land Use in Very High Fire Hazard Severity Zones, p. 27.

[48] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☐	☒
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

The analysis of hydrology and water quality below is based, in part, on the Hydrology & Water Resources Technical Report (Water Resources Report) prepared for the Project by Langan Engineering and Environmental Services, Inc., dated January 2024, and included as Appendix IS-3 of this Initial Study.

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

Less Than Significant Impact. As discussed below, the Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

Surface Water Quality

Construction

Construction activities such as earth moving, maintenance/operation of construction equipment, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff. However, because the Project Site is greater than 1 acre, the Project would be required to obtain

coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (i.e., Order 2012-0006-DWQ). In accordance with the requirements of the permit, the Applicant would prepare and implement a site-specific stormwater pollution prevention plan (SWPPP) adhering to the California Stormwater Quality Association BMP Handbook. The SWPPP would specify Best Management Practices (BMPs) to be used during construction. BMPs would include, but would not necessarily be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs.

With the implementation of an erosion control plan, site-specific BMPs would reduce or eliminate the discharge of potential pollutants from stormwater runoff. In addition, the Applicant would be required to comply with City grading permit regulations, which require implementation of necessary measures, plans (including a wet weather erosion control plan if construction occurs during the rainy season), and inspection to reduce sedimentation and erosion. Therefore, with compliance with NPDES requirements and City grading regulations, construction of the Project would not result in discharge that would cause: (1) pollution which would alter the quality of the water of the State to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, for the same reasons, construction of the Project would not result in discharges that would cause regulatory standards to be violated in Los Angeles River. Based on the above, with compliance with these existing regulatory requirements that include specific BMPs to address surface water quality, impacts during construction would be less than significant.

Operation

As expected for most urban developments, operation of the Project has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project include sediment, nutrients, pesticides, metals, oil, and grease. However, in accordance with the LID Manual, the Project will implement multiple pre-treatment facilities and will capture runoff for reuse in supplementing the Project's irrigation demand.

With implementation of the treatment facilities prescribed by the LID Manual, operation of the Project would not result in discharges that would cause: (1) pollution which would alter the quality of the waters of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. The pollutants listed above would be addressed through the implementation of approved LID BMPs.

Furthermore, a portion of the Project Site will be allocated to stormwater control, in compliance with LID BMP requirements, to control and treat stormwater runoff to the 85th percentile storm event. The installed BMP systems will be designed with an internal bypass overflow system to prevent upstream flooding during major storm events. As the Project Site currently does not have structural BMPs for the treatment of stormwater runoff from the existing impervious surfaces, implementation of the

proposed BMPs would result in an improvement in surface water quality runoff from the entire Project Site. As such, operation of the Project would not result in discharges that would cause regulatory standards to be violated.

Therefore, with implementation of the BMPs described above that would be implemented in accordance with regulatory requirements, operational impacts on surface water quality would be less than significant.

Groundwater Quality

Construction

As discussed in the Hydrology and Water Resources Technical Report included as Appendix IS-3 of this Initial Study, while groundwater was observed at 24 to 27 feet below ground surface, historic high groundwater depth is reported to be 20 feet below surface. Construction activities for the Project would include excavations up to approximately 17 feet for the subterranean parking level which will be the lowest depth of excavation, as well as grading for building structures, foundations, hardscape and landscape around the structures, and trenching within the public right-of-way for utility connections. As such, although unlikely based on groundwater depth, temporary dewatering during construction may be required. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations.

In the event any contaminated soils are found during construction, these soils would be captured within that volume of excavated material removed from the Project Site, and would be remediated at an approved disposal facility in accordance with Los Angeles Department of Building and Safety Information Bulletin for Procedures When Hazardous and Contaminated Materials are Encountered During Construction or Geotechnical/Geological Exploration (Document No. P/BC 2020-131). Agencies that may be involved in this process include, but are not limited to, LAFD, California Geologic Energy Management Division, the Los Angeles Regional Water Quality Control Board (LARWQCB), Los Angeles County Fire Department Health Hazardous Materials Division, SCAQMD, and the Department of Toxic Substances Control.

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater. Compliance with all applicable federal, State, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater contamination, or cause a violation of regulatory water quality standards at an existing production well. Additionally, any contaminated soils found would be captured within that volume of excavated material, removed from the Project Site, and remediated at an approved disposal facility in accordance with LADBS Information Bulletin for Procedures When Hazardous and Contaminated Materials are Encountered During Construction or Geotechnical/Geological Exploration (Document No. P/BC 2020-131). Furthermore, there are no groundwater production wells or public water supply wells located near the Project Site. In addition, construction of the Project would not involve drilling to or through a clean or contaminated aquifer. Due to compliance with measures as listed above and the implementation of

BMPs, construction activities would not be anticipated to affect existing wells. Therefore, the Project would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.

Operation

The Project does not include the installation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility.

Operational activities which could affect groundwater quality include hazardous material spills and leaking underground storage tanks. No underground storage tanks are known to be currently operated or will be operated by the Project. Therefore, operation of the Project would not include the use or storage of hazardous materials beyond those typically associated with commercial uses such as cleaning products, paints, and maintenance of landscaping. Compliance with all applicable existing regulations at the Project Site regarding the handling and potentially required cleanup of hazardous materials would prevent the Project from affecting or expanding any potential areas of contamination, increasing the level of contamination, or causing regulatory water standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. In addition, operation of the Project would not involve drilling to or through a clean or contaminated aquifer. Therefore, the Project's potential impact on groundwater recharge is less than significant.

Conclusion

As discussed above, neither construction or operation of the Project would violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Impacts would be less than significant, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

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

Less Than Significant Impact. As discussed in the following analysis, the Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.

Construction

As described in Section 3, Project Description, of this Initial Study, construction activities for the Project would include demolition of existing hardscape areas, excavating down to a maximum depth of 17 feet below grade to build up the underground parking level, building up the structures, and constructing hardscape and landscape around the structures. As noted in the Hydrology Report, while groundwater was observed at 24 to 27 feet below ground surface, historic high groundwater depth is reported to be 20 feet below surface. As such, although unlikely based on groundwater depth, temporary dewatering during construction may be required. The temporary system would

comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. Due to the limited and temporary nature of these dewatering operations, regional impacts to groundwater flow and level would not be significant. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

Operation

The percolation of precipitation that falls on pervious surfaces is variable dependent upon the soil type, condition of the soil, vegetative cover, and other factors. The implementation of the Project would include the addition of pervious surfaces throughout the Project Site boundary. Specifically, the Project Site is entirely impervious under existing conditions and would be 85 percent impervious with the Project. However, as the Project is located in a highly urbanized area, any change in groundwater recharge due to the overall net change in impervious area would be minimal in the context of the regional groundwater basin. Furthermore, as discussed above, the Project would include the installation of a Standard Urban Storm Water Mitigation Plan (SUSMP) and LID BMPs. The installed BMP systems will be designed with an internal bypass or overflow system to prevent upstream flooding due to large storm events. The stormwater that bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and not result in infiltration of a large amount of rainfall, which would affect groundwater hydrology, including the direction of groundwater flow. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site;

Less Than Significant Impact. Although no streams or rivers cross the Project Site, construction activities for the Project would include excavation up to 17 feet for the subterranean parking level, as well as grading for building structures, foundations, and hardscape and landscape around the structures. It is estimated that approximately 66,234 cubic yards of export would be hauled from the Project Site. These activities have potential to temporarily alter existing drainage patterns and flows on the Project Site by exposing the underlying soils, modifying flow direction, and making the Project Site temporarily more permeable. Also, exposed and stockpiled soils could be subject to erosion and conveyance into nearby storm drains during storm events. In addition, on-site watering activities to reduce airborne dust could contribute to pollutant loading in runoff. However, as discussed throughout this Checklist Question No. X, Hydrology and Water Quality, the Project would be required to comply with all applicable City grading permit regulations that require necessary measures, plans, and inspections to reduce sedimentation and erosion. In addition, as discussed in Response to Checklist Questions No. X.b above, the Project Site is entirely impervious under existing conditions and would be 85 percent impervious with the Project. Accordingly, similar to existing conditions, there would be a limited potential for erosion or siltation to occur from the exposed soils or large expanses of impervious areas. Therefore, the Project would not result in substantial erosion or siltation on- or off-site. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

Less Than Significant Impact. The Project Site is developed with a surface parking lot and is entirely impervious under existing conditions. Development of the Project would include development of a new building and landscaped areas that would drain to the proposed stormwater treatment system. Upon completion, the amount of impervious surfaces would decrease from 100 percent to approximately 85 percent. In addition, the Project would implement a capture and use system to comply with LID requirements. Specifically, based on the requirements in Section 3.1.3 of the City's LID Manual, the Project is required to provide at least equivalent of 8 percent of the Project Site and landscaping for biofiltration plants for treating the runoff water. Therefore, the Project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

Less Than Significant Impact. Refer to Response to Checklist Questions No. X.a and No. X.c.ii, above. As discussed in Response to Checklist Question No. X.a, the Project would implement capture and use systems to collect and store the first flush of stormwater runoff to satisfy LID requirements and use it for irrigation. Based on the proposed landscape area and irrigation demands, a capture and reuse system is feasible for the Project Site. The capture and use system will be designed to comply with the most current LID standards. Compliance with the LID requirements for the Project Site would ensure stormwater treatment through the implementation of post-construction BMPs, which are required to control pollutants associated with storm events up to the 85th percentile storm event, per the City's Stormwater Program. As the Project Site currently does not have structural BMPs for the treatment of stormwater runoff from the existing impervious surfaces, implementation of the proposed BMPs would result in an improvement in surface water quality runoff from the entire Project Site. In addition, as discussed in Response to Checklist Question No. X.c.ii, upon completion of the Project, the Project Site is entirely impervious under existing conditions and would be 85 percent impervious post-construction. Furthermore, as detailed in the Water Resources Report, stormwater flows would decrease slightly from 7.24 cubic feet per second under existing conditions to 7.10 cubic feet per second with implementation of the Project. As such, the Project would not cause flooding during a 50-year storm event or result in an adverse change to the movement of surface water. Additionally, the Project will not increase concentrations of the items listed as constituents of concern for the Los Angeles River Watershed because it will capture and convey the runoff to two pre-treatment devices and storage tanks for reuse on the Project Site. Therefore, the Project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

iv. impede or redirect flood flows?

No Impact. The Project Site is not located within a 100-year flood hazard area as mapped by the Federal Emergency Management Agency (FEMA) or by the City.[49,50] Thus, the Project would not impede or redirect flood flows. No impacts would occur, and no mitigation measures would be required. No further analysis of this topic in an EIR is required.

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

Less Than Significant Impact. As discussed above, the Project Site is not located within a 100-year flood hazard area as mapped by FEMA or by the City. In addition, the Project Site is located approximately 15 miles northeast of the Pacific Ocean. Therefore, no tsunami or tsunami events would be expected to impact the Project Site. Furthermore, there are no standing bodies of water near the Project Site that may experience a seiche and according to the California Department of Water Resources, the Project Site is not located within a dam inundation area.[51]

Additionally, as discussed above, the Project would include new structural BMPs throughout the Project Site which would reduce the amount of pollutants entering the stormwater system and groundwater in the unlikely event of inundation of the Project Site. Impacts would be less than significant, and no mitigation measures would be required. No further evaluation of this topic in an EIR is required.

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

Less Than Significant Impact. As discussed above, Project construction could result in erosion of exposed and stockpiled soils, increased pollutant loading due to on-site watering activities, and pollutant discharges relating to the storage, handling, use and disposal of chemicals, adhesives, coatings, lubricants, and fuel. However, the Project would be required to comply with all applicable City grading permit regulations that require necessary measures, plans, and inspections to reduce sedimentation and erosion. BMPs to be used during construction would include, but would not necessarily be limited to, erosion control, sediment control, non-stormwater management, and materials management BMPs. These BMPs will be included in the SWPPP which would be included as part of the construction documents and is utilized to minimize pollutant discharge during construction. With the implementation of site-specific BMPs included as part of the required erosion control plan, the Project would reduce or eliminate the discharge of potential pollutants from the stormwater runoff. In addition, the Applicant would be required to comply with City grading permit regulations, which require implementation of necessary measures, plans (including a wet weather erosion control plan if construction occurs during the rainy season), and inspection to reduce sedimentation and erosion. With compliance with these existing regulatory requirements that include

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49 Federal Emergency Management Agency, Flood Insurance Rate Map 06037C1628F, September 26, 2008.

50 City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

51 Department of Water Resources, Dam Breach Inundation Map Web Publisher, https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2, accessed June 14, 2023.

specific BMPs to address surface water quality, impacts during construction would be less than significant.

Potential pollutants generated by the Project during operation would include sediment, nutrients, pesticides, trash and debris, oil and grease, and metals typical of urban developments. However, the implementation of BMPs required by the City's LID Ordinance would reduce the amount of these pollutants entering the stormwater. Additionally, since the existing Project Site does not have any structural or LID BMPs to treat or infiltrate stormwater, implementation of the LID features proposed as part of the Project would result in an improvement in surface water quality runoff as compared to existing conditions. As such, the Project would not introduce new pollutants or an increase in pollutants that could conflict with or obstruct any water quality control plans.

With respect to groundwater, as discussed above in Checklist Question No. X.b, the Project would not result in impacts related to groundwater recharge or interfere with sustainable groundwater management of the basin.

Therefore, with compliance with existing regulatory requirements and implementation of LID BMPs, the Project would not conflict with or obstruct implementation of a water quality control plan or a sustainable groundwater management plan. Impacts would be less than significant, and no mitigation measures would be required. No further evaluation of this topic in an EIR is required.

XI. LAND USE AND PLANNING

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

a. Would the project physically divide an established community?

Less than Significant Impact. As discussed in Section 3, Project Description, of this Initial Study, the Project Site is currently developed with asphalt surface parking, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. The Project would replace the existing surface parking with a new commercial building comprised of office, restaurant, and retail uses. These uses would be consistent with the adjacent uses in the community. In addition, access to the adjacent streets and properties would be maintained throughout construction and operation. Furthermore, the Project does not propose a freeway or other large infrastructure that would divide the existing surrounding community. Therefore, the Project would not physically divide an established community. Impacts related to the physical division of an established community would be less than

significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

Potentially Significant Impact. As discussed in Section 3, Project Description, of this Initial Study, the Project requires several discretionary approvals. While the Project would not be anticipated to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, the EIR will provide further analysis of the Project's potential to conflict with applicable land use plans, policies, and regulations that were adopted for the purpose of avoiding or mitigating an environmental effect.

XII. MINERAL RESOURCES

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

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The Project Site is located within an urbanized area and no mineral extraction operations currently occur on the Project Site. In addition, the Project Site is not located within a mineral producing area as classified by CGS.[52] The Project Site is also not located within a City-designated oil field or oil drilling area.[53] As such, the potential for mineral resources to occur on-site is low. Therefore, the Project would not result in the loss of availability of a mineral resource or a mineral resource recovery site, and, as such, no impact would occur. No further analysis of this topic in the EIR is required.

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[52] California Geological Survey, Aggregate Sustainability in California, Fifty-Year Aggregate Demand Compared to Permitted Aggregate Reserves, 2018.

[53] City of Los Angeles Department of Public Works, Bureau of Engineering, NavigateLA, Parcel Profile Report, www.ladbsservices2.lacity.org/OnlineServices/PermitReport/ParcelProfileDetail2?pin=135A215-285, accessed June 14, 2023.

b. Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. No mineral extraction operations currently occur on the Project Site. Furthermore, the Project Site is not located within a City-designated Mineral Resource Zone where significant mineral deposits are known to be present, or within a mineral producing area as classified by CGS. The Project Site is also not located within a City designated oil field or oil drilling area. Therefore, the Project would not result in the loss of availability of a mineral resource or a mineral resource recovery site. No impact would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

XIII. NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

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

Potentially Significant Impact. Noise sensitive uses near the Project Site include residential uses to the west and a proposed mixed-use development to the north. During construction activities associated with the Project, the use of heavy equipment (e.g., bulldozers, backhoes, cranes, loaders, etc.) would generate noise on a short-term basis. In addition, noise levels from on-site sources including, but not limited to, the parking garage and mechanical equipment may increase during operation of the Project. Furthermore, traffic attributable to the Project has the potential to increase noise levels along adjacent roadways. Therefore, further evaluation of this topic will be provided in the EIR.

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

Potentially Significant Impact. Construction of the Project could generate groundborne noise and vibration associated with demolition, site grading and excavation, other clearing activities, the installation of building footings, and construction truck travel. As such, the Project would have the potential to generate excessive groundborne vibration and noise levels during short-term construction activities. Therefore, further evaluation of this topic will be provided in the EIR, including an analysis of potential impacts to the historic Granite Block Paving near the Project Site.

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

Less Than Significant Impact. The Project Site is not located within the vicinity of a private airstrip or within 2 miles of a public airport or public use airport. The nearest airport is the Hollywood-Burbank Airport located approximately 10 miles northwest of the Project Site. Therefore, the Project would not expose people residing or working in the Project area to excessive airport noise. Impacts would be less than significant, and no further evaluation of this topic in an EIR is required.

XIV. POPULATION AND HOUSING

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

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

Less Than Significant Impact. The Project would include the construction of new office, restaurant, and retail uses. Since the Project does not propose a housing component, it would not directly induce a new residential population which would contribute to population growth in the vicinity of the Project Site or the Central City North Community Plan area.

While construction of the Project would create temporary construction-related jobs, the work requirements of most construction projects are highly specialized such that construction workers remain at a job site only for the time in which their specific skills are needed to complete a particular phase of the construction process. Thus, Project-related construction workers would not be anticipated to relocate their household's place of residence as a consequence of working on the Project and, therefore, no new permanent residents would be generated during construction of the Project which could induce substantial population growth.

As discussed in Section, 3, Project Description, of this Initial Study, the Project would include the development of 234,601 square feet of new uses within the Project Site consisting of 224,597 square feet of office uses, 5,894 square feet of restaurant uses, and 4,110 square feet of retail uses. Based on employee generation factors from LADOT, the Project is estimated to generate an increase of 930 new employees on the Project Site.[54] Using employment data from the 2020–2045 RTP/SCS, an estimated 1,967,307 employees are projected within the City of Los Angeles in 2028, the Project's buildout year, with 49,586 new employees between 2024 and 2028. The Project's net increase in employees would represent 0.04 percent of the total number of employees in 2028 and 1.88 percent of the growth between 2024 and 2028. As noted above, the Project would not introduce new residential uses at the Project Site and would therefore not result in a direct population growth in the area, and the number of jobs would be consistent with both SCAG's 2020–2045 RTP/SCS. While some of the new employment positions could be filled by persons who would relocate to the vicinity of the Project Site, this potential increase in population would not be substantial since not all employees would move close to the Project Site. Specifically, some employment opportunities may be filled by people already residing in the vicinity of the Project Site and other persons would commute to the Project Site from other communities in and outside of the City. Therefore, given that the Project would not directly contribute to substantial population growth in the Project area through the development of residential uses and as some of the employment opportunities generated by the Project would be filled by people already residing in the vicinity of the Project Site or who would commute to the Project Site, the potential growth associated with Project employees who may relocate their place of residence would not be substantial. Furthermore, as the Project would be located in a highly developed area with an established network of roads and other urban infrastructure, the Project would not require the extension of such infrastructure in a manner that would indirectly induce substantial population growth. Based on the above, the Project would not induce substantial population or housing growth. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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

No Impact. The Project Site is currently occupied by an asphalt surface parking lot, a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing. No housing currently exists on the Project Site and the Project would not displace any existing people or housing. No impacts would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

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[54] Los Angeles Department of Transportation (LADOT) and Los Angeles Department of City Planning (DCP), City of Los Angeles VMT Calculator Documentation, Version 1.3, May 2020.

XV. PUBLIC SERVICES

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

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Fire protection?	☐	☐	☒	☐
b. Police protection?	☐	☐	☒	☐
c. Schools?	☐	☐	☒	☐
d. Parks?	☐	☐	☒	☐
e. Other public facilities?	☐	☐	☒	☐

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

Less Than Significant Impact. The Project Site and the surrounding area are currently served by LAFD Fire Station 4, located at 450 E. Temple Street (approximately 1.1 miles south of the Project Site). Additional stations within 2 miles of the Project Site are Fire Station 1 located at 2230 Pasadena Avenue (approximately 1.5 miles northeast of the Project Site), Fire Station 2 located at 1962 Cesar E. Chavez Avenue (approximately 1.7 miles southeast of the Project Site, Fire Station 3 located at (approximately 1.4 miles southwest of the Project Site), and Fire Station 9 located at 430 7th Street (approximately 2 miles southwest of the Project Site.[55] Based on the response distance from existing fire stations, LAFD considers fire protection to be adequate.[56]

Project construction could potentially impact the provision of LAFD services in the vicinity of the Project Site as a result of construction impacts to the surrounding roadways. While the majority of construction activities would be contained within the boundaries of the Project Site, access to the Project Site and the surrounding vicinity could be impacted by temporary lane closures, roadway/access improvements, and the trenching associated with utility line connections. Construction activities would also generate traffic associated with the movement of construction

[55] LAFD, Find Your Station, www.lafd.org/fire-stations/station-results, accessed December 1, 2023.

[56] Written correspondence from Kristin Crowley, Fire Chief, Los Angeles Fire Department, April 23, 2024. See Appendix IS-4 of this Initial Study.

equipment, the hauling of soil and construction materials to and from the Project Site, and construction worker traffic. Thus, although construction activities would be short-term and temporary for the area, Project construction activities could temporarily increase response times along adjacent streets due to travel time delays caused by traffic during the Project's construction phase. However, construction-related traffic, including hauling activities and construction worker trips, would occur outside the typical weekday commuter morning and afternoon peak periods, thereby reducing the potential for traffic-related conflicts. In addition, a construction traffic management plan would be implemented during Project construction to ensure that adequate and safe access remains available within and near the Project Site during construction activities. The Project would also employ temporary traffic controls, such as flag persons, to control traffic movement during temporary traffic flow disruptions. Traffic management personnel would be trained to assist in emergency response by restricting or controlling the movement of traffic that could interfere with emergency vehicle access. Appropriate construction traffic control measures (e.g., detour signage, delineators, etc.) would also be implemented, as necessary, to ensure emergency access to the Project Site and traffic flow is maintained on adjacent rights-of-way. Furthermore, the drivers of emergency vehicles normally have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. Since emergency access to the Project Site would remain unobstructed during construction of the Project, impacts related to LAFD emergency access would be less than significant.

As previously discussed, the Project would include the development of 234,601 square feet of new uses within the Project Site consisting of 224,597 square feet of office uses, 5,894 square feet of restaurant uses, and 4,110 square feet of retail uses. Based on employee generation factors from LADOT, the Project is estimated to generate an increase of 930 new employees on the Project Site.[57] As the Project would increase the building area and daytime population of the Project Site compared to existing conditions, the Project would increase the demand for LAFD fire protection services. However, the proposed uses would be similar to existing uses within and immediately adjacent to the Project Site and would be expected to generate a range of fire service calls similar to what occurs under existing conditions. The Project would not include any unique or especially hazardous uses, such as industrial facilities, that use or generate large quantities of hazardous and/or toxic materials that could pose an extreme risk of serious accident or fire at the Project Site. The types of fires that could potentially occur within the Project Site and typically associated with office, restaurant, and retail uses would be adequately suppressed with the fire equipment found at the fire stations nearest the Project Site. Additionally, the Project would implement all applicable City Building Code and Fire Code requirements regarding structural design, building materials, site access, fire flow, storage and management of hazardous materials, alarm and communications systems, etc., including as required by LAFD. Compliance with applicable City Building Code and Fire Code requirements would be demonstrated as part of LAFD's fire/life safety plan review and LAFD's fire/life safety inspection for new construction projects, as set forth in LAMC Section 57.118, and which are required prior to the issuance of a building permit.

Compliance with applicable regulatory requirements, including LAFD's fire/life safety plan review and LAFD's fire/life safety inspection for new construction projects, would ensure that adequate fire prevention features would be provided that would reduce the demand on LAFD facilities and

[57] Los Angeles Department of Transportation (LADOT) and Los Angeles Department of City Planning (DCP), City of Los Angeles VMT Calculator Documentation, Version 1.3, May 2020.

equipment resulting from the Project. As such, compliance with Fire Code requirements would minimize the potential for incidents requiring an emergency response by LAFD and therefore reduce the need for a new fire station, or the expansion, consolidation, or relocation of an existing fire station.

Vehicular access to the Project Site, including access for emergency vehicles, provided through two driveways which would be located along West College Street and conform to LADOT standards. Project-related traffic would have the potential to increase emergency vehicle response times to the Project Site and surrounding properties due to travel time delays caused by traffic. However, the area surrounding the Project Site includes an established street system, consisting of freeways, primary and secondary arterials, and collector and local streets, which provide regional, sub-regional, and local access and circulation within the Project vicinity. The Project Site is located within an urbanized area of the City and is surrounded by an existing network of streets. While sidewalks, curbs, and gutters do not currently meet City standards, these will be upgraded as part of Project construction. Therefore, the street system surrounding the Project Site would not be considered substandard. In addition, the drivers of emergency vehicles normally have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. Therefore, the increase in traffic generated by the Project would not significantly impact emergency vehicle access to the Project Site and surrounding area. Furthermore, the Project's driveways and internal circulation would be designed to incorporate all applicable City Building Code and Fire Code requirements regarding site access, including providing adequate emergency vehicle access. Compliance with applicable City Building Code and Fire Code requirements, including emergency vehicle access, would be demonstrated as part of LAFD's fire/life safety plan review and LAFD's fire/life safety inspection for new construction projects, as set forth in LAMC Section 57.118, and which are required prior to the issuance of a building permit. The Project also would not include the installation of barriers that could impede emergency vehicle access. Lastly, the passenger drop-off area would provide a designated area for vehicles to drop-off passengers and not impede traffic. As such, emergency access to the Project Site and surrounding uses would be maintained and Project-related traffic is not anticipated to impair the LAFD from responding to emergencies at the Project Site or the surrounding area.

Based on the above, the Project operation would not require the addition of a new fire station or the expansion of an existing facility in order to maintain service. Therefore, operation of the Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities (fire protection), the construction of which would cause significant environmental impacts, in order to maintain acceptable fire protection services. Project impacts would be less than significant, and no mitigation measures are required. No further analysis of this issue in an EIR is required.

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

Less Than Significant Impact. The Project Site and the surrounding area are currently served by the Los Angeles Police Department's (LAPD) Central Bureau and the Central Community Police Station, located at 251 E. 6th Street (approximately 1.5 miles southwest of the Project Site).[58]

Project construction could potentially impact the provision of LAPD services in the vicinity of the Project Site as a result of construction impacts to the surrounding roadways. While the majority of construction activities would be contained within the boundaries of the Project Site, access to the Project Site and the surrounding vicinity could be impacted by temporary lane closures, roadway/access improvements, and trenching associated with utility line connections. Construction activities would also generate traffic associated with the movement of construction equipment, the hauling of soil and construction materials to and from the Project Site, and construction worker traffic. Thus, although construction activities would be short-term and temporary for the area, Project construction activities could temporarily increase response times along adjacent streets due to travel time delays caused by traffic during the Project's construction phase. However, construction-related traffic, including hauling activities and construction worker trips, would occur outside the typical weekday commuter morning and afternoon peak periods, thereby reducing the potential for traffic-related conflicts. In addition, a construction traffic management plan would be implemented during Project construction to ensure that adequate and safe access remains available within and near the Project Site during construction activities. The Project would also employ temporary traffic controls, such as flag persons, to control traffic movement during temporary traffic flow disruptions. Traffic management personnel would be trained to assist in emergency response by restricting or controlling the movement of traffic that could interfere with emergency vehicle access. Appropriate construction traffic control measures (e.g., detour signage, delineators, etc.) would also be implemented, as necessary, to ensure emergency access to the Project Site and traffic flow is maintained on adjacent rights-of-way. Furthermore, the drivers of emergency vehicles normally have a variety of options for avoiding traffic, such as using sirens to clear a path of travel or driving in the lanes of opposing traffic. Since emergency access to the Project Site would remain unobstructed during construction of the Project, impacts related to LAPD emergency access would be less than significant.

As previously noted, the Project does not include the development of residential uses. Therefore, the Project would not directly affect the existing officer-to-resident ratio within LAPD's Central Bureau. However, the Project would introduce a new employee and visitor population to the Project Site, which could result in an indirect demand for police services. These employment opportunities would include a range of full-time and part-time positions, which may be filled, in part, by employees already residing in the vicinity of the Project Site and who are already included in the residential population of the LAPD's Central Bureau. Other positions may be filled by persons who would commute and who would not relocate their place of residence as a result of working at the Project Site. Overall, given the LAPD's metrics for evaluating service capacity based on residential population, the Project's increase in the police service population would not affect the officer-to-resident ratio for LAPD's Central Bureau and the officer-to-resident ratio would remain at its current level.

However, the Project would incorporate security features to reduce the demand for police protection services. These features would include sufficient lighting throughout the Project Site to ensure safety

[58] LAPD, Your LAPD By Division, Central Community Police Station, www.lapdonline.org/lapd-contact/central-bureau/central-community-police-station/, accessed December 1, 2023.

and visibility and well illuminated entryways, walkways, and parking areas to eliminate areas of concealment. Additionally, as recommended by LAPD, prior to the issuance of a building permit, the Applicant would submit the Project plans to LAPD for review regarding the incorporation of feasible crime prevention features as well as access routes and other information that might facilitate police response. In addition to the implementation of these design features, which would help offset the Project-related increase in demand for police services, the Project would generate revenues to the City's General Fund (in the form of property taxes, sales revenue, etc.) that could be applied toward the provision of new police facilities and related staffing in the community, as deemed appropriate.

Overall, the Project would not generate a demand for additional police protection services that would exceed the LAPD's capacity to serve the Project Site. In its April 30, 2024 letter included as Appendix IS-5 of this Initial Study, LAPD stated that there are no planned improvements to the Central Community Police Station and concluded that the Project "…individually or combined with other past or present projects, will not result in the need for new or altered police facilities."[59]

Therefore, Project operation would not necessitate the provision of new or physically altered government facilities, the construction of which would cause significant environmental impacts, in order to maintain LAPD's capability to serve the Project Site. Impacts to police protection services would be less than significant, and no mitigation measures are required. No further analysis of this issue in an EIR is required.

c. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which would cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives for schools?

Less Than Significant Impact. The Project Site is located within the boundaries of the Los Angeles Unified School District (LAUSD). LAUSD is divided into six local districts.[60] The Project Site is located in Local District–East.[61] As previously discussed, the Project does not propose the development of residential uses. Therefore, implementation of the Project would not result in a direct increase in the number of students within the service area of LAUSD from the introduction of a residential population. In addition, not all new employees of the Project would relocate to the vicinity of the Project Site, which could otherwise trigger a demand for new or expanded school facilities. Furthermore, even if there were new school facilities that would need to be built, pursuant to Government Code Section 65995, the Applicant would be required to pay development fees for schools to LAUSD prior to the issuance of building permits. Pursuant to Government Code Section 65995, the payment of these fees is considered mitigation of Project-related school impacts. Therefore, impacts to schools would be less than significant, and no mitigation measures are required. No further analysis of this issue in an EIR is required.

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[59] Written correspondence from Dominic H. Choi, Los Angeles Police Department, April 30, 2024. See Appendix IS-4 of this Initial Study.

[60] Los Angeles Unified School District, Local District—East Map, July 29, 2022.

[61] Los Angeles Unified School District, Local District—East Map, July 29, 2022.

d. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which would cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for park services?

Less Than Significant Impact. Parks and recreational facilities in the vicinity of the Project Site are primarily operated and maintained by the Los Angeles Department of Recreation and Parks. There are 48 parks within a 2-mile radius of the Project Site, including six within 1 mile as shown in Table 2 on page 66: Alpine Recreation Center, Los Angeles Plaza Park, Buena Vista Meadow Picnic Area, Downey Recreation Center, City Hall Park Center, and Everett Triangle Park.[62]

As previously discussed, the Project does not propose the development of residential uses. Therefore, implementation of the Project would not result in on-site residents who would utilize nearby parks and/or recreational facilities. Additionally, the new employment opportunities that would be generated by the Project may be filled, in part, by employees already residing in the vicinity of the Project Site who already utilize existing parks and recreational facilities. Therefore, only a fraction of the new employees generated by the Project could create a demand for parks. While it is possible that some of these employees may utilize local parks and recreational facilities, such use would be anticipated to be limited due to work obligations and the amount of time it would take for employees to access off-site local parks. In addition, Project employees would be more likely to use parks near their homes during non-work hours. Furthermore, the Project proposes on-site amenities which would reduce the likelihood employees would use local parks. Specifically, as discussed in Section 3, Project Description, of this Initial Study, the Project would provide approximately 52,716 square feet of outdoor areas on-site with 33,776 square feet of hardscaping and 18,940 square feet of landscaping. Additionally, the Project proposes approximately 13,575 square feet of exterior space, of which 11,217 square feet is hardscape accessible to the public and 2,358 square feet of landscaping within the public-right-of-way at the sidewalk areas adjacent to the Project Site. In total, the Project would provide approximately 28,126 square feet of publicly accessible hardscape and landscape area on-site and off-site. Outdoor amenities within the Project would include a publicly accessible street plaza and garden which would both be located on the ground floor. The street plaza would be located on the corner of North Alameda Street and West College Street. The street plaza would include an entrance to the Project, outdoor seating, a raised planter, and bicycle parking. The garden would be located near the entrance of the Project along Bruno Street with egress stairs, raised planters, and architectural screening. Therefore, the Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered parks or the need for new or physically altered parks. Impacts would be less than significant, and no mitigation measures are required. No further analysis of the issue in an EIR is required.

[62] City of Los Angeles Department of Recreation and Parks, Facility Map Locator, www.laparks.org/facility-map-locator, accessed December 1, 2023.

Table 2
City of Los Angeles Parks and Recreational Facilities Within a 1-Mile Radius of the Project Site

No.	Facility and Address	Distance from Project Site[a] (miles)	Type of Park/ Recreational Facilities	Amenities
1	**Alpine Recreation Center** 817 Yale Street Los Angeles, CA 90012	0.28	Recreation Center	Auditorium, Sports Courts, Children's Play Area
2	**Los Angeles Plaza Park** 125 Paseo de la Plaza Los Angeles, CA 90012	0.46	Park	Grassy Area, Public Plaza
3	**Buena Vista Meadow Picnic Area** Meadow Road (East Side of Dodger Stadium) Los Angeles, CA 90012	0.73	Park	Barbecue Pits, Children's Play Area, Picnic Tables, Benches
4	**Downey Recreation Center** 6567 Selma Avenue Los Angeles, CA 90028	0.73	Recreation Center	Auditorium, Sports Courts/Fields, Picnic Tables, Indoor Gym, Stage
5	**City Hall Park Center** 200 N. Main Street Los Angeles, CA 90012	0.95	Park	Grassy Area, Public Plaza
6	**Everett Triangle Park** Everett Street One Block North of Sunset Echo Park, CA 90026	1.00	Park	Grassy Area

[a] *Distances are approximate aerial/bird's eye view distances from the Project Site obtained from the City of Los Angeles, Department of Recreation and Parks Facility Locator.*

Source: City of Los Angeles Department of Recreation and Parks, Facility Map Locator, www.laparks.org/facility-map-locator, accessed December 1, 2023.

e. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which would cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities?

Less Than Significant Impact. Other public facilities available include libraries. The Los Angeles Public Library (LAPL) provides library services to the City through its Central Library, eight regional branch libraries, and 64 neighborhood branch libraries, as well as through web-based resources.[63] The Project area is served by existing libraries within the Central City North Community Plan area, including the Chinatown Branch Library, located 0.3 miles southeast of the Project Site.

[63] Los Angeles Public Library, Los Angeles Public Library Strategic Plan 2015–2020.

As previously discussed, the Project does not propose the development of residential uses. Therefore, implementation of the Project would not result in a direct increase in the number of residents within the service population of the Chinatown Branch Library. In addition, Project employees would have internet access to LAPL and other web-based resources, decreasing the demand on library facilities. Furthermore, Project employees would be more likely to use library facilities near their homes during non-work hours. Given that some of the employment opportunities generated by the Project would be filled by people already residing in the vicinity of the Project Site, Project employees and the potential indirect population generation that could be attributable to those employees would generate minimal demand for library services. Therefore, the Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered library facilities or the need for new or physically altered library facilities. Impacts would be less than significant, and no mitigation measures are required. No further analysis of this issue in an EIR is required.

XVI. RECREATION

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

a. Would the project Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?

Less Than Significant Impact. The Project does not propose the development of residential uses which would create a demand on nearby parks and/or recreational facilities. Additionally, the new employment opportunities that would be generated by the Project may be filled, in part, by employees already residing in the vicinity of the Project Site who already utilize existing parks and recreational facilities. Therefore, only a fraction of the new employees generated by the Project could create a demand for parks and recreational facilities. While it is possible that some of these employees may utilize local parks and recreational facilities, such use would be anticipated to be limited due to work obligations and the amount of time it would take for employees to access off-site local parks and recreational facilities. The Project proposes on-site amenities that would reduce the likelihood employees would use local parks. Specifically, as discussed in Section 3, Project Description, of this Initial Study, the Project would provide approximately 52,716 square feet of outdoor areas on-site with 33,776 square feet of hardscaping and 18,940 square feet of landscaping. Additionally, the Project proposes approximately 13,575 square feet of exterior space, of which 11,217 square feet is

hardscape accessible to the public and 2,358 square feet of landscaping within the public-right-of-way at the sidewalk areas adjacent to the Project Site. In total, the Project would provide approximately 28,126 square feet of publicly accessible hardscape and landscape area on- and off-site. Outdoor amenities within the Project would include a publicly accessible street plaza and garden which would both be located on the ground floor. The street plaza would be located on the corner of North Alameda Street and West College Street. The street plaza would include an entrance to the Project, outdoor seating, a raised planter, and bicycle parking. The garden would be located near the entrance of the Project along Bruno Street with egress stairs, raised planters, and architectural screening. In addition, Project employees would be more likely to use parks near their homes during non-work hours. Therefore, the Project would not substantially increase the demand for off-site public parks and recreational facilities such that substantial physical deterioration of those facilities would occur or be accelerated. The impact on parks and recreational facilities would be less than significant, and mitigation measures would not be required. No further evaluation of this topic in an EIR is required.

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The Project does not include any residential uses and therefore would not result in any direct substantial population growth that would increase use of existing recreational facilities. Therefore, the Project would not necessitate construction of new recreational facilities. Therefore, no impact would occur, and no mitigation measures would be required. No further evaluation of this topic in an EIR is required.

XVII. TRANSPORTATION

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

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

Potentially Significant Impact. Operation of the proposed uses would generate vehicle and transit trips throughout the day. The resulting increase in the use of the area's roadways could conflict with an applicable plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Therefore, further analysis of this issue will be provided in the EIR.

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

Potentially Significant Impact. SB 743, which went into effect in January 2014, requires the Governor's Office of Planning and Research to change the way public agencies evaluate transportation impacts of projects under CEQA. Under SB 743, the focus of transportation analysis has shifted from driver delay, which is typically measured by traffic level of service (LOS), to a new measurement that better addresses the state's goals on reduction of greenhouse gas emissions, creation of a multi-modal transportation, and promotion of mixed-use developments. CEQA Guidelines Section 15064.3 states that vehicle miles traveled (VMT) is the most appropriate measure of transportation impacts, replacing LOS.

On July 30, 2019, the City adopted the CEQA Transportation Analysis Update, which sets forth the revised thresholds of significance for evaluating transportation impacts as well as screening and evaluation criteria for determining impacts. The CEQA Transportation Analysis Update establishes VMT as the City's formal method of evaluating a project's transportation impacts. In conjunction with this update, LADOT adopted its *Transportation Assessment Guidelines* (TAG; July 2019), which defines the methodology for analyzing a project's transportation impacts in accordance with SB 743. The TAG was most recently updated in August 2022.

The Project would develop new commercial uses on the Project Site. As a result, VMT would increase over existing conditions. Therefore, further analysis of this issue will be provided in the EIR.

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

Less Than Significant Impact. The TAG requires analysis of hazardous geometric design features or incompatible uses if a project proposes new driveways or includes any voluntary or required modifications to the public right-of-way. As discussed in Section 3, Project Description, of this Initial Study, access to the Project's parking garage and loading/trash areas would be provided via two driveways on College Street. A passenger drop-off and pick-up area would also be provided along Bruno Street, which is designed to preserve the Granite Block Paving (HCM #211) along Bruno Street consistent with City Planning policy. Overall, the number of curb cuts on the Project Site would be reduced by one with the elimination of one curb cut on West College Street which is currently used for access to the surface parking lot. The new driveways, passenger drop-off area, and curb cuts would conform to LADOT standards related to widths, distances from corners, and pedestrian safety.

Additionally, the roadways adjacent to the Project Site are part of the urban roadway network and contain no sharp curves or dangerous intersections. The Project Site is located in a highly urbanized area developed with roadways and infrastructure. All access and circulation associated with the Project would be designed and constructed in conformance with all applicable requirements established by LADBS, LAFD, and the LAMC. The Project would not include any new roads that

would result in an increase in hazards due to a design feature. Lastly, the Project would not result in incompatible uses as the proposed uses are consistent with the types of commercial uses already present in the surrounding area. Thus, impacts related to increased hazards due to a geometric design feature or incompatible use would be less than significant, and no further analysis of this topic in the EIR is required.

d. Would the project result in inadequate emergency access?

Less Than Significant Impact. As discussed above under Checklist Question No. IX, Hazards and Hazardous Materials, the nearest emergency/disaster route to the Project Site is Alameda Street adjacent to the Project Site to the west.[64] While the majority of construction activities for the Project would be confined to the Project Site, the Project includes off-site trenching within the public right-of-way for utility connections, which could potentially require temporary lane closures. However, if lane closures are necessary, both directions of travel would continue to be maintained in accordance with standard construction traffic management plans that would be implemented to ensure adequate circulation and emergency access. With regard to operation, the Project would not require the permanent closure of any local public or private streets and would not impede emergency vehicle access to the Project Site or surrounding area. In addition, the Project would comply with LAFD access requirements and applicable LAFD regulations regarding safety. Therefore, the Project would not result in inadequate emergency access. Impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

XVIII. TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☒	☐	☐	☐

[64] City of Los Angeles, Geohub, Disaster Routes, https://geohub.lacity.org/datasets/lacounty::disaster-routes-1/explore?location=34.062986%2C-118.234620%2C18.63, accessed June 14, 2023.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1 (k)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Potentially Significant Impact (a and b). Approved by Governor Jerry Brown on September 25, 2014, AB 52 establishes a formal consultation process for California Native American Tribes to identify potential significant impacts to Tribal Cultural Resources, as defined in PRC Section 21074, as part of CEQA. As specified in AB 52, lead agencies must provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if the tribe has submitted a written request to be notified. The tribe must respond to the lead agency within 30 days of receipt of the notification if it wishes to engage in consultation on the project, and the lead agency must begin the consultation process within 30 days of receiving the request for consultation.

As noted above, the Project would require grading, excavation, trenching within the public right-of-way for utility connections, and other construction activities that could have the potential to disturb existing but undiscovered tribal cultural resources. Therefore, the potential exists for the Project to significantly impact a site, feature, place, cultural landscape, sacred place, or object with cultural value to a California Native American Tribe. In compliance with AB 52, the City notified all applicable tribes on April 10, 2024, and the City will participate in any requested consultations for the Project. Further analysis of this topic will be provided in the EIR.

XIX. UTILITIES AND SERVICE SYSTEMS

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

The wastewater analysis below is based, in part, on the *Utility Technical Report for 130 W College Street* (Utility Report) prepared for the Project by Langan Engineering and Environmental Services, Inc., dated July 11, 2023, and included as Appendix IS-6 of this Initial Study.

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Potentially Significant Impact (Water, Electric Power, and Natural Gas)/Less Than Significant Impact (Wastewater, Stormwater, and Telecommunications Facilities). Water, wastewater, electric power, and natural gas systems consist of two components, the source of the supply or place of treatment (for wastewater), and the conveyance systems (i.e., distribution lines and mains) that link the location of these facilities to an individual development site. Given the Project's increase in the amount of developed floor area on the Project Site and the potential corresponding increase in water, electricity, and natural gas demand, further analysis of this issue in an EIR will be provided.

Wastewater and telecommunications facilities are analyzed below. Stormwater is analyzed under Section X, Hydrology and Water Quality, above.

Wastewater

Wastewater generated by the Project would be conveyed via the existing wastewater conveyance systems for treatment at the Hyperion Water Reclamation Plant (HWRP). The HWRP has a capacity of 450 million gallons per day (mgd),[65] and current average wastewater flows are at approximately 275 mgd.[66] Accordingly, the remaining available capacity at the HWRP is approximately 175 mgd. As shown in Table 3 on page 74, the Project would generate a wastewater flow of approximately 31,135 gallons per day (gpd), or approximately 0.03 mgd. The Project's increase in average daily wastewater flow of 0.03 mgd would represent approximately 0.02 percent of the current estimated 175 mgd of remaining available capacity at the HWRP. Therefore, the Project-generated wastewater would be accommodated by the existing capacity of the HWRP. Furthermore, wastewater flows would be typical of office and commercial developments which are currently treated by HWRP. and no industrial discharge into the wastewater system would occur. Additionally, discharge of effluent from the HWRP into Santa Monica Bay is also regulated by permits issued under the NPDES and is required to meet LARWQCB requirements. As LA Sanitation (LASAN) monitors the treated wastewater, and because the wastewater generated by the Project would be similar to wastewater currently treated at HWRP, wastewater generated from the Project Site would not exceed wastewater treatment requirements of LARWQCB.

The Project is anticipated to utilize existing sewer infrastructure. As provided in the WWSI included as Appendix C of the Utility Report, in the vicinity of the Project Site, there is a 15-inch sewer line on N. Alameda Street, an 18-inch sewer line on Alameda Street, and a 30-inch sewer line on Los Angeles Street. The 15-inch line on Alameda Street has a design capacity of 1.16 mgd, the 18-inch line on Alameda Street has a design capacity of 2.36 mgd, and the 30-inch line on Los Angeles Street has a design capacity of 7.78 mgd. Current gauging was not available for the 15-inch line; however, the 18-inch line was at 25 percent capacity and the 30-inch line was at 17 percent capacity. LASAN has analyzed the Project's demands along with existing conditions and forecasted growth and has determined that there appears to be sufficient service to accommodate the total flows of the Project. As required by LAMC Section 64.15, the Project would submit a Sewer Capacity Availability Request to LASAN to evaluate the capability of the existing wastewater system and obtain approval to discharge the Project's wastewater to the existing sewer lines surrounding the Project Site. Further detailed gauging and evaluation, as required by LAMC Section 64.14, would be conducted to obtain final approval of sewer capacity and connection permit for the Project during the Project's permitting process. In addition, Project-related sanitary sewer connections and on-site infrastructure would be designed and constructed in accordance with applicable LASAN and California Plumbing Code standards. Therefore, the Project would not cause a measurable increase in wastewater flows at a point where, and at a time when, a sewer's capacity is already constrained or that would cause a sewer's capacity to become constrained.

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65 LASAN, Water Reclamation Plants, Hyperion Water Reclamation Plant, www.lacitysan.org/san/faces/wcnav_externalId/s-lsh-wwd-cw-p-hwrp?_adf.ctrl-state=vm8qwyj80_4&_afrLoop=18606279438697733#!, accessed June 14, 2023.

66 LASAN, Water Reclamation Plants, Hyperion Water Reclamation Plant, www.lacitysan.org/san/faces/wcnav_externalId/s-lsh-wwd-cw-p-hwrp?_adf.ctrl-state=vm8qwyj80_4&_afrLoop=18606279438697733#!, accessed June 14, 2023.

Table 3
Estimated Project Wastewater Generation

Land Use	Floor Area	Wastewater Generation Rate (gpd/unit)[a]	Wastewater Generation (gpd)
PROPOSED			
Office	224,597 sf	0.12 gpd/sf	26,952
Restaurant: Full-Service Indoor Seat (5,894 sf)	136 seats	30 gpd/seat	4,080
Retail	4,110 sf	0.025 gpd/sf	103
Proposed Wastewater Generation			**31,135**

sf = square feet

gpd = gallons per day

[a] *Wastewater generation rates are based on 2012 LASAN Sewer Generation Rates.*

Source: Langan Engineering and Environmental Services, 2023. Refer to Appendix IS-4 of this Initial Study.

Based on the above, the Project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. Therefore, impacts would be less than significant, and mitigation measures are not required. No further analysis of this topic in an EIR is required.

Stormwater

As discussed above in Response to Checklist Question No. X.c.iii, the Project would decrease stormwater flow rates. As such, the Project would not require or result in the relocation or construction of new or expanded stormwater drainage. Based on the above, the Project would not require or result in the construction of new stormwater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. Therefore, impacts would be less than significant, and mitigation measures are not required. No further analysis of this topic in an EIR is required.

Telecommunications Facilities

The Project would require construction of new on-site telecommunications infrastructure to serve new buildings and potential upgrades and/or relocation of existing telecommunications infrastructure. Construction impacts associated with the installation of telecommunications infrastructure would primarily involve trenching in order to place the lines below surface. However, the Project would ensure vehicle and pedestrian access is maintained throughout construction. In addition, when considering impacts resulting from the installation of any required telecommunications infrastructure, all impacts are of a relatively short duration (i.e., months) and would cease to occur when installation is complete. Installation of new telecommunications infrastructure would be limited to on-site telecommunications distribution and minor off-site work associated with connections to the public system. No upgrades to off-site telecommunications systems are anticipated. Any work that may affect services to the existing telecommunications lines would be coordinated with service providers and the City as applicable. As such, the Project would not require or result in the relocation or

construction of new or expanded telecommunications facilities. Impacts would be less than significant and no further evaluation of this topic in an EIR is required.

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

Potentially Significant Impact. LADWP supplies water to the Project Site. Given the Project's increase in the amount of developed floor area on the Project Site, the Project has the potential to result in increased demand for water provided by LADWP. Therefore, further analysis of this issue will be provided in the EIR.

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less Than Significant Impact. As shown in Table 3 on page 74 of this Initial Study, the Project would generate a wastewater flow from the Project Site of approximately 31,135 gpd, or approximately 0.03 mgd. The Project's increase in average daily wastewater flow of 0.03 mgd would represent approximately 0.02 percent of the current 175 mgd of remaining available capacity of the HWRP.[67] Therefore, wastewater generated by the Project would be accommodated by the existing capacity of the HWRP.

Various factors, including future development of new treatment plants, upgrades and improvements to existing treatment capacity, development of new technologies, etc., will ultimately determine the available capacity of the Hyperion Service Area in 2028, the operational year of the Project. Planned upgrades would provide for improvements beyond 2040 to serve future population needs. However, it is conservatively assumed that no new improvements to the wastewater treatment plants would occur prior to 2028. Thus, based on this conservative assumption, the capacity of the HWRP in 2028 would continue to be 450 mgd.

Based on LASAN's average flow projections for the HWRP, it is anticipated that average flows in 2028, the Project build-out year, would be approximately 271.2 mgd.[68] Accordingly, the future remaining available capacity in 2028 would be approximately 178.8 mgd.[69] The Project's increase in average daily wastewater flow of 0.03 mgd would represent approximately 0.02 percent of the estimated future remaining available capacity of 178.8 mgd at the HWRP.[70] Therefore, wastewater generated under the Project would be accommodated by the future capacity of the HWRP.

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67 (0.03 mgd / 175 mgd) x 100 = 0.02%

68 Los Angeles Department of Water and Power, One Water LA 2040 Plan—Volume 2, Table ES.1, Projected Wastewater Flows. Based on a straight-line interpolation of the projected flows for the HWRP for 2020 (approximately 256 mgd) and 2030 (approximately 275 mgd). The 2028 value is extrapolated from 2020 and 2030 values: [(275 mgd – 256 mgd) ÷ 10) * 8] + 256 = ~ 271.2 mgd.

69 450 mgd – 271.2 mgd = 178.8 mgd

70 (0.03 mgd ÷ 178.8 mgd) x 100 = 0.02%

Additionally, the Project's net increase in average daily wastewater generation of 0.03 mgd plus the current average flows of approximately 275 mgd to the HWRP would represent approximately 61.1 percent[71] of the HWRP's capacity of 450 mgd. With regard to future flows, the Project's net increase of 0.03 mgd plus the projected flows of approximately 271.2 mgd to the HWRP would represent approximately 60.3 percent[72] of the HWRP's assumed future capacity of 450 mgd.

Based on the above, there is adequate treatment capacity to serve the Project's projected demand in addition to existing LASAN commitments. As such, the Project would result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments. Impacts would be less than significant, and no mitigation measures are required. No further analysis of this topic in an EIR is required.

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

Less Than Significant Impact. While LASAN generally provides waste collection services to single-family and some small multi-family developments, private haulers permitted by the City provide waste collection services for most multi-family residential and commercial developments within the City. Solid waste transported by both public and private haulers is either recycled, reused, or transformed at a waste-to-energy facility, or disposed of at a landfill. Landfills within the County of Los Angeles (County) are categorized as either Class III or inert waste landfills. Non-hazardous municipal solid waste is disposed of in Class III landfills, while inert waste such as construction waste, yard trimmings, and earth-like waste are disposed of in inert waste landfills.[73] Ten Class III landfills and one inert waste landfill with solid waste facility permits are currently serving the County.[74] In addition, there is one solid waste transformation facility within the County that converts, combusts, or otherwise processes solid waste for the purpose of energy recovery.

Based on 2021 Countywide Integrated Waste Management Plan (CoIWMP) Annual Report, the most recent report available, the total remaining Class III landfill capacity in the County is estimated at 137.09 million tons. In 2021, approximately 6.24 million tons of solid waste were disposed of at the County's Class III landfills and approximately 0.375 million tons of solid waste were disposed of at County transformation facilities.[75] The estimated remaining capacity for the Class III landfills open to

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71 [(0.03 mgd + 275 mgd) ÷ 450 mgd] x 100 = 61.12 (~ 61.1%)

72 [(0.03 mgd + 271.2 mgd) ÷ 450 mgd] x 100 = ~60.3

73 Inert waste is waste which is neither chemically or biologically reactive and will not decompose. Examples of this are sand and concrete.

74 County of Los Angeles, Department of Public Works, Los Angeles County Integrated Waste Management Plan 2021 Annual Report, December 2022. The 10 Class III landfills serving the County include the Antelope Valley Landfill, the Burbank Landfill, the Calabasas Landfill, Chiquita Canyon Landfill, Lancaster Landfill, Pebbly Beach Landfill, San Clemente Landfill, the Scholl Canyon Landfill, the Sunshine Canyon City and County Landfill, and the Whittier/Savage Canyon Landfill. Azusa Land Reclamation is the only permitted Inert Waste Landfill in the County that has a full solid waste facility permit.

75 County of Los Angeles, Department of Public Works, Countywide Integrated Waste Management Plan 2021 Annual Report, December 2022, Figure 6.

the City is approximately 127.44 million tons.[76]. In addition, the permitted inert waste landfill serving the County is Azusa Land Reclamation. This facility currently has 50.77 million tons of remaining capacity.[77] The County continually evaluates landfill disposal needs and capacity through preparation of the CoIWMP Annual Reports. Within each annual report, future landfill disposal needs over the next 15-year planning horizon are addressed in part by determining the available landfill capacity.[78]

Additionally, the City's Recovering Energy, Natural Resources and Economic Benefit from Waste for Los Angeles (RENEW LA) Plan sets a goal of becoming a "zero waste" city by 2030. To this end, the City implements a number of source reduction and recycling programs such as curbside recycling, home composting demonstration programs, and construction and demolition debris recycling.[79] The City is currently diverting 76 percent of its waste from landfills.[80] The City has adopted the goal of achieving 90 percent diversion by 2025, and zero waste by 2030.

The following analysis quantifies the Project's construction and operation solid waste generation.

Construction

As discussed in Section 3, Project Description, of this Initial Study construction of the Project would include the construction of 234,601 square feet of new commercial uses. Pursuant to the requirements of SB 1374, the Project would implement a construction waste management plan to recycle and/or salvage a minimum of 75 percent of non-hazardous demolition and construction debris. Materials that could be recycled or salvaged include asphalt, glass, and concrete. Debris not recycled could be accepted at the unclassified landfill (Azusa Land Reclamation) within the County and within the Class III landfills open to the City. Furthermore, pursuant to LAMC Sections 66.32 through 66.32.5 (Ordinance No. 181,519), the Project's construction contractor would be required to deliver all remaining construction and demolition waste generated by the Project to a certified construction and demolition waste processing facility. Thus, although the total diversion rate may ultimately exceed 75 percent, this analysis conservatively assumes a diversion rate of 75 percent.

As shown in Table 4 on page 78 of this Initial Study, based on construction and debris rates established by the United States Environmental Protection Agency and after accounting for mandatory recycling, it is conservatively calculated that the Project would generate approximately 1,980 tons of construction-related waste. This amount of construction and debris waste would

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76 County of Los Angeles, Department of Public Works. Los Angeles County Integrated Waste Management Plan 2020 Annual Report, October 2021

77 County of Los Angeles, Department of Public Works; Los Angeles County Integrated Waste Management Plan 2020 Annual Report, October 2021.

78 County of Los Angeles, Department of Public Works. Los Angeles County Integrated Waste Management Plan 2020 Annual Report, October 2021.

79 LA Sanitation, Solid Waste Integrated Resource Plan, www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-s/s-lsh-wwd-s-zwswirp?_adf.ctrl-state=148ffk6elf_78&_afrLoop=5743103707890135&_afrWindowMode=0&_afrWindowId=null#!%40%40%3F_afrWindowId%3Dnull%26_afrLoop%3D5743103707890135%26_afrWindowMode%3D0%26_adf.ctrl-state%3D148ffk6elf_82, accessed June 14, 2023.

80 LA Sanitation, Recycling, www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-s/s-lsh-wwd-s-r?_adf.ctrl-state=alxbkb91s_4&_afrLoop=18850686489149411#!, accessed June 14, 2023.

Table 4
Project Demolition and Construction Waste Generation

Building	Size	Generation Rate (lbs/square feet)[a]	Total (tons)
Construction Waste			
Office	224,597 sf	3.89	437
Restaurant	5,894 sf [c]	3.89	12
Retail	4,110 sf	3.89	8
Construction Waste Subtotal			*457*
Demolition Waste			
Surface Parking[b]	96,268 sf	155	7,461
Demolition Waste Subtotal			*7,461*
Total for Construction and Demolition Waste			***7,918***
Total After 75-Percent Recycling			**1,980**

lbs = pound

sf = square feet

[a] *United States Environmental Protection Agency, Report No. EPA530-98-010, Characterization of Building-Related Construction and Demolition Debris in the United States, June 1998, Tables 3, 4, 5, and 6. Generation rates used in this analysis are based on an average of individual rates assigned to specific building types.*

[b] *No demolition rate for surface parking is included in the USEPA report. Therefore, the average construction and demolition rate for non-residential debris is used to provide a conservative estimate.*

[c] *The Project would also include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the LAMC, but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of this environmental analysis, the Project would include 5,894 square feet of restaurant space.*

Source: Eyestone Environmental, 2024.

represent approximately 0.004 percent of the Azusa Land Reclamation Landfill's remaining disposal capacity of 50.77 million tons.[81] It should be noted that soil export is not typically included in the calculation of construction waste to be landfilled since soil is not disposed of as waste but, rather, is typically used as a cover material or fill at other construction sites requiring soils import. As reported above, the Azusa Land Reclamation landfill, the County's inert waste landfill, would be able to accommodate waste from the Project's construction activities .

Based on the above, Project construction would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and strategies identified in the ColWMP or by the City (refer to Response to Checklist Question No. XIX(e) regarding consistency with City solid waste planning goals).

[81] (1,980 ÷ 50.77 million tons) * 100 = 0.004 percent.

Therefore, Project construction impacts to solid waste facilities would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

Operation

As shown in Table 5 on page 80 of this Initial Study, based on solid waste generation factors from LASAN, the Project would result in a net increase in solid waste generation of approximately 1,932 tons per year. The estimated solid waste is conservative because the waste generation factors used do not account for recycling or other waste diversion measures, such as compliance with AB 341, which requires California commercial enterprises and public entities that generate 4 cubic yards or more per week of waste, and multi-family housing with five or more units, to adopt recycling practices. Likewise, the analysis does not include implementation of the City's Zero Waste Plan, which is expected to result in a reduction of landfill disposal Citywide with a goal of reaching a Citywide recycling rate of 90 percent by the year 2025.[82]

The estimated net increase in solid waste that would be generated by the Project represents approximately 0.002 percent of the remaining capacity (127.44 million tons) for the Class III landfills serving the City.[83] The Project's estimated solid waste generation would therefore represent a nominal percentage of the remaining daily disposal capacity of those landfills. As such, Project operation would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals or strategies identified in the ColWMP or by the City (refer to Response to Question No. XIX(e) regarding consistency with City solid waste planning goals). Therefore, the Project's potential construction impacts to solid waste facilities would be less than significant, and no mitigation measures would be required.

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

Less Than Significant Impact. Solid waste management in the State is primarily guided by the California Integrated Waste Management Act of 1989 (AB 939), which emphasizes resource conservation through reduction, recycling, and reuse of solid waste. AB 939 establishes an integrated waste management hierarchy consisting of (in order of priority): (1) source reduction; (2) recycling and composting; and (3) environmentally safe transformation and land disposal. In addition, AB 1327 provided for the development of the California Solid Waste Reuse and Recycling Access Act of 1991, which requires the adoption of an ordinance by any local agency governing the provision of adequate areas for the collection and loading of recyclable materials in development projects. Furthermore, AB 341, which became effective on July 1, 2012, requires businesses and public entities that generate 4 cubic yards or more of waste per week and multi-family dwellings with five or more units, to recycle. The purpose of AB 341 is to reduce greenhouse gas emissions by diverting commercial

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82 LA Sanitation, Solid Waste Integrated Resource Plan, www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-s/s-lsh-wwd-s-zwswirp?_adf.ctrl-state=148ffk6elf_78&_afrLoop=5743103707890135&_afrWindowMode=0&_afrWindowId=null#!%40%40%3F_afrWindowId%3Dnull%26_afrLoop%3D5743103707890135%26_afrWindowMode%3D0%26_adf.ctrl-state%3D148ffk6elf_82, accessed June 14, 2023.

83 (1,932 tons per year/127.44 million tons) x 100 ≈ 0.002%

Table 5
Estimated Project Solid Waste Generation

Building	Size	Employee Generation Rate per thousand square feet[a]	Estimated Number of Employees[a]	Solid Waste Generation Rate[b]	Total Generation (tons/year)
Proposed					
Office	224,597 sf	4	898 emp	2.02 tons/emp/year	1,814
Restaurant	5,894 sf[c]	6.7	40 emp	1.92 tons/emp/year	77
Retail	4,110 sf	2	8 emp	5.08 tons/emp/year	41
Total Proposed					**1,932**

emp = employees

lbs = pounds

sf = square feet

[a] *Los Angeles Department of Transportation (LADOT) and Los Angeles Department of City Planning (DCP), City of Los Angeles VMT Calculator Documentation, Version 1.3, May 2020.*

[b] *Solid waste generation rates are from CalRecycle's Disposal and Diversion Rates for Business Groups, www2.calrecycle.ca.gov/wastecharacterization/businessgrouprates, accessed April 12, 2024. To present a conservative analysis, the Services – Professional Technical, & Financial rate was used for the office use and Retail Trade – Food & Beverage Stores rate was used for the retail use because these categories have the highest generation rates.*

[c] *The Project would also include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the LAMC, but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of this environmental analysis, the Project would include 5,894 square feet of restaurant space.*

Source: Eyestone Environmental, 2024.

solid waste from landfills and expand opportunities for recycling in California. In addition, in March 2006, the Los Angeles City Council adopted RENEW LA, a 20-year plan with the primary goal of shifting from waste disposal to resource recovery within the City, resulting in "zero waste" by 2030. The plan also calls for reductions in the quantity and environmental impacts of residue material disposed in landfills. In October 2014, Governor Jerry Brown signed AB 1826, requiring businesses to recycle their organic waste[84] on and after April 1, 2016, depending on the amount of waste generated per week. Specifically, beginning April 1, 2016, businesses that generate 8 cubic yards of organic waste per week were required to arrange for organic waste recycling services. In addition, beginning January 1, 2017, businesses that generate 4 cubic yards of organic waste per week were required to arrange for organic waste recycling services.

[84] Organic waste refers to food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

The Project would be consistent with the applicable regulations associated with solid waste. Specifically, the Project would provide adequate storage areas in accordance with the City of Los Angeles Space Allocation Ordinance (Ordinance No. 171,687), which requires that development projects include an on-site recycling area or room of specified size.[85] The Project would also comply with AB 939, AB 341, AB 1826, and City waste diversion goals, as applicable, by providing clearly marked, source-sorted receptacles to facilitate recycling. Since the Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste, impacts would be less than significant, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

XX. WILDFIRE

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

a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

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

[85] Ordinance No. 171,687, adopted by the Los Angeles City Council on August 6, 1997.

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

d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact (a–d). The Project Site is located in an urbanized area, and there are no wildlands located in the vicinity of the Project Site. The Project Site is not located within a City-designated Very High Fire Hazard Severity Zone or Fire District No. 1, which consists of areas identified by the City that are required to meet additional development regulations to reduce fire hazard-related risks.[86] Therefore, the Project Site is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. No impacts regarding wildfire risks would occur, and no mitigation measures are required. No further evaluation of this topic in an EIR is required.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

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

[86] City of Los Angeles, Zone Information and Map Access System (ZIMAS), Parcel Profile Report for 130 W. College Street, January 15, 2024.

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Potentially Significant Impact. As discussed above, the Project is located in a highly urbanized area and does not serve as habitat for fish or wildlife species. In addition, no sensitive plant or animal community or special status species occur on the Project Site. Therefore, the Project would not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal.

As discussed above, the Project's potential environmental impacts for the following subject areas will be further analyzed in the EIR: air quality; cultural resources; energy; geology and soils (paleontological resources); greenhouse gas emissions; hazards and hazardous materials; land use and planning; noise; transportation; tribal cultural resources; and utilities and service systems (water supply and energy infrastructure).

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

Potentially Significant Impact. The potential for cumulative impacts occurs when the impacts of the Project are combined with impacts from related development projects and result in impacts that are greater than the impacts of the Project alone. Located in the vicinity of the Project Site are other current and reasonably foreseeable projects, the development of which, in conjunction with that of the Project, may contribute to potential cumulative impacts. Impacts of the Project on both an individual and cumulative basis will be addressed in the EIR for the following subject areas: air quality; cultural resources; energy; geology and soils (paleontological resources); greenhouse gas emissions; hazards and hazardous materials; land use and planning; noise; transportation; tribal cultural resources; and utilities and service systems (water supply and energy infrastructure.

With regard to agriculture and forestry resources, biological resources, and mineral resources, no such resources are located on the Project Site or in the surrounding area. In addition, the Project would have no impact on these resources, and therefore could not combine with other projects to result in cumulative impacts. Therefore, cumulative impacts to agriculture and forestry resources, biological resources, and mineral resources would be less than significant.

As analyzed above, the Project would not result in significant impacts to geology and soils. Thus, the Project would not contribute to any cumulative impacts associated with geology and soils. In addition, due to their site-specific nature, geology and soils impacts are typically assessed on a project-by-project basis or for a particular localized area. Therefore, as with the Project, related projects would address site-specific geologic hazards through the implementation of site-specific geotechnical recommendations and/or mitigation measures. While cumulative development would expose a greater number of people to seismic hazards, as with the Project, related projects would be subject to

local, State, and federal regulations and standards for seismic safety. Thus, Project impacts related to geology and soils would not be cumulatively considerable and would be less than significant.

Related projects could potentially result in an increase in surface water runoff and contribute point and non-point source pollutants to nearby water bodies. However, as with the Project, related projects would be subject to the City's LID requirements and, for applicable projects, NPDES permit requirements, including development of SWPPPs for construction projects greater than 1 acre, compliance with SUSMP requirements during operation, and compliance with other local requirements pertaining to hydrology and surface water quality. It is anticipated that related projects would also be evaluated on an individual basis by the Department of Public Works to determine appropriate BMPs and treatment measures to avoid significant impacts to hydrology and surface water quality. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to hydrology and water quality. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

In terms of population and housing, related development would not induce substantial population growth since most of the City is already fully developed and occupied by a long-standing residential population. In addition, not all related projects include residential uses and therefore would not contribute to population growth. As discussed in the analysis above, the Project does not propose residential uses and thus would not directly contribute to population growth. While the Project would not displace housing or people, other projects might displace existing housing and people residing in them. However, even if construction of replacement housing were required elsewhere, such developments would likely occur on infill sites within the City, and the appropriate level of environmental review would be conducted to analyze the extent to which the related projects could cause significant environmental impacts. Overall, the Project's contribution would not be cumulatively considerable since no residential units are proposed, and cumulative impacts related to population and housing would be less than significant.

With regard to fire protection, the increase in development and residential service populations from the Project, related projects, and other future development in the service areas of the above-mentioned fire stations would result in a cumulative increase in the demand for LAFD services. However, similar to the Project, the related projects and other future development projects in the Community Plan area would be reviewed by the LAFD to ensure that sufficient fire safety and hazards measures are implemented. Furthermore, each related project and other future development projects would be required to comply with regulatory requirements related to fire protection services. In addition, the Project, related projects, and other future development projects would be subject to the City's standard construction permitting process, which includes a review by LAFD for compliance with building and site design standards related to fire/life safety, as well as coordinating with LADWP to ensure that local fire flow infrastructure meets current code standards for the type and intensity of land uses involved. Furthermore, given that the Project Site is located within an urban area, each of the related projects, as well as other future developments, would likewise be developed within urbanized locations that fall within an acceptable distance from one or more existing fire stations. In addition, as with the Project, the related projects and other future development projects in the vicinity, would also generate revenues to the City's General Fund (in the form of property taxes, sales revenue, etc.) that could be applied toward the provision of new fire station facilities and related staffing, as deemed appropriate. Cumulative increases in demand for fire protection services due to related projects and other future development projects would be identified and addressed through the City's annual

programming and budgeting processes. LAFD resource needs would be identified and monies allocated according to the priorities at the time. Any requirement for a new fire station, or the expansion, consolidation, or relocation of an existing fire station, would also be identified through this process, the impacts of which would be addressed accordingly. Furthermore, over time, LAFD would continue to monitor population growth and land development throughout the City and identify additional resource needs, including staffing, equipment, trucks and engines, ambulances, other special apparatuses, and possibly station expansions or new station construction, which may become necessary to achieve the required level of service. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant

With regard to police protection, it is anticipated that the Project in combination with the related projects would increase the demand for police protection services. This cumulative increase in demand for police protection services would increase demand for additional LAPD staffing, equipment, and facilities over time. Similar to the Project, other projects served by LAPD would implement safety and security features according to LAPD recommendations. LAPD would continue to monitor population growth and land development throughout the City and identify additional resource needs including staffing, equipment, vehicles, and possibly station expansions or new station construction that may become necessary to achieve the desired level of service. Through the City's annual budgeting efforts, LAPD's resource needs would be identified and monies allocated according to the priorities at the time. Any new or expanded police station would be funded via existing mechanisms (e.g., property and sales taxes, government funding, and developer fees) to which the Project and cumulative growth would contribute. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

With regard to public services such as schools, parks/recreational facilities, and libraries, the Project would not generate a residential population that could increase the demand for schools, parks/recreational facilities, and libraries. Therefore, the Project would not contribute to an increased demand for these services. Other related projects could increase the demand for these services and facilities. However, the applicants for those projects would be required to pay mitigation impact fees for identified impacts under applicable regulatory requirements. Specifically, in the case of schools, the applicants for some related projects may be required to pay school impact fees, which would offset any potential impact to schools associated with the related projects. Similarly, in the case of parks and recreational facilities (i.e., existing neighborhood and regional parks), projects would be required by the LAMC to include open space and amenity spaces (e.g. gyms, outdoor decks with pools, etc.) and pay park fees (as required), which would help reduce the demand on neighborhood and regional parks, thereby reducing the likelihood that there would be substantial deterioration of parks. Employees generated by the non-residential related projects would be more likely to use parks and library facilities near their homes during non-work hours, as opposed to patronizing local facilities on their way to or from work or during their lunch hours. In addition, each related project would generate revenues to the City's General Fund (in the form of property taxes, sales tax, business tax, transient occupancy tax, etc.) that could be applied toward the provision of enhancing park facilities and library services in the City, as deemed appropriate. These revenues to the City's General Fund would help offset the increase in demand for park facilities and library services as a result of the Project and the related projects. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to schools, parks/recreational facilities, and libraries. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

With respect to wastewater, since the HWRP is in compliance with the State's wastewater treatment requirements, and the wastewater generated by the related projects would be typical of urban uses, no industrial discharges into the wastewater system would occur that would exceed the wastewater treatment requirements of the LARWQCB. Additionally, as discussed above, the HWRP currently treats 275 mgd of wastewater and has remaining capacity for 175 mgd. Consequently, there would be no need to construct new or expand wastewater treatment facilities, the construction of which could cause significant environmental effects. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to the wastewater treatment systems. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

With regard to stormwater infrastructure, as with the Project, related projects would be required to comply with the requirements of the City's LID Ordinance. In accordance with the City's LID Ordinance, related projects would also implement BMPs to capture a specified amount of runoff within the Project Site and reduce the potential impact of increased runoff to existing drainage systems. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to stormwater infrastructure. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

Development of the Project and related projects could require new or expanded telecommunications infrastructure. As with the Project, the installation of any required telecommunications infrastructure associated with the related projects would occur during a relatively short duration and would be limited to on-site telecommunications distribution and minor off-site work associated with connections to the public system. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to telecommunication infrastructure. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

The Project in conjunction with related projects would increase the need for solid waste disposal during their respective construction periods. However, unclassified landfills in the County do not generally have capacity concerns, and inert landfills serving the Project and related projects would have sufficient capacity to accommodate construction waste disposal needs. With regard to operational solid waste disposal needs, the increase in solid waste generated by the Project would be well within the capacity of existing landfills, as discussed in Checklist Question No. XIX of this Initial Study. In addition, with the implementation of solid waste policies and objectives intended to help achieve the requirements of AB 939 and the City's 90 percent diversion goal by 2025, it is expected that the Project and related projects would not substantially reduce the projected timeline for landfills within the region to reach capacity. Furthermore, the County conducts ongoing evaluations to ensure that landfill capacity is adequate to serve the forecasted disposal needs of the region. Therefore, cumulative impacts with respect to solid waste would be less than significant.

As discussed above, the Project Site is located in an urbanized area, and there are no wildlands located in the vicinity of the Project Site. Therefore, the Project would not contribute to an increased wildfire risk. Moreover, the Project and related projects would be developed in accordance with LAMC requirements pertaining to fire safety. Specifically, Section 57.106.5.2 of the LAMC provides that the Fire Chief shall have the authority to require drawings, plans, and sketches as necessary to identify access points, fire suppression devices and systems, utility controls, and stairwells; Section 57.118 of the LAMC establishes LAFD's fire/life safety plan review and LAFD's fire/life safety

inspection for new construction projects; and Section 57.507.3.1 establishes fire water flow standards. Therefore, the Project and related projects would not result in significant cumulative impacts with respect to wildfire. As such, the Project's contribution would not be cumulatively considerable, and cumulative impacts would be less than significant.

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

Potentially Significant Impact. Based on the analysis contained in this Initial Study, the Project could result in potentially significant impacts with regard to the following topics: air quality; cultural resources; energy; geology and soils (paleontological resources); greenhouse gas emissions; hazards and hazardous materials; land use and planning; noise; transportation; tribal cultural resources; and Utilities and Service Systems (water supply and energy infrastructure). As a result, these potential effects will be analyzed further in the EIR.

Appendices

Appendix IS-1

Tree Survey

Arborist Report for the

130 West College Street Project, City of Los Angeles, California

NOVEMBER 2022

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
City	City of Los Angeles
ISA	International Society of Arboriculture
project	130 West College Street Project

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1 Introduction

This arborist report provides a summary of the tree inventory and evaluation of the 130 West College Street Project (project) site. The project site is located at 130 West College Street within the City of Los Angeles, California (Figure 1, Project Vicinity). As such, this arborist report addresses any applicable City of Los Angeles (City) tree policies and/or ordinances within the City's jurisdiction for City-managed street trees.

Dudek conducted a tree inventory and assessment of trees located on the project site and the immediate public right-of-way. Dudek's Urban and Community Forestry Division's International Society of Arboriculture (ISA)-certified arborist performed various functions associated with surveying, inventorying, and evaluating the condition of trees found within the project site or adjacent public right-of-way, as described in the following text.

The purpose of this arborist report is to present the physical characteristics and mapped locations of trees (if any) that would either be removed or protected in place during grading and construction-related activities.

1.1 Project Location

The project site is located at 130 West College Street within the City of Los Angeles, California (Figure 1).[1]

1.2 Site Characteristics

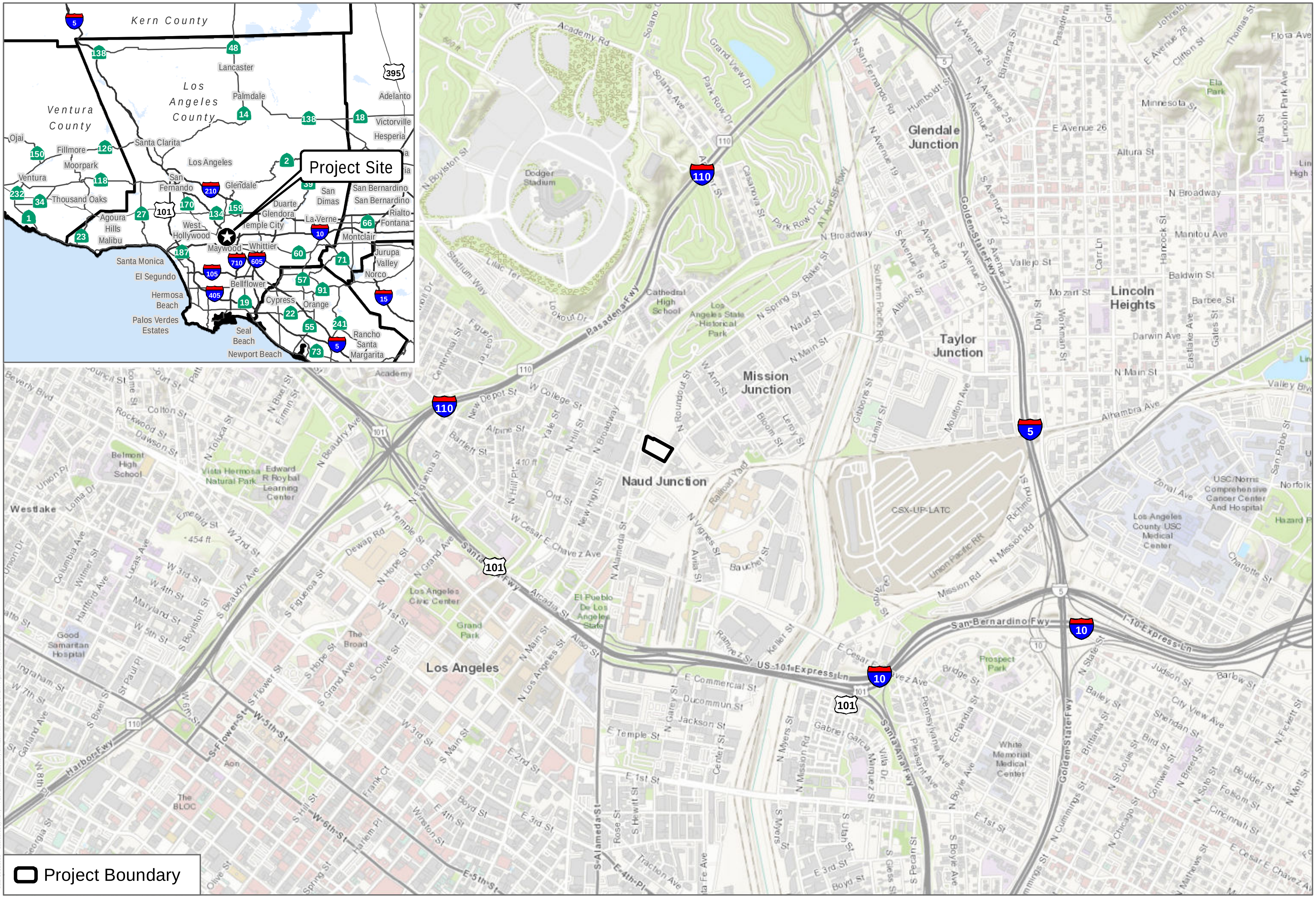
The project site is currently a school bus storage/parking lot that is devoid of any trees and vegetation. Two street trees are found immediately adjacent to the project site on North Alameda Street. The two trees are City-owned and located in the City's right-of-way within planter cut-outs. Photographs of the two observed trees are provided in Appendix A, Site Photograph Log.

1.3 Project Description

Among the first mass timber commercial developments in Los Angeles, the proposed commercial office building at 130 West College Street would contribute to Chinatown's evolution as the City's next "creative hub." The six-story construction would supplant a previously undeveloped freight railyard just east of the Chinatown Metro Station. Exterior-covered workspaces and implementation of biophilic design principles (e.g., designed to increase occupant connectivity to the natural environment) aims to bolster the health and well-being of future occupants while anticipating the needs of a post-pandemic workplace. These amenities, paired with a thermal envelope and sustainable design, would provide resilience in response to climate change. Ground-level restaurant and retail spaces would further support planned and existing residential developments while encouraging pedestrian traffic to expand beyond the area's historic center.

[1] The project site is associated with the following Los Angeles County Assessor Parcel Numbers: 5409-008-001, 5409-008-002, 5409-008-003, 5409-008-004, 5409-008-005, 5409-008-006, and 5409-008-015.

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SOURCE: County of Los Angeles 2020; Bing Maps

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Vicinity

Arborist Report for the 130 West College Street Project

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2 Methods

2.1 Individual Tree Evaluation

Dudek's scope of work was to perform a tree inventory of all trees within the project site and public right-of-way that could be impacted by project construction and related activities. However, since no trees were found on the project site, this report only addresses the two City street trees located within the adjacent public right-of-way. The inventoried street trees are not of protected status, as defined by the City's Protected Tree Ordinance No. 186,873. Street trees are regulated by the City's Municipal Code (LAMC) Chapter VI, Article 2, Section 62.161 et. seq. The project is proposing to retain the two inventoried street trees.

Tree mapping was conducted using a Trimble Pathfinder Pro XH GPS receiver with H-Star technology. Because tree canopies can sometimes cause loss of satellite lock by blocking the line-of-sight to satellites, an electronic compass and reflectorless, electronic distance-measuring device were also used in mapping tree locations. The reflectorless, electronic distance-measuring device/compass combination operates in concert with the Pathfinder system to position offsets, and offset information is automatically attached to the GPS position data string. The electronic tree locations were then evaluated using ArcView 10.4 software to determine the position of the trees in relation to the project site.

Collected attribute information for each evaluated tree is presented in the Tree Information Matrix (Appendix B). Tree trunk diameters were measured using a diameter tape providing adjusted figures[2] for diameter measurements when wrapping the tape around an object's circumference. Diameter measurements were taken using the protocol provided by the Council of Tree and Landscape Appraisers in the Guide for Plant Appraisal (ISA 2000). Each tree's trunk diameter—measurement at 4.5 feet above the ground along the trunk axis—was collected, with common exceptions. An experienced tree surveyor visually estimated tree height. Tree canopy spread diameters were estimated by "pacing-off" the measurement based on the investigator's knowledge of his/her stride length or by visually estimating the canopy width. Additionally, Dudek arborists calculated composite trunk diameters for multiple-stem trees according to ISA standards. According to these standards, the sum of all stem diameters was calculated to ascertain composite trunk diameter values for multiple stem trees.

Pursuant to the Guide for Plant Appraisal (ISA 2000), tree health and structure were evaluated with respect to five tree components: roots, trunk, scaffold branches, small branches, and foliage. Each component of the tree was assessed with regard to health factors such as insect or pathogen damage, mechanical damage, presence of decay, presence of wilted or dead leaves, and wound closure. Tree health and structure were graded as good, fair, poor, or dead, with "good" representing no apparent problems and "dead" representing a dying and/or dead tree. Good condition trees exhibit acceptable vigor, healthy foliage, adequate structure, and lack any major maladies. Fair condition trees typically have few maladies but declining vigor. This method of tree condition rating is comprehensive and results in ratings that are useful for determining the status of trees based on common urban forestry standards.

[2] Inches divided by 3.14 (π) provide diameter measurement in inches.

2.2 Scope of Work Limitations

No root crown excavations or investigations, internal probing, or aerial canopy inspections were performed during the tree assessment. Therefore, the presence or absence of internal decay or other hidden or inaccessible inferiorities in individual trees could not be confirmed. It is recommended that any large tree proposed for preservation in an urban setting be thoroughly inspected for internal and subterranean decay by a qualified arborist before finalizing preservation or relocation plans.

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3 Regulatory Definitions and Requirements

A tree inventory and assessment of the project site was performed pursuant to the City's Protected Tree Ordinance No. 186,873 and the City's Application for a Tree Removal Permit (City of Los Angeles 2021), which is required for any proposed removal of a street tree. The following is an outline of the key aspects of the City's regulations applicable to the trees found in the adjacent right-of-way.

3.1 City of Los Angeles Municipal Code

The following sections of the City of Los Angeles Municipal Code outlines the City's authority to require a permit before any work is performed on a street tree within the City:

VI.2.62.162. Power To Plant, Maintain and Issue Permits. (Amended by Ord. No. 183,474, Eff. 4/19/15.)

a. Except as provided in Section 62.169, the Board, through its authorized officers and employees, shall have charge of and direct and supervise the planting, removal, trimming, pruning, cutting and maintenance of trees, plants and shrubs in the streets of the City, and shall have charge of all work incidental to the above activities, and shall issue all permits for the replacement, removal, planting, cutting, pruning or trimming of trees, shrubs and plants in the streets of the City.
b. The Board, through its authorized officers and employees, shall determine the variety of trees, shrubs and plants that may be planted in, upon or along any street, or any portion thereof, and the distance apart at which such trees, shrubs or plants shall be planted.

VI.2.62.170 Conditional Permit to Remove or Destroy Trees (Amended by Ord. No. 153,500, Eff. 4/18/80.)

a. The Board may require, as a condition to any permit to remove or destroy a tree, that the permittee plant another tree of the type and size specified in the permit, within forty (40) days from the date of the issuance of the permit, in place of the tree to be destroyed or removed pursuant to the permit. It shall be a misdemeanor for a permittee to fail, refuse to comply with, or willfully violate any condition or requirement imposed in such a permit.

3.2 Tree Removal Application

The City's Application for a Tree Removal Permit (City of Los Angeles 2021) provides the following must be included when applications pertain to land development or subdivision cases:

1. Project title and case number (CP, ZA, TR, CPC, DIR, DIR, VAC, PM, DOT). Attach the Letter of Determination and final CEQA document. Tree removals must be addressed, or an addendum will be required.
2. Plot Plans
3. Clear color photos of entire tree (No Google images).
4. B-permit drawings in 11" x 17", showing existing tree location and proposed improvements.
5. Planting plan (2:1) ratio
6. B-permit showing tree fees have been paid.

3.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (1918) prohibits tree removal and potentially disturbing construction activities from occurring during certain time periods to avoid harassment of nesting birds. According to the Migratory Bird Treaty Act, no construction or other disturbing activities can occur within 300 feet of an active bird nest (500 feet for listed species) during a period typically beginning in February and ending in September each year. Biological surveys should be conducted to provide clearance prior to project initiation during this period of time.

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4 Observations

4.1 Individual Tree Summary

Table 1 summarizes the individual tree species occurring within the project survey area, including the project site and the adjacent public right-of-way. The tree population is composed entirely of non-native species.

Table 1. Summary of Tree Survey

Scientific Name	Common Name	Number of Trees
Koelreuteria bipinnata	Chinese flame tree	2
	Total	2

There are no trees on the project site; however, there are two street trees located within the City's right-of-way immediately adjacent to the project site. None of the inventoried trees are of protected status, as defined by the City's Protected Tree Ordinance No. 186,873. The two street trees are regulated by LAMC section VI.2.62.161, and will be preserved. Details regarding the location and size of the trees can be found in Appendix B, Tree Information Matrix and Appendix C, Tree Locations.

4.2 Tree Characteristics

Overall, the two street trees exhibit growth and structural conditions that are typical of their locations as ornamental street trees in an urban landscape. The trees include various trunk and branch maladies, and varying health and structural conditions. As presented in the Tree Information Matrix (Appendix B),tree no. 1 is in fair health, and tree no. 2 is in good health. The two trees were found to be in fair structural condition at the time of the evaluation. Trees in good condition exhibit acceptable vigor, healthy foliage, and adequate structure, and lack any major maladies. Trees in fair condition are typical, with visible minor maladies and defects. Trees in poor and critical condition exhibit declining vigor, unhealthy foliage, poor branch structure, signs of pests/disease, and/or excessive lean. No pests and/or disease were observed on the trees.

Trees no. 1 and 2 are single stemmed, with trunk diameters of 8 inches and 10 inches, respectively. The two street trees are approximately 20 feet tall and have crown widths that extended up to 30 feet across at their widest points.

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5 Impacts

Impacts presented are based on conceptual disturbance limits and development plans as of the date of this arborist report. As such, the actual number of trees subject to impacts may change as the detailed site planning process proceeds. Once detailed grading plans are developed and finalized, actual tree impact numbers may differ from what is presented in this report. Measures to reduce tree decline should be implemented in the field during construction operations.

5.1 Tree Impacts

Based on a review of the preliminary project grading and disturbance limits, neither of the two street trees would be impacted or require removal to accommodate the project. The two trees will be retained in place during construction. Best management practices to help protect the two trees during construction are provided in Chapter 7, Tree Protection Measures, of this report.

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6 Mitigation

6.1 Tree Replacement Plan

None of the trees adjacent to the project site would require removal, as such, a tree replacement plan is not required for this project.

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7 Tree Protection Measures

Dudek recommends the following measures to reduce impacts to the trees and protect their current health status.

7.1 Tree Protection Measures Prior to Construction

As outlined in LAMC section VI.2.62.173, prior to construction, guards may be placed around trees in order to protect the trunk and lower scaffold branches from injury. These guards should be removed when construction is completed.

7.2 Protection and Maintenance During Construction

Once construction activities have begun, the protection measures provided below should be observed.

Materials Storage and Disposal

Per LAMC section VI.2.62.174, contractors should not store or discard any supplies or materials (e.g., paint, lumber, concrete overflow) near City street trees in a manner that will injure such tree. In addition, the contractors should avoid draining or leakage of equipment fluids near retained trees. Fluids such as gasoline, diesel, oils, hydraulics, brake and transmission fluids, paint, paint thinners, and antifreeze should be disposed of in accordance with applicable standards and laws. Contractors should ensure that equipment is not stored within close proximity to City street trees to avoid the possibility of leakage of equipment fluids into the soil or damage to branches and/or trunks.

Moving Construction Materials

Contractors should ensure that care be exercised when moving construction equipment and supplies near the City street trees, especially overhead. Contractors should ensure that damage to the trees be avoided when transporting or moving construction materials and working around the trees. Contractors should flag aboveground tree parts with potential for damage (e.g., low limbs, scaffold branches, trunks) with high-visibility flagging, such as florescent red or orange. If contact with the tree crown is unavoidable, a permit should be obtained as specified in LAMC section VI.2.62.162.

Pruning

Per LAMC section VI.2.62.162 the contractor shall obtain a permit prior to removing, cutting, pruning or trimming City street trees.

8 Conclusion

Dudek arborists inventoried and evaluated two ornamental street trees in the public right-of-way, neither of which would be removed by the proposed project. No trees were observed on the project site. As described in the preceding sections, the City requires that the two street trees are regulated in accordance with LAMC and the tree protection measures provided within this report. All tree protection measures included in this report and/or required by the City, should be implemented prior to and maintained throughout the project's construction-related activities.

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9 Arborist's Disclosure Statement

This tree report provides conclusions and recommendations based only on a visual examination of the trees and surrounding site by an ISA-certified arborist, review by an American Society of Consulting Arborists Registered Consulting Arborist, and reasonable reliance on the completeness and accuracy of the information provided to the arborist. The examination did not include subterranean or internal examination of the trees.

Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near them. Although trees provide many benefits to those who live near them, they also include inherent risks from breakage or failure that can be minimized but not eliminated.

Arborists cannot detect every condition that could possibly lead to the failure of a tree. Trees are living organisms subject to attack by disease, insects, fungi, weather, and other forces of nature, and conditions that lead to failure are often hidden within trees and belowground. There are some inherent risks with trees that cannot be predicted with any degree of certainty, even by a skilled and experienced arborist. Arborists cannot predict acts of nature, including, without limitation, storms of sufficient strength, which can cause an apparently healthy tree to fail. Additionally, arborists cannot guarantee that a tree will be healthy or safe under all circumstances or for any specific period of time. A tree's condition could change over a short or long period of time due to climatic, cultural, or environmental conditions. Further, there is no guarantee or certainty that recommendations or efforts to correct unsafe conditions will prevent future breakage or failure of a tree.

To live or work near trees is to accept some degree of risk. Neither the author of this protected tree report nor Dudek assume any responsibility for or will be liable for any claims, losses, or damages for damage to any tree, death or injury to any person, or any loss of or damage to any personal or real property.

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10 References

City of Los Angeles. 2006. City of Los Angeles Municipal Code, Ordinance 177404, Protected Tree Relocation and Replacement. Effective April 23, 2006. Accessed November 2022. http://cityplanning.lacity.org/Code_Studies/Other/ProtectedTreeOrd.pdf.

City of Los Angeles. 2018. City of Los Angeles Municipal Code. As amended June 30, 2018. Accessed November 2022. http://www.amlegal.com/nxt/gateway.dll/California/lamc/municipalcode?f=templates$fn=default.htm$3.0$vid=amlegal:losangeles_ca_mc.

ISA (International Society of Arboriculture). 2000. *Guide for Plant Appraisal*. 9th ed. Council of Tree and Landscape Appraisers.

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Appendix A
Site Photograph Log



Photo 1. Tree No. 1



Photo 2. Close-Up View of Tree No. 1



Photo 3. Close-Up View of Tree No. 2

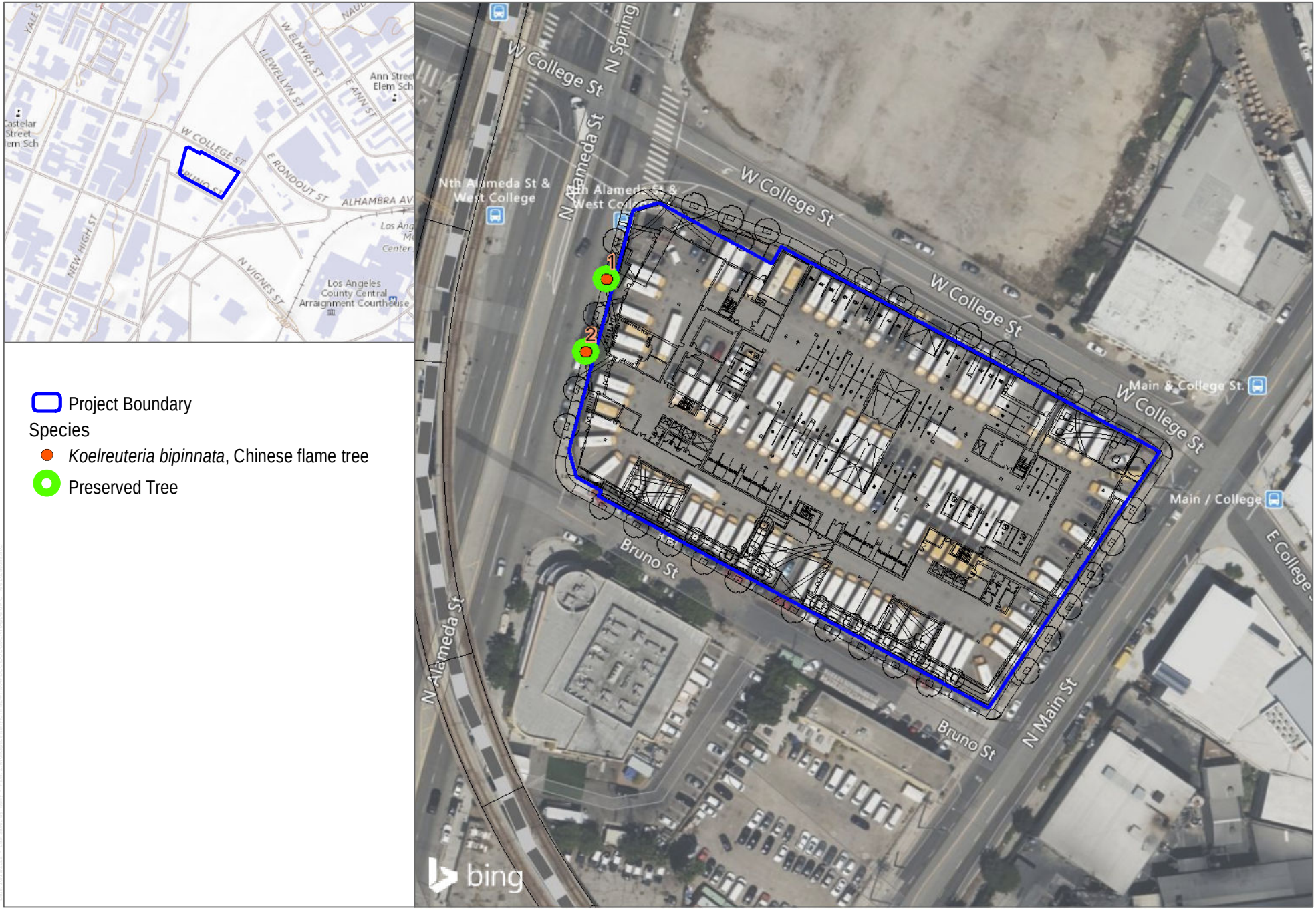


Photo 4. View of Tree No. 2

Appendix B
Tree Information Matrix

Tree No.	Botanical Name	Common Name	No. of Stems	Stem Diameter (in.)	Height (ft.)	Crown Spread (ft.)	Health	Structure	Status	X-Coordinate	Y-Coordinate
1	*Koelreuteria bipinnata*	Chinese flame tree	1	8	20	20	Fair	Fair	Preserve	6490296.12	1845436.56
2	*Koelreuteria bipinnata*	Chinese flame tree	1	10	25	30	Good	Fair	Preserve	6490285.19	1845376.85

Appendix C
Tree Locations



SOURCE: BING MAPPING SERVICE 2021

DUDEK

0 50 100 Feet

APPENDIX C

Tree Locations

Arborist Report for the 130 West College Street Project

Appendix IS-2

Geotechnical Investigation

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GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

March 1, 2024

LOG # 125167-03
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT: FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)

LOT(S): D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16

LOCATION: 130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	02/07/2024	LANGAN
Oversized Doc(s)	``	``	``

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	125167-02	10/24/2023	LADBS
Soils Report	721036101	09/26/2023	LANGAN
Dept. Review Letter	125167-01	09/06/2023	LADBS
Soils Report	721036101	08/07/2023	LANGAN
Dept. Review Letter	125167	03/30/2023	LADBS
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

Engineering analyses provided by LANGAN are based on laboratory testing performed by AP Engineering and Testing, Inc. In accordance to Code section 91.7008.5 of LABC, LANGAN concurs with the results and accepts responsibility for use of the data.

The consultants recommend to support the proposed structure on mat-type foundations bearing on native undisturbed soils. The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.).

1. Provide a notarized letter from all adjoining property owners allowing tie-back anchors on their property (7006.6).

2. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).

3. All recommendations of the reports that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

4. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

5. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).

6. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.

7. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

8. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).

9. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).

10. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

11. Where any excavation, not addressed in the approved reports, would remove lateral support (as defined in 3307.3.1) from a public way, adjacent property or structures, a supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction.

12. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).

13. The soils engineer shall review and approve the shoring and/or underpinning plans prior to issuance of the permit (3307.3.2).

14. Prior to the issuance of the permits, the soils engineer and/or the structural designer shall evaluate the surcharge loads used in the report calculations for the design of the retaining walls and shoring. If the surcharge loads used in the calculations do not conform to the actual surcharge loads, the soil engineer shall submit a supplementary report with revised recommendations to the Department for approval.

15. Unsurcharged temporary excavations shall be trimmed back at a gradient not exceeding 2H:1V, as recommended.

16. Cantilever shoring shall be designed for a minimum EFP of 25 PCF; Shoring with tiebacks/restrained shall be designed for a trapezoidal distributed lateral earth pressure of 25H PSF, as specified in the Appendix E of the 02/07/2024 report; all surcharge loads shall be included into the design. Total lateral load on shoring piles shall be determined by multiplying the recommended EFP by the pile spacing.

17. Shoring shall be designed for a maximum lateral deflection of ½ inch where a structure is within a 1:1 plane projected up from the base of the excavation, and for a maximum lateral deflection of 1 inch provided there are no structures within a 1:1 plane projected up from the base of the excavation, as recommended.

18. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.

19. All foundations shall derive entire support from native undisturbed soils, as recommended (and approved by the geologist and soils engineer by inspection).

20. The building design shall incorporate provisions for total settlements of up to 4 inches, which include 3.5 and 0.5 inches for seismic-induced and static loads, respectively. (1808.2)

21. Special provisions such as flexible or swing joints shall be made for buried utilities and drain lines to allow for differential vertical displacement.

22. The seismic design shall be based on a Site Class D, as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check. According to ASCE 7-16 Section 11.4.8, for structures on Site Class D sites with S1 greater than or equal to 0.2, the parameter SM1 determined by EQ. (11.4-2) shall be increased by 50%. Alternatively, a supplemental report containing a site-specific ground motion hazard analysis in accordance with ASCE 7-16 Section 21.2 shall be submitted for review and approval.

23. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure of 63 PCF, as specified in the response to comment report (1610.1). All surcharge loads shall be included into the design.

24. Retaining walls higher than 6 feet shall be designed for lateral earth pressure due to earthquake motions of 26 PCF, as specified on page 9 of the 02/17/2023 report (1803.5.12).

25. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted in a non-erosive device to the street in an acceptable manner (7013.11).

26. With the exception of retaining walls designed for hydrostatic pressure, all retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soils report shall be incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record (1805.4).

27. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector (108.9).

28. Basement walls and floors shall be waterproofed/damp-proofed with an LA City approved "Below-grade" waterproofing/damp-proofing material with a research report number (104.2.6).

29. The use of acceptable prefabricated drainage composites (also known as geosynthetic subdrain systems), as an alternative to traditionally accepted methods of draining retained earth, shall be determined during structural plan check.

30. Where the ground water table is lowered and maintained at an elevation not less than 6 inches below the bottom of the lowest floor, or where hydrostatic pressures will not occur, the floor and basement walls shall be damp-proofed. Where a hydrostatic pressure condition exists, and the design does not include a ground-water control system, basement walls and floors shall be waterproofed. (1803.5.4, 1805.1.3, 1805.2, 1805.3)

31. The structure shall be connected to the public sewer system per P/BC 2020-027.

32. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).

33. An on-site storm water infiltration system at the subject site shall not be implemented, as recommended.

34. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).

35. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008, 1705.6 & 1705.8).

36. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

37. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; shoring; protection fences; and, dust and traffic control will be scheduled (108.9.1).

38. Installation of shoring, shall be performed under the inspection and approval of the soils engineer and deputy grading inspector (1705.6, 1705.8).

39. The installation and testing of tie-back anchors shall comply with the recommendations included in the report or the standard sheets titled "Requirement for Tie-back Earth Anchors", whichever is more restrictive. [Research Report #23835]

40. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).

41. A supplemental report shall be provided in the event any deviation to the currently proposed project configuration, as presented and as shown in the plans and cross sections included in the approved reports, is made. This shall include but not limited to: relocation, change in any dimension, change in the number of stories above or below grade of any of the proposed structures; addition of any structure(s), such as retaining walls, decks, swimming pools, driveways, access roads, living quarters, etc.; or, additional permanent grading or temporary grading for construction purposes that are not described and not shown in the plans and cross sections included in the approved reports.

42. In the event dewatering is proposed, a supplemental report shall be submitted to Grading Division for review. The report shall evaluate the effect of temporary dewatering on adjacent structures, including but not limited to settlement potential and flow rates.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167-03
213-482-0480

cc: LANGAN, Project Consultant
LA District Office

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7 February 2024

Mr. Steven J. Riboli
S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

Re: Response to Soils Report Review Letter
Log # 125167-02
Tract M R 72-75/76
130, 114, 110 W College Street
Langan Project No. 721036101

Dear Mr. Riboli:

We are providing this response to the Soils Report Review Letter dated 24 October 2023, Log #125167-02 issued by the City of Los Angeles (City) Grading Division received via email on 30 October 2023. Our responses to geotechnical related items are below. A copy of the City's review letter is provided in Attachment A.

As further noted below, the project's excavation would extend up to a depth of approximately 17-feet below ground surface, and the analysis presented in our comment responses reflect the 17-feet excavation depth. The liquefaction analysis, shoring recommendations and retaining wall pressures have been updated to reflect the 17-feet excavation depth; however, the remaining geotechnical analysis and recommendations in our geotechnical report remain applicable and unchanged.

Comment 1: *Revise liquefaction analyses to address the following review items:*

a) *Laboratory testing shall be provided for each layer considered non-liquefiable; engineering judgement to consider layers of the same earth material having similar properties is acceptable. However, the clay layer from LB-1 at 45'-50', which was described as silty sand in the original report, has similar N-value, similar description, similar fine content with the silt layer located at 35-45'. Therefore, unless laboratory testing shows otherwise, the layer from 45-50'shall be considered liquefiable.*
b) *The liquefaction evaluation spreadsheet for LB-3 shows two clay layers at 15 and 30 feet below the bottom of the footing (bbf), while the settlement calculation table shows a clay layer at 10 and 25 feet bbf. Revise liquefaction calculations to consider the clay layer at 33 to 38 and 48 to 51.5 feet below ground surface, as shown in the boring log.*
c) *Clarify what $C_{N\ adjusted}$, and m represent in the liquefaction spreadsheet. Provide a hand calculation of the liquefaction evaluation and liquefaction settlement at one depth.*
d) *The liquefaction analyses are based on an assumed 20-foot excavation. However, the report dated 02/17/2023 provided shoring recommendations for a maximum heigh of 13 feet. Revise liquefaction analyses using a 13-foot excavation or provide shoring recommendations for a maximum height of 20 feet.*

Response:

a) Please find in Attachment B the revised liquefaction analysis which includes the clay layer in boring LB-1 at 45- to 50-feet as being considered liquefiable.

b) Please find in Attachment B the revised liquefaction analysis which includes the clay layers from 33- to 38-feet and from 48- to 51.5-feet below ground surface. Please note that the clay layer between 48- to 51.5-feet has a Plasticity Index of > 18 and is therefore not considered liquefiable. Laboratory results are also included in Attachment B.

c) Cn, adjusted takes into account the adjustment that the m coefficient applies to the standard Cn overburden correction. The, m, coefficient takes into consideration the adjusted $(N1)_{60,cs}$ value which takes into account fines content. Please find in Attachment C a hand calculation from LB-1 at approximately 25-feet below ground surface.

d) The previous liquefaction analysis showed a 20-foot excavation depth; however, the updated analysis reflects the current design of the subterranean parking level which would extend up to a depth of approximately 17-feet below ground surface, and includes shoring recommendations for 17-foot excavation. The 17-foot excavation depth is based on the architectural plans dated 18 January 2024, prepared by Grimshaw, provided in Attachment D. The liquefaction evaluation assuming the 17 feet deep excavation is included in Attachment B, supplemental temporary shoring recommendations that are applicable for a braced excavation with a maximum excavation depth of 17-feet are provided in Attachment E.

Comment 2: *In the response to comment 2 regarding the lateral earth pressure on basement wall, the consultants provided active pressure calculations for a 20-foot cantilever retaining wall. As previously requested, provide at-rest lateral earth pressure recommendations for basement wall retaining clays. Justify the unit weight used in the calculations. Note: based on laboratory testing, the dry unit weight of clay layers varies from 90.8 PCF to 100.6 PCF.*

Response: At-Rest Lateral Earth Pressures for the basement walls retaining clay is provided below and included in Attachment F. The total unit weight of 116-pounds-per-cubic-foot (pcf) comes from the direct shear laboratory test result, of sample LB-3 / S-9 at 35-feet depth, indicating dry unit weight of 89.2-pcf and a moisture content of 30 percent.

Total Unit Weight = 116-pcf
Friction Angle = 27-degrees
Coefficient of At-Rest Pressure = 0.55
At-Rest Earth Pressure = 63 psf / ft

Please contact us if you have any questions regarding this letter.

Sincerely,
Langan Engineering and Environmental Services, Inc.





Enrique Riutort, PE
Senior Project Engineer
GE# 2863

Diane M. Fiorelli, PE, GE
Principal/Vice President
GE# 3042

Enclosure(s): Attachment A – Copy of Soils Report Review Letter, Log # 125167-02
Attachment B – Liquefaction Results
Attachment C – Hand Calculation Cn, adjusted and m coefficient.
Attachment D – Architectural Sheet A-301
Attachment E - Temporary Shoring Recommendation
Attachment F – Earth Pressure Analysis

ATTACHMENT A

BOARD OF
BUILDING AND SAFETY
COMMISSIONERS

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BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT REVIEW LETTER

October 24, 2023

LOG # 125167-02
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT: FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)

LOT(S): D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16

LOCATION: 130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	09/26/2023	LANGAN

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	125167-01	09/06/2023	LADBS
Soils Report	721036101	08/07/2023	LANGAN
Dept. Review Letter	125167	03/30/2023	LADBS
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

The consultants recommend to support the proposed structure on mat-type foundations bearing on native undisturbed soils. The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

1. Revise liquefaction analyses to address the following review items:
    a. Laboratory testing shall be provided for each layer considered non-liquefiable; engineering judgment to consider layers of the same earth material having similar properties is acceptable. However, the clay layer from LB-1 at 45'-50', which was described as silty sand in the original report, has similar N-value, similar description, similar fine content with the silt layer located at 35-45'. Therefore, unless laboratory testing shows otherwise, the layer from 45-50' shall be considered liquefiable.
    b. The liquefaction evaluation spreadsheet for LB-3 shows two clay layers at 15 and 30 feet below the bottom of the footing (bbf), while the settlement calculation table shows a clay layer at 10 and 25 feet bbf. Revise liquefaction calculations to consider the clay layer at 33 to 38 and 48 to 51.5 feet below ground surface, as shown in the boring log.
    c. Clarify what $C_{N\ adjusted}$, and m represent in the liquefaction spreadsheet. Provide a hand calculation of the liquefaction evaluation and liquefaction settlement at one depth.
    d. The liquefaction analyses are based on an assumed 20-foot excavation. However, the report dated 02/17/2023 provided shoring recommendations for a maximum height of 13 feet. Revise liquefaction analyses using a 13-foot excavation or provide shoring recommendations for a maximum height of 20 feet.
2. In the response to comment 2 regarding the lateral earth pressure on basement wall, the consultants provided active pressure calculations for a 20-foot cantilever retaining wall. As previously requested, provide at-rest lateral earth pressure recommendations for basement wall retaining clays. Justify the unit weight used in the calculations. Note: based on laboratory testing, the dry unit weight of clay layers varies from 90.8 PCF to 100.6 PCF.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167-02
213-482-0480

cc: LANGAN, Project Consultant
LA District Office

ATTACHMENT B

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 1: Two-Thirds PGA

Project Location: Los Angeles, California

Project Number: 721036101

Date: 1/18/2024

BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	291.8
Boring Depth (ft):	66.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.33
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	274.8
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

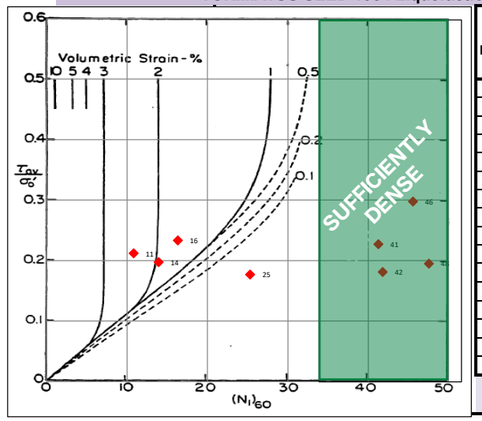
Notes:

1. Assumes 17-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. $\sigma_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

per our 17 February 2023 GIR

Proposed Bottom of Basement 17-ft bgs

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-cs}}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	27	#VALUE!	**0.0**	5.00	**dry**
EX	7.5	20	#VALUE!	**0.0**	2.50	**dry**
EX	10	64	#VALUE!	**0.0**	5.00	**dry**
EX	15	66	#VALUE!	**0.0**	5.00	**dry**
1	20	77	0.23	**0.0**	5.00	**0.0**
1	25	41	0.31	**0.0**	5.00	**0.0**
1	30	46	0.30	**0.0**	5.00	**0.0**
1	35	16	0.23	**1.7**	5.00	**1.0**
1	40	11	0.21	**2.3**	5.00	**1.4**
1	45	14	0.20	**1.9**	5.00	**1.1**
1	50	41	0.23	**0.0**	5.00	**0.0**
1	55	25	0.18	**0.1**	5.00	**0.0**
1	60	48	0.19	**0.0**	5.00	**0.0**
1	65	42	0.18	**0.0**	5.00	**0.0**
					SAT. SETTLEMENT (IN) =	**3.5**

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60\,cs}$	m	$C_{N,adjusted}$	$(N_1)_{60\,cs,\,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
5	286.8	CR	18	5	SM	120	35	600	0	600	---	---	0.75	1.7	1.3	1.05	0.7	22	6	28	0.38	1.6	27	-0.052	0.006	0.96	#VALUE!	0.2	#VALUE!	0.3	#VALUE!	---	No	#VALUE!
7.5	284.3	CR	14	2.5	SM	120	35	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	16	6	21	0.43	1.4	20	-0.093	0.011	0.92	#VALUE!	0.1	#VALUE!	0.2	#VALUE!	---	No	#VALUE!
10	281.8	CR	70	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	0.7	73	6	78	0.10	1.1	64	-0.137	0.016	0.89	#VALUE!	-0.7	#VALUE!	3257357301.0	#VALUE!	---	No	#VALUE!
15	276.8	SPT	50	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	1	65	6	70	0.14	1.0	66	-0.236	0.027	0.82	#VALUE!	-0.5	#VALUE!	351036153751.1	#VALUE!	---	No	#VALUE!
20	271.8	CR	78	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	0.7	68	6	74	0.12	1.0	77	-0.348	0.039	0.74	0.304	-0.3	1.1	799502634857049000000000.0	1074310269736030000000000.0	5.0	No	1362
25	266.8	SPT	32	5	SM	120	35	3000	312	2688	1920	4608	0.85	0.9	1.3	1.05	1	34	6	39	**0.30**	0.93	41	-0.472	0.053	0.67	0.292	0.3	0.8	5.7	5.3	5.0	No	1343
30	261.8	CR	50	5	SM	120	35	3600	624	2976	1775	4751	0.9	0.8	1.3	1.05	0.7	37	6	43	0.28	0.91	46	-0.604	0.068	0.59	0.275	0.3	0.8	41.2	38.1	5.0	No	1309
35	256.8	SPT	10	5	ML	120	35	4200	936	3264	1646	4910	0.95	0.8	1.3	1.05	1	11	6	16	0.47	0.81	16	-0.744	0.083	0.53	0.257	0.1	0.9	0.2	0.2	0.7	No	1261
40	251.8	CR	7	5	ML	120	51	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	0.7	5	6	11	0.53	0.76	11	-0.888	0.099	0.46	0.237	0.1	0.9	0.1	0.1	0.6	No	1206
45	246.8	SPT	8	5	SM	120	51	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	1	8	6	14	0.50	0.74	14	-1.034	0.115	0.41	0.218	0.1	0.9	0.1	0.2	0.7	No	1146
50	241.8	CR	45	5	ML	120	74.1	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	0.7	32	6	37	0.32	0.81	41	-1.180	0.131	0.36	0.199	0.3	0.7	6.4	5.6	5.0	No	1085
55	236.8	SPT	19	5	ML	120	51	6600	2184	4416	1249	5665	1	0.7	1.3	1.05	1	18	6	24	0.41	0.74	25	-1.322	0.146	0.32	0.181	0.2	0.8	0.3	0.3	1.7	No	1025
60	231.8	CR	54	5	ML	120	51	7200	2496	4704	1172	5876	1	0.7	1.3	1.05	0.7	35	6	41	0.29	0.79	48	-1.460	0.161	0.28	0.165	0.3	0.7	122.8	104.0	5.0	No	970
65	226.8	SPT	34	1.5	ML	120	51	7800	2808	4992	1102	6094	1	0.7	1.3	1.05	1	31	6	37	0.32	0.76	42	-1.590	0.174	0.25	0.151	0.3	0.7	7.8	6.5	5.0	No	921

Notes:

1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 2: FULL PGA

Project Location: Los Angeles, California

Project Number: 721036101

Date: 1/18/2024

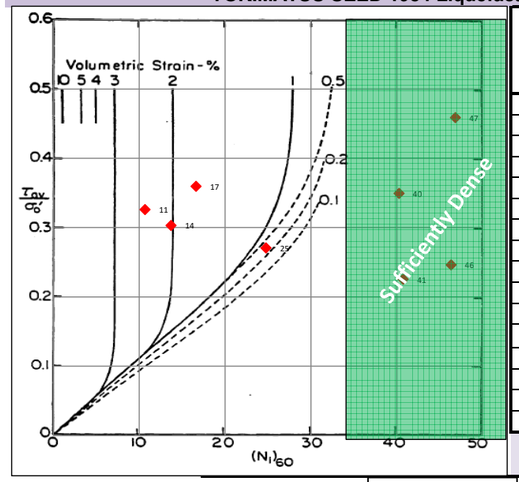
BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	291.8
Boring Depth (ft):	66.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	274.8
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:

1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-cs}}$	CSRM=7.5,σ' v=1	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	26	#VALUE!	**0.0**	2.50	**dry**
EX	7.5	20	#VALUE!	**0.0**	2.50	**dry**
EX	10	63	#VALUE!	**0.0**	5.00	**dry**
EX	15	65	#VALUE!	**0.0**	5.00	**dry**
1	20	75	0.35	**0.0**	5.00	**0.0**
1	25	44	0.48	**0.0**	5.00	**0.0**
1	30	47	0.46	**0.0**	5.00	**0.0**
1	35	17	0.36	**1.8**	5.00	**1.1**
1	40	11	0.33	**2.5**	5.00	**1.5**
1	45	14	0.30	**2.0**	5.00	**1.2**
1	50	40	0.35	**0.0**	5.00	**0.0**
1	55	25	0.27	**0.3**	5.00	**0.2**
1	60	46	0.25	**0.0**	5.00	**0.0**
1	65	41	0.23	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**3.8**

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling												Corrected SPT N-Value										CSR Evaluation				CRR Evaluation						
Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ ft)	Thickness (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,adjusted}$	$(N_1)_{60cs,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
5	286.8	CR	18	2.5	SM	120	35	600	0	600	---	---	0.75	1.7	1.3	1.05	0.7	22	6	27	0.38	1.6	26	-0.052	0.006	0.96	#VALUE!	0.2	#VALUE!	0.327	#VALUE!	---	No	#VALUE!
7.5	284.3	CR	14	2.5	SM	120	35	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	15	6	21	0.43	1.4	20	-0.093	0.011	0.92	#VALUE!	0.1	#VALUE!	0.206	#VALUE!	---	No	#VALUE!
10	281.8	CR	70	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	0.7	71	6	77	0.11	1.1	63	-0.137	0.016	0.89	#VALUE!	-0.8	#VALUE!	485997936.726	#VALUE!	---	No	#VALUE!
15	276.8	SPT	50	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	1	63	6	68	0.15	1.0	65	-0.236	0.027	0.82	#VALUE!	-0.6	#VALUE!	25216431959.815	#VALUE!	---	No	#VALUE!
20	271.8	CR	78	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	0.7	66	6	72	0.13	1.0	75	-0.348	0.039	0.74	0.455	-0.3	1.1	###############	###########	5.0	No	2041
25	266.8	SPT	32	5	SM	120	35	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	1	37	6	42	0.28	0.9	44	-0.472	0.053	0.66	0.437	0.3	0.8	22.017	20.030	5.0	No	2012
30	261.8	CR	50	5	SM	120	35	3600	624	2976	1775	4751	0.95	0.8	1.3	1.05	0.7	38	6	44	0.28	0.9	47	-0.604	0.068	0.59	0.412	0.3	0.8	80.955	72.767	5.0	No	1959
35	256.8	SPT	10	5	SM	120	35	4200	936	3264	1646	4910	1	0.8	1.3	1.05	1	11	6	16	0.47	0.8	17	-0.744	0.083	0.52	0.384	0.1	0.9	0.170	0.182	0.5	No	1888
40	251.8	CR	7	5	ML	120	51	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	0.7	5	6	11	0.53	0.8	11	-0.888	0.099	0.46	0.355	0.1	0.9	0.123	0.134	0.4	No	1804
45	246.8	SPT	8	5	SM	120	51	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	1	8	6	14	0.50	0.7	14	-1.034	0.115	0.41	0.325	0.1	0.9	0.146	0.156	0.5	No	1713
50	241.8	CR	45	5	ML	120	74.1	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	0.7	31	6	36	0.32	0.8	40	-1.180	0.131	0.36	0.297	0.3	0.7	5	4	5.0	No	1620
55	236.8	SPT	19	5	ML	120	51	6600	2184	4416	1249	5665	1	0.7	1.3	1.05	1	18	6	24	0.41	0.7	25	-1.322	0.146	0.32	0.270	0.2	0.8	0.285	0.284	1.1	No	1531
60	231.8	CR	54	5	ML	120	51	7200	2496	4704	1172	5876	1	0.7	1.3	1.05	0.7	35	6	40	0.30	0.8	46	-1.460	0.161	0.28	0.246	0.3	0.7	61.353	50.507	5.0	No	1448
65	226.8	SPT	34	1.5	ML	120	51	7800	2808	4992	1102	6094	1	0.7	1.3	1.05	1	30	6	36	0.32	0.8	41	-1.590	0.174	0.25	0.225	0.3	0.7	5.318	4.309	5.0	No	1374

Notes:

1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02
Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 1: Two-Thirds PGA
Project Location: Los Angeles, California

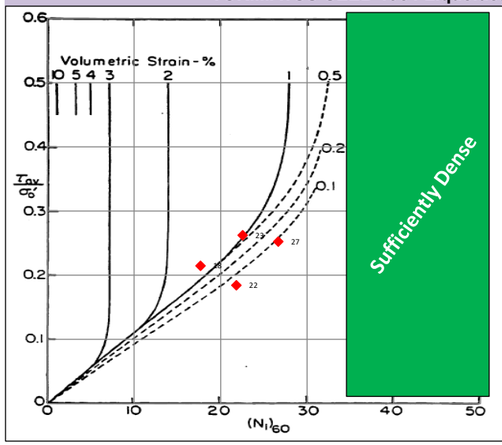
Project Number: 721036101
Date: 1/18/2024

BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	294
Boring Depth (ft):	51.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	277
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. $\sigma'_{v,proposed}$ (psf) = $\sigma'v$ (psf) + $\Delta\sigma$Surcharge (psf) - Overburden Removal
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

per our 17 February 2023 GIR

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-cs}}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	11	#VALUE!	**0.0**	5.00	dry
EX	7.5	17	#VALUE!	**0.0**	2.50	dry
EX	10	37	#VALUE!	**0.0**	5.00	dry
EX	15	61	#VALUE!	**0.0**	5.00	dry
1	20	65	0.23	**0.0**	5.00	**0.0**
1	25	13	0.26	**0.0**	5.00	**0.0**
1	30	23	0.26	**1.2**	5.00	**0.7**
1	35	27	0.25	**0.1**	5.00	**0.1**
1	40	18	0.22	**1.0**	5.00	**0.6**
1	45	47	0.27	**0.0**	5.00	**0.0**
1	50	22	0.18	**0.1**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =		1.4

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value											CSR Evaluation				CRR Evaluation						
Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ft)	Thickness (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60\,cs}$	m	$C_{N,adjusted}$	$(N_1)_{60\,cs,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
5	289	SPT	3	5	ML	120	51	600	0	600	---	---	0.75	1.7	1.3	1.05	1	5	6	11	0.53	1.7	11	-0.052	0.006	0.96	#VALUE!	0.1	#VALUE!	0.124	#VALUE!	---	No	#VALUE!
7.5	286.5	CR	11	2.5	ML	120	51	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	12	6	18	0.46	1.5	17	-0.093	0.011	0.92	#VALUE!	0.1	#VALUE!	0.177	#VALUE!	---	No	#VALUE!
10	284	SPT	24	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	1	35	6	40	0.30	1.2	37	-0.137	0.016	0.89	#VALUE!	0.3	#VALUE!	1.553	#VALUE!	---	No	#VALUE!
15	279	CR	67	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	0.7	59	6	65	0.17	1.0	61	-0.236	0.027	0.82	#VALUE!	-0.9	#VALUE!	92948872.439	#VALUE!	---	No	#VALUE!
20	274	SPT	47	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	1	57	6	63	0.18	1.0	65	-0.348	0.039	0.74	0.304	-0.6	1.1	35064768258.611	47117343963.319	5.0	No	1362
25	269	CR	9	5	ML	120	51	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	0.7	7	6	13	0.51	0.9	13	-0.472	0.053	0.67	0.292	0.1	0.9	0.139	0.156	0.5	No	1343
30	264	SPT	19	5	SM	120	35	5640	624	5016	1775	6791	0.95	0.6	1.3	1.05	1	16	6	22	0.43	0.7	23	-0.604	0.068	0.59	0.266	0.1	0.8	0.242	0.244	0.9	No	1805
35	259	CR	32	5	SM	120	35	6240	936	5304	1646	6950	1	0.6	1.3	1.05	0.7	19	6	25	0.40	0.7	27	-0.744	0.083	0.53	0.245	0.2	0.8	0.335	0.325	1.3	No	1702
40	254	SPT	14	5	SM	120	35	6840	1248	5592	1531	7123	1	0.6	1.3	1.05	1	12	6	17	0.46	0.6	18	-0.888	0.099	0.46	0.224	0.1	0.9	0.180	0.188	0.8	No	1594
45	249	CR	59	5	SM	120	35	7440	1560	5880	1427	7307	1	0.6	1.3	1.05	0.7	34	6	39	0.30	0.7	47	-1.034	0.115	0.41	0.204	0.3	0.6	84.503	64.848	5.0	No	1488
50	244	SPT	19	5	SM	120	35	8040	1872	6168	1333	7501	1	0.6	1.3	1.05	1	15	6	21	0.43	0.6	22	-1.180	0.131	0.36	0.185	0.1	0.8	0.230	0.230	1.2	No	1386

Notes:
1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 2: FULL PGA
Project Location: Los Angeles, California
Project Number: 721036101

Date: 1/18/2024

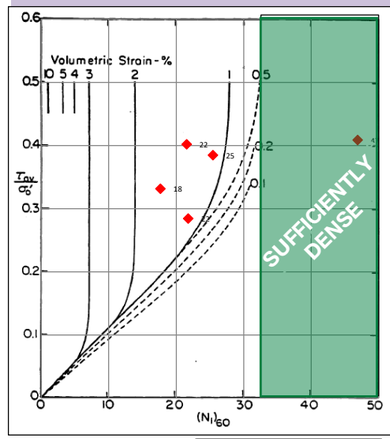
BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	294
Boring Depth (ft):	51.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	277
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:

1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'_v (psf) + $\Delta\sigma$Surcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-cs}}$	CSR$_{M=7.5, \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	11	#VALUE!	**0.0**	5.00	**dry**
EX	7.5	17	#VALUE!	**0.0**	2.50	**dry**
EX	10	37	#VALUE!	**0.0**	5.00	**dry**
EX	15	61	#VALUE!	**0.0**	5.00	**dry**
1	20	65	0.35	**0.0**	5.00	**0.0**
1	25	13	0.40	**0.0**	5.00	**0.0**
1	30	22	0.40	**1.3**	5.00	**0.8**
1	35	25	0.38	**1.1**	5.00	**0.7**
1	40	18	0.33	**1.8**	5.00	**1.1**
1	45	47	0.41	**0.0**	5.00	**0.0**
1	50	22	0.28	**1.2**	1.50	**0.2**
					SAT. SETTLEMENT (IN) =	**2.7**

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value											CSR Evaluation				CRR Evaluation						
Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,adjusted}$	$(N_1)_{60cs,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
5	289	SPT	3	5	ML	120	51	600	0	600	---	---	0.75	1.7	1.3	1.05	1	5	6	11	0.53	1.7	11	-0.052	0.006	0.96	#VALUE!	0.1	#VALUE!	0.124	#VALUE!	---	No	#VALUE!
7.5	286.5	CR	11	2.5	ML	120	51	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	12	6	18	0.46	1.5	17	-0.093	0.011	0.92	#VALUE!	0.1	#VALUE!	0.177	#VALUE!	---	No	#VALUE!
10	284	SPT	24	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	1	35	6	40	0.30	1.2	37	-0.137	0.016	0.89	#VALUE!	0.3	#VALUE!	1.553	#VALUE!	---	No	#VALUE!
15	279	CR	67	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	0.7	59	6	65	0.17	1.0	61	-0.236	0.027	0.82	#VALUE!	-0.9	#VALUE!	92948872.439	#VALUE!	---	No	#VALUE!
20	274	SPT	47	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	1	57	6	63	0.18	1.0	65	-0.348	0.039	0.74	0.455	-0.6	1.1	35064768258.611	45778588129.577	5.0	No	2041
25	269	CR	9	5	ML	120	51	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	0.7	7	6	13	0.51	0.9	13	-0.472	0.053	0.66	0.437	0.1	0.9	0.139	0.152	0.3	No	2012
30	264	SPT	19	5	SM	120	35	5640	624	5016	1775	6791	0.9	0.6	1.3	1.05	1	15	6	21	0.43	0.7	22	-0.604	0.068	0.59	0.398	0.1	0.8	0.226	0.224	0.6	No	2703
35	259	CR	32	5	SM	120	35	6240	936	5304	1646	6950	0.95	0.6	1.3	1.05	0.7	18	6	24	0.41	0.7	25	-0.744	0.083	0.52	0.366	0.2	0.8	0.301	0.287	0.8	No	2546
40	254	SPT	14	5	SM	120	35	6840	1248	5592	1531	7123	1	0.6	1.3	1.05	1	12	6	17	0.46	0.6	18	-0.888	0.099	0.46	0.335	0.1	0.9	0.180	0.182	0.5	No	2385
45	249	CR	59	5	SM	120	35	7440	1560	5880	1427	7307	1	0.6	1.3	1.05	0.7	34	6	39	0.30	0.7	47	-1.034	0.115	0.41	0.304	0.3	0.6	84.503	63.005	5.0	No	2224
50	244	SPT	19	5	SM	120	35	8040	1872	6168	1333	7501	1	0.6	1.3	1.05	1	15	6	21	0.43	0.6	22	-1.180	0.131	0.36	0.276	0.1	0.8	0.230	0.224	0.8	No	2071

Notes:

1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 1: Two-Thirds PGA

Project Location: Los Angeles, California

Project Number: 721036101

Date: 1/18/2024

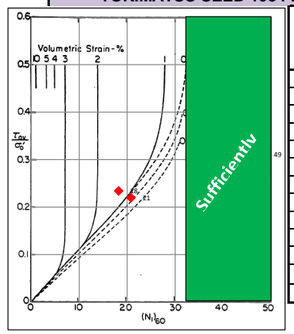
BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	290.6
Boring Depth (ft):	51.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	274.8
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:

1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60-cs}$	CSR$_{M=7.5, \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	13	#VALUE!	**0.0**	5.00	**dry**
EX	7.5	13	#VALUE!	**0.0**	2.50	**dry**
EX	10	9	#VALUE!	**0.0**	5.00	**dry**
EX	12.5	38	#VALUE!	**1.0**	5.00	**dry**
EX	15	13	#VALUE!	**0.0**	5.00	**dry**
1	20	42	0.32	**0.0**	5.00	**0.0**
1	25	49	0.31	**0.0**	5.00	**0.0**
1	30	33	0.28	**0.0**	5.00	**0.0**
1	35	18	0.23	**1.5**	5.00	**0.9**
1	40	21	0.22	**1.0**	5.00	**0.6**
1	45	44	0.25	**0.0**	5.00	**0.0**
1	50	35	0.22	**0.0**	5.00	**Clay**
					SAT. SETTLEMENT (IN) =	**1.5**

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value										CSR Evaluation				CRR Evaluation						
Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,adjusted}$	$(N_1)_{60cs,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
5	285.6	SPT	4	5	CL	120	51	600	0	600	---	---	0.75	1.7	1.3	1.05	1	7	6	13	0.51	1.7	13	-0.052	0.006	0.96	######	0.1	#VALUE!	0.137	#VALUE!	---	No	#VALUE!
7.5	283.1	CR	7	2.5	CL	120	51	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	8	6	13	0.50	1.5	13	-0.093	0.011	0.92	######	0.1	#VALUE!	0.143	#VALUE!	---	NO	#VALUE!
10	280.6	SPT	2	5	CL	120	51	1200	0	1200	---	---	0.8	1.3	1.3	1.05	1	3	6	9	0.56	1.4	9	-0.137	0.016	0.89	######	0.1	#VALUE!	0.109	#VALUE!	---	NO	#VALUE!
12.5	278.1	CR	39	5	SM	120	35	1500	0	1500	---	---	0.8	1.2	1.3	1.05	0.7	35	6	41	0.29	1.1	38	-0.185	0.021	0.85	######	0.3	#VALUE!	2.597	#VALUE!	---	NO	#VALUE!
15	275.6	CR	9	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	0.7	8	6	13	0.50	1.1	13	-0.236	0.027	0.82	######	0.1	#VALUE!	0.143	#VALUE!	---	NO	#VALUE!
20	270.6	SPT	29	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	1	35	6	41	0.29	1.0	42	-0.348	0.039	0.74	0.304	0.3	0.8	7.639	7.229	5.0	No	1362
25	265.6	CR	51	5	SM	120	35	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	0.7	41	6	47	0.26	0.9	49	-0.472	0.053	0.67	0.292	0.3	0.8	308.735	289.085	5.0	No	1343
30	260.6	SPT	24	5	SM	120	35	3600	624	2976	1775	4751	0.95	0.8	1.3	1.05	1	26	6	32	0.35	0.9	33	-0.604	0.068	0.59	0.275	0.2	0.8	0.774	0.765	2.8	No	1309
35	255.6	CR	16	5	CL	120	51	4200	936	3264	1646	4910	1	0.8	1.3	1.05	0.7	12	6	18	0.46	0.8	18	-0.744	0.083	0.53	0.257	0.1	0.9	0.185	0.203	0.8	No	1261
40	250.6	SPT	14	5	SC	120	35	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	1	15	6	20	0.44	0.8	21	-0.888	0.099	0.46	0.237	0.1	0.9	0	0	1.0	No	1206
45	245.6	CR	48	5	SC	120	35	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	0.7	34	6	40	0.30	0.8	44	-1.034	0.115	0.41	0.218	0.3	0.7	18.071	16.036	5.0	No	1146
50	240.6	SPT	27	5	CL	120	51	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	1	26	6	32	0.35	0.8	35	-1.180	0.131	0.36	0.199	0.3	0.8	1.062	0.979	4.9	Yes	1085

Notes:

1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

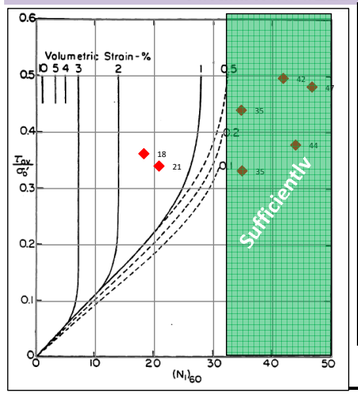
Project Title: 130 W College — Case 2: FULL PGA
Project Location: Los Angeles, California
Project Number: 721036101
Date: 1/18/2024

BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	290.6
Boring Depth (ft):	51.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	273.6
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-}cs}$	CSR$_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	13	#######	**0.0**	5.00	**dry**
EX	7.5	13	#######	**0.0**	2.50	**dry**
EX	10	9	#######	**0.0**	5.00	**dry**
EX	12.5	38	#######	**0.0**	5.00	**dry**
0	15	13	#######	**0.0**	5.00	**dry**
1	20	42	0.50	**0.0**	5.00	**0.0**
1	25	47	0.48	**0.0**	5.00	**0.0**
1	30	35	0.44	**0.0**	5.00	**0.0**
1	35	18	0.36	**1.8**	5.00	**1.1**
1	40	21	0.34	**1.6**	5.00	**1.0**
1	45	44	0.38	**0.0**	5.00	**0.0**
1	50	35	0.33	**0.0**	5.00	**Clay**
					SAT. SETTLEMENT (IN) =	**2.0**

√

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value											CSR Evaluation				CRR Evaluation						
Depth BGS (ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
5	285.6	SPT	4	5	CL	120	51	600	0	600	---	---	0.75	1.7	1.3	1.05	1	7	6	13	0.51	1.7	13	-0.052	0.006	0.96	#VALUE!	0.1	#######	0.137	#VALUE!	---	No	#VALUE!
7.5	283.1	CR	7	2.5	CL	120	51	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	8	6	13	0.50	1.5	13	-0.093	0.011	0.92	#VALUE!	0.1	#######	0.143	#VALUE!	---	No	#VALUE!
10	280.6	SPT	2	5	CL	120	51	1200	0	1200	---	---	0.8	1.3	1.3	1.05	1	3	6	9	0.56	1.4	9	-0.137	0.016	0.89	#VALUE!	0.1	#######	0.109	#VALUE!	---	No	#VALUE!
12.5	278.1	CR	39	5	SM	120	35	1500	0	1500	---	---	0.8	1.2	1.3	1.05	0.7	35	6	41	0.29	1.1	38	-0.185	0.021	0.85	#VALUE!	0.3	#######	2.597	#VALUE!	---	No	#VALUE!
15	275.6	CR	9	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	0.7	8	6	13	0.50	1.1	13	-0.236	0.027	0.82	#VALUE!	0.1	#######	0.143	#VALUE!	---	No	#VALUE!
20	270.6	SPT	29	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	1	35	6	41	0.29	1.0	42	-0.348	0.039	0.74	0.455	0.3	0.8	7.639	7.024	5.0	No	2041
25	265.6	CR	51	5	SM	120	35	3000	312	2688	1920	4608	0.9	0.9	1.3	1.05	0.7	39	6	44	0.27	0.9	47	-0.472	0.053	0.66	0.437	0.3	0.8	71.666	65.199	5.0	No	2012
30	260.6	SPT	24	5	SM	120	35	3600	624	2976	1775	4751	1	0.8	1.3	1.05	1	28	6	33	0.34	0.9	35	-0.604	0.068	0.59	0.412	0.3	0.8	1.034	0.972	2.4	No	1959
35	255.6	CR	16	5	CL	120	51	4200	936	3264	1646	4910	1	0.8	1.3	1.05	0.7	12	6	18	0.46	0.8	18	-0.744	0.083	0.52	0.384	0.1	0.9	0.185	0.197	0.5	No	1888
40	250.6	SPT	14	5	SC	120	35	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	1	15	6	20	0.44	0.8	21	-0.888	0.099	0.46	0.355	0.1	0.9	0.215	0.225	0.6	No	1804
45	245.6	CR	48	5	SC	120	35	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	0.7	34	6	40	0.30	0.8	44	-1.034	0.115	0.41	0.325	0.3	0.7	18.071	15.580	5.0	No	1713
50	240.6	SPT	27	5	CL	120	51	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	1	26	6	32	0.35	0.8	35	-1.180	0.131	0.36	0.297	0.3	0.8	1	1	3.2	Yes	1620

Notes:
1. BGS = Below Ground Surface
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 1: Two-Thirds PGA

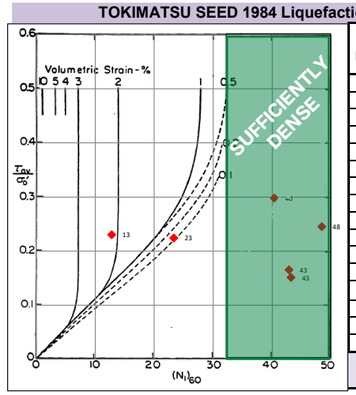
Project Location: Los Angeles, California
Project Number: 721036101
Date: 1/18/2024

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	292.8
Boring Depth (ft):	66.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	275.8
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60\text{-}cs}$	CSRM =7.5,σ'v =1	ϵ_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	14	#####	**0.0**	5.00	**dry**
EX	7.5	9	#####	**0.0**	2.50	**dry**
EX	10	36	#####	**0.0**	5.00	**dry**
EX	15	37	#####	**0.0**	5.00	**dry**
1	20	35	0.31	**0.0**	5.00	**0.0**
1	25	11	0.26	**0.0**	5.00	**0.0**
1	30	40	0.30	**0.0**	5.00	**0.0**
1	35	13	0.23	**2.2**	5.00	**1.3**
1	40	23	0.22	**0.2**	5.00	**0.1**
1	45	48	0.25	**0.0**	5.00	**0.0**
1	50	70	0.15	**0.0**	5.00	**0.0**
1	55	75	0.13	**0.0**	5.00	**0.0**
1	60	43	0.17	**0.0**	5.00	**0.0**
1	65	43	0.15	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**1.4**

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value										CSR Evaluation				CRR Evaluation					
Depth BGS (ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
5	287.8	CR	7	5	SM	120	35	600	0	600	---	---	0.75	1.7	1.3	1.05	0.7	9	6	14	0.50	1.7	14	-0.052	0.006	0.96	######	0.1	#VALUE!	0.148	#VALUE!	---	No	#VALUE!
7.5	285.3	CR	3	2.5	SM	120	35	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	3	6	9	0.56	1.6	9	-0.093	0.011	0.92	######	0.1	#VALUE!	0.111	#VALUE!	---	No	#VALUE!
10	282.8	CR	34	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	0.7	35	6	40	0.30	1.2	36	-0.137	0.016	0.89	######	0.3	#VALUE!	1.472	#VALUE!	---	No	#VALUE!
15	277.8	SPT	26	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	1	33	6	38	0.31	1.1	37	-0.236	0.027	0.82	######	0.3	#VALUE!	1.850	#VALUE!	---	No	#VALUE!
20	272.8	CR	34	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	0.7	29	6	34	0.33	1.0	35	-0.348	0.039	0.74	0.304	0.3	0.8	1.132	1.109	3.7	No	1362
25	267.8	SPT	5	5	SM	120	35	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	1	6	6	11	0.53	0.9	11	-0.472	0.053	0.67	0.292	0.1	0.9	0.127	0.143	0.5	No	1343
30	262.8	CR	45	5	SM	120	35	3600	624	2976	1775	4751	0.9	0.8	1.3	1.05	0.7	33	6	38	0.31	0.9	40	-0.604	0.068	0.59	0.275	0.3	0.8	4.602	4.258	5.0	No	1309
35	257.8	SPT	7	5	SM	120	35	4200	936	3264	1646	4910	0.95	0.8	1.3	1.05	1	7	6	13	0.51	0.8	13	-0.744	0.083	0.53	0.257	0.1	0.9	0.138	0.155	0.6	No	1261
40	252.8	CR	23	5	ML	120	51	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	0.7	17	6	23	0.42	0.8	23	-0.888	0.099	0.46	0.237	0.2	0.9	0.255	0.270	1.1	No	1206
45	247.8	SPT	37	5	SM	120	51	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	1	37	6	43	0.28	0.8	48	-1.034	0.115	0.41	0.218	0.3	0.7	203.480	180.564	5.0	No	1146
50	242.8	CR	77	5	ML	120	74.1	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	0.7	53	6	58	0.20	0.9	70	-1.180	0.131	0.36	0.199	-0.4	1.1	651479628533895	875408316300193	5.0	No	1085
55	237.8	SPT	58	5	ML	120	51	6600	2184	4416	1249	5665	1	0.7	1.3	1.05	1	55	6	60	0.19	0.9	75	-1.322	0.146	0.32	0.181	-0.3	1.1	6921091310355300000.000	9300031229821950000.000	5.0	No	1025
60	232.8	CR	50	5	ML	120	51	7200	2496	4704	1172	5876	1	0.7	1.3	1.05	0.7	32	6	38	0.31	0.8	43	-1.460	0.161	0.28	0.165	0.3	0.7	11.703	9.916	5.0	No	970
65	227.8	SPT	36	1.5	ML	120	51	7800	2808	4992	1102	6094	1	0.7	1.3	1.05	1	32	6	38	0.31	0.8	43	-1.590	0.174	0.25	0.151	0.3	0.7	13.541	11.293	5.0	No	921

Notes:
1. BGS = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Reference: Idriss, I.M. and Boulanger, R.W. (2014). "CPT and SPT Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-14/01

Project Title: 130 W College Case 2: FULL PGA
Project Location: Los Angeles, California
Project Number: 721036101

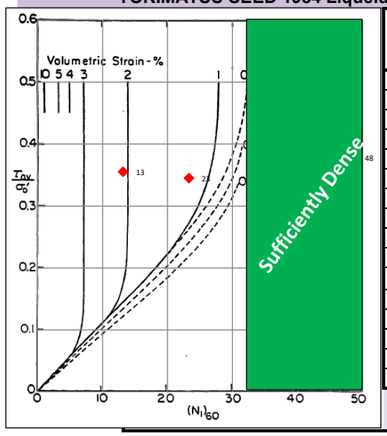
Date: 1/18/2024

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	292.8
Boring Depth (ft):	66.5
GWT Depth (ft):	20
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	275.8
Foundation Surcharge(psf):	3000
Foundation Width (ft):	100
Foundation Length (ft):	100
Overburden Removal:	2040
Removal Unit Weight (pcf)	120
Proposed Removal Depth	17

per our 17 February 2023 GIR

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 3-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)
7. Corrected Cn,adjusted value
8. Foundation Surcharge based recommended allowable bearing capacity
9. Corrected Initial Overburden for at time of drilling
10. **$\sigma'_{v,proposed}$ (psf) = σ'v (psf) + ΔσSurcharge (psf) - Overburden Removal**
11. EX = Building Excavation; Layer 1 = Liquefiable Layers

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth BGS (feet)	Adjusted $(N_1)_{60}$	$CSR_{M=7.5, σ'v=1}$	$ε_v$ (%) (Fig. 10)	Thickness (ft)	Δ H (in)
EX	5	14	#VALUE!	**0.0**	5.00	**dry**
EX	7.5	9	#VALUE!	**0.0**	2.50	**dry**
EX	10	36	#VALUE!	**0.0**	5.00	**dry**
EX	15	37	#VALUE!	**0.0**	5.00	**dry**
1	20	35	0.48	**0.0**	5.00	**0**
1	25	11	0.40	**0.0**	5.00	**0.0**
1	30	42	0.46	**0.0**	5.00	**0.0**
1	35	13	0.35	**2.1**	5.00	**1.3**
1	40	23	0.34	**1.3**	5.00	**0.8**
1	45	48	0.38	**0.0**	5.00	**0.0**
1	50	70	0.23	**0.0**	5.00	**0.0**
1	55	75	0.21	**0.0**	5.00	**0.0**
1	60	43	0.25	**0.0**	5.00	**0.0**
1	65	43	0.23	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**2.0**

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

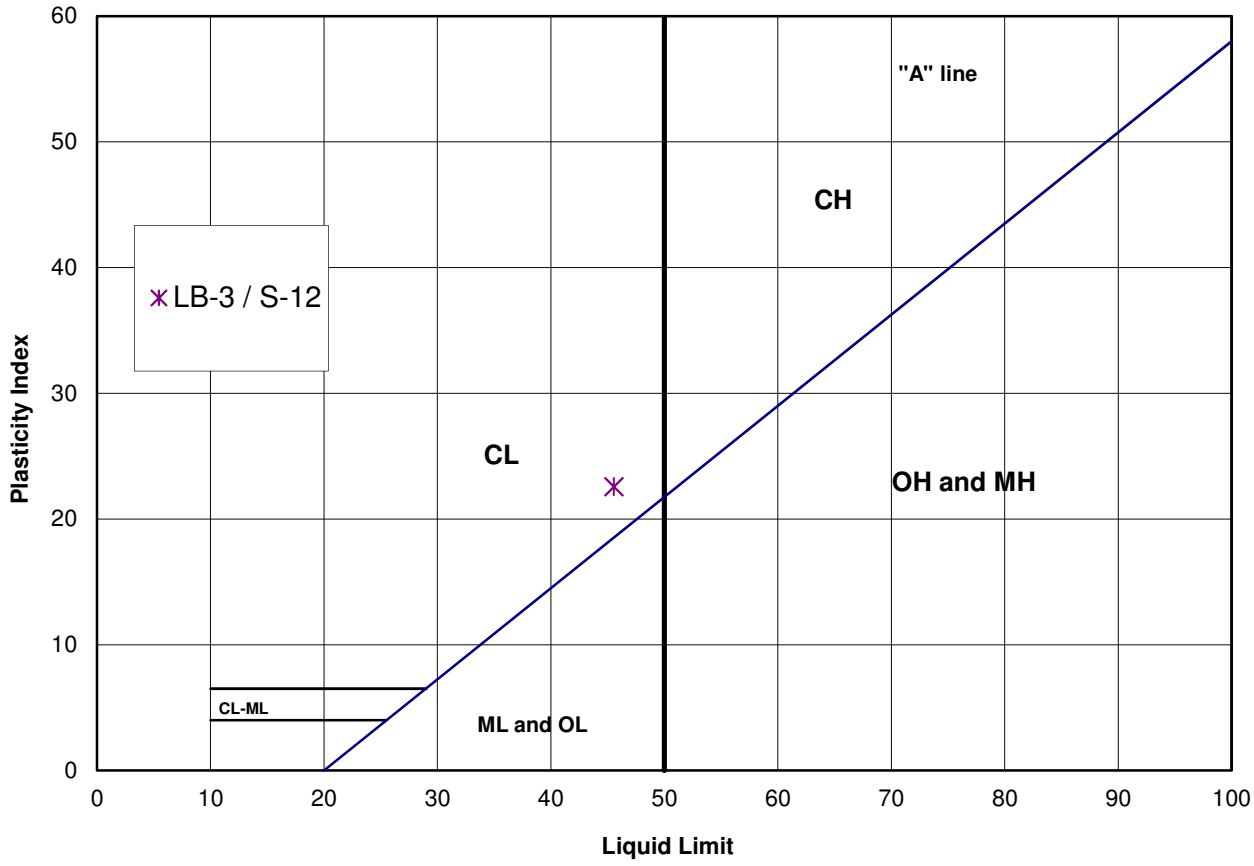
At Time of Drilling

2010/2014 Idriss-Boulanger

	At Time of Drilling											Corrected SPT N-Value											CSR Evaluation						CRR Evaluation				
Depth BGS (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	$σ_v$ (psf)	u (psf)	σ'v (psf)	$Δσ_{Surcharge}$ (psf)	$σ'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$Δ(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,adjusted}$	$(N_1)_{60cs,adj.}$	α	β	r_d	$CSR_{M,σ'v}$	$C_σ$	$K_σ$	$CRR_{M7.5,1atm}$	$CRR_{M,σ'v}$	FoS	Clay?	CSRxσ'
5	287.8	CR	7	5	SM	120	35	600	0	600	---	---	0.75	1.7	1.3	1.05	0.7	9	6	14	0.50	1.7	14	-0.052	0.006	0.96	######	0.1	#VALUE!	0.148	#VALUE!	---	No	#VALUE!
7.5	285.3	CR	3	2.5	SM	120	35	900	0	900	---	---	0.75	1.5	1.3	1.05	0.7	3	6	9	0.56	1.6	9	-0.093	0.011	0.92	######	0.1	#VALUE!	0.111	#VALUE!	---	No	#VALUE!
10	282.8	CR	34	5	SM	120	35	1200	0	1200	---	---	0.8	1.3	1.3	1.05	0.7	35	6	40	0.30	1.2	36	-0.137	0.016	0.89	######	0.3	#VALUE!	1.472	#VALUE!	---	No	#VALUE!
15	277.8	SPT	26	5	SM	120	35	1800	0	1800	---	---	0.85	1.1	1.3	1.05	1	33	6	38	0.31	1.1	37	-0.236	0.027	0.82	######	0.3	#VALUE!	1.850	#VALUE!	---	No	#VALUE!
20	272.8	CR	34	5	SM	120	35	2400	0	2400	2083	4483	0.95	0.9	1.3	1.05	0.7	29	6	34	0.33	1.0	35	-0.348	0.039	0.74	0.455	0.3	0.8	1.132	1.078	2.4	No	2041
25	267.8	SPT	5	5	SM	120	35	3000	312	2688	1920	4608	0.95	0.9	1.3	1.05	1	6	6	11	0.53	0.9	11	-0.472	0.053	0.66	0.437	0.1	0.9	0.127	0.139	0.3	No	2012
30	262.8	CR	45	5	SM	120	35	3600	624	2976	1775	4751	0.95	0.8	1.3	1.05	0.7	34	6	40	0.30	0.9	42	-0.604	0.068	0.59	0.412	0.3	0.8	9.834	8.839	5.0	No	1959
35	257.8	SPT	7	5	SM	120	35	4200	936	3264	1646	4910	1	0.8	1.3	1.05	1	8	6	13	0.50	0.8	13	-0.744	0.083	0.52	0.384	0.1	0.9	0.141	0.153	0.4	No	1888
40	252.8	CR	23	5	ML	120	51	4800	1248	3552	1531	5083	1	0.8	1.3	1.05	0.7	17	6	23	0.42	0.8	23	-0.888	0.099	0.46	0.355	0.2	0.9	0.255	0.262	0.7	No	1804
45	247.8	SPT	37	5	SM	120	51	5400	1560	3840	1427	5267	1	0.7	1.3	1.05	1	37	6	43	0.28	0.8	48	-1.034	0.115	0.41	0.325	0.3	0.7	203.480	175.434	5.0	NO	1713
50	242.8	CR	77	5	ML	120	74.1	6000	1872	4128	1333	5461	1	0.7	1.3	1.05	0.7	53	6	58	0.20	0.9	70	-1.180	0.131	0.36	0.297	-0.4	1.1	651479628533895	850535140272578	5.0	No	1620
55	237.8	SPT	58	5	ML	120	51	6600	2184	4416	1249	5665	1	0.7	1.3	1.05	1	55	6	60	0.19	0.9	75	-1.322	0.146	0.32	0.270	-0.3	1.1	6921091310355300000.000	9035787322682340000.000	5.0	No	1531
60	232.8	CR	50	5	ML	120	51	7200	2496	4704	1172	5876	1	0.7	1.3	1.05	0.7	32	6	38	0.31	0.8	43	-1.460	0.161	0.28	0.246	0.3	0.7	11.703	9.634	5.0	No	1448
65	227.8	SPT	36	1.5	ML	120	51	7800	2808	4992	1102	6094	1	0.7	1.3	1.05	1	32	6	38	0.31	0.8	43	-1.590	0.174	0.25	0.225	0.3	0.7	13.541	10.972	5.0	No	1374

Notes:
1. BGS = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

PLASTICITY INDEX _ ASTM D4318



Sample	Depth	LL	PL	PI	USCS	Material Description
LB-3 / S-12	50'	46	23	23	CL	

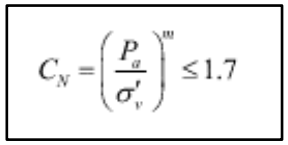
Job Name: Langan # 721036103 Date: 9/16/23

Job No.: 2012-0057

ATTACHMENT C

This Hand Calculation is in response to Item 1.C - to provide hand calculation for Cn and m varaibles.
This hand calculation refers to LB-1 Case 1 at approximately 25-feet bgs at time of drilling.

$$C_{n,adjusted} = \left(\frac{2116}{2688}\right)^{0.29} \leq 1.7$$

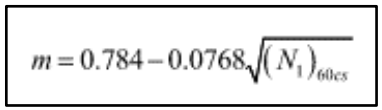


$$\mathbf{C_{n,adjusted} = 0.93 \leq 1.7}$$

$$\text{Coefficient m} = 0.784 - 0.0768 \times \sqrt{(N1)_{60\,cs}}$$

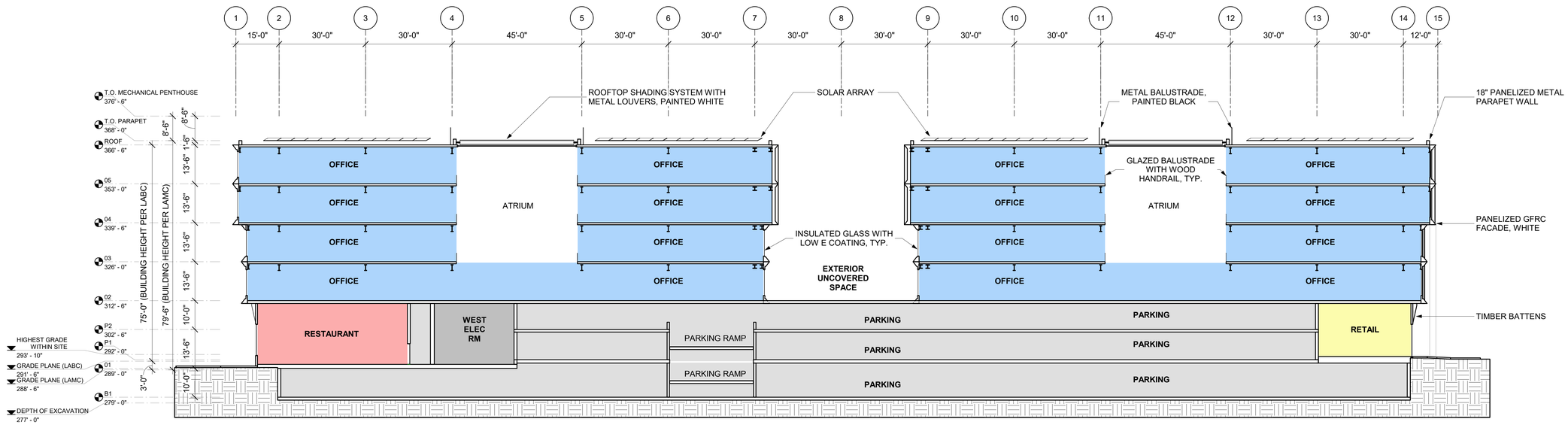
$$\text{Coefficient m} = 0.784 - 0.0768 \times \sqrt{39}$$

Coefficient m = 0.30



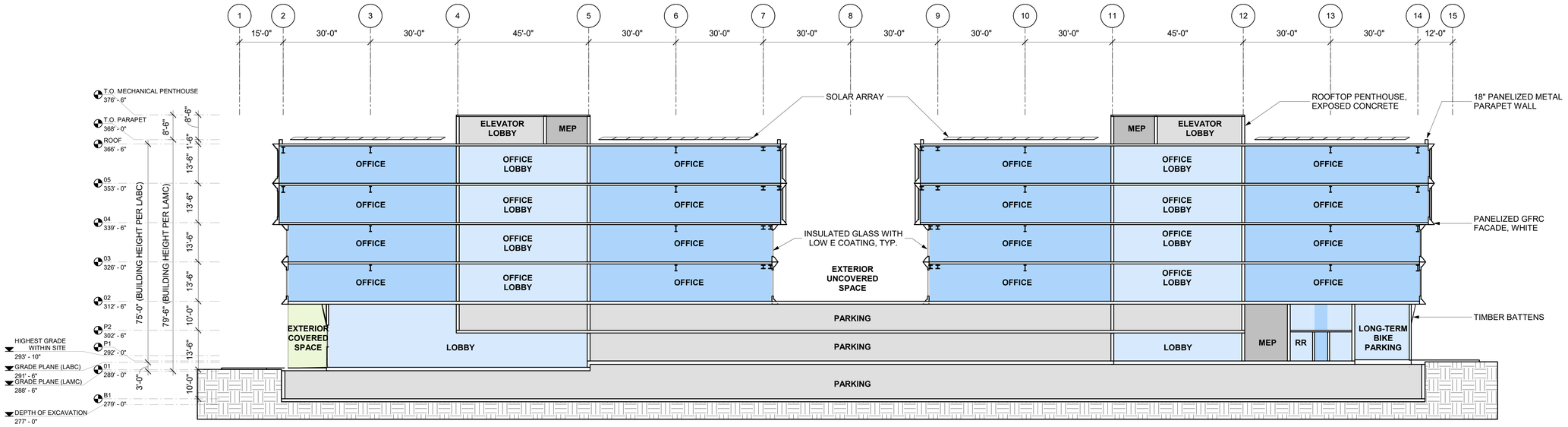
Results in **BOLD**

ATTACHMENT D



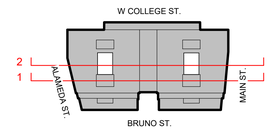
2 SECTION 2

1/16" = 1'-0" | EAST-WEST SECTION LOOKING NORTH



1 SECTION 1

1/16" = 1'-0" | EAST-WEST SECTION LOOKING NORTH



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DRAWING NOTICES
Do not scale - all dimensions to be checked on site. Grimshaw drawings to be read in conjunction with Grimshaw and specialist specifications. Drawings to be read in conjunction with consultant information.

NOT FOR CONSTRUCTION

CLIENT
S&R Partners, LLC

CONSULTANTS

PROJECT NAME
130 West College Street

PROJECT NO.
20046

ADDRESS
130 West College St.
Los Angeles, CA
90012
USA

REV	BY	DATE	DESCRIPTION
1	GA	10.06.2023	100% Entitlement Review 01
2	GA	01.18.2024	100% Entitlement Review 02

0 6'-0" 12'-0" 24'-0"
SCALE: 1/16" = 1'-0"

KEY PLAN

NORTH

DRAWING TITLE
LONGITUDINAL SECTIONS

SCALE
As indicated
@ARCH E1

STATUS
For Information

DRW	CH	APPR	DRW DATE	REV
JS	HN	AB	01.18.2024	2

DRAWING NO.
A-301

ATTACHMENT E

Temporary Excavation Support and Construction Dewatering

Temporary excavations are anticipated for the proposed development. The fill and alluvial soils can be classified as Cal/OSHA Type C soils (California Code of Regulations, Title 8 Subchapter 4). Temporary excavations will be required to facilitate below-grade excavation for the proposed development and will need to be constructed in accordance with Cal/OSHA requirements. Based on our evaluation of subsurface data and proposed temporary excavations at the Site are anticipated to extend up to 17 feet.

We anticipate soldier beams and lagging with tiebacks could be used. Written permission allowing use of tiebacks will be required from adjacent property owners and the City if within the public right-of-way. Prior to installation of tiebacks, the location of subsurface utilities as well as the subterranean structure that might be located north of the Project Site.

The soil pressure distribution for temporary excavation support is a function of the type of excavation support system and any bracing used. For design, the shoring system with tiebacks should be designed using a trapezoidal pressure distribution having a maximum pressure of 25H within the middle 0.6H and reducing to zero towards the top and bottom of the wall, where H is the height of the wall in feet. Cantilever shoring conditions should be designed using a triangular distribution having a maximum pressure of 25H, where H is the height of the wall in feet.

Surcharge loading along the walls should consider adjacent structures, streets, sidewalks, and proposed pedestrian passageway. The below-grade wall along the east and north side of the site should be designed to withstand surcharge loading from adjacent foundations. Surcharge loading should be considered where the neighboring building foundations are supported on material above a 1:1 (horizontal:vertical) theoretical influence line extending upward from the base of the below-grade wall. Surcharge loading from neighboring building foundations need not be considered if these foundations are supported outside the aforementioned influence line.

Surcharge loading due to adjacent structures, temporary traffic and construction loading within a distance of 10 feet from the wall top should be designed based on published documentation, such as Federal Highway Administration (FHWA) or Naval Facilities Engineering Command (NAVFAC) Design Manuals and as set forth in LADBS Information Bulletin 2017-141 "Guidelines for Determining Live Loads Surcharge From Sidewalk Pedestrian Traffic And Street Traffic", whichever is stricter. Development of surcharge distributions other than specified in LADBS Information Bulletin 2017-141 should be developed by the project shoring engineer and subsequently reviewed by LANGAN for confirmation with our GER.

The design earth pressure on the lagging can be 0.6 times the earth pressure or a maximum of 400 psf in accordance with California Department of Transportation (2011), "Trenching and Shoring Manual," Revision 1, August 2011. Excavation lifts for lagging installation should not exceed 5 feet or as stated in Los Angeles Bureau of Engineering Special Order document "Requirements for Deep Excavation Construction and Installation of Tiebacks On Site in or Adjacent to Public Ways", whichever is stricter.

Soldier piles placed in suitably pre/drilled and cleaned/out holes that are subsequently backfilled with grout or structural concrete may support vertical loads from the tiebacks or rakers by a combination of side shear in the embedded portion of the socket and end bearing from the tip of the pile. Soldier piles should not be drilled adjacently if within three diameters center-to-center and be backfilled same day. It is anticipated that groundwater will be encountered during drilling/installation of soldier piles and therefore groundwater should be pumped out prior to backfill of the annular space. Backfill of the annular space should be performed tremie style. The soldier piles can be designed using the following parameters:

Stratum	Side Shear	End Bearing
Bottom of Excavation to Pile Toe	400 psf	2500 psf

Passive resistance against soldier beams below the excavated level should be based on a equivalent fluid weight of 150 psf/foot beginning 3 feet below the lowest subgrade level in front of the soldier beams. This passive resistance includes a factor of safety of 1.5. Should passive resistance be taken at the lowest excavation level a reduced equivalent fluid pressure of 50 psf/ft should be used. A maximum of 3 times the width of the soldier beam can be considered as contributing to passive resistance. Care must be taken during construction so as not to excavate any soil providing lateral restraint to the shoring system's toe. To minimize vibration and avoid adversely impacting neighboring structures, we recommend placing soldier piles in predrilled and cleaned-out holes that are subsequently backfilled with grout or concrete.

Tieback anchors should have a minimum free-stressing length of 10 feet, a minimum bond length of 15 feet, and should develop a minimum allowable bond stress of 1500 psf in the bond zone; post-grouting is expected to be necessary to attain this minimum allowable bond stress. Higher bond stress may be feasible and should be confirmed by performance and proof load tests as documented below. Should lower bond stresses be determined during load testing, tiebacks should be lengthened as necessary per the project shoring engineer.

At least two (2) initial tiebacks along each excavation face should be performance tested to 200% of the design load to confirm the design bond stress. All tiebacks should be proof tested to 150% of their design capacity prior to locking off the tieback, with each anchor "lift-off" tested to verify proper lock-off load transfer.

Deflection at the top of the excavation support system will be a function of the design and sequence of installation of the tiebacks. For temporary excavation walls adjacent to the public right/of/way or a public structure, the allowable maximum deflection of shoring system should be 1 inch in accordance with City of Los Angeles Bureau of Engineering (2000), "Requirements for Deep Excavation Construction and Installation of Tiebacks on Sites in or Adjacent to Public Ways", special Order no. 003/0201, dated 16 February 2000. For temporary excavation walls adjacent to neighboring buildings the allowable maximum deflection of shoring system should be ½ inch, but in no case should deformations be such that cause damage or loss of support to areas, structures, and utilities beyond the excavation.

The excavation is anticipated to extend at or below the design groundwater level where groundwater was encountered in our borings. Do to existing groundwater conditions, subsurface seepage is anticipated to be encountered during excavation, dewatering measures, such as placing pumps in sump pits in the bottom of the excavation, should be employed. Keeping the bottom dry will be important for ensuring the integrity of the mat foundation.

Where rakers are used instead of or in addition to tiebacks to support the excavation, the excavation, raker installation should be sequenced in such a manner as to avoid excessive deflection of the shoring system. In addition, the following are recommended:

- The initial excavation, prior to raker installation, can be a cantilever excavation that should be designed such that shoring deflection does not exceed the criteria provided herein. The maximum cantilever height will be a function of the stiffness of the soldier piles and lagging system.
- A soil berm should be maintained from the bottom of the cantilever section of the shoring to the bottom excavation until the rakers are installed and the concrete for the continuous concrete dead man has reached the required strength. The soil berm should have a slope of 1 horizontal to 1 vertical or shallower.
- The berm can be slot cut if required to facilitate installation of the rakers, however the maximum slot width cut should not exceed 2 feet. Depending on final spacing of rakers, rakers installation may need to be sequenced such that one raker and concrete deadman are installed prior to slot cutting of the berm and installation of an adjacent raker.
- The soil berm in front of the excavation should remain in place until the rakers and continuous concrete deadman are installed and the concrete has reached the minimum strength required by the shoring design engineer.
- The rakers should remain in place until the below grade walls and floor slabs up to the top of the raker have been installed and the concrete has reached sufficient strength to support the soil and surcharge pressures.

If a continuous concrete deadman is used at the base of the excavation to support rakers, the concrete deadman can be designed using an allowable passive resistance based on an equivalent fluid weight of 150 psf/foot beginning 3 feet below the lowest subgrade level in front of the raker. Should passive resistance be taken at the lowest excavation level a reduced equivalent fluid pressure of 50 psf/ft should be used. The concrete deadman should be located so as not to disturb the soils beneath the proposed shallow foundations.

- Allowable bearing capacity for a temporary concrete deadmen bearing on alluvium a minimum of 5 feet below grade, is 2,500 psf.
- Concrete deadmen can be designed with an ultimate friction coefficient of 0.25.

  We suggest tieback anchors be placed at least 20 feet below sidewalk and street level since based our past experience that the City of Los Angeles requires tieback removal prior to project completion if tiebacks are installed shallower. In no case

should tiebacks be placed at a level lower than that required to provide sufficient wall bracing without causing damage or loss of support to areas behind the wall.

ATTACHMENT F

LATERAL AND SEISMIC EARTH PRESSURE CALCULATION SHEET

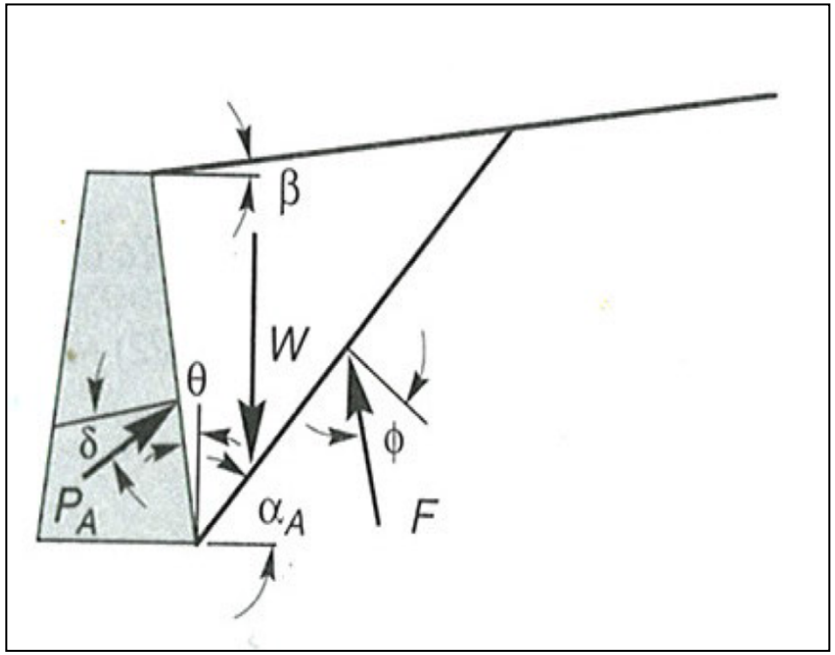
Project:	130 W College
Project No.:	721036101
Date:	31-Oct-22
Condition:	Level Backfill

Material Properties	
Unit Weight (pcf)	116
ϕ (deg)	27
Seismic Parameters	
PGA	0.947
k_h	0.474
k_v	0.276

Retaining Wall-Soil Geometry Parameters		
Parameter	**Angle**	**Description**
Slope Run (H)	1	Horizontal Distance
Slope Rise (V)	0	Vertical Height
β	0.0	Backfill Slope Angle
δ	16	Soil-wall friction angle
θ	0.0	Wall angle
Ψ	33.2	Seismic force-wall angle

Earth Pressure Coefficients			
Method	**Coefficient**	**Value**	**Definition**
General	K_0	0.55	At-rest
Rankine	K_A	0.38	Active
	K_P	2.66	Passive
Coloumb	K_A	0.34	Active
	K_P	4.38	Passive

SCHEMATIC OF TYPICAL CANTILEVER WALL



Total Earth Pressures and Distributions				
Method	**Pressure**	**Total (psf/ft)**	**EFP (psf/ft)**	**Definition**
General	P_0	32	63	At-rest
Rankine	P_A	22	44	Active
	P_P	154	309	Passive
Coloumb	P_A	20	39	Active
	P_P	254	508	Passive

LANGAN

Formulas:

Seismic Parameters

$k_h = PGA/2$

$k_v = [(k_h/2) + (2k_h/3)]/2$

$\Psi = \tan^{-1}(k_h/(1 - k_v))$

Earth Pressure Coefficients

$K_0 = (1 - \sin\varphi)(1 + \sin\beta)$

$K_A \text{ (Rankine)} = \cos\beta(\cos\beta - [\cos^2\beta - \cos^2\varphi]^{1/2})/(\cos\beta + [\cos^2\beta - \cos^2\varphi]^{1/2})$

$K_P \text{ (Rankine)} = \cos\beta(\cos\beta + [\cos^2\beta - \cos^2\varphi]^{1/2})/(\cos\beta - [\cos^2\beta - \cos^2\varphi]^{1/2})$

$K_A \text{ (Coloumb)} = \cos^2(\varphi - \theta)/\{\cos^2\theta\cos(\delta + \theta)[1 - [\sin(\delta + \varphi)\sin(\varphi - \beta)/(\cos(\delta + \theta)\cos(\beta - \theta))]^{1/2}]\}$

$K_P \text{ (Coloumb)} = \cos^2(\varphi + \theta)/\{\cos^2\theta\cos(\delta - \theta)[1 + [\sin(\delta + \varphi)\sin(\varphi + \beta)/(\cos(\delta - \theta)\cos(\beta - \theta))]^{1/2}]\}$

$K_{AE} = \cos^2(\varphi - \theta - \Psi)/\{\cos\Psi\cos^2\theta\cos(\delta + \theta + \Psi)[1 - [\sin(\delta + \varphi)\sin(\varphi - \beta - \Psi)/(\cos(\delta + \theta + \Psi)\cos(\beta - \theta))]^{1/2}]\}$

$\Delta K_{AE} = K_{AE} - K_A$

Total Lateral Earth Pressures

$P_0 = (1/2)\gamma K_0 H^2$

$P_A = (1/2)\gamma K_A H^2$

$P_P = (1/2)\gamma K_P H^2$

$P_{AE} = (1/2)\gamma K_{AE} H^2(1 - k_v)$

$\Delta P_{AE} = P_{AE} - P_A$

Equivalent Fluid Pressure (EFP)

$P_0 = \gamma K_0$

$P_A = \gamma K_A$

$P_P = \gamma K_P$

$P_{AE} = \gamma K_{AE}(1 - k_v)$

$\Delta P_{AE} = P_{AE} - P_A$

Additional Notes:

$\varphi - \beta \geq \Psi$

for $\beta = 0$, $K_A \equiv \tan^2(45 - \varphi/2)$; $K_P \equiv \tan^2(45 + \varphi/2)$

$\delta \approx 2\varphi/3$

Coulomb Theory tends to overestimate passive pressure

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201 NORTH FIGUEROA STREET
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SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT REVIEW LETTER

October 24, 2023

LOG # 125167-02
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT: FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)

LOT(S): D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16

LOCATION: 130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	09/26/2023	LANGAN

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	125167-01	09/06/2023	LADBS
Soils Report	721036101	08/07/2023	LANGAN
Dept. Review Letter	125167	03/30/2023	LADBS
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

The consultants recommend to support the proposed structure on mat-type foundations bearing on native undisturbed soils. The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

1. Revise liquefaction analyses to address the following review items:
    a. Laboratory testing shall be provided for each layer considered non-liquefiable; engineering judgment to consider layers of the same earth material having similar properties is acceptable. However, the clay layer from LB-1 at 45'-50', which was described as silty sand in the original report, has similar N-value, similar description, similar fine content with the silt layer located at 35-45'. Therefore, unless laboratory testing shows otherwise, the layer from 45-50' shall be considered liquefiable.
    b. The liquefaction evaluation spreadsheet for LB-3 shows two clay layers at 15 and 30 feet below the bottom of the footing (bbf), while the settlement calculation table shows a clay layer at 10 and 25 feet bbf. Revise liquefaction calculations to consider the clay layer at 33 to 38 and 48 to 51.5 feet below ground surface, as shown in the boring log.
    c. Clarify what $C_{N\ adjusted}$, and m represent in the liquefaction spreadsheet. Provide a hand calculation of the liquefaction evaluation and liquefaction settlement at one depth.
    d. The liquefaction analyses are based on an assumed 20-foot excavation. However, the report dated 02/17/2023 provided shoring recommendations for a maximum height of 13 feet. Revise liquefaction analyses using a 13-foot excavation or provide shoring recommendations for a maximum height of 20 feet.
2. In the response to comment 2 regarding the lateral earth pressure on basement wall, the consultants provided active pressure calculations for a 20-foot cantilever retaining wall. As previously requested, provide at-rest lateral earth pressure recommendations for basement wall retaining clays. Justify the unit weight used in the calculations. Note: based on laboratory testing, the dry unit weight of clay layers varies from 90.8 PCF to 100.6 PCF.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167-02
213-482-0480

cc: LANGAN, Project Consultant
LA District Office

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26 September 2023

Mr. Steven J. Riboli
S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

Re: Response to Soils Report Review Letter
Log # 125167-01
Tract M R 72-75/76
130, 114, 110 W College Street
Langan Project No. 721036101

Dear Mr. Riboli:

We are providing this response to the Soils Report Review Letter dated 6 September 2023, Log #125167-01 issued by the City of Los Angeles (City) Grading Division received via email on 07 September 2023. Our responses to geotechnical related items are below. A copy of the City's review letter is provided in Attachment A.

The presented liquefaction analysis has been updated to take into account a 20-foot excavation for the proposed development based on the latest information provided by Granite Properties on the document titled, "130 College Standalone PD No Graphics" dated May 2023. Previous our analysis showed a 13-foot excavation as proposed however the updated analysis reflects the current design of the subterranean parking level would extend to a depth of approximately 20 feet below ground surface.

Comment 1: *Revise liquefaction analyses to address the following items*

a) *Provide justification and appropriate laboratory testing for all layers, including clay layers, considered non-potentially liquefiable (based on the screening criteria followed by the consultant) to substantiate such argument.*

   Note: The department requires the criteria for the soils "not susceptible" to liquefaction to be demonstrated. The soils considered "not susceptible" to liquefaction are soils with a PI>=18 that are not sensitive or soils having a saturated moisture content <=80% of the liquid limit.
b) *The consultant used a factor of 0.8 to convert the Cal Mod N-values to SPT N-values. However, this value is not supported by CGS Special Publication 117 (i.e. SP 117A), Guidelines for Evaluating and Mitigating Seismic Hazards in California (Section 5.4.5), Revise conversion factor accordingly.*
c) *Calculate the overburden correction factor, CN, based on the conditions encountered at the time the SPT testing was conducted (i.e., depth below ground surface and ground water elevation at the time of the drilling).*
d) *Calculate the seismic demand on the soil layer or cyclic stress ratio, CSR based on the historically highest groundwater level.*

Response:

a) Based on the laboratory test result in attachment B on sample LB-3/S-12 the test results indicate encountered clay layers have a Plasticity Index greater than 18. (PI=23).

b) The analyses have been updated using a reduction factor of 0.7 based on CGS Special Publication 117 (Section 5.4.5). Refer to Attachment C for the updated analysis.

c) The analysis has been updated to with the CN factor based on depth below ground surface and ground water at the time of drilling. Refer to Attachment C for the liquefaction analysis.

d) The Analysis has been updated to calculate the seismic demand based on the historical groundwater (20-feet below ground surface) based on the seismic hazard zone report 029 – Los Angeles Quadrangle. Refer to Attachment C for the liquefaction analysis.

Based on our analysis, liquefaction-induced settlements are anticipated to range from approximately 0.8- to 2.0-inches. The results of these analysis are attached in Attachment C. Based on the updated analysis there is no change to the recommendations presented in our Geotechnical Investigation Report dated 17 February 2023.

Comment 2: *The consultant used a friction angle of 39 degrees for basement wall lateral earth pressure calculation. However, the upper soils consists of sands (sand,silt/sand) and clays. The direct shear test for a clay sample shows a peak friction angle of 29 degrees. Provide lateral earth pressure recommendations for basement wall retaining clays.*

Response: We evaluated earth pressures using the clay data and the resulting wall pressures are less than those calculated using the sand soil parameters. For preliminary design purposes we recommend using the higher wall pressures as previously presented. Calculations are included in Attachment D.

Please contact us if you have any questions regarding this letter.

Sincerely,
Langan Engineering and Environmental Services, Inc.

Enrique Riutort, PE
Senior Project Engineer
GE# 2863

REGISTERED PROFESSIONAL ENGINEER ENRIQUE A. RIUTORT GE2863 exp 12/31/24 GEOTECHNICAL STATE OF CALIFORNIA
9/26/2023

Diane M. Fiorelli, PE, GE
Principal/Vice President
GE# 3042

REGISTERED PROFESSIONAL ENGINEER DIANE M FIORELLI No. GE 3042 exp 6/30/25 GEOTECHNICAL STATE OF CALIFORNIA
9/26/2023

Enclosure(s): Attachment A – Copy of Soils Report Review Letter, Log # 125167-01
Attachment B – Laboratory Results
Attachment C – Liquefaction Results
Attachment D – Earth Pressure Analysis

ATTACHMENT A

BOARD OF
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EXECUTIVE OFFICER

SOILS REPORT REVIEW LETTER

September 6, 2023

LOG # 125167-01
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT:	FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)
LOT(S):	D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16
LOCATION:	130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	08/07/2023	LANGAN

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	125167	03/30/2023	LADBS
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

The consultants recommend to support the proposed structure on mat-type foundations bearing on native undisturbed soils.

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Revise liquefaction analyses to address the following items:

    a. Provide justification and appropriate laboratory testing for all layers, including clay layers, considered non-potentially liquefiable (based on the screening criteria followed by the consultant) to substantiate such argument.

    Note: The Department requires that the criteria for soils "not susceptible" to liquefaction be demonstrated. The soils considered "not susceptible" to liquefaction are soils with a PI >= 18 that are not sensitive or soils having a saturated moisture content <= 80% of the liquid limit.

    b. The consultants used a factor of 0.8 to convert the Cal Mod N-values to SPT N-values. However, this value is not supported by CGS Special Publication 117 (i.e. SP 117A), Guidelines for Evaluating and Mitigating Seismic Hazards in California (Section 5.4.5). Revise conversion factor accordingly.

    c. Calculate the overburden correction factor, CN, based on the conditions encountered at the time the SPT testing was conducted (i.e., depth below ground surface and ground water elevation at the time of drilling).

    d. Calculate the seismic demand on the soil layer or cyclic stress ratio, CSR based on the historically highest ground water level.

2. The consultants used a friction angle of 39 degrees for basement wall lateral earth pressure calculation. However, the upper soils consist of sands (sand, silt/sand) and clays. The direct shear test for a clay sample shows a peak friction angle of 29 degrees. Provide lateral earth pressure recommendations for basement wall retaining clays.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167-01
213-482-0480

cc: Charles Tan & Associates, Applicant
LANGAN, Project Consultant
LA District Office

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District LA | Log No. 125167-1

APPLICATION FOR REVIEW OF TECHNICAL REPORTS

INSTRUCTIONS

A. Address all communications to the Grading Division, LADBS, 221 N. Figueroa St., 12th Fl., Los Angeles, CA 90012 Telephone No. (213)482-0480.
B. Submit two copies (three for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom or flash drive, and one copy of application with items "1" through "10" completed.
C. Check should be made to the City of Los Angeles.

1. LEGAL DESCRIPTION
Tract: FREIGHT DEPOT TRACT
Block: _____ Lots: FR D

2. PROJECT ADDRESS: 130 West College, Los Angeles, California

3. OWNER: S&R Partners, LLC
Address: 737 Lamar Street
City: Los Angeles Zip: 90031
Phone (Daytime):

4. APPLICANT Langan
Address: 18575 Jamboree Road, Suite 150
City: Irvine Zip: 92612
Phone (Daytime): 949-561-9200
E-mail address: eriutort@langan.com; awei@langan.com

5. Report(s) Prepared by: Langan

6. Report Date(s): 17 February 2023

7. Status of project: ☑ Proposed ☐ Under Construction ☐ Storm Damage

8. Previous site reports? ☐ YES if yes, give date(s) of report(s) and name of company who prepared report(s)

9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates:

10. Applicant Signature: Dion M. Freeller Position: Principal / Vice President

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED	FEES
☒ Soils Engineering		No. of Lots	
☐ Geology		No. of Acres	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☐ Supplemental		Other	
☐ Combined Supplemental		☒ Expedite	90.75
☐ Import-Export Route		☒ Response to Correction	181.50
Cubic Yards:		☐ Expedite ONLY	
		Sub-total	272.25
		Surcharge	69.91
		TOTAL FEE	342.16

Fee Due: 342.16
Fee Verified By: AM Date: 8/14/23
(Cashier Use Only)

Receipt # 165122

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED
☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

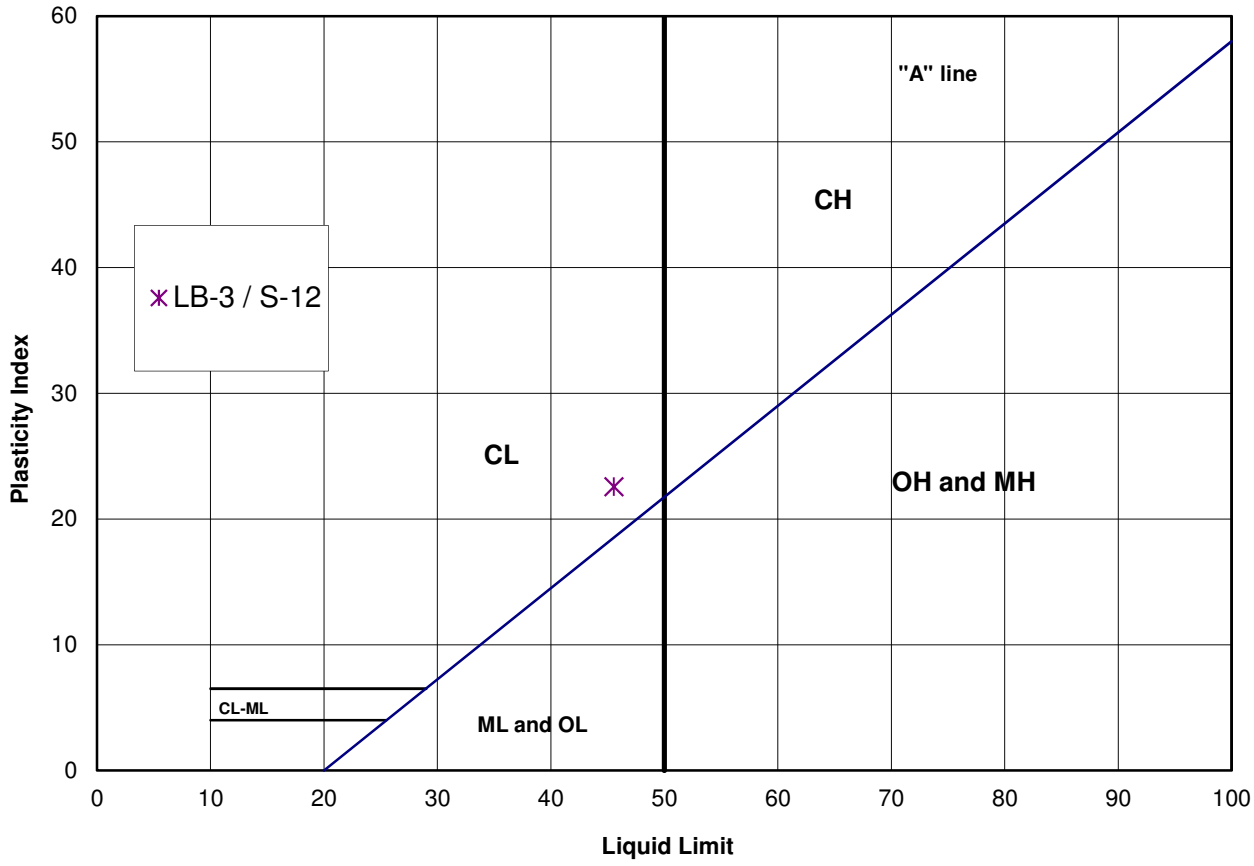
For Geology _____ Date _____

For Soils _____ Date _____

Paid on 8/16/23

ATTACHMENT B

PLASTICITY INDEX _ ASTM D4318



Sample	Depth	LL	PL	PI	USCS	Material Description
LB-3 / S-12	50'	46	23	23	CL	

Job Name: Langan # 721036103 Date: 9/16/23

Job No.: 2012-0057

ATTACHMENT C

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

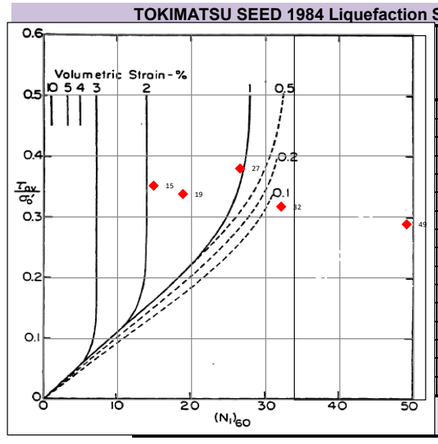
Case 1: Two-Thirds PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	291.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
5	72	0.32	**0.0**	8.00	**0.0**
10	71	0.31	**0.0**	5.00	**0.0**
15	27	0.38	**1.3**	3.00	**0.5**
20	15	0.35	**2.00**	5.00	**1.2**
25	19	0.34	**1.8**	5.00	**Clay**
30	52	0.36	**0.0**	5.00	**0.0**
35	32	0.32	**0.1**	5.00	**0.1**
40	56	0.22	**0.0**	5.00	**0.0**
45	49	0.29	**0.0**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =	**1.7**

												2010 Idriss-Boulanger																							
												Corrected SPT N-Value												**CSR Evaluation**				**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\,cs}$**	**m**	**$C_{N,\,adjusted}$**	**$(N_1)_{60\,cs,\,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
5	286.8	SPT	32	8	SM	120	25	600	312	288	3628	3916	0.9	0.8	1.3	1.05	1	33	5	38	0.31	1.7	72	-0.052	0.006	0.96	0.423	-0.4	1.1	5576845234593740 0.000	##################	5.0	No	1658
10	281.8	CR	50	5	SM	120	25	1200	624	576	3306	3882	0.95	0.8	1.3	1.05	0.7	37	5	42	0.29	1.5	71	-0.137	0.016	0.89	0.423	-0.4	1.1	7981784643884760	10725309511056100	5.0	No	1643
15	276.8	SPT	10	3	ML	120	51	1800	936	864	3025	3889	1	0.8	1.3	1.05	1	11	6	16	0.48	1.5	27	-0.236	0.027	0.82	0.415	0.2	0.9	0.331	0.361	0.9	No	1615
20	271.8	CR	7	5	ML	120	51	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	0.7	5	6	11	0.53	1.4	15	-0.348	0.039	0.74	0.400	0.1	0.9	0.155	0.176	0.4	No	1573
25	266.8	SPT	8	5	CL	120	76.9	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	1	8	6	13	0.50	1.2	19	-0.472	0.053	0.67	0.379	0.1	0.9	0.192	0.216	0.6	Yes	1518
30	261.8	CR	45	5	ML	120	51	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	0.7	30	6	35	0.33	1.1	52	-0.604	0.068	0.59	0.355	0.3	0.8	1943	1904	5.0	No	1453
35	256.8	SPT	19	5	ML	120	51	4200	2184	2016	2195	4211	1	0.7	1.3	1.05	1	17	6	23	0.42	1.0	32	-0.744	0.083	0.53	0.328	0.2	0.8	0.652	0.674	2.1	No	1380
40	251.8	CR	54	5	ML	120	51	4800	2496	2304	2041	4345	1	0.7	1.3	1.05	0.7	34	6	39	0.30	1.0	56	-0.888	0.099	0.46	0.300	-6.1	1.1	101740	136710	5.0	No	1303
45	246.8	SPT	34	1.5	ML	120	51	5400	2808	2592	1902	4494	1	0.6	1.3	1.05	1	29	6	35	0.33	0.9	49	-1.034	0.115	0.41	0.273	0.3	0.8	312	295	5.0	No	1226

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

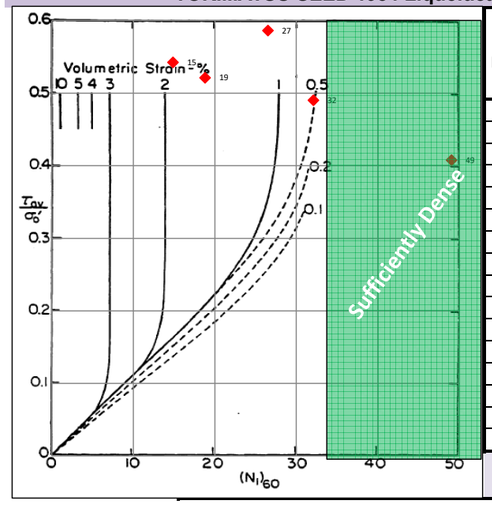
Project Title: 130 W College — Case 2: FULL PGA
Project Location: Los Angeles

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-cs}}$	CSR$_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	5	70	0.49	**0.0**	8.00	**0.0**
	10	70	0.49	**0.0**	5.00	**0.0**
	15	27	0.59	**1.1**	3.00	**0.4**
	20	15	0.54	**2.0**	5.00	**1.2**
	25	19	0.52	**1.8**	5.00	**Clay**
	30	52	0.56	**0.0**	5.00	**0.0**
	35	32	0.49	**0.6**	5.00	**0.3**
	40	56	0.45	**0.0**	5.00	**0.0**
	45	49	0.41	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**1.9**

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													2010 Idriss-Boulanger																							
													Corrected SPT N-Value												**CSR Evaluation**				**CRR Evaluation**							
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
5	266.8	SPT	32	8	SM	120	15	600	312	288	3628	3916	0.9	0.8	1.3	1.05	1	33	3	36	0.32	1.7	70	-0.052	0.006	0.96	0.635	-0.4	1.1	###############	###############	5.0	No	2488
10	261.8	CR	50	5	SM	120	15	1200	624	576	3306	3882	0.95	0.8	1.3	1.05	0.7	37	3	40	0.30	1.5	70	-0.137	0.016	0.89	0.635	-0.4	1.1	###############	###############	5.0	No	2464
15	256.8	SPT	10	3	ML	120	51	1800	936	864	3025	3889	1	0.8	1.3	1.05	1	11	6	16	0.48	1.5	27	-0.236	0.027	0.82	0.623	0.2	0.9	0.331	0.351	0.6	No	2421
20	251.8	CR	7	5	ML	120	51	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	0.7	5	6	11	0.53	1.4	15	-0.348	0.039	0.74	0.600	0.1	0.9	0.155	0.171	0.3	No	2357
25	246.8	SPT	8	5	CL	120	74.1	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	1	8	6	13	0.50	1.2	19	-0.472	0.053	0.66	0.568	0.1	0.9	0	0	0.4	Yes	2274
30	241.8	CR	45	5	ML	120	51	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	0.7	30	6	35	0.33	1.1	52	-0.604	0.068	0.59	0.531	0.3	0.8	1943.401	1849.703	5.0	No	2175
35	236.8	SPT	19	5	ML	120	51	4200	2184	2016	2195	4211	1	0.7	1.3	1.05	1	17	6	23	0.42	1.0	32	-0.744	0.083	0.52	0.490	0.2	0.8	0.652	0.654	1.3	No	2065
40	231.8	CR	54	5	ML	120	51	4800	2496	2304	2041	4345	1	0.7	1.3	1.05	0.7	34	6	39	0.30	1.0	56	-0.888	0.099	0.46	0.449	-6.1	1.1	101739.769	132825.717	5.0	No	1949
45	226.8	SPT	34	1.5	ML	120	51	5400	2808	2592	1902	4494	1	0.6	1.3	1.05	1	29	6	35	0.33	0.9	49	-1.034	0.115	0.41	0.408	0.3	0.8	311.608	286.252	5.0	No	1832

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles

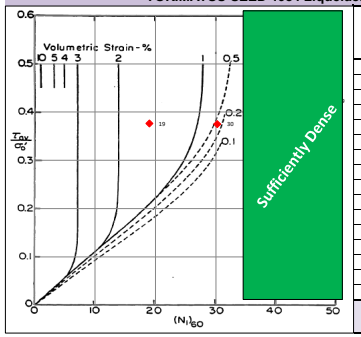
Case 1: Two-Thirds PGA

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5,\ \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	1.5	43	0.42	**0.0**	5.00	**0.0**
	5	19	0.38	**1.8**	5.00	**1.1**
	10	49	0.42	**0.0**	5.00	**0.0**
	15	48	0.42	**0.0**	5.00	**0.0**
	20	30	0.38	**0.5**	5.00	**0.3**
	25	68	0.28	**0.0**	5.00	**0.0**
	30	33	0.34	**0.0**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =		**1.4**

2010 Idriss-Boulanger

													Corrected SPT N-Value										**CSR Evaluation**				**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	N_{Raw} (blows/ ft)	**Thickness (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	σ_v (psf)	**u (psf)**	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60\text{-}cs}$	m	$C_{N,\ adjusted}$	$(N_1)_{60\text{-}cs,\ adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	270.3	SPT	18	3	SM	120	25	180	94	86	3883	3969	0.9	0.8	1.3	1.05	1	19	5	24	0.41	1.7	43	-0.003	0.001	1.00	0.419	0.3	0.8	10.940	10.842	5.0	No	1663
5	266.8	CR	9	5	ML	120	25	600	312	288	3628	3916	0.95	0.8	1.3	1.05	0.7	7	5	12	0.52	1.7	19	-0.052	0.006	0.96	0.423	0.1	0.9	0.194	0.218	0.5	No	1658
10	261.8	SPT	19	5	SM	120	25	1200	624	576	3306	3882	1	0.8	1.3	1.05	1	20	5	25	0.40	1.7	49	-0.137	0.016	0.89	0.423	0.3	0.8	245.811	245.616	5.0	No	1643
15	256.8	CR	32	5	SM	120	25	1800	936	864	3025	3889	1	0.7	1.3	1.05	0.7	23	5	28	0.38	1.4	48	-0.236	0.027	0.82	0.415	0.3	0.8	162.984	162.749	5.0	No	1615
20	251.8	SPT	14	5	SM	120	25	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	1	14	5	19	0.45	1.3	30	-0.348	0.039	0.74	0.400	0.2	0.9	0.499	0.532	1.3	No	1573
25	246.8	CR	59	5	SM	120	25	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	0.7	39	5	44	0.27	1.1	68	-0.472	0.053	0.67	0.379	-0.5	1.1	4658100647229	6259198087168	5.0	No	1518
30	241.8	SPT	19	1.5	SM	120	25	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	1	17	5	22	0.42	1.1	33	-0.604	0.068	0.59	0.355	0.2	0.8	0.801	0.824	2.3	No	1453

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures." Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

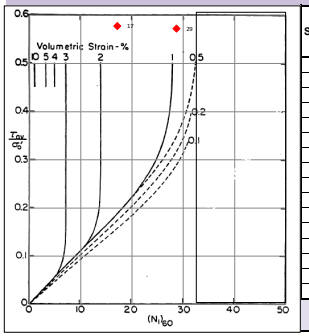
Case 2: FULL PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	1.5	41	0.65	**0.0**	3.00	**0.0**
	5	17	0.58	**1.9**	5.00	**1.1**
	10	47	0.65	**0.0**	5.00	**0.0**
	15	47	0.64	**0.0**	5.00	**0.0**
	20	29	0.57	**1.0**	5.00	**0.6**
	25	66	0.44	**0.0**	5.00	**0.0**
	30	32	0.52	**0.0**	5.00	**0.0**
				SAT. SETTLEMENT (IN) =		**1.7**

2010 Idriss-Boulanger

													Corrected SPT N-Value										**CSR Evaluation**				**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\text{-}cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60\text{-}cs,\ adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	270.3	SPT	18	3	SM	120	15	180	94	86	3883	3969	0.9	0.8	1.3	1.05	1	19	3	22	0.42	1.7	41	-0.003	0.001	1.00	0.629	0.3	0.8	5.515	5.311	5.0	No	2496
5	266.8	CR	9	5	ML	120	15	600	312	288	3628	3916	0.95	0.8	1.3	1.05	0.7	7	3	10	0.54	1.7	17	-0.052	0.006	0.96	0.635	0.1	0.9	0.175	0.193	0.3	No	2488
10	261.8	SPT	19	5	SM	120	15	1200	624	576	3306	3882	1	0.8	1.3	1.05	1	20	3	23	0.41	1.7	47	-0.137	0.016	0.89	0.635	0.3	0.8	109.953	106.744	5.0	No	2464
15	256.8	CR	32	5	SM	120	15	1800	936	864	3025	3889	1	0.7	1.3	1.05	0.7	23	3	26	0.39	1.4	47	-0.236	0.027	0.82	0.623	0.3	0.8	76.440	74.162	5.0	No	2421
20	251.8	SPT	14	5	SM	120	15	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	1	14	3	17	0.47	1.3	29	-0.348	0.039	0.74	0.600	0.2	0.9	0.412	0.432	0.7	No	2357
25	246.8	CR	59	5	SM	120	15	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	0.7	39	3	42	0.28	1.1	66	-0.472	0.053	0.66	0.568	-0.5	1.1	228409508083	298198599754	5.0	No	2274
30	241.8	SPT	19	1.5	SM	120	15	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	1	17	3	21	0.43	1.1	32	-0.604	0.068	0.59	0.531	0.2	0.9	0.604	0.614	1.2	No	2175

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

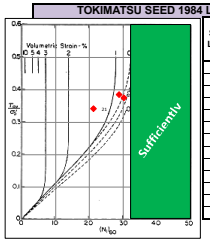
Project Title: 130 W College
Project Location: Los Angeles

Case 1: Two-Thirds PGA

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)



TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)

Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5, \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	1.5	66	0.31	**0.0**	3.00	**0.0**
	5	88	0.32	**0.0**	5.00	**0.0**
	10	57	0.31	**0.0**	5.00	**Clay**
	15	29	0.38	**0.9**	5.00	**0.5**
	20	30	0.38	**0.5**	5.00	**0.3**
	25	21	0.34	**1.4**	5.00	**Clay**
	30	74	0.26	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**0.8**

														2010 Idriss-Boulanger																				
														Corrected SPT N-Value												**CSR Evaluation**				**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ft)**	**Thickness (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_M**	**C_E**	**C_S**	**C_d**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\text{-}CS}$**	**m**	**C_{N_1} adjusted**	**$(N_1)_{60}$ $_{CE, CR, CS}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**$C_σ$**	**$K_σ$**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxα'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1.5	270.3	SPT	29	3	SM	120	25	180	94	86	3883	3969	0.9	0.8	1.3	1.05	1	30	5	35	0.33	1.7	66	-0.003	0.001	1.00	0.419	-0.6	1.1	88458660324.293	118863957528.384	5.0	No	1663
5	266.8	CR	51	5	SM	120	25	600	312	288	3628	3916	1	0.8	1.3	1.05	0.7	39	5	44	0.27	1.7	88	-0.052	0.006	0.96	0.423	-0.2	1.1	##	##	5.0	No	1658
10	261.8	SPT	24	5	SM	120	25	1200	624	576	3306	3882	1	0.8	1.3	1.05	1	25	5	30	0.36	1.6	57	-0.137	0.016	0.89	0.423	-2.3	1.1	549807	738788	5.0	No	1643
15	256.8	CR	16	5	CL	120	75	1800	936	864	3025	3889	1	0.7	1.3	1.05	0.7	11	6	17	0.47	1.5	29	-0.236	0.027	0.82	0.415	0.2	0.9	0.419	0.453	1.1	Yes	1615
20	251.8	SPT	14	5	SC	120	25	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	1	14	5	19	0.45	1.3	30	-0.348	0.039	0.74	0.400	0.2	0.9	0.499	0.532	1.3	No	1573
25	246.8	CR	14	5	SC	120	25	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	0.7	9	5	14	0.49	1.2	21	-0.472	0.053	0.67	0.379	0.1	0.9	0	0	0.7	No	1518
30	241.8	SPT	48	1.5	CL	120	75	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	1	44	6	50	0.24	1.1	74	-0.604	0.068	0.59	0.355	-0.3	1.1	377631772308900000000	507432588064713000000	5.0	Yes	1453

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

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SPT-BASED LIQUEFACTION TRIGGERING EVALUATION
Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

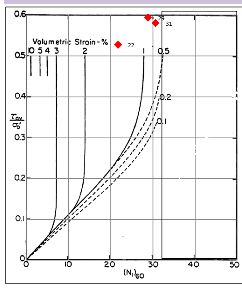
Project Title: 130 W College   Case 2: FULL PGA
Project Location: Los Angeles
Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C

5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-cs}}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	**-**
	0	---	-	**0.0**	-	**-**
	0	---	-	**0.0**	-	**-**
	0	---	-	**0.0**	-	**-**
	0	---	-	**0.0**	-	**-**
	0	---	-	**0.0**	-	**-**
	1.5	61	0.48	**0.0**	5.00	**0.0**
	5	86	0.49	**0.0**	5.00	**0.0**
	10	57	0.49	**0.0**	5.00	**Clay**
	15	29	0.59	**1.0**	5.00	**0.6**
	20	31	0.58	**0.9**	5.00	**0.5**
	25	22	0.53	**1.5**	5.00	**Clay**
	30	74	0.41	**0.0**	5.00	**0.0**
					SAT. SETTLEMENT (IN) =	**1.1**

√

Depth Below BOF (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
					BOF			---	---	---	---	---
1.5	270.3	SPT	29	3	SM	120	5.9	180	94	86	3883	3969
5	266.8	CR	51	5	SM	120	15	600	312	288	3628	3916
10	261.8	SPT	24	5	SM	120	15	1200	624	576	3306	3882
15	256.8	CR	16	5	CL	120	51	1800	936	864	3025	3889
20	251.8	SPT	14	5	SC	120	49	2400	1248	1152	2778	3930
25	246.8	CR	14	5	SC	120	49	3000	1560	1440	2560	4000
30	241.8	SPT	48	1.5	CL	120	75	3600	1872	1728	2367	4095

2010 Idriss-Boulanger

Depth Below BOF (ft)	Corrected SPT N-Value C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,}$ adjusted	$(N_1)_{60cs,adj.}$	CSR Evaluation α	β	r_d	$CSR_{M,\sigma'v}$	CRR Evaluation C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	0.9	0.8	1.3	1.05	1	30	0	30	0.36	1.7	61	-0.003	0.001	1.00	0.629	-1.1	1.1	28979785.617	37834377.232	5.0	No	2496
5	1	0.8	1.3	1.05	0.7	39	3	43	0.28	1.7	86	-0.052	0.006	0.96	0.635	-0.2	1.1	#####################	#######################	5.0	No	2488
10	1	0.8	1.3	1.05	1	25	3	29	0.37	1.6	57	-0.137	0.016	0.89	0.635	-3.7	1.1	194766.935	254276.750	5.0	Yes	2464
15	1	0.7	1.3	1.05	0.7	11	6	17	0.47	1.5	29	-0.236	0.027	0.82	0.623	0.2	0.9	0.422	0.442	0.7	No	2421
20	1	0.7	1.3	1.05	1	14	6	19	0.45	1.3	31	-0.348	0.039	0.74	0.600	0.2	0.9	0.531	0.549	0.9	No	2357
25	1	0.7	1.3	1.05	0.7	9	6	15	0.49	1.2	22	-0.472	0.053	0.66	0.568	0.1	0.9	0	0	0.4	No	2274
30	1	0.7	1.3	1.05	1	44	6	50	0.24	1.1	74	-0.604	0.068	0.59	0.531	-0.3	1.1	#####################	#######################	5.0	Yes	2175

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

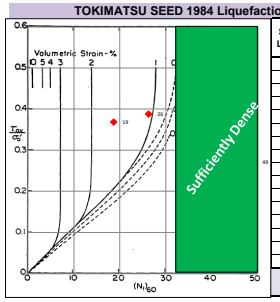
Project Title: 130 W College — Case 1: Two-Thirds PGA

Project Location: Los Angeles
Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	CSR$_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	5	26	0.39	**1.1**	5.00	**0.7**
	10	67	0.31	**0.0**	5.00	**0.0**
	15	19	0.37	**1.9**	5.00	**1.1**
	20	34	0.39	**0.0**	5.00	**Clay**
	25	60	0.28	**0.0**	5.00	**0.0**
	30	80	0.26	**0.0**	5.00	**0.0**
	35	83	0.33	**0.0**	5.00	**0.0**
	40	59	0.30	**0.0**	5.00	**0.0**
	45	49	0.27	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**1.8**

2010 Idriss-Boulanger

													Corrected SPT N-Value											**CSR Evaluation**				**CRR Evaluation**					
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{meas} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_B**	**C_N**	**C_E**	**C_R**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\text{-}cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60\text{-}cs,adj.}$**	**α**	**β**	**r_d**	**CSR$_{M,\sigma'v}$**	**C_w**	**K_σ**	**CRR$_{M7.5,1atm}$**	**CRR$_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	266.8	SPT	11	5	SM	120	15	600	312	288	3628	3916	0.9	0.8	1.3	1.05	1	11	3	15	0.49	1.7	26	-0.052	0.006	0.96	0.423	0.2	0.9	0.322	0.352	0.8	No	1658
10	261.8	CR	45	5	ML	120	51	1200	624	576	3306	3882	0.95	0.8	1.3	1.05	0.7	33	6	39	0.31	1.5	67	-0.137	0.016	0.89	0.423	-0.5	1.1	456399905422.770	613275158986.690	5.0	No	1643
15	256.8	SPT	7	5	SM	120	15	1800	936	864	3025	3889	1	0.8	1.3	1.05	1	7	3	11	0.53	1.6	19	-0.236	0.027	0.82	0.415	0.1	0.9	0.191	0.215	0.5	No	1615
20	251.8	CR	23	5	CL	120	75	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	0.7	16	6	22	0.42	1.3	34	-0.348	0.039	0.74	0.400	0.2	0.8	0.910	0.941	2.4	Yes	1573
25	246.8	SPT	37	5	SM	120	15	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	1	36	3	39	0.30	1.1	60	-0.472	0.053	0.67	0.379	-1.2	1.1	12715374	17085944	5.0	No	1518
30	241.8	CR	77	5	SM	120	15	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	0.7	51	3	54	0.22	1.0	80	-0.604	0.068	0.59	0.355	-0.3	1.1	309990071661374000000000000.000	416540863009871000000000000.000	5.0	No	1453
35	236.8	SPT	58	5	SM	120	15	4200	2184	2016	2195	4211	1	0.7	1.3	1.05	1	53	3	56	0.21	1.0	83	-0.744	0.083	0.53	0.328	-0.2	1.1	3586648787832170000000000000000.000	481946332471228000000000000000.000	5.0	No	1380
40	231.8	CR	60	5	SM	120	15	4800	2496	2304	2041	4345	1	0.7	1.3	1.05	0.7	37	3	41	0.29	1.0	59	-0.888	0.099	0.46	0.300	-1.4	1.1	4452110.537	5982404.389	5.0	No	1303
45	226.8	SPT	36	1.5	SM	120	15	5400	2808	2592	1902	4494	1	0.6	1.3	1.05	1	31	3	34	0.33	0.9	49	-1.034	0.115	0.41	0.273	0.3	0.8	347.080	328.162	5.0	No	1226

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

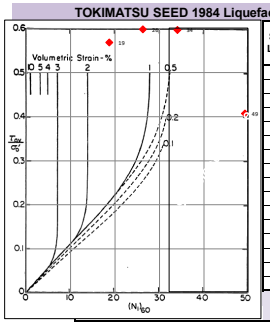
Case 2: FULL PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	0
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
3. Historic Groundwater Approximately at 20-ft (therefore 0-ft below BOF)
4. Cn Calculated at the time of drilling as per Comment 1.C
5. BOF = Bottom of Footing
6. Sampler Correction revised per comment 1.B (SP117 5.4.5-Sampler Type)

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60}$	CSRM=7.5,σ'v=1	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	0	---	-	**0.0**	-	-
	5	26	0.60	**1.2**	5.00	**0.7**
	10	67	0.49	**0.0**	5.00	**0.0**
	15	19	0.57	**1.9**	5.00	**1.1**
	20	34	0.60	**0.5**	5.00	**Clay**
	25	60	0.44	**0.0**	5.00	**0.0**
	30	80	0.41	**0.0**	5.00	**0.0**
	35	83	0.49	**0.0**	5.00	**0.0**
	40	59	0.45	**0.0**	5.00	**0.0**
	45	49	0.41	**0.0**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =		**1.9**

													2010 Idriss-Boulanger																					
													Corrected SPT N-Value												**CSR Evaluation**					**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
5	266.8	SPT	11	5	SM	120	15	600	312	288	3628	3916	0.9	0.8	1.3	1.05	1	11	3	15	0.49	1.7	26	-0.052	0.006	0.96	0.635	0.2	0.9	0.322	0.342	0.5	No	2488
10	261.8	CR	45	5	ML	120	51	1200	624	576	3306	3882	0.95	0.8	1.3	1.05	0.7	33	6	39	0.31	1.5	67	-0.137	0.016	0.89	0.635	-0.5	1.1	456399905422.770	595850032107.260	5.0	No	2464
15	256.8	SPT	7	5	SM	120	15	1800	936	864	3025	3889	1	0.8	1.3	1.05	1	7	3	11	0.53	1.6	19	-0.236	0.027	0.82	0.623	0.1	0.9	0.191	0.209	0.3	No	2421
20	251.8	CR	23	5	CL	120	75	2400	1248	1152	2778	3930	1	0.7	1.3	1.05	0.7	16	6	22	0.42	1.3	34	-0.348	0.039	0.74	0.600	0.2	0.8	0.910	0.915	1.5	Yes	2357
25	246.8	SPT	37	5	SM	120	15	3000	1560	1440	2560	4000	1	0.7	1.3	1.05	1	36	3	39	0.30	1.1	60	-0.472	0.053	0.66	0.568	-1.2	1.1	12715374	16600477	5.0	No	2274
30	241.8	CR	77	5	SM	120	15	3600	1872	1728	2367	4095	1	0.7	1.3	1.05	0.7	51	3	54	0.22	1.0	80	-0.604	0.068	0.59	0.531	-0.3	1.1	309990071661374000000000000.000	##########################	5.0	No	2175
35	236.8	SPT	58	5	SM	120	15	4200	2184	2016	2195	4211	1	0.7	1.3	1.05	1	53	3	56	0.21	1.0	83	-0.744	0.083	0.52	0.490	-0.2	1.1	##	##########################	5.0	No	2065
40	231.8	CR	60	5	SM	120	15	4800	2496	2304	2041	4345	1	0.7	1.3	1.05	0.7	37	3	41	0.29	1.0	59	-0.888	0.099	0.46	0.449	-1.4	1.1	4452110.537	5812424.970	5.0	No	1949
45	226.8	SPT	36	1.5	SM	120	15	5400	2808	2592	1902	4494	1	0.6	1.3	1.05	1	31	3	34	0.33	0.9	49	-1.034	0.115	0.41	0.408	0.3	0.8	347.080	318.838	5.0	No	1832

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

ATTACHMENT D

ACTIVE EARTH PRESSURES - LIMIT EQUILIBRIUM ANALYSIS (DM 7.1)

CASE 1 - Sample LB-1 / S-5

GIVEN:

Soil Parameters

Unit weight $\gamma := 111.7\ \frac{lb}{ft^3}$

Cohesion $c := 100\ \frac{lb}{ft^2}$

Friction angle $\phi := 39\ deg$

Backfill Slope Angle $\beta := 0\ deg$

Retaining Wall Parameters

Wall height $H := 20\ ft$

Factor of safety $FS := 1.5$

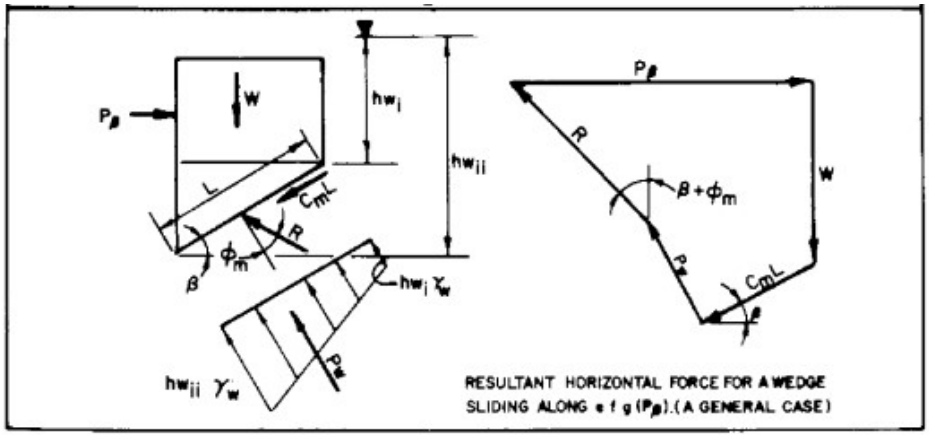


FIGURE 6
Stability Analysis of Translational Failure

CALCULATIONS:

Mobilized parameters $c_m := \frac{c}{FS} = 66.7\ \frac{lb}{ft^2}$ $\phi_m := \operatorname{atan}\left(\frac{\tan(\phi)}{FS}\right) = 28.4\ deg$

Failure surface parameters $\alpha := 45\ deg + \frac{\phi_m}{2} = 59.2\ deg$

$L := \frac{H \cdot \sin(90\ deg + \beta)}{\sin(\alpha - \beta)} = 23.3\ ft$ $W := \frac{H}{2}\left(\frac{H \cdot \sin(90\ deg - \alpha) \cdot \cos(\beta)}{\sin(\alpha - \beta)}\right) \cdot \gamma = 13327\ \frac{lb}{ft}$

LANGAN

$$R_y := W = 13327.2 \ \frac{lb}{ft}$$

$$R_x := R_y \cdot \tan\left(\alpha - \phi_m\right) = 7950.5 \ \frac{lb}{ft}$$

Resultant horizontal force for an active wedge along potential sliding surface

$$P_A := R_x - c_m \cdot L \cdot \cos\left(\alpha\right) = 7155.1 \ \frac{lb}{ft}$$

Equivalent fluid pressure

$$EFP := \frac{P_A}{\frac{H^2}{2}} = 36 \ \frac{lb}{ft^3}$$

ACTIVE EARTH PRESSURES - LIMIT EQUILIBRIUM ANALYSIS (DM 7.1)

CASE 1 - Sample LB-3 / S-9

GIVEN:

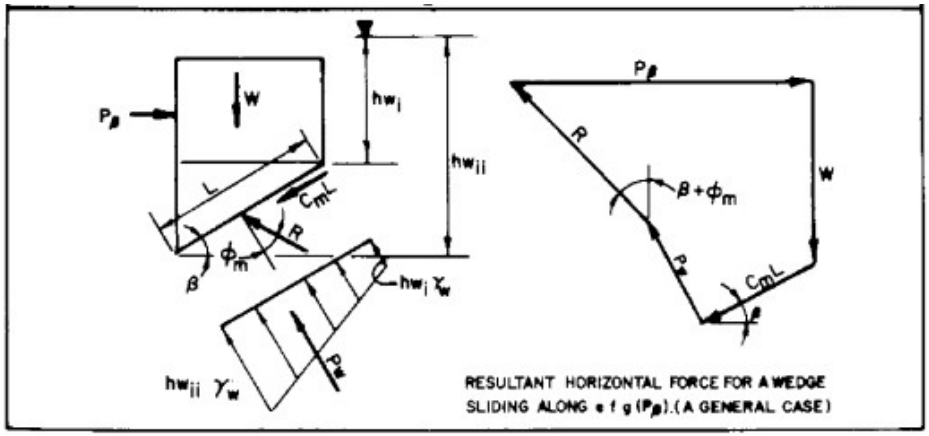
Soil Parameters

Unit weight $\gamma := 89.2\ \frac{lb}{ft^3}$

Cohesion $c := 350\ \frac{lb}{ft^2}$

Friction angle $\phi := 27\ deg$

Backfill Slope Angle $\beta := 0\ deg$



RESULTANT HORIZONTAL FORCE FOR A WEDGE SLIDING ALONG a f g (P_a).(A GENERAL CASE)

FIGURE 6
Stability Analysis of Translational Failure

Retaining Wall Parameters

Wall height $H := 20\ ft$

Factor of safety $FS := 1.5$

CALCULATIONS:

Mobilized parameters $c_m := \frac{c}{FS} = 233.3\ \frac{lb}{ft^2}$ $\phi_m := \operatorname{atan}\left(\frac{\tan(\phi)}{FS}\right) = 18.8\ deg$

Failure surface parameters $\alpha := 45\ deg + \frac{\phi_m}{2} = 54.4\ deg$

$L := \frac{H \cdot \sin(90\ deg + \beta)}{\sin(\alpha - \beta)} = 24.6\ ft$ $W := \frac{H}{2}\left(\frac{H \cdot \sin(90\ deg - \alpha) \cdot \cos(\beta)}{\sin(\alpha - \beta)}\right) \cdot \gamma = 12781\ \frac{lb}{ft}$

LANGAN

$$R_y := W = 12781.2 \ \frac{lb}{ft}$$

$$R_x := R_y \cdot \tan\left(\alpha - \phi_m\right) = 9156.9 \ \frac{lb}{ft}$$

Resultant horizontal force for an active wedge along potential sliding surface

$$P_A := R_x - c_m \cdot L \cdot \cos\left(\alpha\right) = 5813.5 \ \frac{lb}{ft}$$

Equivalent fluid pressure

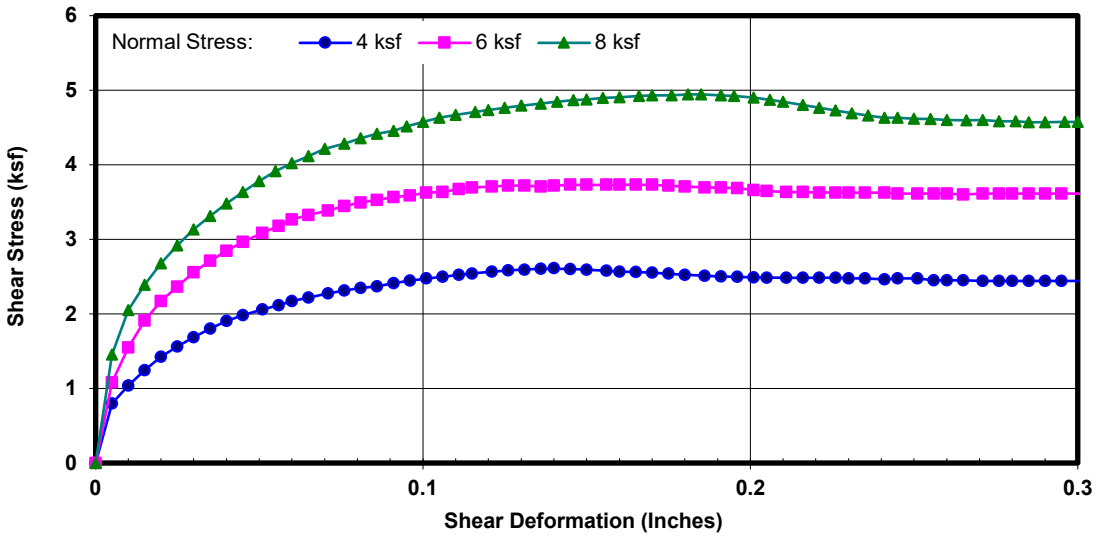
$$EFP := \frac{P_A}{\frac{H^2}{2}} = 29 \ \frac{lb}{ft^3}$$

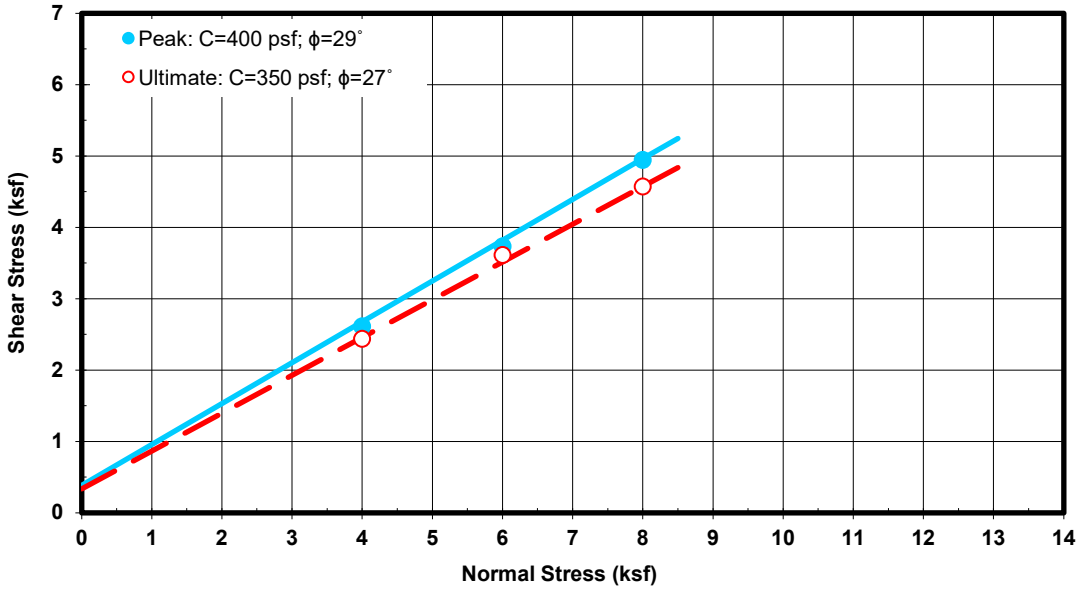
AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/24/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/25/22
Boring No.:	LB-3		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-9	**Depth (ft):** 35			
Sample Type:	Mod. Cal.				
Soil Description:	Clay w/sand				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.0	89.2	30.0	33.0	91	100	4	2.611	2.440
						6	3.732	3.612
						8	4.944	4.572



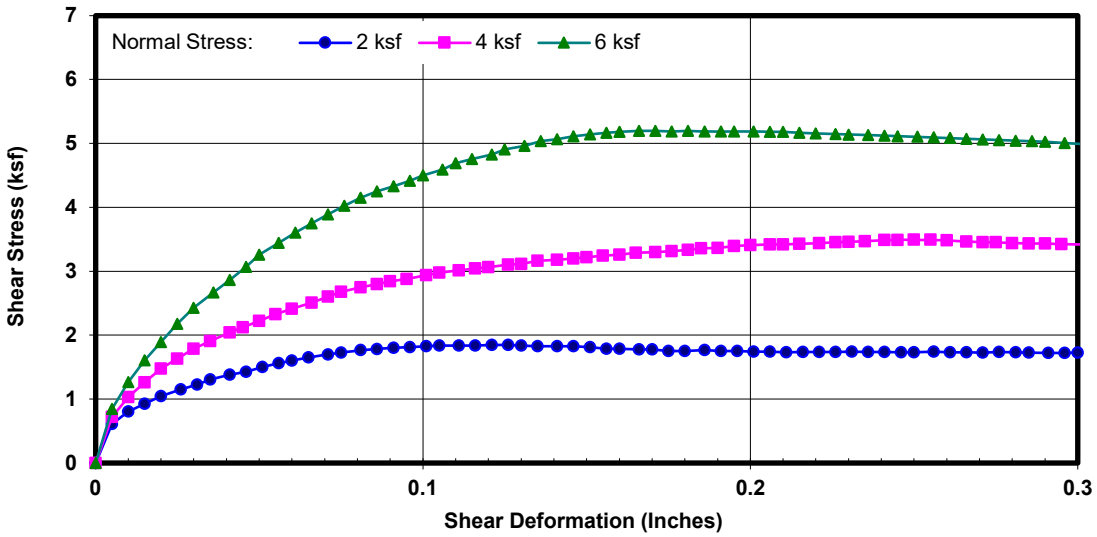


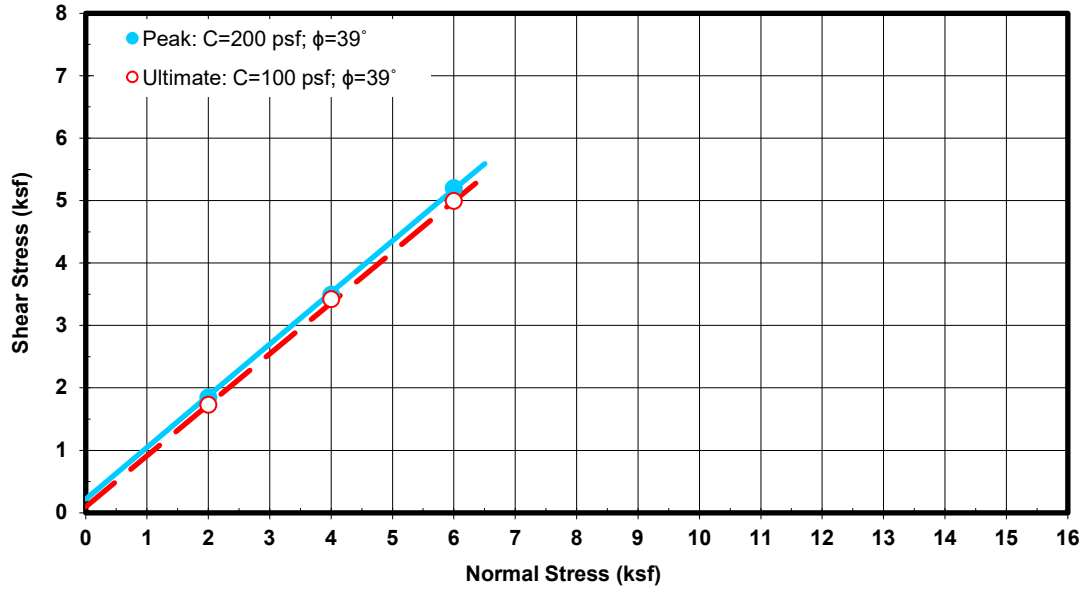
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DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/21/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/24/22
Boring No.:	LB-1		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-5	**Depth (ft):** 20			
Sample Type:	Mod. Cal.				
Soil Description:	Silty Sand w/gravel				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.5	111.7	4.3	16.8	23	89	2	1.848	1.728
						4	3.492	3.420
						6	5.198	4.993





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SOILS REPORT REVIEW LETTER

September 6, 2023

LOG # 125167-01
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT:	FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)
LOT(S):	D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16
LOCATION:	130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	08/07/2023	LANGAN

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	125167	03/30/2023	LADBS
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

The consultants recommend to support the proposed structure on mat-type foundations bearing on native undisturbed soils.

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Revise liquefaction analyses to address the following items:

    a. Provide justification and appropriate laboratory testing for all layers, including clay layers, considered non-potentially liquefiable (based on the screening criteria followed by the consultant) to substantiate such argument.

    Note: The Department requires that the criteria for soils "not susceptible" to liquefaction be demonstrated. The soils considered "not susceptible" to liquefaction are soils with a PI >= 18 that are not sensitive or soils having a saturated moisture content <= 80% of the liquid limit.

    b. The consultants used a factor of 0.8 to convert the Cal Mod N-values to SPT N-values. However, this value is not supported by CGS Special Publication 117 (i.e. SP 117A), Guidelines for Evaluating and Mitigating Seismic Hazards in California (Section 5.4.5). Revise conversion factor accordingly.

    c. Calculate the overburden correction factor, CN, based on the conditions encountered at the time the SPT testing was conducted (i.e., depth below ground surface and ground water elevation at the time of drilling).

    d. Calculate the seismic demand on the soil layer or cyclic stress ratio, CSR based on the historically highest ground water level.

2. The consultants used a friction angle of 39 degrees for basement wall lateral earth pressure calculation. However, the upper soils consist of sands (sand, silt/sand) and clays. The direct shear test for a clay sample shows a peak friction angle of 29 degrees. Provide lateral earth pressure recommendations for basement wall retaining clays.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167-01
213-482-0480

cc: Charles Tan & Associates, Applicant
LANGAN, Project Consultant
LA District Office

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07 August 2023

Mr. Steven J. Riboli
S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

Re: Response to Soils Report Review Letter
Log # 125167
Tract M R 72-75/76
130, 114, 110 W College Street
Langan Project No. 721036101

Dear Mr. Riboli:

We are providing this response to the Soils Report Review Letter dated 17 February 2023, Log #125167 issued by the City of Los Angeles (City) Grading Division received via email on 04 April 2023. Our responses to geotechnical related items are below. A copy of the City's review letter is provided in Attachment A.

The presented liquefaction analysis has been updated to take into account a 20-foot excavation for the proposed development based on the latest information provided by Granite Properties on the document titled, "130 College Standalone PD No Graphics" dated May 2023. Previous our analysis showed a 13-foot excavation as proposed however the updated analysis reflects the current design of the subterranean parking level would extend to a depth of approximately 20 feet below ground surface.

Comment 1: *Revise liquefaction analysis to address the following items*

a) Provide justification and appropriate laboratory testing for all layers considered non-potential liquefiable
b) The consultant used blow counts from California Modified samplers with no reduction. Provide conversion factors to correlate the California Mod N-values to SPT N-values. Revise liquefaction analysis accordingly
c) Provide liquefaction analysis for all borings where N-Values are available. The most critical seismic settlement should be used in the foundation design
d) Provide detailed printouts of the liquefaction analyses showing the C_N, r_d, overburden pressure for the corrected N Values, MSF, K_σ and settlement calculation.

Response:

a) In our liquefaction analysis the only layers that are considered as non-potential liquefiable are the clay layers. Silt layers were found to have a PI of < 18, so were considered potentially liquefiable for this analysis. Laboratory test results and updated boring logs are included in attachment B.
b) The analyses have been updated to account for the reduction. Refer to attachment C for the conversion factors used to correlate the California Mod N-values to SPT N-values.

c) Refer to Attachment C for the liquefaction analysis for all borings where N-Values are available and their respective print out calculations (LB 1 through LB-4). Analyses were performed to meet the information bulletin PB/C 2020-151 "Liquefaction Analysis Guidelines". The full PGA_M analysis most critical was LB-1, a settlement of about 2.0 inches is expected for a full PGA_M of 0.947g, and a Mw 6.85 for a 2475-Year Return Period. The two-thirds of the PGA_M analysis most critical were LB-1 and LB-4, both with a settlement of about 1.7 inches for a two-thirds PGA_M of 0.631g, and a Mw 6.74 for a 475-Year Return Period. The detailed printouts of the liquefaction analyses for the most critical case are shown in Attachment C.

   Additionally, since Cone Penetration tests were performed at the Site during our field investigation. Langan utilized the CPTs to verify liquefaction hazard. To evaluate the liquefaction potential at the Site, we utilized the Boulanger and Idriss (2014) method in the computer program *CLiq*. The reference boring for the CLiq analysis used was LB-4. For the analysis we show a factor of safety (FS) of 1.1 and 1.0 and Design Peak Ground Acceleration (Two-Thirds-PGA_M) of 0.690g and (Full PGA_M) of 0.947g as the criteria for determining zones that are potentially liquefiable, and a Mw 6.74 and Mw 6.85 for a 475- and 2475-Year Return period. The most critical settlement analysis indicates a settlement of up to 1.7 inches is expected for a full PGAm of 0.947g, and a Mw 6.85 for a 2475 Year Return Period.

d) The results for this analysis, including detailed printouts of the liquefaction analyses showing the C_N, r_d, overburden pressure for the corrected N Values, MSF, K_s and settlement calculation are shown in attachment C.

Comment 2: *Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. If onsite infiltration is proposed, liquefaction analysis shall be provided assuming the design groundwater table at the proposed level of infiltration. Clearly indicate if the onsite infiltration is recommended.*

Response: As we understand, on-site storm water infiltration is not proposed at this project.

Comment 3: *In the event on-site infiltration is proposed, provide an evaluation according to Information Bulletin P/BC 2020-118.*

Response: As we understand, on-site storm water infiltration is not proposed at this project.

Comment 4: *Revise the retaining wall calculations and recommendations to address the following items:*

a) Indicate why a friction angle of 39 degrees was used.
b) Revise the unit weight used in the equivalent fluid pressure calculation. Alternatively, provide justification for using a value of 110 PCF.

Response:

a) A friction angle of 39 degrees was used as indicated by the direct shear test result from Sample LB-1/S-5.
b) Based on the laboratory result of Sample LB-1/S-5 a unit weight of 110-pounds-per-cubic-foot was used in the equivalent fluid pressure calculation. The laboratory results are shown in Attachment B.

Please contact us if you have any questions regarding this letter.

Sincerely,
Langan Engineering and Environmental Services, Inc.

Enrique Riutort, PE
Senior Project Engineer

Diane M. Fiorelli, PE, GE
Principal/Vice President
GE# 3042



Enclosure(s): Attachment A – Copy of Soils Report Review Letter, Log # 125167
Attachment B – Boring Logs and Laboratory Results
Attachment C – Liquefaction Results

ATTACHMENT A

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JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT REVIEW LETTER

March 30, 2023

LOG # 125167
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT: FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)
LOT(S): D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16
LOCATION: 130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

The consultants recommend to support the proposed structure(s) on mat-type foundations bearing on native undisturbed soils.

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Revise liquefaction analyses to address the following items:

   a. Provide justification and appropriate laboratory testing for all layers considered non-potentially liquefiable (based on the screening criteria followed by the consultant) to substantiate such argument.

      Note: The Department requires that the criteria for soils "not susceptible" to liquefaction be demonstrated. The soils considered "not susceptible" to liquefaction are soils with a PI >= 18 that are not sensitive or soils having a saturated moisture content <= 80% of the liquid limit.

   b. The consultants used blow counts from California Modified samplers with no reduction. Provide conversion factor to correlate the Cal Mod N-values to SPT N-values. Revise liquefaction analyses accordingly.

   c. Provide liquefaction analyses for all borings where N-values are available. The most critical seismic settlement shall be used for the foundation design.

   d. Provide detailed printouts of the liquefaction analyses showing the C_N (overburden correction factor), r_d (stress reduction coefficient), overburden pressure, the corrected N values, MSF (magnitude scaling factor), $K\sigma$ (confining stress correction factor) and settlement calculation.

2. Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. If onsite infiltration is proposed, liquefaction analyses shall be provided assuming the design ground water table (i.e., the ground water during an earthquake) at the proposed level of infiltration. Clearly indicate if the onsite infiltration is recommended.

3. In the event on-site infiltration is proposed, provide an evaluation on the following items (please refer to Information Bulletin P/BC 2020-118, which can be downloaded from our web site www.ladbs.org):

   a. Potential on creating perched ground water conditions.

   b. Presence of potential expansive soils and/or susceptibility for hydroconsolidation.

   c. Influence of the proposed infiltration system on adjacent proposed/existing foundations and retaining walls.

   d. The "Time Interval" shown on Percolation Test Data sheets is 10 minutes for each trial. However, based on the "Time of Measurement", each trial appears to last 5 minutes. Revise the calculations accordingly.

4. Revise the retaining wall calculations and recommendations to address the following items:

   a. Indicate why a friction angle of 39 degrees was used? The upper soils consist of sand (LB-1), silt/sand (LB-2), clay (LB-3) and silt/sand (LB-4).

   b. Revise the unit weight used in the equivalent fluid pressure calculation. Alternatively, provide justification for using a value of 110 PCF.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167
213-482-0480

cc: LANGAN, Project Consultant
LA District Office

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District LA | Log No. 125167

APPLICATION FOR REVIEW OF TECHNICAL REPORTS

INSTRUCTIONS

A. Address all communications to the Grading Division, LADBS, 221 N. Figueroa St., 12th Fl., Los Angeles, CA 90012 Telephone No. (213)482-0480.
B. Submit two copies (three for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom or flash drive, and one copy of application with items "1" through "10" completed.
C. Check should be made to the City of Los Angeles.

1. LEGAL DESCRIPTION
Tract: FREIGHT DEPOT TRACT
Block: ____ Lots: FR D
3. OWNER: S&R Partners, LLC
Address: 737 Lamar Street
City: Los Angeles Zip: 90031
Phone (Daytime): ____

2. PROJECT ADDRESS: 130 West College, Los Angeles, California
4. APPLICANT Langan
Address: 18575 Jamboree Road, Suite 150
City: Irvine Zip: 92612
Phone (Daytime): 949-561-9200
E-mail address: eriutort@langan.com; awei@langan.com

5. Report(s) Prepared by: Langan
6. Report Date(s): 17 February 2023

7. Status of project: ☑ Proposed ☐ Under Construction ☐ Storm Damage
8. Previous site reports? ☐ YES if yes, give date(s) of report(s) and name of company who prepared report(s)

9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates:
10. Applicant Signature: Dian N. Freeller Position: Principal / Vice President

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED	FEES
☒ Soils Engineering	363.00	No. of Lots	
☐ Geology		No. of Acres	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☐ Supplemental		Other	
☐ Combined Supplemental		☒ Expedite	181.50
☐ Import-Export Route		☐ Response to Correction	
Cubic Yards:		☐ Expedite ONLY	
		Sub-total	544.50
		Surcharge	129.80
		TOTAL FEE	674.30

Fee Due: 674.30
Fee Verified By: BM Date: 2/27/23
(Cashier Use Only)

Receipt # 1530989

Paid on 3/7/23

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED
☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology ____ Date ____

For Soils ____ Date ____

ATTACHMENT B

LANGAN

Log of Boring **LB-1** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 291.8
Drilling Company: Martini Drilling	Date Started: 10/15/2022 — Date Finished: 10/15/2022
Drilling Equipment: CME 75	Completion Depth: 66.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 14, Undisturbed ---, Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 24.4, Completion ▼ ---, 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod; Bulk	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	291.8		0						
	291.0	Asphalt 4 inches and Aggregate Base 6 inches.							
		Dark brown, clayey SAND, trace fine gravel, (SC), moist.	2						
	287.8		4						
		Medium dense, brown, fine to medium coarse silty SAND, trace fine gravel, (SM), moist.	6	S-1	CR	10	8 9 9	18	
		Medium dense, yellow-brown, fine to coarse SAND, trace silt, fine to corase gravel, (SM), moist.	8	S-2	CR	10	11 9 5	14	
		Very dense, white-brown, fine to coarse SAND, some silt, fine to coarse gravel, (SM), moist.	10	S-3	CR	10	11 31 39	70	
			12						
			14						
		Very dense, yellow-brown, fine to coarse SAND, some silt, trace fine gravel, (SM), moist.	16	S-4	SPT	9	22 50/3	50/3	
			18						
		Top: very dense, yellow-brown, fine to coarse SAND, some silt, trace fine gravel, (SM), moist. Bottom: very dense, dark bluish-gray, fine to coarse SAND, some silt, fine to coarse gravel, (SM), moist.	20	S-5	CR	18	18 37 41	78	
			22						
		▽	24						
		Dense, gray, fine to coarse SAND, some silt, (SM), wet.	26	S-6	SPT	18	7 15 17	32	
			28						
		Dense, gray, fine to coarse SAND, some silt, (SM), wet.	30	S-7	CR	10	42 50/4	50/4	
	258.8		32						
			34						
			35						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-1** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	291.8

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+256.8	Stiff, dark gray, SILT, some fine to medium sand, trace clay, (ML), wet.	35	S-8	SPT	18	3 4 6	10	
			36						
			38						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, strong odor, (ML), wet.	40	S-9	CR	10	2 3 4	7	
			42						
			44						
	+246.8	Stiff, dark gray, fine to medium sandy CLAY, trace silt, (CL), wet.	46	S-10	SPT	17	1 3 5	8	
			48						
	+241.8	Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	50	S-11	CR	18	9 18 27	45	
			52						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	54						
			56	S-12	SPT	18	3 7 12	19	
			58						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	60	S-13	CR	18	7 17 37	54	
			62						
			64						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	66	S-14	SPT	18	6 14 20	34	
	+225.3	End boring at 66.5 feet. Groundwater encountered at 24.5 feet. Boring backfilled with grout.	68						
			70						
			72						
			74						
			76						
			78						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-2** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 294
Drilling Company: Martini Drilling	Date Started: 10/04/2022 — Date Finished: 10/05/2021
Drilling Equipment: CME 75	Completion Depth: 51.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 11, Undisturbed ---, Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 27, Completion ▼ ---, 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+294.0		0						
	+293.2	Asphalt 4 inches and Aggregate Base 6 inches.							
		Dark brown, silty fine to medium SAND, some gravel, (SM), brikes and asphalt debris, moist. [FILL]	2						
			4						
	+288.9	Soft, brown, fine to medium sandy SILT, (ML), moist.	6	S-1	SPT	18	1 1 2	3	
		Stiff, brown, fine to medium sandy SILT, (ML), moist.	8	S-2	CR	10	5 5 6	11	
	+284.5		10	S-3	SPT	10	8 9 15	24	
		Whitish-brown, fine to coarse SAND, trace silt, some fine to coarse gravel, (SM), moist.	12						
			14						
		Whitish-brown, fine to coarse SAND, trace silt, some fine to coarse gravel, (SM), moist.	16	S-4	CR	10	16 31 36	67	
			18						
		Whitish-brown, fine to coarse SAND, trace silt, some fine to coarse gravel, (SM), moist.	20	S-5	SPT	12	24 29 18	47	
	+271.0		22						
		Stiff, gray, SILT, some fine sand, low plasticity, (ML), wet.	24						
			26 ▽	S-6	CR	16	4 4 5	9	
	+266.0		28						
			30						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-2** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	294

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+264.0	Dense, Bluish-gray, silty fine to medium SAND, trace fine gravel, (SM), wet.	30	S-7	SPT	18	11 11 8	19	
			32						
			34						
		Dense, Bluish-gray, silty fine to medium SAND, trace fine gravel, (SM), wet.	36	S-8	CR	10	10 19 13	32	
			38						
		Stiff, bluish-gray, silty SAND, trace fine silt, low plasticity, (SM), wet.	40	S-9	SPT	18	2 6 8	14	
			42						
			44						
		Very dense, bluish-gray, fine to coarse sand, trace silt, (SM), strong odor, wet.	46	S-10	CR	18	5 19 40	59	
			48						
			50						
	+242.5	Very dense, bluish-gray, fine to coarse sand, trace silt, (SM), strong odor, wet.		S-11	SPT	15	4 7 12	19	
		End boring at 51.5 feet. Groundwater encountered at 27 feet. Boring backfilled with grout.	52						
			54						
			56						
			58						
			60						
			62						
			64						
			66						
			67.5						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-3** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 290.6
Drilling Company: Martini Drilling	Date Started: 10/07/2022 — Date Finished: 10/07/2022
Drilling Equipment: CME 75	Completion Depth: 51.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 12 — Undisturbed --- — Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 25.5 — Completion ▼ --- — 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	290.6		0						
	289.8	Asphalt 5 inches and Aggregate Base 5 inches.							
		Dark brown, fine to coarse clayey SAND, (SC), moist. [FILL]	2						
	286.6		4						
		Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	6	S-1	SPT	18	1 2 2	4	
		Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	8	S-2	CR	10	2 3 4	7	
		Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	10	S-3	SPT	17	1 1	2	
	278.6		12						
		Dense, grayish-brown, fine to coarse SAND, some silt, trace fine to coarse gravel, (SP), moist.		S-4	CR	10	12 18 21	39	
		Stiff, gray, sandy SILT, (SM), low plasticity, moist.	16	S-5	CR	10	3 3 6	9	
			18						
		Medium dense, gray-brown, fine to coarse silty SAND, trace fine to coarse gravel, (SM), moist.	20	S-6	SPT	18	12 15 14	29	
			22						
			24						
		Very dense, bluish-gray, silty fine SAND, (SM), wet. ▽	26	S-7	CR	16	11 22 29	51	
			28						
			30						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-3** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	290.6

Material Symbol	Elev. (ft)	Sample Description
	260.6	Very dense, bluish-gray, silty fine SAND, (SM), wet.
	257.6	Very stiff, bluish gray, CLAY, trace fine sand, (CL), wet.
	252.6	Medium dense, bluish-gray, clayey SAND, trace fine gravel, high plasticity clay, (SC), wet.
	242.6	Dense, bluish-gray, clayey fine to coarse SAND, some fine to coarse gravel, high plasticity clay, (SC), wet.
	239.1	Very stiff, bluish-gray, fine sandy CLAY, low plasticity, trace fine gracel, (CL), wet.
		End boring at 51.5 feet. Groundwater encountered at Boring backfilled with grout.

Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
30	S-8	SPT	18	3 7 17	24	
32						
34						
36	S-9	CR	18	3 7 9	16	
38						
40	S-10	SPT	18	1 3 11	14	
42						
44						
46	S-11	CR	18	9 22 26	48	
48						
50	S-12	SPT	18	4 12 15	27	
52						
54						
56						
58						
60						
62						
64						
66						

N-Value (Blows/ft) scale: 10 20 30 40

67.5

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Log of Boring **LB-4** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 292.8
Drilling Company: Martini Drilling	Date Started: 10/07/2022 — Date Finished: 10/07/2022
Drilling Equipment: CME 75	Completion Depth: 66.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 14 — Undisturbed --- — Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 27.2 — Completion ▼ --- — 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod; Bulk	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)
	292.8		0					
	292.0	Asphalt 5 inches and Aggregate Base 5 inches.						
		Redish-brown, fine to medium sandy SILT, (ML), moist.	2					
			4					
		Medium stiff, brown, fine to medium sandy SILT, (ML), moist.	6	S-1	CR	10	3 3 4	7
		Soft, brown, fine to medium sandy SILT, (ML), moist.	8	S-2	SPT	18	1 1 2	3
	283.8		10	S-3	CR	18	3 12 22	34
		Dense, whitish-brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, trace fine to coarse gravel, (SM), moist.	12					
			14					
		Medium dense, light brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, (SM), wet.	16	S-4	SPT	16	3 12 14	26
			18					
		Dense, light brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, (SM), wet.	20	S-5	CR	18	7 13 21	34
			22					
		Medium stiff, greyish-brown, silty SAND, fine silt, (SM), moist.	24					
			26 ▽	S-6	SPT	18	1 2 3	5
	264.8		28					
		Medium stiff, greyish-brown, sandy SILT, fine sand, (ML), wet.	30	S-7	CR	16	3 5 40	45
	259.8		32					
			34					
			35					

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Bulk sample from 0 - 5 feet.

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Log of Boring **LB-4** Sheet 2 of 2

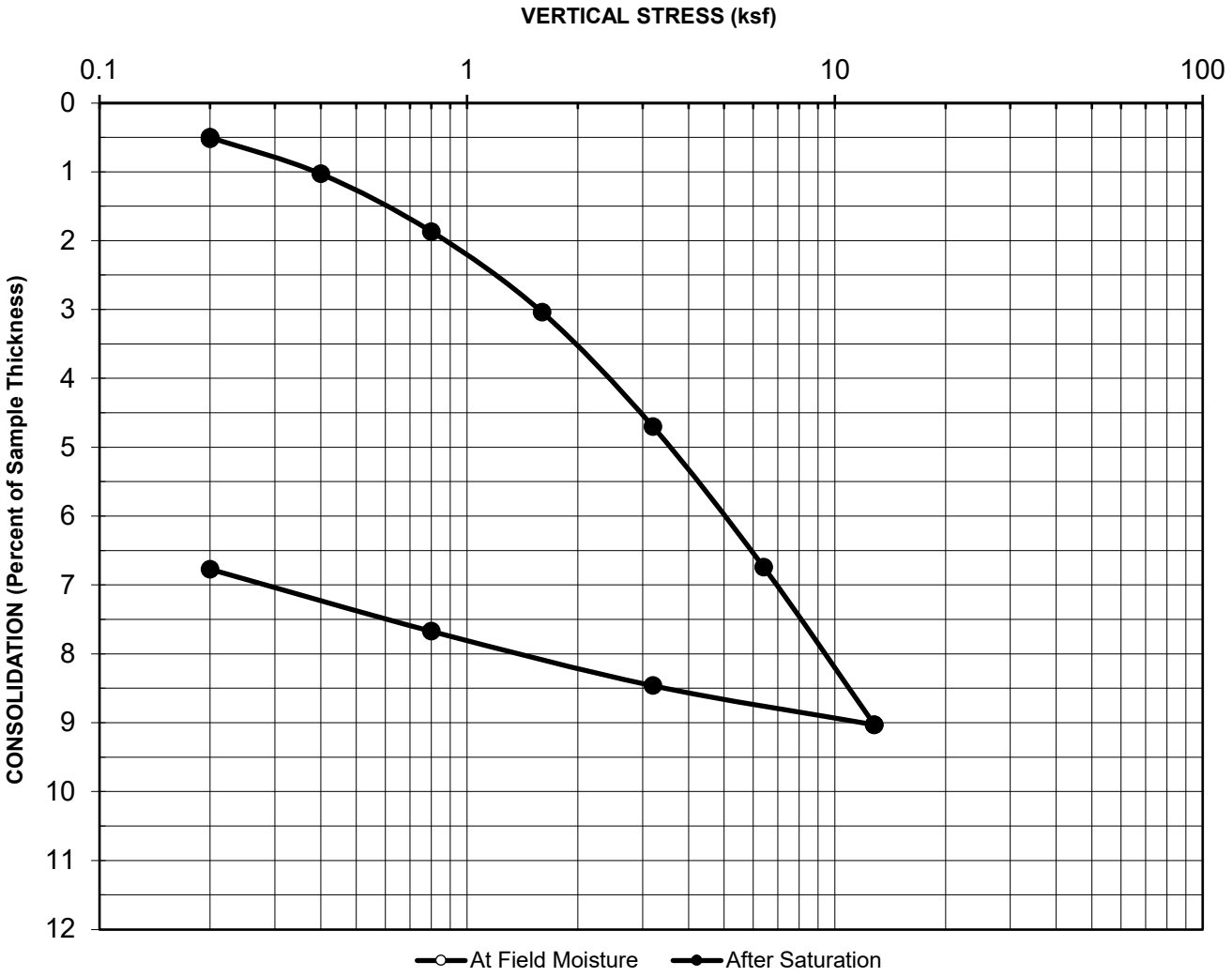
Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	292.8

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	257.8	Medium stiff, bluish-gray, silty SAND, trace fine silt, (SM), wet.	35	S-8	SPT	17	2 3 4	7	
	254.8		36						
			38						
		Very stiff, bluish-gray, CLAY, trace fine sand, high plasticity, (CL), strong odor, wet.	40	S-9	CR	16	6 10 13	23	
	248.8		42						
			44						
		Dense, bluish-gray, fine to coarse SAND, some silt, trace fine gravel, (SM), strong odor, wet.	46	S-10	SPT	10	5 16 21	37	
			48						
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	50	S-11	CR	10	19 34 43	77	
			52						
			54						
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	56	S-12	SPT	16	13 30 28	58	
			58						
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	60	S-13	CR	11	4 50/5	50/5	
			62						
			64						
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	66	S-14	SPT	18	23 18 18	36	
	226.3								
		End boring at 66.5 feet. Groundwater encountered at 27 feet. Boring backfilled with grout.	68						
			70						
			72						
			74						
			76						
			78						

N-Value (Blows/ft) scale: 10 20 30 40

\\LANGAN.COM\DATA\LAX\DATA1\721036101\PROJECT DATA_DISCIPLINE\GEOTECHNICAL\GINTLOGS\721036101_LB1-4.GPJ ... 8/3/2023 12:31:01 PM ... Report: Log - LANGAN

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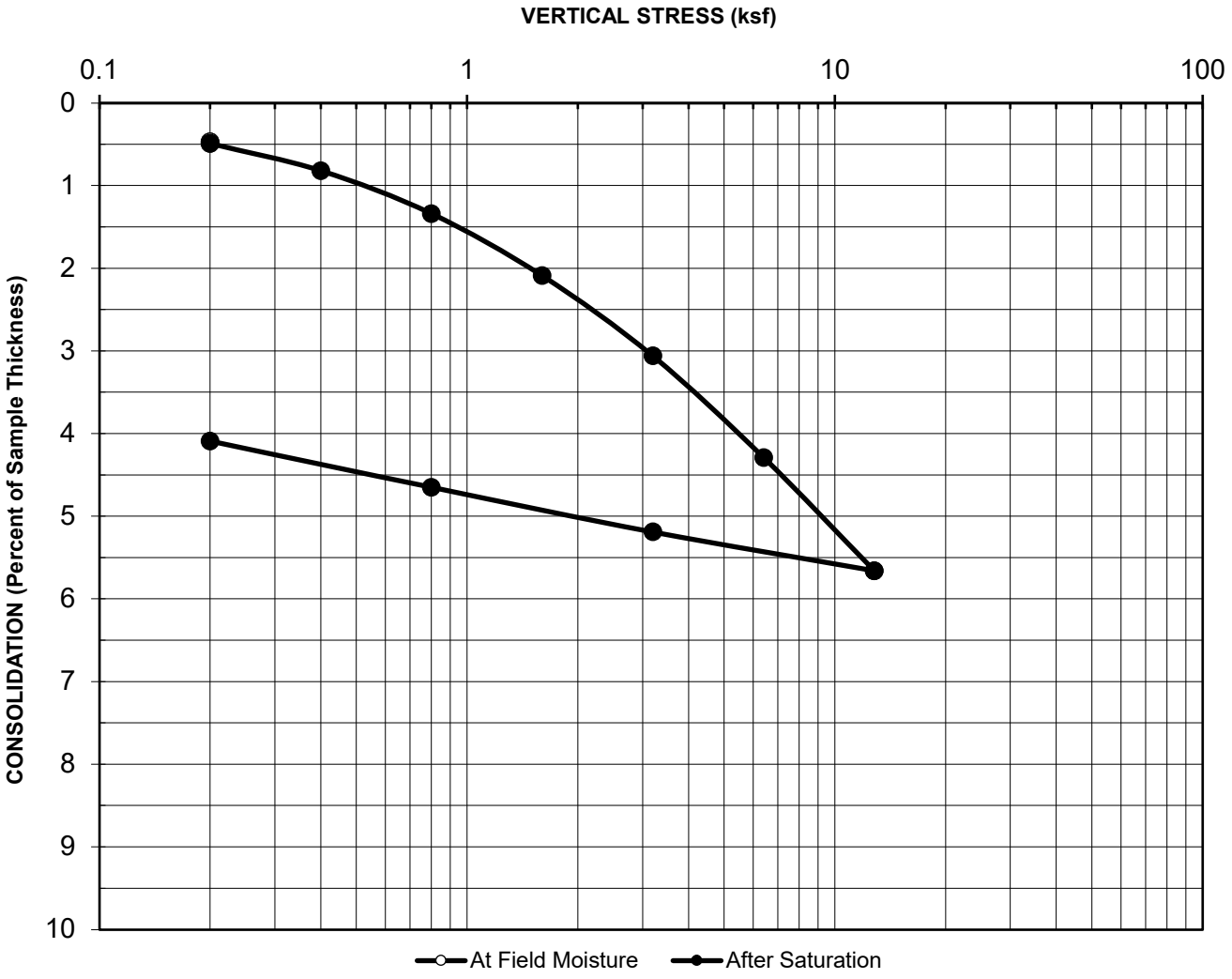


Boring No. :	LB-1	Initial Dry Unit Weight (pcf):	94.6
Sample No.:	S-9	Initial Moisture Content (%):	26.1
Depth (feet):	40	Final Moisture Content (%):	27.5
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Sandy Clay	Initial Void Ratio:	0.78
Remarks:	Swell= 0.02% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

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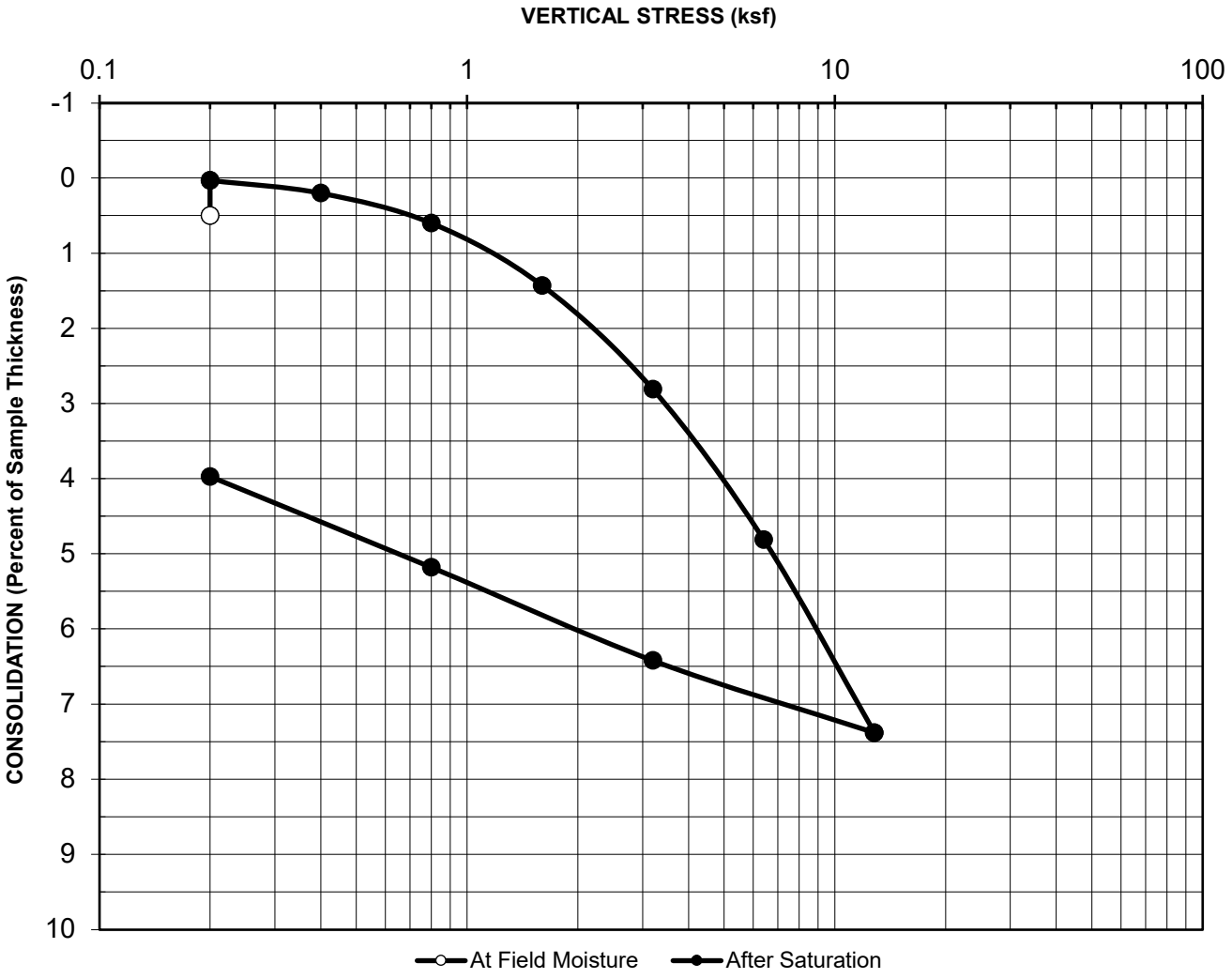


Boring No. :	LB-2	Initial Dry Unit Weight (pcf):	100.6
Sample No.:	S-6	Initial Moisture Content (%):	24.6
Depth (feet):	25	Final Moisture Content (%):	24.7
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Silty Sand	Initial Void Ratio:	0.67
Remarks:	Collapse= 0.02% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

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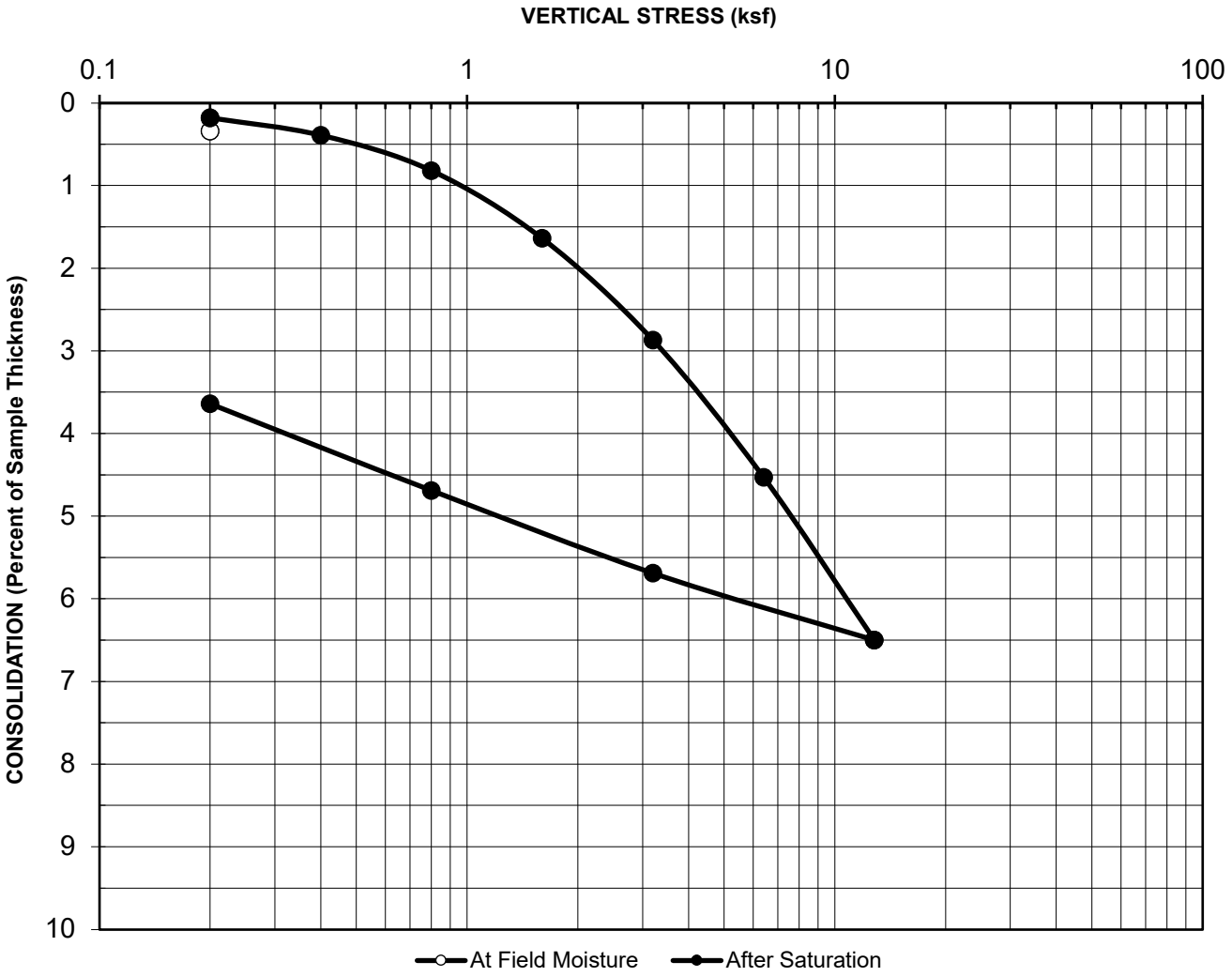


Boring No. :	LB-3	Initial Dry Unit Weight (pcf):	90.8
Sample No.:	S-9	Initial Moisture Content (%):	30.0
Depth (feet):	35	Final Moisture Content (%):	31.8
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Clay w/sand	Initial Void Ratio:	0.86
Remarks:	Swell= 0.47% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name: 130 W College Street
Project No.: 721036101
Date: 10/20/2022
AP No: 22-1039 **Sheet No:** 1

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Boring No. :	LB-4	Initial Dry Unit Weight (pcf):	94.5
Sample No.:	S-9	Initial Moisture Content (%):	29.7
Depth (feet):	40	Final Moisture Content (%):	29.6
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Sandy Clay	Initial Void Ratio:	0.78
Remarks:	Swell= 0.16% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

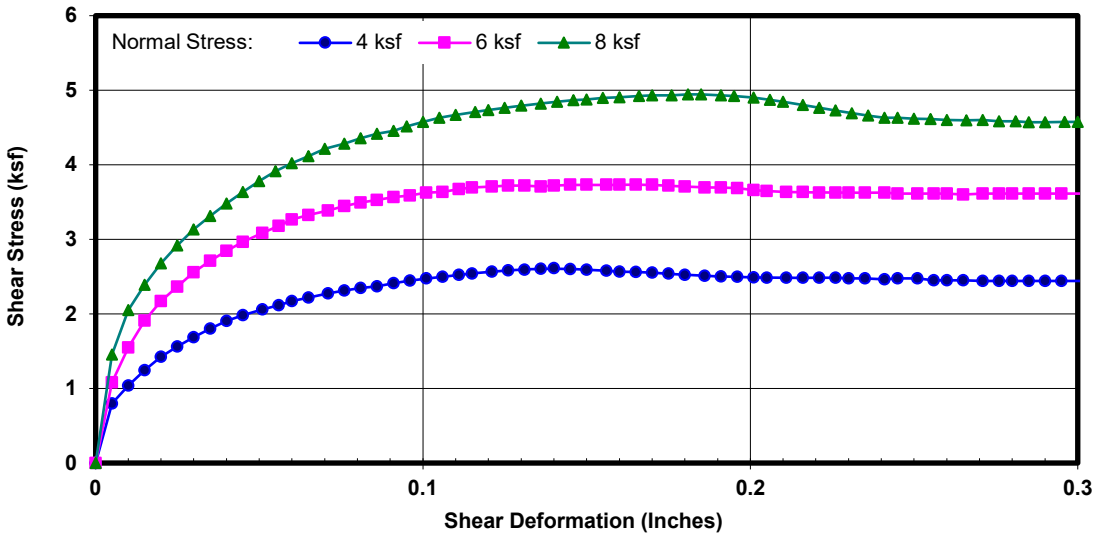
Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

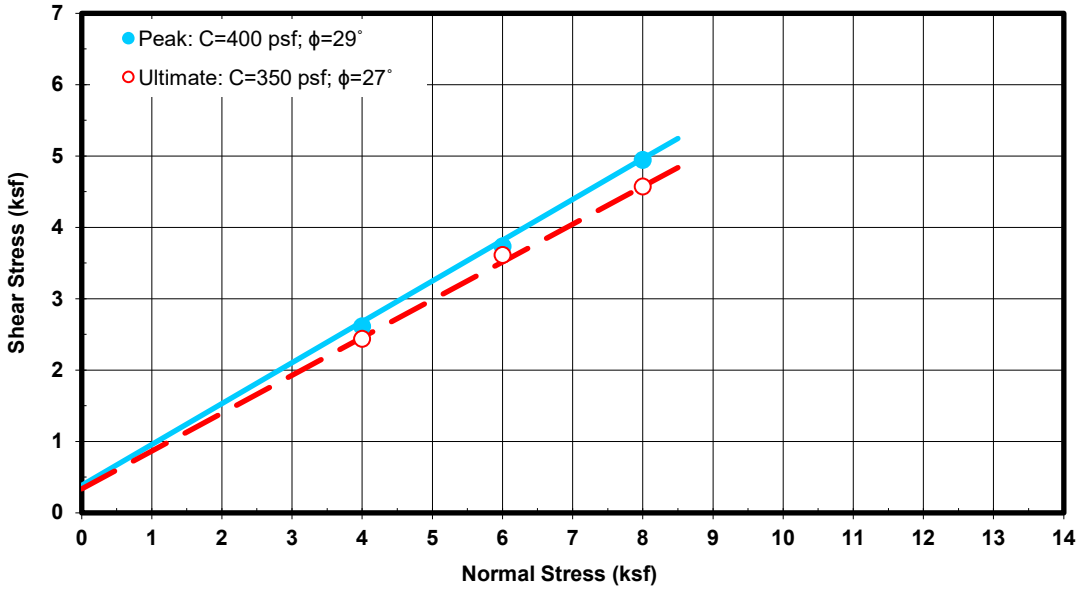
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DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/24/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/25/22
Boring No.:	LB-3		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-9	**Depth (ft):** 35			
Sample Type:	Mod. Cal.				
Soil Description:	Clay w/sand				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.0	89.2	30.0	33.0	91	100	4	2.611	2.440
						6	3.732	3.612
						8	4.944	4.572



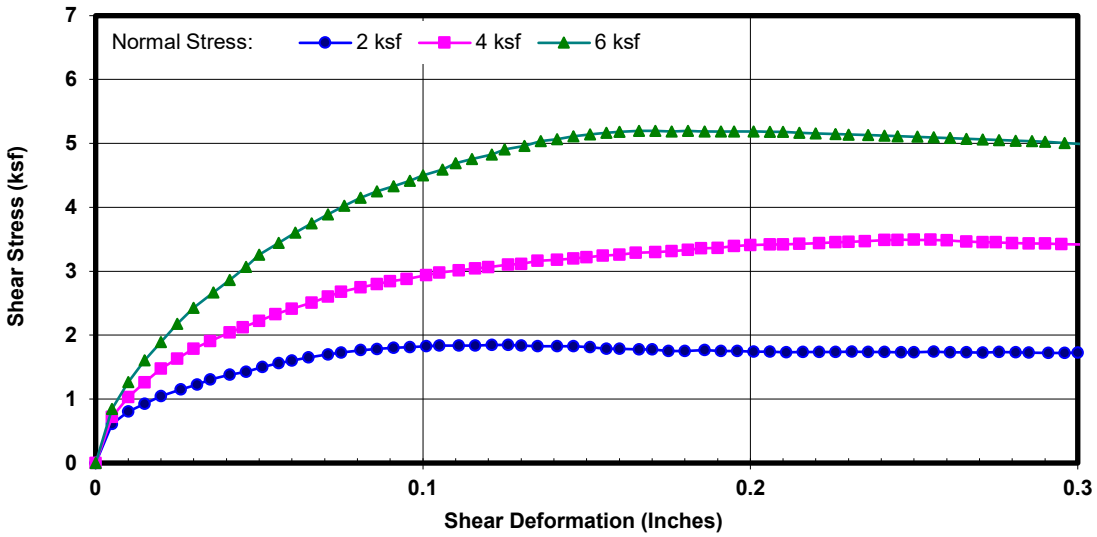


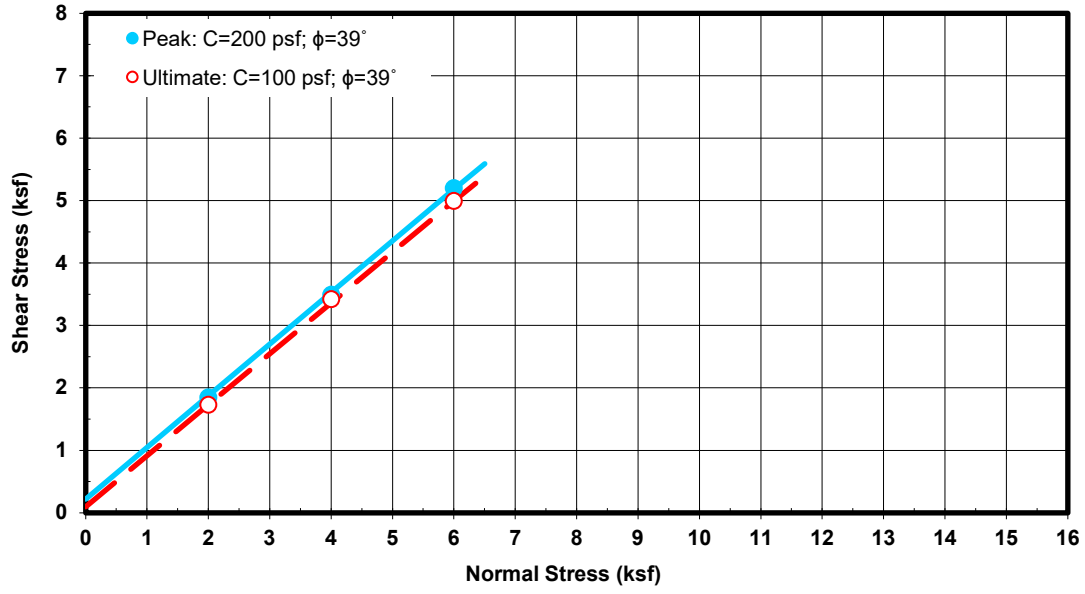
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DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/21/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/24/22
Boring No.:	LB-1		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-5	**Depth (ft):** 20			
Sample Type:	Mod. Cal.				
Soil Description:	Silty Sand w/gravel				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.5	111.7	4.3	16.8	23	89	2	1.848	1.728
						4	3.492	3.420
						6	5.198	4.993





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CORROSION TEST RESULTS

Client Name: Langan Engineering
Project Name: 130 W College Street
Project No.: 721036101

AP Job No.: 22-1039
Date: 10/25/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
LB-1	B-1	0-5	Clayey Sand	1,169	7.8	687	287

NOTES: Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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EXPANSION INDEX TEST RESULTS

ASTM D 4829

Client Name: Langan Engineering
Project Name: 130 W College Street
Project No.: 721036101

AP Job No.: 22-1039
Date: 10/24/22

Boring No.	Sample No.	Depth (ft)	Soil Description	Molded Dry Density (pcf)	Molded Moisture Content (%)	Init. Degree Saturation (%)	Measured Expansion Index	Corrected Expansion Index
LB-1	B-1	0-5	Clayey Sand	116.1	8.0	48.0	16	15

ASTM EXPANSION CLASSIFICATION

Expansion Index	Classification
0-20	V. Low
21-50	Low
51-90	Medium
91-130	High
>130	V. High

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PERCENT PASSING NO. 200 SIEVE

ASTM D1140

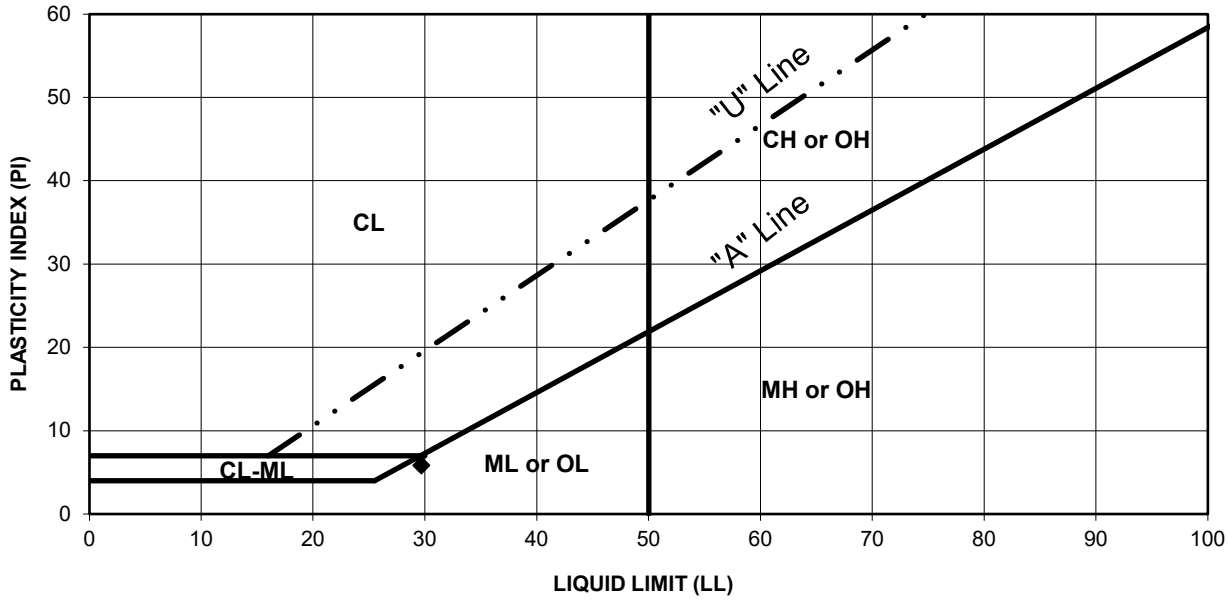
Client:	Langan Engineering	AP Lab No.:	22-1039
Project Name:	130 W College Street	Test Date:	10/21/22
Project Number:	721036101		

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
LB-1	S-8	35	75.0
LB-1	S-10	45	76.9
LB-2	S-9	40	74.1
LB-3	S-5	15	50.8
LB-3	S-6	20	5.9
LB-4	S-6	25	47.7
LB-4	S-8	35	97.5

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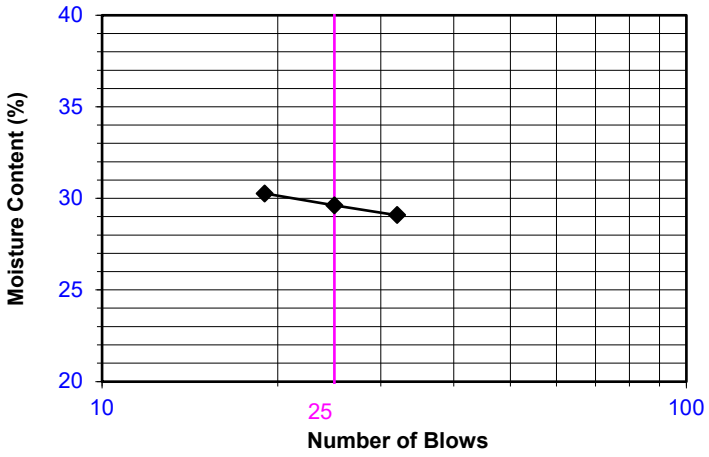
ATTERBERG LIMITS
ASTM D 4318

Client Name:	Langan Engineering	Tested By:	DK	Date:	10/24/22
Project Name:	130 W College Street	Computed By:	NR	Date:	10/25/22
Project No.:	721036101	Checked By:	AP	Date:	10/26/22



PROCEDURE USED

- ☐ Wet Preparation
- ☒ Dry Preparation
- ☒ Procedure A Multipoint Test
- ☐ Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	LB-1	S-8	35	30	24	6	ML

ATTACHMENT C

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

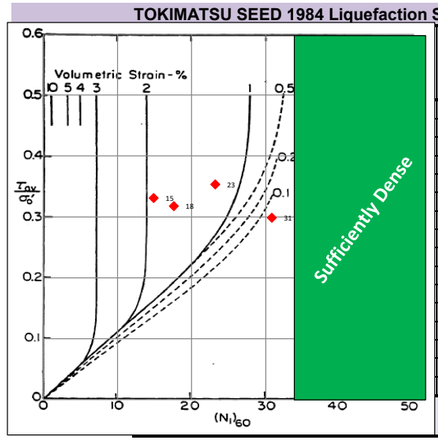
Case 1: Two-Thirds PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	291.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Depth (feet)	Adjusted $(N_1)_{60\text{-cs}}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
0	---	-	**0.0**	-	-
5	52	0.41	**0.0**	8.00	**0.0**
10	60	0.29	**0.0**	5.00	**0.0**
15	23	0.35	**1.3**	3.00	**0.5**
20	15	0.33	**1.9**	5.00	**1.1**
25	18	0.32	**1.8**	5.00	**Clay**
30	55	0.25	**0.0**	5.00	**0.0**
35	31	0.30	**0.1**	5.00	**0.1**
40	62	0.21	**0.0**	5.00	**0.0**
45	48	0.28	**0.0**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =	**1.7**

																																2010 Idriss-Boulanger						
																																Corrected SPT N-Value						
																																CSR Evaluation						
																																CRR Evaluation						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\,cs}$**	**m**	**$C_{N,\,adjusted}$**	**$(N_1)_{60\,cs\,,\,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	286.8	SPT	32	8	SM	120	25	600	37	563	3628	4191	0.9	1.7	1.3	1.05	1	67	5	72	0.13	1.2	52	-0.052	0.006	0.96	0.396	0.3	0.8	2649.441	2572.991	5.0	No	1658
10	281.8	CR	50	5	SM	120	25	1200	349	851	3306	4156	0.95	1.6	1.3	1.05	0.8	82	5	87	0.07	1.1	60	-0.137	0.016	0.89	0.395	-1.1	1.1	18653089	25064589	5.0	No	1643
15	276.8	SPT	10	3	ML	120	51	1800	661	1139	3025	4163	1	1.4	1.3	1.05	1	19	6	24	0.41	1.3	23	-0.236	0.027	0.82	0.388	0.2	0.9	0.252	0.277	0.7	No	1615
20	271.8	CR	7	5	ML	120	51	2400	973	1427	2778	4204	1	1.2	1.3	1.05	0.8	9	6	15	0.49	1.2	15	-0.348	0.039	0.74	0.374	0.1	0.9	0.155	0.175	0.5	No	1573
25	266.8	SPT	8	5	CL	120	76.9	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	1	12	6	18	0.46	1.1	18	-0.472	0.053	0.67	0.355	0.1	0.9	0.180	0.201	0.6	Yes	1518
30	261.8	CR	45	5	ML	120	51	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	0.8	51	6	56	0.21	1.0	55	-0.604	0.068	0.59	0.332	-15.0	1.1	56388	75770	5.0	No	1453
35	256.8	SPT	19	5	ML	120	51	4200	1909	2291	2195	4485	1	1.0	1.3	1.05	1	25	6	31	0.36	1.0	31	-0.744	0.083	0.53	0.308	0.2	0.8	0.541	0.557	1.8	No	1380
40	251.8	CR	54	5	ML	120	51	4800	2221	2579	2041	4619	1	0.9	1.3	1.05	0.8	53	6	59	0.19	1.0	62	-0.888	0.099	0.46	0.282	-0.8	1.1	380778820	511661349	5.0	No	1303
45	246.8	SPT	34	1.5	ML	120	51	5400	2533	2867	1902	4769	1	0.9	1.3	1.05	1	40	6	45	0.27	0.9	48	-1.034	0.115	0.41	0.257	0.3	0.8	211	195	5.0	No	1226

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

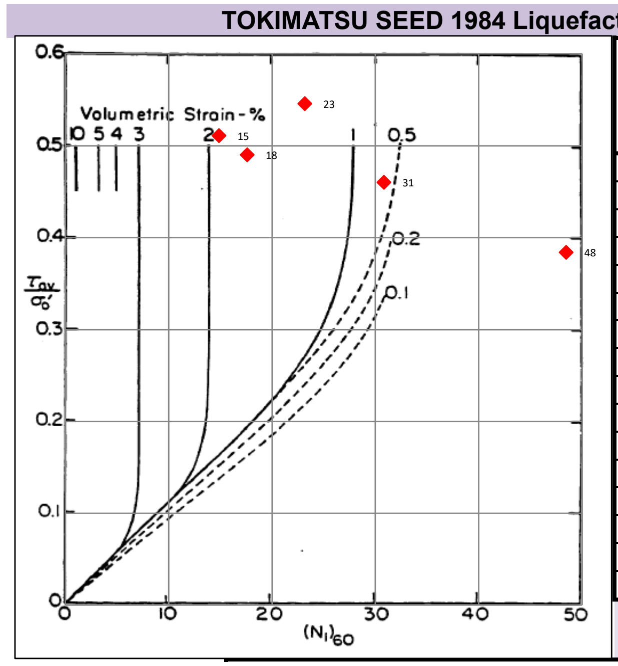
Project Title: 130 W College Case 2: FULL PGA
Project Location: Los Angeles

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-1
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-cs}}$	CSR$_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	5	51	0.63	**0.0**	8.00	**0.0**
0	10	59	0.45	**0.0**	5.00	**0.0**
0	15	23	0.55	**1.4**	3.00	**0.5**
0	20	15	0.51	**1.9**	5.00	**1.1**
0	25	18	0.49	**1.8**	5.00	**Clay**
0	30	55	0.38	**0.0**	5.00	**0.0**
0	35	31	0.46	**0.6**	5.00	**0.3**
0	40	62	0.42	**0.0**	5.00	**0.0**
0	45	48	0.38	**0.0**	1.50	**0.0**
			SAT. SETTLEMENT (IN) =			**2.0**

√

													2010 Idriss-Boulanger																					
													Corrected SPT N-Value											**CSR Evaluation**				**CRR Evaluation**						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
5	266.8	SPT	32	8	SM	120	15	600	37	563	3628	4191	0.9	1.7	1.3	1.05	1	67	3	70	0.14	1.2	51	-0.052	0.006	0.96	0.594	0.3	0.8	971.864	917.004	5.0	No	2488
10	261.8	CR	50	5	SM	120	15	1200	349	851	3306	4156	0.95	1.6	1.3	1.05	0.8	82	3	85	0.08	1.1	59	-0.137	0.016	0.89	0.593	-1.5	1.1	2903940.792	3791221.675	5.0	No	2464
15	256.8	SPT	10	3	ML	120	51	1800	661	1139	3025	4163	1	1.4	1.3	1.05	1	19	6	24	0.41	1.3	23	-0.236	0.027	0.82	0.582	0.2	0.9	0.252	0.269	0.5	No	2421
20	251.8	CR	7	5	ML	120	51	2400	973	1427	2778	4204	1	1.2	1.3	1.05	0.8	9	6	15	0.49	1.2	15	-0.348	0.039	0.74	0.561	0.1	0.9	0.155	0.170	0.3	No	2357
25	246.8	SPT	8	5	CL	120	74.1	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	1	12	6	18	0.46	1.1	18	-0.472	0.053	0.66	0.532	0.1	0.9	0	0	0.4	Yes	2274
30	241.8	CR	45	5	ML	120	51	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	0.8	51	6	56	0.21	1.0	55	-0.604	0.068	0.59	0.498	-15.0	1.1	56387.963	73616.951	5.0	No	2175
35	236.8	SPT	19	5	ML	120	51	4200	1909	2291	2195	4485	1	1.0	1.3	1.05	1	25	6	31	0.36	1.0	31	-0.744	0.083	0.52	0.460	0.2	0.8	0.541	0.541	1.2	No	2065
40	231.8	CR	54	5	ML	120	51	4800	2221	2579	2041	4619	1	0.9	1.3	1.05	0.8	53	6	59	0.19	1.0	62	-0.888	0.099	0.46	0.422	-0.8	1.1	380778819.960	497123398.588	5.0	No	1949
45	226.8	SPT	34	1.5	ML	120	51	5400	2533	2867	1902	4769	1	0.9	1.3	1.05	1	40	6	45	0.27	0.9	48	-1.034	0.115	0.41	0.384	0.3	0.8	211.383	189.720	5.0	No	1832

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles

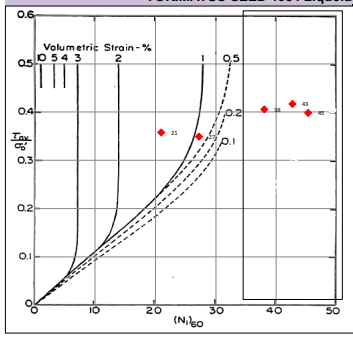
Case 1: Two-Thirds PGA

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring. Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5,\ \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	1.5	43	0.42	**0.0**	3.00	**dry**
0	5	21	0.36	**1.4**	5.00	**0.8**
0	10	38	0.41	**0.0**	5.00	**0.0**
0	15	45	0.40	**0.0**	5.00	**0.0**
0	20	27	0.35	**0.9**	5.00	**0.5**
0	25	71	0.26	**0.0**	5.00	**0.0**
0	30	32	0.32	**0.0**	1.50	**0.0**
				SAT. SETTLEMENT (IN) =		**1.4**

2010 Idriss-Boulanger

Depth Below BOF(ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ ft)	Thickness (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60\text{-}cs}$	m	$C_{N,\ adjusted}$	$(N_1)_{60\text{-}cs,\ adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	270.3	SPT	18	3	SM	120	25	180	0	180	3883	4063	0.9	1.7	1.3	1.05	1	38	5	43	0.28	1.7	43	-0.003	0.001	1.00	0.409	0.3	0.8	10.940	10.749	---	No	1663
5	266.8	CR	9	5	ML	120	25	600	37	563	3628	4191	0.95	1.7	1.3	1.05	0.8	16	5	21	0.43	1.7	21	-0.052	0.006	0.96	0.396	0.1	0.9	0.218	0.241	0.6	No	1658
10	261.8	SPT	19	5	SM	120	25	1200	349	851	3306	4156	1	1.6	1.3	1.05	1	41	5	46	0.26	1.3	38	-0.137	0.016	0.89	0.395	0.3	0.8	2.297	2.238	5.0	No	1643
15	256.8	CR	32	5	SM	120	25	1800	661	1139	3025	4163	1	1.4	1.3	1.05	0.8	48	5	53	0.23	1.2	45	-0.236	0.027	0.82	0.388	0.3	0.8	35.770	34.825	5.0	No	1615
20	251.8	SPT	14	5	SM	120	25	2400	973	1427	2778	4204	1	1.2	1.3	1.05	1	23	5	28	0.38	1.2	27	-0.348	0.039	0.74	0.374	0.2	0.9	0.354	0.380	1.0	No	1573
25	246.8	CR	59	5	SM	120	25	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	0.8	72	5	77	0.11	1.0	71	-0.472	0.053	0.67	0.355	-0.4	1.1	6755818883243970	9077950828821590	5.0	No	1518
30	241.8	SPT	19	1.5	SM	120	25	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	1	27	5	32	0.35	1.0	32	-0.604	0.068	0.59	0.332	0.2	0.8	0.598	0.615	1.9	No	1453

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

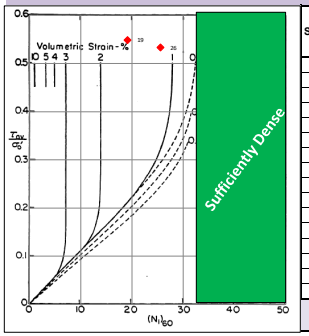
Case 2: FULL PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-2
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring. Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	1.5	41	0.64	**0.0**	3.00	**dry**
0	5	19	0.55	**1.7**	5.00	**1.0**
0	10	37	0.62	**0.0**	5.00	**0.0**
0	15	44	0.61	**0.0**	5.00	**0.0**
0	20	26	0.53	**1.3**	5.00	**0.8**
0	25	69	0.41	**0.0**	5.00	**0.0**
0	30	30	0.49	**0.0**	5.00	**dry**
					SAT. SETTLEMENT (IN) =	**1.8**

														Corrected SPT N-Value														2010 Idriss-Boulanger CSR Evaluation				CRR Evaluation						
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\text{-}cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60\text{-}cs,\ adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	270.3	SPT	18	3	SM	120	15	180	0	180	3883	4063	0.9	1.7	1.3	1.05	1	38	3	41	0.29	1.7	41	-0.003	0.001	1.00	0.614	0.3	0.8	5.515	5.265	---	No	2496
5	266.8	CR	9	5	ML	120	15	600	37	563	3628	4191	0.95	1.7	1.3	1.05	0.8	16	3	19	0.45	1.7	19	-0.052	0.006	0.96	0.594	0.1	0.9	0.196	0.212	0.4	No	2488
10	261.8	SPT	19	5	SM	120	15	1200	349	851	3306	4156	1	1.6	1.3	1.05	1	41	3	44	0.27	1.3	37	-0.137	0.016	0.89	0.593	0.3	0.8	1.564	1.496	2.5	No	2464
15	256.8	CR	32	5	SM	120	15	1800	661	1139	3025	4163	1	1.4	1.3	1.05	0.8	48	3	51	0.24	1.2	44	-0.236	0.027	0.82	0.582	0.3	0.8	17.069	16.145	5.0	No	2421
20	251.8	SPT	14	5	SM	120	15	2400	973	1427	2778	4204	1	1.2	1.3	1.05	1	23	3	27	0.39	1.2	26	-0.348	0.039	0.74	0.561	0.2	0.9	0.303	0.319	0.6	No	2357
25	246.8	CR	59	5	SM	120	15	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	0.8	72	3	75	0.12	1.0	69	-0.472	0.053	0.66	0.532	-0.4	1.1	140636494431601	183607092654628	5.0	No	2274
30	241.8	SPT	19	1.5	SM	120	15	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	1	27	3	30	0.36	1.0	30	-0.604	0.068	0.59	0.498	0.2	0.9	0.468	0.475	1.0	No	2175

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles

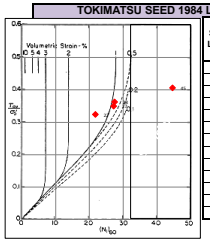
Case 1: Two-Thirds PGA

Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring. Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	$CSR_{M=7.5, \sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	1.5	58	0.30	**0.0**	3.00	**dry**
0	5	62	0.29	**0.0**	5.00	**0.0**
0	10	45	0.41	**0.0**	5.00	**Clay**
0	15	28	0.36	**0.8**	5.00	**0.5**
0	20	27	0.35	**0.9**	5.00	**0.5**
0	25	22	0.32	**1.4**	5.00	**Clay**
0	30	72	0.25	**0.0**	1.50	**dry**
				SAT. SETTLEMENT (IN) =		**1.0**

2010 Idriss-Boulanger

													Corrected SPT N-Value										**CSR Evaluation**				**CRR Evaluation**					
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ft)**	**Thickness (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_M**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\text{-}cs}$**	**m**	**$C_{N,adjusted}$**	**$(N_1)_{60\text{-}cs,adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxα'**
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1.5	270.3	SPT	29	3	SM	120	25	180	0	180	3883	4063	0.9	1.7	1.3	1.05	1	61	5	66	0.16	1.5	58	-0.003	0.001	1.00	0.409	-1.8	1.1	1264751.407	1699475.856	---	No	1663
5	266.8	CR	51	5	SM	120	25	600	37	563	3628	4191	1	1.7	1.3	1.05	0.8	95	5	100	0.02	1.0	62	-0.052	0.006	0.96	0.396	-0.8	1.1	229826840.390	308823666.273	5.0	No	1658
10	261.8	SPT	24	5	SM	120	25	1200	349	851	3306	4156	1	1.6	1.3	1.05	1	52	5	57	0.21	1.2	45	-0.137	0.016	0.89	0.395	0.3	0.8	25	25	5.0	No	1643
15	256.8	CR	16	5	CL	120	75	1800	661	1139	3025	4163	1	1.4	1.3	1.05	0.8	24	6	29	0.37	1.3	28	-0.236	0.027	0.82	0.388	0.2	0.9	0.364	0.391	1.0	Yes	1615
20	251.8	SPT	14	5	SC	120	25	2400	973	1427	2778	4204	1	1.2	1.3	1.05	1	23	5	28	0.38	1.2	27	-0.348	0.039	0.74	0.374	0.2	0.9	0.354	0.380	1.0	No	1573
25	246.8	CR	14	5	SC	120	25	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	0.8	17	5	22	0.42	1.1	22	-0.472	0.053	0.67	0.355	0.1	0.9	0	0	0.7	No	1518
30	241.8	SPT	48	1.5	CL	120	75	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	1	67	6	73	0.13	1.0	72	-0.604	0.068	0.59	0.332	-0.4	1.1	2315455601170880 0	3111331499114390 0	5.0	Yes	1453

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

H

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

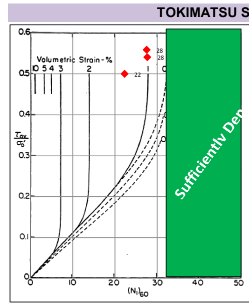
Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College — Case 2: FULL PGA
Project Location: Los Angeles
Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-3
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring.
Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60-cs}$	$CSR_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	0	---	-	**0.0**	-	**-**
0	1.5	56	0.47	**0.0**	3.00	**dry**
0	5	61	0.45	**0.0**	5.00	**0.0**
0	10	43	0.63	**0.0**	5.00	**Clay**
0	15	28	0.56	**1.0**	5.00	**0.6**
0	20	28	0.54	**1.0**	5.00	**0.6**
0	25	22	0.50	**1.4**	5.00	**Clay**
	30	72	0.38	**0.0**	5.00	**dry**
					SAT. SETTLEMENT (IN) =	**1.2**

Depth Below BOF (ft)	Elevation (ft)	Sample Type	N_{Raw} (blows/ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
								---	---	---	---	---
					BOF			---	---	---	---	---
1.5	270.3	SPT	29	3	SM	120	5.9	180	0	180	3883	4063
5	266.8	CR	51	5	SM	120	15	600	37	563	3628	4191
10	261.8	SPT	24	5	SM	120	15	1200	349	851	3306	4156
15	256.8	CR	16	5	CL	120	51	1800	661	1139	3025	4163
20	251.8	SPT	14	5	SC	120	49	2400	973	1427	2778	4204
25	246.8	CR	14	5	SC	120	49	3000	1285	1715	2560	4275
30	241.8	SPT	48	1.5	CL	120	75	3600	1597	2003	2367	4369

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Depth Below BOF (ft)	Corrected SPT N-Value											CSR Evaluation				CRR Evaluation						
	C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	m	$C_{N,adjusted}$	$(N_1)_{60cs,adj.}$	α	β	r_d	$CSR_{M,\sigma'v}$	C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	---
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	No	---
1.5	0.9	1.7	1.3	1.05	1	61	0	61	0.19	1.6	56	-0.003	0.001	1.00	0.614	-4.0	1.1	171851.026	224359.028	---	No	2496
5	1	1.7	1.3	1.05	0.8	95	3	98	0.02	1.0	61	-0.052	0.006	0.96	0.594	-1.0	1.1	36258488.949	47337042.685	5.0	No	2488
10	1	1.6	1.3	1.05	1	52	3	55	0.21	1.2	43	-0.137	0.016	0.89	0.593	0.3	0.8	13.133	12.430	5.0	Yes	2464
15	1	1.4	1.3	1.05	0.8	24	6	29	0.37	1.3	28	-0.236	0.027	0.82	0.582	0.2	0.9	0.366	0.381	0.7	No	2421
20	1	1.2	1.3	1.05	1	23	6	29	0.37	1.2	28	-0.348	0.039	0.74	0.561	0.2	0.9	0.373	0.387	0.7	No	2357
25	1	1.1	1.3	1.05	0.8	17	6	23	0.42	1.1	22	-0.472	0.053	0.66	0.532	0.1	0.9	0	0	0.5	No	2274
30	1	1.0	1.3	1.05	1	67	6	73	0.13	1.0	72	-0.604	0.068	0.59	0.498	-0.4	1.1	23154556011708800.000	30229285280473500.000	5.0	Yes	2175

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

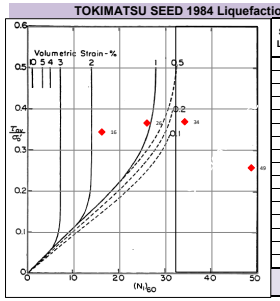
Project Title: 130 W College — Case 1: Two-Thirds PGA

Project Location: Los Angeles
Project Number: 721036101
Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.74
Acceleration (g):	0.631
MSF:	1.22
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring. Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60\text{-}cs}$	CSR$_{M=7.5,\sigma'v=1}$	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	5	26	0.37	**1.1**	5.00	**0.7**
0	10	57	0.29	**0.0**	5.00	**0.0**
0	15	16	0.34	**1.8**	5.00	**1.1**
0	20	34	0.37	**0.0**	5.00	**Clay**
0	25	56	0.26	**0.0**	5.00	**0.0**
0	30	88	0.25	**0.0**	5.00	**0.0**
0	35	82	0.31	**0.0**	5.00	**0.0**
0	40	67	0.28	**0.0**	5.00	**0.0**
0	45	49	0.26	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**1.7**

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Depth Below BOF(ft)	Elevation (ft)	Sample Type	N_{field} (blows/ ft)	Thicknes (Feet)	USCS	Unit Wt (pcf)	FC (%)	σ_v (psf)	u (psf)	σ'_v (psf)	$\Delta\sigma_{Surcharge}$ (psf)	$\sigma'_{v,proposed}$ (psf)	**Corrected SPT N-Value** C_R	C_N	C_E	C_B	C_S	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60\text{-}cs}$	m	$C_{N,adjusted}$	$(N_1)_{60\text{-}cs,adj.}$	**CSR Evaluation** α	β	r_d	$CSR_{M,\sigma'v}$	**CRR Evaluation** C_σ	K_σ	$CRR_{M7.5,1atm}$	$CRR_{M,\sigma'v}$	FoS	Clay?	CSRxσ'
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	266.8	SPT	11	5	SM	120	15	600	37	563	3628	4191	0.9	1.7	1.3	1.05	1	23	3	26	0.39	1.7	26	-0.052	0.006	0.96	0.396	0.2	0.9	0.314	0.339	0.9	No	1658
10	261.8	CR	45	5	ML	120	51	1200	349	851	3306	4156	0.95	1.6	1.3	1.05	0.8	74	6	79	0.10	1.1	57	-0.137	0.016	0.89	0.395	-3.2	1.1	258103.303	346819.406	5.0	No	1643
15	256.8	SPT	7	5	SM	120	15	1800	661	1139	3025	4163	1	1.4	1.3	1.05	1	13	3	16	0.47	1.3	16	-0.236	0.027	0.82	0.388	0.1	0.9	0.165	0.186	0.5	No	1615
20	251.8	CR	23	5	CL	120	75	2400	973	1427	2778	4204	1	1.2	1.3	1.05	0.8	31	6	36	0.32	1.1	34	-0.348	0.039	0.74	0.374	0.2	0.8	0.923	0.934	2.5	Yes	1573
25	246.8	SPT	37	5	SM	120	15	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	1	56	3	59	0.19	1.0	56	-0.472	0.053	0.67	0.355	-6.4	1.1	96782	130048	5.0	No	1518
30	241.8	CR	77	5	SM	120	15	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	0.8	86	3	90	0.06	1.0	88	-0.604	0.068	0.59	0.332	-0.2	1.1	872827828956186000000000000000000000000000.000	1172839037017920000000000000000000000000000.000	5.0	No	1453
35	236.8	SPT	58	5	SM	120	15	4200	1909	2291	2195	4485	1	1.0	1.3	1.05	1	76	3	79	0.10	1.0	82	-0.744	0.083	0.53	0.308	-0.2	1.1	13481816239819400000000000000000.000	18115829779249800000000000000000.000	5.0	No	1380
40	231.8	CR	60	5	SM	120	15	4800	2221	2579	2041	4619	1	0.9	1.3	1.05	0.8	59	3	63	0.18	1.0	67	-0.888	0.099	0.46	0.282	-0.5	1.1	470272612018.077	631916237220.332	5.0	No	1303
45	226.8	SPT	36	1.5	SM	120	15	5400	2533	2867	1902	4769	1	0.9	1.3	1.05	1	42	3	45	0.27	0.9	49	-1.034	0.115	0.41	0.257	0.3	0.8	234.673	216.783	5.0	No	1226

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

SPT-BASED LIQUEFACTION TRIGGERING EVALUATION

Reference: Idriss, I.M. and Boulanger, R.W. (2010). "SPT-Based Liquefaction Triggering Procedures."
Center for Geotechnical Modeling. Report No. UCD/CGM-10/02

Project Title: 130 W College
Project Location: Los Angeles
Project Number: 721036101

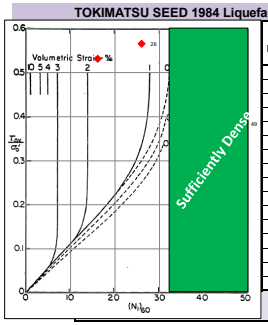
Case 2: FULL PGA

Date: 7/19/2023

BORING AND GWT INPUT	
Boring:	LB-4
Ground Surface Elevation:	271.8
Boring Depth (ft):	66.5
GWT Depth (ft):	4.4
SAMPLING INPUT	
Rod Used to Sample? (Yes/No)	Yes
Hammer Energy Ratio:	1.3
Hammer Weight (lbs):	140
Hammer Drop (in):	30
Boring Diameter (in):	6
EARTHQUAKE INPUT	
Moment Magnitude:	6.85
Acceleration (g):	0.947
MSF:	1.19
STRUCTURAL/GRADING INPUT	
Lowest Proposed Elevation:	271.8
Foundation Surcharge(psf):	4000
Foundation Width (ft):	100
Foundation Length (ft):	100

Notes:
1. Assumes 20-foot excavation (assumed bottom of foundation,BOF)
2. Groundwater Elevation 24.4-feet below ground surface at time of boring. Therefore Groundwater 4.4-feet Below BOF.

TOKIMATSU SEED 1984 Liquefaction Settlements (Volumetric Strain)



Sub-Layer	Depth (feet)	Adjusted $(N_1)_{60}$	CSRM=7.5,σ'v=1	ε_v (%) (Fig. 10)	Thickness (ft)	Δ H (in)
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	0	---	-	**0.0**	-	-
0	5	26	0.57	**1.2**	5.00	**0.7**
0	10	57	0.45	**0.0**	5.00	**0.0**
0	15	16	0.53	**1.9**	5.00	**1.1**
0	20	34	0.57	**0.4**	5.00	**Clay**
0	25	56	0.41	**0.0**	5.00	**0.0**
0	30	88	0.38	**0.0**	5.00	**0.0**
0	35	82	0.46	**0.0**	5.00	**0.0**
0	40	67	0.42	**0.0**	5.00	**0.0**
0	45	49	0.38	**0.0**	1.50	**0.0**
					SAT. SETTLEMENT (IN) =	**1.9**

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													Corrected SPT N-Value										**CSR Evaluation**				**CRR Evaluation**				
Depth Below BOF(ft)	**Elevation (ft)**	**Sample Type**	**N_{Raw} (blows/ ft)**	**Thicknes (Feet)**	**USCS**	**Unit Wt (pcf)**	**FC (%)**	**σ_v (psf)**	**u (psf)**	**σ'_v (psf)**	**$\Delta\sigma_{Surcharge}$ (psf)**	**$\sigma'_{v,proposed}$ (psf)**	**C_R**	**C_N**	**C_E**	**C_B**	**C_S**	**$(N_1)_{60}$**	**$\Delta(N_1)_{60}$**	**$(N_1)_{60\ cs}$**	**m**	**$C_{N\ adjusted}$**	**$(N_1)_{60\ cs,\ adj.}$**	**α**	**β**	**r_d**	**$CSR_{M,\sigma'v}$**	**C_σ**	**K_σ**	**$CRR_{M7.5,1atm}$**	**$CRR_{M,\sigma'v}$**	**FoS**	**Clay?**	**CSRxσ'**
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
								---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					BOF			---	---	---	---	---	---	---	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	266.8	SPT	11	5	SM	120	15	600	37	563	3628	4191	0.9	1.7	1.3	1.05	1	23	3	26	0.39	1.7	26	-0.052	0.006	0.96	0.594	0.2	0.9	0.314	0.330	0.6	No	2488
10	261.8	CR	45	5	ML	120	51	1200	349	851	3306	4156	0.95	1.6	1.3	1.05	0.8	74	6	79	0.10	1.1	57	-0.137	0.016	0.89	0.593	-3.2	1.1	258103.303	336965.147	5.0	No	2464
15	256.8	SPT	7	5	SM	120	15	1800	661	1139	3025	4163	1	1.4	1.3	1.05	1	13	3	16	0.47	1.3	16	-0.236	0.027	0.82	0.582	0.1	0.9	0.165	0.181	0.3	No	2421
20	251.8	CR	23	5	CL	120	75	2400	973	1427	2778	4204	1	1.2	1.3	1.05	0.8	31	6	36	0.32	1.1	34	-0.348	0.039	0.74	0.561	0.2	0.8	0.923	0.908	1.6	Yes	2357
25	246.8	SPT	37	5	SM	120	15	3000	1285	1715	2560	4275	1	1.1	1.3	1.05	1	56	3	59	0.19	1.0	56	-0.472	0.053	0.66	0.532	-6.4	1.1	96782	126353	5.0	No	2274
30	241.8	CR	77	5	SM	120	15	3600	1597	2003	2367	4369	1	1.0	1.3	1.05	0.8	86	3	90	0.06	1.0	88	-0.604	0.068	0.59	0.498	-0.2	1.1	##########	##########	5.0	No	2175
35	236.8	SPT	58	5	SM	120	15	4200	1909	2291	2195	4485	1	1.0	1.3	1.05	1	76	3	79	0.10	1.0	82	-0.744	0.083	0.52	0.460	-0.2	1.1	##########	##########	5.0	No	2065
40	231.8	CR	60	5	SM	120	15	4800	2221	2579	2041	4619	1	0.9	1.3	1.05	0.8	59	3	63	0.18	1.0	67	-0.888	0.099	0.46	0.422	-0.5	1.1	470272612018.077	613961457136.087	5.0	No	1949
45	226.8	SPT	36	1.5	SM	120	15	5400	2533	2867	1902	4769	1	0.9	1.3	1.05	1	42	3	45	0.27	0.9	49	-1.034	0.115	0.41	0.384	0.3	0.8	234.673	210.624	5.0	No	1832

Notes:
1. BOF = Assumed Bottom of Foundation
2. FC = Fines Content (assumed or Laboratory Result)

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CPT-2 CASE II Excav results

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http://www.geologismiki.gr

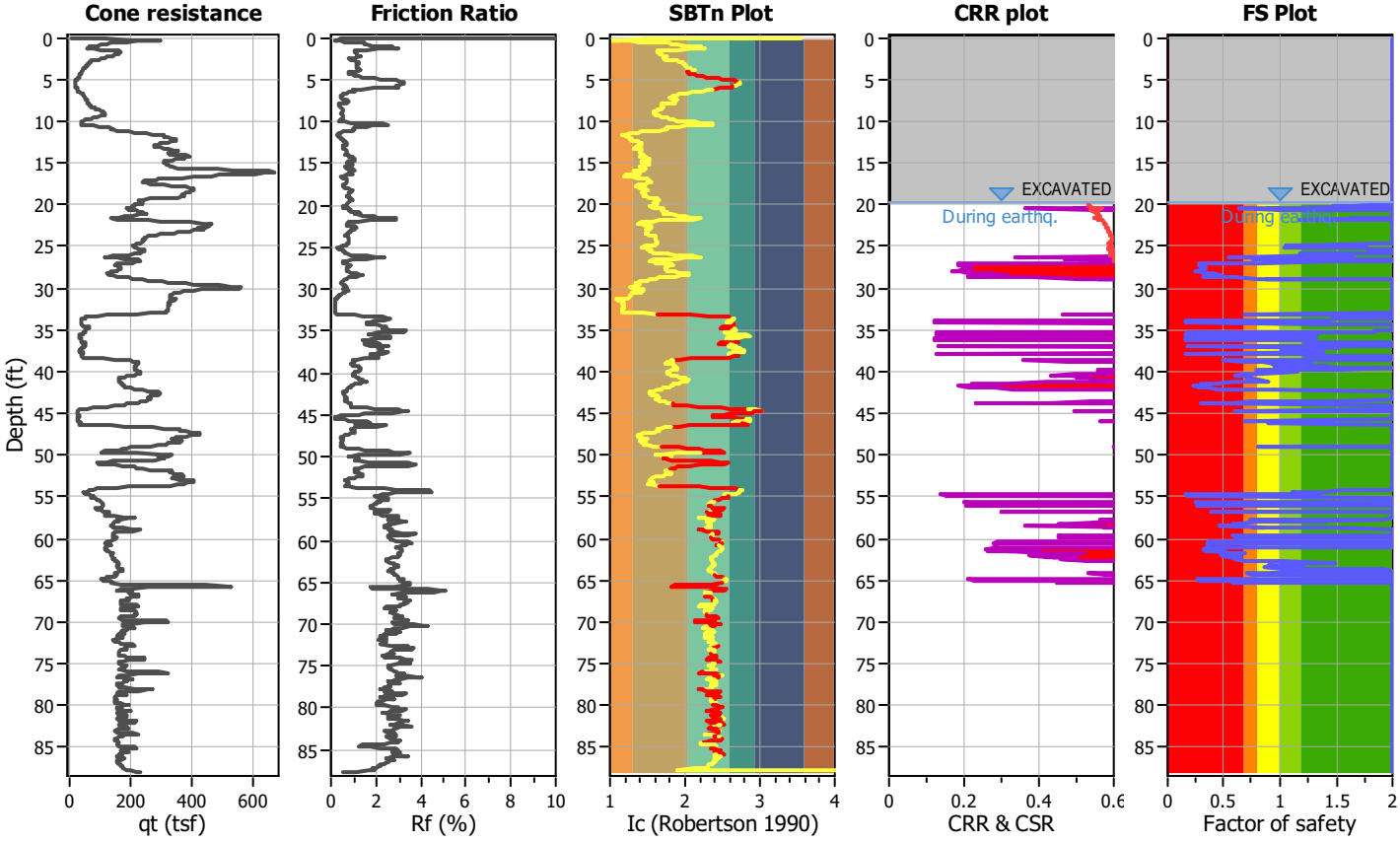
LIQUEFACTION ANALYSIS REPORT

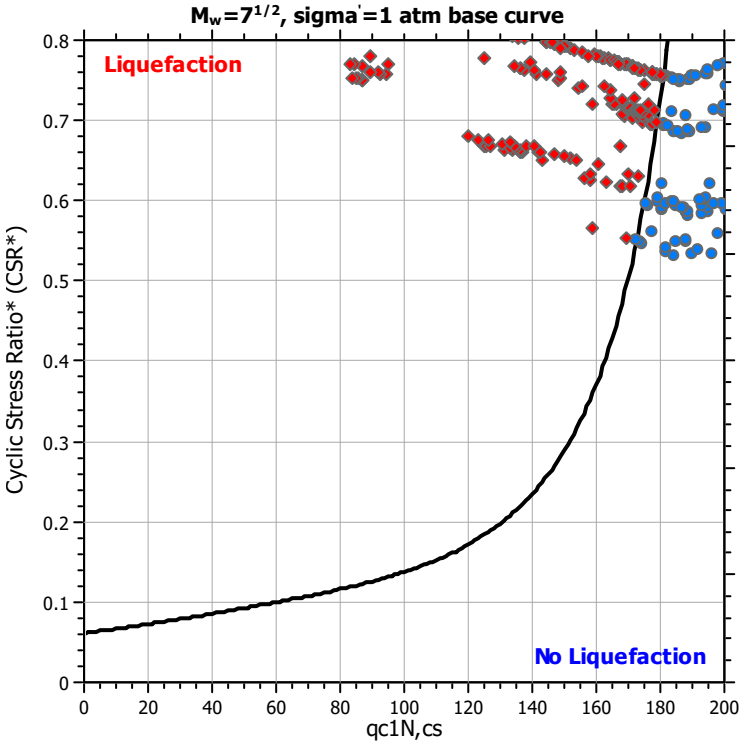
Project title : Creative Workplace Development **Location : 130 W College Street**

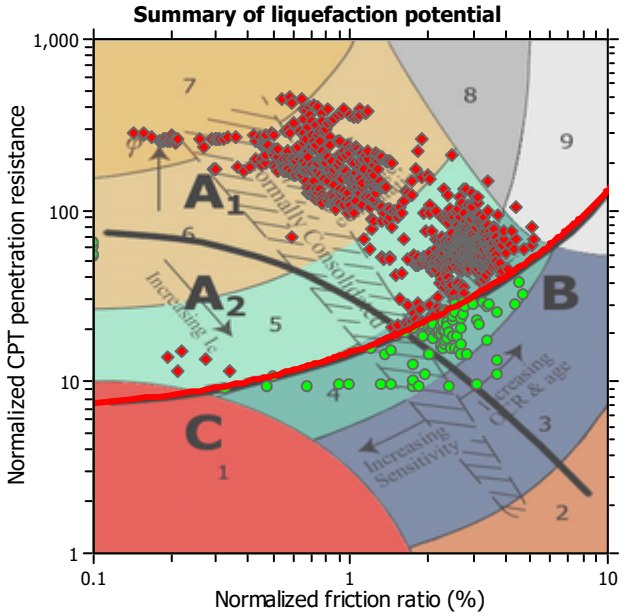
CPT file : CPT-2 CASE II Excav

Input parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	19.69 ft	Excavation:	Yes	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	19.69 ft	Excavation depth:	20.00 ft	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Footing load:	1.50 tsf	Limit depth:	65.62 ft
Earthquake magnitude M_w:	6.85	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method
Peak ground acceleration:	0.95	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

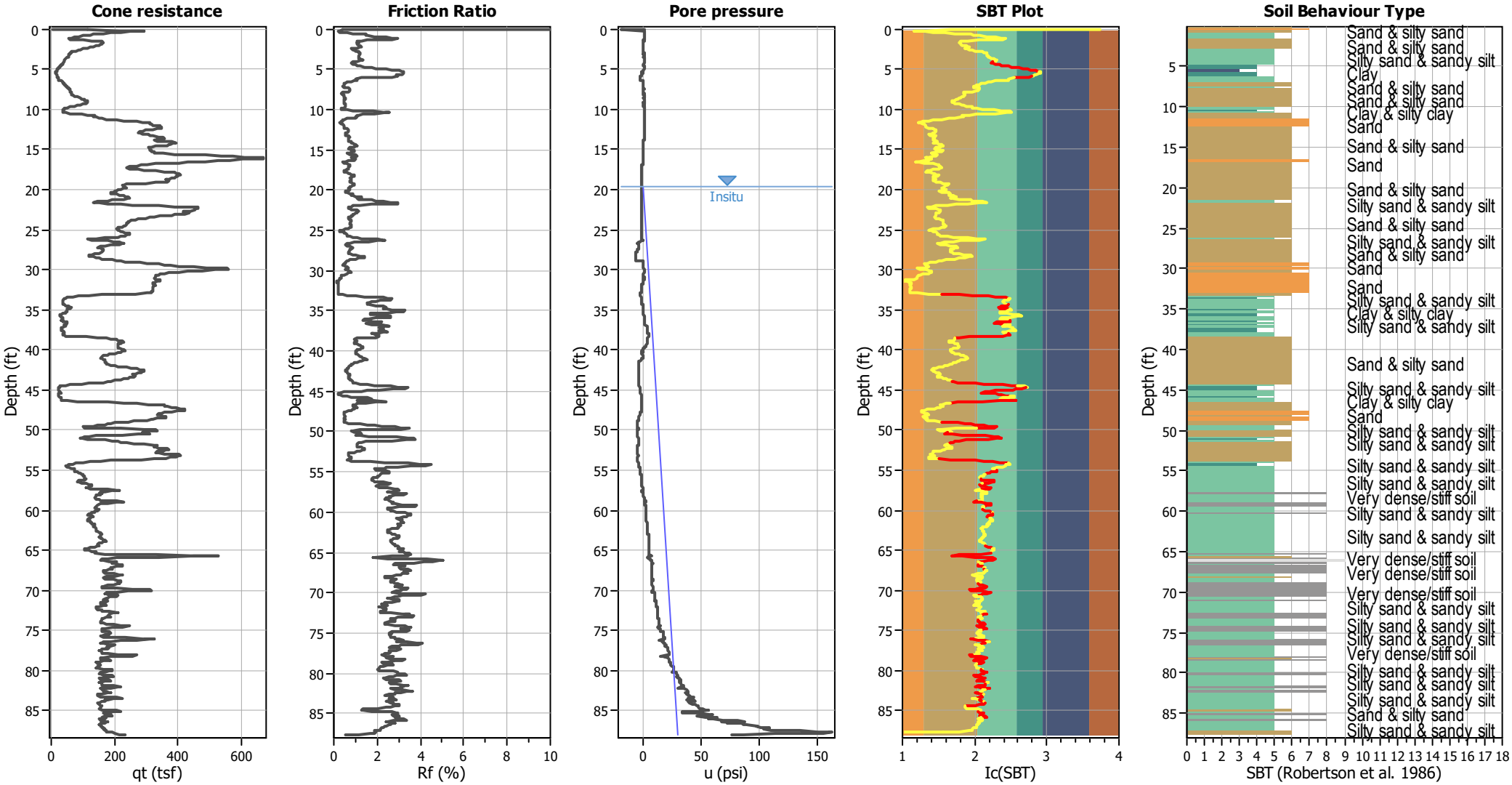






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



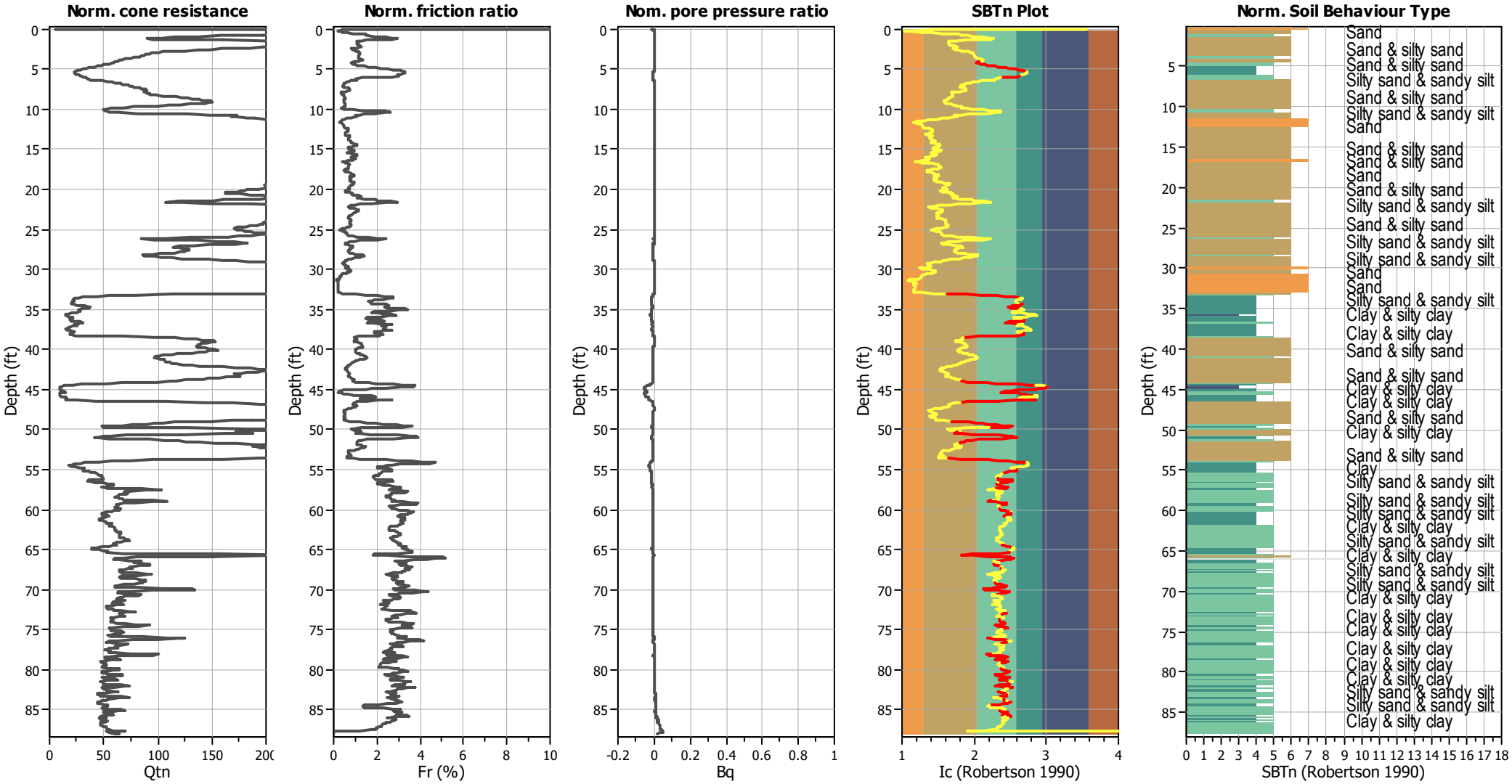
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

SBT legend

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

CPT basic interpretation plots (normalized)



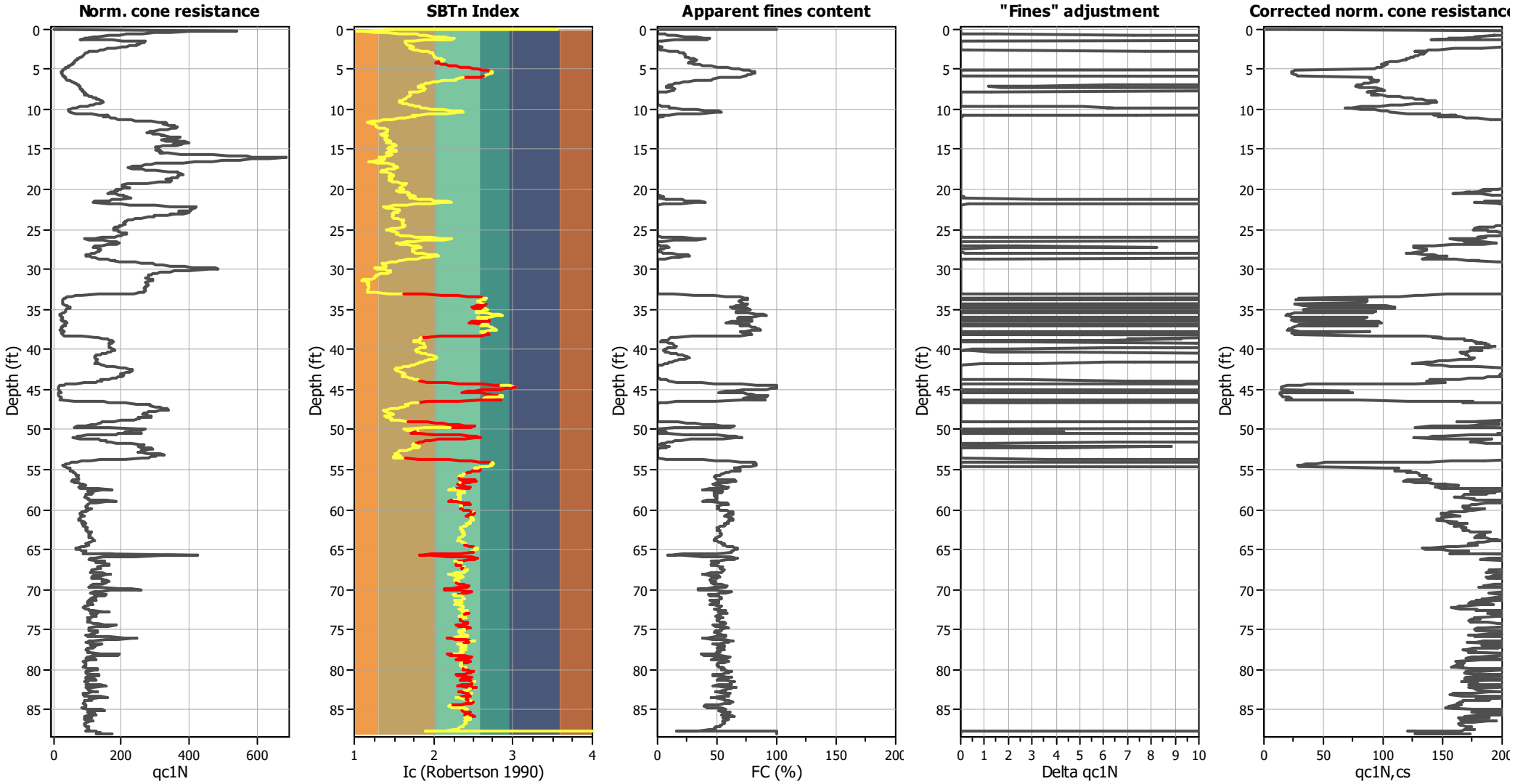
Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

SBTn legend

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

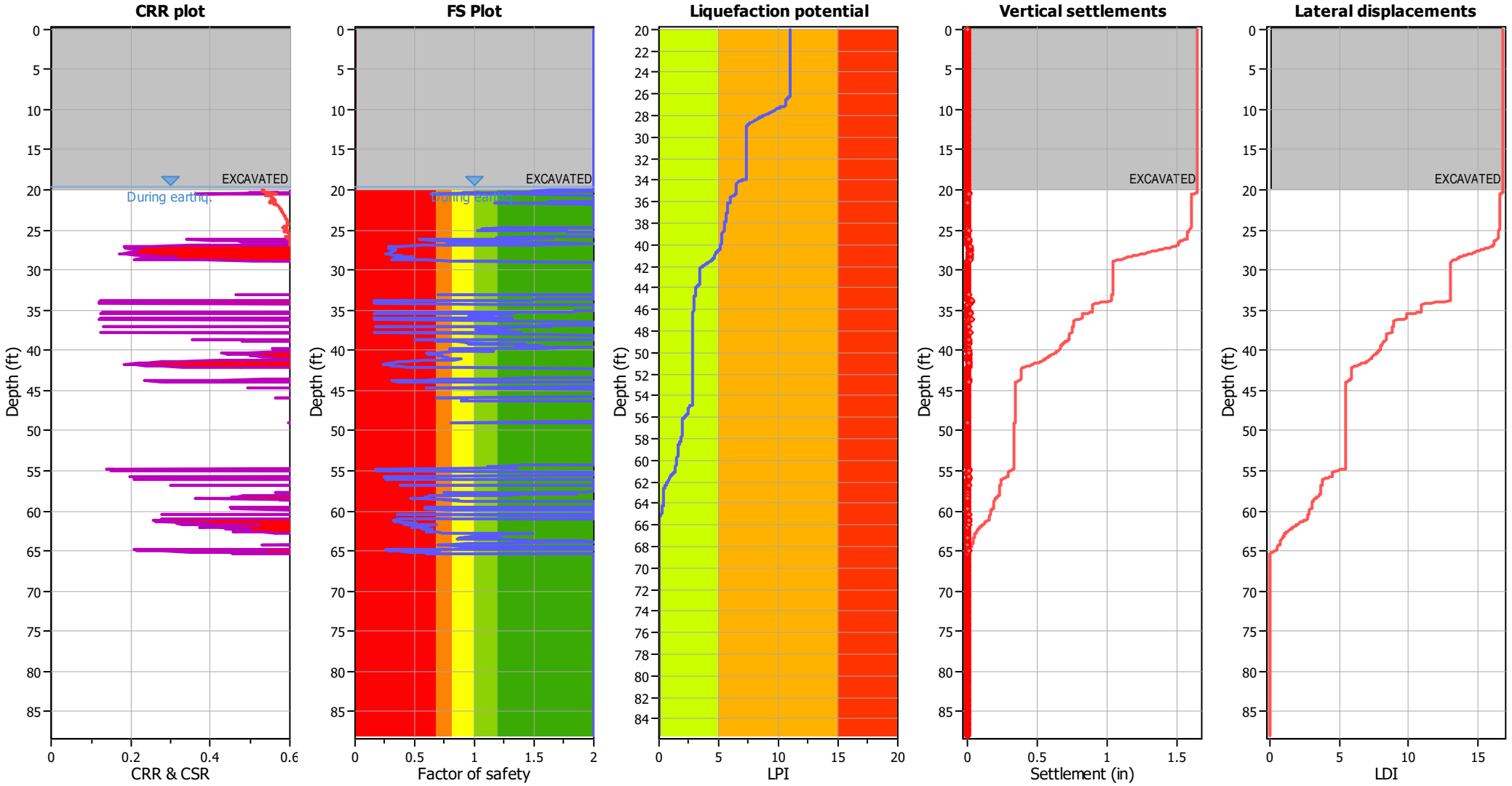
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

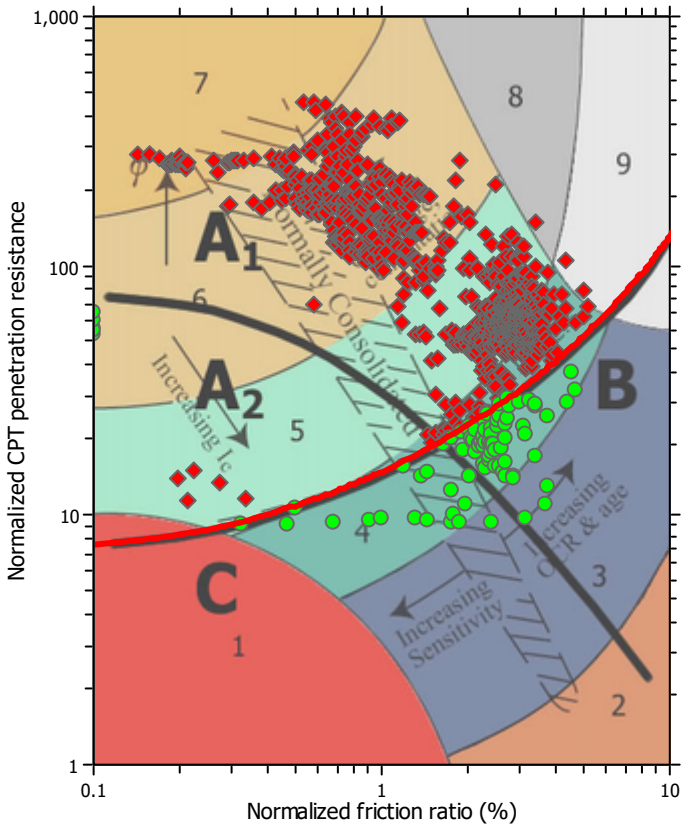
F.S. color scheme

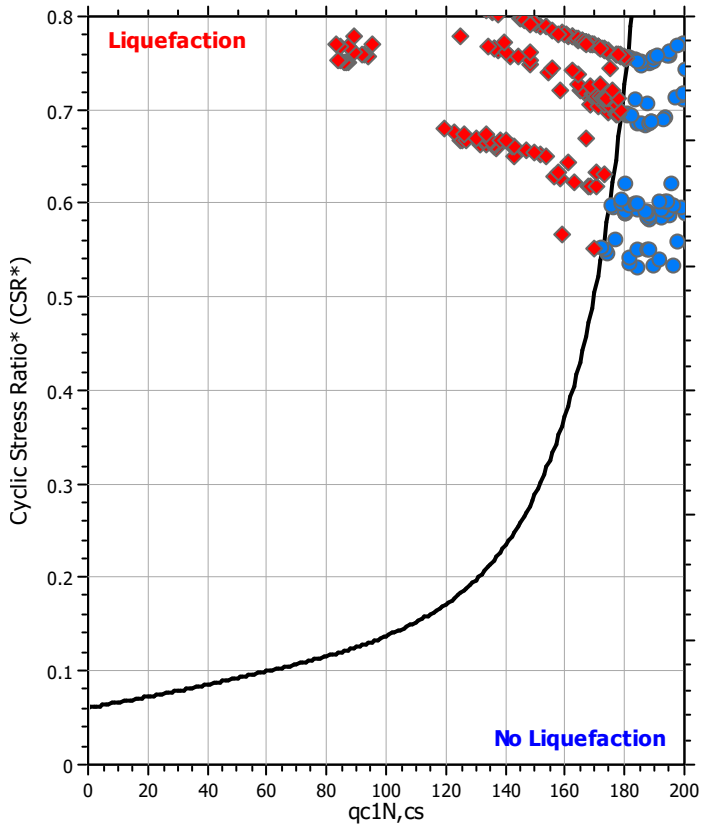
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

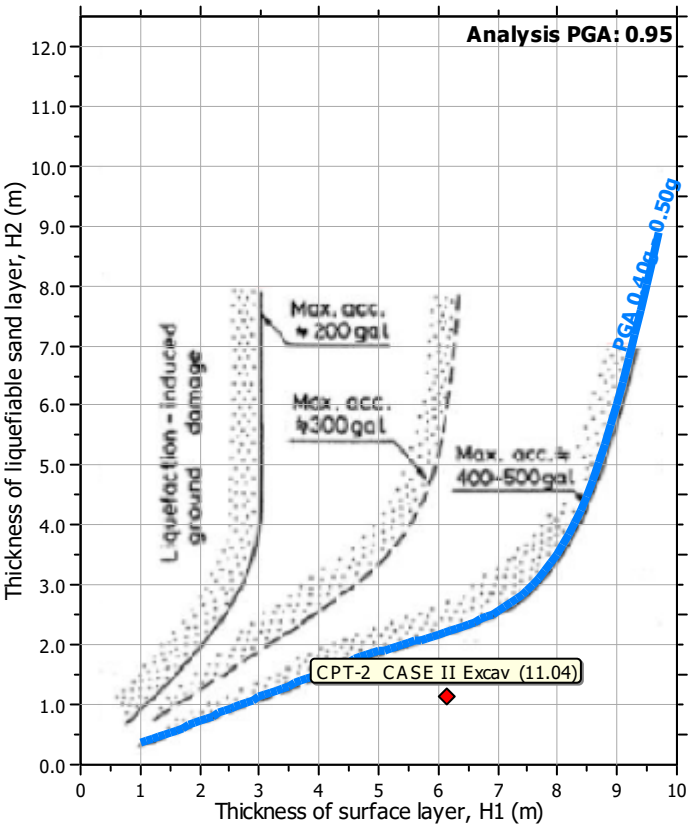
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



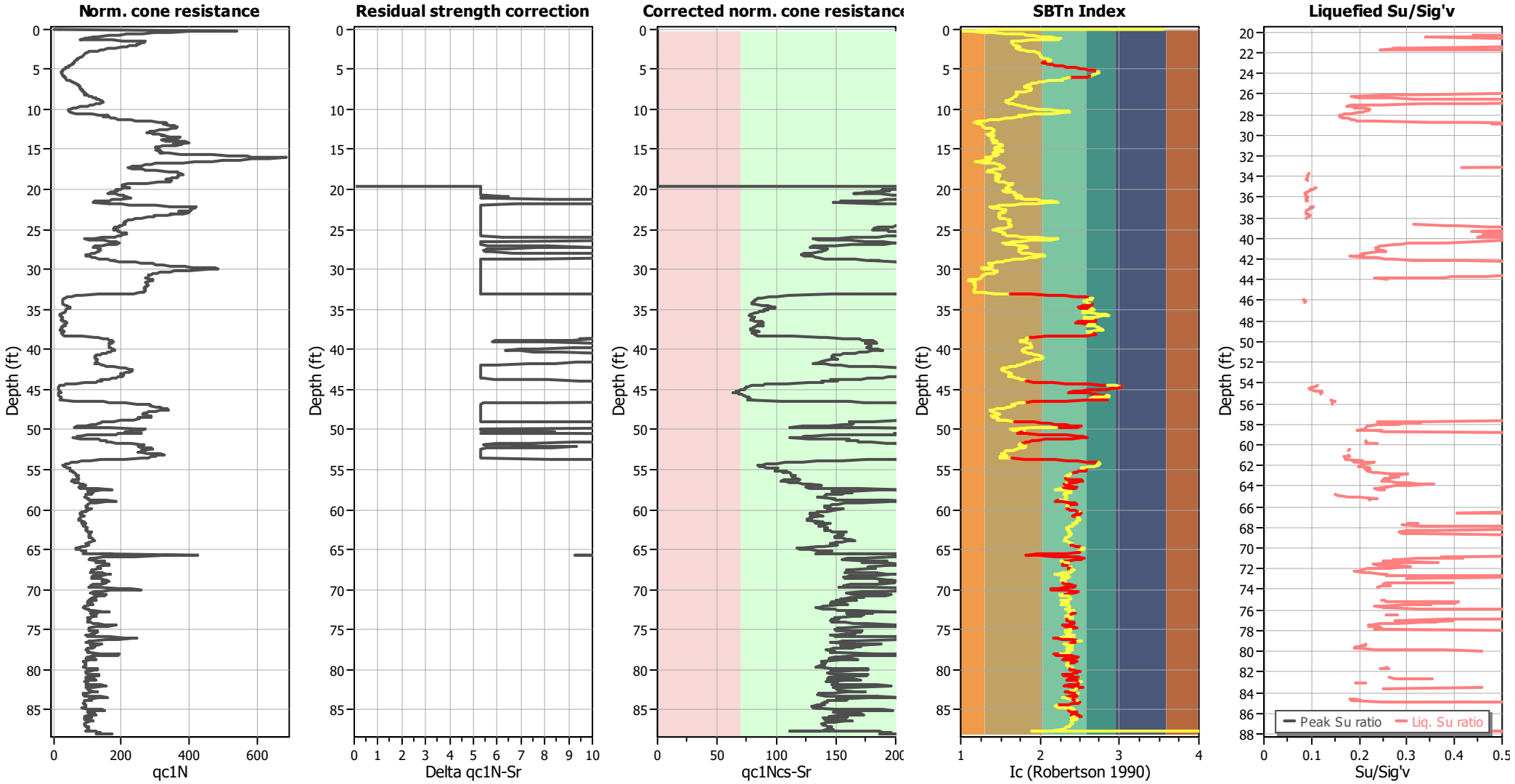




Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

Check for strength loss plots (Idriss & Boulanger (2008))



Input parameters and analysis data

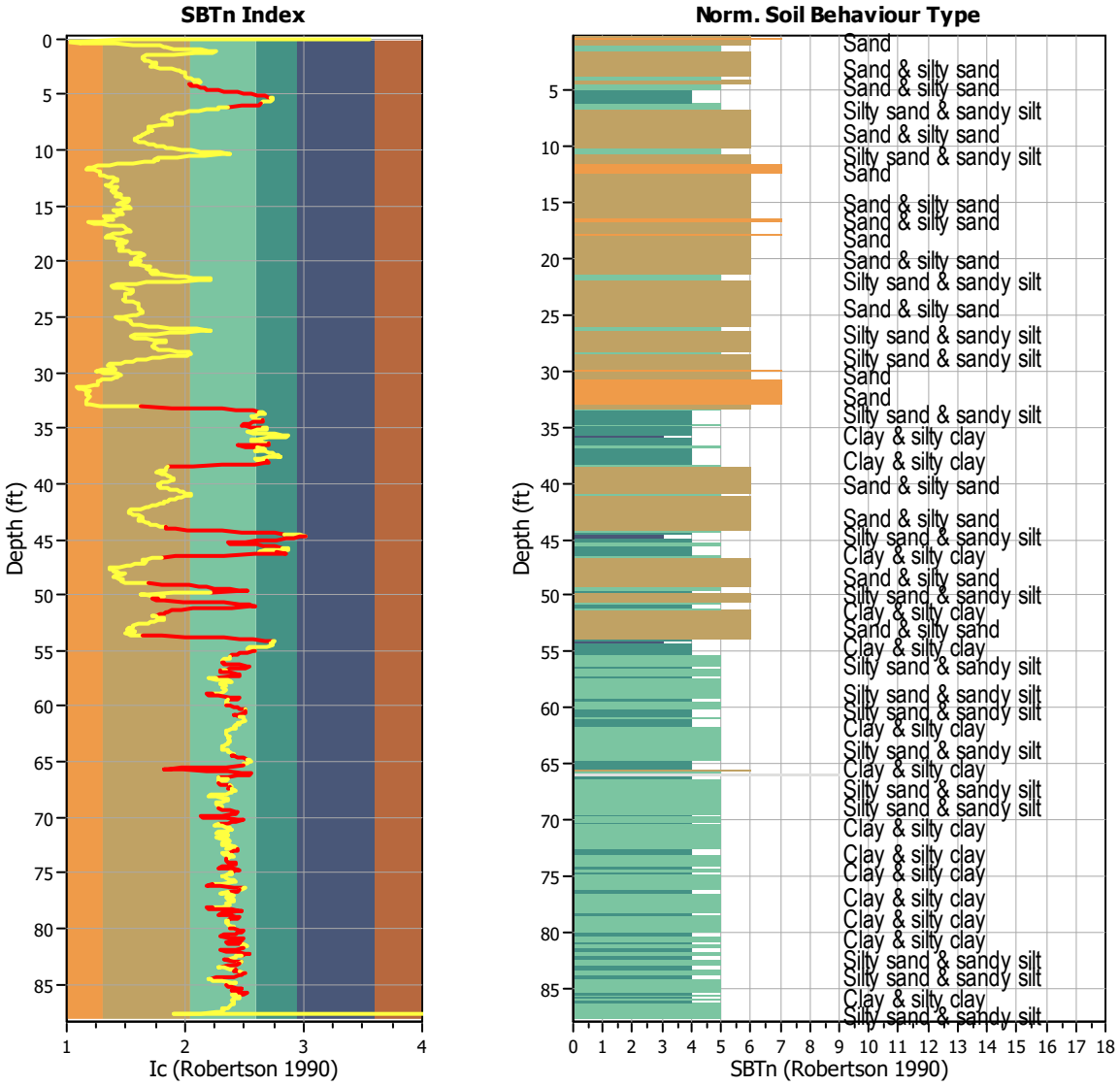
Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.69 ft	Footing load:	1.50 tsf
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.85	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.95	Excavation:	Yes	Limit depth applied:	Yes
Depth to water table (insitu):	19.69 ft	Excavation depth:	20.00 ft	Limit depth:	65.62 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0100
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	1341
Total points excluded:	394
Exclusion percentage:	29.38%
Number of layers detected:	64

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 1	20	Start depth: 4.15 (ft)	6	Sand & silty sand
		End depth: 5.38 (ft)	4	Clay & silty clay
Transition layer 2	5	Start depth: 5.91 (ft)	4	Clay & silty clay
		End depth: 6.18 (ft)	5	Silty sand & sandy silt
Transition layer 3	8	Start depth: 33.15 (ft)	6	Sand & silty sand
		End depth: 33.60 (ft)	4	Clay & silty clay
Transition layer 4	6	Start depth: 34.41 (ft)	4	Clay & silty clay
		End depth: 34.72 (ft)	5	Silty sand & sandy silt
Transition layer 5	5	Start depth: 34.72 (ft)	5	Silty sand & sandy silt
		End depth: 35.00 (ft)	4	Clay & silty clay
Transition layer 6	4	Start depth: 36.45 (ft)	4	Clay & silty clay
		End depth: 36.62 (ft)	5	Silty sand & sandy silt
Transition layer 7	4	Start depth: 36.62 (ft)	5	Silty sand & sandy silt
		End depth: 36.83 (ft)	4	Clay & silty clay
Transition layer 8	9	Start depth: 38.06 (ft)	4	Clay & silty clay
		End depth: 38.62 (ft)	6	Sand & silty sand
Transition layer 9	10	Start depth: 44.00 (ft)	6	Sand & silty sand
		End depth: 44.57 (ft)	3	Clay
Transition layer 10	9	Start depth: 44.79 (ft)	3	Clay
		End depth: 45.31 (ft)	5	Silty sand & sandy silt
Transition layer 11	9	Start depth: 45.31 (ft)	5	Silty sand & sandy silt
		End depth: 45.80 (ft)	4	Clay & silty clay
Transition layer 12	7	Start depth: 46.30 (ft)	4	Clay & silty clay
		End depth: 46.67 (ft)	6	Sand & silty sand
Transition layer 13	10	Start depth: 49.03 (ft)	6	Sand & silty sand
		End depth: 49.62 (ft)	4	Clay & silty clay
Transition layer 14	4	Start depth: 49.62 (ft)	4	Clay & silty clay
		End depth: 49.82 (ft)	6	Sand & silty sand
Transition layer 15	10	Start depth: 50.39 (ft)	6	Sand & silty sand
		End depth: 50.99 (ft)	4	Clay & silty clay
Transition layer 16	14	Start depth: 50.99 (ft)	4	Clay & silty clay
		End depth: 51.87 (ft)	6	Sand & silty sand
Transition layer 17	9	Start depth: 53.68 (ft)	6	Sand & silty sand
		End depth: 54.23 (ft)	3	Clay
Transition layer 18	9	Start depth: 55.10 (ft)	4	Clay & silty clay
		End depth: 55.58 (ft)	5	Silty sand & sandy silt
Transition layer 19	6	Start depth: 56.11 (ft)	5	Silty sand & sandy silt
		End depth: 56.43 (ft)	4	Clay & silty clay
Transition layer 20	6	Start depth: 56.43 (ft)	4	Clay & silty clay
		End depth: 56.77 (ft)	5	Silty sand & sandy silt
Transition layer 21	5	Start depth: 56.89 (ft)	5	Silty sand & sandy silt
		End depth: 57.15 (ft)	4	Clay & silty clay
Transition layer 22	5	Start depth: 57.22 (ft)	4	Clay & silty clay
		End depth: 57.49 (ft)	5	Silty sand & sandy silt
Transition layer 23	6	Start depth: 58.93 (ft)	5	Silty sand & sandy silt
		End depth: 59.27 (ft)	4	Clay & silty clay

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 24	5	Start depth: 59.27 (ft)	4	Clay & silty clay
		End depth: 59.53 (ft)	5	Silty sand & sandy silt
Transition layer 25	8	Start depth: 59.92 (ft)	5	Silty sand & sandy silt
		End depth: 60.37 (ft)	4	Clay & silty clay
Transition layer 26	4	Start depth: 60.56 (ft)	4	Clay & silty clay
		End depth: 60.78 (ft)	5	Silty sand & sandy silt
Transition layer 27	4	Start depth: 60.78 (ft)	5	Silty sand & sandy silt
		End depth: 60.97 (ft)	4	Clay & silty clay
Transition layer 28	6	Start depth: 64.46 (ft)	5	Silty sand & sandy silt
		End depth: 64.81 (ft)	4	Clay & silty clay
Transition layer 29	6	Start depth: 65.36 (ft)	4	Clay & silty clay
		End depth: 65.69 (ft)	6	Sand & silty sand
Transition layer 30	7	Start depth: 65.69 (ft)	6	Sand & silty sand
		End depth: 66.08 (ft)	4	Clay & silty clay
Transition layer 31	7	Start depth: 66.08 (ft)	4	Clay & silty clay
		End depth: 66.47 (ft)	5	Silty sand & sandy silt
Transition layer 32	5	Start depth: 66.93 (ft)	5	Silty sand & sandy silt
		End depth: 67.20 (ft)	4	Clay & silty clay
Transition layer 33	4	Start depth: 67.35 (ft)	5	Silty sand & sandy silt
		End depth: 67.53 (ft)	4	Clay & silty clay
Transition layer 34	5	Start depth: 69.24 (ft)	5	Silty sand & sandy silt
		End depth: 69.51 (ft)	4	Clay & silty clay
Transition layer 35	6	Start depth: 69.57 (ft)	4	Clay & silty clay
		End depth: 69.88 (ft)	5	Silty sand & sandy silt
Transition layer 36	5	Start depth: 69.97 (ft)	5	Silty sand & sandy silt
		End depth: 70.21 (ft)	4	Clay & silty clay
Transition layer 37	7	Start depth: 70.28 (ft)	4	Clay & silty clay
		End depth: 70.68 (ft)	5	Silty sand & sandy silt
Transition layer 38	5	Start depth: 72.97 (ft)	4	Clay & silty clay
		End depth: 73.24 (ft)	5	Silty sand & sandy silt
Transition layer 39	6	Start depth: 73.84 (ft)	5	Silty sand & sandy silt
		End depth: 74.16 (ft)	4	Clay & silty clay
Transition layer 40	5	Start depth: 74.25 (ft)	4	Clay & silty clay
		End depth: 74.49 (ft)	5	Silty sand & sandy silt
Transition layer 41	4	Start depth: 74.49 (ft)	5	Silty sand & sandy silt
		End depth: 74.70 (ft)	4	Clay & silty clay
Transition layer 42	4	Start depth: 74.76 (ft)	4	Clay & silty clay
		End depth: 74.97 (ft)	5	Silty sand & sandy silt
Transition layer 43	6	Start depth: 76.08 (ft)	5	Silty sand & sandy silt
		End depth: 76.38 (ft)	4	Clay & silty clay
Transition layer 44	4	Start depth: 76.59 (ft)	4	Clay & silty clay
		End depth: 76.79 (ft)	5	Silty sand & sandy silt
Transition layer 45	6	Start depth: 78.10 (ft)	5	Silty sand & sandy silt
		End depth: 78.42 (ft)	4	Clay & silty clay
Transition layer 46	5	Start depth: 78.42 (ft)	4	Clay & silty clay
		End depth: 78.68 (ft)	5	Silty sand & sandy silt

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 47	5	Start depth: 78.68 (ft)	5	Silty sand & sandy silt
		End depth: 78.96 (ft)	4	Clay & silty clay
Transition layer 48	6	Start depth: 78.96 (ft)	4	Clay & silty clay
		End depth: 79.29 (ft)	5	Silty sand & sandy silt
Transition layer 49	4	Start depth: 80.02 (ft)	5	Silty sand & sandy silt
		End depth: 80.19 (ft)	4	Clay & silty clay
Transition layer 50	8	Start depth: 80.19 (ft)	4	Clay & silty clay
		End depth: 80.66 (ft)	5	Silty sand & sandy silt
Transition layer 51	5	Start depth: 80.66 (ft)	5	Silty sand & sandy silt
		End depth: 80.93 (ft)	4	Clay & silty clay
Transition layer 52	5	Start depth: 81.01 (ft)	4	Clay & silty clay
		End depth: 81.24 (ft)	5	Silty sand & sandy silt
Transition layer 53	5	Start depth: 81.24 (ft)	5	Silty sand & sandy silt
		End depth: 81.50 (ft)	4	Clay & silty clay
Transition layer 54	4	Start depth: 81.77 (ft)	4	Clay & silty clay
		End depth: 81.97 (ft)	5	Silty sand & sandy silt
Transition layer 55	5	Start depth: 81.97 (ft)	5	Silty sand & sandy silt
		End depth: 82.22 (ft)	4	Clay & silty clay
Transition layer 56	4	Start depth: 82.22 (ft)	4	Clay & silty clay
		End depth: 82.42 (ft)	5	Silty sand & sandy silt
Transition layer 57	5	Start depth: 82.75 (ft)	5	Silty sand & sandy silt
		End depth: 83.01 (ft)	4	Clay & silty clay
Transition layer 58	5	Start depth: 83.20 (ft)	4	Clay & silty clay
		End depth: 83.47 (ft)	5	Silty sand & sandy silt
Transition layer 59	4	Start depth: 83.74 (ft)	5	Silty sand & sandy silt
		End depth: 83.93 (ft)	4	Clay & silty clay
Transition layer 60	8	Start depth: 84.05 (ft)	4	Clay & silty clay
		End depth: 84.51 (ft)	5	Silty sand & sandy silt
Transition layer 61	5	Start depth: 85.11 (ft)	5	Silty sand & sandy silt
		End depth: 85.37 (ft)	4	Clay & silty clay
Transition layer 62	4	Start depth: 85.37 (ft)	4	Clay & silty clay
		End depth: 85.57 (ft)	5	Silty sand & sandy silt
Transition layer 63	4	Start depth: 85.57 (ft)	5	Silty sand & sandy silt
		End depth: 85.77 (ft)	4	Clay & silty clay
Transition layer 64	4	Start depth: 85.77 (ft)	4	Clay & silty clay
		End depth: 85.96 (ft)	5	Silty sand & sandy silt

Start depth: Depth where the transition layer begins
End depth: Depth where the transition layer ends

:: Field input data ::

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
305	20.02	217.80	1.86	-1.91	4.75	126.80
306	20.10	204.82	1.32	-1.91	4.34	125.75
307	20.15	202.50	0.97	-1.91	3.55	124.26
308	20.23	211.26	1.10	-2.00	3.31	123.49
309	20.29	194.45	1.00	-2.00	3.83	123.98
310	20.36	189.52	1.21	-2.00	4.57	124.62
311	20.43	193.90	1.44	-2.03	5.58	125.59
312	20.47	178.35	1.56	-2.03	6.17	126.49
313	20.54	193.34	1.75	-2.03	6.17	126.76
314	20.62	202.91	1.59	-2.02	5.63	127.12
315	20.68	214.18	1.70	-2.10	5.75	128.20
316	20.75	226.46	2.45	-2.00	6.18	129.40
317	20.81	228.57	2.53	-2.00	6.74	130.52
318	20.88	232.70	2.73	-2.00	7.33	131.47
319	20.94	238.94	3.47	-2.02	7.50	131.91
320	21.00	240.35	3.02	-2.02	7.22	132.03
321	21.07	251.32	2.80	-2.02	6.12	131.14
322	21.14	255.95	2.34	-2.00	6.56	131.26
323	21.21	222.73	3.22	-2.00	8.29	132.04
324	21.27	204.62	3.95	-2.00	10.86	132.85
325	21.34	191.13	3.82	-2.00	12.23	132.91
326	21.41	181.67	3.57	-2.00	12.99	132.48
327	21.47	168.48	3.54	-2.00	15.01	132.23
328	21.53	133.96	3.85	-2.00	17.44	132.22
329	21.59	132.50	3.95	-2.00	19.55	132.21
330	21.65	132.50	3.85	-2.00	19.64	132.14
331	21.72	131.04	3.76	-1.81	16.20	131.85
332	21.80	185.39	3.05	-1.81	11.64	131.24
333	21.86	222.63	2.42	-1.91	7.64	130.75
334	21.92	252.93	2.59	-2.00	5.48	130.71
335	21.98	292.38	2.62	-2.00	4.15	131.25
336	22.05	336.46	2.63	-2.00	2.86	131.63
337	22.12	384.67	2.64	-2.00	1.80	132.22
338	22.20	448.89	2.88	-1.91	1.23	132.92
339	22.26	468.72	3.14	-1.91	1.16	133.77
340	22.33	467.71	3.50	-1.92	1.46	134.30
341	22.39	448.99	3.59	-1.92	1.86	134.86
342	22.44	457.74	4.00	-1.92	2.58	135.85
343	22.51	455.23	5.13	-1.91	3.29	136.89
344	22.58	453.12	5.53	-1.91	3.71	137.37
345	22.65	452.41	5.04	-1.88	3.74	137.04
346	22.71	420.81	4.54	-1.85	3.54	136.32
347	22.77	413.96	4.24	-1.85	3.56	135.86
348	22.84	411.95	4.34	-1.85	3.45	135.74
349	22.90	424.33	4.31	-1.85	3.08	135.67
350	22.97	450.80	3.99	-1.81	2.71	135.31
351	23.04	427.85	3.69	-1.81	2.61	134.72
352	23.10	387.59	3.48	-1.81	2.62	134.11

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
353	23.17	401.68	3.24	-1.81	2.74	133.62
354	23.23	377.53	3.16	-1.81	2.65	133.05
355	23.31	356.39	2.82	-1.81	2.82	132.30
356	23.37	333.75	2.51	-1.81	2.71	131.46
357	23.43	334.85	2.34	-1.81	2.58	130.51
358	23.50	312.61	1.99	-1.81	2.55	129.69
359	23.57	290.97	1.87	-1.81	2.72	129.04
360	23.62	285.13	1.92	-1.81	3.19	128.96
361	23.70	271.24	2.02	-1.81	3.62	129.07
362	23.76	264.20	2.03	-1.81	4.09	129.16
363	23.82	256.45	2.06	-1.91	4.42	129.18
364	23.88	250.81	2.09	-1.91	4.59	128.98
365	23.96	245.18	1.91	-1.91	4.59	128.64
366	24.02	242.46	1.82	-1.91	4.48	128.25
367	24.10	241.35	1.82	-1.91	4.49	128.09
368	24.16	238.23	1.81	-1.91	4.51	128.07
369	24.24	240.95	1.81	-1.91	4.55	128.06
370	24.29	238.74	1.81	-1.91	4.57	128.13
371	24.35	240.55	1.86	-1.91	4.68	128.19
372	24.42	236.97	1.86	-1.94	4.78	128.24
373	24.48	235.21	1.86	-1.94	4.94	128.22
374	24.56	230.89	1.87	-1.94	5.08	128.10
375	24.62	225.45	1.80	-1.92	5.10	127.81
376	24.67	222.93	1.68	-1.92	4.87	127.16
377	24.74	218.81	1.45	-1.91	4.61	126.35
378	24.81	209.75	1.32	-2.00	4.33	125.41
379	24.88	205.42	1.18	-1.91	3.62	123.95
380	24.95	210.10	0.75	-2.00	2.52	121.65
381	25.01	204.92	0.45	-1.91	1.64	119.68
382	25.08	210.45	0.61	-1.91	1.62	119.95
383	25.15	218.71	0.81	-1.91	2.10	121.60
384	25.21	218.96	0.90	-1.91	2.43	122.61
385	25.26	219.21	0.94	-1.91	2.74	123.46
386	25.34	226.15	1.13	-1.91	3.07	124.46
387	25.39	231.39	1.32	-1.81	3.38	125.58
388	25.48	239.94	1.47	-1.81	3.46	126.28
389	25.54	247.79	1.48	-1.81	3.40	126.60
390	25.60	248.20	1.47	-1.81	3.38	126.55
391	25.66	239.54	1.44	-1.81	3.61	126.45
392	25.74	229.07	1.45	-1.91	4.13	126.65
393	25.79	224.85	1.65	-1.91	4.88	127.22
394	25.86	219.41	1.85	-1.91	5.89	128.08
395	25.93	210.45	2.12	-2.00	7.36	129.09
396	25.99	196.97	2.57	-2.00	9.49	129.81
397	26.05	166.17	2.75	-2.10	12.25	130.18
398	26.12	141.81	2.84	-2.10	15.85	129.95
399	26.19	112.62	2.82	-2.19	18.78	129.56
400	26.26	109.40	2.71	-1.72	19.64	129.17

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
401	26.32	121.78	2.56	-1.24	16.77	129.05
402	26.39	152.68	2.41	-0.95	13.12	128.94
403	26.45	176.03	2.19	-1.24	9.75	128.60
404	26.51	199.58	1.88	-3.15	7.26	127.91
405	26.57	216.49	1.60	-4.87	5.25	126.83
406	26.65	227.56	1.28	-5.72	3.99	125.76
407	26.72	228.47	1.17	-4.82	3.37	124.98
408	26.78	225.95	1.18	-5.15	3.45	124.83
409	26.85	217.80	1.23	-4.77	3.92	124.87
410	26.92	202.60	1.24	-4.58	4.60	124.83
411	26.97	188.92	1.23	-4.58	5.57	124.79
412	27.03	172.41	1.30	-4.48	6.87	124.67
413	27.13	149.46	1.31	-4.29	8.25	124.61
414	27.19	143.32	1.31	-4.20	8.95	124.52
415	27.23	151.12	1.32	-4.82	8.80	124.49
416	27.31	152.78	1.28	-4.82	8.07	124.41
417	27.37	162.34	1.22	-4.82	7.45	124.25
418	27.43	166.37	1.20	-4.87	6.99	124.14
419	27.50	165.46	1.19	-5.44	6.86	124.11
420	27.56	165.97	1.19	-5.63	6.82	124.03
421	27.63	165.77	1.16	-5.72	6.73	123.86
422	27.70	164.26	1.11	-6.11	6.67	123.62
423	27.76	162.24	1.09	-6.11	6.73	123.44
424	27.82	159.63	1.09	-6.20	7.05	123.34
425	27.90	151.17	1.10	-6.39	7.58	123.24
426	27.96	143.83	1.09	-6.49	8.36	123.17
427	28.02	136.08	1.12	-6.58	9.64	123.52
428	28.10	126.61	1.33	-6.49	11.19	124.02
429	28.15	120.27	1.41	-6.58	12.91	124.61
430	28.23	114.94	1.53	-6.49	13.98	125.05
431	28.29	116.95	1.63	-6.49	14.40	125.56
432	28.36	123.29	1.73	-6.49	14.08	126.04
433	28.43	130.04	1.78	-6.49	13.17	126.28
434	28.48	138.79	1.71	-6.49	11.56	125.98
435	28.56	149.76	1.41	-6.49	9.63	125.40
436	28.65	162.55	1.30	-6.49	8.00	124.88
437	28.69	172.21	1.31	-6.49	6.60	124.80
438	28.78	194.85	1.25	-6.49	5.56	124.85
439	28.82	205.32	1.23	-6.39	4.57	124.80
440	28.91	216.90	1.19	-3.75	4.26	124.72
441	28.95	208.34	1.18	-1.14	3.80	124.80
442	29.01	233.40	1.21	-1.05	3.34	125.26
443	29.07	261.38	1.34	-1.05	2.74	126.05
444	29.14	280.50	1.47	-1.05	2.18	126.59
445	29.20	301.34	1.40	-1.05	1.58	126.67
446	29.28	322.27	1.29	-0.95	1.05	126.71
447	29.33	338.98	1.41	-0.86	0.93	127.40
448	29.40	352.06	1.73	-0.67	1.14	128.82

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
449	29.48	377.83	2.15	-0.67	1.40	130.38
450	29.54	403.50	2.53	-0.67	1.39	131.39
451	29.61	422.32	2.53	-0.48	1.50	132.58
452	29.68	452.21	3.25	-0.38	1.55	133.61
453	29.73	479.08	3.60	-0.29	1.05	133.98
454	29.80	534.64	2.76	-0.19	0.43	133.88
455	29.88	559.80	2.91	-0.10	0.00	133.68
456	29.93	568.05	3.18	0.10	0.16	134.39
457	30.00	554.77	3.61	0.19	0.58	135.04
458	30.06	539.27	3.86	0.19	1.24	135.28
459	30.12	466.10	3.78	0.57	1.83	134.84
460	30.20	418.09	3.29	0.57	2.26	133.91
461	30.26	401.28	2.89	0.57	2.21	132.89
462	30.32	393.53	2.65	0.48	2.07	131.94
463	30.39	367.36	2.33	0.29	1.94	131.06
464	30.45	357.20	2.09	0.00	1.71	129.95
465	30.52	349.45	1.74	-0.10	1.27	128.65
466	30.58	342.10	1.36	-0.10	0.76	127.19
467	30.64	337.87	1.17	-0.29	0.39	125.91
468	30.71	330.43	1.08	-0.29	0.21	125.16
469	30.78	329.62	1.02	-0.29	0.14	124.79
470	30.84	329.42	1.02	0.00	0.09	124.63
471	30.92	329.22	1.01	0.19	0.04	124.46
472	30.98	329.42	0.95	0.29	0.00	124.34
473	31.04	329.02	0.97	0.38	0.03	124.16
474	31.12	317.95	0.95	0.00	0.00	124.03
475	31.18	331.94	0.90	0.10	0.00	123.29
476	31.25	336.97	0.70	0.10	0.00	121.65
477	31.33	346.13	0.42	-0.29	0.00	120.01
478	31.37	344.32	0.49	-0.29	0.00	119.30
479	31.46	338.88	0.55	-0.57	0.00	119.91
480	31.50	339.38	0.55	-0.57	0.00	120.23
481	31.58	318.95	0.57	-0.92	0.00	120.73
482	31.64	318.15	0.68	-0.92	0.00	121.34
483	31.71	322.68	0.72	-0.92	0.00	121.65
484	31.79	325.80	0.65	-1.34	0.00	121.54
485	31.83	324.99	0.64	-1.34	0.00	121.25
486	31.91	330.93	0.64	-1.34	0.00	121.23
487	31.96	329.12	0.65	-1.34	0.00	121.24
488	32.04	324.89	0.64	-1.34	0.00	121.32
489	32.09	324.79	0.66	-1.53	0.00	121.47
490	32.16	318.35	0.69	-1.53	0.00	121.42
491	32.24	318.85	0.63	-1.72	0.00	121.27
492	32.29	317.95	0.63	-1.72	0.00	121.03
493	32.37	318.75	0.63	-1.72	0.00	120.96
494	32.43	321.97	0.61	-1.72	0.00	120.85
495	32.50	320.66	0.60	-1.81	0.00	120.77
496	32.57	323.18	0.60	-1.81	0.00	120.72

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
497	32.61	321.47	0.60	-1.91	0.00	120.59
498	32.70	317.24	0.57	-2.19	0.00	120.44
499	32.75	317.04	0.57	-2.29	0.00	120.27
500	32.83	317.14	0.57	-2.38	0.00	120.26
501	32.87	315.93	0.57	-2.38	0.00	121.16
502	32.96	302.85	0.80	-2.58	0.15	122.64
503	33.01	283.93	1.03	-2.67	2.04	124.79
504	33.10	208.84	1.53	-2.53	4.80	125.99
505	33.15	167.88	1.65	-2.48	9.95	126.34
506	33.23	103.47	1.74	-2.48	15.48	125.86
507	33.29	84.85	1.70	-2.48	22.77	124.98
508	33.35	67.03	1.60	-2.38	27.33	124.13
509	33.41	58.07	1.49	-2.29	31.28	123.22
510	33.46	52.74	1.38	-2.19	34.32	122.19
511	33.55	44.08	1.20	-2.00	36.71	121.10
512	33.60	40.76	1.07	-1.91	38.53	119.89
513	33.67	38.75	0.93	-1.81	38.60	118.70
514	33.75	36.84	0.77	-1.81	38.03	117.62
515	33.79	36.43	0.72	-1.72	36.59	116.65
516	33.88	37.74	0.64	-1.72	35.26	116.09
517	33.96	37.84	0.61	-1.72	34.00	115.63
518	33.99	37.94	0.59	-1.62	33.59	115.23
519	34.06	36.94	0.55	-1.62	34.23	115.19
520	34.13	35.73	0.61	-1.53	34.63	114.79
521	34.20	34.82	0.51	-1.53	35.20	114.67
522	34.28	34.82	0.53	-1.34	35.82	114.83
523	34.33	34.82	0.65	-1.34	38.42	116.26
524	34.41	34.82	0.88	-1.06	38.40	118.15
525	34.48	44.89	1.06	-0.67	37.09	119.75
526	34.51	48.51	1.17	-0.67	34.32	121.15
527	34.60	54.55	1.35	-0.67	32.47	122.09
528	34.68	60.49	1.42	-0.67	30.61	122.73
529	34.72	63.31	1.40	-0.76	29.51	122.92
530	34.80	62.30	1.41	-0.67	30.80	123.02
531	34.88	54.75	1.52	-0.76	33.55	123.07
532	34.92	50.42	1.53	-0.67	38.00	123.13
533	35.00	44.49	1.62	-0.57	39.51	123.18
534	35.05	49.72	1.61	-0.51	39.51	122.99
535	35.13	49.02	1.43	-0.51	37.19	122.33
536	35.20	48.01	1.18	-0.29	35.43	120.93
537	35.27	45.90	0.90	-0.29	33.70	119.42
538	35.30	44.99	0.80	-0.29	32.16	117.98
539	35.37	44.18	0.69	-0.29	32.16	117.20
540	35.44	41.06	0.69	-0.19	33.86	116.63
541	35.50	35.73	0.69	-0.29	37.87	116.34
542	35.57	30.70	0.69	-0.10	42.97	115.94
543	35.64	26.97	0.67	-0.10	47.42	115.67
544	35.71	25.77	0.69	0.19	49.70	115.69

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
545	35.78	26.67	0.73	0.19	49.42	115.79
546	35.84	27.88	0.69	0.29	46.00	115.79
547	35.92	32.31	0.63	0.38	40.59	115.57
548	36.00	37.14	0.59	0.48	35.70	115.27
549	36.04	39.15	0.55	0.48	33.38	114.69
550	36.12	36.33	0.48	0.48	33.19	114.11
551	36.16	34.92	0.48	0.48	34.88	113.68
552	36.24	32.21	0.50	0.57	36.31	114.24
553	36.33	35.08	0.60	0.57	38.98	115.01
554	36.37	31.70	0.67	0.67	40.28	116.33
555	36.45	35.23	0.83	0.86	40.32	117.28
556	36.49	39.76	0.86	0.95	35.28	118.04
557	36.58	50.63	0.79	1.05	30.05	117.84
558	36.62	53.64	0.65	0.95	27.91	117.98
559	36.70	50.42	0.85	0.95	30.73	118.65
560	36.79	42.88	1.05	0.95	35.68	119.50
561	36.83	40.56	1.06	0.95	39.30	119.81
562	36.90	40.66	1.05	1.05	37.52	119.79
563	36.97	48.41	1.00	2.86	35.38	119.69
564	37.01	47.30	0.97	2.77	34.52	119.36
565	37.10	41.57	0.91	2.77	36.53	118.86
566	37.14	38.25	0.87	2.96	39.32	118.12
567	37.23	34.62	0.79	3.15	41.01	117.50
568	37.27	33.82	0.76	3.15	42.42	116.64
569	37.36	30.70	0.66	3.15	43.56	115.91
570	37.40	28.89	0.62	3.15	43.73	115.25
571	37.49	30.70	0.60	3.34	44.78	115.13
572	37.53	28.18	0.64	3.43	45.47	115.89
573	37.62	30.70	0.82	3.43	45.92	116.87
574	37.67	34.02	0.87	3.53	41.04	117.59
575	37.75	42.77	0.76	3.62	37.00	117.52
576	37.83	41.57	0.72	3.62	34.65	117.09
577	37.89	39.05	0.70	3.62	35.89	116.73
578	37.93	36.84	0.69	3.62	38.58	116.57
579	38.02	33.01	0.72	3.82	39.69	116.68
580	38.06	36.79	0.75	3.91	40.50	116.89
581	38.15	35.83	0.76	4.01	39.63	117.16
582	38.19	36.74	0.78	4.10	38.67	117.69
583	38.28	42.27	0.88	4.20	34.55	118.66
584	38.32	54.85	0.97	4.39	23.24	120.78
585	38.41	111.92	1.18	4.48	14.96	123.10
586	38.49	158.32	1.44	3.72	10.68	125.03
587	38.53	172.61	1.59	3.72	9.14	126.50
588	38.62	190.93	1.85	3.62	8.78	127.42
589	38.66	196.97	1.97	3.62	8.75	128.41
590	38.74	205.62	2.26	3.62	8.93	129.15
591	38.79	209.55	2.42	3.53	8.64	129.49
592	38.87	220.02	2.20	3.53	7.84	129.14

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
593	38.92	224.44	1.88	3.53	7.15	128.85
594	39.01	227.97	2.11	3.53	7.05	128.92
595	39.05	227.06	2.24	3.53	7.66	129.59
596	39.14	224.14	2.48	3.43	8.22	130.06
597	39.18	223.14	2.58	3.43	8.95	130.37
598	39.27	210.25	2.62	3.24	9.31	130.47
599	39.32	214.48	2.62	3.15	9.66	130.50
600	39.40	211.86	2.65	2.48	9.74	130.56
601	39.44	209.85	2.69	2.10	10.07	130.67
602	39.53	207.43	2.78	1.43	10.28	130.80
603	39.57	209.85	2.80	1.05	10.46	130.92
604	39.66	208.44	2.83	0.76	10.47	130.99
605	39.70	209.85	2.85	0.48	10.11	130.75
606	39.79	213.37	2.51	0.10	9.42	130.28
607	39.83	215.79	2.29	-0.10	8.66	129.84
608	39.92	221.93	2.36	-0.57	8.11	129.69
609	40.00	229.98	2.31	-1.05	7.75	129.75
610	40.05	233.30	2.29	-1.34	7.42	129.71
611	40.09	234.91	2.27	-1.07	7.42	129.61
612	40.18	226.05	2.24	-1.10	7.51	129.50
613	40.23	225.55	2.21	-1.10	7.73	129.33
614	40.30	219.11	2.17	-1.14	7.99	129.19
615	40.38	210.35	2.16	-1.24	8.46	129.05
616	40.43	202.60	2.16	-1.24	9.13	128.94
617	40.51	191.23	2.17	-1.24	9.82	128.84
618	40.56	184.49	2.17	-1.24	10.51	128.75
619	40.62	178.55	2.17	-1.14	11.14	128.65
620	40.70	170.40	2.17	-1.14	11.76	128.56
621	40.76	165.57	2.17	-1.14	12.36	128.49
622	40.82	161.94	2.18	-1.19	12.94	128.54
623	40.89	158.12	2.27	-1.14	13.63	128.73
624	40.98	155.40	2.39	-1.14	14.25	128.98
625	41.02	155.30	2.44	-1.24	14.37	129.14
626	41.11	159.93	2.42	-1.43	14.00	129.16
627	41.15	164.26	2.36	-1.62	13.05	128.91
628	41.24	169.89	2.13	-2.10	12.27	128.55
629	41.28	169.09	2.05	-2.29	11.42	127.85
630	41.37	166.07	1.75	-3.62	10.80	127.21
631	41.41	168.79	1.64	-4.20	10.12	126.50
632	41.50	168.48	1.55	-4.29	9.66	126.18
633	41.55	170.50	1.53	-4.29	9.22	125.95
634	41.63	175.13	1.47	-4.29	8.83	125.81
635	41.68	176.84	1.44	-4.41	8.71	125.55
636	41.74	167.18	1.38	-4.53	8.38	125.41
637	41.80	181.67	1.37	-4.53	7.91	125.33
638	41.87	190.22	1.36	-4.67	7.20	125.43
639	41.94	194.95	1.37	-4.77	6.76	125.46
640	42.02	199.58	1.35	-4.87	6.42	125.58

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
641	42.09	207.74	1.38	-4.77	6.00	125.87
642	42.16	222.23	1.47	-4.87	5.58	126.29
643	42.20	233.10	1.53	-4.77	4.84	126.61
644	42.29	257.46	1.47	-4.87	4.10	126.67
645	42.33	268.13	1.42	-4.87	3.38	126.75
646	42.42	284.03	1.47	-4.87	3.11	127.04
647	42.46	289.87	1.59	-4.87	3.07	127.52
648	42.55	292.58	1.68	-4.77	3.18	127.88
649	42.60	292.98	1.70	-4.77	3.28	128.12
650	42.66	293.39	1.74	-4.77	3.38	128.31
651	42.74	294.09	1.81	-4.67	3.65	128.52
652	42.82	283.52	1.87	-4.67	4.01	128.69
653	42.87	275.67	1.91	-4.67	4.55	128.76
654	42.96	261.88	1.94	-4.67	4.98	128.77
655	43.00	257.56	1.94	-4.67	5.15	128.68
656	43.09	261.94	1.88	-4.58	5.13	128.50
657	43.13	255.54	1.81	-4.58	4.83	128.18
658	43.21	261.99	1.69	-4.58	4.56	127.89
659	43.26	266.01	1.66	-4.58	4.37	127.80
660	43.34	263.90	1.73	-4.58	4.45	127.83
661	43.38	258.76	1.72	-4.58	4.99	128.13
662	43.47	246.28	1.91	-4.58	5.47	128.22
663	43.52	241.35	1.86	-4.58	5.98	128.23
664	43.60	232.90	1.79	-4.58	6.21	128.06
665	43.65	228.27	1.83	-4.48	6.64	128.03
666	43.74	220.42	1.89	-4.48	7.10	128.12
667	43.78	216.69	1.90	-4.48	7.93	127.94
668	43.83	188.31	1.81	-4.40	8.25	127.47
669	43.91	192.94	1.62	-4.40	8.75	126.74
670	44.00	177.34	1.51	-4.40	8.91	126.20
671	44.04	167.88	1.52	-4.29	10.71	126.19
672	44.13	142.01	1.77	-4.29	13.46	126.53
673	44.17	123.49	1.94	-4.29	18.05	126.51
674	44.26	90.68	1.85	-4.29	22.95	125.97
675	44.30	75.38	1.74	-4.29	29.73	124.64
676	44.39	52.54	1.48	-4.29	35.48	123.34
677	44.44	47.00	1.35	-4.29	43.13	121.64
678	44.53	34.22	1.13	-4.01	48.49	120.31
679	44.57	29.59	1.03	-3.82	55.79	118.40
680	44.66	22.85	0.78	-3.62	59.59	116.63
681	44.70	21.74	0.63	-3.53	60.01	114.16
682	44.79	21.34	0.40	-3.43	56.38	111.95
683	44.83	21.34	0.32	-3.34	52.75	110.06
684	44.92	21.54	0.32	-3.34	51.78	109.65
685	44.96	21.64	0.34	-3.24	49.10	108.39
686	45.05	21.94	0.16	-3.24	44.15	105.82
687	45.09	22.85	0.07	-3.15	35.84	101.39
688	45.18	25.36	0.08	-3.15	31.41	99.14

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
689	45.22	26.37	0.07	-3.05	27.49	98.83
690	45.31	32.11	0.06	-3.05	5.00	98.12
691	45.35	32.31	0.05	-2.61	25.66	96.52
692	45.42	20.43	0.04	-2.61	29.35	95.54
693	45.48	20.33	0.04	-2.61	35.98	96.81
694	45.56	20.93	0.09	-2.10	38.30	99.73
695	45.62	21.54	0.12	-2.10	40.92	102.69
696	45.68	22.04	0.17	-2.10	43.47	105.10
697	45.74	22.44	0.23	-2.10	47.30	107.88
698	45.80	22.34	0.36	-2.00	50.20	110.51
699	45.88	24.66	0.48	-1.91	49.71	112.08
700	45.95	27.88	0.45	-1.91	45.41	112.49
701	46.00	31.50	0.39	-1.91	39.37	111.85
702	46.07	34.72	0.33	-1.91	36.31	111.56
703	46.13	34.12	0.39	-1.91	39.26	112.57
704	46.21	28.48	0.56	-1.91	44.22	114.90
705	46.30	33.52	0.81	-1.72	48.66	116.89
706	46.34	32.91	0.94	-1.53	34.88	119.89
707	46.43	84.85	1.23	-1.34	23.32	122.47
708	46.47	123.49	1.46	-1.34	14.24	125.63
709	46.55	194.65	2.03	-1.81	10.72	127.95
710	46.59	223.03	2.39	-1.72	8.23	129.86
711	46.67	273.46	2.62	-1.72	6.64	130.87
712	46.76	312.11	2.66	-1.72	5.49	131.65
713	46.80	329.42	2.89	-1.81	5.01	132.44
714	46.88	351.56	3.32	-1.81	5.01	133.20
715	46.92	357.40	3.48	-1.81	5.15	133.86
716	47.00	361.22	3.71	-1.84	5.36	134.21
717	47.05	357.65	3.80	-1.84	5.54	134.42
718	47.12	357.90	3.80	-1.83	5.34	134.45
719	47.18	379.04	3.69	-1.91	4.78	134.37
720	47.25	399.07	3.55	-1.81	4.07	134.18
721	47.32	408.63	3.36	-1.81	3.48	133.85
722	47.38	413.16	3.12	-1.72	2.88	133.32
723	47.44	424.93	2.79	-1.91	2.15	132.45
724	47.52	429.77	2.28	-2.19	1.50	131.34
725	47.58	416.18	1.96	-2.29	1.12	130.18
726	47.65	394.94	1.81	-2.38	1.10	129.38
727	47.71	380.45	1.73	-2.38	1.24	128.88
728	47.78	366.76	1.67	-2.48	1.43	128.60
729	47.84	355.29	1.67	-2.67	1.51	128.19
730	47.91	347.44	1.50	-2.67	1.78	128.22
731	47.97	338.48	1.73	-2.67	2.13	128.48
732	48.04	333.34	1.88	-2.77	2.67	129.14
733	48.12	332.44	2.02	-2.77	2.66	129.23
734	48.17	344.11	1.79	-3.05	2.22	128.82
735	48.25	353.88	1.54	-3.72	1.67	128.31
736	48.33	362.13	1.61	-3.91	1.41	128.16

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
737	48.37	365.55	1.66	-4.10	1.48	128.48
738	48.46	363.94	1.73	-4.67	1.63	128.66
739	48.50	356.39	1.74	-4.55	2.04	128.64
740	48.56	319.96	1.72	-4.55	2.31	128.40
741	48.63	324.29	1.63	-4.55	2.42	127.88
742	48.69	318.65	1.45	-4.77	2.21	127.22
743	48.76	307.18	1.33	-4.87	2.25	126.44
744	48.84	283.93	1.25	-4.96	2.73	126.17
745	48.90	266.41	1.38	-5.34	3.97	126.64
746	48.98	238.43	1.71	-5.34	5.78	127.62
747	49.03	220.12	2.01	-5.34	8.25	128.66
748	49.09	196.06	2.36	-5.34	10.97	129.80
749	49.18	184.39	2.94	-5.34	13.62	130.75
750	49.21	177.34	3.23	-5.34	16.18	131.80
751	49.30	169.19	3.85	-5.34	18.50	132.56
752	49.38	159.73	4.21	-5.34	20.72	133.07
753	49.42	151.78	4.26	-5.34	22.95	133.06
754	49.50	133.46	4.15	-5.34	25.77	132.58
755	49.58	110.01	3.89	-5.34	28.98	131.83
756	49.62	100.45	3.59	-5.34	31.71	130.72
757	49.69	88.47	3.00	-5.06	29.33	130.04
758	49.76	118.66	2.86	-4.77	19.43	130.21
759	49.82	221.12	2.80	-4.67	10.36	130.79
760	49.89	318.25	2.45	-4.77	5.78	131.15
761	49.95	345.42	2.48	-4.96	4.65	131.70
762	50.03	327.31	3.09	-5.15	5.29	132.70
763	50.07	329.62	3.59	-5.13	6.83	133.63
764	50.15	297.51	3.89	-5.13	7.65	133.92
765	50.20	295.55	3.65	-5.10	8.37	133.71
766	50.27	280.20	3.48	-5.10	8.00	133.27
767	50.33	293.59	3.26	-5.06	7.47	132.90
768	50.39	304.96	3.10	-5.06	6.46	132.78
769	50.47	332.24	3.14	-5.06	7.08	132.76
770	50.54	256.35	3.36	-4.96	8.57	132.96
771	50.59	238.23	3.62	-5.06	12.70	133.04
772	50.66	176.03	4.00	-5.25	17.19	133.05
773	50.73	138.79	4.11	-5.06	23.87	132.73
774	50.80	112.22	4.12	-5.15	29.07	132.21
775	50.86	102.56	3.91	-5.06	32.17	131.55
776	50.93	97.53	3.53	-4.77	33.88	130.87
777	50.99	87.16	3.40	-4.48	34.85	130.24
778	51.06	85.65	3.21	-4.29	32.32	130.01
779	51.13	112.52	3.04	-4.01	26.26	130.01
780	51.18	141.51	2.85	-3.91	18.95	129.98
781	51.26	180.26	2.46	-4.20	14.61	129.79
782	51.33	190.12	2.39	-4.39	11.98	129.59
783	51.38	201.19	2.38	-4.39	10.95	129.63
784	51.45	212.06	2.38	-4.48	10.17	129.71

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
785	51.52	218.00	2.36	-4.48	9.46	129.80
786	51.61	229.68	2.36	-4.58	8.96	129.92
787	51.65	235.31	2.41	-4.57	8.66	130.52
788	51.73	253.43	2.83	-4.66	7.96	131.44
789	51.80	300.23	3.11	-4.66	7.21	132.62
790	51.87	330.73	3.50	-4.48	6.65	133.61
791	51.93	340.89	3.87	-4.87	6.83	134.38
792	51.99	335.36	4.15	-5.06	7.51	134.99
793	52.06	324.99	4.52	-5.15	8.11	135.48
794	52.11	335.26	4.76	-5.15	8.71	135.81
795	52.17	320.86	4.82	-5.15	8.66	135.93
796	52.24	335.16	4.71	-5.15	8.34	135.93
797	52.30	354.48	4.67	-5.15	7.49	135.90
798	52.37	371.59	4.54	-5.15	6.82	135.80
799	52.44	375.31	4.36	-5.06	6.34	135.50
800	52.50	368.77	4.06	-5.06	6.00	134.74
801	52.56	346.13	3.36	-5.15	5.36	133.42
802	52.63	337.47	2.53	-5.15	4.51	131.74
803	52.70	332.64	2.11	-5.15	3.77	130.52
804	52.76	335.96	2.16	-5.15	3.63	130.10
805	52.83	325.80	2.17	-5.06	3.62	130.06
806	52.89	331.13	2.08	-5.15	3.61	130.41
807	52.95	356.49	2.43	-5.15	3.43	131.08
808	53.02	381.25	2.68	-4.96	3.28	132.01
809	53.10	404.10	2.88	-4.96	3.06	132.62
810	53.16	420.30	2.95	-4.87	3.34	133.24
811	53.25	396.55	3.39	-4.87	3.79	133.70
812	53.29	392.12	3.52	-4.96	3.98	133.49
813	53.37	387.69	2.76	-4.96	3.43	132.38
814	53.45	373.40	2.08	-4.96	2.81	130.97
815	53.50	362.23	2.12	-4.96	2.87	130.39
816	53.59	346.73	2.32	-4.96	3.54	130.87
817	53.63	340.49	2.60	-4.96	5.15	131.69
818	53.68	283.83	3.15	-5.01	8.30	132.95
819	53.76	227.87	4.26	-5.01	13.07	133.75
820	53.82	187.00	4.52	-5.01	18.54	134.07
821	53.88	152.68	4.58	-5.25	23.62	133.55
822	53.96	120.98	4.23	-5.06	28.95	132.77
823	54.02	100.75	4.04	-4.77	34.31	131.87
824	54.08	85.55	3.86	-4.48	38.88	131.11
825	54.14	76.69	3.61	-4.39	42.11	129.93
826	54.23	66.53	2.80	-4.10	43.22	128.33
827	54.28	60.99	2.16	-4.01	42.64	125.98
828	54.34	55.36	1.49	-3.91	41.72	123.66
829	54.41	49.62	1.20	-3.91	41.71	121.58
830	54.49	44.89	1.09	-3.82	42.82	120.44
831	54.53	43.78	1.04	-3.82	42.72	119.98
832	54.61	47.00	1.02	-3.72	39.91	120.01

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
833	54.70	54.25	1.03	-3.62	35.61	120.28
834	54.75	61.70	1.03	-3.62	32.40	122.00
835	54.83	76.29	1.62	-3.53	31.55	123.65
836	54.88	75.59	1.80	-3.53	32.46	124.95
837	54.92	70.86	1.82	-3.53	33.93	125.22
838	55.01	71.01	1.87	-3.43	34.64	125.16
839	55.10	71.16	1.80	-3.24	34.46	125.14
840	55.13	71.76	1.80	-2.96	31.83	125.18
841	55.20	86.76	1.77	-2.96	30.14	125.32
842	55.29	83.84	1.80	-2.96	28.69	125.57
843	55.33	85.35	1.88	-2.58	28.36	125.94
844	55.42	94.31	2.00	-2.48	27.38	126.34
845	55.46	97.33	2.02	-2.48	26.17	126.49
846	55.55	97.93	1.92	-2.38	25.68	126.43
847	55.58	97.93	1.93	-2.26	25.53	126.41
848	55.66	98.53	2.00	-2.26	25.21	126.58
849	55.72	103.57	2.01	-2.26	24.40	126.63
850	55.78	106.69	1.91	-2.10	23.56	126.46
851	55.84	104.27	1.83	-2.10	23.04	126.16
852	55.91	104.07	1.78	-2.00	23.02	125.98
853	55.98	104.07	1.79	-2.00	23.18	126.05
854	56.05	103.87	1.88	-1.81	23.30	126.33
855	56.11	107.59	1.97	-1.72	23.25	126.66
856	56.19	110.31	2.02	-1.81	23.71	126.82
857	56.25	101.86	2.02	-2.00	25.63	126.83
858	56.32	88.97	2.10	-2.00	28.67	126.78
859	56.36	83.84	2.17	-1.91	31.82	126.84
860	56.43	79.71	2.25	-1.91	32.40	126.89
861	56.52	85.95	2.17	-1.72	31.03	126.90
862	56.57	93.50	2.10	-1.62	28.16	126.95
863	56.64	102.26	2.11	-1.62	25.76	127.07
864	56.69	108.80	2.11	-1.62	23.91	127.29
865	56.77	115.74	2.14	-1.53	22.84	127.85
866	56.85	124.30	2.47	-1.53	22.59	128.50
867	56.89	124.35	2.62	-1.32	22.49	129.38
868	56.97	135.17	2.93	-1.32	23.39	129.92
869	57.03	124.40	3.08	-1.32	25.27	130.39
870	57.12	111.92	3.31	-1.05	27.85	130.54
871	57.15	110.41	3.34	-1.05	29.22	130.54
872	57.22	111.11	3.20	-1.05	29.08	130.66
873	57.29	115.64	3.43	-0.86	28.13	131.48
874	57.35	136.28	4.25	-0.86	25.37	132.95
875	57.42	177.04	4.90	-0.67	21.23	134.49
876	57.49	224.65	5.25	-0.95	18.81	135.45
877	57.56	219.92	5.49	-1.24	18.63	135.80
878	57.62	194.75	5.51	-1.24	21.16	135.64
879	57.68	163.55	5.45	-1.24	24.73	135.19
880	57.74	141.91	5.26	-0.95	26.04	134.72

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
881	57.83	161.89	4.86	-0.76	25.88	134.16
882	57.89	150.87	4.44	-0.29	23.58	133.60
883	57.96	160.23	4.00	-0.19	22.84	133.05
884	58.02	158.52	3.93	-0.10	22.54	132.71
885	58.07	146.64	3.92	-0.10	23.31	132.38
886	58.16	140.00	3.64	0.00	24.02	132.00
887	58.22	139.40	3.51	0.00	23.71	131.52
888	58.28	139.45	3.28	0.00	23.20	131.20
889	58.34	139.45	3.20	0.00	23.00	131.08
890	58.42	139.50	3.35	0.10	23.24	131.12
891	58.48	137.38	3.35	0.19	24.18	131.29
892	58.53	130.94	3.49	0.38	24.02	131.59
893	58.60	148.76	3.70	0.95	23.93	131.89
894	58.67	146.04	3.73	1.05	23.33	132.33
895	58.73	150.37	3.99	1.14	23.68	133.06
896	58.80	162.85	4.76	1.24	22.22	134.36
897	58.86	206.73	5.54	1.43	20.03	135.86
898	58.93	244.17	6.30	1.43	18.49	136.88
899	59.00	240.35	6.51	1.53	19.10	137.25
900	59.07	207.13	6.50	0.76	21.76	137.01
901	59.14	172.71	6.35	0.76	25.43	136.49
902	59.21	153.69	6.11	0.76	28.19	135.80
903	59.27	145.23	5.53	1.05	28.81	135.06
904	59.33	144.43	4.95	1.14	27.84	134.18
905	59.39	143.62	4.35	1.34	26.07	133.19
906	59.47	143.12	3.68	1.43	24.74	132.31
907	59.53	140.40	3.51	1.53	23.95	131.66
908	59.58	138.89	3.42	1.53	24.07	131.55
909	59.67	138.84	3.55	1.62	24.25	131.57
910	59.73	138.84	3.56	1.62	24.67	131.79
911	59.81	138.79	3.74	1.72	24.53	132.05
912	59.84	147.15	3.87	1.81	24.02	132.52
913	59.92	157.41	4.12	1.72	24.23	132.92
914	60.00	146.34	4.34	1.72	25.38	133.19
915	60.04	138.29	4.42	1.72	26.84	133.35
916	60.12	142.32	4.55	1.72	28.04	133.53
917	60.20	136.18	4.78	1.72	28.85	133.68
918	60.24	132.35	4.77	1.72	30.18	133.50
919	60.32	123.19	4.43	1.72	30.75	133.09
920	60.37	121.38	4.20	1.72	31.07	132.55
921	60.44	117.76	3.97	1.72	31.05	132.16
922	60.52	115.64	3.86	1.72	31.11	131.90
923	60.56	115.74	3.83	1.72	31.01	131.80
924	60.64	116.95	3.83	1.72	30.06	131.83
925	60.71	125.61	3.80	1.91	28.34	131.86
926	60.78	134.26	3.68	1.91	27.12	131.85
927	60.83	130.44	3.68	1.91	27.54	131.73
928	60.93	118.46	3.69	1.91	28.88	131.65

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
929	60.97	118.26	3.72	1.91	30.18	131.62
930	61.05	116.85	3.78	2.19	30.12	131.56
931	61.10	118.06	3.60	2.29	30.33	131.38
932	61.18	112.73	3.51	2.29	30.50	131.22
933	61.23	112.42	3.59	2.29	31.04	131.23
934	61.30	113.43	3.67	2.29	30.99	131.33
935	61.36	115.24	3.63	2.10	30.74	131.35
936	61.42	115.24	3.59	2.10	29.10	131.47
937	61.49	131.85	3.65	2.58	28.69	131.64
938	61.55	123.19	3.81	2.58	28.46	131.98
939	61.63	125.10	4.02	2.58	28.80	132.28
940	61.69	134.87	4.09	2.77	27.74	132.58
941	61.75	141.81	4.10	2.67	27.11	132.65
942	61.82	134.46	4.06	2.58	27.23	132.58
943	61.88	131.85	4.01	2.86	27.73	132.43
944	61.95	132.75	3.94	3.05	27.61	132.25
945	62.01	131.85	3.79	3.05	27.07	131.97
946	62.09	132.05	3.57	3.15	26.20	131.72
947	62.15	137.38	3.51	3.15	24.99	131.56
948	62.22	143.62	3.46	3.15	24.37	131.56
949	62.30	140.10	3.49	3.15	24.02	131.61
950	62.34	143.47	3.53	3.15	24.28	131.65
951	62.42	141.31	3.55	3.34	24.19	131.73
952	62.50	143.32	3.58	3.34	24.30	131.69
953	62.54	141.41	3.50	3.43	24.22	131.80
954	62.62	145.03	3.67	3.43	24.69	132.11
955	62.70	144.73	4.04	3.43	25.15	132.55
956	62.74	146.24	4.14	3.43	25.42	133.07
957	62.82	154.59	4.44	3.53	24.92	133.48
958	62.86	162.75	4.60	3.53	24.90	133.77
959	62.94	154.49	4.59	3.53	25.00	133.88
960	63.01	156.10	4.63	3.53	25.70	133.92
961	63.07	154.19	4.77	3.82	25.64	134.01
962	63.15	157.82	4.73	3.82	25.70	133.94
963	63.21	153.49	4.51	3.82	25.43	133.70
964	63.26	151.88	4.35	3.91	25.12	133.41
965	63.32	154.59	4.23	4.01	24.81	133.18
966	63.41	151.93	4.11	4.01	24.53	133.02
967	63.47	151.98	4.07	4.01	24.20	132.91
968	63.54	156.71	4.04	4.01	23.63	132.96
969	63.61	161.74	4.11	4.01	23.20	133.21
970	63.67	165.87	4.38	4.10	23.09	133.64
971	63.74	170.80	4.67	4.20	22.93	134.02
972	63.82	175.53	4.68	4.20	22.80	134.19
973	63.86	173.52	4.64	4.20	22.95	134.12
974	63.94	166.27	4.57	4.10	23.69	133.97
975	63.99	159.02	4.54	4.10	24.56	133.72
976	64.07	153.19	4.36	4.29	25.01	133.49

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
977	64.11	153.69	4.28	4.39	25.51	133.26
978	64.20	146.14	4.25	4.29	25.96	133.16
979	64.24	144.43	4.26	4.20	26.66	133.25
980	64.33	146.84	4.51	4.29	26.74	133.45
981	64.38	150.57	4.58	4.29	26.54	133.62
982	64.46	151.37	4.49	4.10	26.15	133.58
983	64.51	151.47	4.40	4.10	26.78	133.27
984	64.59	134.46	4.18	4.10	28.13	132.88
985	64.64	125.61	4.06	4.10	30.63	132.21
986	64.72	109.40	3.70	4.20	31.76	131.11
987	64.81	102.26	2.83	4.20	32.88	130.32
988	64.85	102.16	3.22	4.20	32.85	130.00
989	64.93	104.27	3.33	4.29	33.36	130.49
990	64.97	106.69	3.43	4.29	32.56	131.02
991	65.06	118.36	3.79	4.39	31.79	131.92
992	65.11	128.43	4.44	4.39	30.64	133.09
993	65.17	142.52	5.01	4.39	30.42	133.81
994	65.23	137.38	4.93	4.39	30.14	134.07
995	65.29	137.99	4.84	4.77	30.28	133.82
996	65.36	135.27	4.61	4.86	30.17	133.59
997	65.43	133.36	4.53	4.86	24.00	134.11
998	65.49	233.50	4.84	4.67	21.74	135.07
999	65.56	205.12	5.89	4.58	12.06	137.37
1000	65.62	554.37	7.86	6.58	9.42	137.37
1001	65.69	575.10	10.15	7.54	8.69	137.37
1002	65.76	448.38	11.41	4.20	12.37	137.37
1003	65.81	327.51	11.71	3.62	18.44	137.37
1004	65.88	239.44	11.21	3.24	24.74	137.37
1005	65.95	203.31	10.23	3.72	29.85	137.37
1006	66.02	173.42	9.08	4.48	32.11	137.37
1007	66.08	164.16	8.07	5.44	32.97	137.37
1008	66.15	157.82	7.20	6.01	32.45	137.19
1009	66.21	152.58	6.44	6.30	31.30	136.37
1010	66.28	155.80	5.89	6.49	28.39	135.94
1011	66.34	184.29	5.74	6.77	24.70	135.79
1012	66.41	204.82	5.48	6.87	21.89	135.84
1013	66.47	209.55	5.48	7.15	21.46	135.91
1014	66.54	195.76	5.80	6.96	23.24	136.22
1015	66.61	181.06	6.45	6.96	24.62	136.73
1016	66.69	201.80	6.82	7.63	24.21	137.15
1017	66.75	218.51	6.67	7.54	22.49	137.35
1018	66.80	223.64	6.56	7.44	21.66	137.37
1019	66.87	222.63	6.79	6.39	21.53	137.37
1020	66.93	223.44	6.72	6.49	21.77	137.37
1021	66.99	222.13	6.83	6.58	22.28	137.37
1022	67.06	205.72	6.56	6.77	23.81	137.23
1023	67.15	185.59	6.64	6.87	25.35	136.96
1024	67.20	184.29	6.53	6.77	26.21	136.88

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1025	67.27	188.31	6.55	7.25	25.50	136.76
1026	67.35	193.85	6.23	7.35	24.84	136.57
1027	67.40	189.52	5.97	7.15	25.17	136.15
1028	67.48	168.89	5.72	7.20	26.08	135.81
1029	67.53	168.28	5.69	6.87	27.27	135.53
1030	67.59	163.35	5.60	7.25	26.82	135.26
1031	67.66	167.68	5.11	7.25	26.47	134.97
1032	67.73	165.06	5.09	7.35	26.08	134.75
1033	67.80	162.85	5.12	7.35	25.76	134.74
1034	67.85	172.41	5.06	7.44	24.12	135.02
1035	67.93	199.89	5.33	7.44	21.82	135.36
1036	67.98	215.79	5.34	7.44	19.56	135.69
1037	68.06	233.10	5.26	7.06	18.68	135.70
1038	68.12	221.32	5.18	6.68	19.06	135.55
1039	68.18	201.29	5.14	6.58	21.10	135.28
1040	68.26	178.05	5.13	7.15	23.33	134.99
1041	68.32	169.69	5.04	7.35	24.70	134.59
1042	68.37	166.07	4.66	7.44	25.05	134.29
1043	68.46	163.85	4.66	7.44	24.66	133.93
1044	68.52	165.57	4.39	7.54	24.09	133.90
1045	68.59	174.42	4.53	7.54	22.95	134.43
1046	68.66	198.98	5.36	7.63	21.74	135.20
1047	68.70	213.17	5.52	7.63	21.21	136.07
1048	68.79	216.69	6.08	7.44	21.24	136.52
1049	68.83	215.79	6.29	7.06	21.36	136.90
1050	68.91	225.45	6.34	7.44	21.76	137.07
1051	68.98	214.88	6.54	6.96	22.64	137.19
1052	69.04	201.80	6.75	7.44	23.19	137.24
1053	69.10	216.29	6.57	7.54	23.10	137.09
1054	69.17	211.16	6.17	7.54	21.90	136.84
1055	69.24	217.70	5.94	7.54	21.93	136.44
1056	69.29	200.39	5.71	7.54	23.05	135.93
1057	69.38	170.60	5.35	7.44	25.45	135.45
1058	69.44	160.03	5.41	7.73	27.58	135.17
1059	69.51	160.23	5.51	7.82	28.27	135.22
1060	69.57	162.85	5.56	7.73	28.14	135.17
1061	69.64	160.53	5.29	7.73	27.35	134.67
1062	69.70	157.41	4.46	7.73	26.12	135.10
1063	69.77	193.14	6.17	7.73	22.95	136.68
1064	69.84	268.43	7.89	8.11	19.87	137.37
1065	69.88	312.01	8.40	8.20	16.93	137.37
1066	69.97	355.39	8.89	7.63	17.15	137.37
1067	70.06	285.74	9.20	6.49	19.31	137.37
1068	70.11	234.21	8.88	6.49	23.98	137.37
1069	70.16	200.59	8.47	6.87	27.86	137.37
1070	70.21	177.84	7.97	8.59	29.75	137.37
1071	70.28	176.84	7.21	8.97	30.03	137.20
1072	70.35	164.26	5.90	9.06	27.79	136.10

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1073	70.41	176.94	5.05	9.25	26.45	135.11
1074	70.47	167.28	5.02	9.35	25.15	134.86
1075	70.56	177.04	5.25	9.63	24.15	135.08
1076	70.62	200.19	5.27	9.73	21.88	135.41
1077	70.68	220.22	5.24	9.73	20.42	135.55
1078	70.74	213.07	5.25	9.63	20.92	135.50
1079	70.81	187.61	5.26	9.73	22.70	135.39
1080	70.87	180.86	5.34	9.35	24.30	135.40
1081	70.94	184.59	5.54	9.73	25.31	135.42
1082	71.02	171.70	5.47	9.83	25.60	135.01
1083	71.10	163.85	4.61	10.02	25.90	134.40
1084	71.15	162.45	4.51	10.02	24.99	133.68
1085	71.23	164.76	4.15	10.11	24.60	133.35
1086	71.26	161.04	4.07	10.02	22.79	133.14
1087	71.33	184.89	3.96	10.68	21.71	133.09
1088	71.40	181.97	3.94	10.49	21.38	133.02
1089	71.46	165.06	3.92	10.40	22.81	132.81
1090	71.53	154.49	3.85	10.78	24.34	132.57
1091	71.60	152.08	3.80	10.88	24.63	132.44
1092	71.66	157.82	3.79	11.07	23.47	132.40
1093	71.74	170.50	3.65	11.16	21.95	132.44
1094	71.80	177.74	3.67	11.16	20.93	132.45
1095	71.85	175.73	3.67	11.07	21.34	132.47
1096	71.92	164.16	3.73	11.07	23.04	132.38
1097	72.01	147.35	3.75	11.07	24.80	132.13
1098	72.07	143.42	3.55	11.26	25.56	131.72
1099	72.13	144.03	3.29	11.35	25.32	131.30
1100	72.19	140.71	3.21	11.35	25.27	131.01
1101	72.26	137.48	3.20	11.54	25.02	130.96
1102	72.34	146.24	3.20	11.64	24.34	131.10
1103	72.38	152.98	3.30	11.64	23.22	131.41
1104	72.47	161.04	3.45	11.54	22.90	131.75
1105	72.51	160.03	3.58	11.54	25.27	133.21
1106	72.60	156.61	5.54	11.73	27.35	134.76
1107	72.64	174.82	6.28	11.73	27.39	136.45
1108	72.73	210.15	6.94	11.73	24.92	137.29
1109	72.77	227.77	6.97	11.54	24.36	137.37
1110	72.86	195.96	6.82	11.50	26.45	137.37
1111	72.90	164.96	6.90	11.50	28.25	137.16
1112	72.97	191.03	6.82	11.45	28.07	136.82
1113	73.04	187.91	5.98	11.73	26.48	136.22
1114	73.10	171.00	5.29	12.12	25.19	135.45
1115	73.17	187.66	5.06	12.31	24.56	134.89
1116	73.24	180.86	4.84	12.40	23.19	134.66
1117	73.31	187.41	4.67	12.40	23.30	134.41
1118	73.36	177.94	4.65	12.50	24.23	134.19
1119	73.43	158.72	4.62	12.50	25.82	133.96
1120	73.50	156.31	4.51	12.50	26.62	133.75

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1121	73.56	160.94	4.42	12.78	25.77	133.45
1122	73.63	162.85	4.04	12.88	24.72	133.02
1123	73.71	159.93	3.74	12.78	24.03	132.50
1124	73.77	157.41	3.61	12.97	24.04	132.19
1125	73.84	154.70	3.63	13.07	24.13	132.16
1126	73.91	157.92	3.71	13.16	24.49	132.27
1127	73.99	155.30	3.79	13.26	24.94	132.56
1128	74.03	155.90	4.07	13.36	26.45	133.66
1129	74.12	166.17	5.52	13.36	27.20	134.71
1130	74.16	174.12	5.64	13.36	27.45	135.85
1131	74.25	186.10	6.29	13.45	27.37	136.52
1132	74.29	188.61	6.92	13.45	26.92	137.37
1133	74.38	216.79	7.98	13.64	25.14	137.37
1134	74.41	250.21	8.03	14.12	22.78	137.37
1135	74.49	259.57	7.62	12.78	21.95	137.37
1136	74.56	225.35	7.06	11.64	23.40	137.37
1137	74.63	186.10	6.49	12.31	26.67	136.88
1138	74.70	162.14	5.97	13.26	29.07	135.90
1139	74.76	157.61	5.35	14.21	29.13	134.94
1140	74.82	158.32	4.60	14.50	27.56	134.02
1141	74.89	158.32	4.13	14.60	25.99	133.24
1142	74.97	158.32	3.92	14.69	25.25	132.84
1143	75.01	158.32	3.93	14.88	25.40	132.96
1144	75.10	159.43	4.32	14.79	25.85	133.33
1145	75.14	161.94	4.51	14.98	24.66	133.82
1146	75.20	189.82	4.52	16.69	23.50	134.19
1147	75.27	189.72	4.76	16.98	23.00	134.50
1148	75.34	180.66	4.94	17.17	23.70	134.60
1149	75.41	180.76	4.79	17.12	24.07	134.51
1150	75.48	180.86	4.66	17.08	24.30	134.29
1151	75.54	170.40	4.61	17.08	25.22	134.04
1152	75.61	158.62	4.49	17.08	26.63	133.74
1153	75.67	152.28	4.37	17.08	27.05	133.47
1154	75.74	157.61	4.25	17.17	27.60	133.67
1155	75.82	156.61	4.87	17.36	27.42	134.40
1156	75.86	174.82	5.55	17.55	26.51	136.31
1157	75.94	229.28	7.78	17.65	23.22	137.37
1158	76.01	298.92	9.19	18.03	20.01	137.37
1159	76.08	342.50	9.60	17.46	18.29	137.37
1160	76.12	328.51	9.54	16.41	19.07	137.37
1161	76.19	267.12	9.19	13.16	22.09	137.37
1162	76.25	219.21	8.63	16.55	26.78	137.37
1163	76.32	174.22	7.57	15.07	30.09	137.37
1164	76.38	166.67	6.59	16.69	31.13	136.61
1165	76.45	162.24	5.49	17.08	29.68	135.35
1166	76.52	157.51	4.65	17.36	28.63	134.38
1167	76.59	154.09	4.64	17.84	28.44	133.89
1168	76.66	151.98	4.64	18.03	27.07	134.14

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1169	76.73	182.98	4.88	18.51	24.60	134.63
1170	76.79	206.13	5.12	18.98	22.28	135.14
1171	76.84	210.45	5.17	19.08	22.59	135.38
1172	76.92	185.39	5.36	18.98	24.95	135.40
1173	76.99	164.36	5.55	18.70	26.70	135.46
1174	77.04	184.19	5.56	20.32	27.06	135.39
1175	77.11	177.94	5.28	20.61	25.36	135.13
1176	77.17	182.98	4.79	20.89	24.58	134.58
1177	77.24	180.06	4.46	20.70	24.14	134.05
1178	77.30	169.19	4.35	20.51	24.90	133.59
1179	77.38	157.61	4.17	20.61	26.14	133.19
1180	77.44	151.17	4.02	20.99	26.87	132.80
1181	77.51	149.26	3.85	21.18	26.84	132.49
1182	77.56	150.47	3.73	21.27	25.91	132.33
1183	77.64	159.32	3.71	21.56	24.87	132.28
1184	77.70	162.75	3.67	21.56	24.04	132.15
1185	77.77	159.32	3.47	21.46	23.91	131.97
1186	77.83	156.71	3.46	21.46	24.97	132.65
1187	77.90	165.26	4.67	21.85	25.29	134.47
1188	77.97	206.33	6.30	22.42	22.85	136.36
1189	78.06	264.20	6.60	22.32	20.06	137.37
1190	78.10	273.56	6.43	21.27	18.16	137.37
1191	78.16	265.00	6.16	14.31	18.94	137.21
1192	78.23	225.15	5.96	20.80	21.81	136.67
1193	78.28	180.46	5.88	16.60	26.02	136.00
1194	78.36	160.53	5.55	20.32	29.22	135.28
1195	78.42	155.00	5.03	21.08	29.57	134.40
1196	78.49	151.68	4.31	21.46	27.98	133.48
1197	78.56	157.21	3.83	21.94	25.16	133.04
1198	78.63	182.17	4.02	22.42	22.84	133.12
1199	78.68	190.63	4.13	22.51	21.79	133.41
1200	78.76	184.59	4.12	22.04	22.64	133.40
1201	78.81	167.07	4.12	21.75	25.22	133.18
1202	78.90	143.12	4.13	21.66	27.71	132.90
1203	78.96	143.12	3.99	22.13	29.03	132.57
1204	79.02	143.12	3.81	22.70	28.35	132.30
1205	79.07	145.03	3.69	22.80	27.26	131.92
1206	79.15	147.35	3.37	22.99	25.76	131.55
1207	79.21	153.49	3.20	23.18	24.58	131.20
1208	79.29	152.48	3.15	23.28	23.92	131.06
1209	79.34	153.34	3.15	23.37	23.93	131.05
1210	79.41	153.19	3.18	24.80	24.14	131.05
1211	79.48	149.56	3.17	25.09	24.49	130.96
1212	79.54	146.44	3.08	25.19	24.78	130.67
1213	79.60	142.62	2.89	25.19	24.79	130.35
1214	79.69	142.11	2.83	25.38	24.93	130.37
1215	79.73	145.23	3.11	25.47	26.42	131.74
1216	79.81	156.10	4.60	25.76	26.97	133.68

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1217	79.89	184.59	5.61	26.14	26.64	135.22
1218	79.93	194.95	5.71	26.14	25.52	135.86
1219	80.02	194.75	5.67	25.09	25.60	135.87
1220	80.06	183.68	5.63	25.09	27.14	135.65
1221	80.12	163.25	5.53	24.52	29.08	135.31
1222	80.19	156.41	5.31	27.38	30.48	134.80
1223	80.26	151.07	4.85	27.95	29.89	134.11
1224	80.32	152.68	4.23	28.33	28.89	133.44
1225	80.39	151.78	4.08	28.52	28.10	133.07
1226	80.46	151.78	4.20	28.71	27.35	133.00
1227	80.53	160.73	4.04	29.00	25.96	133.23
1228	80.58	177.04	4.26	29.48	23.37	133.55
1229	80.66	201.40	4.34	29.57	22.06	134.05
1230	80.72	200.09	4.62	29.19	22.48	134.50
1231	80.78	184.08	5.04	28.33	25.32	134.67
1232	80.87	157.82	5.05	29.10	28.41	134.54
1233	80.93	150.67	4.83	30.05	29.96	134.04
1234	81.01	150.77	4.39	30.24	29.65	133.64
1235	81.04	151.37	4.35	30.34	28.07	133.54
1236	81.11	168.18	4.47	32.15	26.38	133.88
1237	81.18	183.78	4.71	32.53	24.60	134.30
1238	81.24	191.13	4.78	32.15	24.08	134.50
1239	81.31	183.58	4.74	30.91	24.81	134.49
1240	81.37	171.40	4.79	30.15	27.58	134.42
1241	81.45	147.05	5.05	30.05	30.40	134.47
1242	81.50	147.75	5.20	31.10	31.81	134.62
1243	81.56	158.22	5.24	31.96	30.74	134.65
1244	81.64	160.83	4.96	32.44	29.73	134.49
1245	81.69	156.41	4.78	31.77	29.66	134.31
1246	81.77	154.49	4.91	32.63	29.98	134.55
1247	81.83	163.45	5.43	33.29	27.46	135.10
1248	81.91	206.73	5.42	34.44	24.46	135.72
1249	81.97	223.74	5.61	34.25	22.27	136.15
1250	82.02	221.93	5.89	32.15	23.90	136.27
1251	82.12	178.35	5.95	29.10	27.40	136.15
1252	82.18	159.12	5.98	31.39	31.20	135.83
1253	82.22	157.71	5.83	33.10	32.34	135.47
1254	82.28	154.19	5.38	34.15	30.80	134.94
1255	82.36	163.95	4.74	36.73	29.35	134.38
1256	82.42	161.04	4.60	37.01	27.98	134.07
1257	82.49	164.26	4.68	37.78	27.64	133.92
1258	82.55	164.66	4.44	37.78	27.49	134.12
1259	82.62	168.79	4.91	38.06	26.54	134.38
1260	82.69	185.80	4.99	38.54	24.62	134.49
1261	82.75	198.38	4.37	37.97	23.31	134.06
1262	82.83	178.05	4.02	35.49	23.78	133.49
1263	82.88	160.43	4.18	37.97	26.84	133.10
1264	82.96	141.51	4.16	37.21	29.28	132.90

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1265	83.01	141.71	4.01	37.97	29.67	132.57
1266	83.07	147.85	3.74	38.35	28.91	132.14
1267	83.14	140.50	3.49	39.21	28.17	132.13
1268	83.20	150.47	3.92	40.54	28.69	133.20
1269	83.27	167.98	5.31	41.50	27.31	134.93
1270	83.34	207.13	6.16	42.74	24.97	136.29
1271	83.40	233.40	6.19	42.17	22.58	136.53
1272	83.47	224.14	5.37	38.45	21.55	135.78
1273	83.53	200.99	4.49	42.12	23.27	134.82
1274	83.61	164.86	4.73	36.44	25.63	134.25
1275	83.67	166.07	4.75	42.07	27.20	134.22
1276	83.74	176.74	4.64	43.02	26.50	134.18
1277	83.80	174.02	4.57	44.55	27.19	134.01
1278	83.86	151.58	4.57	38.64	28.81	133.83
1279	83.93	149.96	4.56	39.21	30.66	133.68
1280	84.00	147.25	4.55	39.30	30.70	133.60
1281	84.05	149.36	4.45	39.59	30.56	133.34
1282	84.13	145.23	4.13	42.45	29.72	132.99
1283	84.19	148.76	3.92	43.79	28.75	132.51
1284	84.25	149.26	3.65	44.74	27.07	132.02
1285	84.33	154.59	3.30	46.27	24.50	131.07
1286	84.39	159.63	2.52	46.94	21.26	129.52
1287	84.46	158.82	1.79	47.03	19.42	128.34
1288	84.51	155.50	2.16	47.22	18.91	127.70
1289	84.58	152.78	2.01	47.41	19.30	127.81
1290	84.65	155.15	1.90	48.37	19.80	128.12
1291	84.72	154.80	2.42	49.61	22.93	129.56
1292	84.79	139.80	3.46	50.37	25.96	131.53
1293	84.85	161.34	4.25	53.61	27.71	133.52
1294	84.91	182.57	5.33	56.09	26.64	135.49
1295	84.98	213.47	6.70	54.28	25.43	136.70
1296	85.05	223.64	6.52	48.56	24.37	137.12
1297	85.11	218.71	6.06	33.20	24.27	136.58
1298	85.18	195.46	5.49	33.20	24.61	135.53
1299	85.24	180.66	4.49	33.20	26.31	134.63
1300	85.31	161.44	4.67	39.78	27.88	134.16
1301	85.37	158.72	4.92	47.13	29.38	134.53
1302	85.44	170.19	5.31	56.76	28.30	135.02
1303	85.51	190.32	5.40	59.24	26.72	135.41
1304	85.57	194.65	5.41	55.62	25.98	135.54
1305	85.63	186.80	5.44	47.60	27.23	135.47
1306	85.70	168.28	5.47	45.41	29.83	135.31
1307	85.77	152.08	5.49	52.85	31.49	135.21
1308	85.84	162.24	5.48	61.15	30.53	135.05
1309	85.89	176.13	5.03	63.06	27.31	134.33
1310	85.96	176.13	3.77	62.58	26.31	133.43
1311	86.04	151.37	3.91	56.00	26.56	132.70
1312	86.09	153.19	4.01	59.24	28.99	132.95

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1313	86.16	150.67	4.39	68.21	28.89	133.42
1314	86.23	164.56	4.61	80.52	28.68	133.85
1315	86.29	166.87	4.65	87.39	26.93	134.13
1316	86.36	182.98	4.63	84.14	26.31	134.18
1317	86.43	175.73	4.60	67.07	26.20	134.00
1318	86.48	163.55	4.34	84.14	26.54	133.43
1319	86.55	161.84	3.78	72.41	26.83	132.79
1320	86.62	154.29	3.70	84.14	26.66	132.20
1321	86.68	150.87	3.53	85.48	26.79	131.90
1322	86.75	152.38	3.40	85.29	26.53	131.64
1323	86.82	151.58	3.36	87.58	26.05	131.51
1324	86.88	153.89	3.32	98.17	25.63	131.47
1325	86.95	156.81	3.32	97.21	25.31	131.59
1326	87.01	158.92	3.47	100.84	25.21	131.88
1327	87.08	162.85	3.66	106.66	24.73	132.00
1328	87.14	166.87	3.42	107.80	23.61	131.58
1329	87.21	164.76	2.84	107.32	22.83	131.18
1330	87.28	164.26	3.12	108.47	22.91	131.13
1331	87.35	164.71	3.38	102.55	23.43	131.43
1332	87.40	164.66	3.23	109.14	22.62	131.25
1333	87.47	172.01	2.82	116.58	21.91	130.82
1334	87.53	164.56	2.85	134.32	21.21	130.78
1335	87.61	174.62	3.12	149.30	16.82	127.96
1336	87.67	176.33	0.00	154.17	10.48	123.35
1337	87.73	192.84	0.00	161.89	100.00	87.42
1338	87.80	195.05	0.00	153.97	100.00	87.42
1339	87.87	204.11	0.00	113.33	100.00	87.42
1340	87.93	193.14	0.00	85.10	100.00	87.42
1341	88.00	250.21	0.00	75.56	100.00	87.42

Abbreviations

Depth:	Depth from free surface, at which CPT was performed (ft)
q_c:	Measured cone resistance (tsf)
f_s:	Sleeve friction resistance (tsf)
u:	Pore pressure (tsf)
Fines content:	Percentage of fines in soil (%)
Unit weight:	Bulk soil unit weight (pcf)

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
305	0.02	1.51	0.01	1.50	1.00	0.622	1.19	0.524	0.91	1.00	0.533	No
306	0.10	1.52	0.01	1.51	1.00	0.623	1.19	0.525	0.92	1.00	0.531	No
307	0.15	1.52	0.01	1.51	1.00	0.623	1.19	0.525	0.92	1.00	0.535	No
308	0.23	1.53	0.02	1.51	1.00	0.624	1.19	0.526	0.92	1.00	0.532	No
309	0.29	1.53	0.02	1.51	1.00	0.625	1.19	0.527	0.93	1.00	0.546	No
310	0.36	1.54	0.02	1.51	1.00	0.626	1.19	0.527	0.93	1.00	0.552	No
311	0.43	1.54	0.02	1.52	1.00	0.627	1.19	0.528	0.93	1.00	0.549	No
312	0.47	1.54	0.02	1.52	1.00	0.627	1.19	0.529	0.94	1.00	0.566	No
313	0.54	1.55	0.03	1.52	1.00	0.628	1.19	0.529	0.93	1.00	0.551	No
314	0.62	1.55	0.03	1.52	1.00	0.629	1.19	0.530	0.92	1.00	0.541	No
315	0.68	1.56	0.03	1.52	1.00	0.630	1.19	0.531	0.91	1.00	0.539	No
316	0.75	1.56	0.03	1.53	1.00	0.631	1.19	0.532	0.90	1.00	0.548	No
317	0.81	1.56	0.04	1.53	1.00	0.632	1.19	0.532	0.90	1.00	0.550	No
318	0.88	1.57	0.04	1.53	1.00	0.632	1.19	0.533	0.89	1.00	0.554	No
319	0.94	1.57	0.04	1.53	1.00	0.633	1.19	0.534	0.89	1.00	0.556	No
320	1.00	1.58	0.04	1.54	1.00	0.634	1.19	0.534	0.89	1.00	0.557	No
321	1.07	1.58	0.04	1.54	1.00	0.635	1.19	0.535	0.89	1.00	0.558	No
322	1.14	1.58	0.05	1.54	1.00	0.636	1.19	0.536	0.89	1.00	0.559	No
323	1.21	1.59	0.05	1.54	1.00	0.636	1.19	0.536	0.90	1.00	0.553	No
324	1.27	1.59	0.05	1.54	1.00	0.637	1.19	0.537	0.89	1.00	0.561	No
325	1.34	1.60	0.05	1.55	1.00	0.638	1.19	0.538	0.89	1.00	0.562	No
326	1.41	1.60	0.05	1.55	1.00	0.639	1.19	0.538	0.89	1.00	0.563	No
327	1.47	1.61	0.06	1.55	1.00	0.640	1.19	0.539	0.89	1.00	0.564	No
328	1.53	1.61	0.06	1.55	1.00	0.640	1.19	0.540	0.91	1.00	0.549	No
329	1.59	1.61	0.06	1.55	1.00	0.641	1.19	0.540	0.91	1.00	0.549	No
330	1.65	1.62	0.06	1.56	1.00	0.642	1.19	0.541	0.91	1.00	0.550	No
331	1.72	1.62	0.06	1.56	1.00	0.643	1.19	0.541	0.92	1.00	0.561	No
332	1.80	1.63	0.07	1.56	1.00	0.644	1.19	0.542	0.89	1.00	0.566	No
333	1.86	1.63	0.07	1.56	1.00	0.644	1.19	0.543	0.90	1.00	0.559	No
334	1.92	1.63	0.07	1.56	1.00	0.645	1.19	0.543	0.88	1.00	0.570	No
335	1.98	1.64	0.07	1.56	1.00	0.646	1.19	0.544	0.88	1.00	0.571	No
336	2.05	1.64	0.07	1.57	1.00	0.647	1.19	0.545	0.88	1.00	0.572	No
337	2.12	1.64	0.08	1.57	1.00	0.647	1.19	0.545	0.88	1.00	0.573	No
338	2.20	1.65	0.08	1.57	1.00	0.648	1.19	0.546	0.88	1.00	0.574	No
339	2.26	1.65	0.08	1.57	1.00	0.649	1.19	0.547	0.88	1.00	0.575	No
340	2.33	1.66	0.08	1.57	1.00	0.650	1.19	0.548	0.88	1.00	0.576	No
341	2.39	1.66	0.08	1.58	1.00	0.650	1.19	0.548	0.88	1.00	0.577	No
342	2.44	1.66	0.09	1.58	1.00	0.651	1.19	0.548	0.88	1.00	0.577	No
343	2.51	1.67	0.09	1.58	1.00	0.652	1.19	0.549	0.88	1.00	0.578	No
344	2.58	1.67	0.09	1.58	1.00	0.652	1.19	0.550	0.88	1.00	0.579	No
345	2.65	1.67	0.09	1.58	1.00	0.653	1.19	0.550	0.88	1.00	0.580	No
346	2.71	1.68	0.09	1.58	1.00	0.654	1.19	0.551	0.88	1.00	0.581	No
347	2.77	1.68	0.10	1.58	1.00	0.654	1.19	0.551	0.88	1.00	0.581	No
348	2.84	1.68	0.10	1.59	1.00	0.655	1.19	0.552	0.88	1.00	0.582	No
349	2.90	1.69	0.10	1.59	1.00	0.655	1.19	0.552	0.88	1.00	0.583	No
350	2.97	1.69	0.10	1.59	1.00	0.656	1.19	0.553	0.88	1.00	0.583	No
351	3.04	1.70	0.10	1.59	1.00	0.657	1.19	0.553	0.88	1.00	0.584	No
352	3.10	1.70	0.11	1.59	1.00	0.657	1.19	0.554	0.88	1.00	0.585	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
353	3.17	1.70	0.11	1.59	1.00	0.658	1.19	0.554	0.88	1.00	0.586	No
354	3.23	1.70	0.11	1.59	1.00	0.658	1.19	0.555	0.88	1.00	0.586	No
355	3.31	1.71	0.11	1.60	1.00	0.659	1.19	0.555	0.88	1.00	0.587	No
356	3.37	1.71	0.11	1.60	1.00	0.660	1.19	0.556	0.88	1.00	0.588	No
357	3.43	1.71	0.12	1.60	1.00	0.660	1.19	0.556	0.88	1.00	0.588	No
358	3.50	1.72	0.12	1.60	1.00	0.661	1.19	0.557	0.88	1.00	0.589	No
359	3.57	1.72	0.12	1.60	1.00	0.662	1.19	0.557	0.88	1.00	0.590	No
360	3.62	1.72	0.12	1.60	1.00	0.662	1.19	0.558	0.88	1.00	0.590	No
361	3.70	1.73	0.13	1.60	1.00	0.663	1.19	0.558	0.88	1.00	0.591	No
362	3.76	1.73	0.13	1.60	1.00	0.663	1.19	0.559	0.88	1.00	0.592	No
363	3.82	1.73	0.13	1.60	1.00	0.664	1.19	0.559	0.88	1.00	0.592	No
364	3.88	1.73	0.13	1.60	0.99	0.665	1.19	0.560	0.88	1.00	0.593	No
365	3.96	1.74	0.13	1.60	0.99	0.665	1.19	0.561	0.88	1.00	0.594	No
366	4.02	1.74	0.14	1.60	0.99	0.666	1.19	0.561	0.88	1.00	0.594	No
367	4.10	1.74	0.14	1.61	0.99	0.667	1.19	0.562	0.87	1.00	0.595	No
368	4.16	1.75	0.14	1.61	0.99	0.667	1.19	0.562	0.88	1.00	0.592	No
369	4.24	1.75	0.14	1.61	0.99	0.668	1.19	0.563	0.88	1.00	0.596	No
370	4.29	1.75	0.14	1.61	0.99	0.668	1.19	0.563	0.88	1.00	0.594	No
371	4.35	1.75	0.15	1.61	0.99	0.669	1.19	0.564	0.88	1.00	0.596	No
372	4.42	1.76	0.15	1.61	0.99	0.669	1.19	0.564	0.88	1.00	0.593	No
373	4.48	1.76	0.15	1.61	0.99	0.670	1.19	0.565	0.88	1.00	0.592	No
374	4.56	1.76	0.15	1.61	0.99	0.671	1.19	0.565	0.89	1.00	0.589	No
375	4.62	1.76	0.15	1.61	0.99	0.671	1.19	0.566	0.90	1.00	0.585	No
376	4.67	1.77	0.16	1.61	0.99	0.672	1.19	0.566	0.90	1.00	0.584	No
377	4.74	1.77	0.16	1.61	0.99	0.672	1.19	0.567	0.90	1.00	0.582	No
378	4.81	1.77	0.16	1.61	0.99	0.673	1.19	0.567	0.91	1.00	0.588	No
379	4.88	1.77	0.16	1.61	0.99	0.674	1.19	0.568	0.91	1.00	0.594	No
380	4.95	1.77	0.16	1.61	0.99	0.674	1.19	0.568	0.91	1.00	0.589	No
381	5.01	1.78	0.17	1.61	0.99	0.675	1.19	0.569	0.91	1.00	0.596	No
382	5.08	1.78	0.17	1.61	0.99	0.676	1.19	0.569	0.91	1.00	0.590	No
383	5.15	1.78	0.17	1.61	0.99	0.676	1.19	0.570	0.90	1.00	0.585	No
384	5.21	1.78	0.17	1.61	0.99	0.677	1.19	0.570	0.90	1.00	0.585	No
385	5.26	1.78	0.17	1.61	0.99	0.677	1.19	0.571	0.90	1.00	0.586	No
386	5.34	1.79	0.18	1.61	0.99	0.678	1.19	0.571	0.90	1.00	0.591	No
387	5.39	1.79	0.18	1.61	0.99	0.679	1.19	0.572	0.89	1.00	0.595	No
388	5.48	1.79	0.18	1.61	0.99	0.679	1.19	0.572	0.88	1.00	0.603	No
389	5.54	1.79	0.18	1.61	0.99	0.680	1.19	0.573	0.87	1.00	0.608	No
390	5.60	1.80	0.18	1.61	0.99	0.681	1.19	0.573	0.87	1.00	0.608	No
391	5.66	1.80	0.19	1.61	0.99	0.681	1.19	0.574	0.88	1.00	0.604	No
392	5.74	1.80	0.19	1.61	0.99	0.682	1.19	0.574	0.89	1.00	0.596	No
393	5.79	1.80	0.19	1.61	0.99	0.682	1.19	0.575	0.90	1.00	0.593	No
394	5.86	1.80	0.19	1.61	0.99	0.683	1.19	0.575	0.90	1.00	0.590	No
395	5.93	1.81	0.19	1.61	0.99	0.684	1.19	0.576	0.91	1.00	0.599	No
396	5.99	1.81	0.20	1.61	0.99	0.684	1.19	0.576	0.91	1.00	0.592	No
397	6.05	1.81	0.20	1.61	0.99	0.685	1.19	0.577	0.90	1.00	0.591	No
398	6.12	1.81	0.20	1.61	0.99	0.685	1.19	0.577	0.91	1.00	0.597	No
399	6.19	1.81	0.20	1.61	0.99	0.686	1.19	0.578	0.93	1.00	0.627	No
400	6.26	1.82	0.20	1.61	0.99	0.687	1.19	0.579	0.93	1.00	0.629	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
401	6.32	1.82	0.21	1.61	0.99	0.687	1.19	0.579	0.92	1.00	0.622	No
402	6.39	1.82	0.21	1.61	0.99	0.688	1.19	0.580	0.91	1.00	0.603	No
403	6.45	1.82	0.21	1.61	0.99	0.688	1.19	0.580	0.92	1.00	0.618	No
404	6.51	1.82	0.21	1.61	0.99	0.689	1.19	0.581	0.92	1.00	0.617	No
405	6.57	1.82	0.21	1.61	0.99	0.690	1.19	0.581	0.91	1.00	0.598	No
406	6.65	1.83	0.22	1.61	0.98	0.690	1.19	0.582	0.90	1.00	0.601	No
407	6.72	1.83	0.22	1.61	0.98	0.691	1.19	0.582	0.90	1.00	0.602	No
408	6.78	1.83	0.22	1.61	0.98	0.691	1.19	0.583	0.90	1.00	0.601	No
409	6.85	1.83	0.22	1.61	0.98	0.692	1.19	0.583	0.91	1.00	0.599	No
410	6.92	1.83	0.23	1.61	0.98	0.693	1.19	0.584	0.92	1.00	0.618	No
411	6.97	1.84	0.23	1.61	0.98	0.693	1.19	0.584	0.93	1.00	0.633	No
412	7.03	1.84	0.23	1.61	0.98	0.694	1.19	0.585	0.94	1.00	0.651	No
413	7.13	1.84	0.23	1.61	0.98	0.695	1.19	0.585	0.95	1.00	0.668	No
414	7.19	1.84	0.23	1.61	0.98	0.695	1.19	0.586	0.95	1.00	0.668	No
415	7.23	1.84	0.24	1.61	0.98	0.696	1.19	0.586	0.94	1.00	0.664	No
416	7.31	1.84	0.24	1.61	0.98	0.696	1.19	0.587	0.95	1.00	0.668	No
417	7.37	1.85	0.24	1.61	0.98	0.697	1.19	0.587	0.94	1.00	0.663	No
418	7.43	1.85	0.24	1.60	0.98	0.698	1.19	0.588	0.94	1.00	0.660	No
419	7.50	1.85	0.24	1.60	0.98	0.698	1.19	0.588	0.94	1.00	0.661	No
420	7.56	1.85	0.25	1.60	0.98	0.699	1.19	0.589	0.94	1.00	0.662	No
421	7.63	1.85	0.25	1.60	0.98	0.699	1.19	0.589	0.94	1.00	0.662	No
422	7.70	1.85	0.25	1.60	0.98	0.700	1.19	0.590	0.94	1.00	0.664	No
423	7.76	1.85	0.25	1.60	0.98	0.701	1.19	0.590	0.94	1.00	0.667	No
424	7.82	1.86	0.25	1.60	0.98	0.701	1.19	0.591	0.94	1.00	0.669	No
425	7.90	1.86	0.26	1.60	0.98	0.702	1.19	0.591	0.95	1.00	0.676	No
426	7.96	1.86	0.26	1.60	0.98	0.703	1.19	0.592	0.95	1.00	0.680	No
427	8.02	1.86	0.26	1.60	0.98	0.703	1.19	0.592	0.95	1.00	0.675	No
428	8.10	1.86	0.26	1.60	0.98	0.704	1.19	0.593	0.94	1.00	0.668	No
429	8.15	1.86	0.26	1.60	0.98	0.704	1.19	0.593	0.94	1.00	0.661	No
430	8.23	1.87	0.27	1.60	0.98	0.705	1.19	0.594	0.94	1.00	0.661	No
431	8.29	1.87	0.27	1.60	0.98	0.706	1.19	0.595	0.94	1.00	0.657	No
432	8.36	1.87	0.27	1.60	0.98	0.706	1.19	0.595	0.93	1.00	0.652	No
433	8.43	1.87	0.27	1.60	0.98	0.707	1.19	0.596	0.93	1.00	0.651	No
434	8.48	1.87	0.27	1.60	0.98	0.707	1.19	0.596	0.93	1.00	0.655	No
435	8.56	1.87	0.28	1.60	0.98	0.708	1.19	0.597	0.94	1.00	0.668	No
436	8.65	1.88	0.28	1.60	0.98	0.709	1.19	0.597	0.94	1.00	0.674	No
437	8.69	1.88	0.28	1.60	0.98	0.709	1.19	0.598	0.94	1.00	0.667	No
438	8.78	1.88	0.28	1.60	0.98	0.710	1.19	0.598	0.93	1.00	0.645	No
439	8.82	1.88	0.29	1.60	0.98	0.711	1.19	0.599	0.92	1.00	0.633	No
440	8.91	1.88	0.29	1.59	0.98	0.711	1.19	0.599	0.91	1.00	0.620	No
441	8.95	1.88	0.29	1.59	0.98	0.712	1.19	0.600	0.92	1.00	0.631	No
442	9.01	1.88	0.29	1.59	0.98	0.712	1.19	0.600	0.90	1.00	0.620	No
443	9.07	1.89	0.29	1.59	0.98	0.713	1.19	0.601	0.88	1.00	0.635	No
444	9.14	1.89	0.29	1.59	0.98	0.714	1.19	0.601	0.88	1.00	0.635	No
445	9.20	1.89	0.30	1.59	0.97	0.714	1.19	0.602	0.88	1.00	0.636	No
446	9.28	1.89	0.30	1.59	0.97	0.715	1.19	0.602	0.88	1.00	0.636	No
447	9.33	1.89	0.30	1.59	0.97	0.715	1.19	0.603	0.88	1.00	0.637	No
448	9.40	1.89	0.30	1.59	0.97	0.716	1.19	0.603	0.88	1.00	0.637	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
449	9.48	1.90	0.31	1.59	0.97	0.717	1.19	0.604	0.88	1.00	0.638	No
450	9.54	1.90	0.31	1.59	0.97	0.717	1.19	0.604	0.88	1.00	0.638	No
451	9.61	1.90	0.31	1.59	0.97	0.718	1.19	0.605	0.88	1.00	0.639	No
452	9.68	1.90	0.31	1.59	0.97	0.718	1.19	0.605	0.88	1.00	0.639	No
453	9.73	1.90	0.31	1.59	0.97	0.719	1.19	0.606	0.88	1.00	0.640	No
454	9.80	1.91	0.32	1.59	0.97	0.720	1.19	0.606	0.88	1.00	0.640	No
455	9.88	1.91	0.32	1.59	0.97	0.720	1.19	0.607	0.88	1.00	0.641	No
456	9.93	1.91	0.32	1.59	0.97	0.721	1.19	0.607	0.88	1.00	0.641	No
457	10.00	1.91	0.32	1.59	0.97	0.721	1.19	0.608	0.88	1.00	0.642	No
458	10.06	1.91	0.32	1.59	0.97	0.722	1.19	0.608	0.88	1.00	0.642	No
459	10.12	1.92	0.33	1.59	0.97	0.722	1.19	0.609	0.88	1.00	0.643	No
460	10.20	1.92	0.33	1.59	0.97	0.723	1.19	0.609	0.88	1.00	0.643	No
461	10.26	1.92	0.33	1.59	0.97	0.724	1.19	0.610	0.88	1.00	0.644	No
462	10.32	1.92	0.33	1.59	0.97	0.724	1.19	0.610	0.88	1.00	0.644	No
463	10.39	1.92	0.33	1.59	0.97	0.725	1.19	0.611	0.88	1.00	0.645	No
464	10.45	1.92	0.34	1.59	0.97	0.725	1.19	0.611	0.88	1.00	0.645	No
465	10.52	1.93	0.34	1.59	0.97	0.726	1.19	0.612	0.88	1.00	0.646	No
466	10.58	1.93	0.34	1.59	0.97	0.726	1.19	0.612	0.88	1.00	0.646	No
467	10.64	1.93	0.34	1.59	0.97	0.727	1.19	0.613	0.88	1.00	0.646	No
468	10.71	1.93	0.34	1.59	0.97	0.728	1.19	0.613	0.88	1.00	0.647	No
469	10.78	1.93	0.35	1.59	0.97	0.728	1.19	0.614	0.88	1.00	0.647	No
470	10.84	1.93	0.35	1.59	0.97	0.729	1.19	0.614	0.88	1.00	0.648	No
471	10.92	1.94	0.35	1.59	0.97	0.729	1.19	0.615	0.88	1.00	0.648	No
472	10.98	1.94	0.35	1.59	0.97	0.730	1.19	0.615	0.88	1.00	0.649	No
473	11.04	1.94	0.35	1.59	0.97	0.731	1.19	0.616	0.88	1.00	0.649	No
474	11.12	1.94	0.36	1.58	0.97	0.731	1.19	0.616	0.88	1.00	0.650	No
475	11.18	1.94	0.36	1.58	0.97	0.732	1.19	0.617	0.88	1.00	0.650	No
476	11.25	1.94	0.36	1.58	0.97	0.732	1.19	0.617	0.88	1.00	0.651	No
477	11.33	1.95	0.36	1.58	0.97	0.733	1.19	0.618	0.88	1.00	0.651	No
478	11.37	1.95	0.36	1.58	0.97	0.734	1.19	0.618	0.88	1.00	0.652	No
479	11.46	1.95	0.37	1.58	0.97	0.734	1.19	0.619	0.88	1.00	0.652	No
480	11.50	1.95	0.37	1.58	0.96	0.735	1.19	0.619	0.88	1.00	0.653	No
481	11.58	1.95	0.37	1.58	0.96	0.735	1.19	0.620	0.88	1.00	0.653	No
482	11.64	1.95	0.37	1.58	0.96	0.736	1.19	0.620	0.88	1.00	0.654	No
483	11.71	1.96	0.38	1.58	0.96	0.737	1.19	0.621	0.88	1.00	0.654	No
484	11.79	1.96	0.38	1.58	0.96	0.737	1.19	0.621	0.88	1.00	0.655	No
485	11.83	1.96	0.38	1.58	0.96	0.738	1.19	0.622	0.88	1.00	0.655	No
486	11.91	1.96	0.38	1.58	0.96	0.739	1.19	0.622	0.88	1.00	0.655	No
487	11.96	1.96	0.38	1.58	0.96	0.739	1.19	0.623	0.88	1.00	0.656	No
488	12.04	1.96	0.39	1.58	0.96	0.740	1.19	0.623	0.88	1.00	0.656	No
489	12.09	1.96	0.39	1.58	0.96	0.740	1.19	0.624	0.88	1.00	0.657	No
490	12.16	1.97	0.39	1.58	0.96	0.741	1.19	0.624	0.88	1.00	0.657	No
491	12.24	1.97	0.39	1.58	0.96	0.741	1.19	0.625	0.88	1.00	0.658	No
492	12.29	1.97	0.39	1.58	0.96	0.742	1.19	0.625	0.88	1.00	0.658	No
493	12.37	1.97	0.40	1.58	0.96	0.743	1.19	0.626	0.88	1.00	0.659	No
494	12.43	1.97	0.40	1.58	0.96	0.743	1.19	0.626	0.88	1.00	0.659	No
495	12.50	1.98	0.40	1.58	0.96	0.744	1.19	0.627	0.88	1.00	0.660	No
496	12.57	1.98	0.40	1.57	0.96	0.744	1.19	0.627	0.88	1.00	0.660	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
497	12.61	1.98	0.40	1.57	0.96	0.745	1.19	0.627	0.88	1.00	0.660	No
498	12.70	1.98	0.41	1.57	0.96	0.745	1.19	0.628	0.88	1.00	0.661	No
499	12.75	1.98	0.41	1.57	0.96	0.746	1.19	0.628	0.88	1.00	0.661	No
500	12.83	1.98	0.41	1.57	0.96	0.747	1.19	0.629	0.88	1.00	0.662	No
501	12.87	1.98	0.41	1.57	0.96	0.747	1.19	0.629	0.88	1.00	0.662	No
502	12.96	1.99	0.41	1.57	0.96	0.748	1.19	0.630	0.88	1.00	0.663	No
503	13.01	1.99	0.42	1.57	0.96	0.748	1.19	0.630	0.88	1.00	0.663	No
504	13.10	1.99	0.42	1.57	0.96	0.749	1.19	0.631	0.93	1.00	0.669	No
505	13.15	1.99	0.42	1.57	0.96	0.749	1.19	0.631	0.93	1.00	2.000	Yes
506	13.23	1.99	0.42	1.57	0.96	0.750	1.19	0.632	0.95	1.00	2.000	Yes
507	13.29	2.00	0.42	1.57	0.96	0.751	1.19	0.632	0.95	1.00	2.000	Yes
508	13.35	2.00	0.43	1.57	0.96	0.751	1.19	0.633	0.95	1.00	2.000	Yes
509	13.41	2.00	0.43	1.57	0.96	0.752	1.19	0.633	0.96	1.00	2.000	Yes
510	13.46	2.00	0.43	1.57	0.96	0.752	1.19	0.634	0.96	1.00	2.000	Yes
511	13.55	2.00	0.43	1.57	0.96	0.753	1.19	0.634	0.96	1.00	2.000	Yes
512	13.60	2.00	0.43	1.57	0.96	0.753	1.19	0.635	0.96	1.00	2.000	Yes
513	13.67	2.01	0.44	1.57	0.96	0.754	1.19	0.635	0.96	1.00	0.747	No
514	13.75	2.01	0.44	1.57	0.95	0.754	1.19	0.636	0.96	1.00	0.749	No
515	13.79	2.01	0.44	1.57	0.95	0.755	1.19	0.636	0.96	1.00	0.749	No
516	13.88	2.01	0.44	1.57	0.95	0.756	1.19	0.637	0.96	1.00	0.750	No
517	13.96	2.01	0.45	1.57	0.95	0.756	1.19	0.637	0.96	1.00	0.751	No
518	13.99	2.01	0.45	1.57	0.95	0.757	1.19	0.637	0.96	1.00	0.751	No
519	14.06	2.02	0.45	1.57	0.95	0.757	1.19	0.638	0.96	1.00	0.752	No
520	14.13	2.02	0.45	1.57	0.95	0.758	1.19	0.639	0.96	1.00	0.753	No
521	14.20	2.02	0.45	1.57	0.95	0.758	1.19	0.639	0.96	1.00	0.754	No
522	14.28	2.02	0.46	1.57	0.95	0.759	1.19	0.640	0.96	1.00	0.754	No
523	14.33	2.02	0.46	1.57	0.95	0.760	1.19	0.640	0.96	1.00	0.754	No
524	14.41	2.03	0.46	1.57	0.95	0.760	1.19	0.641	0.96	1.00	2.000	Yes
525	14.48	2.03	0.46	1.57	0.95	0.761	1.19	0.641	0.96	1.00	2.000	Yes
526	14.51	2.03	0.46	1.57	0.95	0.761	1.19	0.641	0.96	1.00	2.000	Yes
527	14.60	2.03	0.47	1.57	0.95	0.762	1.19	0.642	0.96	1.00	2.000	Yes
528	14.68	2.03	0.47	1.56	0.95	0.762	1.19	0.642	0.96	1.00	2.000	Yes
529	14.72	2.03	0.47	1.56	0.95	0.763	1.19	0.643	0.95	1.00	2.000	Yes
530	14.80	2.04	0.47	1.56	0.95	0.763	1.19	0.643	0.96	1.00	2.000	Yes
531	14.88	2.04	0.47	1.56	0.95	0.764	1.19	0.644	0.96	1.00	2.000	Yes
532	14.92	2.04	0.48	1.56	0.95	0.764	1.19	0.644	0.96	1.00	2.000	Yes
533	15.00	2.04	0.48	1.56	0.95	0.765	1.19	0.645	0.96	1.00	2.000	Yes
534	15.05	2.04	0.48	1.56	0.95	0.765	1.19	0.645	0.96	1.00	0.753	No
535	15.13	2.05	0.48	1.56	0.95	0.766	1.19	0.645	0.96	1.00	0.754	No
536	15.20	2.05	0.48	1.56	0.95	0.767	1.19	0.646	0.96	1.00	0.756	No
537	15.27	2.05	0.49	1.56	0.95	0.767	1.19	0.646	0.96	1.00	0.758	No
538	15.30	2.05	0.49	1.56	0.95	0.767	1.19	0.647	0.96	1.00	0.759	No
539	15.37	2.05	0.49	1.56	0.95	0.768	1.19	0.647	0.96	1.00	0.760	No
540	15.44	2.06	0.49	1.56	0.95	0.769	1.19	0.648	0.96	1.00	0.761	No
541	15.50	2.06	0.49	1.56	0.95	0.769	1.19	0.648	0.96	1.00	0.764	No
542	15.57	2.06	0.50	1.56	0.95	0.770	1.19	0.648	0.96	1.00	0.766	No
543	15.64	2.06	0.50	1.56	0.95	0.770	1.19	0.649	0.96	1.00	0.767	No
544	15.71	2.06	0.50	1.56	0.95	0.771	1.19	0.649	0.97	1.00	0.768	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
545	15.78	2.06	0.50	1.56	0.95	0.771	1.19	0.650	0.97	1.00	0.768	No
546	15.84	2.07	0.50	1.56	0.94	0.772	1.19	0.650	0.96	1.00	0.769	No
547	15.92	2.07	0.51	1.56	0.94	0.772	1.19	0.651	0.96	1.00	0.768	No
548	16.00	2.07	0.51	1.56	0.94	0.773	1.19	0.651	0.96	1.00	0.767	No
549	16.04	2.07	0.51	1.56	0.94	0.773	1.19	0.652	0.96	1.00	0.767	No
550	16.12	2.07	0.51	1.56	0.94	0.774	1.19	0.652	0.96	1.00	0.769	No
551	16.16	2.08	0.51	1.56	0.94	0.774	1.19	0.653	0.96	1.00	0.770	No
552	16.24	2.08	0.52	1.56	0.94	0.775	1.19	0.653	0.96	1.00	0.771	No
553	16.33	2.08	0.52	1.56	0.94	0.776	1.19	0.654	0.96	1.00	0.770	No
554	16.37	2.08	0.52	1.56	0.94	0.776	1.19	0.654	0.96	1.00	0.772	No
555	16.45	2.08	0.52	1.56	0.94	0.777	1.19	0.654	0.96	1.00	2.000	Yes
556	16.49	2.08	0.52	1.56	0.94	0.777	1.19	0.655	0.96	1.00	2.000	Yes
557	16.58	2.09	0.53	1.56	0.94	0.778	1.19	0.655	0.96	1.00	2.000	Yes
558	16.62	2.09	0.53	1.56	0.94	0.778	1.19	0.656	0.96	1.00	2.000	Yes
559	16.70	2.09	0.53	1.56	0.94	0.779	1.19	0.656	0.96	1.00	2.000	Yes
560	16.79	2.09	0.53	1.56	0.94	0.779	1.19	0.657	0.96	1.00	2.000	Yes
561	16.83	2.09	0.54	1.56	0.94	0.780	1.19	0.657	0.96	1.00	2.000	Yes
562	16.90	2.10	0.54	1.56	0.94	0.780	1.19	0.657	0.96	1.00	0.773	No
563	16.97	2.10	0.54	1.56	0.94	0.781	1.19	0.658	0.96	1.00	0.769	No
564	17.01	2.10	0.54	1.56	0.94	0.781	1.19	0.658	0.96	1.00	0.770	No
565	17.10	2.10	0.54	1.56	0.94	0.782	1.19	0.659	0.96	1.00	0.774	No
566	17.14	2.10	0.54	1.56	0.94	0.782	1.19	0.659	0.96	1.00	0.775	No
567	17.23	2.11	0.55	1.56	0.94	0.783	1.19	0.659	0.96	1.00	0.777	No
568	17.27	2.11	0.55	1.56	0.94	0.783	1.19	0.660	0.96	1.00	0.778	No
569	17.36	2.11	0.55	1.56	0.94	0.784	1.19	0.660	0.96	1.00	0.779	No
570	17.40	2.11	0.55	1.56	0.94	0.784	1.19	0.661	0.96	1.00	0.780	No
571	17.49	2.12	0.56	1.56	0.94	0.785	1.19	0.661	0.96	1.00	0.780	No
572	17.53	2.12	0.56	1.56	0.94	0.785	1.19	0.661	0.97	1.00	0.782	No
573	17.62	2.12	0.56	1.56	0.94	0.786	1.19	0.662	0.96	1.00	0.781	No
574	17.67	2.12	0.56	1.56	0.94	0.786	1.19	0.662	0.96	1.00	0.781	No
575	17.75	2.12	0.56	1.56	0.94	0.787	1.19	0.663	0.96	1.00	0.778	No
576	17.83	2.13	0.57	1.56	0.94	0.787	1.19	0.663	0.96	1.00	0.780	No
577	17.89	2.13	0.57	1.56	0.93	0.788	1.19	0.664	0.96	1.00	0.781	No
578	17.93	2.13	0.57	1.56	0.93	0.788	1.19	0.664	0.96	1.00	0.782	No
579	18.02	2.13	0.57	1.56	0.93	0.789	1.19	0.664	0.96	1.00	0.784	No
580	18.06	2.13	0.57	1.56	0.93	0.789	1.19	0.665	0.96	1.00	2.000	Yes
581	18.15	2.14	0.58	1.56	0.93	0.789	1.19	0.665	0.96	1.00	2.000	Yes
582	18.19	2.14	0.58	1.56	0.93	0.790	1.19	0.665	0.96	1.00	2.000	Yes
583	18.28	2.14	0.58	1.56	0.93	0.790	1.19	0.666	0.96	1.00	2.000	Yes
584	18.32	2.14	0.58	1.56	0.93	0.791	1.19	0.666	0.96	1.00	2.000	Yes
585	18.41	2.14	0.58	1.56	0.93	0.791	1.19	0.667	0.95	1.00	2.000	Yes
586	18.49	2.15	0.59	1.56	0.93	0.792	1.19	0.667	0.94	1.00	2.000	Yes
587	18.53	2.15	0.59	1.56	0.93	0.792	1.19	0.667	0.94	1.00	2.000	Yes
588	18.62	2.15	0.59	1.56	0.93	0.793	1.19	0.668	0.94	1.00	2.000	Yes
589	18.66	2.15	0.59	1.56	0.93	0.793	1.19	0.668	0.93	1.00	0.720	No
590	18.74	2.16	0.59	1.56	0.93	0.793	1.19	0.668	0.93	1.00	0.706	No
591	18.79	2.16	0.60	1.56	0.93	0.794	1.19	0.669	0.93	1.00	0.707	No
592	18.87	2.16	0.60	1.56	0.93	0.794	1.19	0.669	0.92	1.00	0.703	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
593	18.92	2.16	0.60	1.56	0.93	0.794	1.19	0.669	0.92	1.00	0.698	No
594	19.01	2.17	0.60	1.56	0.93	0.795	1.19	0.670	0.92	1.00	0.694	No
595	19.05	2.17	0.60	1.56	0.93	0.795	1.19	0.670	0.92	1.00	0.695	No
596	19.14	2.17	0.61	1.57	0.93	0.796	1.19	0.670	0.92	1.00	0.696	No
597	19.18	2.17	0.61	1.57	0.93	0.796	1.19	0.671	0.91	1.00	0.685	No
598	19.27	2.18	0.61	1.57	0.93	0.797	1.19	0.671	0.92	1.00	0.696	No
599	19.32	2.18	0.61	1.57	0.93	0.797	1.19	0.671	0.91	1.00	0.683	No
600	19.40	2.18	0.62	1.57	0.93	0.797	1.19	0.672	0.91	1.00	0.684	No
601	19.44	2.18	0.62	1.57	0.93	0.797	1.19	0.672	0.91	1.00	0.685	No
602	19.53	2.19	0.62	1.57	0.93	0.798	1.19	0.672	0.91	1.00	0.686	No
603	19.57	2.19	0.62	1.57	0.93	0.798	1.19	0.673	0.90	1.00	0.690	No
604	19.66	2.19	0.62	1.57	0.93	0.799	1.19	0.673	0.90	1.00	0.690	No
605	19.70	2.20	0.62	1.57	0.93	0.799	1.19	0.673	0.91	1.00	0.687	No
606	19.79	2.20	0.63	1.57	0.93	0.799	1.19	0.674	0.92	1.00	0.693	No
607	19.83	2.20	0.63	1.57	0.92	0.800	1.19	0.674	0.92	1.00	0.706	No
608	19.92	2.20	0.63	1.57	0.92	0.800	1.19	0.674	0.92	1.00	0.706	No
609	20.00	2.21	0.63	1.57	0.92	0.801	1.19	0.675	0.92	1.00	0.699	No
610	20.05	2.21	0.64	1.57	0.92	0.801	1.19	0.675	0.92	1.00	0.695	No
611	20.09	2.21	0.64	1.57	0.92	0.801	1.19	0.675	0.91	1.00	0.693	No
612	20.18	2.21	0.64	1.58	0.92	0.802	1.19	0.675	0.92	1.00	0.706	No
613	20.23	2.22	0.64	1.58	0.92	0.802	1.19	0.676	0.92	1.00	0.706	No
614	20.30	2.22	0.64	1.58	0.92	0.802	1.19	0.676	0.92	1.00	0.714	No
615	20.38	2.22	0.65	1.58	0.92	0.803	1.19	0.676	0.93	1.00	0.721	No
616	20.43	2.23	0.65	1.58	0.92	0.803	1.19	0.676	0.93	1.00	0.719	No
617	20.51	2.23	0.65	1.58	0.92	0.803	1.19	0.677	0.93	1.00	0.720	No
618	20.56	2.23	0.65	1.58	0.92	0.804	1.19	0.677	0.92	1.00	0.716	No
619	20.62	2.23	0.65	1.58	0.92	0.804	1.19	0.677	0.92	1.00	0.713	No
620	20.70	2.24	0.66	1.58	0.92	0.804	1.19	0.678	0.92	1.00	0.716	No
621	20.76	2.24	0.66	1.58	0.92	0.805	1.19	0.678	0.92	1.00	0.715	No
622	20.82	2.24	0.66	1.58	0.92	0.805	1.19	0.678	0.92	1.00	0.714	No
623	20.89	2.24	0.66	1.58	0.92	0.805	1.19	0.678	0.92	1.00	0.713	No
624	20.98	2.25	0.66	1.58	0.92	0.806	1.19	0.679	0.92	1.00	0.712	No
625	21.02	2.25	0.67	1.58	0.92	0.806	1.19	0.679	0.92	1.00	0.711	No
626	21.11	2.25	0.67	1.58	0.92	0.806	1.19	0.679	0.92	1.00	0.708	No
627	21.15	2.25	0.67	1.58	0.92	0.807	1.19	0.680	0.92	1.00	0.711	No
628	21.24	2.26	0.67	1.59	0.92	0.807	1.19	0.680	0.92	1.00	0.713	No
629	21.28	2.26	0.67	1.59	0.92	0.807	1.19	0.680	0.93	1.00	0.727	No
630	21.37	2.26	0.68	1.59	0.92	0.808	1.19	0.681	0.93	1.00	0.741	No
631	21.41	2.27	0.68	1.59	0.92	0.808	1.19	0.681	0.94	1.00	0.749	No
632	21.50	2.27	0.68	1.59	0.92	0.808	1.19	0.681	0.94	1.00	0.758	No
633	21.55	2.27	0.68	1.59	0.92	0.809	1.19	0.681	0.94	1.00	0.763	No
634	21.63	2.27	0.69	1.59	0.92	0.809	1.19	0.682	0.94	1.00	0.765	No
635	21.68	2.28	0.69	1.59	0.92	0.809	1.19	0.682	0.94	1.00	0.765	No
636	21.74	2.28	0.69	1.59	0.91	0.809	1.19	0.682	0.95	1.00	0.778	No
637	21.80	2.28	0.69	1.59	0.91	0.810	1.19	0.682	0.94	1.00	0.768	No
638	21.87	2.28	0.69	1.59	0.91	0.810	1.19	0.683	0.94	1.00	0.761	No
639	21.94	2.29	0.69	1.59	0.91	0.810	1.19	0.683	0.94	1.00	0.757	No
640	22.02	2.29	0.70	1.59	0.91	0.811	1.19	0.683	0.94	1.00	0.752	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
641	22.09	2.29	0.70	1.59	0.91	0.811	1.19	0.683	0.93	1.00	0.743	No
642	22.16	2.30	0.70	1.59	0.91	0.812	1.19	0.684	0.92	1.00	0.726	No
643	22.20	2.30	0.70	1.59	0.91	0.812	1.19	0.684	0.91	1.00	0.712	No
644	22.29	2.30	0.71	1.60	0.91	0.812	1.19	0.684	0.89	1.00	0.711	No
645	22.33	2.30	0.71	1.60	0.91	0.812	1.19	0.684	0.88	1.00	0.722	No
646	22.42	2.31	0.71	1.60	0.91	0.813	1.19	0.685	0.88	1.00	0.724	No
647	22.46	2.31	0.71	1.60	0.91	0.813	1.19	0.685	0.88	1.00	0.724	No
648	22.55	2.31	0.71	1.60	0.91	0.813	1.19	0.685	0.88	1.00	0.725	No
649	22.60	2.31	0.72	1.60	0.91	0.813	1.19	0.685	0.88	1.00	0.725	No
650	22.66	2.32	0.72	1.60	0.91	0.814	1.19	0.686	0.88	1.00	0.726	No
651	22.74	2.32	0.72	1.60	0.91	0.814	1.19	0.686	0.88	1.00	0.726	No
652	22.82	2.32	0.72	1.60	0.91	0.814	1.19	0.686	0.88	1.00	0.726	No
653	22.87	2.33	0.72	1.60	0.91	0.815	1.19	0.686	0.88	1.00	0.727	No
654	22.96	2.33	0.73	1.60	0.91	0.815	1.19	0.687	0.89	1.00	0.718	No
655	23.00	2.33	0.73	1.60	0.91	0.815	1.19	0.687	0.89	1.00	0.714	No
656	23.09	2.34	0.73	1.61	0.91	0.816	1.19	0.687	0.89	1.00	0.718	No
657	23.13	2.34	0.73	1.61	0.91	0.816	1.19	0.687	0.89	1.00	0.713	No
658	23.21	2.34	0.73	1.61	0.91	0.816	1.19	0.688	0.89	1.00	0.719	No
659	23.26	2.34	0.74	1.61	0.91	0.816	1.19	0.688	0.88	1.00	0.723	No
660	23.34	2.35	0.74	1.61	0.91	0.817	1.19	0.688	0.88	1.00	0.721	No
661	23.38	2.35	0.74	1.61	0.91	0.817	1.19	0.688	0.89	1.00	0.717	No
662	23.47	2.35	0.74	1.61	0.91	0.817	1.19	0.688	0.90	1.00	0.706	No
663	23.52	2.35	0.74	1.61	0.91	0.817	1.19	0.689	0.91	1.00	0.709	No
664	23.60	2.36	0.75	1.61	0.90	0.818	1.19	0.689	0.91	1.00	0.721	No
665	23.65	2.36	0.75	1.61	0.90	0.818	1.19	0.689	0.92	1.00	0.728	No
666	23.74	2.36	0.75	1.61	0.90	0.818	1.19	0.689	0.92	1.00	0.739	No
667	23.78	2.37	0.75	1.61	0.90	0.818	1.19	0.689	0.92	1.00	0.742	No
668	23.83	2.37	0.75	1.61	0.90	0.818	1.19	0.690	0.94	1.00	0.772	No
669	23.91	2.37	0.76	1.62	0.90	0.819	1.19	0.690	0.93	1.00	0.761	No
670	24.00	2.38	0.76	1.62	0.90	0.819	1.19	0.690	0.94	1.00	2.000	Yes
671	24.04	2.38	0.76	1.62	0.90	0.819	1.19	0.690	0.93	1.00	2.000	Yes
672	24.13	2.38	0.76	1.62	0.90	0.820	1.19	0.691	0.93	1.00	2.000	Yes
673	24.17	2.38	0.76	1.62	0.90	0.820	1.19	0.691	0.93	1.00	2.000	Yes
674	24.26	2.39	0.77	1.62	0.90	0.820	1.19	0.691	0.94	1.00	2.000	Yes
675	24.30	2.39	0.77	1.62	0.90	0.820	1.19	0.691	0.95	1.00	2.000	Yes
676	24.39	2.39	0.77	1.62	0.90	0.821	1.19	0.691	0.96	1.00	2.000	Yes
677	24.44	2.39	0.77	1.62	0.90	0.821	1.19	0.692	0.96	1.00	2.000	Yes
678	24.53	2.40	0.78	1.62	0.90	0.821	1.19	0.692	0.96	1.00	2.000	Yes
679	24.57	2.40	0.78	1.62	0.90	0.821	1.19	0.692	0.96	1.00	2.000	Yes
680	24.66	2.40	0.78	1.62	0.90	0.822	1.19	0.692	0.96	1.00	0.823	No
681	24.70	2.40	0.78	1.62	0.90	0.822	1.19	0.693	0.96	1.00	0.823	No
682	24.79	2.41	0.78	1.62	0.90	0.822	1.19	0.693	0.96	1.00	2.000	Yes
683	24.83	2.41	0.78	1.62	0.90	0.823	1.19	0.693	0.96	1.00	2.000	Yes
684	24.92	2.41	0.79	1.63	0.90	0.823	1.19	0.693	0.96	1.00	2.000	Yes
685	24.96	2.41	0.79	1.63	0.90	0.823	1.19	0.694	0.96	1.00	2.000	Yes
686	25.05	2.42	0.79	1.63	0.90	0.824	1.19	0.694	0.96	1.00	2.000	Yes
687	25.09	2.42	0.79	1.63	0.90	0.824	1.19	0.694	0.96	1.00	2.000	Yes
688	25.18	2.42	0.80	1.63	0.90	0.824	1.19	0.695	0.96	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
689	25.22	2.42	0.80	1.63	0.90	0.825	1.19	0.695	0.96	1.00	2.000	Yes
690	25.31	2.43	0.80	1.63	0.90	0.825	1.19	0.695	0.96	1.00	2.000	Yes
691	25.35	2.43	0.80	1.63	0.90	0.825	1.19	0.695	0.96	1.00	2.000	Yes
692	25.42	2.43	0.80	1.63	0.89	0.826	1.19	0.696	0.97	1.00	2.000	Yes
693	25.48	2.43	0.81	1.63	0.89	0.826	1.19	0.696	0.96	1.00	2.000	Yes
694	25.56	2.43	0.81	1.63	0.89	0.827	1.19	0.696	0.96	1.00	2.000	Yes
695	25.62	2.43	0.81	1.63	0.89	0.827	1.19	0.697	0.96	1.00	2.000	Yes
696	25.68	2.44	0.81	1.63	0.89	0.827	1.19	0.697	0.96	1.00	2.000	Yes
697	25.74	2.44	0.81	1.63	0.89	0.827	1.19	0.697	0.96	1.00	2.000	Yes
698	25.80	2.44	0.82	1.63	0.89	0.828	1.19	0.697	0.96	1.00	2.000	Yes
699	25.88	2.44	0.82	1.63	0.89	0.828	1.19	0.698	0.96	1.00	0.829	No
700	25.95	2.45	0.82	1.63	0.89	0.828	1.19	0.698	0.96	1.00	0.829	No
701	26.00	2.45	0.82	1.63	0.89	0.829	1.19	0.698	0.96	1.00	0.828	No
702	26.07	2.45	0.82	1.63	0.89	0.829	1.19	0.698	0.96	1.00	0.828	No
703	26.13	2.45	0.83	1.63	0.89	0.829	1.19	0.699	0.96	1.00	0.828	No
704	26.21	2.46	0.83	1.63	0.89	0.829	1.19	0.699	0.96	1.00	0.830	No
705	26.30	2.46	0.83	1.63	0.89	0.830	1.19	0.699	0.96	1.00	2.000	Yes
706	26.34	2.46	0.83	1.63	0.89	0.830	1.19	0.699	0.96	1.00	2.000	Yes
707	26.43	2.47	0.83	1.63	0.89	0.830	1.19	0.699	0.95	1.00	2.000	Yes
708	26.47	2.47	0.84	1.63	0.89	0.830	1.19	0.700	0.94	1.00	2.000	Yes
709	26.55	2.47	0.84	1.63	0.89	0.830	1.19	0.700	0.91	1.00	2.000	Yes
710	26.59	2.47	0.84	1.63	0.89	0.831	1.19	0.700	0.92	1.00	2.000	Yes
711	26.67	2.48	0.84	1.64	0.89	0.831	1.19	0.700	0.87	1.00	2.000	Yes
712	26.76	2.48	0.85	1.64	0.89	0.831	1.19	0.700	0.87	1.00	0.747	No
713	26.80	2.48	0.85	1.64	0.89	0.831	1.19	0.700	0.87	1.00	0.747	No
714	26.88	2.49	0.85	1.64	0.89	0.831	1.19	0.700	0.87	1.00	0.747	No
715	26.92	2.49	0.85	1.64	0.89	0.831	1.19	0.700	0.87	1.00	0.747	No
716	27.00	2.49	0.85	1.64	0.89	0.831	1.19	0.701	0.87	1.00	0.748	No
717	27.05	2.50	0.85	1.64	0.89	0.832	1.19	0.701	0.87	1.00	0.748	No
718	27.12	2.50	0.86	1.64	0.89	0.832	1.19	0.701	0.87	1.00	0.748	No
719	27.18	2.50	0.86	1.64	0.89	0.832	1.19	0.701	0.87	1.00	0.749	No
720	27.25	2.51	0.86	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.749	No
721	27.32	2.51	0.86	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.749	No
722	27.38	2.51	0.86	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.749	No
723	27.44	2.52	0.87	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.750	No
724	27.52	2.52	0.87	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.750	No
725	27.58	2.52	0.87	1.65	0.88	0.832	1.19	0.701	0.87	1.00	0.750	No
726	27.65	2.53	0.87	1.65	0.88	0.833	1.19	0.702	0.87	1.00	0.751	No
727	27.71	2.53	0.87	1.65	0.88	0.833	1.19	0.702	0.87	1.00	0.751	No
728	27.78	2.53	0.88	1.66	0.88	0.833	1.19	0.702	0.87	1.00	0.751	No
729	27.84	2.54	0.88	1.66	0.88	0.833	1.19	0.702	0.87	1.00	0.752	No
730	27.91	2.54	0.88	1.66	0.88	0.833	1.19	0.702	0.87	1.00	0.752	No
731	27.97	2.54	0.88	1.66	0.88	0.833	1.19	0.702	0.87	1.00	0.752	No
732	28.04	2.54	0.89	1.66	0.88	0.833	1.19	0.702	0.86	1.00	0.752	No
733	28.12	2.55	0.89	1.66	0.88	0.834	1.19	0.702	0.86	1.00	0.753	No
734	28.17	2.55	0.89	1.66	0.88	0.834	1.19	0.702	0.86	1.00	0.753	No
735	28.25	2.55	0.89	1.66	0.88	0.834	1.19	0.703	0.86	1.00	0.753	No
736	28.33	2.56	0.89	1.66	0.88	0.834	1.19	0.703	0.86	1.00	0.754	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
737	28.37	2.56	0.90	1.67	0.88	0.834	1.19	0.703	0.86	1.00	0.754	No
738	28.46	2.56	0.90	1.67	0.88	0.834	1.19	0.703	0.86	1.00	0.754	No
739	28.50	2.57	0.90	1.67	0.88	0.834	1.19	0.703	0.86	1.00	0.754	No
740	28.56	2.57	0.90	1.67	0.88	0.834	1.19	0.703	0.86	1.00	0.755	No
741	28.63	2.57	0.90	1.67	0.88	0.834	1.19	0.703	0.86	1.00	0.755	No
742	28.69	2.58	0.91	1.67	0.88	0.835	1.19	0.703	0.86	1.00	0.755	No
743	28.76	2.58	0.91	1.67	0.88	0.835	1.19	0.703	0.86	1.00	0.756	No
744	28.84	2.58	0.91	1.67	0.88	0.835	1.19	0.703	0.86	1.00	0.756	No
745	28.90	2.59	0.91	1.67	0.88	0.835	1.19	0.704	0.88	1.00	0.742	No
746	28.98	2.59	0.91	1.68	0.87	0.835	1.19	0.704	0.91	1.00	0.745	No
747	29.03	2.59	0.92	1.68	0.87	0.835	1.19	0.704	0.92	1.00	2.000	Yes
748	29.09	2.59	0.92	1.68	0.87	0.835	1.19	0.704	0.91	1.00	2.000	Yes
749	29.18	2.60	0.92	1.68	0.87	0.835	1.19	0.704	0.89	1.00	2.000	Yes
750	29.21	2.60	0.92	1.68	0.87	0.835	1.19	0.704	0.88	1.00	2.000	Yes
751	29.30	2.61	0.92	1.68	0.87	0.836	1.19	0.704	0.88	1.00	2.000	Yes
752	29.38	2.61	0.93	1.68	0.87	0.836	1.19	0.704	0.89	1.00	2.000	Yes
753	29.42	2.61	0.93	1.68	0.87	0.836	1.19	0.704	0.89	1.00	2.000	Yes
754	29.50	2.62	0.93	1.69	0.87	0.836	1.19	0.704	0.91	1.00	2.000	Yes
755	29.58	2.62	0.93	1.69	0.87	0.836	1.19	0.704	0.93	1.00	2.000	Yes
756	29.62	2.62	0.93	1.69	0.87	0.836	1.19	0.704	0.93	1.00	2.000	Yes
757	29.69	2.63	0.94	1.69	0.87	0.836	1.19	0.704	0.94	1.00	2.000	Yes
758	29.76	2.63	0.94	1.69	0.87	0.836	1.19	0.704	0.93	1.00	2.000	Yes
759	29.82	2.63	0.94	1.69	0.87	0.836	1.19	0.704	0.89	1.00	2.000	Yes
760	29.89	2.64	0.94	1.69	0.87	0.836	1.19	0.705	0.86	1.00	0.760	No
761	29.95	2.64	0.94	1.69	0.87	0.836	1.19	0.705	0.86	1.00	0.760	No
762	30.03	2.64	0.95	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.761	No
763	30.07	2.64	0.95	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.761	No
764	30.15	2.65	0.95	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.761	No
765	30.20	2.65	0.95	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.761	No
766	30.27	2.65	0.95	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.762	No
767	30.33	2.66	0.96	1.70	0.87	0.836	1.19	0.705	0.86	1.00	0.762	No
768	30.39	2.66	0.96	1.70	0.87	0.837	1.19	0.705	0.86	1.00	2.000	Yes
769	30.47	2.67	0.96	1.70	0.87	0.837	1.19	0.705	0.86	1.00	2.000	Yes
770	30.54	2.67	0.96	1.71	0.87	0.837	1.19	0.705	0.88	1.00	2.000	Yes
771	30.59	2.67	0.96	1.71	0.87	0.837	1.19	0.705	0.86	1.00	2.000	Yes
772	30.66	2.68	0.97	1.71	0.87	0.837	1.19	0.705	0.88	1.00	2.000	Yes
773	30.73	2.68	0.97	1.71	0.86	0.837	1.19	0.705	0.91	1.00	2.000	Yes
774	30.80	2.68	0.97	1.71	0.86	0.837	1.19	0.705	0.92	1.00	2.000	Yes
775	30.86	2.69	0.97	1.71	0.86	0.837	1.19	0.705	0.93	1.00	2.000	Yes
776	30.93	2.69	0.98	1.71	0.86	0.837	1.19	0.705	0.93	1.00	2.000	Yes
777	30.99	2.69	0.98	1.71	0.86	0.837	1.19	0.705	0.94	1.00	2.000	Yes
778	31.06	2.70	0.98	1.72	0.86	0.837	1.19	0.705	0.94	1.00	2.000	Yes
779	31.13	2.70	0.98	1.72	0.86	0.837	1.19	0.705	0.92	1.00	2.000	Yes
780	31.18	2.70	0.98	1.72	0.86	0.837	1.19	0.705	0.91	1.00	2.000	Yes
781	31.26	2.71	0.99	1.72	0.86	0.837	1.19	0.705	0.88	1.00	2.000	Yes
782	31.33	2.71	0.99	1.72	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes
783	31.38	2.71	0.99	1.72	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes
784	31.45	2.72	0.99	1.72	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
785	31.52	2.72	0.99	1.73	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes
786	31.61	2.72	1.00	1.73	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes
787	31.65	2.73	1.00	1.73	0.86	0.837	1.19	0.705	0.90	1.00	2.000	Yes
788	31.73	2.73	1.00	1.73	0.86	0.837	1.19	0.705	0.89	1.00	2.000	Yes
789	31.80	2.73	1.00	1.73	0.86	0.837	1.19	0.705	0.85	1.00	2.000	Yes
790	31.87	2.74	1.00	1.73	0.86	0.837	1.19	0.705	0.85	1.00	2.000	Yes
791	31.93	2.74	1.01	1.73	0.86	0.837	1.19	0.705	0.85	1.00	0.768	No
792	31.99	2.74	1.01	1.73	0.86	0.837	1.19	0.705	0.85	1.00	0.768	No
793	32.06	2.75	1.01	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.768	No
794	32.11	2.75	1.01	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.768	No
795	32.17	2.75	1.01	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.768	No
796	32.24	2.76	1.02	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.769	No
797	32.30	2.76	1.02	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.769	No
798	32.37	2.76	1.02	1.74	0.86	0.837	1.19	0.705	0.85	1.00	0.769	No
799	32.44	2.77	1.02	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.769	No
800	32.50	2.77	1.02	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.769	No
801	32.56	2.77	1.03	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.770	No
802	32.63	2.78	1.03	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.770	No
803	32.70	2.78	1.03	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.770	No
804	32.76	2.78	1.03	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.770	No
805	32.83	2.79	1.03	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.771	No
806	32.89	2.79	1.04	1.75	0.85	0.837	1.19	0.705	0.85	1.00	0.771	No
807	32.95	2.79	1.04	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.771	No
808	33.02	2.80	1.04	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.771	No
809	33.10	2.80	1.04	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.771	No
810	33.16	2.81	1.04	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.772	No
811	33.25	2.81	1.05	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.772	No
812	33.29	2.81	1.05	1.76	0.85	0.837	1.19	0.705	0.85	1.00	0.772	No
813	33.37	2.82	1.05	1.77	0.85	0.837	1.19	0.705	0.85	1.00	0.772	No
814	33.45	2.82	1.05	1.77	0.85	0.837	1.19	0.705	0.85	1.00	0.772	No
815	33.50	2.82	1.06	1.77	0.85	0.837	1.19	0.705	0.85	1.00	0.773	No
816	33.59	2.83	1.06	1.77	0.85	0.837	1.19	0.705	0.85	1.00	0.773	No
817	33.63	2.83	1.06	1.77	0.85	0.837	1.19	0.705	0.85	1.00	0.773	No
818	33.68	2.83	1.06	1.77	0.85	0.837	1.19	0.705	0.85	1.00	2.000	Yes
819	33.76	2.84	1.06	1.77	0.85	0.837	1.19	0.705	0.85	1.00	2.000	Yes
820	33.82	2.84	1.07	1.77	0.85	0.837	1.19	0.705	0.84	1.00	2.000	Yes
821	33.88	2.84	1.07	1.78	0.85	0.837	1.19	0.705	0.88	1.00	2.000	Yes
822	33.96	2.85	1.07	1.78	0.85	0.837	1.19	0.705	0.91	1.00	2.000	Yes
823	34.02	2.85	1.07	1.78	0.85	0.837	1.19	0.705	0.92	1.00	2.000	Yes
824	34.08	2.85	1.07	1.78	0.85	0.837	1.19	0.705	0.93	1.00	2.000	Yes
825	34.14	2.86	1.08	1.78	0.84	0.837	1.19	0.705	0.94	1.00	2.000	Yes
826	34.23	2.86	1.08	1.78	0.84	0.837	1.19	0.705	0.94	1.00	2.000	Yes
827	34.28	2.86	1.08	1.78	0.84	0.837	1.19	0.705	0.94	1.00	0.833	No
828	34.34	2.87	1.08	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.836	No
829	34.41	2.87	1.08	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.839	No
830	34.49	2.87	1.09	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.840	No
831	34.53	2.88	1.09	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.841	No
832	34.61	2.88	1.09	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.840	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
833	34.70	2.88	1.09	1.79	0.84	0.837	1.19	0.705	0.95	1.00	0.838	No
834	34.75	2.89	1.09	1.79	0.84	0.837	1.19	0.705	0.94	1.00	0.835	No
835	34.83	2.89	1.10	1.79	0.84	0.837	1.19	0.705	0.94	1.00	0.826	No
836	34.88	2.89	1.10	1.79	0.84	0.837	1.19	0.705	0.94	1.00	0.827	No
837	34.92	2.90	1.10	1.80	0.84	0.837	1.19	0.705	0.94	1.00	0.830	No
838	35.01	2.90	1.10	1.80	0.84	0.837	1.19	0.705	0.94	1.00	0.829	No
839	35.10	2.90	1.11	1.80	0.84	0.837	1.19	0.705	0.94	1.00	2.000	Yes
840	35.13	2.91	1.11	1.80	0.84	0.837	1.19	0.705	0.94	1.00	2.000	Yes
841	35.20	2.91	1.11	1.80	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
842	35.29	2.91	1.11	1.80	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
843	35.33	2.92	1.11	1.80	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
844	35.42	2.92	1.12	1.81	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
845	35.46	2.92	1.12	1.81	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
846	35.55	2.93	1.12	1.81	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
847	35.58	2.93	1.12	1.81	0.84	0.837	1.19	0.705	0.93	1.00	2.000	Yes
848	35.66	2.93	1.12	1.81	0.84	0.837	1.19	0.705	0.93	1.00	0.813	No
849	35.72	2.94	1.12	1.81	0.84	0.837	1.19	0.705	0.92	1.00	0.809	No
850	35.78	2.94	1.13	1.81	0.84	0.837	1.19	0.705	0.92	1.00	0.807	No
851	35.84	2.94	1.13	1.81	0.83	0.837	1.19	0.705	0.93	1.00	0.810	No
852	35.91	2.95	1.13	1.81	0.83	0.836	1.19	0.705	0.93	1.00	0.810	No
853	35.98	2.95	1.13	1.82	0.83	0.836	1.19	0.705	0.93	1.00	0.810	No
854	36.05	2.95	1.14	1.82	0.83	0.836	1.19	0.705	0.93	1.00	0.810	No
855	36.11	2.96	1.14	1.82	0.83	0.836	1.19	0.705	0.92	1.00	2.000	Yes
856	36.19	2.96	1.14	1.82	0.83	0.836	1.19	0.705	0.92	1.00	2.000	Yes
857	36.25	2.96	1.14	1.82	0.83	0.836	1.19	0.705	0.92	1.00	2.000	Yes
858	36.32	2.97	1.14	1.82	0.83	0.836	1.19	0.705	0.93	1.00	2.000	Yes
859	36.36	2.97	1.14	1.82	0.83	0.836	1.19	0.705	0.93	1.00	2.000	Yes
860	36.43	2.97	1.15	1.83	0.83	0.836	1.19	0.704	0.93	1.00	2.000	Yes
861	36.52	2.98	1.15	1.83	0.83	0.836	1.19	0.704	0.93	1.00	2.000	Yes
862	36.57	2.98	1.15	1.83	0.83	0.836	1.19	0.704	0.93	1.00	2.000	Yes
863	36.64	2.98	1.15	1.83	0.83	0.836	1.19	0.704	0.92	1.00	2.000	Yes
864	36.69	2.99	1.16	1.83	0.83	0.836	1.19	0.704	0.92	1.00	2.000	Yes
865	36.77	2.99	1.16	1.83	0.83	0.836	1.19	0.704	0.92	1.00	2.000	Yes
866	36.85	2.99	1.16	1.83	0.83	0.836	1.19	0.704	0.91	1.00	0.790	No
867	36.89	3.00	1.16	1.83	0.83	0.836	1.19	0.704	0.91	1.00	2.000	Yes
868	36.97	3.00	1.16	1.84	0.83	0.836	1.19	0.704	0.90	1.00	2.000	Yes
869	37.03	3.00	1.17	1.84	0.83	0.836	1.19	0.704	0.91	1.00	2.000	Yes
870	37.12	3.01	1.17	1.84	0.83	0.835	1.19	0.704	0.92	1.00	2.000	Yes
871	37.15	3.01	1.17	1.84	0.83	0.835	1.19	0.704	0.92	1.00	2.000	Yes
872	37.22	3.01	1.17	1.84	0.83	0.835	1.19	0.704	0.92	1.00	2.000	Yes
873	37.29	3.02	1.17	1.84	0.83	0.835	1.19	0.704	0.91	1.00	2.000	Yes
874	37.35	3.02	1.18	1.85	0.83	0.835	1.19	0.704	0.90	1.00	2.000	Yes
875	37.42	3.02	1.18	1.85	0.83	0.835	1.19	0.704	0.85	1.00	2.000	Yes
876	37.49	3.03	1.18	1.85	0.83	0.835	1.19	0.703	0.83	1.00	2.000	Yes
877	37.56	3.03	1.18	1.85	0.82	0.835	1.19	0.703	0.83	1.00	0.783	No
878	37.62	3.04	1.18	1.85	0.82	0.835	1.19	0.703	0.83	1.00	0.783	No
879	37.68	3.04	1.19	1.85	0.82	0.835	1.19	0.703	0.86	1.00	0.757	No
880	37.74	3.04	1.19	1.86	0.82	0.834	1.19	0.703	0.89	1.00	0.764	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
881	37.83	3.05	1.19	1.86	0.82	0.834	1.19	0.703	0.86	1.00	0.756	No
882	37.89	3.05	1.19	1.86	0.82	0.834	1.19	0.703	0.88	1.00	0.755	No
883	37.96	3.06	1.19	1.86	0.82	0.834	1.19	0.703	0.87	1.00	0.749	No
884	38.02	3.06	1.20	1.86	0.82	0.834	1.19	0.703	0.87	1.00	0.747	No
885	38.07	3.06	1.20	1.86	0.82	0.834	1.19	0.703	0.89	1.00	0.762	No
886	38.16	3.07	1.20	1.87	0.82	0.834	1.19	0.702	0.89	1.00	0.770	No
887	38.22	3.07	1.20	1.87	0.82	0.834	1.19	0.702	0.89	1.00	0.771	No
888	38.28	3.07	1.20	1.87	0.82	0.834	1.19	0.702	0.89	1.00	0.772	No
889	38.34	3.08	1.21	1.87	0.82	0.833	1.19	0.702	0.89	1.00	0.772	No
890	38.42	3.08	1.21	1.87	0.82	0.833	1.19	0.702	0.89	1.00	0.772	No
891	38.48	3.08	1.21	1.87	0.82	0.833	1.19	0.702	0.89	1.00	0.773	No
892	38.53	3.09	1.21	1.87	0.82	0.833	1.19	0.702	0.90	1.00	0.782	No
893	38.60	3.09	1.21	1.88	0.82	0.833	1.19	0.702	0.88	1.00	0.759	No
894	38.67	3.09	1.22	1.88	0.82	0.833	1.19	0.702	0.89	1.00	0.764	No
895	38.73	3.10	1.22	1.88	0.82	0.833	1.19	0.702	0.88	1.00	0.757	No
896	38.80	3.10	1.22	1.88	0.82	0.833	1.19	0.702	0.87	1.00	0.751	No
897	38.86	3.10	1.22	1.88	0.82	0.833	1.19	0.701	0.83	1.00	0.786	No
898	38.93	3.11	1.23	1.88	0.82	0.832	1.19	0.701	0.83	1.00	2.000	Yes
899	39.00	3.11	1.23	1.89	0.82	0.832	1.19	0.701	0.83	1.00	2.000	Yes
900	39.07	3.12	1.23	1.89	0.82	0.832	1.19	0.701	0.83	1.00	2.000	Yes
901	39.14	3.12	1.23	1.89	0.82	0.832	1.19	0.701	0.84	1.00	2.000	Yes
902	39.21	3.12	1.23	1.89	0.82	0.832	1.19	0.701	0.87	1.00	2.000	Yes
903	39.27	3.13	1.24	1.89	0.81	0.832	1.19	0.701	0.88	1.00	2.000	Yes
904	39.33	3.13	1.24	1.89	0.81	0.832	1.19	0.701	0.88	1.00	2.000	Yes
905	39.39	3.13	1.24	1.90	0.81	0.831	1.19	0.701	0.88	1.00	2.000	Yes
906	39.47	3.14	1.24	1.90	0.81	0.831	1.19	0.700	0.89	1.00	2.000	Yes
907	39.53	3.14	1.24	1.90	0.81	0.831	1.19	0.700	0.89	1.00	2.000	Yes
908	39.58	3.15	1.25	1.90	0.81	0.831	1.19	0.700	0.89	1.00	0.773	No
909	39.67	3.15	1.25	1.90	0.81	0.831	1.19	0.700	0.89	1.00	0.773	No
910	39.73	3.15	1.25	1.90	0.81	0.831	1.19	0.700	0.89	1.00	0.772	No
911	39.81	3.16	1.25	1.91	0.81	0.831	1.19	0.700	0.89	1.00	0.773	No
912	39.84	3.16	1.25	1.91	0.81	0.831	1.19	0.700	0.88	1.00	0.763	No
913	39.92	3.16	1.26	1.91	0.81	0.830	1.19	0.700	0.87	1.00	2.000	Yes
914	40.00	3.17	1.26	1.91	0.81	0.830	1.19	0.699	0.88	1.00	2.000	Yes
915	40.04	3.17	1.26	1.91	0.81	0.830	1.19	0.699	0.89	1.00	2.000	Yes
916	40.12	3.18	1.26	1.91	0.81	0.830	1.19	0.699	0.88	1.00	2.000	Yes
917	40.20	3.18	1.26	1.92	0.81	0.830	1.19	0.699	0.89	1.00	2.000	Yes
918	40.24	3.18	1.27	1.92	0.81	0.830	1.19	0.699	0.89	1.00	2.000	Yes
919	40.32	3.19	1.27	1.92	0.81	0.829	1.19	0.699	0.90	1.00	2.000	Yes
920	40.37	3.19	1.27	1.92	0.81	0.829	1.19	0.699	0.90	1.00	2.000	Yes
921	40.44	3.19	1.27	1.92	0.81	0.829	1.19	0.699	0.90	1.00	0.792	No
922	40.52	3.20	1.27	1.92	0.81	0.829	1.19	0.699	0.91	1.00	0.795	No
923	40.56	3.20	1.28	1.92	0.81	0.829	1.19	0.698	0.91	1.00	2.000	Yes
924	40.64	3.20	1.28	1.93	0.81	0.829	1.19	0.698	0.91	1.00	2.000	Yes
925	40.71	3.21	1.28	1.93	0.81	0.829	1.19	0.698	0.90	1.00	2.000	Yes
926	40.78	3.21	1.28	1.93	0.81	0.828	1.19	0.698	0.89	1.00	2.000	Yes
927	40.83	3.21	1.28	1.93	0.81	0.828	1.19	0.698	0.89	1.00	2.000	Yes
928	40.93	3.22	1.29	1.93	0.81	0.828	1.19	0.698	0.90	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
929	40.97	3.22	1.29	1.93	0.80	0.828	1.19	0.698	0.90	1.00	2.000	Yes
930	41.05	3.23	1.29	1.94	0.80	0.828	1.19	0.698	0.90	1.00	0.794	No
931	41.10	3.23	1.29	1.94	0.80	0.828	1.19	0.697	0.90	1.00	0.793	No
932	41.18	3.23	1.30	1.94	0.80	0.828	1.19	0.697	0.91	1.00	0.798	No
933	41.23	3.24	1.30	1.94	0.80	0.828	1.19	0.697	0.91	1.00	0.798	No
934	41.30	3.24	1.30	1.94	0.80	0.827	1.19	0.697	0.91	1.00	0.797	No
935	41.36	3.24	1.30	1.94	0.80	0.827	1.19	0.697	0.91	1.00	0.796	No
936	41.42	3.25	1.30	1.94	0.80	0.827	1.19	0.697	0.91	1.00	0.797	No
937	41.49	3.25	1.30	1.95	0.80	0.827	1.19	0.697	0.89	1.00	0.778	No
938	41.55	3.25	1.31	1.95	0.80	0.827	1.19	0.697	0.90	1.00	0.788	No
939	41.63	3.26	1.31	1.95	0.80	0.827	1.19	0.696	0.90	1.00	0.786	No
940	41.69	3.26	1.31	1.95	0.80	0.826	1.19	0.696	0.89	1.00	0.775	No
941	41.75	3.27	1.31	1.95	0.80	0.826	1.19	0.696	0.88	1.00	0.767	No
942	41.82	3.27	1.32	1.95	0.80	0.826	1.19	0.696	0.89	1.00	0.776	No
943	41.88	3.27	1.32	1.96	0.80	0.826	1.19	0.696	0.89	1.00	0.779	No
944	41.95	3.28	1.32	1.96	0.80	0.826	1.19	0.696	0.89	1.00	0.778	No
945	42.01	3.28	1.32	1.96	0.80	0.826	1.19	0.696	0.89	1.00	0.780	No
946	42.09	3.29	1.32	1.96	0.80	0.825	1.19	0.696	0.89	1.00	0.781	No
947	42.15	3.29	1.33	1.96	0.80	0.825	1.19	0.695	0.89	1.00	0.776	No
948	42.22	3.29	1.33	1.96	0.80	0.825	1.19	0.695	0.88	1.00	0.769	No
949	42.30	3.30	1.33	1.97	0.80	0.825	1.19	0.695	0.89	1.00	0.774	No
950	42.34	3.30	1.33	1.97	0.80	0.825	1.19	0.695	0.88	1.00	0.769	No
951	42.42	3.30	1.33	1.97	0.80	0.825	1.19	0.695	0.88	1.00	0.772	No
952	42.50	3.31	1.34	1.97	0.80	0.824	1.19	0.695	0.88	1.00	0.770	No
953	42.54	3.31	1.34	1.97	0.80	0.824	1.19	0.695	0.88	1.00	0.772	No
954	42.62	3.32	1.34	1.97	0.80	0.824	1.19	0.694	0.88	1.00	0.767	No
955	42.70	3.32	1.34	1.98	0.79	0.824	1.19	0.694	0.88	1.00	0.767	No
956	42.74	3.32	1.34	1.98	0.79	0.824	1.19	0.694	0.88	1.00	0.765	No
957	42.82	3.33	1.35	1.98	0.79	0.824	1.19	0.694	0.87	1.00	0.755	No
958	42.86	3.33	1.35	1.98	0.79	0.824	1.19	0.694	0.85	1.00	0.754	No
959	42.94	3.33	1.35	1.98	0.79	0.823	1.19	0.694	0.87	1.00	0.755	No
960	43.01	3.34	1.35	1.98	0.79	0.823	1.19	0.694	0.86	1.00	0.752	No
961	43.07	3.34	1.35	1.99	0.79	0.823	1.19	0.693	0.86	1.00	0.755	No
962	43.15	3.35	1.36	1.99	0.79	0.823	1.19	0.693	0.86	1.00	0.750	No
963	43.21	3.35	1.36	1.99	0.79	0.823	1.19	0.693	0.87	1.00	0.756	No
964	43.26	3.35	1.36	1.99	0.79	0.822	1.19	0.693	0.87	1.00	0.759	No
965	43.32	3.36	1.36	1.99	0.79	0.822	1.19	0.693	0.86	1.00	0.756	No
966	43.41	3.36	1.36	2.00	0.79	0.822	1.19	0.693	0.87	1.00	0.759	No
967	43.47	3.36	1.37	2.00	0.79	0.822	1.19	0.692	0.87	1.00	0.760	No
968	43.54	3.37	1.37	2.00	0.79	0.822	1.19	0.692	0.86	1.00	0.755	No
969	43.61	3.37	1.37	2.00	0.79	0.821	1.19	0.692	0.86	1.00	0.750	No
970	43.67	3.38	1.37	2.00	0.79	0.821	1.19	0.692	0.85	1.00	0.755	No
971	43.74	3.38	1.38	2.00	0.79	0.821	1.19	0.692	0.84	1.00	0.762	No
972	43.82	3.38	1.38	2.01	0.79	0.821	1.19	0.692	0.83	1.00	0.770	No
973	43.86	3.39	1.38	2.01	0.79	0.821	1.19	0.692	0.84	1.00	0.767	No
974	43.94	3.39	1.38	2.01	0.79	0.820	1.19	0.691	0.85	1.00	0.756	No
975	43.99	3.39	1.38	2.01	0.79	0.820	1.19	0.691	0.86	1.00	0.751	No
976	44.07	3.40	1.39	2.01	0.79	0.820	1.19	0.691	0.87	1.00	0.758	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
977	44.11	3.40	1.39	2.01	0.79	0.820	1.19	0.691	0.86	1.00	0.756	No
978	44.20	3.41	1.39	2.02	0.79	0.820	1.19	0.691	0.87	1.00	0.765	No
979	44.24	3.41	1.39	2.02	0.79	0.820	1.19	0.691	0.87	1.00	0.766	No
980	44.33	3.41	1.39	2.02	0.79	0.819	1.19	0.690	0.87	1.00	0.763	No
981	44.38	3.42	1.40	2.02	0.78	0.819	1.19	0.690	0.87	1.00	0.759	No
982	44.46	3.42	1.40	2.02	0.78	0.819	1.19	0.690	0.87	1.00	2.000	Yes
983	44.51	3.42	1.40	2.02	0.78	0.819	1.19	0.690	0.86	1.00	2.000	Yes
984	44.59	3.43	1.40	2.03	0.78	0.819	1.19	0.690	0.88	1.00	2.000	Yes
985	44.64	3.43	1.40	2.03	0.78	0.818	1.19	0.690	0.89	1.00	2.000	Yes
986	44.72	3.44	1.41	2.03	0.78	0.818	1.19	0.689	0.90	1.00	2.000	Yes
987	44.81	3.44	1.41	2.03	0.78	0.818	1.19	0.689	0.91	1.00	2.000	Yes
988	44.85	3.44	1.41	2.03	0.78	0.818	1.19	0.689	0.91	1.00	0.806	No
989	44.93	3.45	1.41	2.03	0.78	0.818	1.19	0.689	0.91	1.00	0.804	No
990	44.97	3.45	1.41	2.04	0.78	0.818	1.19	0.689	0.91	1.00	0.802	No
991	45.06	3.45	1.42	2.04	0.78	0.817	1.19	0.689	0.90	1.00	0.791	No
992	45.11	3.46	1.42	2.04	0.78	0.817	1.19	0.688	0.89	1.00	0.781	No
993	45.17	3.46	1.42	2.04	0.78	0.817	1.19	0.688	0.87	1.00	0.765	No
994	45.23	3.46	1.42	2.04	0.78	0.817	1.19	0.688	0.88	1.00	0.771	No
995	45.29	3.47	1.42	2.04	0.78	0.817	1.19	0.688	0.88	1.00	0.771	No
996	45.36	3.47	1.43	2.05	0.78	0.816	1.19	0.688	0.88	1.00	2.000	Yes
997	45.43	3.48	1.43	2.05	0.78	0.816	1.19	0.688	0.89	1.00	2.000	Yes
998	45.49	3.48	1.43	2.05	0.78	0.816	1.19	0.687	0.80	1.00	2.000	Yes
999	45.56	3.48	1.43	2.05	0.78	0.816	1.19	0.687	0.86	1.00	2.000	Yes
1000	45.62	3.49	1.43	2.05	0.78	0.815	1.19	0.687	0.80	1.00	2.000	Yes
1001	45.69	3.49	1.44	2.05	0.78	0.815	1.19	0.687	0.80	1.00	2.000	Yes
1002	45.76	3.49	1.44	2.06	0.78	0.815	1.19	0.687	0.80	1.00	2.000	Yes
1003	45.81	3.50	1.44	2.06	0.78	0.815	1.19	0.687	0.80	1.00	2.000	Yes
1004	45.88	3.50	1.44	2.06	0.78	0.815	1.19	0.686	0.80	1.00	2.000	Yes
1005	45.95	3.51	1.44	2.06	0.78	0.814	1.19	0.686	0.80	1.00	2.000	Yes
1006	46.02	3.51	1.45	2.06	0.78	0.814	1.19	0.686	0.81	1.00	2.000	Yes
1007	46.08	3.51	1.45	2.07	0.77	0.814	1.19	0.686	0.83	1.00	2.000	Yes
1008	46.15	3.52	1.45	2.07	0.77	0.814	1.19	0.686	0.84	1.00	2.000	Yes
1009	46.21	3.52	1.45	2.07	0.77	0.813	1.19	0.685	0.85	1.00	2.000	Yes
1010	46.28	3.53	1.45	2.07	0.77	0.813	1.19	0.685	0.85	1.00	2.000	Yes
1011	46.34	3.53	1.46	2.07	0.77	0.813	1.19	0.685	0.80	1.00	2.000	Yes
1012	46.41	3.53	1.46	2.08	0.77	0.813	1.19	0.685	0.80	1.00	2.000	Yes
1013	46.47	3.54	1.46	2.08	0.77	0.813	1.19	0.685	0.80	1.00	2.000	Yes
1014	46.54	3.54	1.46	2.08	0.77	0.812	1.19	0.684	0.80	1.00	2.000	No
1015	46.61	3.55	1.46	2.08	0.77	0.812	1.19	0.684	0.81	1.00	2.000	No
1016	46.69	3.55	1.47	2.08	0.77	0.812	1.19	0.684	0.80	1.00	2.000	No
1017	46.75	3.55	1.47	2.08	0.77	0.812	1.19	0.684	0.80	1.00	2.000	No
1018	46.80	3.56	1.47	2.09	0.77	0.811	1.19	0.684	0.80	1.00	2.000	No
1019	46.87	3.56	1.47	2.09	0.77	0.811	1.19	0.683	0.80	1.00	2.000	No
1020	46.93	3.56	1.47	2.09	0.77	0.811	1.19	0.683	0.80	1.00	2.000	Yes
1021	46.99	3.57	1.48	2.09	0.77	0.811	1.19	0.683	0.80	1.00	2.000	Yes
1022	47.06	3.57	1.48	2.09	0.77	0.810	1.19	0.683	0.80	1.00	2.000	Yes
1023	47.15	3.58	1.48	2.10	0.77	0.810	1.19	0.683	0.79	1.00	2.000	Yes
1024	47.20	3.58	1.48	2.10	0.77	0.810	1.19	0.682	0.79	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1025	47.27	3.59	1.49	2.10	0.77	0.810	1.19	0.682	0.79	1.00	2.000	No
1026	47.35	3.59	1.49	2.10	0.77	0.809	1.19	0.682	0.79	1.00	2.000	Yes
1027	47.40	3.59	1.49	2.10	0.77	0.809	1.19	0.682	0.79	1.00	2.000	Yes
1028	47.48	3.60	1.49	2.11	0.77	0.809	1.19	0.682	0.83	1.00	2.000	Yes
1029	47.53	3.60	1.49	2.11	0.77	0.809	1.19	0.681	0.83	1.00	2.000	Yes
1030	47.59	3.60	1.50	2.11	0.77	0.809	1.19	0.681	0.84	1.00	2.000	No
1031	47.66	3.61	1.50	2.11	0.77	0.808	1.19	0.681	0.83	1.00	2.000	No
1032	47.73	3.61	1.50	2.11	0.77	0.808	1.19	0.681	0.84	1.00	2.000	No
1033	47.80	3.62	1.50	2.11	0.76	0.808	1.19	0.681	0.84	1.00	2.000	No
1034	47.85	3.62	1.50	2.12	0.76	0.808	1.19	0.680	0.83	1.00	2.000	No
1035	47.93	3.62	1.51	2.12	0.76	0.807	1.19	0.680	0.79	1.00	2.000	No
1036	47.98	3.63	1.51	2.12	0.76	0.807	1.19	0.680	0.79	1.00	2.000	No
1037	48.06	3.63	1.51	2.12	0.76	0.807	1.19	0.680	0.79	1.00	2.000	No
1038	48.12	3.64	1.51	2.12	0.76	0.807	1.19	0.680	0.79	1.00	2.000	No
1039	48.18	3.64	1.51	2.13	0.76	0.806	1.19	0.679	0.79	1.00	2.000	No
1040	48.26	3.64	1.52	2.13	0.76	0.806	1.19	0.679	0.82	1.00	2.000	No
1041	48.32	3.65	1.52	2.13	0.76	0.806	1.19	0.679	0.83	1.00	2.000	No
1042	48.37	3.65	1.52	2.13	0.76	0.806	1.19	0.679	0.84	1.00	2.000	No
1043	48.46	3.66	1.52	2.13	0.76	0.805	1.19	0.679	0.84	1.00	2.000	No
1044	48.52	3.66	1.52	2.13	0.76	0.805	1.19	0.678	0.84	1.00	2.000	No
1045	48.59	3.66	1.53	2.14	0.76	0.805	1.19	0.678	0.83	1.00	2.000	No
1046	48.66	3.67	1.53	2.14	0.76	0.805	1.19	0.678	0.79	1.00	2.000	No
1047	48.70	3.67	1.53	2.14	0.76	0.805	1.19	0.678	0.79	1.00	2.000	No
1048	48.79	3.67	1.53	2.14	0.76	0.804	1.19	0.678	0.79	1.00	2.000	No
1049	48.83	3.68	1.53	2.14	0.76	0.804	1.19	0.677	0.79	1.00	2.000	No
1050	48.91	3.68	1.54	2.15	0.76	0.804	1.19	0.677	0.79	1.00	2.000	No
1051	48.98	3.69	1.54	2.15	0.76	0.804	1.19	0.677	0.79	1.00	2.000	No
1052	49.04	3.69	1.54	2.15	0.76	0.803	1.19	0.677	0.79	1.00	2.000	No
1053	49.10	3.69	1.54	2.15	0.76	0.803	1.19	0.677	0.79	1.00	2.000	No
1054	49.17	3.70	1.54	2.15	0.76	0.803	1.19	0.676	0.79	1.00	2.000	No
1055	49.24	3.70	1.55	2.16	0.76	0.803	1.19	0.676	0.79	1.00	2.000	Yes
1056	49.29	3.71	1.55	2.16	0.76	0.802	1.19	0.676	0.79	1.00	2.000	Yes
1057	49.38	3.71	1.55	2.16	0.76	0.802	1.19	0.676	0.83	1.00	2.000	Yes
1058	49.44	3.71	1.55	2.16	0.76	0.802	1.19	0.676	0.84	1.00	2.000	Yes
1059	49.51	3.72	1.56	2.16	0.76	0.802	1.19	0.675	0.84	1.00	2.000	Yes
1060	49.57	3.72	1.56	2.16	0.75	0.801	1.19	0.675	0.84	1.00	2.000	Yes
1061	49.64	3.73	1.56	2.17	0.75	0.801	1.19	0.675	0.84	1.00	2.000	Yes
1062	49.70	3.73	1.56	2.17	0.75	0.801	1.19	0.675	0.85	1.00	2.000	Yes
1063	49.77	3.73	1.56	2.17	0.75	0.801	1.19	0.675	0.78	1.00	2.000	Yes
1064	49.84	3.74	1.57	2.17	0.75	0.800	1.19	0.674	0.78	1.00	2.000	Yes
1065	49.88	3.74	1.57	2.17	0.75	0.800	1.19	0.674	0.78	1.00	2.000	Yes
1066	49.97	3.75	1.57	2.18	0.75	0.800	1.19	0.674	0.78	1.00	2.000	Yes
1067	50.06	3.75	1.57	2.18	0.75	0.799	1.19	0.674	0.78	1.00	2.000	Yes
1068	50.11	3.75	1.57	2.18	0.75	0.799	1.19	0.673	0.78	1.00	2.000	Yes
1069	50.16	3.76	1.58	2.18	0.75	0.799	1.19	0.673	0.78	1.00	2.000	Yes
1070	50.21	3.76	1.58	2.18	0.75	0.799	1.19	0.673	0.80	1.00	2.000	Yes
1071	50.28	3.76	1.58	2.19	0.75	0.799	1.19	0.673	0.80	1.00	2.000	Yes
1072	50.35	3.77	1.58	2.19	0.75	0.798	1.19	0.673	0.83	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1073	50.41	3.77	1.58	2.19	0.75	0.798	1.19	0.672	0.81	1.00	2.000	Yes
1074	50.47	3.78	1.59	2.19	0.75	0.798	1.19	0.672	0.83	1.00	2.000	Yes
1075	50.56	3.78	1.59	2.19	0.75	0.798	1.19	0.672	0.81	1.00	2.000	Yes
1076	50.62	3.78	1.59	2.19	0.75	0.797	1.19	0.672	0.78	1.00	2.000	Yes
1077	50.68	3.79	1.59	2.20	0.75	0.797	1.19	0.672	0.78	1.00	2.000	Yes
1078	50.74	3.79	1.59	2.20	0.75	0.797	1.19	0.671	0.78	1.00	2.000	No
1079	50.81	3.80	1.60	2.20	0.75	0.797	1.19	0.671	0.79	1.00	2.000	No
1080	50.87	3.80	1.60	2.20	0.75	0.796	1.19	0.671	0.80	1.00	2.000	No
1081	50.94	3.80	1.60	2.20	0.75	0.796	1.19	0.671	0.79	1.00	2.000	No
1082	51.02	3.81	1.60	2.21	0.75	0.796	1.19	0.670	0.82	1.00	2.000	No
1083	51.10	3.81	1.61	2.21	0.75	0.795	1.19	0.670	0.83	1.00	2.000	No
1084	51.15	3.82	1.61	2.21	0.75	0.795	1.19	0.670	0.84	1.00	2.000	No
1085	51.23	3.82	1.61	2.21	0.75	0.795	1.19	0.670	0.84	1.00	2.000	No
1086	51.26	3.82	1.61	2.21	0.75	0.795	1.19	0.670	0.85	1.00	2.000	No
1087	51.33	3.83	1.61	2.21	0.74	0.795	1.19	0.669	0.80	1.00	2.000	No
1088	51.40	3.83	1.61	2.22	0.74	0.794	1.19	0.669	0.81	1.00	2.000	No
1089	51.46	3.83	1.62	2.22	0.74	0.794	1.19	0.669	0.84	1.00	2.000	No
1090	51.53	3.84	1.62	2.22	0.74	0.794	1.19	0.669	0.85	1.00	2.000	No
1091	51.60	3.84	1.62	2.22	0.74	0.794	1.19	0.669	0.86	1.00	2.000	No
1092	51.66	3.85	1.62	2.22	0.74	0.793	1.19	0.668	0.85	1.00	2.000	No
1093	51.74	3.85	1.63	2.23	0.74	0.793	1.19	0.668	0.83	1.00	2.000	No
1094	51.80	3.85	1.63	2.23	0.74	0.793	1.19	0.668	0.82	1.00	2.000	No
1095	51.85	3.86	1.63	2.23	0.74	0.793	1.19	0.668	0.82	1.00	2.000	No
1096	51.92	3.86	1.63	2.23	0.74	0.792	1.19	0.668	0.84	1.00	2.000	No
1097	52.01	3.87	1.63	2.23	0.74	0.792	1.19	0.667	0.86	1.00	2.000	No
1098	52.07	3.87	1.64	2.23	0.74	0.792	1.19	0.667	0.86	1.00	2.000	No
1099	52.13	3.87	1.64	2.24	0.74	0.792	1.19	0.667	0.86	1.00	2.000	No
1100	52.19	3.88	1.64	2.24	0.74	0.791	1.19	0.667	0.87	1.00	2.000	No
1101	52.26	3.88	1.64	2.24	0.74	0.791	1.19	0.667	0.87	1.00	2.000	No
1102	52.34	3.89	1.64	2.24	0.74	0.791	1.19	0.666	0.86	1.00	2.000	No
1103	52.38	3.89	1.64	2.24	0.74	0.791	1.19	0.666	0.86	1.00	2.000	No
1104	52.47	3.89	1.65	2.25	0.74	0.790	1.19	0.666	0.84	1.00	2.000	No
1105	52.51	3.90	1.65	2.25	0.74	0.790	1.19	0.666	0.84	1.00	2.000	No
1106	52.60	3.90	1.65	2.25	0.74	0.790	1.19	0.666	0.84	1.00	2.000	No
1107	52.64	3.90	1.65	2.25	0.74	0.790	1.19	0.665	0.81	1.00	2.000	No
1108	52.73	3.91	1.66	2.25	0.74	0.789	1.19	0.665	0.77	1.00	2.000	No
1109	52.77	3.91	1.66	2.25	0.74	0.789	1.19	0.665	0.77	1.00	2.000	No
1110	52.86	3.92	1.66	2.26	0.74	0.789	1.19	0.665	0.77	1.00	2.000	No
1111	52.90	3.92	1.66	2.26	0.74	0.789	1.19	0.665	0.83	1.00	2.000	No
1112	52.97	3.92	1.66	2.26	0.74	0.788	1.19	0.664	0.77	1.00	2.000	Yes
1113	53.04	3.93	1.67	2.26	0.74	0.788	1.19	0.664	0.77	1.00	2.000	Yes
1114	53.10	3.93	1.67	2.26	0.73	0.788	1.19	0.664	0.82	1.00	2.000	Yes
1115	53.17	3.94	1.67	2.27	0.73	0.788	1.19	0.664	0.78	1.00	2.000	Yes
1116	53.24	3.94	1.67	2.27	0.73	0.787	1.19	0.663	0.80	1.00	2.000	Yes
1117	53.31	3.94	1.67	2.27	0.73	0.787	1.19	0.663	0.79	1.00	2.000	No
1118	53.36	3.95	1.68	2.27	0.73	0.787	1.19	0.663	0.81	1.00	2.000	No
1119	53.43	3.95	1.68	2.27	0.73	0.787	1.19	0.663	0.84	1.00	2.000	No
1120	53.50	3.96	1.68	2.28	0.73	0.786	1.19	0.662	0.84	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1121	53.56	3.96	1.68	2.28	0.73	0.786	1.19	0.662	0.84	1.00	2.000	No
1122	53.63	3.96	1.68	2.28	0.73	0.786	1.19	0.662	0.84	1.00	2.000	No
1123	53.71	3.97	1.69	2.28	0.73	0.786	1.19	0.662	0.84	1.00	2.000	No
1124	53.77	3.97	1.69	2.28	0.73	0.785	1.19	0.662	0.85	1.00	2.000	No
1125	53.84	3.98	1.69	2.28	0.73	0.785	1.19	0.661	0.85	1.00	2.000	Yes
1126	53.91	3.98	1.69	2.29	0.73	0.785	1.19	0.661	0.84	1.00	2.000	Yes
1127	53.99	3.98	1.70	2.29	0.73	0.784	1.19	0.661	0.85	1.00	2.000	Yes
1128	54.03	3.99	1.70	2.29	0.73	0.784	1.19	0.661	0.84	1.00	2.000	Yes
1129	54.12	3.99	1.70	2.29	0.73	0.784	1.19	0.661	0.82	1.00	2.000	Yes
1130	54.16	3.99	1.70	2.29	0.73	0.784	1.19	0.660	0.81	1.00	2.000	Yes
1131	54.25	4.00	1.70	2.30	0.73	0.783	1.19	0.660	0.77	1.00	2.000	Yes
1132	54.29	4.00	1.70	2.30	0.73	0.783	1.19	0.660	0.77	1.00	2.000	Yes
1133	54.38	4.01	1.71	2.30	0.73	0.783	1.19	0.660	0.77	1.00	2.000	Yes
1134	54.41	4.01	1.71	2.30	0.73	0.783	1.19	0.659	0.77	1.00	2.000	Yes
1135	54.49	4.01	1.71	2.30	0.73	0.782	1.19	0.659	0.77	1.00	2.000	Yes
1136	54.56	4.02	1.71	2.31	0.73	0.782	1.19	0.659	0.77	1.00	2.000	Yes
1137	54.63	4.02	1.72	2.31	0.73	0.782	1.19	0.659	0.78	1.00	2.000	Yes
1138	54.70	4.03	1.72	2.31	0.73	0.782	1.19	0.658	0.83	1.00	2.000	Yes
1139	54.76	4.03	1.72	2.31	0.73	0.781	1.19	0.658	0.84	1.00	2.000	Yes
1140	54.82	4.03	1.72	2.31	0.73	0.781	1.19	0.658	0.84	1.00	2.000	Yes
1141	54.89	4.04	1.72	2.32	0.72	0.781	1.19	0.658	0.84	1.00	2.000	Yes
1142	54.97	4.04	1.73	2.32	0.72	0.780	1.19	0.658	0.84	1.00	2.000	Yes
1143	55.01	4.05	1.73	2.32	0.72	0.780	1.19	0.657	0.84	1.00	2.000	No
1144	55.10	4.05	1.73	2.32	0.72	0.780	1.19	0.657	0.84	1.00	2.000	No
1145	55.14	4.05	1.73	2.32	0.72	0.780	1.19	0.657	0.83	1.00	2.000	No
1146	55.20	4.06	1.73	2.32	0.72	0.780	1.19	0.657	0.77	1.00	2.000	No
1147	55.27	4.06	1.74	2.33	0.72	0.779	1.19	0.657	0.78	1.00	2.000	No
1148	55.34	4.07	1.74	2.33	0.72	0.779	1.19	0.656	0.80	1.00	2.000	No
1149	55.41	4.07	1.74	2.33	0.72	0.779	1.19	0.656	0.80	1.00	2.000	No
1150	55.48	4.07	1.74	2.33	0.72	0.778	1.19	0.656	0.80	1.00	2.000	No
1151	55.54	4.08	1.74	2.33	0.72	0.778	1.19	0.656	0.82	1.00	2.000	No
1152	55.61	4.08	1.75	2.34	0.72	0.778	1.19	0.655	0.84	1.00	2.000	No
1153	55.67	4.09	1.75	2.34	0.72	0.778	1.19	0.655	0.85	1.00	2.000	No
1154	55.74	4.09	1.75	2.34	0.72	0.777	1.19	0.655	0.84	1.00	2.000	No
1155	55.82	4.09	1.75	2.34	0.72	0.777	1.19	0.655	0.84	1.00	2.000	No
1156	55.86	4.10	1.75	2.34	0.72	0.777	1.19	0.655	0.80	1.00	2.000	No
1157	55.94	4.10	1.76	2.35	0.72	0.777	1.19	0.654	0.76	1.00	2.000	No
1158	56.01	4.11	1.76	2.35	0.72	0.776	1.19	0.654	0.76	1.00	2.000	No
1159	56.08	4.11	1.76	2.35	0.72	0.776	1.19	0.654	0.76	1.00	2.000	Yes
1160	56.12	4.11	1.76	2.35	0.72	0.776	1.19	0.654	0.76	1.00	2.000	Yes
1161	56.19	4.12	1.76	2.35	0.72	0.775	1.19	0.653	0.76	1.00	2.000	Yes
1162	56.25	4.12	1.77	2.36	0.72	0.775	1.19	0.653	0.76	1.00	2.000	Yes
1163	56.32	4.13	1.77	2.36	0.72	0.775	1.19	0.653	0.80	1.00	2.000	Yes
1164	56.38	4.13	1.77	2.36	0.72	0.775	1.19	0.653	0.81	1.00	2.000	Yes
1165	56.45	4.13	1.77	2.36	0.72	0.774	1.19	0.652	0.82	1.00	2.000	No
1166	56.52	4.14	1.77	2.36	0.72	0.774	1.19	0.652	0.83	1.00	2.000	No
1167	56.59	4.14	1.78	2.37	0.72	0.774	1.19	0.652	0.84	1.00	2.000	Yes
1168	56.66	4.15	1.78	2.37	0.72	0.774	1.19	0.652	0.84	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1169	56.73	4.15	1.78	2.37	0.71	0.773	1.19	0.651	0.79	1.00	2.000	Yes
1170	56.79	4.15	1.78	2.37	0.71	0.773	1.19	0.651	0.76	1.00	2.000	Yes
1171	56.84	4.16	1.78	2.37	0.71	0.773	1.19	0.651	0.76	1.00	2.000	No
1172	56.92	4.16	1.79	2.37	0.71	0.772	1.19	0.651	0.78	1.00	2.000	No
1173	56.99	4.17	1.79	2.38	0.71	0.772	1.19	0.651	0.82	1.00	2.000	No
1174	57.04	4.17	1.79	2.38	0.71	0.772	1.19	0.650	0.78	1.00	2.000	No
1175	57.11	4.17	1.79	2.38	0.71	0.772	1.19	0.650	0.80	1.00	2.000	No
1176	57.17	4.18	1.79	2.38	0.71	0.771	1.19	0.650	0.79	1.00	2.000	No
1177	57.24	4.18	1.80	2.38	0.71	0.771	1.19	0.650	0.80	1.00	2.000	No
1178	57.30	4.18	1.80	2.39	0.71	0.771	1.19	0.649	0.82	1.00	2.000	No
1179	57.38	4.19	1.80	2.39	0.71	0.771	1.19	0.649	0.84	1.00	2.000	No
1180	57.44	4.19	1.80	2.39	0.71	0.770	1.19	0.649	0.84	1.00	2.000	No
1181	57.51	4.20	1.81	2.39	0.71	0.770	1.19	0.649	0.85	1.00	2.000	No
1182	57.56	4.20	1.81	2.39	0.71	0.770	1.19	0.649	0.85	1.00	2.000	No
1183	57.64	4.20	1.81	2.40	0.71	0.770	1.19	0.648	0.84	1.00	2.000	No
1184	57.70	4.21	1.81	2.40	0.71	0.769	1.19	0.648	0.83	1.00	2.000	No
1185	57.77	4.21	1.81	2.40	0.71	0.769	1.19	0.648	0.84	1.00	2.000	No
1186	57.83	4.22	1.81	2.40	0.71	0.769	1.19	0.648	0.84	1.00	2.000	No
1187	57.90	4.22	1.82	2.40	0.71	0.768	1.19	0.647	0.82	1.00	2.000	No
1188	57.97	4.22	1.82	2.41	0.71	0.768	1.19	0.647	0.75	1.00	2.000	No
1189	58.06	4.23	1.82	2.41	0.71	0.768	1.19	0.647	0.75	1.00	2.000	No
1190	58.10	4.23	1.82	2.41	0.71	0.768	1.19	0.647	0.75	1.00	2.000	Yes
1191	58.16	4.24	1.83	2.41	0.71	0.767	1.19	0.647	0.75	1.00	2.000	Yes
1192	58.23	4.24	1.83	2.41	0.71	0.767	1.19	0.646	0.75	1.00	2.000	Yes
1193	58.28	4.24	1.83	2.41	0.71	0.767	1.19	0.646	0.79	1.00	2.000	Yes
1194	58.36	4.25	1.83	2.42	0.71	0.767	1.19	0.646	0.82	1.00	2.000	Yes
1195	58.42	4.25	1.83	2.42	0.71	0.766	1.19	0.646	0.83	1.00	2.000	Yes
1196	58.49	4.26	1.84	2.42	0.71	0.766	1.19	0.645	0.84	1.00	2.000	Yes
1197	58.56	4.26	1.84	2.42	0.71	0.766	1.19	0.645	0.84	1.00	2.000	Yes
1198	58.63	4.26	1.84	2.42	0.70	0.765	1.19	0.645	0.79	1.00	2.000	Yes
1199	58.68	4.27	1.84	2.43	0.70	0.765	1.19	0.645	0.78	1.00	2.000	Yes
1200	58.76	4.27	1.84	2.43	0.70	0.765	1.19	0.644	0.79	1.00	2.000	Yes
1201	58.81	4.28	1.85	2.43	0.70	0.765	1.19	0.644	0.82	1.00	2.000	Yes
1202	58.90	4.28	1.85	2.43	0.70	0.764	1.19	0.644	0.85	1.00	2.000	Yes
1203	58.96	4.28	1.85	2.43	0.70	0.764	1.19	0.644	0.85	1.00	2.000	Yes
1204	59.02	4.29	1.85	2.44	0.70	0.764	1.19	0.644	0.85	1.00	2.000	Yes
1205	59.07	4.29	1.85	2.44	0.70	0.764	1.19	0.643	0.85	1.00	2.000	Yes
1206	59.15	4.30	1.86	2.44	0.70	0.763	1.19	0.643	0.85	1.00	2.000	Yes
1207	59.21	4.30	1.86	2.44	0.70	0.763	1.19	0.643	0.84	1.00	2.000	Yes
1208	59.29	4.30	1.86	2.44	0.70	0.763	1.19	0.643	0.85	1.00	2.000	Yes
1209	59.34	4.31	1.86	2.44	0.70	0.763	1.19	0.643	0.84	1.00	2.000	No
1210	59.41	4.31	1.86	2.45	0.70	0.762	1.19	0.642	0.84	1.00	2.000	No
1211	59.48	4.32	1.87	2.45	0.70	0.762	1.19	0.642	0.85	1.00	2.000	No
1212	59.54	4.32	1.87	2.45	0.70	0.762	1.19	0.642	0.85	1.00	2.000	No
1213	59.60	4.32	1.87	2.45	0.70	0.762	1.19	0.642	0.86	1.00	2.000	No
1214	59.69	4.33	1.87	2.45	0.70	0.761	1.19	0.641	0.86	1.00	2.000	No
1215	59.73	4.33	1.87	2.46	0.70	0.761	1.19	0.641	0.85	1.00	2.000	No
1216	59.81	4.33	1.88	2.46	0.70	0.761	1.19	0.641	0.83	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1217	59.89	4.34	1.88	2.46	0.70	0.760	1.19	0.641	0.77	1.00	2.000	No
1218	59.93	4.34	1.88	2.46	0.70	0.760	1.19	0.640	0.75	1.00	2.000	No
1219	60.02	4.35	1.88	2.46	0.70	0.760	1.19	0.640	0.75	1.00	2.000	Yes
1220	60.06	4.35	1.88	2.47	0.70	0.760	1.19	0.640	0.77	1.00	2.000	Yes
1221	60.12	4.35	1.89	2.47	0.70	0.759	1.19	0.640	0.82	1.00	2.000	Yes
1222	60.19	4.36	1.89	2.47	0.70	0.759	1.19	0.640	0.83	1.00	2.000	Yes
1223	60.26	4.36	1.89	2.47	0.70	0.759	1.19	0.639	0.84	1.00	2.000	Yes
1224	60.32	4.37	1.89	2.47	0.70	0.759	1.19	0.639	0.84	1.00	2.000	Yes
1225	60.39	4.37	1.90	2.48	0.70	0.758	1.19	0.639	0.84	1.00	2.000	Yes
1226	60.46	4.37	1.90	2.48	0.70	0.758	1.19	0.639	0.84	1.00	2.000	Yes
1227	60.53	4.38	1.90	2.48	0.69	0.758	1.19	0.638	0.83	1.00	2.000	Yes
1228	60.58	4.38	1.90	2.48	0.69	0.758	1.19	0.638	0.80	1.00	2.000	Yes
1229	60.66	4.39	1.90	2.48	0.69	0.757	1.19	0.638	0.74	1.00	2.000	Yes
1230	60.72	4.39	1.91	2.48	0.69	0.757	1.19	0.638	0.74	1.00	2.000	Yes
1231	60.78	4.39	1.91	2.49	0.69	0.757	1.19	0.638	0.78	1.00	2.000	Yes
1232	60.87	4.40	1.91	2.49	0.69	0.756	1.19	0.637	0.83	1.00	2.000	Yes
1233	60.93	4.40	1.91	2.49	0.69	0.756	1.19	0.637	0.84	1.00	2.000	Yes
1234	61.01	4.41	1.91	2.49	0.69	0.756	1.19	0.637	0.84	1.00	2.000	Yes
1235	61.04	4.41	1.92	2.49	0.69	0.756	1.19	0.637	0.84	1.00	2.000	Yes
1236	61.11	4.41	1.92	2.50	0.69	0.755	1.19	0.636	0.81	1.00	2.000	Yes
1237	61.18	4.42	1.92	2.50	0.69	0.755	1.19	0.636	0.78	1.00	2.000	Yes
1238	61.24	4.42	1.92	2.50	0.69	0.755	1.19	0.636	0.76	1.00	2.000	Yes
1239	61.31	4.43	1.92	2.50	0.69	0.754	1.19	0.636	0.78	1.00	2.000	Yes
1240	61.37	4.43	1.93	2.50	0.69	0.754	1.19	0.635	0.80	1.00	2.000	Yes
1241	61.45	4.43	1.93	2.51	0.69	0.754	1.19	0.635	0.84	1.00	2.000	Yes
1242	61.50	4.44	1.93	2.51	0.69	0.754	1.19	0.635	0.84	1.00	2.000	Yes
1243	61.56	4.44	1.93	2.51	0.69	0.753	1.19	0.635	0.82	1.00	2.000	No
1244	61.64	4.45	1.93	2.51	0.69	0.753	1.19	0.635	0.82	1.00	2.000	No
1245	61.69	4.45	1.94	2.51	0.69	0.753	1.19	0.634	0.83	1.00	2.000	No
1246	61.77	4.45	1.94	2.52	0.69	0.753	1.19	0.634	0.83	1.00	2.000	Yes
1247	61.83	4.46	1.94	2.52	0.69	0.752	1.19	0.634	0.82	1.00	2.000	Yes
1248	61.91	4.46	1.94	2.52	0.69	0.752	1.19	0.634	0.74	1.00	2.000	Yes
1249	61.97	4.47	1.94	2.52	0.69	0.752	1.19	0.633	0.74	1.00	2.000	Yes
1250	62.02	4.47	1.95	2.52	0.69	0.751	1.19	0.633	0.74	1.00	2.000	Yes
1251	62.12	4.48	1.95	2.53	0.69	0.751	1.19	0.633	0.79	1.00	2.000	Yes
1252	62.18	4.48	1.95	2.53	0.69	0.751	1.19	0.633	0.82	1.00	2.000	Yes
1253	62.22	4.48	1.95	2.53	0.69	0.751	1.19	0.632	0.82	1.00	2.000	Yes
1254	62.28	4.49	1.95	2.53	0.69	0.750	1.19	0.632	0.83	1.00	2.000	Yes
1255	62.36	4.49	1.96	2.53	0.69	0.750	1.19	0.632	0.81	1.00	2.000	Yes
1256	62.42	4.49	1.96	2.54	0.69	0.750	1.19	0.632	0.82	1.00	2.000	Yes
1257	62.49	4.50	1.96	2.54	0.68	0.749	1.19	0.631	0.81	1.00	2.000	No
1258	62.55	4.50	1.96	2.54	0.68	0.749	1.19	0.631	0.81	1.00	2.000	No
1259	62.62	4.51	1.96	2.54	0.68	0.749	1.19	0.631	0.81	1.00	2.000	No
1260	62.69	4.51	1.97	2.54	0.68	0.749	1.19	0.631	0.77	1.00	2.000	No
1261	62.75	4.51	1.97	2.55	0.68	0.748	1.19	0.631	0.74	1.00	2.000	Yes
1262	62.83	4.52	1.97	2.55	0.68	0.748	1.19	0.630	0.80	1.00	2.000	Yes
1263	62.88	4.52	1.97	2.55	0.68	0.748	1.19	0.630	0.82	1.00	2.000	Yes
1264	62.96	4.53	1.98	2.55	0.68	0.748	1.19	0.630	0.85	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1265	63.01	4.53	1.98	2.55	0.68	0.747	1.19	0.630	0.85	1.00	2.000	Yes
1266	63.07	4.53	1.98	2.55	0.68	0.747	1.19	0.629	0.84	1.00	2.000	No
1267	63.14	4.54	1.98	2.56	0.68	0.747	1.19	0.629	0.85	1.00	2.000	No
1268	63.20	4.54	1.98	2.56	0.68	0.747	1.19	0.629	0.84	1.00	2.000	Yes
1269	63.27	4.55	1.99	2.56	0.68	0.746	1.19	0.629	0.81	1.00	2.000	Yes
1270	63.34	4.55	1.99	2.56	0.68	0.746	1.19	0.629	0.73	1.00	2.000	Yes
1271	63.40	4.55	1.99	2.56	0.68	0.746	1.19	0.628	0.73	1.00	2.000	Yes
1272	63.47	4.56	1.99	2.57	0.68	0.745	1.19	0.628	0.73	1.00	2.000	Yes
1273	63.53	4.56	1.99	2.57	0.68	0.745	1.19	0.628	0.73	1.00	2.000	No
1274	63.61	4.57	2.00	2.57	0.68	0.745	1.19	0.628	0.82	1.00	2.000	No
1275	63.67	4.57	2.00	2.57	0.68	0.745	1.19	0.627	0.81	1.00	2.000	No
1276	63.74	4.57	2.00	2.57	0.68	0.744	1.19	0.627	0.79	1.00	2.000	Yes
1277	63.80	4.58	2.00	2.58	0.68	0.744	1.19	0.627	0.79	1.00	2.000	Yes
1278	63.86	4.58	2.00	2.58	0.68	0.744	1.19	0.627	0.83	1.00	2.000	Yes
1279	63.93	4.59	2.01	2.58	0.68	0.744	1.19	0.626	0.83	1.00	2.000	Yes
1280	64.00	4.59	2.01	2.58	0.68	0.743	1.19	0.626	0.84	1.00	2.000	No
1281	64.05	4.59	2.01	2.58	0.68	0.743	1.19	0.626	0.83	1.00	2.000	Yes
1282	64.13	4.60	2.01	2.59	0.68	0.743	1.19	0.626	0.84	1.00	2.000	Yes
1283	64.19	4.60	2.01	2.59	0.68	0.742	1.19	0.626	0.84	1.00	2.000	Yes
1284	64.25	4.61	2.02	2.59	0.68	0.742	1.19	0.625	0.84	1.00	2.000	Yes
1285	64.33	4.61	2.02	2.59	0.68	0.742	1.19	0.625	0.83	1.00	2.000	Yes
1286	64.39	4.61	2.02	2.59	0.68	0.742	1.19	0.625	0.83	1.00	2.000	Yes
1287	64.46	4.62	2.02	2.60	0.67	0.741	1.19	0.625	0.84	1.00	2.000	Yes
1288	64.51	4.62	2.02	2.60	0.67	0.741	1.19	0.625	0.85	1.00	2.000	Yes
1289	64.58	4.62	2.03	2.60	0.67	0.741	1.19	0.624	0.85	1.00	2.000	No
1290	64.65	4.63	2.03	2.60	0.67	0.741	1.19	0.624	0.85	1.00	2.000	No
1291	64.72	4.63	2.03	2.60	0.67	0.740	1.19	0.624	0.84	1.00	2.000	No
1292	64.79	4.64	2.03	2.60	0.67	0.740	1.19	0.624	0.85	1.00	2.000	No
1293	64.85	4.64	2.03	2.61	0.67	0.740	1.19	0.623	0.82	1.00	2.000	No
1294	64.91	4.64	2.04	2.61	0.67	0.740	1.19	0.623	0.77	1.00	2.000	No
1295	64.98	4.65	2.04	2.61	0.67	0.739	1.19	0.623	0.73	1.00	2.000	No
1296	65.05	4.65	2.04	2.61	0.67	0.739	1.19	0.623	0.73	1.00	2.000	No
1297	65.11	4.66	2.04	2.61	0.67	0.739	1.19	0.622	0.73	1.00	2.000	Yes
1298	65.18	4.66	2.04	2.62	0.67	0.739	1.19	0.622	0.74	1.00	2.000	Yes
1299	65.24	4.66	2.05	2.62	0.67	0.738	1.19	0.622	0.78	1.00	2.000	Yes
1300	65.31	4.67	2.05	2.62	0.67	0.738	1.19	0.622	0.82	1.00	2.000	Yes
1301	65.37	4.67	2.05	2.62	0.67	0.738	1.19	0.622	0.82	1.00	2.000	Yes
1302	65.44	4.68	2.05	2.62	0.67	0.737	1.19	0.621	0.80	1.00	2.000	Yes
1303	65.51	4.68	2.05	2.63	0.67	0.737	1.19	0.621	0.75	1.00	2.000	Yes
1304	65.57	4.68	2.06	2.63	0.67	0.737	1.19	0.621	0.74	1.00	2.000	Yes
1305	65.63	4.69	2.06	2.63	0.67	0.737	1.19	0.621	0.76	1.00	2.000	Yes
1306	65.70	4.69	2.06	2.63	0.67	0.736	1.19	0.620	0.80	1.00	2.000	Yes
1307	65.77	4.70	2.06	2.63	0.67	0.736	1.19	0.620	0.83	1.00	2.000	Yes
1308	65.84	4.70	2.07	2.64	0.67	0.736	1.19	0.620	0.81	1.00	2.000	Yes
1309	65.89	4.70	2.07	2.64	0.67	0.736	1.19	0.620	0.79	1.00	2.000	Yes
1310	65.96	4.71	2.07	2.64	0.67	0.735	1.19	0.619	0.79	1.00	2.000	Yes
1311	66.04	4.71	2.07	2.64	0.67	0.735	1.19	0.619	0.83	1.00	2.000	No
1312	66.09	4.72	2.07	2.64	0.67	0.735	1.19	0.619	0.83	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1313	66.16	4.72	2.08	2.65	0.67	0.734	1.19	0.619	0.83	1.00	2.000	No
1314	66.23	4.73	2.08	2.65	0.67	0.734	1.19	0.619	0.81	1.00	2.000	No
1315	66.29	4.73	2.08	2.65	0.67	0.734	1.19	0.618	0.81	1.00	2.000	No
1316	66.36	4.73	2.08	2.65	0.67	0.734	1.19	0.618	0.77	1.00	2.000	No
1317	66.43	4.74	2.08	2.65	0.67	0.733	1.19	0.618	0.79	1.00	2.000	No
1318	66.48	4.74	2.09	2.66	0.67	0.733	1.19	0.618	0.81	1.00	2.000	No
1319	66.55	4.75	2.09	2.66	0.66	0.733	1.19	0.617	0.82	1.00	2.000	No
1320	66.62	4.75	2.09	2.66	0.66	0.733	1.19	0.617	0.83	1.00	2.000	No
1321	66.68	4.75	2.09	2.66	0.66	0.732	1.19	0.617	0.83	1.00	2.000	No
1322	66.75	4.76	2.09	2.66	0.66	0.732	1.19	0.617	0.83	1.00	2.000	No
1323	66.82	4.76	2.10	2.67	0.66	0.732	1.19	0.617	0.83	1.00	2.000	No
1324	66.88	4.77	2.10	2.67	0.66	0.732	1.19	0.616	0.83	1.00	2.000	No
1325	66.95	4.77	2.10	2.67	0.66	0.731	1.19	0.616	0.83	1.00	2.000	No
1326	67.01	4.77	2.10	2.67	0.66	0.731	1.19	0.616	0.82	1.00	2.000	No
1327	67.08	4.78	2.10	2.67	0.66	0.731	1.19	0.616	0.82	1.00	2.000	No
1328	67.14	4.78	2.11	2.67	0.66	0.731	1.19	0.616	0.81	1.00	2.000	No
1329	67.21	4.78	2.11	2.68	0.66	0.730	1.19	0.615	0.82	1.00	2.000	No
1330	67.28	4.79	2.11	2.68	0.66	0.730	1.19	0.615	0.82	1.00	2.000	No
1331	67.35	4.79	2.11	2.68	0.66	0.730	1.19	0.615	0.82	1.00	2.000	No
1332	67.40	4.80	2.11	2.68	0.66	0.729	1.19	0.615	0.82	1.00	2.000	No
1333	67.47	4.80	2.12	2.68	0.66	0.729	1.19	0.614	0.81	1.00	2.000	No
1334	67.53	4.80	2.12	2.69	0.66	0.729	1.19	0.614	0.82	1.00	2.000	No
1335	67.61	4.81	2.12	2.69	0.66	0.729	1.19	0.614	0.83	1.00	2.000	No
1336	67.67	4.81	2.12	2.69	0.66	0.728	1.19	0.614	0.88	1.00	2.000	No
1337	67.73	4.81	2.12	2.69	0.66	0.728	1.19	0.614	0.72	1.00	2.000	No
1338	67.80	4.82	2.13	2.69	0.66	0.728	1.19	0.614	0.72	1.00	2.000	No
1339	67.87	4.82	2.13	2.69	0.66	0.728	1.19	0.614	0.72	1.00	2.000	No
1340	67.93	4.82	2.13	2.69	0.66	0.728	1.19	0.614	0.72	1.00	2.000	No
1341	68.00	4.82	2.13	2.69	0.66	0.728	1.19	0.613	0.72	1.00	2.000	No

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
305	0.02	213.38	0.00	1.62	0.33	0.95	196.53	0.00	196.53	1.565	No	No	2.00
306	0.10	208.35	0.00	1.60	0.35	0.95	184.27	0.00	184.27	0.868	No	No	1.63
307	0.15	206.17	0.00	1.55	0.35	0.95	182.01	0.00	182.01	0.789	No	No	1.48
308	0.23	202.71	0.00	1.53	0.34	0.95	190.05	0.00	190.05	1.129	No	No	2.00
309	0.29	198.38	0.00	1.57	0.37	0.95	174.27	0.00	174.27	0.585	No	No	1.07
310	0.36	192.59	0.00	1.61	0.37	0.95	169.58	0.00	169.58	0.497	No	No	0.90
311	0.43	187.23	0.00	1.67	0.37	0.95	173.52	0.00	173.52	0.569	No	No	1.04
312	0.47	188.50	0.00	1.70	0.39	0.94	159.02	0.00	159.02	0.362	No	No	0.64
313	0.54	191.50	0.00	1.70	0.37	0.95	172.81	0.00	172.81	0.555	No	No	1.01
314	0.62	203.45	0.00	1.67	0.36	0.95	181.59	0.00	181.59	0.775	No	No	1.43
315	0.68	214.49	0.00	1.68	0.34	0.95	192.00	0.00	192.00	1.240	No	No	2.00
316	0.75	223.04	0.00	1.70	0.33	0.95	203.35	0.00	203.35	2.297	No	No	2.00
317	0.81	229.21	1.59	1.73	0.32	0.95	205.21	0.00	205.21	2.570	No	No	2.00
318	0.88	233.37	3.98	1.76	0.32	0.95	208.96	0.03	208.99	3.264	No	No	2.00
319	0.94	237.30	4.62	1.77	0.31	0.95	214.71	0.11	214.82	4.000	No	No	2.00
320	1.00	243.51	3.55	1.76	0.31	0.95	215.91	0.01	215.92	4.000	No	No	2.00
321	1.07	249.18	0.00	1.70	0.30	0.95	226.11	0.00	226.11	4.000	No	No	2.00
322	1.14	243.30	0.86	1.72	0.29	0.95	230.33	0.00	230.33	4.000	No	No	2.00
323	1.21	227.74	7.61	1.81	0.33	0.95	199.14	3.30	202.44	2.177	No	No	2.00
324	1.27	206.13	16.54	1.92	0.30	0.95	183.53	36.12	219.65	4.000	No	No	2.00
325	1.34	192.44	20.85	1.97	0.30	0.95	171.37	49.21	220.58	4.000	No	No	2.00
326	1.41	180.40	23.13	2.00	0.31	0.95	162.66	54.12	216.78	4.000	No	No	2.00
327	1.47	161.34	28.85	2.07	0.31	0.95	150.70	63.92	214.61	4.000	No	No	2.00
328	1.53	144.95	35.21	2.15	0.35	0.94	118.92	65.97	184.89	0.892	No	No	1.62
329	1.59	132.96	40.32	2.22	0.35	0.94	117.65	70.59	188.23	1.036	No	No	1.89
330	1.65	131.99	40.52	2.22	0.35	0.94	117.58	70.74	188.32	1.040	No	No	1.89
331	1.72	149.62	32.04	2.11	0.36	0.94	115.89	61.55	177.43	0.657	No	No	1.17
332	1.80	179.66	19.01	1.95	0.32	0.94	165.10	42.71	207.80	3.023	No	No	2.00
333	1.86	220.29	5.17	1.78	0.33	0.94	197.67	0.28	197.95	1.689	No	No	2.00
334	1.92	255.95	0.00	1.67	0.30	0.95	225.97	0.00	225.97	4.000	No	No	2.00
335	1.98	293.89	0.00	1.59	0.26	0.95	262.73	0.00	254.00	4.000	No	No	2.00
336	2.05	337.81	0.00	1.50	0.26	0.95	302.19	0.00	254.00	4.000	No	No	2.00
337	2.12	389.98	0.00	1.42	0.26	0.95	345.32	0.00	254.00	4.000	No	No	2.00
338	2.20	434.07	0.00	1.38	0.26	0.95	402.74	0.00	254.00	4.000	No	No	2.00
339	2.26	461.75	0.00	1.37	0.26	0.95	420.36	0.00	254.00	4.000	No	No	2.00
340	2.33	461.78	0.00	1.39	0.26	0.95	419.22	0.00	254.00	4.000	No	No	2.00
341	2.39	458.12	0.00	1.43	0.26	0.95	402.28	0.00	254.00	4.000	No	No	2.00
342	2.44	453.96	0.00	1.48	0.26	0.95	409.94	0.00	254.00	4.000	No	No	2.00
343	2.51	455.34	0.00	1.53	0.26	0.95	407.50	0.00	254.00	4.000	No	No	2.00
344	2.58	453.56	0.00	1.56	0.26	0.95	405.40	0.00	254.00	4.000	No	No	2.00
345	2.65	442.09	0.00	1.56	0.26	0.95	404.54	0.00	254.00	4.000	No	No	2.00
346	2.71	429.03	0.00	1.55	0.26	0.95	376.11	0.00	254.00	4.000	No	No	2.00
347	2.77	415.55	0.00	1.55	0.26	0.95	369.82	0.00	254.00	4.000	No	No	2.00
348	2.84	416.72	0.00	1.54	0.26	0.94	367.84	0.00	254.00	4.000	No	No	2.00
349	2.90	429.00	0.00	1.52	0.26	0.94	378.72	0.00	254.00	4.000	No	No	2.00
350	2.97	434.30	0.00	1.49	0.26	0.94	402.14	0.00	254.00	4.000	No	No	2.00
351	3.04	422.05	0.00	1.48	0.26	0.94	381.48	0.00	254.00	4.000	No	No	2.00
352	3.10	405.68	0.00	1.48	0.26	0.94	345.44	0.00	254.00	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
353	3.17	388.91	0.00	1.49	0.26	0.94	357.81	0.00	254.00	4.000	No	No	2.00
354	3.23	378.51	0.00	1.49	0.26	0.94	336.16	0.00	254.00	4.000	No	No	2.00
355	3.31	355.86	0.00	1.50	0.26	0.94	317.17	0.00	254.00	4.000	No	No	2.00
356	3.37	341.64	0.00	1.49	0.26	0.94	296.90	0.00	254.00	4.000	No	No	2.00
357	3.43	327.04	0.00	1.48	0.26	0.94	297.76	0.00	254.00	4.000	No	No	2.00
358	3.50	312.78	0.00	1.48	0.26	0.94	277.84	0.00	254.00	4.000	No	No	2.00
359	3.57	296.21	0.00	1.49	0.26	0.94	258.50	0.00	254.00	4.000	No	No	2.00
360	3.62	282.42	0.00	1.52	0.26	0.94	253.17	0.00	253.17	4.000	No	No	2.00
361	3.70	273.50	0.00	1.55	0.28	0.94	239.84	0.00	239.84	4.000	No	No	2.00
362	3.76	263.94	0.00	1.58	0.29	0.93	233.08	0.00	233.08	4.000	No	No	2.00
363	3.82	257.13	0.00	1.60	0.30	0.93	225.66	0.00	225.66	4.000	No	No	2.00
364	3.88	250.79	0.00	1.61	0.30	0.93	220.24	0.00	220.24	4.000	No	No	2.00
365	3.96	246.12	0.00	1.61	0.31	0.93	214.81	0.00	214.81	4.000	No	No	2.00
366	4.02	242.97	0.00	1.61	0.31	0.93	212.16	0.00	212.16	4.000	No	No	2.00
367	4.10	240.65	0.00	1.61	0.32	0.92	210.98	0.00	210.98	3.724	No	No	2.00
368	4.16	240.15	0.00	1.61	0.32	0.92	207.97	0.00	207.97	3.055	No	No	2.00
369	4.24	239.28	0.00	1.61	0.32	0.92	210.37	0.00	210.37	3.574	No	No	2.00
370	4.29	240.05	0.00	1.61	0.32	0.92	208.20	0.00	208.20	3.102	No	No	2.00
371	4.35	238.73	0.00	1.62	0.32	0.92	209.79	0.00	209.79	3.441	No	No	2.00
372	4.42	237.55	0.00	1.63	0.32	0.92	206.34	0.00	206.34	2.756	No	No	2.00
373	4.48	234.33	0.00	1.63	0.32	0.92	204.58	0.00	204.58	2.473	No	No	2.00
374	4.56	230.49	0.00	1.64	0.33	0.92	200.41	0.00	200.41	1.936	No	No	2.00
375	4.62	226.40	0.00	1.64	0.34	0.92	195.25	0.00	195.25	1.463	No	No	2.00
376	4.67	222.37	0.00	1.63	0.34	0.92	192.82	0.00	192.82	1.292	No	No	2.00
377	4.74	217.14	0.00	1.62	0.35	0.91	188.86	0.00	188.86	1.067	No	No	1.83
378	4.81	211.30	0.00	1.60	0.36	0.91	180.37	0.00	180.37	0.738	No	No	1.25
379	4.88	208.39	0.00	1.55	0.36	0.91	176.27	0.00	176.27	0.629	No	No	1.06
380	4.95	206.79	0.00	1.48	0.36	0.91	180.48	0.00	180.48	0.741	No	No	1.26
381	5.01	208.46	0.00	1.41	0.36	0.91	175.61	0.00	175.61	0.614	No	No	1.03
382	5.08	211.33	0.00	1.41	0.36	0.91	180.61	0.00	180.61	0.745	No	No	1.26
383	5.15	216.01	0.00	1.45	0.35	0.91	188.17	0.00	188.17	1.033	No	No	1.77
384	5.21	218.93	0.00	1.47	0.35	0.91	188.33	0.00	188.33	1.041	No	No	1.78
385	5.26	221.41	0.00	1.49	0.35	0.91	188.47	0.00	188.47	1.048	No	No	1.79
386	5.34	225.56	0.00	1.52	0.34	0.91	194.79	0.00	194.79	1.428	No	No	2.00
387	5.39	232.47	0.00	1.54	0.33	0.91	199.57	0.00	199.57	1.847	No	No	2.00
388	5.48	239.68	0.00	1.54	0.32	0.91	207.41	0.00	207.41	2.949	No	No	2.00
389	5.54	245.28	0.00	1.54	0.31	0.92	214.66	0.00	214.66	4.000	No	No	2.00
390	5.60	245.15	0.00	1.54	0.31	0.92	214.95	0.00	214.95	4.000	No	No	2.00
391	5.66	238.91	0.00	1.55	0.32	0.91	206.74	0.00	206.74	2.827	No	No	2.00
392	5.74	231.13	0.00	1.59	0.33	0.91	196.86	0.00	196.86	1.592	No	No	2.00
393	5.79	224.42	0.00	1.63	0.34	0.91	192.84	0.00	192.84	1.293	No	No	2.00
394	5.86	218.21	0.00	1.69	0.35	0.91	187.70	0.00	187.70	1.011	No	No	1.71
395	5.93	208.91	4.09	1.76	0.36	0.90	179.28	0.03	179.32	0.707	No	No	1.18
396	5.99	191.17	11.94	1.86	0.35	0.90	168.09	16.75	184.84	0.890	No	No	1.50
397	6.05	168.29	20.90	1.97	0.35	0.90	141.86	45.14	187.00	0.979	No	No	1.66
398	6.12	140.17	31.11	2.10	0.35	0.90	120.76	61.34	182.10	0.792	No	No	1.33
399	6.19	121.25	38.48	2.19	0.39	0.89	94.85	63.57	158.41	0.356	No	No	0.57
400	6.26	114.58	40.52	2.22	0.39	0.89	92.00	64.53	156.53	0.339	No	No	0.54

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
401	6.32	127.93	33.50	2.13	0.38	0.89	102.67	60.47	163.14	0.406	No	No	0.65
402	6.39	150.15	23.52	2.01	0.36	0.90	129.56	49.65	179.21	0.704	No	No	1.17
403	6.45	176.07	12.84	1.87	0.38	0.89	148.53	19.12	167.65	0.467	No	No	0.76
404	6.51	197.32	3.68	1.76	0.38	0.89	168.36	0.01	168.37	0.478	No	No	0.77
405	6.57	214.48	0.00	1.65	0.35	0.90	183.82	0.00	183.82	0.852	No	No	1.42
406	6.65	224.10	0.00	1.58	0.34	0.90	193.94	0.00	193.94	1.367	No	No	2.00
407	6.72	227.25	0.00	1.54	0.34	0.90	194.68	0.00	194.68	1.419	No	No	2.00
408	6.78	224.00	0.00	1.54	0.34	0.90	192.26	0.00	192.26	1.256	No	No	2.00
409	6.85	215.38	0.00	1.57	0.35	0.90	184.61	0.00	184.61	0.881	No	No	1.47
410	6.92	203.04	0.00	1.61	0.37	0.89	170.50	0.00	170.50	0.513	No	No	0.83
411	6.97	187.91	0.00	1.67	0.39	0.88	157.97	0.00	157.97	0.352	No	No	0.56
412	7.03	170.20	2.13	1.74	0.42	0.88	142.99	0.00	142.99	0.249	No	No	0.38
413	7.13	155.00	7.49	1.81	0.45	0.87	122.61	2.42	125.02	0.184	No	No	0.27
414	7.19	147.90	10.02	1.84	0.45	0.87	117.56	8.26	125.82	0.186	No	No	0.28
415	7.23	149.01	9.50	1.83	0.44	0.87	124.30	6.96	131.26	0.202	No	No	0.30
416	7.31	155.34	6.80	1.80	0.44	0.87	125.24	1.44	126.68	0.188	No	No	0.28
417	7.37	160.43	4.44	1.77	0.43	0.87	133.53	0.06	133.60	0.209	No	No	0.32
418	7.43	164.65	2.59	1.74	0.43	0.87	137.05	0.00	137.05	0.222	No	No	0.34
419	7.50	165.86	2.08	1.74	0.43	0.87	136.15	0.00	136.15	0.219	No	No	0.33
420	7.56	165.65	1.94	1.74	0.43	0.87	136.51	0.00	136.51	0.220	No	No	0.33
421	7.63	165.25	1.57	1.73	0.43	0.87	136.24	0.00	136.24	0.219	No	No	0.33
422	7.70	164.00	1.32	1.73	0.43	0.87	134.81	0.00	134.81	0.214	No	No	0.32
423	7.76	161.95	1.54	1.73	0.43	0.87	132.93	0.00	132.93	0.207	No	No	0.31
424	7.82	157.59	2.86	1.75	0.44	0.87	130.53	0.00	130.53	0.199	No	No	0.30
425	7.90	151.45	4.94	1.77	0.45	0.86	122.97	0.15	123.12	0.179	No	No	0.26
426	7.96	143.60	7.90	1.81	0.46	0.86	116.68	3.08	119.76	0.171	No	No	0.25
427	8.02	135.41	12.47	1.87	0.44	0.86	110.80	15.68	126.48	0.187	No	No	0.28
428	8.10	127.56	17.59	1.93	0.43	0.87	103.53	31.07	134.60	0.213	No	No	0.32
429	8.15	120.51	22.89	2.00	0.42	0.87	98.73	43.34	142.07	0.244	No	No	0.37
430	8.23	117.29	25.98	2.04	0.42	0.87	94.33	48.37	142.69	0.247	No	No	0.37
431	8.29	118.30	27.16	2.05	0.41	0.87	96.15	50.63	146.79	0.269	No	No	0.41
432	8.36	123.33	26.28	2.04	0.40	0.87	101.58	50.18	151.76	0.301	No	No	0.46
433	8.43	130.61	23.66	2.01	0.40	0.87	107.19	46.29	153.47	0.314	No	No	0.48
434	8.48	139.44	18.76	1.95	0.40	0.87	114.11	35.60	149.71	0.287	No	No	0.44
435	8.56	150.27	12.43	1.87	0.42	0.86	122.22	16.16	138.38	0.228	No	No	0.34
436	8.65	161.41	6.52	1.79	0.43	0.86	132.15	1.15	133.30	0.208	No	No	0.31
437	8.69	176.44	1.01	1.73	0.42	0.86	140.57	0.00	140.57	0.237	No	No	0.36
438	8.78	190.70	0.00	1.67	0.39	0.87	160.77	0.00	160.77	0.380	No	No	0.59
439	8.82	205.61	0.00	1.61	0.37	0.88	170.26	0.00	170.26	0.508	No	No	0.80
440	8.91	210.13	0.00	1.59	0.36	0.88	180.72	0.00	180.72	0.748	No	No	1.21
441	8.95	219.52	0.00	1.56	0.37	0.88	172.83	0.00	172.83	0.555	No	No	0.88
442	9.01	234.36	0.00	1.53	0.34	0.89	195.78	0.00	195.78	1.503	No	No	2.00
443	9.07	258.41	0.00	1.49	0.30	0.90	221.78	0.00	221.78	4.000	No	No	2.00
444	9.14	281.06	0.00	1.45	0.28	0.90	239.75	0.00	239.75	4.000	No	No	2.00
445	9.20	301.36	0.00	1.40	0.26	0.91	258.98	0.00	254.00	4.000	No	No	2.00
446	9.28	320.85	0.00	1.36	0.26	0.91	276.85	0.00	254.00	4.000	No	No	2.00
447	9.33	337.76	0.00	1.35	0.26	0.91	291.11	0.00	254.00	4.000	No	No	2.00
448	9.40	356.28	0.00	1.37	0.26	0.91	302.22	0.00	254.00	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
449	9.48	377.79	0.00	1.39	0.26	0.91	324.20	0.00	254.00	4.000	No	No	2.00
450	9.54	401.21	0.00	1.39	0.26	0.91	346.11	0.00	254.00	4.000	No	No	2.00
451	9.61	426.00	0.00	1.40	0.26	0.91	362.10	0.00	254.00	4.000	No	No	2.00
452	9.68	451.20	0.00	1.40	0.26	0.91	387.56	0.00	254.00	4.000	No	No	2.00
453	9.73	488.64	0.00	1.36	0.26	0.91	410.47	0.00	254.00	4.000	No	No	2.00
454	9.80	524.50	0.00	1.30	0.26	0.91	457.85	0.00	254.00	4.000	No	No	2.00
455	9.88	554.16	0.00	1.25	0.26	0.91	479.18	0.00	254.00	4.000	No	No	2.00
456	9.93	560.87	0.00	1.28	0.26	0.91	486.09	0.00	254.00	4.000	No	No	2.00
457	10.00	554.03	0.00	1.32	0.26	0.91	474.50	0.00	254.00	4.000	No	No	2.00
458	10.06	520.05	0.00	1.38	0.26	0.90	461.09	0.00	254.00	4.000	No	No	2.00
459	10.12	474.49	0.00	1.42	0.26	0.90	398.37	0.00	254.00	4.000	No	No	2.00
460	10.20	428.50	0.00	1.46	0.26	0.90	357.18	0.00	254.00	4.000	No	No	2.00
461	10.26	404.31	0.00	1.45	0.26	0.90	342.69	0.00	254.00	4.000	No	No	2.00
462	10.32	387.40	0.00	1.44	0.26	0.90	335.95	0.00	254.00	4.000	No	No	2.00
463	10.39	372.70	0.00	1.43	0.26	0.90	313.48	0.00	254.00	4.000	No	No	2.00
464	10.45	358.00	0.00	1.42	0.26	0.90	304.70	0.00	254.00	4.000	No	No	2.00
465	10.52	349.58	0.00	1.38	0.26	0.90	297.98	0.00	254.00	4.000	No	No	2.00
466	10.58	343.14	0.00	1.33	0.26	0.90	291.61	0.00	254.00	4.000	No	No	2.00
467	10.64	336.80	0.00	1.30	0.26	0.90	287.91	0.00	254.00	4.000	No	No	2.00
468	10.71	332.64	0.00	1.28	0.26	0.90	281.46	0.00	254.00	4.000	No	No	2.00
469	10.78	329.82	0.00	1.27	0.26	0.90	280.67	0.00	254.00	4.000	No	No	2.00
470	10.84	329.42	0.00	1.27	0.26	0.90	280.41	0.00	254.00	4.000	No	No	2.00
471	10.92	329.36	0.00	1.26	0.26	0.90	280.14	0.00	254.00	4.000	No	No	2.00
472	10.98	329.22	0.00	1.26	0.26	0.90	280.22	0.00	254.00	4.000	No	No	2.00
473	11.04	325.47	0.00	1.26	0.26	0.90	279.79	0.00	254.00	4.000	No	No	2.00
474	11.12	326.31	0.00	1.26	0.26	0.90	270.27	0.00	254.00	4.000	No	No	2.00
475	11.18	328.95	0.00	1.23	0.26	0.90	282.07	0.00	254.00	4.000	No	No	2.00
476	11.25	338.35	0.00	1.16	0.26	0.90	286.25	0.00	254.00	4.000	No	No	2.00
477	11.33	342.47	0.00	1.10	0.26	0.90	293.91	0.00	254.00	4.000	No	No	2.00
478	11.37	343.10	0.00	1.09	0.26	0.90	292.32	0.00	254.00	4.000	No	No	2.00
479	11.46	340.85	0.00	1.11	0.26	0.90	287.58	0.00	254.00	4.000	No	No	2.00
480	11.50	332.39	0.00	1.13	0.26	0.90	287.95	0.00	254.00	4.000	No	No	2.00
481	11.58	325.48	0.00	1.16	0.26	0.90	270.51	0.00	254.00	4.000	No	No	2.00
482	11.64	319.91	0.00	1.19	0.26	0.90	269.75	0.00	254.00	4.000	No	No	2.00
483	11.71	322.19	0.00	1.19	0.26	0.90	273.49	0.00	254.00	4.000	No	No	2.00
484	11.79	324.47	0.00	1.18	0.26	0.90	276.03	0.00	254.00	4.000	No	No	2.00
485	11.83	327.22	0.00	1.17	0.26	0.90	275.30	0.00	254.00	4.000	No	No	2.00
486	11.91	328.33	0.00	1.17	0.26	0.90	280.21	0.00	254.00	4.000	No	No	2.00
487	11.96	328.29	0.00	1.17	0.26	0.90	278.63	0.00	254.00	4.000	No	No	2.00
488	12.04	326.25	0.00	1.17	0.26	0.90	274.93	0.00	254.00	4.000	No	No	2.00
489	12.09	322.66	0.00	1.19	0.26	0.90	274.79	0.00	254.00	4.000	No	No	2.00
490	12.16	320.64	0.00	1.19	0.26	0.89	269.24	0.00	254.00	4.000	No	No	2.00
491	12.24	318.36	0.00	1.19	0.26	0.89	269.56	0.00	254.00	4.000	No	No	2.00
492	12.29	318.49	0.00	1.18	0.26	0.89	268.73	0.00	254.00	4.000	No	No	2.00
493	12.37	319.53	0.00	1.18	0.26	0.89	269.30	0.00	254.00	4.000	No	No	2.00
494	12.43	320.43	0.00	1.17	0.26	0.89	271.96	0.00	254.00	4.000	No	No	2.00
495	12.50	321.91	0.00	1.17	0.26	0.89	270.75	0.00	254.00	4.000	No	No	2.00
496	12.57	321.74	0.00	1.17	0.26	0.89	272.79	0.00	254.00	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
497	12.61	320.60	0.00	1.17	0.26	0.89	271.29	0.00	254.00	4.000	No	No	2.00
498	12.70	318.55	0.00	1.17	0.26	0.89	267.61	0.00	254.00	4.000	No	No	2.00
499	12.75	317.11	0.00	1.17	0.26	0.89	267.39	0.00	254.00	4.000	No	No	2.00
500	12.83	316.67	0.00	1.17	0.26	0.89	267.36	0.00	254.00	4.000	No	No	2.00
501	12.87	311.94	0.00	1.20	0.26	0.89	266.29	0.00	254.00	4.000	No	No	2.00
502	12.96	300.87	0.00	1.27	0.26	0.89	255.15	0.00	254.00	4.000	No	No	2.00
503	13.01	265.17	0.00	1.44	0.28	0.88	237.14	0.00	237.14	4.000	No	No	2.00
504	13.10	220.18	0.00	1.63	0.38	0.85	167.42	0.00	167.42	0.463	No	No	0.69
505	13.15	160.03	13.52	1.88	0.40	0.84	133.25	20.65	153.90	4.000	Yes	No	2.00
506	13.23	118.70	30.11	2.09	0.43	0.83	80.79	51.79	132.59	4.000	Yes	No	2.00
507	13.29	85.08	47.55	2.31	0.44	0.82	66.00	62.32	128.32	4.000	Yes	No	2.00
508	13.35	69.95	56.79	2.42	0.47	0.81	51.47	62.16	113.62	4.000	Yes	No	2.00
509	13.41	59.25	64.06	2.51	0.48	0.81	44.27	62.19	106.46	4.000	Yes	No	2.00
510	13.46	51.60	69.29	2.58	0.49	0.80	40.02	62.13	102.15	4.000	Yes	No	2.00
511	13.55	45.83	73.20	2.63	0.51	0.80	33.16	0.00	33.16	4.000	Yes	Yes	2.00
512	13.60	41.17	76.07	2.66	0.52	0.79	30.55	0.00	30.55	4.000	Yes	Yes	2.00
513	13.67	38.76	76.17	2.66	0.52	0.79	28.96	0.00	28.96	1.138	No	Yes	1.52
514	13.75	37.31	75.28	2.65	0.53	0.79	27.45	0.00	27.45	1.092	No	Yes	1.46
515	13.79	36.98	72.99	2.62	0.53	0.79	27.11	0.00	27.11	1.081	No	Yes	1.44
516	13.88	37.31	70.85	2.60	0.53	0.79	28.10	58.96	87.05	0.123	No	No	0.16
517	13.96	37.82	68.75	2.57	0.53	0.79	28.14	58.58	86.72	0.122	No	No	0.16
518	13.99	37.55	68.06	2.56	0.53	0.79	28.21	58.46	86.66	0.122	No	No	0.16
519	14.06	36.85	69.13	2.58	0.53	0.79	27.42	58.44	85.86	0.121	No	No	0.16
520	14.13	35.81	69.80	2.59	0.53	0.78	26.47	58.29	84.77	0.120	No	No	0.16
521	14.20	35.10	70.74	2.60	0.54	0.78	25.76	58.26	84.02	0.120	No	No	0.16
522	14.28	34.80	71.75	2.61	0.54	0.78	25.75	0.00	25.75	1.004	No	Yes	1.33
523	14.33	34.80	75.90	2.66	0.53	0.78	25.76	0.00	25.76	1.004	No	Yes	1.33
524	14.41	38.16	75.85	2.66	0.53	0.78	25.74	0.00	25.74	4.000	Yes	Yes	2.00
525	14.48	42.73	73.79	2.63	0.51	0.79	33.53	0.00	33.53	4.000	Yes	Yes	2.00
526	14.51	49.31	69.29	2.58	0.50	0.79	36.33	61.06	97.39	4.000	Yes	No	2.00
527	14.60	54.51	66.15	2.54	0.49	0.80	41.04	61.75	102.79	4.000	Yes	No	2.00
528	14.68	59.44	62.87	2.50	0.48	0.80	45.72	62.30	108.02	4.000	Yes	No	2.00
529	14.72	62.02	60.88	2.47	0.48	0.80	47.94	62.40	110.34	4.000	Yes	No	2.00
530	14.80	60.11	63.21	2.50	0.48	0.80	47.12	62.79	109.91	4.000	Yes	No	2.00
531	14.88	55.81	67.98	2.56	0.49	0.79	41.10	62.17	103.28	4.000	Yes	No	2.00
532	14.92	49.88	75.23	2.65	0.50	0.79	37.73	0.00	37.73	4.000	Yes	Yes	2.00
533	15.00	48.20	77.56	2.68	0.51	0.79	33.08	0.00	33.08	4.000	Yes	Yes	2.00
534	15.05	47.74	77.58	2.68	0.50	0.79	37.15	0.00	37.15	1.382	No	Yes	1.84
535	15.13	48.91	73.95	2.64	0.50	0.79	36.55	0.00	36.55	1.415	No	Yes	1.88
536	15.20	47.64	71.13	2.60	0.50	0.79	35.72	0.00	35.72	1.375	No	Yes	1.82
537	15.27	46.30	68.24	2.57	0.51	0.78	34.02	60.18	94.20	0.130	No	No	0.17
538	15.30	45.02	65.61	2.53	0.51	0.78	33.28	59.41	92.69	0.129	No	No	0.17
539	15.37	43.41	65.60	2.53	0.52	0.78	32.63	59.22	91.85	0.128	No	No	0.17
540	15.44	40.32	68.52	2.57	0.52	0.78	30.23	59.14	89.36	0.125	No	No	0.16
541	15.50	35.83	75.03	2.65	0.53	0.77	26.16	0.00	26.16	1.012	No	Yes	1.33
542	15.57	31.13	82.71	2.75	0.54	0.77	22.36	0.00	22.36	0.870	No	Yes	1.14
543	15.64	27.81	88.96	2.82	0.55	0.77	19.56	0.00	19.56	0.769	No	Yes	1.00
544	15.71	26.47	92.01	2.86	0.55	0.77	18.66	0.00	18.66	0.728	No	Yes	0.95

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
545	15.78	26.78	91.65	2.86	0.55	0.77	19.32	0.00	19.32	0.736	No	Yes	0.96
546	15.84	28.96	87.00	2.80	0.55	0.77	20.20	0.00	20.20	0.801	No	Yes	1.04
547	15.92	32.45	79.21	2.70	0.54	0.77	23.50	0.00	23.50	0.904	No	Yes	1.18
548	16.00	36.21	71.56	2.61	0.53	0.77	27.10	0.00	27.10	1.015	No	Yes	1.32
549	16.04	37.55	67.70	2.56	0.53	0.77	28.60	58.50	87.10	0.123	No	No	0.16
550	16.12	36.81	67.37	2.55	0.54	0.77	26.43	57.81	84.24	0.120	No	No	0.16
551	16.16	34.49	70.21	2.59	0.54	0.77	25.37	58.05	83.42	0.119	No	No	0.15
552	16.24	34.08	72.55	2.62	0.54	0.77	23.32	0.00	23.32	0.947	No	Yes	1.23
553	16.33	33.01	76.76	2.67	0.53	0.77	25.50	0.00	25.50	0.914	No	Yes	1.19
554	16.37	34.01	78.74	2.70	0.54	0.77	22.94	0.00	22.94	0.944	No	Yes	1.22
555	16.45	35.58	78.80	2.70	0.53	0.77	25.59	0.00	25.59	4.000	Yes	Yes	2.00
556	16.49	41.89	70.87	2.60	0.53	0.77	28.98	59.22	88.20	4.000	Yes	No	2.00
557	16.58	48.02	61.86	2.49	0.50	0.78	37.26	59.65	96.91	4.000	Yes	No	2.00
558	16.62	51.58	57.88	2.44	0.50	0.78	39.54	59.20	98.73	4.000	Yes	No	2.00
559	16.70	48.99	63.08	2.50	0.50	0.78	37.07	59.90	96.97	4.000	Yes	No	2.00
560	16.79	44.63	71.53	2.61	0.52	0.77	31.29	0.00	31.29	4.000	Yes	Yes	2.00
561	16.83	41.38	77.24	2.68	0.52	0.77	29.54	0.00	29.54	4.000	Yes	Yes	2.00
562	16.90	43.23	74.47	2.64	0.52	0.77	29.58	0.00	29.58	1.206	No	Yes	1.56
563	16.97	45.49	71.03	2.60	0.51	0.78	35.50	0.00	35.50	1.271	No	Yes	1.65
564	17.01	45.80	69.62	2.58	0.51	0.77	34.62	60.63	95.25	0.132	No	No	0.17
565	17.10	42.41	72.91	2.62	0.52	0.77	30.22	0.00	30.22	1.178	No	Yes	1.52
566	17.14	38.19	77.27	2.68	0.53	0.77	27.71	0.00	27.71	1.053	No	Yes	1.36
567	17.23	35.61	79.83	2.71	0.53	0.76	24.96	0.00	24.96	0.976	No	Yes	1.26
568	17.27	33.09	81.92	2.74	0.54	0.76	24.36	0.00	24.36	0.901	No	Yes	1.16
569	17.36	31.18	83.56	2.76	0.54	0.76	22.01	0.00	22.01	0.844	No	Yes	1.08
570	17.40	30.14	83.81	2.76	0.55	0.76	20.66	0.00	20.66	0.813	No	Yes	1.04
571	17.49	29.30	85.30	2.78	0.54	0.76	22.00	0.00	22.00	0.788	No	Yes	1.01
572	17.53	29.91	86.27	2.79	0.55	0.76	20.12	0.00	20.12	0.805	No	Yes	1.03
573	17.62	31.02	86.90	2.80	0.54	0.76	21.98	0.00	21.98	0.836	No	Yes	1.07
574	17.67	35.88	79.88	2.71	0.54	0.76	24.42	0.00	24.42	0.977	No	Yes	1.25
575	17.75	39.51	73.66	2.63	0.52	0.77	30.97	0.00	30.97	1.080	No	Yes	1.39
576	17.83	41.18	69.83	2.59	0.52	0.76	30.01	59.33	89.33	0.125	No	No	0.16
577	17.89	39.21	71.86	2.61	0.53	0.76	28.10	0.00	28.10	1.069	No	Yes	1.37
578	17.93	36.35	76.14	2.66	0.53	0.76	26.46	0.00	26.46	0.986	No	Yes	1.26
579	18.02	35.60	77.84	2.69	0.54	0.76	23.58	0.00	23.58	0.963	No	Yes	1.23
580	18.06	35.27	79.07	2.70	0.53	0.76	26.40	0.00	26.40	4.000	Yes	Yes	2.00
581	18.15	36.51	77.75	2.68	0.53	0.76	25.66	0.00	25.66	4.000	Yes	Yes	2.00
582	18.19	38.34	76.28	2.67	0.53	0.76	26.32	0.00	26.32	4.000	Yes	Yes	2.00
583	18.28	44.68	69.66	2.58	0.52	0.76	30.42	59.42	89.84	4.000	Yes	No	2.00
584	18.32	69.74	48.54	2.32	0.51	0.77	39.76	55.93	95.69	4.000	Yes	No	2.00
585	18.41	108.42	28.70	2.07	0.43	0.80	84.45	50.66	135.12	4.000	Yes	No	2.00
586	18.49	147.67	15.94	1.91	0.41	0.81	120.83	27.89	148.72	4.000	Yes	No	2.00
587	18.53	174.01	10.70	1.85	0.42	0.80	130.87	10.77	141.64	4.000	Yes	No	2.00
588	18.62	186.89	9.42	1.83	0.40	0.81	146.25	7.24	153.49	4.000	Yes	No	2.00
589	18.66	197.89	9.30	1.83	0.39	0.81	151.47	7.00	158.46	0.356	No	No	0.50
590	18.74	204.10	9.97	1.84	0.37	0.82	159.33	9.26	168.59	0.481	No	No	0.68
591	18.79	211.78	8.91	1.82	0.37	0.82	162.30	6.08	168.38	0.478	No	No	0.68
592	18.87	218.05	5.93	1.79	0.37	0.82	170.72	0.70	171.43	0.529	No	No	0.75

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
593	18.92	224.19	3.23	1.75	0.37	0.82	174.53	0.00	174.53	0.590	No	No	0.84
594	19.01	226.54	2.86	1.75	0.36	0.82	177.59	0.00	177.59	0.661	No	No	0.95
595	19.05	226.44	5.23	1.78	0.36	0.82	176.75	0.29	177.04	0.648	No	No	0.93
596	19.14	224.83	7.35	1.80	0.36	0.82	174.36	2.57	176.93	0.645	No	No	0.93
597	19.18	219.23	10.02	1.84	0.35	0.83	174.54	9.88	184.42	0.874	No	No	1.28
598	19.27	216.00	11.32	1.85	0.36	0.82	163.50	14.17	177.67	0.664	No	No	0.95
599	19.32	212.24	12.51	1.87	0.35	0.83	167.94	19.00	186.94	0.976	No	No	1.43
600	19.40	212.10	12.81	1.87	0.35	0.83	165.63	20.01	185.64	0.922	No	No	1.35
601	19.44	209.74	13.93	1.89	0.35	0.83	164.40	24.33	188.73	1.060	No	No	1.55
602	19.53	209.07	14.62	1.90	0.34	0.83	162.49	26.87	189.36	1.092	No	No	1.59
603	19.57	208.59	15.21	1.90	0.34	0.83	164.94	29.32	194.27	1.390	No	No	2.00
604	19.66	209.39	15.26	1.90	0.34	0.83	163.59	29.39	192.99	1.303	No	No	1.89
605	19.70	210.56	14.05	1.89	0.34	0.83	164.15	24.80	188.95	1.071	No	No	1.56
606	19.79	213.01	11.68	1.86	0.36	0.82	165.85	15.63	181.48	0.772	No	No	1.11
607	19.83	217.03	8.97	1.82	0.37	0.82	166.53	6.35	172.88	0.556	No	No	0.79
608	19.92	222.56	6.95	1.80	0.37	0.82	171.20	1.88	173.08	0.560	No	No	0.79
609	20.00	228.39	5.60	1.78	0.36	0.82	178.10	0.48	178.58	0.687	No	No	0.98
610	20.05	232.71	4.30	1.77	0.36	0.82	180.96	0.05	181.01	0.757	No	No	1.09
611	20.09	231.40	4.32	1.77	0.35	0.82	182.36	0.06	182.42	0.802	No	No	1.16
612	20.18	228.82	4.65	1.77	0.37	0.82	174.26	0.11	174.36	0.587	No	No	0.83
613	20.23	223.55	5.52	1.78	0.37	0.82	173.79	0.43	174.22	0.584	No	No	0.83
614	20.30	218.32	6.50	1.79	0.37	0.81	168.07	1.25	169.32	0.493	No	No	0.69
615	20.38	210.67	8.24	1.82	0.38	0.81	160.67	4.32	164.99	0.430	No	No	0.60
616	20.43	201.38	10.67	1.85	0.38	0.81	154.88	11.50	166.38	0.448	No	No	0.62
617	20.51	192.76	13.08	1.88	0.38	0.81	146.06	19.88	165.93	0.442	No	No	0.61
618	20.56	184.74	15.39	1.90	0.37	0.81	141.24	27.90	169.15	0.490	No	No	0.68
619	20.62	177.80	17.44	1.93	0.37	0.81	136.89	34.36	171.25	0.526	No	No	0.74
620	20.70	171.49	19.39	1.95	0.37	0.81	130.42	39.43	169.85	0.501	No	No	0.70
621	20.76	165.95	21.22	1.98	0.37	0.81	126.75	43.80	170.56	0.514	No	No	0.72
622	20.82	161.86	22.98	2.00	0.37	0.81	124.04	47.56	171.59	0.532	No	No	0.75
623	20.89	158.47	24.98	2.02	0.37	0.81	121.13	51.29	172.42	0.548	No	No	0.77
624	20.98	156.26	26.74	2.05	0.37	0.81	119.07	54.19	173.26	0.564	No	No	0.79
625	21.02	156.86	27.10	2.05	0.37	0.81	119.01	54.80	173.82	0.575	No	No	0.81
626	21.11	159.81	26.04	2.04	0.36	0.81	122.75	53.61	176.36	0.631	No	No	0.89
627	21.15	164.67	23.31	2.00	0.37	0.81	125.83	48.58	174.42	0.588	No	No	0.83
628	21.24	167.72	20.96	1.97	0.37	0.81	129.98	43.61	173.59	0.571	No	No	0.80
629	21.28	168.31	18.33	1.94	0.38	0.80	128.31	36.09	164.40	0.422	No	No	0.58
630	21.37	167.93	16.35	1.92	0.40	0.80	124.80	29.59	154.39	0.321	No	No	0.43
631	21.41	167.72	14.08	1.89	0.41	0.79	126.06	22.09	148.15	0.277	No	No	0.37
632	21.50	169.20	12.51	1.87	0.42	0.78	124.86	16.59	141.45	0.241	No	No	0.32
633	21.55	171.31	11.01	1.85	0.43	0.78	125.80	11.57	137.37	0.224	No	No	0.29
634	21.63	174.09	9.59	1.83	0.43	0.78	129.00	7.31	136.31	0.219	No	No	0.29
635	21.68	172.99	9.16	1.83	0.43	0.78	130.23	6.16	136.39	0.220	No	No	0.29
636	21.74	175.17	7.96	1.81	0.45	0.77	121.58	3.25	124.83	0.183	No	No	0.24
637	21.80	179.62	6.20	1.79	0.43	0.78	133.36	0.84	134.20	0.212	No	No	0.28
638	21.87	188.88	3.45	1.76	0.42	0.78	140.45	0.00	140.46	0.237	No	No	0.31
639	21.94	194.85	1.69	1.73	0.41	0.78	144.57	0.00	144.57	0.257	No	No	0.34
640	22.02	200.69	0.26	1.72	0.41	0.79	148.50	0.00	148.50	0.279	No	No	0.37

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
641	22.09	209.78	0.00	1.69	0.39	0.79	155.54	0.00	155.54	0.330	No	No	0.44
642	22.16	220.95	0.00	1.67	0.37	0.80	168.26	0.00	168.26	0.476	No	No	0.66
643	22.20	237.53	0.00	1.63	0.36	0.81	177.94	0.00	177.94	0.670	No	No	0.94
644	22.29	252.83	0.00	1.58	0.33	0.82	200.03	0.00	200.03	1.895	No	No	2.00
645	22.33	269.80	0.00	1.54	0.32	0.83	209.86	0.00	209.86	3.456	No	No	2.00
646	22.42	280.61	0.00	1.52	0.30	0.84	224.66	0.00	224.66	4.000	No	No	2.00
647	22.46	288.76	0.00	1.52	0.29	0.84	230.13	0.00	230.13	4.000	No	No	2.00
648	22.55	291.74	0.00	1.52	0.29	0.84	232.59	0.00	232.59	4.000	No	No	2.00
649	22.60	292.91	0.00	1.53	0.29	0.84	232.90	0.00	232.90	4.000	No	No	2.00
650	22.66	293.42	0.00	1.54	0.29	0.84	233.20	0.00	233.20	4.000	No	No	2.00
651	22.74	290.27	0.00	1.56	0.29	0.84	233.76	0.00	233.76	4.000	No	No	2.00
652	22.82	284.36	0.00	1.58	0.30	0.83	223.62	0.00	223.62	4.000	No	No	2.00
653	22.87	273.62	0.00	1.61	0.31	0.83	216.17	0.00	216.17	4.000	No	No	2.00
654	22.96	264.97	0.00	1.64	0.33	0.82	203.21	0.00	203.21	2.278	No	No	2.00
655	23.00	260.39	0.00	1.65	0.33	0.82	199.17	0.00	199.17	1.806	No	No	2.00
656	23.09	258.28	0.00	1.65	0.33	0.82	203.09	0.00	203.09	2.262	No	No	2.00
657	23.13	259.76	0.00	1.63	0.33	0.82	197.13	0.00	197.13	1.616	No	No	2.00
658	23.21	261.11	0.00	1.61	0.33	0.82	202.97	0.00	202.97	2.245	No	No	2.00
659	23.26	263.90	0.00	1.60	0.32	0.82	206.64	0.00	206.64	2.808	No	No	2.00
660	23.34	262.82	0.00	1.61	0.32	0.82	204.57	0.00	204.57	2.471	No	No	2.00
661	23.38	256.25	0.00	1.64	0.33	0.82	199.76	0.00	199.76	1.866	No	No	2.00
662	23.47	248.73	0.00	1.66	0.35	0.81	188.22	0.00	188.22	1.035	No	No	1.47
663	23.52	240.11	0.00	1.69	0.35	0.81	183.69	0.00	183.69	0.847	No	No	1.19
664	23.60	234.11	0.00	1.71	0.36	0.80	175.96	0.00	175.96	0.622	No	No	0.86
665	23.65	227.13	1.20	1.73	0.37	0.80	171.76	0.00	171.76	0.535	No	No	0.74
666	23.74	221.73	3.03	1.75	0.38	0.79	164.67	0.00	164.67	0.426	No	No	0.58
667	23.78	208.41	6.28	1.79	0.38	0.79	161.51	0.99	162.50	0.399	No	No	0.54
668	23.83	199.25	7.50	1.81	0.42	0.77	136.97	2.54	139.52	0.232	No	No	0.30
669	23.91	186.13	9.33	1.83	0.41	0.78	141.72	6.86	148.58	0.280	No	No	0.37
670	24.00	179.32	9.91	1.84	0.43	0.77	128.47	8.22	136.68	4.000	Yes	No	2.00
671	24.04	162.35	16.04	1.91	0.40	0.78	123.66	28.47	152.13	4.000	Yes	No	2.00
672	24.13	144.40	24.50	2.02	0.40	0.78	104.54	47.49	152.02	4.000	Yes	No	2.00
673	24.17	118.66	36.71	2.17	0.40	0.78	90.81	61.06	151.87	4.000	Yes	No	2.00
674	24.26	96.45	47.93	2.31	0.44	0.76	64.90	62.22	127.12	4.000	Yes	No	2.00
675	24.30	72.80	61.28	2.48	0.46	0.75	53.31	64.03	117.34	4.000	Yes	No	2.00
676	24.39	58.24	71.20	2.60	0.50	0.73	36.18	0.00	36.18	4.000	Yes	Yes	2.00
677	24.44	44.53	82.94	2.75	0.51	0.72	32.20	0.00	32.20	4.000	Yes	Yes	2.00
678	24.53	36.88	90.41	2.84	0.54	0.71	23.04	0.00	23.04	4.000	Yes	Yes	2.00
679	24.57	28.83	99.75	2.96	0.55	0.71	19.81	0.00	19.81	4.000	Yes	Yes	2.00
680	24.66	24.67	100.00	3.02	0.56	0.70	15.13	0.00	15.13	0.566	No	Yes	0.69
681	24.70	21.93	100.00	3.02	0.57	0.70	14.36	0.00	14.36	0.494	No	Yes	0.60
682	24.79	21.42	100.00	2.97	0.57	0.70	14.08	0.00	14.08	4.000	Yes	Yes	2.00
683	24.83	21.36	95.96	2.91	0.57	0.70	14.07	0.00	14.07	4.000	Yes	Yes	2.00
684	24.92	21.46	94.72	2.90	0.57	0.70	14.19	0.00	14.19	4.000	Yes	Yes	2.00
685	24.96	21.66	91.22	2.85	0.57	0.70	14.25	0.00	14.25	4.000	Yes	Yes	2.00
686	25.05	22.10	84.41	2.77	0.57	0.70	14.42	0.00	14.42	4.000	Yes	Yes	2.00
687	25.09	23.34	71.78	2.61	0.57	0.69	14.99	0.00	14.99	4.000	Yes	Yes	2.00
688	25.18	24.82	64.29	2.52	0.57	0.69	16.65	54.36	71.01	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
689	25.22	27.90	57.10	2.43	0.57	0.69	17.28	52.81	70.09	4.000	Yes	No	2.00
690	25.31	30.22	51.74	2.36	0.56	0.70	21.16	52.23	73.39	4.000	Yes	No	2.00
691	25.35	28.24	53.51	2.38	0.56	0.70	21.32	52.85	74.17	4.000	Yes	No	2.00
692	25.42	24.32	60.58	2.47	0.59	0.69	13.27	52.57	65.84	4.000	Yes	No	2.00
693	25.48	20.53	72.01	2.61	0.58	0.69	13.26	0.00	13.26	4.000	Yes	Yes	2.00
694	25.56	20.90	75.71	2.66	0.58	0.69	13.67	0.00	13.67	4.000	Yes	Yes	2.00
695	25.62	21.47	79.69	2.71	0.57	0.69	14.09	0.00	14.09	4.000	Yes	Yes	2.00
696	25.68	21.98	83.44	2.76	0.57	0.69	14.44	0.00	14.44	4.000	Yes	Yes	2.00
697	25.74	22.24	88.80	2.82	0.57	0.69	14.72	0.00	14.72	4.000	Yes	Yes	2.00
698	25.80	23.12	92.68	2.87	0.57	0.69	14.66	0.00	14.66	4.000	Yes	Yes	2.00
699	25.88	24.93	92.03	2.86	0.56	0.70	16.23	0.00	16.23	0.563	No	Yes	0.68
700	25.95	27.99	86.19	2.79	0.55	0.70	18.41	0.00	18.41	0.641	No	Yes	0.77
701	26.00	31.34	77.36	2.68	0.55	0.70	20.87	0.00	20.87	0.725	No	Yes	0.88
702	26.07	33.42	72.54	2.62	0.54	0.70	23.07	0.00	23.07	0.778	No	Yes	0.94
703	26.13	32.41	77.19	2.68	0.54	0.70	22.67	0.00	22.67	0.751	No	Yes	0.91
704	26.21	32.01	84.51	2.77	0.55	0.70	18.78	0.00	18.78	0.740	No	Yes	0.89
705	26.30	31.61	90.63	2.85	0.54	0.70	22.29	0.00	22.29	4.000	Yes	Yes	2.00
706	26.34	50.40	70.22	2.59	0.55	0.70	21.75	56.99	78.74	4.000	Yes	No	2.00
707	26.43	80.40	48.70	2.32	0.46	0.74	59.57	61.20	120.77	4.000	Yes	No	2.00
708	26.47	134.31	26.73	2.05	0.43	0.76	88.33	48.49	136.82	4.000	Yes	No	2.00
709	26.55	180.37	16.07	1.91	0.36	0.79	144.97	30.63	175.60	4.000	Yes	No	2.00
710	26.59	230.35	7.41	1.81	0.38	0.78	164.73	2.61	167.34	4.000	Yes	No	2.00
711	26.67	269.51	1.21	1.73	0.32	0.81	209.82	0.00	209.82	4.000	Yes	No	2.00
712	26.76	304.97	0.00	1.67	0.27	0.84	246.39	0.00	246.39	4.000	No	No	2.00
713	26.80	331.00	0.00	1.64	0.26	0.84	261.65	0.00	254.00	4.000	No	No	2.00
714	26.88	346.10	0.00	1.64	0.26	0.84	279.12	0.00	254.00	4.000	No	No	2.00
715	26.92	356.70	0.00	1.65	0.26	0.84	283.70	0.00	254.00	4.000	No	No	2.00
716	27.00	358.73	0.00	1.66	0.26	0.84	286.63	0.00	254.00	4.000	No	No	2.00
717	27.05	358.90	0.00	1.67	0.26	0.84	283.73	0.00	254.00	4.000	No	No	2.00
718	27.12	364.84	0.00	1.66	0.26	0.84	283.85	0.00	254.00	4.000	No	No	2.00
719	27.18	378.64	0.00	1.63	0.26	0.84	300.52	0.00	254.00	4.000	No	No	2.00
720	27.25	395.55	0.00	1.58	0.26	0.84	316.30	0.00	254.00	4.000	No	No	2.00
721	27.32	406.93	0.00	1.54	0.26	0.84	323.78	0.00	254.00	4.000	No	No	2.00
722	27.38	415.55	0.00	1.50	0.26	0.84	327.28	0.00	254.00	4.000	No	No	2.00
723	27.44	422.59	0.00	1.45	0.26	0.84	336.51	0.00	254.00	4.000	No	No	2.00
724	27.52	423.60	0.00	1.40	0.26	0.84	340.22	0.00	254.00	4.000	No	No	2.00
725	27.58	413.60	0.00	1.37	0.26	0.84	329.38	0.00	254.00	4.000	No	No	2.00
726	27.65	397.16	0.00	1.36	0.26	0.84	312.48	0.00	254.00	4.000	No	No	2.00
727	27.71	380.68	0.00	1.38	0.26	0.84	300.94	0.00	254.00	4.000	No	No	2.00
728	27.78	367.46	0.00	1.39	0.26	0.84	290.03	0.00	254.00	4.000	No	No	2.00
729	27.84	356.46	0.00	1.40	0.26	0.84	280.88	0.00	254.00	4.000	No	No	2.00
730	27.91	347.03	0.00	1.42	0.26	0.84	274.60	0.00	254.00	4.000	No	No	2.00
731	27.97	339.71	0.00	1.45	0.26	0.84	267.45	0.00	254.00	4.000	No	No	2.00
732	28.04	334.71	0.00	1.49	0.26	0.84	263.31	0.00	254.00	4.000	No	No	2.00
733	28.12	336.59	0.00	1.49	0.26	0.84	262.51	0.00	254.00	4.000	No	No	2.00
734	28.17	343.43	0.00	1.45	0.26	0.84	271.66	0.00	254.00	4.000	No	No	2.00
735	28.25	353.32	0.00	1.41	0.26	0.84	279.29	0.00	254.00	4.000	No	No	2.00
736	28.33	360.46	0.00	1.39	0.26	0.83	285.71	0.00	254.00	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
737	28.37	363.81	0.00	1.40	0.26	0.83	288.35	0.00	254.00	4.000	No	No	2.00
738	28.46	361.90	0.00	1.41	0.26	0.83	286.98	0.00	254.00	4.000	No	No	2.00
739	28.50	346.70	0.00	1.44	0.26	0.83	280.98	0.00	254.00	4.000	No	No	2.00
740	28.56	333.48	0.00	1.46	0.27	0.83	251.51	0.00	251.51	4.000	No	No	2.00
741	28.63	320.90	0.00	1.47	0.26	0.83	255.54	0.00	254.00	4.000	No	No	2.00
742	28.69	316.64	0.00	1.45	0.27	0.83	250.06	0.00	250.06	4.000	No	No	2.00
743	28.76	303.18	0.00	1.46	0.28	0.82	238.88	0.00	238.88	4.000	No	No	2.00
744	28.84	285.77	0.00	1.49	0.31	0.81	216.69	0.00	216.69	4.000	No	No	2.00
745	28.90	262.85	0.00	1.58	0.33	0.80	200.34	0.00	200.34	1.928	No	No	2.00
746	28.98	241.58	0.00	1.68	0.37	0.78	174.89	0.00	174.89	0.598	No	No	0.80
747	29.03	218.13	7.47	1.81	0.38	0.77	159.24	2.68	161.91	4.000	Yes	No	2.00
748	29.09	200.11	16.88	1.92	0.36	0.78	144.10	33.27	177.37	4.000	Yes	No	2.00
749	29.18	185.85	24.97	2.02	0.34	0.79	137.34	54.08	191.42	4.000	Yes	No	2.00
750	29.21	176.90	31.96	2.11	0.33	0.79	132.88	65.06	197.93	4.000	Yes	No	2.00
751	29.30	168.68	37.80	2.19	0.33	0.79	126.61	70.43	197.04	4.000	Yes	No	2.00
752	29.38	160.16	43.02	2.25	0.34	0.79	118.90	73.03	191.93	4.000	Yes	No	2.00
753	29.42	148.25	47.93	2.31	0.35	0.78	112.43	74.62	187.05	4.000	Yes	No	2.00
754	29.50	131.67	53.74	2.38	0.37	0.77	97.19	73.51	170.71	4.000	Yes	No	2.00
755	29.58	114.56	59.90	2.46	0.41	0.75	78.10	70.58	148.68	4.000	Yes	No	2.00
756	29.62	99.57	64.82	2.52	0.42	0.74	70.62	69.91	140.53	4.000	Yes	No	2.00
757	29.69	102.45	60.54	2.47	0.44	0.73	61.14	66.02	127.16	4.000	Yes	No	2.00
758	29.76	142.68	40.04	2.21	0.41	0.75	83.88	62.20	146.08	4.000	Yes	No	2.00
759	29.82	219.28	14.89	1.90	0.34	0.79	164.22	28.04	192.26	4.000	Yes	No	2.00
760	29.89	294.86	0.00	1.68	0.27	0.82	248.05	0.00	248.05	4.000	No	No	2.00
761	29.95	330.26	0.00	1.62	0.26	0.83	270.68	0.00	254.00	4.000	No	No	2.00
762	30.03	334.04	0.00	1.65	0.26	0.83	256.40	0.00	254.00	4.000	No	No	2.00
763	30.07	318.07	1.95	1.74	0.26	0.83	258.16	0.00	254.00	4.000	No	No	2.00
764	30.15	307.49	5.21	1.78	0.30	0.81	227.83	0.32	228.15	4.000	No	No	2.00
765	30.20	291.01	7.92	1.81	0.29	0.81	226.86	4.32	231.17	4.000	No	No	2.00
766	30.27	289.71	6.55	1.79	0.31	0.80	211.65	1.48	213.13	4.000	No	No	2.00
767	30.33	292.84	4.51	1.77	0.30	0.81	223.81	0.09	223.90	4.000	No	No	2.00
768	30.39	310.19	0.46	1.72	0.29	0.81	234.52	0.00	234.52	4.000	Yes	No	2.00
769	30.47	297.78	2.98	1.75	0.26	0.83	259.76	0.00	254.00	4.000	Yes	No	2.00
770	30.54	275.53	8.65	1.82	0.34	0.79	190.32	5.82	196.14	4.000	Yes	No	2.00
771	30.59	223.46	22.25	1.99	0.28	0.82	183.75	55.08	238.83	4.000	Yes	No	2.00
772	30.66	184.28	34.56	2.14	0.33	0.79	130.99	67.94	198.93	4.000	Yes	No	2.00
773	30.73	142.27	49.86	2.34	0.37	0.77	100.59	72.57	173.16	4.000	Yes	No	2.00
774	30.80	117.78	60.07	2.46	0.40	0.75	79.23	70.95	150.18	4.000	Yes	No	2.00
775	30.86	104.03	65.63	2.53	0.42	0.74	71.63	70.41	142.04	4.000	Yes	No	2.00
776	30.93	95.68	68.54	2.57	0.42	0.73	67.72	70.01	137.73	4.000	Yes	No	2.00
777	30.99	90.05	70.17	2.59	0.44	0.73	59.73	68.05	127.78	4.000	Yes	No	2.00
778	31.06	95.05	65.88	2.54	0.45	0.72	58.45	66.70	125.15	4.000	Yes	No	2.00
779	31.13	113.17	54.70	2.40	0.41	0.74	79.00	68.97	147.97	4.000	Yes	No	2.00
780	31.18	144.71	38.89	2.20	0.38	0.76	101.62	65.53	167.15	4.000	Yes	No	2.00
781	31.26	170.57	27.76	2.06	0.34	0.78	132.70	58.54	191.25	4.000	Yes	No	2.00
782	31.33	190.46	20.07	1.96	0.36	0.77	138.42	42.39	180.81	4.000	Yes	No	2.00
783	31.38	201.06	16.82	1.92	0.36	0.77	146.24	33.32	179.57	4.000	Yes	No	2.00
784	31.45	210.35	14.27	1.89	0.36	0.77	153.96	24.87	178.83	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
785	31.52	219.85	11.82	1.86	0.37	0.76	157.23	15.77	172.99	4.000	Yes	No	2.00
786	31.61	227.60	10.07	1.84	0.36	0.77	166.07	9.79	175.86	4.000	Yes	No	2.00
787	31.65	239.41	8.99	1.82	0.36	0.77	170.26	6.47	176.73	4.000	Yes	No	2.00
788	31.73	262.92	6.40	1.79	0.35	0.77	185.13	1.20	186.32	4.000	Yes	No	2.00
789	31.80	294.73	3.50	1.76	0.30	0.80	228.13	0.01	228.14	4.000	Yes	No	2.00
790	31.87	323.88	1.25	1.73	0.26	0.82	257.10	0.00	254.00	4.000	Yes	No	2.00
791	31.93	335.59	1.95	1.74	0.26	0.82	264.93	0.00	254.00	4.000	No	No	2.00
792	31.99	333.67	4.68	1.77	0.26	0.82	260.56	0.14	254.00	4.000	No	No	2.00
793	32.06	331.80	6.96	1.80	0.26	0.82	252.27	2.34	254.00	4.000	No	No	2.00
794	32.11	326.96	9.17	1.83	0.26	0.82	260.34	8.82	254.00	4.000	No	No	2.00
795	32.17	330.35	9.00	1.83	0.26	0.82	249.10	7.99	254.00	4.000	No	No	2.00
796	32.24	336.76	7.80	1.81	0.26	0.82	260.12	4.33	254.00	4.000	No	No	2.00
797	32.30	353.67	4.60	1.77	0.26	0.82	275.04	0.13	254.00	4.000	No	No	2.00
798	32.37	367.05	1.91	1.74	0.26	0.82	288.23	0.00	254.00	4.000	No	No	2.00
799	32.44	371.82	0.00	1.71	0.26	0.82	291.03	0.00	254.00	4.000	No	No	2.00
800	32.50	363.33	0.00	1.69	0.26	0.82	285.88	0.00	254.00	4.000	No	No	2.00
801	32.56	350.72	0.00	1.66	0.26	0.82	268.26	0.00	254.00	4.000	No	No	2.00
802	32.63	338.67	0.00	1.61	0.26	0.82	261.48	0.00	254.00	4.000	No	No	2.00
803	32.70	335.28	0.00	1.56	0.26	0.82	257.66	0.00	254.00	4.000	No	No	2.00
804	32.76	331.39	0.00	1.55	0.26	0.82	260.17	0.00	254.00	4.000	No	No	2.00
805	32.83	330.89	0.00	1.55	0.27	0.82	251.38	0.00	251.38	4.000	No	No	2.00
806	32.89	337.73	0.00	1.55	0.26	0.82	256.30	0.00	254.00	4.000	No	No	2.00
807	32.95	356.22	0.00	1.54	0.26	0.82	275.86	0.00	254.00	4.000	No	No	2.00
808	33.02	380.54	0.00	1.53	0.26	0.82	294.94	0.00	254.00	4.000	No	No	2.00
809	33.10	401.81	0.00	1.52	0.26	0.82	312.52	0.00	254.00	4.000	No	No	2.00
810	33.16	406.91	0.00	1.53	0.26	0.82	324.96	0.00	254.00	4.000	No	No	2.00
811	33.25	402.92	0.00	1.56	0.26	0.82	306.49	0.00	254.00	4.000	No	No	2.00
812	33.29	392.05	0.00	1.58	0.26	0.82	303.01	0.00	254.00	4.000	No	No	2.00
813	33.37	384.33	0.00	1.54	0.26	0.82	299.49	0.00	254.00	4.000	No	No	2.00
814	33.45	374.37	0.00	1.50	0.26	0.82	288.36	0.00	254.00	4.000	No	No	2.00
815	33.50	360.72	0.00	1.50	0.26	0.82	279.68	0.00	254.00	4.000	No	No	2.00
816	33.59	349.75	0.00	1.55	0.26	0.82	267.62	0.00	254.00	4.000	No	No	2.00
817	33.63	323.61	0.00	1.65	0.26	0.82	262.76	0.00	254.00	4.000	No	No	2.00
818	33.68	283.99	7.67	1.81	0.31	0.79	211.08	3.53	214.61	4.000	Yes	No	2.00
819	33.76	232.83	23.37	2.00	0.30	0.80	171.56	56.15	227.71	4.000	Yes	No	2.00
820	33.82	189.11	37.90	2.19	0.31	0.78	138.69	73.37	212.06	4.000	Yes	No	2.00
821	33.88	153.48	49.33	2.33	0.35	0.76	110.09	74.80	184.90	4.000	Yes	No	2.00
822	33.96	124.73	59.84	2.46	0.39	0.74	84.41	72.33	156.74	4.000	Yes	No	2.00
823	34.02	102.36	69.27	2.58	0.42	0.72	68.66	70.45	139.11	4.000	Yes	No	2.00
824	34.08	87.60	76.61	2.67	0.45	0.71	57.22	0.00	57.22	4.000	Yes	Yes	2.00
825	34.14	76.19	81.46	2.73	0.46	0.70	50.70	0.00	50.70	4.000	Yes	Yes	2.00
826	34.23	68.01	83.08	2.75	0.48	0.69	43.33	0.00	43.33	4.000	Yes	Yes	2.00
827	34.28	60.90	82.24	2.74	0.49	0.68	39.34	0.00	39.34	1.285	No	Yes	1.54
828	34.34	55.27	80.89	2.72	0.50	0.68	35.39	0.00	35.39	1.158	No	Yes	1.38
829	34.41	49.90	80.88	2.72	0.51	0.67	31.42	0.00	31.42	1.037	No	Yes	1.24
830	34.49	46.04	82.50	2.74	0.52	0.66	28.20	0.00	28.20	0.950	No	Yes	1.13
831	34.53	45.17	82.35	2.74	0.53	0.66	27.44	0.00	27.44	0.930	No	Yes	1.11
832	34.61	48.29	78.18	2.69	0.52	0.67	29.57	0.00	29.57	0.998	No	Yes	1.19

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
833	34.70	54.26	71.41	2.61	0.51	0.67	34.45	0.00	34.45	1.130	No	Yes	1.35
834	34.75	64.03	66.03	2.54	0.50	0.68	39.52	61.29	100.81	0.139	No	No	0.17
835	34.83	71.14	64.54	2.52	0.47	0.69	49.89	63.91	113.81	0.159	No	No	0.19
836	34.88	74.20	66.12	2.54	0.47	0.69	49.40	64.15	113.56	0.158	No	No	0.19
837	34.92	72.44	68.64	2.57	0.48	0.69	46.02	63.74	109.76	0.152	No	No	0.18
838	35.01	70.96	69.81	2.59	0.48	0.69	46.12	64.01	110.13	0.152	No	No	0.18
839	35.10	71.26	69.51	2.58	0.48	0.69	46.19	63.97	110.17	4.000	Yes	No	2.00
840	35.13	76.52	65.03	2.53	0.48	0.69	46.53	63.07	109.60	4.000	Yes	No	2.00
841	35.20	80.74	62.03	2.49	0.45	0.70	57.39	65.39	122.78	4.000	Yes	No	2.00
842	35.29	85.28	59.36	2.45	0.46	0.70	55.12	63.98	119.10	4.000	Yes	No	2.00
843	35.33	87.79	58.74	2.45	0.46	0.70	56.20	64.09	120.29	4.000	Yes	No	2.00
844	35.42	92.29	56.87	2.42	0.44	0.70	62.79	65.31	128.10	4.000	Yes	No	2.00
845	35.46	96.49	54.52	2.39	0.44	0.71	64.96	65.07	130.02	4.000	Yes	No	2.00
846	35.55	97.70	53.55	2.38	0.44	0.71	65.33	64.80	130.13	4.000	Yes	No	2.00
847	35.58	98.10	53.25	2.38	0.44	0.71	65.31	64.67	129.98	4.000	Yes	No	2.00
848	35.66	99.98	52.62	2.37	0.44	0.71	65.70	64.52	130.22	0.198	No	No	0.24
849	35.72	102.90	50.96	2.35	0.43	0.71	69.43	64.82	134.25	0.212	No	No	0.26
850	35.78	104.81	49.21	2.33	0.43	0.71	71.70	64.62	136.32	0.219	No	No	0.27
851	35.84	104.98	48.11	2.31	0.43	0.71	69.76	63.58	133.34	0.209	No	No	0.26
852	35.91	104.11	48.08	2.31	0.43	0.71	69.57	63.52	133.09	0.208	No	No	0.26
853	35.98	103.98	48.42	2.32	0.43	0.71	69.55	63.68	133.24	0.208	No	No	0.26
854	36.05	105.15	48.66	2.32	0.43	0.71	69.38	63.76	133.14	0.208	No	No	0.26
855	36.11	107.23	48.55	2.32	0.43	0.71	72.20	64.44	136.64	4.000	Yes	No	2.00
856	36.19	106.56	49.52	2.33	0.42	0.71	74.31	65.46	139.77	4.000	Yes	No	2.00
857	36.25	100.35	53.46	2.38	0.43	0.71	67.99	65.48	133.48	4.000	Yes	No	2.00
858	36.32	91.53	59.33	2.45	0.45	0.70	58.50	64.91	123.42	4.000	Yes	No	2.00
859	36.36	84.15	65.01	2.53	0.46	0.69	54.85	65.45	120.31	4.000	Yes	No	2.00
860	36.43	83.14	66.03	2.54	0.46	0.69	51.84	64.83	116.67	4.000	Yes	No	2.00
861	36.52	86.36	63.62	2.51	0.45	0.69	56.31	65.51	121.82	4.000	Yes	No	2.00
862	36.57	93.88	58.37	2.44	0.44	0.70	61.74	65.51	127.25	4.000	Yes	No	2.00
863	36.64	101.50	53.72	2.38	0.43	0.70	68.13	65.62	133.76	4.000	Yes	No	2.00
864	36.69	108.91	49.94	2.34	0.42	0.71	72.92	65.29	138.21	4.000	Yes	No	2.00
865	36.77	116.26	47.69	2.31	0.42	0.71	78.11	65.55	143.66	4.000	Yes	No	2.00
866	36.85	121.44	47.15	2.30	0.40	0.72	84.86	67.01	151.87	0.302	No	No	0.38
867	36.89	127.92	46.93	2.30	0.40	0.72	84.87	66.89	151.76	4.000	Yes	No	2.00
868	36.97	127.95	48.86	2.32	0.38	0.73	93.65	70.22	163.88	4.000	Yes	No	2.00
869	37.03	123.81	52.72	2.37	0.40	0.72	85.20	69.83	155.03	4.000	Yes	No	2.00
870	37.12	115.56	57.79	2.43	0.41	0.71	75.48	69.14	144.62	4.000	Yes	No	2.00
871	37.15	111.13	60.34	2.47	0.41	0.71	74.40	69.68	144.08	4.000	Yes	No	2.00
872	37.22	112.37	60.09	2.46	0.41	0.71	74.89	69.74	144.63	4.000	Yes	No	2.00
873	37.29	121.00	58.32	2.44	0.41	0.72	78.40	70.13	148.54	4.000	Yes	No	2.00
874	37.35	142.98	52.94	2.37	0.38	0.73	94.60	72.46	167.06	4.000	Yes	No	2.00
875	37.42	179.31	44.16	2.26	0.32	0.77	128.23	76.21	204.44	4.000	Yes	No	2.00
876	37.49	207.19	38.55	2.19	0.27	0.80	170.45	81.54	251.99	4.000	Yes	No	2.00
877	37.56	213.09	38.12	2.19	0.27	0.80	165.88	79.99	245.87	4.000	No	No	2.00
878	37.62	192.72	44.01	2.26	0.30	0.78	143.77	80.02	223.79	4.000	No	No	2.00
879	37.68	166.72	51.64	2.36	0.34	0.76	117.10	77.88	194.98	1.442	No	No	1.90
880	37.74	155.77	54.28	2.39	0.37	0.74	99.05	74.25	173.30	0.565	No	No	0.74

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
881	37.83	151.55	53.95	2.39	0.34	0.76	115.75	78.65	194.40	1.399	No	No	1.85
882	37.89	157.66	49.26	2.33	0.36	0.74	106.04	73.70	179.73	0.719	No	No	0.95
883	37.96	156.54	47.69	2.31	0.35	0.75	113.73	74.82	188.55	1.051	No	No	1.40
884	38.02	155.13	47.03	2.30	0.35	0.75	112.18	74.02	186.20	0.945	No	No	1.27
885	38.07	148.39	48.69	2.32	0.37	0.74	102.35	72.41	174.76	0.595	No	No	0.78
886	38.16	142.01	50.17	2.34	0.37	0.73	96.95	71.77	168.72	0.483	No	No	0.63
887	38.22	139.62	49.53	2.33	0.38	0.73	96.37	71.29	167.66	0.467	No	No	0.61
888	38.28	139.43	48.45	2.32	0.38	0.73	96.30	70.70	167.00	0.457	No	No	0.59
889	38.34	139.47	48.02	2.31	0.38	0.73	96.23	70.45	166.67	0.453	No	No	0.59
890	38.42	138.78	48.54	2.32	0.38	0.73	96.26	70.74	167.00	0.457	No	No	0.59
891	38.48	135.94	50.51	2.34	0.38	0.73	94.64	71.33	165.97	0.443	No	No	0.57
892	38.53	139.03	50.17	2.34	0.39	0.72	89.39	69.77	159.16	0.363	No	No	0.46
893	38.60	141.92	49.99	2.34	0.36	0.74	103.88	73.51	177.39	0.656	No	No	0.87
894	38.67	148.41	48.73	2.32	0.37	0.74	101.48	72.21	173.70	0.573	No	No	0.75
895	38.73	153.10	49.47	2.33	0.36	0.74	105.09	73.56	178.64	0.689	No	No	0.91
896	38.80	173.34	46.35	2.29	0.34	0.75	115.26	74.39	189.65	1.107	No	No	1.47
897	38.86	204.60	41.43	2.23	0.29	0.78	153.27	80.23	233.50	4.000	No	No	2.00
898	38.93	230.44	37.79	2.18	0.26	0.80	184.75	84.05	254.00	4.000	Yes	No	2.00
899	39.00	230.57	39.25	2.20	0.26	0.80	181.82	85.00	254.00	4.000	Yes	No	2.00
900	39.07	206.74	45.34	2.28	0.28	0.79	154.06	83.64	237.70	4.000	Yes	No	2.00
901	39.14	177.85	53.05	2.38	0.32	0.76	124.09	80.48	204.57	4.000	Yes	No	2.00
902	39.21	157.22	58.43	2.44	0.35	0.74	108.16	78.45	186.62	4.000	Yes	No	2.00
903	39.27	147.80	59.59	2.46	0.36	0.74	101.13	76.92	178.05	4.000	Yes	No	2.00
904	39.33	144.44	57.75	2.43	0.36	0.74	100.33	76.02	176.36	4.000	Yes	No	2.00
905	39.39	143.74	54.33	2.39	0.37	0.73	99.43	74.38	173.80	4.000	Yes	No	2.00
906	39.47	142.40	51.66	2.36	0.37	0.73	98.78	72.99	171.78	4.000	Yes	No	2.00
907	39.53	140.82	50.02	2.34	0.38	0.73	96.41	71.55	167.96	4.000	Yes	No	2.00
908	39.58	139.40	50.28	2.34	0.38	0.73	95.17	71.35	166.52	0.450	No	No	0.58
909	39.67	138.88	50.65	2.35	0.38	0.72	95.10	71.52	166.62	0.452	No	No	0.58
910	39.73	138.85	51.51	2.36	0.38	0.72	95.13	71.94	167.07	0.458	No	No	0.59
911	39.81	141.62	51.22	2.35	0.38	0.72	95.02	71.77	166.80	0.454	No	No	0.59
912	39.84	147.81	50.18	2.34	0.37	0.73	101.76	73.05	174.81	0.596	No	No	0.78
913	39.92	150.33	50.62	2.35	0.35	0.74	110.28	75.54	185.82	4.000	Yes	No	2.00
914	40.00	147.37	52.95	2.37	0.36	0.73	101.20	74.25	175.44	4.000	Yes	No	2.00
915	40.04	142.34	55.83	2.41	0.37	0.73	94.77	73.73	168.50	4.000	Yes	No	2.00
916	40.12	138.95	58.13	2.44	0.37	0.73	98.14	75.55	173.69	4.000	Yes	No	2.00
917	40.20	136.97	59.66	2.46	0.38	0.72	93.18	74.72	167.90	4.000	Yes	No	2.00
918	40.24	130.60	62.10	2.49	0.38	0.72	90.18	74.69	164.86	4.000	Yes	No	2.00
919	40.32	125.66	63.12	2.50	0.39	0.71	82.88	72.93	155.82	4.000	Yes	No	2.00
920	40.37	120.80	63.69	2.51	0.40	0.71	81.46	72.69	154.15	4.000	Yes	No	2.00
921	40.44	118.28	63.66	2.51	0.40	0.71	78.59	71.87	150.46	0.292	No	No	0.37
922	40.52	116.40	63.76	2.51	0.41	0.70	76.91	71.42	148.33	0.278	No	No	0.35
923	40.56	116.13	63.58	2.51	0.41	0.70	76.96	71.38	148.33	4.000	Yes	No	2.00
924	40.64	119.46	61.87	2.49	0.41	0.70	77.79	71.11	148.91	4.000	Yes	No	2.00
925	40.71	125.63	58.71	2.45	0.39	0.71	84.39	71.94	156.33	4.000	Yes	No	2.00
926	40.78	130.13	56.38	2.42	0.38	0.72	91.12	72.94	164.06	4.000	Yes	No	2.00
927	40.83	127.75	57.18	2.43	0.39	0.71	88.08	72.41	160.49	4.000	Yes	No	2.00
928	40.93	122.41	59.72	2.46	0.40	0.70	78.73	70.70	149.42	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
929	40.97	117.89	62.09	2.49	0.40	0.70	78.65	71.42	150.07	4.000	Yes	No	2.00
930	41.05	117.75	61.98	2.49	0.41	0.70	77.51	71.07	148.58	0.280	No	No	0.35
931	41.10	115.91	62.37	2.49	0.40	0.70	78.44	71.45	149.89	0.288	No	No	0.36
932	41.18	114.44	62.66	2.50	0.41	0.70	74.30	70.36	144.66	0.257	No	No	0.32
933	41.23	112.89	63.63	2.51	0.41	0.70	74.07	70.57	144.65	0.257	No	No	0.32
934	41.30	113.73	63.55	2.51	0.41	0.70	74.81	70.76	145.57	0.262	No	No	0.33
935	41.36	114.67	63.11	2.50	0.41	0.70	76.16	71.01	147.17	0.271	No	No	0.34
936	41.42	120.81	60.12	2.46	0.41	0.70	76.01	70.07	146.07	0.265	No	No	0.33
937	41.49	123.46	59.36	2.45	0.38	0.71	88.95	73.43	162.39	0.398	No	No	0.51
938	41.55	126.75	58.94	2.45	0.40	0.70	82.06	71.37	153.42	0.313	No	No	0.40
939	41.63	127.76	59.55	2.46	0.39	0.71	83.54	71.99	155.53	0.330	No	No	0.42
940	41.69	133.97	57.57	2.43	0.38	0.72	91.16	73.41	164.57	0.424	No	No	0.55
941	41.75	137.09	56.35	2.42	0.37	0.72	96.66	74.46	171.12	0.523	No	No	0.68
942	41.82	136.08	56.60	2.42	0.38	0.71	90.71	72.92	163.62	0.412	No	No	0.53
943	41.88	133.06	57.56	2.43	0.39	0.71	88.64	72.71	161.35	0.386	No	No	0.50
944	41.95	132.19	57.33	2.43	0.38	0.71	89.31	72.81	162.12	0.395	No	No	0.51
945	42.01	132.26	56.27	2.42	0.39	0.71	88.50	72.18	160.69	0.379	No	No	0.49
946	42.09	133.80	54.59	2.39	0.39	0.71	88.52	71.52	160.04	0.372	No	No	0.48
947	42.15	137.73	52.16	2.36	0.38	0.71	92.58	71.56	164.14	0.419	No	No	0.54
948	42.22	140.41	50.90	2.35	0.37	0.72	97.48	72.28	169.76	0.500	No	No	0.65
949	42.30	142.44	50.18	2.34	0.38	0.71	94.54	71.14	165.67	0.439	No	No	0.57
950	42.34	141.67	50.72	2.35	0.37	0.72	97.28	72.13	169.41	0.494	No	No	0.64
951	42.42	142.75	50.53	2.34	0.38	0.71	95.47	71.56	167.03	0.458	No	No	0.59
952	42.50	142.06	50.75	2.35	0.37	0.72	97.07	72.09	169.16	0.490	No	No	0.64
953	42.54	143.30	50.58	2.34	0.38	0.71	95.49	71.59	167.07	0.458	No	No	0.59
954	42.62	143.77	51.56	2.36	0.37	0.72	98.44	72.85	171.30	0.527	No	No	0.69
955	42.70	145.38	52.49	2.37	0.37	0.72	98.22	73.23	171.45	0.529	No	No	0.69
956	42.74	148.57	53.03	2.38	0.37	0.72	99.47	73.81	173.28	0.564	No	No	0.74
957	42.82	154.58	52.03	2.36	0.36	0.73	106.21	75.16	181.36	0.768	No	No	1.02
958	42.86	157.33	51.97	2.36	0.34	0.73	113.00	76.95	189.95	1.123	No	No	1.49
959	42.94	157.83	52.19	2.36	0.36	0.73	106.07	75.20	181.27	0.765	No	No	1.01
960	43.01	154.98	53.58	2.38	0.35	0.73	107.46	76.23	183.69	0.847	No	No	1.13
961	43.07	156.09	53.48	2.38	0.36	0.73	105.83	75.74	181.57	0.775	No	No	1.03
962	43.15	155.22	53.60	2.38	0.35	0.73	108.81	76.60	185.41	0.912	No	No	1.22
963	43.21	154.45	53.05	2.38	0.36	0.72	105.13	75.36	180.49	0.741	No	No	0.98
964	43.26	153.38	52.44	2.37	0.36	0.72	103.72	74.69	178.41	0.683	No	No	0.90
965	43.32	152.86	51.80	2.36	0.36	0.72	105.87	74.96	180.83	0.752	No	No	0.99
966	43.41	152.89	51.22	2.35	0.36	0.72	103.58	74.06	177.64	0.663	No	No	0.87
967	43.47	153.60	50.55	2.34	0.36	0.72	103.53	73.71	177.23	0.652	No	No	0.86
968	43.54	156.87	49.37	2.33	0.36	0.72	107.29	74.08	181.37	0.768	No	No	1.02
969	43.61	161.50	48.45	2.32	0.35	0.73	111.35	74.64	185.98	0.936	No	No	1.25
970	43.67	166.20	48.21	2.32	0.34	0.73	114.75	75.39	190.14	1.133	No	No	1.50
971	43.74	170.79	47.88	2.31	0.34	0.74	118.85	76.27	195.11	1.452	No	No	1.91
972	43.82	173.34	47.60	2.31	0.33	0.74	122.81	77.12	199.94	1.885	No	No	2.00
973	43.86	171.83	47.91	2.31	0.33	0.74	121.10	76.87	197.97	1.690	No	No	2.00
974	43.94	166.33	49.49	2.33	0.34	0.73	115.04	76.20	191.23	1.195	No	No	1.58
975	43.99	159.55	51.28	2.35	0.35	0.73	109.09	75.56	184.66	0.883	No	No	1.17
976	44.07	155.36	52.22	2.37	0.36	0.72	104.29	74.73	179.02	0.699	No	No	0.92

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
977	44.11	151.07	53.21	2.38	0.36	0.72	104.75	75.32	180.08	0.729	No	No	0.96
978	44.20	148.15	54.12	2.39	0.37	0.71	98.59	74.06	172.65	0.552	No	No	0.72
979	44.24	145.86	55.50	2.41	0.37	0.71	97.27	74.28	171.55	0.531	No	No	0.69
980	44.33	147.34	55.65	2.41	0.37	0.71	99.18	74.87	174.05	0.580	No	No	0.76
981	44.38	149.65	55.26	2.40	0.36	0.72	102.18	75.53	177.71	0.664	No	No	0.88
982	44.46	151.20	54.49	2.39	0.36	0.72	102.73	75.35	178.07	4.000	Yes	No	2.00
983	44.51	145.83	55.72	2.41	0.36	0.72	102.87	75.91	178.78	4.000	Yes	No	2.00
984	44.59	137.24	58.31	2.44	0.38	0.70	89.26	73.15	162.41	4.000	Yes	No	2.00
985	44.64	123.22	62.91	2.50	0.40	0.70	82.51	72.76	155.27	4.000	Yes	No	2.00
986	44.72	112.48	64.91	2.52	0.42	0.68	70.09	69.78	139.87	4.000	Yes	No	2.00
987	44.81	104.67	66.85	2.55	0.43	0.67	64.83	68.77	133.60	4.000	Yes	No	2.00
988	44.85	102.96	66.79	2.55	0.43	0.67	64.74	68.73	133.47	0.209	No	No	0.26
989	44.93	104.43	67.67	2.56	0.43	0.67	66.28	69.39	135.67	0.217	No	No	0.27
990	44.97	109.84	66.29	2.54	0.43	0.67	68.01	69.55	137.55	0.224	No	No	0.28
991	45.06	117.89	64.95	2.52	0.41	0.69	76.80	71.72	148.52	0.279	No	No	0.35
992	45.11	129.83	62.93	2.50	0.39	0.70	84.48	73.33	157.80	0.350	No	No	0.45
993	45.17	136.17	62.53	2.49	0.37	0.71	95.61	76.36	171.97	0.539	No	No	0.70
994	45.23	139.36	62.02	2.49	0.38	0.70	91.43	75.02	166.45	0.449	No	No	0.58
995	45.29	136.95	62.27	2.49	0.38	0.70	91.89	75.23	167.12	0.459	No	No	0.60
996	45.36	135.61	62.07	2.49	0.38	0.70	89.68	74.54	164.22	4.000	Yes	No	2.00
997	45.43	167.45	50.14	2.34	0.39	0.69	87.42	69.23	156.65	4.000	Yes	No	2.00
998	45.49	190.73	45.30	2.28	0.26	0.78	172.54	88.32	254.00	4.000	Yes	No	2.00
999	45.56	331.07	20.32	1.97	0.35	0.72	139.24	43.21	182.45	4.000	Yes	No	2.00
1000	45.62	444.95	11.69	1.86	0.26	0.78	409.45	26.93	254.00	4.000	Yes	No	2.00
1001	45.69	526.04	9.09	1.83	0.26	0.78	424.66	11.78	254.00	4.000	Yes	No	2.00
1002	45.76	450.40	21.26	1.98	0.26	0.78	331.01	73.75	254.00	4.000	Yes	No	2.00
1003	45.81	338.50	37.66	2.18	0.26	0.78	241.72	97.23	254.00	4.000	Yes	No	2.00
1004	45.88	256.80	51.66	2.36	0.26	0.78	176.68	93.85	254.00	4.000	Yes	No	2.00
1005	45.95	205.45	61.49	2.48	0.28	0.77	147.22	90.59	237.82	4.000	Yes	No	2.00
1006	46.02	180.36	65.53	2.53	0.32	0.74	120.98	84.55	205.53	4.000	Yes	No	2.00
1007	46.08	165.21	67.01	2.55	0.34	0.73	113.13	82.74	195.88	4.000	Yes	No	2.00
1008	46.15	158.27	66.12	2.54	0.35	0.72	107.73	80.92	188.65	4.000	Yes	No	2.00
1009	46.21	155.49	64.09	2.51	0.35	0.72	103.25	79.03	182.28	4.000	Yes	No	2.00
1010	46.28	164.32	58.80	2.45	0.35	0.72	105.56	77.87	183.43	4.000	Yes	No	2.00
1011	46.34	181.73	51.58	2.36	0.32	0.74	129.09	81.07	210.16	4.000	Yes	No	2.00
1012	46.41	199.65	45.63	2.28	0.29	0.76	146.50	81.92	228.42	4.000	Yes	No	2.00
1013	46.47	203.48	44.69	2.27	0.29	0.76	150.59	82.26	232.84	4.000	Yes	No	2.00
1014	46.54	195.56	48.54	2.32	0.30	0.75	138.69	81.85	220.55	4.000	No	No	2.00
1015	46.61	192.98	51.41	2.36	0.32	0.74	126.09	80.17	206.26	4.000	No	No	2.00
1016	46.69	200.56	50.56	2.34	0.29	0.76	144.24	84.54	228.78	4.000	No	No	2.00
1017	46.75	214.76	46.93	2.30	0.28	0.77	158.95	86.05	245.00	4.000	No	No	2.00
1018	46.80	221.70	45.13	2.28	0.27	0.77	163.38	85.85	249.23	4.000	No	No	2.00
1019	46.87	223.33	44.82	2.27	0.27	0.77	162.33	85.34	247.68	4.000	No	No	2.00
1020	46.93	222.83	45.36	2.28	0.27	0.77	163.13	85.97	249.10	4.000	Yes	No	2.00
1021	46.99	217.19	46.48	2.29	0.27	0.77	162.05	86.53	248.58	4.000	Yes	No	2.00
1022	47.06	204.58	49.73	2.33	0.29	0.76	147.40	84.88	232.28	4.000	Yes	No	2.00
1023	47.15	191.96	52.89	2.37	0.32	0.74	129.80	81.94	211.74	4.000	Yes	No	2.00
1024	47.20	186.16	54.61	2.40	0.32	0.74	128.80	82.51	211.31	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1025	47.27	188.92	53.20	2.38	0.31	0.74	132.12	82.72	214.84	4.000	No	No	2.00
1026	47.35	190.66	51.86	2.36	0.30	0.75	136.81	83.28	220.09	4.000	Yes	No	2.00
1027	47.40	184.19	52.53	2.37	0.31	0.74	133.02	82.62	215.65	4.000	Yes	No	2.00
1028	47.48	175.67	54.36	2.39	0.34	0.72	115.38	78.74	194.12	4.000	Yes	No	2.00
1029	47.53	166.94	56.67	2.42	0.34	0.72	115.02	79.65	194.67	4.000	Yes	No	2.00
1030	47.59	166.54	55.79	2.41	0.35	0.72	110.79	78.11	188.90	4.000	No	No	2.00
1031	47.66	165.47	55.12	2.40	0.34	0.72	114.31	78.79	193.10	4.000	No	No	2.00
1032	47.73	165.30	54.34	2.39	0.34	0.72	112.01	77.81	189.82	4.000	No	No	2.00
1033	47.80	166.88	53.72	2.38	0.35	0.72	110.08	77.00	187.08	4.000	No	No	2.00
1034	47.85	178.49	50.38	2.34	0.34	0.72	117.75	77.40	195.14	4.000	No	No	2.00
1035	47.93	196.14	45.48	2.28	0.30	0.75	140.94	80.39	221.33	4.000	No	No	2.00
1036	47.98	216.37	40.34	2.22	0.29	0.76	154.31	79.48	233.79	4.000	No	No	2.00
1037	48.06	223.51	38.26	2.19	0.27	0.77	169.79	81.06	250.85	4.000	No	No	2.00
1038	48.12	218.67	39.15	2.20	0.28	0.76	159.01	79.45	238.46	4.000	No	No	2.00
1039	48.18	200.32	43.87	2.26	0.30	0.75	141.75	79.40	221.15	4.000	No	No	2.00
1040	48.26	183.11	48.72	2.32	0.33	0.73	122.09	77.61	199.70	4.000	No	No	2.00
1041	48.32	171.38	51.58	2.36	0.34	0.72	115.27	77.37	192.64	4.000	No	No	2.00
1042	48.37	166.64	52.29	2.37	0.35	0.72	112.27	76.92	189.19	4.000	No	No	2.00
1043	48.46	165.27	51.50	2.36	0.35	0.71	110.30	76.00	186.30	4.000	No	No	2.00
1044	48.52	168.05	50.32	2.34	0.35	0.71	111.58	75.73	187.31	4.000	No	No	2.00
1045	48.59	179.77	47.92	2.31	0.34	0.72	118.70	76.25	194.96	4.000	No	No	2.00
1046	48.66	195.63	45.30	2.28	0.31	0.74	139.58	79.92	219.50	4.000	No	No	2.00
1047	48.70	209.72	44.11	2.26	0.29	0.76	152.11	82.20	234.32	4.000	No	No	2.00
1048	48.79	215.32	44.19	2.26	0.28	0.76	155.28	83.06	238.35	4.000	No	No	2.00
1049	48.83	219.42	44.46	2.27	0.28	0.76	154.47	83.06	237.53	4.000	No	No	2.00
1050	48.91	218.81	45.34	2.28	0.27	0.77	163.50	86.05	249.54	4.000	No	No	2.00
1051	48.98	214.15	47.27	2.30	0.28	0.76	153.99	85.01	238.99	4.000	No	No	2.00
1052	49.04	211.10	48.43	2.32	0.30	0.75	142.27	82.72	224.99	4.000	No	No	2.00
1053	49.10	209.86	48.24	2.32	0.28	0.76	155.34	86.02	241.36	4.000	No	No	2.00
1054	49.17	215.16	45.64	2.28	0.29	0.75	150.19	82.87	233.07	4.000	No	No	2.00
1055	49.24	209.86	45.71	2.28	0.28	0.76	156.13	84.44	240.57	4.000	Yes	No	2.00
1056	49.29	196.34	48.14	2.31	0.30	0.74	140.79	82.15	222.94	4.000	Yes	No	2.00
1057	49.38	177.12	53.10	2.38	0.34	0.72	115.50	78.18	193.68	4.000	Yes	No	2.00
1058	49.44	163.73	57.27	2.43	0.35	0.71	107.01	77.68	184.69	4.000	Yes	No	2.00
1059	49.51	161.15	58.56	2.44	0.35	0.71	107.23	78.25	185.47	4.000	Yes	No	2.00
1060	49.57	161.32	58.33	2.44	0.35	0.71	109.34	78.74	188.08	4.000	Yes	No	2.00
1061	49.64	160.37	56.82	2.42	0.35	0.71	107.27	77.57	184.85	4.000	Yes	No	2.00
1062	49.70	170.47	54.44	2.39	0.36	0.70	104.49	75.81	180.30	4.000	Yes	No	2.00
1063	49.77	206.44	47.92	2.31	0.31	0.73	134.02	80.25	214.27	4.000	Yes	No	2.00
1064	49.84	257.98	41.07	2.23	0.26	0.77	195.34	90.19	254.00	4.000	Yes	No	2.00
1065	49.88	312.06	33.92	2.14	0.26	0.77	227.02	88.34	254.00	4.000	Yes	No	2.00
1066	49.97	317.82	34.46	2.14	0.26	0.77	258.51	96.21	254.00	4.000	Yes	No	2.00
1067	50.06	291.88	39.75	2.21	0.26	0.77	207.78	91.78	254.00	4.000	Yes	No	2.00
1068	50.11	240.28	50.09	2.34	0.26	0.77	170.28	91.16	254.00	4.000	Yes	No	2.00
1069	50.16	204.32	57.79	2.43	0.29	0.75	141.46	87.44	228.90	4.000	Yes	No	2.00
1070	50.21	185.21	61.32	2.48	0.32	0.72	121.78	83.35	205.13	4.000	Yes	No	2.00
1071	50.28	173.11	61.83	2.49	0.33	0.72	120.91	83.29	204.20	4.000	Yes	No	2.00
1072	50.35	172.81	57.66	2.43	0.35	0.71	109.98	78.66	188.64	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1073	50.41	169.63	55.07	2.40	0.33	0.72	120.38	80.42	200.80	4.000	Yes	No	2.00
1074	50.47	173.89	52.49	2.37	0.35	0.71	111.98	76.94	188.92	4.000	Yes	No	2.00
1075	50.56	181.64	50.45	2.34	0.33	0.72	119.91	78.01	197.92	4.000	Yes	No	2.00
1076	50.62	199.29	45.61	2.28	0.31	0.74	139.31	80.07	219.37	4.000	Yes	No	2.00
1077	50.68	211.30	42.33	2.24	0.28	0.75	156.74	81.88	238.63	4.000	Yes	No	2.00
1078	50.74	207.11	43.47	2.26	0.29	0.75	150.40	81.26	231.66	4.000	No	No	2.00
1079	50.81	193.98	47.38	2.30	0.32	0.72	128.43	78.45	206.88	4.000	No	No	2.00
1080	50.87	184.49	50.76	2.35	0.33	0.72	123.00	79.00	202.00	4.000	No	No	2.00
1081	50.94	179.19	52.82	2.37	0.32	0.72	126.38	80.98	207.35	4.000	No	No	2.00
1082	51.02	173.52	53.40	2.38	0.34	0.71	115.42	78.30	193.72	4.000	No	No	2.00
1083	51.10	166.14	54.00	2.39	0.35	0.70	108.89	76.81	185.70	4.000	No	No	2.00
1084	51.15	163.83	52.17	2.36	0.35	0.70	107.55	75.59	183.14	4.000	No	No	2.00
1085	51.23	162.89	51.37	2.35	0.35	0.70	109.33	75.67	185.00	4.000	No	No	2.00
1086	51.26	170.38	47.58	2.31	0.36	0.70	105.87	72.71	178.58	4.000	No	No	2.00
1087	51.33	176.12	45.23	2.28	0.33	0.72	125.45	76.26	201.71	4.000	No	No	2.00
1088	51.40	177.46	44.49	2.27	0.33	0.71	122.81	75.07	197.88	4.000	No	No	2.00
1089	51.46	167.33	47.63	2.31	0.35	0.70	109.05	73.56	182.61	4.000	No	No	2.00
1090	51.53	157.36	50.84	2.35	0.37	0.69	100.75	73.11	173.86	4.000	No	No	2.00
1091	51.60	154.95	51.43	2.36	0.37	0.69	98.84	72.89	171.73	4.000	No	No	2.00
1092	51.66	160.29	49.02	2.33	0.36	0.69	103.19	72.81	176.00	4.000	No	No	2.00
1093	51.74	168.85	45.76	2.28	0.35	0.70	113.14	73.47	186.61	4.000	No	No	2.00
1094	51.80	174.82	43.49	2.26	0.34	0.71	118.84	73.36	192.20	4.000	No	No	2.00
1095	51.85	172.70	44.41	2.27	0.34	0.71	117.25	73.61	190.86	4.000	No	No	2.00
1096	51.92	162.57	48.10	2.31	0.36	0.70	108.10	73.59	181.69	4.000	No	No	2.00
1097	52.01	151.80	51.78	2.36	0.38	0.68	94.89	72.00	166.89	4.000	No	No	2.00
1098	52.07	145.10	53.32	2.38	0.38	0.68	91.89	71.89	163.78	4.000	No	No	2.00
1099	52.13	142.88	52.82	2.37	0.38	0.68	92.30	71.79	164.09	4.000	No	No	2.00
1100	52.19	140.90	52.72	2.37	0.39	0.67	89.67	71.03	160.70	4.000	No	No	2.00
1101	52.26	141.64	52.22	2.37	0.39	0.67	87.10	70.11	157.21	4.000	No	No	2.00
1102	52.34	145.73	50.84	2.35	0.38	0.68	93.76	71.26	165.02	4.000	No	No	2.00
1103	52.38	153.59	48.50	2.32	0.37	0.68	98.86	71.39	170.25	4.000	No	No	2.00
1104	52.47	158.18	47.81	2.31	0.36	0.69	105.22	72.67	177.89	4.000	No	No	2.00
1105	52.51	159.39	52.73	2.37	0.36	0.69	104.86	75.13	179.99	4.000	No	No	2.00
1106	52.60	163.99	56.82	2.42	0.36	0.69	102.37	76.22	178.59	4.000	No	No	2.00
1107	52.64	180.70	56.90	2.42	0.33	0.71	117.39	80.40	197.79	4.000	No	No	2.00
1108	52.73	204.41	52.02	2.36	0.29	0.74	147.71	86.30	234.01	4.000	No	No	2.00
1109	52.77	211.46	50.88	2.35	0.27	0.76	163.76	89.93	253.69	4.000	No	No	2.00
1110	52.86	196.40	55.08	2.40	0.31	0.73	135.30	84.51	219.80	4.000	No	No	2.00
1111	52.90	184.15	58.54	2.44	0.35	0.70	109.14	78.77	187.91	4.000	No	No	2.00
1112	52.97	181.47	58.19	2.44	0.31	0.73	131.20	84.77	215.97	4.000	Yes	No	2.00
1113	53.04	183.48	55.14	2.40	0.32	0.72	128.15	82.58	210.74	4.000	Yes	No	2.00
1114	53.10	182.36	52.56	2.37	0.34	0.70	113.51	77.38	190.89	4.000	Yes	No	2.00
1115	53.17	180.02	51.29	2.35	0.32	0.72	127.44	80.47	207.90	4.000	Yes	No	2.00
1116	53.24	185.49	48.42	2.32	0.33	0.71	121.24	77.21	198.46	4.000	Yes	No	2.00
1117	53.31	182.25	48.66	2.32	0.32	0.72	126.82	78.81	205.63	4.000	No	No	2.00
1118	53.36	174.87	50.61	2.35	0.33	0.71	118.96	77.84	196.80	4.000	No	No	2.00
1119	53.43	164.50	53.84	2.39	0.36	0.69	103.36	75.24	178.60	4.000	No	No	2.00
1120	53.50	158.84	55.42	2.41	0.36	0.69	101.51	75.41	176.92	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1121	53.56	160.22	53.72	2.38	0.36	0.69	105.08	75.65	180.73	4.000	No	No	2.00
1122	53.63	161.42	51.62	2.36	0.36	0.69	106.40	75.01	181.41	4.000	No	No	2.00
1123	53.71	160.25	50.19	2.34	0.36	0.69	103.85	73.61	177.46	4.000	No	No	2.00
1124	53.77	157.53	50.22	2.34	0.37	0.68	101.79	73.08	174.87	4.000	No	No	2.00
1125	53.84	156.86	50.41	2.34	0.37	0.68	99.61	72.60	172.20	4.000	Yes	No	2.00
1126	53.91	156.16	51.14	2.35	0.36	0.68	102.21	73.66	175.87	4.000	Yes	No	2.00
1127	53.99	156.56	52.07	2.36	0.37	0.68	100.16	73.55	173.71	4.000	Yes	No	2.00
1128	54.03	159.32	55.08	2.40	0.36	0.68	100.87	75.09	175.96	4.000	Yes	No	2.00
1129	54.12	165.59	56.54	2.42	0.35	0.70	109.28	78.01	187.29	4.000	Yes	No	2.00
1130	54.16	175.66	57.01	2.43	0.34	0.70	115.90	80.03	195.93	4.000	Yes	No	2.00
1131	54.25	183.14	56.87	2.42	0.32	0.72	126.00	82.77	208.77	4.000	Yes	No	2.00
1132	54.29	197.36	56.00	2.41	0.32	0.72	128.06	82.95	211.01	4.000	Yes	No	2.00
1133	54.38	218.73	52.47	2.37	0.28	0.75	152.69	87.89	240.57	4.000	Yes	No	2.00
1134	54.41	242.38	47.56	2.31	0.26	0.76	179.41	91.82	254.00	4.000	Yes	No	2.00
1135	54.49	245.23	45.76	2.28	0.26	0.76	186.07	92.15	254.00	4.000	Yes	No	2.00
1136	54.56	223.85	48.88	2.32	0.27	0.75	159.92	87.64	247.56	4.000	Yes	No	2.00
1137	54.63	191.38	55.50	2.41	0.32	0.71	125.63	82.06	207.68	4.000	Yes	No	2.00
1138	54.70	168.81	60.07	2.46	0.35	0.69	105.91	78.43	184.34	4.000	Yes	No	2.00
1139	54.76	159.56	60.17	2.46	0.36	0.69	102.21	77.43	179.64	4.000	Yes	No	2.00
1140	54.82	158.29	57.22	2.43	0.36	0.69	102.54	76.42	178.96	4.000	Yes	No	2.00
1141	54.89	158.53	54.16	2.39	0.36	0.68	102.25	75.07	177.33	4.000	Yes	No	2.00
1142	54.97	158.53	52.68	2.37	0.36	0.68	102.08	74.36	176.44	4.000	Yes	No	2.00
1143	55.01	158.90	53.00	2.37	0.36	0.68	102.09	74.51	176.59	4.000	No	No	2.00
1144	55.10	160.11	53.90	2.39	0.36	0.68	103.01	75.17	178.18	4.000	No	No	2.00
1145	55.14	170.62	51.49	2.36	0.36	0.68	104.79	74.52	179.31	4.000	No	No	2.00
1146	55.20	180.73	49.10	2.33	0.32	0.71	127.75	79.32	207.07	4.000	No	No	2.00
1147	55.27	186.98	48.03	2.31	0.32	0.71	127.47	78.61	206.08	4.000	No	No	2.00
1148	55.34	183.96	49.51	2.33	0.33	0.70	119.91	77.49	197.41	4.000	No	No	2.00
1149	55.41	181.01	50.28	2.34	0.33	0.70	120.05	77.95	198.00	4.000	No	No	2.00
1150	55.48	177.59	50.75	2.35	0.33	0.70	120.15	78.24	198.38	4.000	No	No	2.00
1151	55.54	170.21	52.63	2.37	0.35	0.69	111.59	76.90	188.49	4.000	No	No	2.00
1152	55.61	160.68	55.42	2.41	0.36	0.68	102.21	75.60	177.81	4.000	No	No	2.00
1153	55.67	156.42	56.24	2.42	0.37	0.68	97.18	74.56	171.74	4.000	No	No	2.00
1154	55.74	155.75	57.31	2.43	0.36	0.68	101.48	76.17	177.64	4.000	No	No	2.00
1155	55.82	163.26	56.95	2.42	0.36	0.68	100.61	75.79	176.39	4.000	No	No	2.00
1156	55.86	187.16	55.20	2.40	0.34	0.70	115.32	79.10	194.41	4.000	No	No	2.00
1157	55.94	234.60	48.50	2.32	0.27	0.75	162.98	88.19	251.17	4.000	No	No	2.00
1158	56.01	290.49	41.38	2.23	0.26	0.75	213.26	94.90	254.00	4.000	No	No	2.00
1159	56.08	323.56	37.31	2.18	0.26	0.75	244.29	97.34	254.00	4.000	Yes	No	2.00
1160	56.12	312.94	39.19	2.20	0.26	0.75	234.28	97.47	254.00	4.000	Yes	No	2.00
1161	56.19	271.83	46.06	2.29	0.26	0.75	190.46	93.51	254.00	4.000	Yes	No	2.00
1162	56.25	220.40	55.72	2.41	0.28	0.74	154.05	89.95	244.00	4.000	Yes	No	2.00
1163	56.32	186.93	61.94	2.49	0.34	0.70	115.09	81.68	196.77	4.000	Yes	No	2.00
1164	56.38	167.94	63.81	2.51	0.34	0.69	108.92	80.55	189.47	4.000	Yes	No	2.00
1165	56.45	162.39	61.19	2.48	0.35	0.69	105.09	78.60	183.69	4.000	No	No	2.00
1166	56.52	158.20	59.25	2.45	0.36	0.68	101.11	76.79	177.90	4.000	No	No	2.00
1167	56.59	154.78	58.90	2.45	0.37	0.68	98.32	75.89	174.21	4.000	Yes	No	2.00
1168	56.66	163.28	56.29	2.42	0.37	0.67	96.42	74.37	170.79	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1169	56.73	180.63	51.37	2.35	0.33	0.70	121.24	78.85	200.10	4.000	Yes	No	2.00
1170	56.79	200.12	46.49	2.29	0.30	0.72	140.56	81.00	221.56	4.000	Yes	No	2.00
1171	56.84	200.93	47.14	2.30	0.30	0.73	144.49	82.46	226.95	4.000	No	No	2.00
1172	56.92	187.01	52.08	2.36	0.33	0.70	123.25	79.76	203.01	4.000	No	No	2.00
1173	56.99	178.26	55.57	2.41	0.35	0.68	106.08	76.73	182.81	4.000	No	No	2.00
1174	57.04	175.78	56.26	2.42	0.33	0.70	122.59	81.56	204.15	4.000	No	No	2.00
1175	57.11	182.00	52.90	2.37	0.34	0.70	116.95	78.48	195.42	4.000	No	No	2.00
1176	57.17	180.63	51.32	2.35	0.33	0.70	120.97	78.76	199.72	4.000	No	No	2.00
1177	57.24	177.71	50.43	2.34	0.34	0.70	118.37	77.59	195.96	4.000	No	No	2.00
1178	57.30	169.25	51.98	2.36	0.35	0.68	109.51	76.02	185.53	4.000	No	No	2.00
1179	57.38	159.62	54.47	2.39	0.37	0.67	100.36	74.69	175.05	4.000	No	No	2.00
1180	57.44	152.98	55.90	2.41	0.37	0.67	95.35	73.92	169.27	4.000	No	No	2.00
1181	57.51	150.60	55.83	2.41	0.38	0.67	93.82	73.47	167.29	4.000	No	No	2.00
1182	57.56	153.32	54.02	2.39	0.38	0.67	94.59	72.93	167.52	4.000	No	No	2.00
1183	57.64	157.82	51.92	2.36	0.37	0.67	101.35	73.80	175.15	4.000	No	No	2.00
1184	57.70	160.77	50.22	2.34	0.36	0.68	103.89	73.63	177.52	4.000	No	No	2.00
1185	57.77	159.90	49.94	2.34	0.37	0.67	101.09	72.75	173.83	4.000	No	No	2.00
1186	57.83	160.74	52.12	2.36	0.37	0.67	99.20	73.32	172.52	4.000	No	No	2.00
1187	57.90	176.42	52.77	2.37	0.36	0.68	106.07	75.48	181.54	4.000	No	No	2.00
1188	57.97	212.25	47.71	2.31	0.30	0.72	140.18	81.71	221.89	4.000	No	No	2.00
1189	58.06	248.35	41.51	2.23	0.26	0.75	187.30	88.66	254.00	4.000	No	No	2.00
1190	58.10	267.86	37.00	2.17	0.26	0.75	193.91	85.22	254.00	4.000	Yes	No	2.00
1191	58.16	254.84	38.87	2.20	0.26	0.75	187.81	86.01	254.00	4.000	Yes	No	2.00
1192	58.23	223.78	45.45	2.28	0.28	0.74	156.59	84.37	240.95	4.000	Yes	No	2.00
1193	58.28	188.99	54.23	2.39	0.33	0.69	118.51	79.53	198.04	4.000	Yes	No	2.00
1194	58.36	165.61	60.34	2.47	0.36	0.68	102.63	77.61	180.24	4.000	Yes	No	2.00
1195	58.42	156.04	60.99	2.47	0.37	0.67	98.23	76.60	174.82	4.000	Yes	No	2.00
1196	58.49	154.94	58.02	2.44	0.37	0.67	95.37	74.74	170.12	4.000	Yes	No	2.00
1197	58.56	164.00	52.50	2.37	0.37	0.67	99.24	73.51	172.75	4.000	Yes	No	2.00
1198	58.63	176.99	47.68	2.31	0.34	0.69	118.96	76.17	195.14	4.000	Yes	No	2.00
1199	58.68	186.12	45.42	2.28	0.33	0.70	125.74	76.46	202.20	4.000	Yes	No	2.00
1200	58.76	181.08	47.26	2.30	0.33	0.69	120.86	76.41	197.27	4.000	Yes	No	2.00
1201	58.81	165.24	52.63	2.37	0.35	0.68	107.01	75.66	182.67	4.000	Yes	No	2.00
1202	58.90	151.42	57.52	2.43	0.39	0.65	88.51	72.66	161.17	4.000	Yes	No	2.00
1203	58.96	143.44	60.00	2.46	0.38	0.66	88.65	73.57	162.21	4.000	Yes	No	2.00
1204	59.02	144.08	58.72	2.45	0.39	0.65	88.53	73.10	161.63	4.000	Yes	No	2.00
1205	59.07	145.50	56.65	2.42	0.38	0.66	89.83	72.69	162.53	4.000	Yes	No	2.00
1206	59.15	148.95	53.71	2.38	0.38	0.66	91.35	71.92	163.27	4.000	Yes	No	2.00
1207	59.21	151.44	51.32	2.35	0.38	0.66	95.87	72.05	167.92	4.000	Yes	No	2.00
1208	59.29	153.44	49.98	2.34	0.38	0.66	94.91	71.13	166.05	4.000	Yes	No	2.00
1209	59.34	153.35	49.98	2.34	0.38	0.66	95.56	71.31	166.87	4.000	No	No	2.00
1210	59.41	152.38	50.42	2.34	0.38	0.66	95.46	71.50	166.96	4.000	No	No	2.00
1211	59.48	150.09	51.15	2.35	0.38	0.66	92.68	71.12	163.79	4.000	No	No	2.00
1212	59.54	146.57	51.74	2.36	0.39	0.65	90.30	70.75	161.06	4.000	No	No	2.00
1213	59.60	144.09	51.75	2.36	0.39	0.65	87.36	69.97	157.33	4.000	No	No	2.00
1214	59.69	143.69	52.05	2.36	0.39	0.65	86.96	70.00	156.96	4.000	No	No	2.00
1215	59.73	148.18	55.01	2.40	0.39	0.65	89.56	71.97	161.53	4.000	No	No	2.00
1216	59.81	162.34	56.09	2.41	0.37	0.66	98.05	74.74	172.79	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1217	59.89	178.92	55.44	2.41	0.33	0.69	121.20	80.82	202.01	4.000	No	No	2.00
1218	59.93	191.80	53.23	2.38	0.32	0.70	129.78	82.10	211.88	4.000	No	No	2.00
1219	60.02	191.49	53.39	2.38	0.32	0.70	129.57	82.13	211.69	4.000	Yes	No	2.00
1220	60.06	180.92	56.42	2.42	0.33	0.69	120.43	81.04	201.46	4.000	Yes	No	2.00
1221	60.12	168.15	60.08	2.46	0.36	0.67	103.88	77.87	181.75	4.000	Yes	No	2.00
1222	60.19	157.29	62.64	2.50	0.36	0.67	98.57	77.23	175.81	4.000	Yes	No	2.00
1223	60.26	153.79	61.57	2.48	0.37	0.66	94.27	75.67	169.95	4.000	Yes	No	2.00
1224	60.32	152.25	59.73	2.46	0.37	0.66	95.38	75.36	170.74	4.000	Yes	No	2.00
1225	60.39	152.49	58.25	2.44	0.37	0.66	94.53	74.60	169.13	4.000	Yes	No	2.00
1226	60.46	155.18	56.82	2.42	0.38	0.66	94.40	74.02	168.42	4.000	Yes	No	2.00
1227	60.53	163.60	54.11	2.39	0.36	0.67	101.17	74.76	175.92	4.000	Yes	No	2.00
1228	60.58	180.15	48.80	2.32	0.35	0.68	113.75	75.47	189.23	4.000	Yes	No	2.00
1229	60.66	193.27	46.00	2.29	0.31	0.70	133.89	78.95	212.84	4.000	Yes	No	2.00
1230	60.72	195.61	46.92	2.30	0.32	0.70	132.87	79.30	212.18	4.000	Yes	No	2.00
1231	60.78	181.08	52.83	2.37	0.33	0.69	119.98	79.25	199.23	4.000	Yes	No	2.00
1232	60.87	164.61	58.83	2.45	0.37	0.66	99.08	76.08	175.16	4.000	Yes	No	2.00
1233	60.93	153.52	61.69	2.48	0.37	0.66	93.64	75.53	169.17	4.000	Yes	No	2.00
1234	61.01	151.37	61.14	2.48	0.37	0.66	93.65	75.36	169.00	4.000	Yes	No	2.00
1235	61.04	157.22	58.20	2.44	0.38	0.66	93.89	74.40	168.29	4.000	Yes	No	2.00
1236	61.11	168.23	54.93	2.40	0.35	0.67	106.91	76.68	183.59	4.000	Yes	No	2.00
1237	61.18	181.49	51.37	2.35	0.33	0.69	119.33	78.34	197.67	4.000	Yes	No	2.00
1238	61.24	186.62	50.30	2.34	0.32	0.69	125.36	79.37	204.73	4.000	Yes	No	2.00
1239	61.31	182.48	51.79	2.36	0.33	0.69	119.13	78.51	197.64	4.000	Yes	No	2.00
1240	61.37	167.78	57.26	2.43	0.35	0.68	109.59	78.39	187.99	4.000	Yes	No	2.00
1241	61.45	155.84	62.49	2.49	0.38	0.65	90.65	74.94	165.59	4.000	Yes	No	2.00
1242	61.50	151.45	65.00	2.52	0.38	0.65	91.30	75.88	167.19	4.000	Yes	No	2.00
1243	61.56	156.06	63.10	2.50	0.36	0.66	99.34	77.60	176.95	4.000	No	No	2.00
1244	61.64	158.95	61.29	2.48	0.36	0.67	101.25	77.55	178.80	4.000	No	No	2.00
1245	61.69	157.71	61.15	2.48	0.37	0.66	97.72	76.50	174.22	4.000	No	No	2.00
1246	61.77	158.59	61.73	2.48	0.37	0.66	96.21	76.27	172.49	4.000	Yes	No	2.00
1247	61.83	175.37	57.04	2.43	0.36	0.67	102.92	76.46	179.38	4.000	Yes	No	2.00
1248	61.91	198.46	51.07	2.35	0.30	0.71	138.57	83.32	221.89	4.000	Yes	No	2.00
1249	61.97	217.95	46.45	2.29	0.28	0.73	153.47	84.30	237.77	4.000	Yes	No	2.00
1250	62.02	208.47	49.93	2.34	0.28	0.72	151.95	86.20	238.16	4.000	Yes	No	2.00
1251	62.12	186.91	56.92	2.42	0.34	0.68	114.86	79.71	194.57	4.000	Yes	No	2.00
1252	62.18	165.51	63.93	2.51	0.36	0.66	99.79	77.99	177.78	4.000	Yes	No	2.00
1253	62.22	157.48	65.91	2.54	0.36	0.66	98.78	78.29	177.07	4.000	Yes	No	2.00
1254	62.28	159.12	63.21	2.50	0.37	0.66	95.82	76.63	172.45	4.000	Yes	No	2.00
1255	62.36	160.24	60.58	2.47	0.36	0.67	103.32	77.89	181.20	4.000	Yes	No	2.00
1256	62.42	163.62	58.03	2.44	0.36	0.66	100.77	76.25	177.02	4.000	Yes	No	2.00
1257	62.49	163.86	57.38	2.43	0.36	0.67	103.24	76.68	179.93	4.000	No	No	2.00
1258	62.55	166.45	57.10	2.43	0.36	0.67	103.51	76.64	180.15	4.000	No	No	2.00
1259	62.62	173.63	55.26	2.40	0.35	0.67	106.62	76.74	183.36	4.000	No	No	2.00
1260	62.69	184.87	51.42	2.36	0.33	0.68	120.15	78.59	198.74	4.000	No	No	2.00
1261	62.75	187.95	48.69	2.32	0.32	0.70	130.43	79.78	210.21	4.000	Yes	No	2.00
1262	62.83	179.49	49.68	2.33	0.35	0.67	113.43	75.88	189.31	4.000	Yes	No	2.00
1263	62.88	160.53	55.84	2.41	0.37	0.66	99.88	75.14	175.01	4.000	Yes	No	2.00
1264	62.96	148.43	60.45	2.47	0.39	0.64	85.60	72.86	158.47	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1265	63.01	144.23	61.18	2.48	0.39	0.64	85.78	73.15	158.92	4.000	Yes	No	2.00
1266	63.07	143.91	59.77	2.46	0.38	0.65	90.32	73.96	164.27	4.000	No	No	2.00
1267	63.14	146.84	58.38	2.44	0.39	0.64	84.63	71.89	156.52	4.000	No	No	2.00
1268	63.20	153.57	59.35	2.45	0.38	0.65	92.24	74.35	166.59	4.000	Yes	No	2.00
1269	63.27	175.79	56.74	2.42	0.35	0.67	105.77	77.13	182.90	4.000	Yes	No	2.00
1270	63.34	203.44	52.12	2.36	0.30	0.71	138.19	83.80	221.99	4.000	Yes	No	2.00
1271	63.40	222.15	47.14	2.30	0.27	0.73	161.66	86.90	248.56	4.000	Yes	No	2.00
1272	63.47	220.10	44.87	2.27	0.29	0.72	152.55	82.90	235.44	4.000	Yes	No	2.00
1273	63.53	197.23	48.60	2.32	0.32	0.70	132.20	80.19	212.39	4.000	No	No	2.00
1274	63.61	177.89	53.45	2.38	0.36	0.66	102.79	74.90	177.70	4.000	No	No	2.00
1275	63.67	169.81	56.53	2.42	0.36	0.66	104.01	76.56	180.57	4.000	No	No	2.00
1276	63.74	172.90	55.18	2.40	0.34	0.67	112.48	78.31	190.80	4.000	Yes	No	2.00
1277	63.80	168.05	56.51	2.42	0.35	0.67	110.35	78.29	188.65	4.000	Yes	No	2.00
1278	63.86	159.11	59.58	2.46	0.38	0.65	92.79	74.58	167.38	4.000	Yes	No	2.00
1279	63.93	150.16	62.95	2.50	0.38	0.65	91.74	75.40	167.14	4.000	Yes	No	2.00
1280	64.00	149.42	63.04	2.50	0.38	0.64	89.64	74.82	164.46	4.000	No	No	2.00
1281	64.05	147.86	62.78	2.50	0.38	0.65	91.21	75.19	166.40	4.000	Yes	No	2.00
1282	64.13	148.39	61.25	2.48	0.39	0.64	87.93	73.78	161.71	4.000	Yes	No	2.00
1283	64.19	148.38	59.48	2.46	0.38	0.64	90.47	73.90	164.37	4.000	Yes	No	2.00
1284	64.25	151.52	56.27	2.42	0.38	0.64	90.59	72.76	163.34	4.000	Yes	No	2.00
1285	64.33	155.16	51.17	2.35	0.38	0.64	94.18	71.53	165.71	4.000	Yes	No	2.00
1286	64.39	158.35	44.24	2.27	0.38	0.64	97.21	68.43	165.64	4.000	Yes	No	2.00
1287	64.46	158.66	40.00	2.21	0.39	0.64	95.89	65.07	160.96	4.000	Yes	No	2.00
1288	64.51	156.38	38.80	2.20	0.39	0.63	93.12	63.42	156.55	4.000	Yes	No	2.00
1289	64.58	155.16	39.73	2.21	0.40	0.63	91.20	63.72	154.91	4.000	No	No	2.00
1290	64.65	154.94	40.91	2.22	0.39	0.64	93.15	65.10	158.25	4.000	No	No	2.00
1291	64.72	150.63	47.88	2.31	0.38	0.64	93.81	69.74	163.55	4.000	No	No	2.00
1292	64.79	152.72	54.11	2.39	0.40	0.63	83.08	69.84	152.92	4.000	No	No	2.00
1293	64.85	162.01	57.51	2.43	0.36	0.65	99.77	75.77	175.54	4.000	No	No	2.00
1294	64.91	186.58	55.45	2.41	0.34	0.68	116.70	79.59	196.29	4.000	No	No	2.00
1295	64.98	207.32	53.05	2.38	0.30	0.71	142.97	85.58	228.55	4.000	No	No	2.00
1296	65.05	219.26	50.89	2.35	0.28	0.72	152.25	86.86	239.11	4.000	No	No	2.00
1297	65.11	213.16	50.68	2.35	0.29	0.71	147.23	85.41	232.64	4.000	Yes	No	2.00
1298	65.18	198.75	51.38	2.35	0.32	0.69	126.91	80.38	207.29	4.000	Yes	No	2.00
1299	65.24	179.70	54.81	2.40	0.34	0.67	114.87	78.80	193.67	4.000	Yes	No	2.00
1300	65.31	167.52	57.84	2.44	0.36	0.65	99.65	75.86	175.51	4.000	Yes	No	2.00
1301	65.37	164.14	60.65	2.47	0.37	0.65	97.70	76.33	174.04	4.000	Yes	No	2.00
1302	65.44	173.86	58.62	2.45	0.35	0.66	106.60	78.09	184.70	4.000	Yes	No	2.00
1303	65.51	185.88	55.61	2.41	0.33	0.68	122.87	81.35	204.22	4.000	Yes	No	2.00
1304	65.57	191.37	54.15	2.39	0.32	0.69	126.34	81.62	207.97	4.000	Yes	No	2.00
1305	65.63	183.96	56.60	2.42	0.33	0.68	119.95	80.98	200.93	4.000	Yes	No	2.00
1306	65.70	169.75	61.46	2.48	0.35	0.66	105.16	78.71	183.88	4.000	Yes	No	2.00
1307	65.77	161.63	64.44	2.52	0.37	0.64	92.61	76.09	168.71	4.000	Yes	No	2.00
1308	65.84	164.33	62.73	2.50	0.36	0.65	100.38	77.78	178.16	4.000	Yes	No	2.00
1309	65.89	172.40	56.75	2.42	0.35	0.67	111.01	78.58	189.58	4.000	Yes	No	2.00
1310	65.96	168.75	54.80	2.40	0.35	0.67	110.78	77.68	188.46	4.000	Yes	No	2.00
1311	66.04	161.08	55.29	2.40	0.38	0.64	91.29	72.56	163.85	4.000	No	No	2.00
1312	66.09	152.62	59.92	2.46	0.38	0.64	93.02	74.77	167.79	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	FC (%)	Ic	m	C_N	q_{c1N}	Δq_{c1N}	$q_{c1N,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1313	66.16	157.14	59.74	2.46	0.38	0.64	91.05	74.15	165.20	4.000	No	No	2.00
1314	66.23	161.83	59.34	2.45	0.36	0.65	101.77	77.01	178.79	4.000	No	No	2.00
1315	66.29	172.68	56.02	2.41	0.36	0.65	103.29	76.15	179.44	4.000	No	No	2.00
1316	66.36	176.34	54.80	2.40	0.34	0.67	116.18	79.16	195.34	4.000	No	No	2.00
1317	66.43	175.22	54.58	2.39	0.35	0.66	110.19	77.42	187.61	4.000	No	No	2.00
1318	66.48	168.11	55.25	2.40	0.36	0.65	100.50	75.07	175.57	4.000	No	No	2.00
1319	66.55	161.05	55.82	2.41	0.37	0.65	99.18	74.94	174.12	4.000	No	No	2.00
1320	66.62	156.83	55.49	2.41	0.38	0.64	93.27	73.18	166.45	4.000	No	No	2.00
1321	66.68	153.74	55.75	2.41	0.38	0.64	90.66	72.57	163.23	4.000	No	No	2.00
1322	66.75	152.85	55.24	2.40	0.38	0.64	91.73	72.66	164.39	4.000	No	No	2.00
1323	66.82	153.92	54.29	2.39	0.38	0.64	91.01	72.07	163.08	4.000	No	No	2.00
1324	66.88	155.45	53.46	2.38	0.38	0.64	92.67	72.17	164.83	4.000	No	No	2.00
1325	66.95	157.96	52.81	2.37	0.38	0.64	94.81	72.46	167.27	4.000	No	No	2.00
1326	67.01	160.99	52.60	2.37	0.37	0.64	96.39	72.79	169.18	4.000	No	No	2.00
1327	67.08	164.39	51.64	2.36	0.37	0.65	99.31	73.12	172.43	4.000	No	No	2.00
1328	67.14	166.37	49.31	2.33	0.37	0.65	102.17	72.70	174.87	4.000	No	No	2.00
1329	67.21	166.85	47.67	2.31	0.37	0.64	100.27	71.30	171.58	4.000	No	No	2.00
1330	67.28	166.10	47.83	2.31	0.37	0.64	99.87	71.29	171.16	4.000	No	No	2.00
1331	67.35	166.08	48.95	2.32	0.37	0.64	100.33	72.02	172.35	4.000	No	No	2.00
1332	67.40	168.70	47.22	2.30	0.37	0.64	100.05	70.99	171.03	4.000	No	No	2.00
1333	67.47	168.80	45.66	2.28	0.36	0.65	105.57	71.47	177.04	4.000	No	No	2.00
1334	67.53	172.32	44.12	2.26	0.38	0.64	99.47	68.92	168.39	4.000	No	No	2.00
1335	67.61	173.94	33.62	2.13	0.38	0.64	105.10	61.13	166.23	4.000	No	No	2.00
1336	67.67	183.50	15.29	1.90	0.46	0.58	96.49	23.64	120.13	4.000	No	No	2.00
1337	67.73	190.33	100.00	4.06	0.31	0.69	126.51	0.00	126.51	4.000	No	Yes	2.00
1338	67.80	199.39	100.00	4.06	0.30	0.70	128.41	0.00	128.41	4.000	No	Yes	2.00
1339	67.87	199.12	100.00	4.06	0.29	0.71	136.35	0.00	136.35	4.000	No	Yes	2.00
1340	67.93	217.14	100.00	4.06	0.31	0.69	126.73	0.00	126.73	4.000	No	Yes	2.00
1341	68.00	232.32	100.00	4.06	0.26	0.73	172.57	0.00	172.57	4.000	No	Yes	2.00

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
FC: Fines content (%)
I_c: Soil behavior type index
m: Stress exponent
C_N: Overburden correction factor
q_{c1N}: Normalized and adjusted cone resistance
Δq_{c1N}: Cone resistance correction factor due to fines
$q_{c1N,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cyclic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
0.02	2.00	0.00	0.00	0.02	0.00	0.10	1.63	0.00	0.00	0.02	0.00
0.15	1.48	0.00	0.00	0.02	0.00	0.23	2.00	0.00	0.00	0.02	0.00
0.29	1.07	0.00	0.00	0.02	0.00	0.36	0.90	0.00	0.00	0.02	0.02
0.43	1.04	0.00	0.00	0.02	0.00	0.47	0.64	0.00	0.00	0.01	0.04
0.54	1.01	0.00	0.00	0.02	0.00	0.62	1.43	0.00	0.00	0.02	0.00
0.68	2.00	0.00	0.00	0.02	0.00	0.75	2.00	0.00	0.00	0.02	0.00
0.81	2.00	0.00	0.00	0.02	0.00	0.88	2.00	0.00	0.00	0.02	0.00
0.94	2.00	0.00	0.00	0.02	0.00	1.00	2.00	0.00	0.00	0.02	0.00
1.07	2.00	0.00	0.00	0.02	0.00	1.14	2.00	0.00	0.00	0.02	0.00
1.21	2.00	0.00	0.00	0.02	0.00	1.27	2.00	0.00	0.00	0.02	0.00
1.34	2.00	0.00	0.00	0.02	0.00	1.41	2.00	0.00	0.00	0.02	0.00
1.47	2.00	0.00	0.00	0.02	0.00	1.53	1.62	0.00	0.00	0.02	0.00
1.59	1.89	0.00	0.00	0.02	0.00	1.65	1.89	0.00	0.00	0.02	0.00
1.72	1.17	0.00	0.00	0.02	0.00	1.80	2.00	0.00	0.00	0.02	0.00
1.86	2.00	0.00	0.00	0.02	0.00	1.92	2.00	0.00	0.00	0.02	0.00
1.98	2.00	0.00	0.00	0.02	0.00	2.05	2.00	0.00	0.00	0.02	0.00
2.12	2.00	0.00	0.00	0.02	0.00	2.20	2.00	0.00	0.00	0.02	0.00
2.26	2.00	0.00	0.00	0.02	0.00	2.33	2.00	0.00	0.00	0.02	0.00
2.39	2.00	0.00	0.00	0.02	0.00	2.44	2.00	0.00	0.00	0.02	0.00
2.51	2.00	0.00	0.00	0.02	0.00	2.58	2.00	0.00	0.00	0.02	0.00
2.65	2.00	0.00	0.00	0.02	0.00	2.71	2.00	0.00	0.00	0.02	0.00
2.77	2.00	0.00	0.00	0.02	0.00	2.84	2.00	0.00	0.00	0.02	0.00
2.90	2.00	0.00	0.00	0.02	0.00	2.97	2.00	0.00	0.00	0.02	0.00
3.04	2.00	0.00	0.00	0.02	0.00	3.10	2.00	0.00	0.00	0.02	0.00
3.17	2.00	0.00	0.00	0.02	0.00	3.23	2.00	0.00	0.00	0.02	0.00
3.31	2.00	0.00	0.00	0.02	0.00	3.37	2.00	0.00	0.00	0.02	0.00
3.43	2.00	0.00	0.00	0.02	0.00	3.50	2.00	0.00	0.00	0.02	0.00
3.57	2.00	0.00	0.00	0.02	0.00	3.62	2.00	0.00	0.00	0.02	0.00
3.70	2.00	0.00	0.00	0.02	0.00	3.76	2.00	0.00	0.00	0.02	0.00
3.82	2.00	0.00	0.00	0.02	0.00	3.88	2.00	0.00	0.00	0.02	0.00
3.96	2.00	0.00	0.00	0.02	0.00	4.02	2.00	0.00	0.00	0.02	0.00
4.10	2.00	0.00	0.00	0.02	0.00	4.16	2.00	0.00	0.00	0.02	0.00
4.24	2.00	0.00	0.00	0.03	0.00	4.29	2.00	0.00	0.00	0.02	0.00
4.35	2.00	0.00	0.00	0.02	0.00	4.42	2.00	0.00	0.00	0.02	0.00
4.48	2.00	0.00	0.00	0.02	0.00	4.56	2.00	0.00	0.00	0.02	0.00
4.62	2.00	0.00	0.00	0.02	0.00	4.67	2.00	0.00	0.00	0.02	0.00
4.74	1.83	0.00	0.00	0.02	0.00	4.81	1.25	0.00	0.00	0.02	0.00
4.88	1.06	0.00	0.00	0.02	0.00	4.95	1.26	0.00	0.00	0.02	0.00
5.01	1.03	0.00	0.00	0.02	0.00	5.08	1.26	0.00	0.00	0.02	0.00
5.15	1.77	0.00	0.00	0.02	0.00	5.21	1.78	0.00	0.00	0.02	0.00
5.26	1.79	0.00	0.00	0.02	0.00	5.34	2.00	0.00	0.00	0.02	0.00
5.39	2.00	0.00	0.00	0.02	0.00	5.48	2.00	0.00	0.00	0.02	0.00
5.54	2.00	0.00	0.00	0.02	0.00	5.60	2.00	0.00	0.00	0.02	0.00
5.66	2.00	0.00	0.00	0.02	0.00	5.74	2.00	0.00	0.00	0.02	0.00
5.79	2.00	0.00	0.00	0.02	0.00	5.86	1.71	0.00	0.00	0.02	0.00
5.93	1.18	0.00	0.00	0.02	0.00	5.99	1.50	0.00	0.00	0.02	0.00
6.05	1.66	0.00	0.00	0.02	0.00	6.12	1.33	0.00	0.00	0.02	0.00
6.19	0.57	0.00	0.00	0.02	0.09	6.26	0.54	0.00	0.00	0.02	0.08

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
6.32	0.65	0.00	0.00	0.02	0.06	6.39	1.17	0.00	0.00	0.02	0.00
6.45	0.76	0.00	0.00	0.02	0.04	6.51	0.77	0.00	0.00	0.02	0.04
6.57	1.42	0.00	0.00	0.02	0.00	6.65	2.00	0.00	0.00	0.02	0.00
6.72	2.00	0.00	0.00	0.02	0.00	6.78	2.00	0.00	0.00	0.02	0.00
6.85	1.47	0.00	0.00	0.02	0.00	6.92	0.83	0.00	0.00	0.02	0.03
6.97	0.56	0.00	0.00	0.02	0.06	7.03	0.38	0.00	0.00	0.02	0.10
7.13	0.27	0.00	0.00	0.03	0.18	7.19	0.28	0.00	0.00	0.02	0.12
7.23	0.30	0.00	0.00	0.01	0.08	7.31	0.28	0.00	0.00	0.02	0.14
7.37	0.32	0.00	0.00	0.02	0.12	7.43	0.34	0.00	0.00	0.02	0.10
7.50	0.33	0.00	0.00	0.02	0.12	7.56	0.33	0.00	0.00	0.02	0.12
7.63	0.33	0.00	0.00	0.02	0.12	7.70	0.32	0.00	0.00	0.02	0.12
7.76	0.31	0.00	0.00	0.02	0.11	7.82	0.30	0.00	0.00	0.02	0.11
7.90	0.26	0.00	0.00	0.02	0.15	7.96	0.25	0.00	0.00	0.02	0.12
8.02	0.28	0.00	0.00	0.02	0.11	8.10	0.32	0.00	0.00	0.02	0.14
8.15	0.37	0.00	0.00	0.02	0.10	8.23	0.37	0.00	0.00	0.02	0.13
8.29	0.41	0.00	0.00	0.02	0.09	8.36	0.46	0.00	0.00	0.02	0.11
8.43	0.48	0.00	0.00	0.02	0.09	8.48	0.44	0.00	0.00	0.02	0.08
8.56	0.34	0.00	0.00	0.03	0.15	8.65	0.31	0.00	0.00	0.03	0.16
8.69	0.36	0.00	0.00	0.01	0.07	8.78	0.59	0.00	0.00	0.03	0.10
8.82	0.80	0.00	0.00	0.01	0.02	8.91	1.21	0.00	0.00	0.03	0.00
8.95	0.88	0.00	0.00	0.01	0.01	9.01	2.00	0.00	0.00	0.02	0.00
9.07	2.00	0.00	0.00	0.02	0.00	9.14	2.00	0.00	0.00	0.02	0.00
9.20	2.00	0.00	0.00	0.02	0.00	9.28	2.00	0.00	0.00	0.02	0.00
9.33	2.00	0.00	0.00	0.02	0.00	9.40	2.00	0.00	0.00	0.02	0.00
9.48	2.00	0.00	0.00	0.02	0.00	9.54	2.00	0.00	0.00	0.02	0.00
9.61	2.00	0.00	0.00	0.02	0.00	9.68	2.00	0.00	0.00	0.02	0.00
9.73	2.00	0.00	0.00	0.02	0.00	9.80	2.00	0.00	0.00	0.02	0.00
9.88	2.00	0.00	0.00	0.02	0.00	9.93	2.00	0.00	0.00	0.02	0.00
10.00	2.00	0.00	0.00	0.02	0.00	10.06	2.00	0.00	0.00	0.02	0.00
10.12	2.00	0.00	0.00	0.02	0.00	10.20	2.00	0.00	0.00	0.02	0.00
10.26	2.00	0.00	0.00	0.02	0.00	10.32	2.00	0.00	0.00	0.02	0.00
10.39	2.00	0.00	0.00	0.02	0.00	10.45	2.00	0.00	0.00	0.02	0.00
10.52	2.00	0.00	0.00	0.02	0.00	10.58	2.00	0.00	0.00	0.02	0.00
10.64	2.00	0.00	0.00	0.02	0.00	10.71	2.00	0.00	0.00	0.02	0.00
10.78	2.00	0.00	0.00	0.02	0.00	10.84	2.00	0.00	0.00	0.02	0.00
10.92	2.00	0.00	0.00	0.02	0.00	10.98	2.00	0.00	0.00	0.02	0.00
11.04	2.00	0.00	0.00	0.02	0.00	11.12	2.00	0.00	0.00	0.02	0.00
11.18	2.00	0.00	0.00	0.02	0.00	11.25	2.00	0.00	0.00	0.02	0.00
11.33	2.00	0.00	0.00	0.02	0.00	11.37	2.00	0.00	0.00	0.01	0.00
11.46	2.00	0.00	0.00	0.03	0.00	11.50	2.00	0.00	0.00	0.01	0.00
11.58	2.00	0.00	0.00	0.02	0.00	11.64	2.00	0.00	0.00	0.02	0.00
11.71	2.00	0.00	0.00	0.02	0.00	11.79	2.00	0.00	0.00	0.02	0.00
11.83	2.00	0.00	0.00	0.01	0.00	11.91	2.00	0.00	0.00	0.03	0.00
11.96	2.00	0.00	0.00	0.01	0.00	12.04	2.00	0.00	0.00	0.03	0.00
12.09	2.00	0.00	0.00	0.01	0.00	12.16	2.00	0.00	0.00	0.02	0.00
12.24	2.00	0.00	0.00	0.02	0.00	12.29	2.00	0.00	0.00	0.02	0.00
12.37	2.00	0.00	0.00	0.02	0.00	12.43	2.00	0.00	0.00	0.02	0.00
12.50	2.00	0.00	0.00	0.02	0.00	12.57	2.00	0.00	0.00	0.02	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
12.61	2.00	0.00	0.00	0.01	0.00	12.70	2.00	0.00	0.00	0.03	0.00
12.75	2.00	0.00	0.00	0.01	0.00	12.83	2.00	0.00	0.00	0.03	0.00
12.87	2.00	0.00	0.00	0.01	0.00	12.96	2.00	0.00	0.00	0.03	0.00
13.01	2.00	0.00	0.00	0.01	0.00	13.10	0.69	0.00	0.00	0.03	0.07
13.15	2.00	0.00	0.00	0.02	0.00	13.23	2.00	0.00	0.00	0.02	0.00
13.29	2.00	0.00	0.00	0.02	0.00	13.35	2.00	0.00	0.00	0.02	0.00
13.41	2.00	0.00	0.00	0.02	0.00	13.46	2.00	0.00	0.00	0.02	0.00
13.55	2.00	0.00	0.00	0.03	0.00	13.60	2.00	0.00	0.00	0.02	0.00
13.67	1.52	0.00	0.00	0.02	0.00	13.75	1.46	0.00	0.00	0.03	0.00
13.79	1.44	0.00	0.00	0.01	0.00	13.88	0.16	0.00	0.00	0.03	0.17
13.96	0.16	0.00	0.00	0.02	0.16	13.99	0.16	0.00	0.00	0.01	0.07
14.06	0.16	0.00	0.00	0.02	0.14	14.13	0.16	0.00	0.00	0.02	0.14
14.20	0.16	0.00	0.00	0.02	0.14	14.28	1.33	0.00	0.00	0.02	0.00
14.33	1.33	0.00	0.00	0.01	0.00	14.41	2.00	0.00	0.00	0.03	0.00
14.48	2.00	0.00	0.00	0.02	0.00	14.51	2.00	0.00	0.00	0.01	0.00
14.60	2.00	0.00	0.00	0.02	0.00	14.68	2.00	0.00	0.00	0.02	0.00
14.72	2.00	0.00	0.00	0.01	0.00	14.80	2.00	0.00	0.00	0.03	0.00
14.88	2.00	0.00	0.00	0.02	0.00	14.92	2.00	0.00	0.00	0.01	0.00
15.00	2.00	0.00	0.00	0.03	0.00	15.05	1.84	0.00	0.00	0.01	0.00
15.13	1.88	0.00	0.00	0.03	0.00	15.20	1.82	0.00	0.00	0.02	0.00
15.27	0.17	0.00	0.00	0.02	0.13	15.30	0.17	0.00	0.00	0.01	0.06
15.37	0.17	0.00	0.00	0.02	0.13	15.44	0.16	0.00	0.00	0.02	0.13
15.50	1.33	0.00	0.00	0.02	0.00	15.57	1.14	0.00	0.00	0.02	0.00
15.64	1.00	0.00	0.00	0.02	0.00	15.71	0.95	0.00	0.00	0.02	0.01
15.78	0.96	0.00	0.00	0.02	0.01	15.84	1.04	0.00	0.00	0.02	0.00
15.92	1.18	0.00	0.00	0.02	0.00	16.00	1.32	0.00	0.00	0.02	0.00
16.04	0.16	0.00	0.00	0.01	0.08	16.12	0.16	0.00	0.00	0.02	0.16
16.16	0.15	0.00	0.00	0.01	0.08	16.24	1.23	0.00	0.00	0.03	0.00
16.33	1.19	0.00	0.00	0.03	0.00	16.37	1.22	0.00	0.00	0.01	0.00
16.45	2.00	0.00	0.00	0.03	0.00	16.49	2.00	0.00	0.00	0.01	0.00
16.58	2.00	0.00	0.00	0.03	0.00	16.62	2.00	0.00	0.00	0.01	0.00
16.70	2.00	0.00	0.00	0.03	0.00	16.79	2.00	0.00	0.00	0.03	0.00
16.83	2.00	0.00	0.00	0.01	0.00	16.90	1.56	0.00	0.00	0.02	0.00
16.97	1.65	0.00	0.00	0.02	0.00	17.01	0.17	0.00	0.00	0.01	0.07
17.10	1.52	0.00	0.00	0.03	0.00	17.14	1.36	0.00	0.00	0.01	0.00
17.23	1.26	0.00	0.00	0.03	0.00	17.27	1.16	0.00	0.00	0.01	0.00
17.36	1.08	0.00	0.00	0.03	0.00	17.40	1.04	0.00	0.00	0.01	0.00
17.49	1.01	0.00	0.00	0.03	0.00	17.53	1.03	0.00	0.00	0.01	0.00
17.62	1.07	0.00	0.00	0.03	0.00	17.67	1.25	0.00	0.00	0.01	0.00
17.75	1.39	0.00	0.00	0.03	0.00	17.83	0.16	0.00	0.00	0.03	0.15
17.89	1.37	0.00	0.00	0.02	0.00	17.93	1.26	0.00	0.00	0.01	0.00
18.02	1.23	0.00	0.00	0.03	0.00	18.06	2.00	0.00	0.00	0.01	0.00
18.15	2.00	0.00	0.00	0.03	0.00	18.19	2.00	0.00	0.00	0.01	0.00
18.28	2.00	0.00	0.00	0.03	0.00	18.32	2.00	0.00	0.00	0.01	0.00
18.41	2.00	0.00	0.00	0.03	0.00	18.49	2.00	0.00	0.00	0.02	0.00
18.53	2.00	0.00	0.00	0.01	0.00	18.62	2.00	0.00	0.00	0.03	0.00
18.66	0.50	0.00	0.00	0.01	0.05	18.74	0.68	0.00	0.00	0.03	0.06
18.79	0.68	0.00	0.00	0.01	0.03	18.87	0.75	0.00	0.00	0.03	0.05

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
18.92	0.84	0.00	0.00	0.01	0.01	19.01	0.95	0.00	0.00	0.03	0.01
19.05	0.93	0.00	0.00	0.01	0.01	19.14	0.93	0.00	0.00	0.03	0.01
19.18	1.28	0.00	0.00	0.01	0.00	19.27	0.95	0.00	0.00	0.03	0.01
19.32	1.43	0.00	0.00	0.01	0.00	19.40	1.35	0.00	0.00	0.03	0.00
19.44	1.55	0.00	0.00	0.01	0.00	19.53	1.59	0.00	0.00	0.03	0.00
19.57	2.00	0.00	0.00	0.01	0.00	19.66	1.89	0.00	0.00	0.03	0.00
19.70	1.56	0.00	0.00	0.01	0.00	19.79	1.11	0.00	0.00	0.03	0.00
19.83	0.79	0.00	0.00	0.01	0.02	19.92	0.79	0.00	0.00	0.03	0.04
20.00	0.98	0.00	0.00	0.03	0.00	20.05	1.09	0.00	0.00	0.01	0.00
20.09	1.16	0.00	0.00	0.01	0.00	20.18	0.83	0.00	0.00	0.03	0.03
20.23	0.83	0.00	0.00	0.02	0.02	20.30	0.69	0.00	0.00	0.02	0.05
20.38	0.60	0.00	0.00	0.02	0.07	20.43	0.62	0.00	0.00	0.02	0.04
20.51	0.61	0.00	0.00	0.02	0.06	20.56	0.68	0.00	0.00	0.02	0.04
20.62	0.74	0.00	0.00	0.02	0.03	20.70	0.70	0.00	0.00	0.03	0.05
20.76	0.72	0.00	0.00	0.02	0.03	20.82	0.75	0.00	0.00	0.02	0.03
20.89	0.77	0.00	0.00	0.02	0.04	20.98	0.79	0.00	0.00	0.03	0.04
21.02	0.81	0.00	0.00	0.01	0.02	21.11	0.89	0.00	0.00	0.03	0.02
21.15	0.83	0.00	0.00	0.01	0.02	21.24	0.80	0.00	0.00	0.03	0.04
21.28	0.58	0.00	0.00	0.01	0.04	21.37	0.43	0.57	0.41	0.09	0.10
21.41	0.37	0.63	0.36	0.04	0.06	21.50	0.32	0.68	0.33	0.09	0.12
21.55	0.29	0.71	0.32	0.04	0.06	21.63	0.29	0.71	0.32	0.09	0.13
21.68	0.29	0.71	0.32	0.04	0.06	21.74	0.24	0.76	0.29	0.06	0.09
21.80	0.28	0.72	0.31	0.07	0.10	21.87	0.31	0.69	0.33	0.07	0.10
21.94	0.34	0.66	0.34	0.07	0.10	22.02	0.37	0.63	0.36	0.07	0.09
22.09	0.44	0.56	0.42	0.07	0.08	22.16	0.66	0.00	0.00	0.02	0.05
22.20	0.94	0.00	0.00	0.01	0.00	22.29	2.00	0.00	0.00	0.03	0.00
22.33	2.00	0.00	0.00	0.01	0.00	22.42	2.00	0.00	0.00	0.03	0.00
22.46	2.00	0.00	0.00	0.01	0.00	22.55	2.00	0.00	0.00	0.03	0.00
22.60	2.00	0.00	0.00	0.01	0.00	22.66	2.00	0.00	0.00	0.02	0.00
22.74	2.00	0.00	0.00	0.02	0.00	22.82	2.00	0.00	0.00	0.03	0.00
22.87	2.00	0.00	0.00	0.01	0.00	22.96	2.00	0.00	0.00	0.03	0.00
23.00	2.00	0.00	0.00	0.01	0.00	23.09	2.00	0.00	0.00	0.03	0.00
23.13	2.00	0.00	0.00	0.01	0.00	23.21	2.00	0.00	0.00	0.03	0.00
23.26	2.00	0.00	0.00	0.01	0.00	23.34	2.00	0.00	0.00	0.03	0.00
23.38	2.00	0.00	0.00	0.01	0.00	23.47	1.47	0.00	0.00	0.03	0.00
23.52	1.19	0.00	0.00	0.01	0.00	23.60	0.86	0.00	0.00	0.03	0.02
23.65	0.74	0.00	0.00	0.01	0.02	23.74	0.58	0.00	0.00	0.03	0.07
23.78	0.54	0.00	0.00	0.01	0.04	23.83	0.30	0.70	0.32	0.05	0.07
23.91	0.37	0.63	0.36	0.08	0.10	24.00	2.00	0.00	0.00	0.03	0.00
24.04	2.00	0.00	0.00	0.01	0.00	24.13	2.00	0.00	0.00	0.03	0.00
24.17	2.00	0.00	0.00	0.01	0.00	24.26	2.00	0.00	0.00	0.03	0.00
24.30	2.00	0.00	0.00	0.01	0.00	24.39	2.00	0.00	0.00	0.03	0.00
24.44	2.00	0.00	0.00	0.01	0.00	24.53	2.00	0.00	0.00	0.03	0.00
24.57	2.00	0.00	0.00	0.01	0.00	24.66	0.69	0.00	0.00	0.03	0.05
24.70	0.60	0.00	0.00	0.01	0.03	24.79	2.00	0.00	0.00	0.03	0.00
24.83	2.00	0.00	0.00	0.01	0.00	24.92	2.00	0.00	0.00	0.03	0.00
24.96	2.00	0.00	0.00	0.01	0.00	25.05	2.00	0.00	0.00	0.03	0.00
25.09	2.00	0.00	0.00	0.01	0.00	25.18	2.00	0.00	0.00	0.03	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
25.22	2.00	0.00	0.00	0.01	0.00	25.31	2.00	0.00	0.00	0.03	0.00
25.35	2.00	0.00	0.00	0.01	0.00	25.42	2.00	0.00	0.00	0.02	0.00
25.48	2.00	0.00	0.00	0.02	0.00	25.56	2.00	0.00	0.00	0.03	0.00
25.62	2.00	0.00	0.00	0.02	0.00	25.68	2.00	0.00	0.00	0.02	0.00
25.74	2.00	0.00	0.00	0.02	0.00	25.80	2.00	0.00	0.00	0.02	0.00
25.88	0.68	0.00	0.00	0.02	0.04	25.95	0.77	0.00	0.00	0.02	0.03
26.00	0.88	0.00	0.00	0.02	0.01	26.07	0.94	0.00	0.00	0.02	0.01
26.13	0.91	0.00	0.00	0.02	0.01	26.21	0.89	0.00	0.00	0.03	0.02
26.30	2.00	0.00	0.00	0.03	0.00	26.34	2.00	0.00	0.00	0.01	0.00
26.43	2.00	0.00	0.00	0.03	0.00	26.47	2.00	0.00	0.00	0.01	0.00
26.55	2.00	0.00	0.00	0.02	0.00	26.59	2.00	0.00	0.00	0.01	0.00
26.67	2.00	0.00	0.00	0.03	0.00	26.76	2.00	0.00	0.00	0.03	0.00
26.80	2.00	0.00	0.00	0.01	0.00	26.88	2.00	0.00	0.00	0.03	0.00
26.92	2.00	0.00	0.00	0.01	0.00	27.00	2.00	0.00	0.00	0.02	0.00
27.05	2.00	0.00	0.00	0.02	0.00	27.12	2.00	0.00	0.00	0.02	0.00
27.18	2.00	0.00	0.00	0.02	0.00	27.25	2.00	0.00	0.00	0.02	0.00
27.32	2.00	0.00	0.00	0.02	0.00	27.38	2.00	0.00	0.00	0.02	0.00
27.44	2.00	0.00	0.00	0.02	0.00	27.52	2.00	0.00	0.00	0.02	0.00
27.58	2.00	0.00	0.00	0.02	0.00	27.65	2.00	0.00	0.00	0.02	0.00
27.71	2.00	0.00	0.00	0.02	0.00	27.78	2.00	0.00	0.00	0.02	0.00
27.84	2.00	0.00	0.00	0.02	0.00	27.91	2.00	0.00	0.00	0.02	0.00
27.97	2.00	0.00	0.00	0.02	0.00	28.04	2.00	0.00	0.00	0.02	0.00
28.12	2.00	0.00	0.00	0.02	0.00	28.17	2.00	0.00	0.00	0.02	0.00
28.25	2.00	0.00	0.00	0.02	0.00	28.33	2.00	0.00	0.00	0.02	0.00
28.37	2.00	0.00	0.00	0.01	0.00	28.46	2.00	0.00	0.00	0.03	0.00
28.50	2.00	0.00	0.00	0.01	0.00	28.56	2.00	0.00	0.00	0.02	0.00
28.63	2.00	0.00	0.00	0.02	0.00	28.69	2.00	0.00	0.00	0.02	0.00
28.76	2.00	0.00	0.00	0.02	0.00	28.84	2.00	0.00	0.00	0.02	0.00
28.90	2.00	0.00	0.00	0.02	0.00	28.98	0.80	0.00	0.00	0.02	0.03
29.03	2.00	0.00	0.00	0.02	0.00	29.09	2.00	0.00	0.00	0.02	0.00
29.18	2.00	0.00	0.00	0.03	0.00	29.21	2.00	0.00	0.00	0.01	0.00
29.30	2.00	0.00	0.00	0.02	0.00	29.38	2.00	0.00	0.00	0.02	0.00
29.42	2.00	0.00	0.00	0.01	0.00	29.50	2.00	0.00	0.00	0.02	0.00
29.58	2.00	0.00	0.00	0.02	0.00	29.62	2.00	0.00	0.00	0.01	0.00
29.69	2.00	0.00	0.00	0.02	0.00	29.76	2.00	0.00	0.00	0.02	0.00
29.82	2.00	0.00	0.00	0.02	0.00	29.89	2.00	0.00	0.00	0.02	0.00
29.95	2.00	0.00	0.00	0.02	0.00	30.03	2.00	0.00	0.00	0.02	0.00
30.07	2.00	0.00	0.00	0.01	0.00	30.15	2.00	0.00	0.00	0.02	0.00
30.20	2.00	0.00	0.00	0.02	0.00	30.27	2.00	0.00	0.00	0.02	0.00
30.33	2.00	0.00	0.00	0.02	0.00	30.39	2.00	0.00	0.00	0.02	0.00
30.47	2.00	0.00	0.00	0.02	0.00	30.54	2.00	0.00	0.00	0.02	0.00
30.59	2.00	0.00	0.00	0.02	0.00	30.66	2.00	0.00	0.00	0.02	0.00
30.73	2.00	0.00	0.00	0.02	0.00	30.80	2.00	0.00	0.00	0.02	0.00
30.86	2.00	0.00	0.00	0.02	0.00	30.93	2.00	0.00	0.00	0.02	0.00
30.99	2.00	0.00	0.00	0.02	0.00	31.06	2.00	0.00	0.00	0.02	0.00
31.13	2.00	0.00	0.00	0.02	0.00	31.18	2.00	0.00	0.00	0.02	0.00
31.26	2.00	0.00	0.00	0.02	0.00	31.33	2.00	0.00	0.00	0.02	0.00
31.38	2.00	0.00	0.00	0.01	0.00	31.45	2.00	0.00	0.00	0.02	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
31.52	2.00	0.00	0.00	0.02	0.00	31.61	2.00	0.00	0.00	0.03	0.00
31.65	2.00	0.00	0.00	0.01	0.00	31.73	2.00	0.00	0.00	0.03	0.00
31.80	2.00	0.00	0.00	0.02	0.00	31.87	2.00	0.00	0.00	0.02	0.00
31.93	2.00	0.00	0.00	0.02	0.00	31.99	2.00	0.00	0.00	0.02	0.00
32.06	2.00	0.00	0.00	0.02	0.00	32.11	2.00	0.00	0.00	0.01	0.00
32.17	2.00	0.00	0.00	0.02	0.00	32.24	2.00	0.00	0.00	0.02	0.00
32.30	2.00	0.00	0.00	0.02	0.00	32.37	2.00	0.00	0.00	0.02	0.00
32.44	2.00	0.00	0.00	0.02	0.00	32.50	2.00	0.00	0.00	0.02	0.00
32.56	2.00	0.00	0.00	0.02	0.00	32.63	2.00	0.00	0.00	0.02	0.00
32.70	2.00	0.00	0.00	0.02	0.00	32.76	2.00	0.00	0.00	0.02	0.00
32.83	2.00	0.00	0.00	0.02	0.00	32.89	2.00	0.00	0.00	0.02	0.00
32.95	2.00	0.00	0.00	0.02	0.00	33.02	2.00	0.00	0.00	0.02	0.00
33.10	2.00	0.00	0.00	0.02	0.00	33.16	2.00	0.00	0.00	0.02	0.00
33.25	2.00	0.00	0.00	0.03	0.00	33.29	2.00	0.00	0.00	0.01	0.00
33.37	2.00	0.00	0.00	0.02	0.00	33.45	2.00	0.00	0.00	0.03	0.00
33.50	2.00	0.00	0.00	0.01	0.00	33.59	2.00	0.00	0.00	0.03	0.00
33.63	2.00	0.00	0.00	0.01	0.00	33.68	2.00	0.00	0.00	0.01	0.00
33.76	2.00	0.00	0.00	0.03	0.00	33.82	2.00	0.00	0.00	0.02	0.00
33.88	2.00	0.00	0.00	0.02	0.00	33.96	2.00	0.00	0.00	0.03	0.00
34.02	2.00	0.00	0.00	0.02	0.00	34.08	2.00	0.00	0.00	0.02	0.00
34.14	2.00	0.00	0.00	0.02	0.00	34.23	2.00	0.00	0.00	0.03	0.00
34.28	1.54	0.00	0.00	0.02	0.00	34.34	1.38	0.00	0.00	0.02	0.00
34.41	1.24	0.00	0.00	0.02	0.00	34.49	1.13	0.00	0.00	0.02	0.00
34.53	1.11	0.00	0.00	0.01	0.00	34.61	1.19	0.00	0.00	0.03	0.00
34.70	1.35	0.00	0.00	0.03	0.00	34.75	0.17	0.83	0.26	0.04	0.05
34.83	0.19	0.81	0.27	0.09	0.10	34.88	0.19	0.81	0.27	0.04	0.05
34.92	0.18	0.82	0.27	0.04	0.05	35.01	0.18	0.82	0.27	0.09	0.10
35.10	2.00	0.00	0.00	0.03	0.00	35.13	2.00	0.00	0.00	0.01	0.00
35.20	2.00	0.00	0.00	0.02	0.00	35.29	2.00	0.00	0.00	0.03	0.00
35.33	2.00	0.00	0.00	0.01	0.00	35.42	2.00	0.00	0.00	0.03	0.00
35.46	2.00	0.00	0.00	0.01	0.00	35.55	2.00	0.00	0.00	0.03	0.00
35.58	2.00	0.00	0.00	0.01	0.00	35.66	0.24	0.76	0.30	0.08	0.08
35.72	0.26	0.74	0.30	0.06	0.06	35.78	0.27	0.73	0.31	0.06	0.06
35.84	0.26	0.74	0.30	0.06	0.06	35.91	0.26	0.74	0.30	0.06	0.06
35.98	0.26	0.74	0.30	0.08	0.08	36.05	0.26	0.74	0.30	0.06	0.07
36.11	2.00	0.00	0.00	0.02	0.00	36.19	2.00	0.00	0.00	0.02	0.00
36.25	2.00	0.00	0.00	0.02	0.00	36.32	2.00	0.00	0.00	0.02	0.00
36.36	2.00	0.00	0.00	0.01	0.00	36.43	2.00	0.00	0.00	0.02	0.00
36.52	2.00	0.00	0.00	0.03	0.00	36.57	2.00	0.00	0.00	0.02	0.00
36.64	2.00	0.00	0.00	0.02	0.00	36.69	2.00	0.00	0.00	0.02	0.00
36.77	2.00	0.00	0.00	0.02	0.00	36.85	0.38	0.62	0.37	0.08	0.07
36.89	2.00	0.00	0.00	0.01	0.00	36.97	2.00	0.00	0.00	0.02	0.00
37.03	2.00	0.00	0.00	0.02	0.00	37.12	2.00	0.00	0.00	0.03	0.00
37.15	2.00	0.00	0.00	0.01	0.00	37.22	2.00	0.00	0.00	0.02	0.00
37.29	2.00	0.00	0.00	0.02	0.00	37.35	2.00	0.00	0.00	0.02	0.00
37.42	2.00	0.00	0.00	0.02	0.00	37.49	2.00	0.00	0.00	0.02	0.00
37.56	2.00	0.00	0.00	0.02	0.00	37.62	2.00	0.00	0.00	0.02	0.00
37.68	1.90	0.00	0.00	0.02	0.00	37.74	0.74	0.00	0.00	0.02	0.02

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
37.83	1.85	0.00	0.00	0.02	0.00	37.89	0.95	0.00	0.00	0.02	0.00
37.96	1.40	0.00	0.00	0.02	0.00	38.02	1.27	0.00	0.00	0.02	0.00
38.07	0.78	0.00	0.00	0.02	0.02	38.16	0.63	0.00	0.00	0.03	0.04
38.22	0.61	0.00	0.00	0.02	0.03	38.28	0.59	0.00	0.00	0.02	0.03
38.34	0.59	0.00	0.00	0.02	0.03	38.42	0.59	0.00	0.00	0.03	0.04
38.48	0.57	0.00	0.00	0.02	0.03	38.53	0.46	0.54	0.44	0.05	0.03
38.60	0.87	0.00	0.00	0.02	0.01	38.67	0.75	0.00	0.00	0.02	0.02
38.73	0.91	0.00	0.00	0.02	0.01	38.80	1.47	0.00	0.00	0.02	0.00
38.86	2.00	0.00	0.00	0.02	0.00	38.93	2.00	0.00	0.00	0.02	0.00
39.00	2.00	0.00	0.00	0.02	0.00	39.07	2.00	0.00	0.00	0.02	0.00
39.14	2.00	0.00	0.00	0.02	0.00	39.21	2.00	0.00	0.00	0.02	0.00
39.27	2.00	0.00	0.00	0.02	0.00	39.33	2.00	0.00	0.00	0.02	0.00
39.39	2.00	0.00	0.00	0.02	0.00	39.47	2.00	0.00	0.00	0.03	0.00
39.53	2.00	0.00	0.00	0.02	0.00	39.58	0.58	0.00	0.00	0.02	0.03
39.67	0.58	0.00	0.00	0.03	0.04	39.73	0.59	0.00	0.00	0.02	0.03
39.81	0.59	0.00	0.00	0.02	0.04	39.84	0.78	0.00	0.00	0.01	0.01
39.92	2.00	0.00	0.00	0.02	0.00	40.00	2.00	0.00	0.00	0.02	0.00
40.04	2.00	0.00	0.00	0.01	0.00	40.12	2.00	0.00	0.00	0.02	0.00
40.20	2.00	0.00	0.00	0.02	0.00	40.24	2.00	0.00	0.00	0.01	0.00
40.32	2.00	0.00	0.00	0.03	0.00	40.37	2.00	0.00	0.00	0.01	0.00
40.44	0.37	0.63	0.36	0.07	0.05	40.52	0.35	0.65	0.35	0.07	0.06
40.56	2.00	0.00	0.00	0.01	0.00	40.64	2.00	0.00	0.00	0.02	0.00
40.71	2.00	0.00	0.00	0.02	0.00	40.78	2.00	0.00	0.00	0.02	0.00
40.83	2.00	0.00	0.00	0.01	0.00	40.93	2.00	0.00	0.00	0.03	0.00
40.97	2.00	0.00	0.00	0.01	0.00	41.05	0.35	0.65	0.35	0.08	0.06
41.10	0.36	0.64	0.36	0.04	0.03	41.18	0.32	0.68	0.33	0.09	0.07
41.23	0.32	0.68	0.33	0.04	0.03	41.30	0.33	0.67	0.34	0.07	0.05
41.36	0.34	0.66	0.35	0.06	0.05	41.42	0.33	0.67	0.34	0.06	0.04
41.49	0.51	0.00	0.00	0.02	0.04	41.55	0.40	0.60	0.38	0.06	0.04
41.63	0.42	0.58	0.40	0.08	0.05	41.69	0.55	0.00	0.00	0.02	0.03
41.75	0.68	0.00	0.00	0.02	0.02	41.82	0.53	0.00	0.00	0.02	0.03
41.88	0.50	0.50	0.47	0.06	0.04	41.95	0.51	0.49	0.49	0.06	0.04
42.01	0.49	0.51	0.46	0.06	0.03	42.09	0.48	0.52	0.45	0.08	0.05
42.15	0.54	0.00	0.00	0.02	0.03	42.22	0.65	0.00	0.00	0.02	0.03
42.30	0.57	0.00	0.00	0.02	0.04	42.34	0.64	0.00	0.00	0.01	0.01
42.42	0.59	0.00	0.00	0.02	0.04	42.50	0.64	0.00	0.00	0.02	0.03
42.54	0.59	0.00	0.00	0.01	0.02	42.62	0.69	0.00	0.00	0.03	0.03
42.70	0.69	0.00	0.00	0.02	0.03	42.74	0.74	0.00	0.00	0.01	0.01
42.82	1.02	0.00	0.00	0.02	0.00	42.86	1.49	0.00	0.00	0.01	0.00
42.94	1.01	0.00	0.00	0.02	0.00	43.01	1.13	0.00	0.00	0.02	0.00
43.07	1.03	0.00	0.00	0.02	0.00	43.15	1.22	0.00	0.00	0.02	0.00
43.21	0.98	0.00	0.00	0.02	0.00	43.26	0.90	0.00	0.00	0.02	0.01
43.32	0.99	0.00	0.00	0.02	0.00	43.41	0.87	0.00	0.00	0.03	0.01
43.47	0.86	0.00	0.00	0.02	0.01	43.54	1.02	0.00	0.00	0.02	0.00
43.61	1.25	0.00	0.00	0.02	0.00	43.67	1.50	0.00	0.00	0.02	0.00
43.74	1.91	0.00	0.00	0.02	0.00	43.82	2.00	0.00	0.00	0.02	0.00
43.86	2.00	0.00	0.00	0.01	0.00	43.94	1.58	0.00	0.00	0.03	0.00
43.99	1.17	0.00	0.00	0.01	0.00	44.07	0.92	0.00	0.00	0.03	0.01

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
44.11	0.96	0.00	0.00	0.01	0.00	44.20	0.72	0.00	0.00	0.03	0.02
44.24	0.69	0.00	0.00	0.01	0.01	44.33	0.76	0.00	0.00	0.03	0.02
44.38	0.88	0.00	0.00	0.01	0.01	44.46	2.00	0.00	0.00	0.03	0.00
44.51	2.00	0.00	0.00	0.01	0.00	44.59	2.00	0.00	0.00	0.03	0.00
44.64	2.00	0.00	0.00	0.01	0.00	44.72	2.00	0.00	0.00	0.03	0.00
44.81	2.00	0.00	0.00	0.03	0.00	44.85	0.26	0.74	0.30	0.04	0.03
44.93	0.27	0.73	0.31	0.08	0.06	44.97	0.28	0.72	0.31	0.04	0.03
45.06	0.35	0.65	0.35	0.09	0.05	45.11	0.45	0.55	0.43	0.04	0.02
45.17	0.70	0.00	0.00	0.02	0.02	45.23	0.58	0.00	0.00	0.02	0.02
45.29	0.60	0.00	0.00	0.02	0.02	45.36	2.00	0.00	0.00	0.02	0.00
45.43	2.00	0.00	0.00	0.02	0.00	45.49	2.00	0.00	0.00	0.02	0.00
45.56	2.00	0.00	0.00	0.02	0.00	45.62	2.00	0.00	0.00	0.02	0.00
45.69	2.00	0.00	0.00	0.02	0.00	45.76	2.00	0.00	0.00	0.02	0.00
45.81	2.00	0.00	0.00	0.02	0.00	45.88	2.00	0.00	0.00	0.02	0.00
45.95	2.00	0.00	0.00	0.02	0.00	46.02	2.00	0.00	0.00	0.02	0.00
46.08	2.00	0.00	0.00	0.02	0.00	46.15	2.00	0.00	0.00	0.02	0.00
46.21	2.00	0.00	0.00	0.02	0.00	46.28	2.00	0.00	0.00	0.02	0.00
46.34	2.00	0.00	0.00	0.02	0.00	46.41	2.00	0.00	0.00	0.02	0.00
46.47	2.00	0.00	0.00	0.02	0.00	46.54	2.00	0.00	0.00	0.02	0.00
46.61	2.00	0.00	0.00	0.02	0.00	46.69	2.00	0.00	0.00	0.02	0.00
46.75	2.00	0.00	0.00	0.02	0.00	46.80	2.00	0.00	0.00	0.01	0.00
46.87	2.00	0.00	0.00	0.02	0.00	46.93	2.00	0.00	0.00	0.02	0.00
46.99	2.00	0.00	0.00	0.02	0.00	47.06	2.00	0.00	0.00	0.02	0.00
47.15	2.00	0.00	0.00	0.03	0.00	47.20	2.00	0.00	0.00	0.02	0.00
47.27	2.00	0.00	0.00	0.02	0.00	47.35	2.00	0.00	0.00	0.02	0.00
47.40	2.00	0.00	0.00	0.02	0.00	47.48	2.00	0.00	0.00	0.02	0.00
47.53	2.00	0.00	0.00	0.02	0.00	47.59	2.00	0.00	0.00	0.02	0.00
47.66	2.00	0.00	0.00	0.02	0.00	47.73	2.00	0.00	0.00	0.02	0.00
47.80	2.00	0.00	0.00	0.02	0.00	47.85	2.00	0.00	0.00	0.02	0.00
47.93	2.00	0.00	0.00	0.02	0.00	47.98	2.00	0.00	0.00	0.02	0.00
48.06	2.00	0.00	0.00	0.02	0.00	48.12	2.00	0.00	0.00	0.02	0.00
48.18	2.00	0.00	0.00	0.02	0.00	48.26	2.00	0.00	0.00	0.02	0.00
48.32	2.00	0.00	0.00	0.02	0.00	48.37	2.00	0.00	0.00	0.02	0.00
48.46	2.00	0.00	0.00	0.03	0.00	48.52	2.00	0.00	0.00	0.02	0.00
48.59	2.00	0.00	0.00	0.02	0.00	48.66	2.00	0.00	0.00	0.02	0.00
48.70	2.00	0.00	0.00	0.01	0.00	48.79	2.00	0.00	0.00	0.03	0.00
48.83	2.00	0.00	0.00	0.01	0.00	48.91	2.00	0.00	0.00	0.02	0.00
48.98	2.00	0.00	0.00	0.02	0.00	49.04	2.00	0.00	0.00	0.02	0.00
49.10	2.00	0.00	0.00	0.02	0.00	49.17	2.00	0.00	0.00	0.02	0.00
49.24	2.00	0.00	0.00	0.02	0.00	49.29	2.00	0.00	0.00	0.02	0.00
49.38	2.00	0.00	0.00	0.03	0.00	49.44	2.00	0.00	0.00	0.02	0.00
49.51	2.00	0.00	0.00	0.02	0.00	49.57	2.00	0.00	0.00	0.02	0.00
49.64	2.00	0.00	0.00	0.02	0.00	49.70	2.00	0.00	0.00	0.02	0.00
49.77	2.00	0.00	0.00	0.02	0.00	49.84	2.00	0.00	0.00	0.02	0.00
49.88	2.00	0.00	0.00	0.01	0.00	49.97	2.00	0.00	0.00	0.03	0.00
50.06	2.00	0.00	0.00	0.03	0.00	50.11	2.00	0.00	0.00	0.02	0.00
50.16	2.00	0.00	0.00	0.01	0.00	50.21	2.00	0.00	0.00	0.02	0.00
50.28	2.00	0.00	0.00	0.02	0.00	50.35	2.00	0.00	0.00	0.02	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
50.41	2.00	0.00	0.00	0.02	0.00	50.47	2.00	0.00	0.00	0.02	0.00
50.56	2.00	0.00	0.00	0.03	0.00	50.62	2.00	0.00	0.00	0.02	0.00
50.68	2.00	0.00	0.00	0.02	0.00	50.74	2.00	0.00	0.00	0.02	0.00
50.81	2.00	0.00	0.00	0.02	0.00	50.87	2.00	0.00	0.00	0.02	0.00
50.94	2.00	0.00	0.00	0.02	0.00	51.02	2.00	0.00	0.00	0.02	0.00
51.10	2.00	0.00	0.00	0.03	0.00	51.15	2.00	0.00	0.00	0.01	0.00
51.23	2.00	0.00	0.00	0.03	0.00	51.26	2.00	0.00	0.00	0.01	0.00
51.33	2.00	0.00	0.00	0.02	0.00	51.40	2.00	0.00	0.00	0.02	0.00
51.46	2.00	0.00	0.00	0.02	0.00	51.53	2.00	0.00	0.00	0.02	0.00
51.60	2.00	0.00	0.00	0.02	0.00	51.66	2.00	0.00	0.00	0.02	0.00
51.74	2.00	0.00	0.00	0.02	0.00	51.80	2.00	0.00	0.00	0.02	0.00
51.85	2.00	0.00	0.00	0.02	0.00	51.92	2.00	0.00	0.00	0.02	0.00
52.01	2.00	0.00	0.00	0.03	0.00	52.07	2.00	0.00	0.00	0.02	0.00
52.13	2.00	0.00	0.00	0.02	0.00	52.19	2.00	0.00	0.00	0.02	0.00
52.26	2.00	0.00	0.00	0.02	0.00	52.34	2.00	0.00	0.00	0.02	0.00
52.38	2.00	0.00	0.00	0.01	0.00	52.47	2.00	0.00	0.00	0.03	0.00
52.51	2.00	0.00	0.00	0.01	0.00	52.60	2.00	0.00	0.00	0.03	0.00
52.64	2.00	0.00	0.00	0.01	0.00	52.73	2.00	0.00	0.00	0.03	0.00
52.77	2.00	0.00	0.00	0.01	0.00	52.86	2.00	0.00	0.00	0.03	0.00
52.90	2.00	0.00	0.00	0.01	0.00	52.97	2.00	0.00	0.00	0.02	0.00
53.04	2.00	0.00	0.00	0.02	0.00	53.10	2.00	0.00	0.00	0.02	0.00
53.17	2.00	0.00	0.00	0.02	0.00	53.24	2.00	0.00	0.00	0.02	0.00
53.31	2.00	0.00	0.00	0.02	0.00	53.36	2.00	0.00	0.00	0.02	0.00
53.43	2.00	0.00	0.00	0.02	0.00	53.50	2.00	0.00	0.00	0.02	0.00
53.56	2.00	0.00	0.00	0.02	0.00	53.63	2.00	0.00	0.00	0.02	0.00
53.71	2.00	0.00	0.00	0.02	0.00	53.77	2.00	0.00	0.00	0.02	0.00
53.84	2.00	0.00	0.00	0.02	0.00	53.91	2.00	0.00	0.00	0.02	0.00
53.99	2.00	0.00	0.00	0.02	0.00	54.03	2.00	0.00	0.00	0.01	0.00
54.12	2.00	0.00	0.00	0.03	0.00	54.16	2.00	0.00	0.00	0.01	0.00
54.25	2.00	0.00	0.00	0.03	0.00	54.29	2.00	0.00	0.00	0.01	0.00
54.38	2.00	0.00	0.00	0.03	0.00	54.41	2.00	0.00	0.00	0.01	0.00
54.49	2.00	0.00	0.00	0.02	0.00	54.56	2.00	0.00	0.00	0.02	0.00
54.63	2.00	0.00	0.00	0.02	0.00	54.70	2.00	0.00	0.00	0.02	0.00
54.76	2.00	0.00	0.00	0.02	0.00	54.82	2.00	0.00	0.00	0.02	0.00
54.89	2.00	0.00	0.00	0.02	0.00	54.97	2.00	0.00	0.00	0.02	0.00
55.01	2.00	0.00	0.00	0.01	0.00	55.10	2.00	0.00	0.00	0.03	0.00
55.14	2.00	0.00	0.00	0.01	0.00	55.20	2.00	0.00	0.00	0.02	0.00
55.27	2.00	0.00	0.00	0.02	0.00	55.34	2.00	0.00	0.00	0.02	0.00
55.41	2.00	0.00	0.00	0.02	0.00	55.48	2.00	0.00	0.00	0.02	0.00
55.54	2.00	0.00	0.00	0.02	0.00	55.61	2.00	0.00	0.00	0.02	0.00
55.67	2.00	0.00	0.00	0.02	0.00	55.74	2.00	0.00	0.00	0.02	0.00
55.82	2.00	0.00	0.00	0.02	0.00	55.86	2.00	0.00	0.00	0.01	0.00
55.94	2.00	0.00	0.00	0.02	0.00	56.01	2.00	0.00	0.00	0.02	0.00
56.08	2.00	0.00	0.00	0.02	0.00	56.12	2.00	0.00	0.00	0.01	0.00
56.19	2.00	0.00	0.00	0.02	0.00	56.25	2.00	0.00	0.00	0.02	0.00
56.32	2.00	0.00	0.00	0.02	0.00	56.38	2.00	0.00	0.00	0.02	0.00
56.45	2.00	0.00	0.00	0.02	0.00	56.52	2.00	0.00	0.00	0.02	0.00
56.59	2.00	0.00	0.00	0.02	0.00	56.66	2.00	0.00	0.00	0.02	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
56.73	2.00	0.00	0.00	0.02	0.00	56.79	2.00	0.00	0.00	0.02	0.00
56.84	2.00	0.00	0.00	0.01	0.00	56.92	2.00	0.00	0.00	0.02	0.00
56.99	2.00	0.00	0.00	0.02	0.00	57.04	2.00	0.00	0.00	0.01	0.00
57.11	2.00	0.00	0.00	0.02	0.00	57.17	2.00	0.00	0.00	0.02	0.00
57.24	2.00	0.00	0.00	0.02	0.00	57.30	2.00	0.00	0.00	0.02	0.00
57.38	2.00	0.00	0.00	0.02	0.00	57.44	2.00	0.00	0.00	0.02	0.00
57.51	2.00	0.00	0.00	0.02	0.00	57.56	2.00	0.00	0.00	0.02	0.00
57.64	2.00	0.00	0.00	0.02	0.00	57.70	2.00	0.00	0.00	0.02	0.00
57.77	2.00	0.00	0.00	0.02	0.00	57.83	2.00	0.00	0.00	0.02	0.00
57.90	2.00	0.00	0.00	0.02	0.00	57.97	2.00	0.00	0.00	0.02	0.00
58.06	2.00	0.00	0.00	0.02	0.00	58.10	2.00	0.00	0.00	0.01	0.00
58.16	2.00	0.00	0.00	0.02	0.00	58.23	2.00	0.00	0.00	0.02	0.00
58.28	2.00	0.00	0.00	0.02	0.00	58.36	2.00	0.00	0.00	0.02	0.00
58.42	2.00	0.00	0.00	0.02	0.00	58.49	2.00	0.00	0.00	0.02	0.00
58.56	2.00	0.00	0.00	0.02	0.00	58.63	2.00	0.00	0.00	0.02	0.00
58.68	2.00	0.00	0.00	0.02	0.00	58.76	2.00	0.00	0.00	0.02	0.00
58.81	2.00	0.00	0.00	0.02	0.00	58.90	2.00	0.00	0.00	0.03	0.00
58.96	2.00	0.00	0.00	0.02	0.00	59.02	2.00	0.00	0.00	0.02	0.00
59.07	2.00	0.00	0.00	0.01	0.00	59.15	2.00	0.00	0.00	0.02	0.00
59.21	2.00	0.00	0.00	0.02	0.00	59.29	2.00	0.00	0.00	0.03	0.00
59.34	2.00	0.00	0.00	0.01	0.00	59.41	2.00	0.00	0.00	0.02	0.00
59.48	2.00	0.00	0.00	0.02	0.00	59.54	2.00	0.00	0.00	0.02	0.00
59.60	2.00	0.00	0.00	0.02	0.00	59.69	2.00	0.00	0.00	0.03	0.00
59.73	2.00	0.00	0.00	0.01	0.00	59.81	2.00	0.00	0.00	0.02	0.00
59.89	2.00	0.00	0.00	0.03	0.00	59.93	2.00	0.00	0.00	0.01	0.00
60.02	2.00	0.00	0.00	0.03	0.00	60.06	2.00	0.00	0.00	0.01	0.00
60.12	2.00	0.00	0.00	0.02	0.00	60.19	2.00	0.00	0.00	0.02	0.00
60.26	2.00	0.00	0.00	0.02	0.00	60.32	2.00	0.00	0.00	0.02	0.00
60.39	2.00	0.00	0.00	0.02	0.00	60.46	2.00	0.00	0.00	0.02	0.00
60.53	2.00	0.00	0.00	0.02	0.00	60.58	2.00	0.00	0.00	0.02	0.00
60.66	2.00	0.00	0.00	0.02	0.00	60.72	2.00	0.00	0.00	0.02	0.00
60.78	2.00	0.00	0.00	0.02	0.00	60.87	2.00	0.00	0.00	0.03	0.00
60.93	2.00	0.00	0.00	0.02	0.00	61.01	2.00	0.00	0.00	0.02	0.00
61.04	2.00	0.00	0.00	0.01	0.00	61.11	2.00	0.00	0.00	0.02	0.00
61.18	2.00	0.00	0.00	0.02	0.00	61.24	2.00	0.00	0.00	0.02	0.00
61.31	2.00	0.00	0.00	0.02	0.00	61.37	2.00	0.00	0.00	0.02	0.00
61.45	2.00	0.00	0.00	0.02	0.00	61.50	2.00	0.00	0.00	0.02	0.00
61.56	2.00	0.00	0.00	0.02	0.00	61.64	2.00	0.00	0.00	0.02	0.00
61.69	2.00	0.00	0.00	0.02	0.00	61.77	2.00	0.00	0.00	0.02	0.00
61.83	2.00	0.00	0.00	0.02	0.00	61.91	2.00	0.00	0.00	0.03	0.00
61.97	2.00	0.00	0.00	0.02	0.00	62.02	2.00	0.00	0.00	0.02	0.00
62.12	2.00	0.00	0.00	0.03	0.00	62.18	2.00	0.00	0.00	0.02	0.00
62.22	2.00	0.00	0.00	0.01	0.00	62.28	2.00	0.00	0.00	0.02	0.00
62.36	2.00	0.00	0.00	0.02	0.00	62.42	2.00	0.00	0.00	0.02	0.00
62.49	2.00	0.00	0.00	0.02	0.00	62.55	2.00	0.00	0.00	0.02	0.00
62.62	2.00	0.00	0.00	0.02	0.00	62.69	2.00	0.00	0.00	0.02	0.00
62.75	2.00	0.00	0.00	0.02	0.00	62.83	2.00	0.00	0.00	0.02	0.00
62.88	2.00	0.00	0.00	0.02	0.00	62.96	2.00	0.00	0.00	0.02	0.00

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}	Depth (ft)	FS	m(FS)	H_1*m(FS)	d_z	LPI_{ISH}
63.01	2.00	0.00	0.00	0.02	0.00	63.07	2.00	0.00	0.00	0.02	0.00
63.14	2.00	0.00	0.00	0.02	0.00	63.20	2.00	0.00	0.00	0.02	0.00
63.27	2.00	0.00	0.00	0.02	0.00	63.34	2.00	0.00	0.00	0.02	0.00
63.40	2.00	0.00	0.00	0.02	0.00	63.47	2.00	0.00	0.00	0.02	0.00
63.53	2.00	0.00	0.00	0.02	0.00	63.61	2.00	0.00	0.00	0.02	0.00
63.67	2.00	0.00	0.00	0.02	0.00	63.74	2.00	0.00	0.00	0.02	0.00
63.80	2.00	0.00	0.00	0.02	0.00	63.86	2.00	0.00	0.00	0.02	0.00
63.93	2.00	0.00	0.00	0.02	0.00	64.00	2.00	0.00	0.00	0.02	0.00
64.05	2.00	0.00	0.00	0.02	0.00	64.13	2.00	0.00	0.00	0.02	0.00
64.19	2.00	0.00	0.00	0.02	0.00	64.25	2.00	0.00	0.00	0.02	0.00
64.33	2.00	0.00	0.00	0.02	0.00	64.39	2.00	0.00	0.00	0.02	0.00
64.46	2.00	0.00	0.00	0.02	0.00	64.51	2.00	0.00	0.00	0.02	0.00
64.58	2.00	0.00	0.00	0.02	0.00	64.65	2.00	0.00	0.00	0.02	0.00
64.72	2.00	0.00	0.00	0.02	0.00	64.79	2.00	0.00	0.00	0.02	0.00
64.85	2.00	0.00	0.00	0.02	0.00	64.91	2.00	0.00	0.00	0.02	0.00
64.98	2.00	0.00	0.00	0.02	0.00	65.05	2.00	0.00	0.00	0.02	0.00
65.11	2.00	0.00	0.00	0.02	0.00	65.18	2.00	0.00	0.00	0.02	0.00
65.24	2.00	0.00	0.00	0.02	0.00	65.31	2.00	0.00	0.00	0.02	0.00
65.37	2.00	0.00	0.00	0.02	0.00	65.44	2.00	0.00	0.00	0.02	0.00
65.51	2.00	0.00	0.00	0.02	0.00	65.57	2.00	0.00	0.00	0.02	0.00
65.63	2.00	0.00	0.00	0.02	0.00	65.70	2.00	0.00	0.00	0.02	0.00
65.77	2.00	0.00	0.00	0.02	0.00	65.84	2.00	0.00	0.00	0.02	0.00
65.89	2.00	0.00	0.00	0.01	0.00	65.96	2.00	0.00	0.00	0.02	0.00
66.04	2.00	0.00	0.00	0.02	0.00	66.09	2.00	0.00	0.00	0.02	0.00
66.16	2.00	0.00	0.00	0.02	0.00	66.23	2.00	0.00	0.00	0.02	0.00
66.29	2.00	0.00	0.00	0.02	0.00	66.36	2.00	0.00	0.00	0.02	0.00
66.43	2.00	0.00	0.00	0.02	0.00	66.48	2.00	0.00	0.00	0.02	0.00
66.55	2.00	0.00	0.00	0.02	0.00	66.62	2.00	0.00	0.00	0.02	0.00
66.68	2.00	0.00	0.00	0.02	0.00	66.75	2.00	0.00	0.00	0.02	0.00
66.82	2.00	0.00	0.00	0.02	0.00	66.88	2.00	0.00	0.00	0.02	0.00
66.95	2.00	0.00	0.00	0.02	0.00	67.01	2.00	0.00	0.00	0.02	0.00
67.08	2.00	0.00	0.00	0.02	0.00	67.14	2.00	0.00	0.00	0.02	0.00
67.21	2.00	0.00	0.00	0.02	0.00	67.28	2.00	0.00	0.00	0.02	0.00
67.35	2.00	0.00	0.00	0.02	0.00	67.40	2.00	0.00	0.00	0.02	0.00
67.47	2.00	0.00	0.00	0.02	0.00	67.53	2.00	0.00	0.00	0.02	0.00
67.61	2.00	0.00	0.00	0.02	0.00	67.67	2.00	0.00	0.00	0.02	0.00
67.73	2.00	0.00	0.00	0.02	0.00	67.80	2.00	0.00	0.00	0.02	0.00
67.87	2.00	0.00	0.00	0.02	0.00	67.93	2.00	0.00	0.00	0.02	0.00
68.00	2.00	0.00	0.00	0.02	0.00						

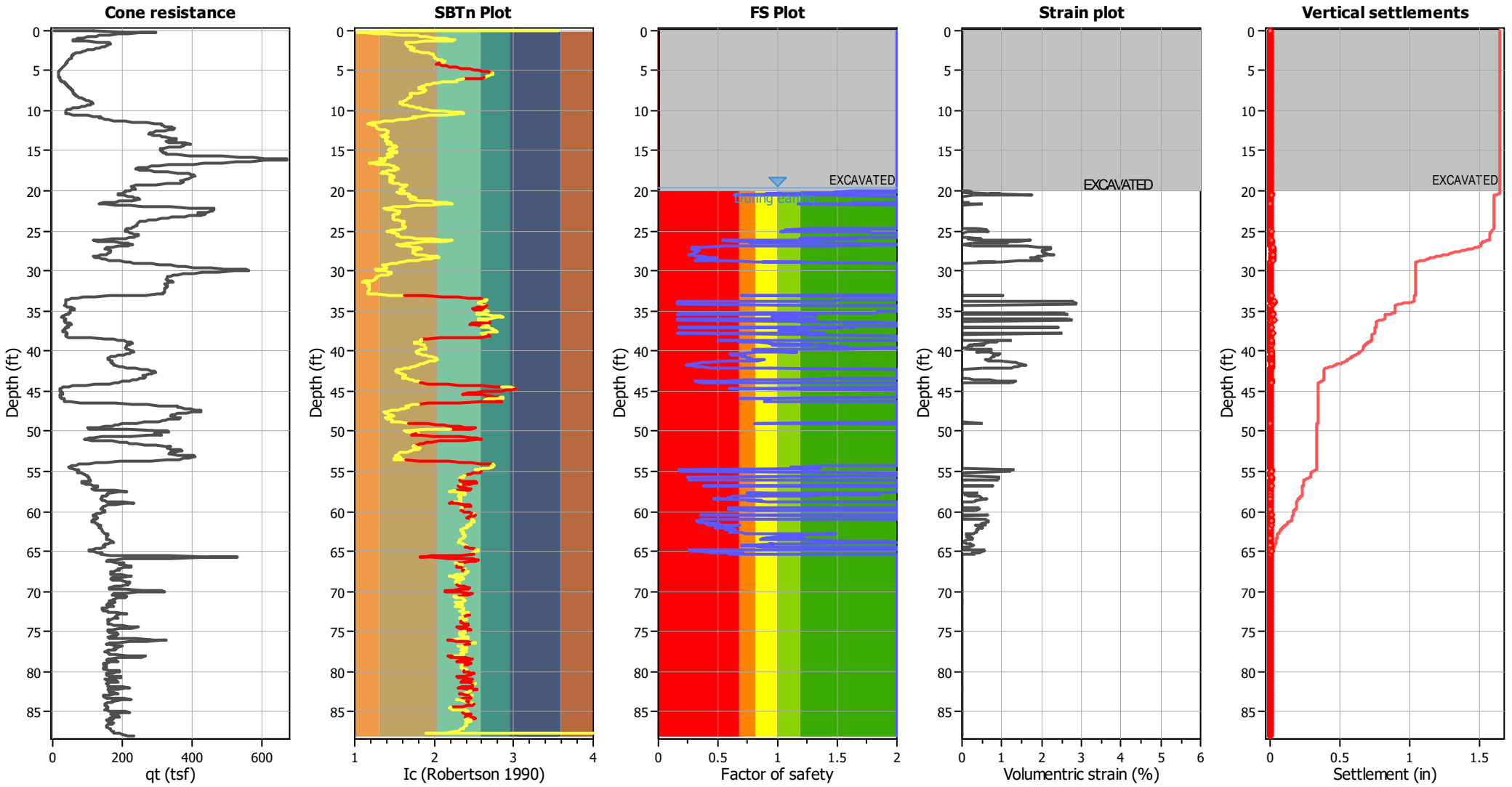
Overall liquefaction potential: 11.04

LPI_{ISH} > 5.0 - Liquefaction manifestation is expected

Abbreviations

FS: Calculated factor of safety for test point
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.02	1.62	186.43	1.00	186.43	0	0	0.53	0.000	0.00	0.00	0.00	0.000
0.10	1.60	182.06	1.00	182.06	0	0	0.53	0.000	0.00	0.00	0.00	0.000
0.15	1.55	180.49	1.00	180.49	0	0	0.53	0.000	0.00	0.00	0.00	0.000
0.23	1.53	177.42	1.00	177.42	0	0	0.53	0.000	0.00	0.00	0.00	0.000
0.29	1.57	173.15	1.00	173.15	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.36	1.61	167.49	1.00	167.49	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.43	1.67	162.08	1.02	165.02	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.47	1.70	162.80	1.04	169.27	0	0	0.57	0.000	0.00	0.00	0.00	0.000
0.54	1.70	165.24	1.04	171.78	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.62	1.67	175.71	1.02	179.21	0	0	0.54	0.000	0.00	0.00	0.00	0.000
0.68	1.68	185.07	1.02	189.57	0	0	0.54	0.000	0.00	0.00	0.00	0.000
0.75	1.70	192.00	1.04	199.69	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.81	1.73	196.81	1.06	208.54	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.88	1.76	199.82	1.08	215.80	0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.94	1.77	202.89	1.09	220.25	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.00	1.76	208.19	1.08	224.07	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.07	1.70	213.60	1.04	221.69	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.14	1.72	207.98	1.05	219.11	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.21	1.81	193.33	1.11	215.04	0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.27	1.92	173.42	1.21	209.40	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.34	1.97	161.06	1.27	203.96	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.41	2.00	150.43	1.30	195.89	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.47	2.07	133.61	1.41	188.12	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.53	2.15	119.14	1.56	185.66	0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.59	2.22	108.56	1.71	185.45	0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.65	2.22	107.60	1.71	184.51	0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.72	2.11	122.86	1.48	181.68	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.80	1.95	149.24	1.24	185.06	0	0	0.57	0.000	0.00	0.00	0.00	0.000
1.86	1.78	185.32	1.09	202.06	0	0	0.56	0.000	0.00	0.00	0.00	0.000
1.92	1.67	217.03	1.01	220.06	0	0	0.57	0.000	0.00	0.00	0.00	0.000
1.98	1.59	250.56	1.00	250.56	0	0	0.57	0.000	0.00	0.00	0.00	0.000
2.05	1.50	289.69	1.00	289.69	0	0	0.57	0.000	0.00	0.00	0.00	0.000
2.12	1.42	336.28	1.00	336.28	0	0	0.57	0.000	0.00	0.00	0.00	0.000
2.20	1.38	375.36	1.00	375.36	0	0	0.57	0.000	0.00	0.00	0.00	0.000
2.26	1.37	399.29	1.00	399.29	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.33	1.39	398.17	1.00	398.17	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.39	1.43	393.72	1.00	393.72	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.44	1.48	388.19	1.00	388.19	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.51	1.53	387.50	1.00	387.50	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.58	1.56	384.75	1.00	384.75	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.65	1.56	374.52	1.00	374.52	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.71	1.55	363.49	1.00	363.49	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.77	1.55	351.66	1.00	351.66	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.84	1.54	352.54	1.00	352.54	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.90	1.52	363.38	1.00	363.38	0	0	0.58	0.000	0.00	0.00	0.00	0.000
2.97	1.49	368.32	1.00	368.32	0	0	0.58	0.000	0.00	0.00	0.00	0.000
3.04	1.48	357.79	1.00	357.79	0	0	0.58	0.000	0.00	0.00	0.00	0.000
3.10	1.48	343.56	1.00	343.56	0	0	0.58	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.17	1.49	328.73	1.00	328.73	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.23	1.49	319.84	1.00	319.84	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.31	1.50	300.03	1.00	300.03	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.37	1.49	287.95	1.00	287.95	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.43	1.48	275.60	1.00	275.60	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.50	1.48	263.33	1.00	263.33	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.57	1.49	248.84	1.00	248.84	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.62	1.52	236.34	1.00	236.34	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.70	1.55	228.01	1.00	228.01	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.76	1.58	219.22	1.00	219.22	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.82	1.60	212.96	1.00	212.96	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.88	1.61	207.30	1.00	207.30	0	0	0.59	0.000	0.00	0.00	0.00	0.000
3.96	1.61	203.21	1.00	203.21	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.02	1.61	200.57	1.00	200.57	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.10	1.61	198.41	1.00	198.41	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.16	1.61	197.83	1.00	197.83	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.24	1.61	196.84	1.00	196.84	0	0	0.60	0.000	0.00	0.00	0.00	0.000
4.29	1.61	197.32	1.00	197.32	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.35	1.62	195.93	1.00	195.93	0	0	0.60	0.000	0.00	0.00	0.00	0.000
4.42	1.63	194.68	1.00	194.68	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.48	1.63	191.67	1.00	191.67	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.56	1.64	188.17	1.00	187.76	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.62	1.64	184.64	1.00	184.39	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.67	1.63	181.44	1.00	181.44	0	0	0.58	0.000	0.00	0.00	0.00	0.000
4.74	1.62	177.26	1.00	177.26	0	0	0.58	0.000	0.00	0.00	0.00	0.000
4.81	1.60	172.60	1.00	172.60	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.88	1.55	170.84	1.00	170.84	0	0	0.59	0.000	0.00	0.00	0.00	0.000
4.95	1.48	170.69	1.00	170.69	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.01	1.41	173.16	1.00	173.16	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.08	1.41	175.46	1.00	175.46	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.15	1.45	178.55	1.00	178.55	0	0	0.58	0.000	0.00	0.00	0.00	0.000
5.21	1.47	180.42	1.00	180.42	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.26	1.49	181.94	1.00	181.94	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.34	1.52	184.75	1.00	184.75	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.39	1.54	189.90	1.00	189.90	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.48	1.54	195.53	1.00	195.53	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.54	1.54	200.07	1.00	200.07	0	0	0.61	0.000	0.00	0.00	0.00	0.000
5.60	1.54	199.83	1.00	199.83	0	0	0.61	0.000	0.00	0.00	0.00	0.000
5.66	1.55	194.26	1.00	194.26	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.74	1.59	187.03	1.00	187.03	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.79	1.63	180.54	1.00	180.54	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.86	1.69	174.27	1.03	179.43	0	0	0.59	0.000	0.00	0.00	0.00	0.000
5.93	1.76	165.25	1.08	178.62	0	0	0.60	0.000	0.00	0.00	0.00	0.000
5.99	1.86	149.32	1.15	172.43	0	0	0.59	0.000	0.00	0.00	0.00	0.000
6.05	1.97	129.54	1.27	164.15	0	0	0.59	0.000	0.00	0.00	0.00	0.000
6.12	2.10	106.04	1.46	154.52	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.19	2.19	90.49	1.65	149.40	0	0	0.63	0.000	0.00	0.00	0.00	0.000
6.26	2.22	85.10	1.71	145.91	0	0	0.63	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.32	2.13	96.01	1.51	145.38	0	0	0.62	0.000	0.00	0.00	0.00	0.000
6.39	2.01	114.37	1.31	149.66	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.45	1.87	136.28	1.16	158.68	0	0	0.62	0.000	0.00	0.00	0.00	0.000
6.51	1.76	154.76	1.08	166.75	0	0	0.62	0.000	0.00	0.00	0.00	0.000
6.57	1.65	170.28	1.00	171.09	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.65	1.58	179.36	1.00	179.36	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.72	1.54	182.61	1.00	182.61	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.78	1.54	179.75	1.00	179.75	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.85	1.57	172.01	1.00	172.01	0	0	0.60	0.000	0.00	0.00	0.00	0.000
6.92	1.61	161.13	1.00	161.13	0	0	0.62	0.000	0.00	0.00	0.00	0.000
6.97	1.67	147.95	1.02	150.54	0	0	0.63	0.000	0.00	0.00	0.00	0.000
7.03	1.74	132.67	1.06	141.19	0	0	0.65	0.000	0.00	0.00	0.00	0.000
7.13	1.81	119.59	1.11	132.88	0	0	0.67	0.000	0.00	0.00	0.00	0.000
7.19	1.84	113.52	1.14	128.87	0	0	0.67	0.000	0.00	0.00	0.00	0.000
7.23	1.83	114.40	1.13	129.29	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.31	1.80	119.69	1.10	132.24	0	0	0.67	0.000	0.00	0.00	0.00	0.000
7.37	1.77	123.98	1.08	134.39	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.43	1.74	127.55	1.07	136.24	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.50	1.74	128.48	1.06	136.67	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.56	1.74	128.23	1.06	136.26	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.63	1.73	127.88	1.06	135.48	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.70	1.73	126.84	1.06	134.12	0	0	0.66	0.000	0.00	0.00	0.00	0.000
7.76	1.73	125.10	1.06	132.51	0	0	0.67	0.000	0.00	0.00	0.00	0.000
7.82	1.75	121.34	1.07	129.88	0	0	0.67	0.000	0.00	0.00	0.00	0.000
7.90	1.77	116.06	1.09	126.31	0	0	0.68	0.000	0.00	0.00	0.00	0.000
7.96	1.81	109.37	1.11	121.95	0	0	0.68	0.000	0.00	0.00	0.00	0.000
8.02	1.87	102.23	1.16	118.63	0	0	0.67	0.000	0.00	0.00	0.00	0.000
8.10	1.93	95.34	1.22	116.39	0	0	0.67	0.000	0.00	0.00	0.00	0.000
8.15	2.00	89.16	1.30	115.74	0	0	0.66	0.000	0.00	0.00	0.00	0.000
8.23	2.04	86.20	1.35	116.54	0	0	0.66	0.000	0.00	0.00	0.00	0.000
8.29	2.05	86.71	1.37	119.16	0	0	0.66	0.000	0.00	0.00	0.00	0.000
8.36	2.04	90.48	1.36	122.81	0	0	0.65	0.000	0.00	0.00	0.00	0.000
8.43	2.01	96.21	1.31	126.13	0	0	0.65	0.000	0.00	0.00	0.00	0.000
8.48	1.95	103.54	1.24	128.04	0	0	0.66	0.000	0.00	0.00	0.00	0.000
8.56	1.87	112.73	1.16	130.76	0	0	0.67	0.000	0.00	0.00	0.00	0.000
8.65	1.79	122.23	1.10	134.74	0	0	0.67	0.000	0.00	0.00	0.00	0.000
8.69	1.73	134.89	1.05	142.28	0	0	0.67	0.000	0.00	0.00	0.00	0.000
8.78	1.67	146.82	1.02	149.36	0	0	0.64	0.000	0.00	0.00	0.00	0.000
8.82	1.61	159.54	1.00	159.54	0	0	0.63	0.000	0.00	0.00	0.00	0.000
8.91	1.59	163.33	1.00	163.33	0	0	0.62	0.000	0.00	0.00	0.00	0.000
8.95	1.56	171.28	1.00	171.28	0	0	0.63	0.000	0.00	0.00	0.00	0.000
9.01	1.53	183.58	1.00	183.58	0	0	0.62	0.000	0.00	0.00	0.00	0.000
9.07	1.49	203.55	1.00	203.55	0	0	0.63	0.000	0.00	0.00	0.00	0.000
9.14	1.45	222.60	1.00	222.60	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.20	1.40	240.18	1.00	240.18	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.28	1.36	257.20	1.00	257.20	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.33	1.35	271.06	1.00	271.06	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.40	1.37	285.08	1.00	285.08	0	0	0.64	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.48	1.39	301.19	1.00	301.19	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.54	1.39	319.77	1.00	319.77	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.61	1.40	338.93	1.00	338.93	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.68	1.40	358.57	1.00	358.57	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.73	1.36	390.58	1.00	390.58	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.80	1.30	422.45	1.00	422.45	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.88	1.25	449.31	1.00	449.31	0	0	0.64	0.000	0.00	0.00	0.00	0.000
9.93	1.28	452.95	1.00	452.95	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.00	1.32	444.44	1.00	444.44	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.06	1.38	413.27	1.00	413.27	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.12	1.42	374.04	1.00	374.04	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.20	1.46	335.72	1.00	335.72	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.26	1.45	316.63	1.00	316.63	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.32	1.44	303.60	1.00	303.60	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.39	1.43	292.22	1.00	292.22	0	0	0.64	0.000	0.00	0.00	0.00	0.000
10.45	1.42	281.18	1.00	281.18	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.52	1.38	275.84	1.00	275.84	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.58	1.33	272.38	1.00	272.38	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.64	1.30	268.56	1.00	268.56	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.71	1.28	265.77	1.00	265.77	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.78	1.27	263.62	1.00	263.62	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.84	1.27	263.34	1.00	263.34	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.92	1.26	263.34	1.00	263.34	0	0	0.65	0.000	0.00	0.00	0.00	0.000
10.98	1.26	263.24	1.00	263.24	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.04	1.26	259.99	1.00	259.99	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.12	1.26	260.74	1.00	260.74	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.18	1.23	263.95	1.00	263.95	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.25	1.16	274.30	1.00	274.30	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.33	1.10	279.68	1.00	279.68	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.37	1.09	280.88	1.00	280.88	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.46	1.11	278.06	1.00	278.06	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.50	1.13	269.99	1.00	269.99	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.58	1.16	263.07	1.00	263.07	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.64	1.19	257.24	1.00	257.24	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.71	1.19	258.78	1.00	258.78	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.79	1.18	260.78	1.00	260.78	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.83	1.17	263.51	1.00	263.51	0	0	0.65	0.000	0.00	0.00	0.00	0.000
11.91	1.17	264.35	1.00	264.35	0	0	0.66	0.000	0.00	0.00	0.00	0.000
11.96	1.17	264.22	1.00	264.22	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.04	1.17	262.09	1.00	262.09	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.09	1.19	258.62	1.00	258.62	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.16	1.19	256.71	1.00	256.71	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.24	1.19	254.67	1.00	254.67	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.29	1.18	254.96	1.00	254.96	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.37	1.18	255.81	1.00	255.81	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.43	1.17	256.62	1.00	256.62	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.50	1.17	257.88	1.00	257.88	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.57	1.17	257.64	1.00	257.64	0	0	0.66	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.61	1.17	256.68	1.00	256.68	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.70	1.17	254.84	1.00	254.84	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.75	1.17	253.64	1.00	253.64	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.83	1.17	253.08	1.00	253.08	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.87	1.20	247.77	1.00	247.77	0	0	0.66	0.000	0.00	0.00	0.00	0.000
12.96	1.27	235.97	1.00	235.97	0	0	0.66	0.000	0.00	0.00	0.00	0.000
13.01	1.44	202.02	1.00	202.02	0	0	0.66	0.000	0.00	0.00	0.00	0.000
13.10	1.63	162.23	1.00	162.23	0	0	0.67	0.000	0.00	0.00	0.00	0.000
13.15	1.88	112.52	1.17	131.87	0	0	0.69	0.000	0.00	0.00	0.00	0.000
13.23	2.09	80.16	1.43	115.02	0	0	0.71	0.000	0.00	0.00	0.00	0.000
13.29	2.31	54.95	1.97	108.30	0	0	0.72	0.000	0.00	0.00	0.00	0.000
13.35	2.42	44.01	2.41	105.90	0	0	0.73	0.000	0.00	0.00	0.00	0.000
13.41	2.51	36.47	2.84	103.46	0	0	0.74	0.000	0.00	0.00	0.00	0.000
13.46	2.58	31.21	3.20	99.84	0	0	0.74	0.000	0.00	0.00	0.00	0.000
13.55	2.63	27.31	3.50	95.56	0	0	0.74	0.000	0.00	0.00	0.00	0.000
13.60	2.66	24.23	3.74	90.54	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.67	2.66	22.70	3.75	85.04	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.75	2.65	21.82	3.67	80.07	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.79	2.62	21.70	3.48	75.56	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.88	2.60	21.97	3.32	72.84	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.96	2.57	22.36	3.16	70.63	0	0	0.75	0.000	0.00	0.00	0.00	0.000
13.99	2.56	22.21	3.11	69.06	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.06	2.58	21.70	3.19	69.13	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.13	2.59	20.99	3.24	67.94	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.20	2.60	20.49	3.31	67.74	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.28	2.61	20.23	3.38	68.46	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.33	2.66	20.03	3.72	74.57	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.41	2.66	22.06	3.72	82.03	0	0	0.76	0.000	0.00	0.00	0.00	0.000
14.48	2.63	24.94	3.55	88.46	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.51	2.58	29.25	3.20	93.55	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.60	2.54	32.65	2.98	97.15	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.68	2.50	35.94	2.76	99.18	0	0	0.74	0.000	0.00	0.00	0.00	0.000
14.72	2.47	37.69	2.64	99.44	0	0	0.74	0.000	0.00	0.00	0.00	0.000
14.80	2.50	36.25	2.78	100.83	0	0	0.74	0.000	0.00	0.00	0.00	0.000
14.88	2.56	33.16	3.10	102.92	0	0	0.75	0.000	0.00	0.00	0.00	0.000
14.92	2.65	29.00	3.67	106.31	0	0	0.75	0.000	0.00	0.00	0.00	0.000
15.00	2.68	27.79	3.87	107.46	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.05	2.68	27.48	3.87	106.31	0	0	0.75	0.000	0.00	0.00	0.00	0.000
15.13	2.64	28.38	3.56	101.03	0	0	0.75	0.000	0.00	0.00	0.00	0.000
15.20	2.60	27.75	3.34	92.58	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.27	2.57	27.07	3.12	84.52	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.30	2.53	26.43	2.94	77.67	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.37	2.53	25.41	2.94	74.66	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.44	2.57	23.32	3.14	73.29	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.50	2.65	20.25	3.65	73.91	0	0	0.76	0.000	0.00	0.00	0.00	0.000
15.57	2.75	17.10	4.35	74.32	0	0	0.77	0.000	0.00	0.00	0.00	0.000
15.64	2.82	14.96	5.00	74.72	0	0	0.77	0.000	0.00	0.00	0.00	0.000
15.71	2.86	14.15	5.34	75.61	0	0	0.77	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.78	2.86	14.31	5.30	75.85	0	0	0.77	0.000	0.00	0.00	0.00	0.000
15.84	2.80	15.58	4.78	74.56	0	0	0.77	0.000	0.00	0.00	0.00	0.000
15.92	2.70	17.91	4.02	71.92	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.00	2.61	20.47	3.37	68.99	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.04	2.56	21.46	3.08	66.15	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.12	2.55	20.99	3.06	64.25	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.16	2.59	19.45	3.27	63.54	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.24	2.62	19.07	3.45	65.74	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.33	2.67	18.22	3.80	69.18	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.37	2.70	18.72	3.97	74.35	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.45	2.70	19.61	3.98	78.00	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.49	2.60	23.74	3.32	78.74	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.58	2.49	27.96	2.70	75.43	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.62	2.44	30.40	2.47	74.95	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.70	2.50	28.42	2.77	78.82	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.79	2.61	25.22	3.37	84.93	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.83	2.68	22.95	3.84	88.12	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.90	2.64	24.17	3.60	87.08	0	0	0.77	0.000	0.00	0.00	0.00	0.000
16.97	2.60	25.68	3.33	85.49	0	0	0.77	0.000	0.00	0.00	0.00	0.000
17.01	2.58	25.93	3.22	83.57	0	0	0.77	0.000	0.00	0.00	0.00	0.000
17.10	2.62	23.69	3.48	82.35	0	0	0.77	0.000	0.00	0.00	0.00	0.000
17.14	2.68	20.96	3.84	80.53	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.23	2.71	19.31	4.07	78.62	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.27	2.74	17.74	4.27	75.75	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.36	2.76	16.55	4.43	73.34	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.40	2.76	15.93	4.46	71.00	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.49	2.78	15.37	4.61	70.81	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.53	2.79	15.67	4.71	73.76	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.62	2.80	16.25	4.77	77.57	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.67	2.71	19.32	4.08	78.75	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.75	2.63	21.70	3.54	76.73	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.83	2.59	22.86	3.24	74.02	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.89	2.61	21.57	3.39	73.19	0	0	0.78	0.000	0.00	0.00	0.00	0.000
17.93	2.66	19.68	3.74	73.67	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.02	2.69	19.14	3.89	74.47	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.06	2.70	18.87	4.00	75.54	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.15	2.68	19.62	3.88	76.20	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.19	2.67	20.73	3.76	77.85	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.28	2.58	24.75	3.23	79.84	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.32	2.32	41.51	2.01	83.53	0	0	0.78	0.000	0.00	0.00	0.00	0.000
18.41	2.07	68.57	1.41	96.35	0	0	0.75	0.000	0.00	0.00	0.00	0.000
18.49	1.91	96.90	1.20	116.29	0	0	0.73	0.000	0.00	0.00	0.00	0.000
18.53	1.85	115.90	1.14	132.37	0	0	0.74	0.000	0.00	0.00	0.00	0.000
18.62	1.83	124.87	1.13	141.03	0	0	0.73	0.000	0.00	0.00	0.00	0.000
18.66	1.83	132.29	1.13	149.25	0	0	0.72	0.000	0.00	0.00	0.00	0.000
18.74	1.84	136.10	1.13	154.44	0	0	0.71	0.000	0.00	0.00	0.00	0.000
18.79	1.82	141.59	1.12	159.21	0	0	0.71	0.000	0.00	0.00	0.00	0.000
18.87	1.79	146.77	1.10	161.01	0	0	0.70	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	K_c	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.92	1.75	151.91	1.07	163.09	0	0	0.70	0.000	0.00	0.00	0.00	0.000
19.01	1.75	153.50	1.07	164.30	0	0	0.69	0.000	0.00	0.00	0.00	0.000
19.05	1.78	152.42	1.09	166.27	0	0	0.70	0.000	0.00	0.00	0.00	0.000
19.14	1.80	150.34	1.11	166.85	0	0	0.70	0.000	0.00	0.00	0.00	0.000
19.18	1.84	145.47	1.14	165.15	0	0	0.69	0.000	0.00	0.00	0.00	0.000
19.27	1.85	142.65	1.15	163.81	0	0	0.70	0.000	0.00	0.00	0.00	0.000
19.32	1.87	139.63	1.16	162.10	0	0	0.68	0.000	0.00	0.00	0.00	0.000
19.40	1.87	139.27	1.16	162.12	0	0	0.68	0.000	0.00	0.00	0.00	0.000
19.44	1.89	137.23	1.18	161.45	0	0	0.69	0.000	0.00	0.00	0.00	0.000
19.53	1.90	136.38	1.18	161.53	0	0	0.69	0.000	0.00	0.00	0.00	0.000
19.57	1.90	135.78	1.19	161.76	0	0	0.69	0.000	0.00	0.00	0.00	0.000
19.66	1.90	136.13	1.19	162.26	0	0	0.69	0.000	0.00	0.00	0.00	0.000

Total estimated settlement: 0.00

Abbreviations

Q_{tn}: Normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
19.70	188.95	1.56	0.14	0.67	0.00	19.79	181.48	1.11	0.39	0.66	0.00
19.83	172.88	0.79	0.73	0.66	0.00	19.92	173.08	0.79	0.73	0.66	0.01
20.00	178.58	0.98	0.51	0.66	0.01	20.05	181.01	1.09	0.41	0.66	0.00
20.09	182.42	1.16	0.36	0.66	0.00	20.18	174.36	0.83	0.69	0.66	0.01
20.23	174.22	0.83	0.69	0.66	0.00	20.30	169.32	0.69	0.82	0.66	0.01
20.38	164.99	0.60	0.95	0.65	0.01	20.43	166.38	0.62	0.91	0.65	0.01
20.51	165.93	0.61	0.92	0.65	0.01	20.56	169.15	0.68	0.82	0.65	0.01
20.62	171.25	0.74	0.76	0.65	0.00	20.70	169.85	0.70	0.80	0.65	0.01
20.76	170.56	0.72	0.78	0.65	0.01	20.82	171.59	0.75	0.75	0.65	0.01
20.89	172.42	0.77	0.73	0.65	0.01	20.98	173.26	0.79	0.70	0.64	0.01
21.02	173.82	0.81	0.69	0.64	0.00	21.11	176.36	0.89	0.59	0.64	0.01
21.15	174.42	0.83	0.67	0.64	0.00	21.24	173.59	0.80	0.69	0.64	0.01
21.28	164.40	0.58	0.95	0.64	0.00	21.37	154.39	0.43	1.28	0.64	0.01
21.41	148.15	0.37	1.34	0.64	0.01	21.50	141.45	0.32	1.41	0.64	0.01
21.55	137.37	0.29	1.46	0.64	0.01	21.63	136.31	0.29	1.46	0.63	0.02
21.68	136.39	0.29	1.46	0.63	0.01	21.74	124.83	0.24	1.61	0.63	0.01
21.80	134.20	0.28	1.48	0.63	0.01	21.87	140.46	0.31	1.41	0.63	0.01
21.94	144.57	0.34	1.36	0.63	0.01	22.02	148.50	0.37	1.32	0.63	0.01
22.09	155.54	0.44	1.25	0.63	0.01	22.16	168.26	0.66	0.81	0.62	0.01
22.20	177.94	0.94	0.52	0.62	0.00	22.29	200.03	2.00	0.00	0.62	0.00
22.33	209.86	2.00	0.00	0.62	0.00	22.42	224.66	2.00	0.00	0.62	0.00
22.46	230.13	2.00	0.00	0.62	0.00	22.55	232.59	2.00	0.00	0.62	0.00
22.60	232.90	2.00	0.00	0.62	0.00	22.66	233.20	2.00	0.00	0.62	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
22.74	233.76	2.00	0.00	0.61	0.00	22.82	223.62	2.00	0.00	0.61	0.00
22.87	216.17	2.00	0.00	0.61	0.00	22.96	203.21	2.00	0.00	0.61	0.00
23.00	199.17	2.00	0.00	0.61	0.00	23.09	203.09	2.00	0.00	0.61	0.00
23.13	197.13	2.00	0.00	0.61	0.00	23.21	202.97	2.00	0.00	0.61	0.00
23.26	206.64	2.00	0.00	0.61	0.00	23.34	204.57	2.00	0.00	0.60	0.00
23.38	199.76	2.00	0.00	0.60	0.00	23.47	188.22	1.47	0.16	0.60	0.00
23.52	183.69	1.19	0.30	0.60	0.00	23.60	175.96	0.86	0.59	0.60	0.01
23.65	171.76	0.74	0.69	0.60	0.00	23.74	164.67	0.58	0.88	0.60	0.01
23.78	162.50	0.54	0.95	0.60	0.00	23.83	139.52	0.30	1.34	0.60	0.01
23.91	148.58	0.37	1.25	0.60	0.01	24.00	136.68	2.00	0.00	0.59	0.00
24.04	152.13	2.00	0.00	0.59	0.00	24.13	152.02	2.00	0.00	0.59	0.00
24.17	151.87	2.00	0.00	0.59	0.00	24.26	127.12	2.00	0.00	0.59	0.00
24.30	117.34	2.00	0.00	0.59	0.00	24.39	36.18	2.00	0.00	0.59	0.00
24.44	32.20	2.00	0.00	0.59	0.00	24.53	23.04	2.00	0.00	0.58	0.00
24.57	19.81	2.00	0.00	0.58	0.00	24.66	15.13	0.69	0.00	0.58	0.00
24.70	14.36	0.60	0.00	0.58	0.00	24.79	14.08	2.00	0.00	0.58	0.00
24.83	14.07	2.00	0.00	0.58	0.00	24.92	14.19	2.00	0.00	0.58	0.00
24.96	14.25	2.00	0.00	0.58	0.00	25.05	14.42	2.00	0.00	0.58	0.00
25.09	14.99	2.00	0.00	0.58	0.00	25.18	71.01	2.00	0.00	0.57	0.00
25.22	70.09	2.00	0.00	0.57	0.00	25.31	73.39	2.00	0.00	0.57	0.00
25.35	74.17	2.00	0.00	0.57	0.00	25.42	65.84	2.00	0.00	0.57	0.00
25.48	13.26	2.00	0.00	0.57	0.00	25.56	13.67	2.00	0.00	0.57	0.00
25.62	14.09	2.00	0.00	0.57	0.00	25.68	14.44	2.00	0.00	0.57	0.00
25.74	14.72	2.00	0.00	0.56	0.00	25.80	14.66	2.00	0.00	0.56	0.00
25.88	16.23	0.68	0.00	0.56	0.00	25.95	18.41	0.77	0.00	0.56	0.00
26.00	20.87	0.88	0.00	0.56	0.00	26.07	23.07	0.94	0.00	0.56	0.00
26.13	22.67	0.91	0.00	0.56	0.00	26.21	18.78	0.89	0.00	0.56	0.00
26.30	22.29	2.00	0.00	0.55	0.00	26.34	78.74	2.00	0.00	0.55	0.00
26.43	120.77	2.00	0.00	0.55	0.00	26.47	136.82	2.00	0.00	0.55	0.00
26.55	175.60	2.00	0.00	0.55	0.00	26.59	167.34	2.00	0.00	0.55	0.00
26.67	209.82	2.00	0.00	0.55	0.00	26.76	246.39	2.00	0.00	0.55	0.00
26.80	254.00	2.00	0.00	0.55	0.00	26.88	254.00	2.00	0.00	0.54	0.00
26.92	254.00	2.00	0.00	0.54	0.00	27.00	254.00	2.00	0.00	0.54	0.00
27.05	254.00	2.00	0.00	0.54	0.00	27.12	254.00	2.00	0.00	0.54	0.00
27.18	254.00	2.00	0.00	0.54	0.00	27.25	254.00	2.00	0.00	0.54	0.00
27.32	254.00	2.00	0.00	0.54	0.00	27.38	254.00	2.00	0.00	0.54	0.00
27.44	254.00	2.00	0.00	0.54	0.00	27.52	254.00	2.00	0.00	0.53	0.00
27.58	254.00	2.00	0.00	0.53	0.00	27.65	254.00	2.00	0.00	0.53	0.00
27.71	254.00	2.00	0.00	0.53	0.00	27.78	254.00	2.00	0.00	0.53	0.00
27.84	254.00	2.00	0.00	0.53	0.00	27.91	254.00	2.00	0.00	0.53	0.00
27.97	254.00	2.00	0.00	0.53	0.00	28.04	254.00	2.00	0.00	0.53	0.00
28.12	254.00	2.00	0.00	0.52	0.00	28.17	254.00	2.00	0.00	0.52	0.00
28.25	254.00	2.00	0.00	0.52	0.00	28.33	254.00	2.00	0.00	0.52	0.00
28.37	254.00	2.00	0.00	0.52	0.00	28.46	254.00	2.00	0.00	0.52	0.00
28.50	254.00	2.00	0.00	0.52	0.00	28.56	251.51	2.00	0.00	0.52	0.00
28.63	254.00	2.00	0.00	0.52	0.00	28.69	250.06	2.00	0.00	0.51	0.00
28.76	238.88	2.00	0.00	0.51	0.00	28.84	216.69	2.00	0.00	0.51	0.00
28.90	200.34	2.00	0.00	0.51	0.00	28.98	174.89	0.80	0.52	0.51	0.01

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
29.03	161.91	2.00	0.00	0.51	0.00	29.09	177.37	2.00	0.00	0.51	0.00
29.18	191.42	2.00	0.00	0.51	0.00	29.21	197.93	2.00	0.00	0.51	0.00
29.30	197.04	2.00	0.00	0.50	0.00	29.38	191.93	2.00	0.00	0.50	0.00
29.42	187.05	2.00	0.00	0.50	0.00	29.50	170.71	2.00	0.00	0.50	0.00
29.58	148.68	2.00	0.00	0.50	0.00	29.62	140.53	2.00	0.00	0.50	0.00
29.69	127.16	2.00	0.00	0.50	0.00	29.76	146.08	2.00	0.00	0.50	0.00
29.82	192.26	2.00	0.00	0.50	0.00	29.89	248.05	2.00	0.00	0.49	0.00
29.95	254.00	2.00	0.00	0.49	0.00	30.03	254.00	2.00	0.00	0.49	0.00
30.07	254.00	2.00	0.00	0.49	0.00	30.15	228.15	2.00	0.00	0.49	0.00
30.20	231.17	2.00	0.00	0.49	0.00	30.27	213.13	2.00	0.00	0.49	0.00
30.33	223.90	2.00	0.00	0.49	0.00	30.39	234.52	2.00	0.00	0.49	0.00
30.47	254.00	2.00	0.00	0.48	0.00	30.54	196.14	2.00	0.00	0.48	0.00
30.59	238.83	2.00	0.00	0.48	0.00	30.66	198.93	2.00	0.00	0.48	0.00
30.73	173.16	2.00	0.00	0.48	0.00	30.80	150.18	2.00	0.00	0.48	0.00
30.86	142.04	2.00	0.00	0.48	0.00	30.93	137.73	2.00	0.00	0.48	0.00
30.99	127.78	2.00	0.00	0.48	0.00	31.06	125.15	2.00	0.00	0.47	0.00
31.13	147.97	2.00	0.00	0.47	0.00	31.18	167.15	2.00	0.00	0.47	0.00
31.26	191.25	2.00	0.00	0.47	0.00	31.33	180.81	2.00	0.00	0.47	0.00
31.38	179.57	2.00	0.00	0.47	0.00	31.45	178.83	2.00	0.00	0.47	0.00
31.52	172.99	2.00	0.00	0.47	0.00	31.61	175.86	2.00	0.00	0.46	0.00
31.65	176.73	2.00	0.00	0.46	0.00	31.73	186.32	2.00	0.00	0.46	0.00
31.80	228.14	2.00	0.00	0.46	0.00	31.87	254.00	2.00	0.00	0.46	0.00
31.93	254.00	2.00	0.00	0.46	0.00	31.99	254.00	2.00	0.00	0.46	0.00
32.06	254.00	2.00	0.00	0.46	0.00	32.11	254.00	2.00	0.00	0.46	0.00
32.17	254.00	2.00	0.00	0.46	0.00	32.24	254.00	2.00	0.00	0.45	0.00
32.30	254.00	2.00	0.00	0.45	0.00	32.37	254.00	2.00	0.00	0.45	0.00
32.44	254.00	2.00	0.00	0.45	0.00	32.50	254.00	2.00	0.00	0.45	0.00
32.56	254.00	2.00	0.00	0.45	0.00	32.63	254.00	2.00	0.00	0.45	0.00
32.70	254.00	2.00	0.00	0.45	0.00	32.76	254.00	2.00	0.00	0.45	0.00
32.83	251.38	2.00	0.00	0.44	0.00	32.89	254.00	2.00	0.00	0.44	0.00
32.95	254.00	2.00	0.00	0.44	0.00	33.02	254.00	2.00	0.00	0.44	0.00
33.10	254.00	2.00	0.00	0.44	0.00	33.16	254.00	2.00	0.00	0.44	0.00
33.25	254.00	2.00	0.00	0.44	0.00	33.29	254.00	2.00	0.00	0.44	0.00
33.37	254.00	2.00	0.00	0.43	0.00	33.45	254.00	2.00	0.00	0.43	0.00
33.50	254.00	2.00	0.00	0.43	0.00	33.59	254.00	2.00	0.00	0.43	0.00
33.63	254.00	2.00	0.00	0.43	0.00	33.68	214.61	2.00	0.00	0.43	0.00
33.76	227.71	2.00	0.00	0.43	0.00	33.82	212.06	2.00	0.00	0.43	0.00
33.88	184.90	2.00	0.00	0.43	0.00	33.96	156.74	2.00	0.00	0.42	0.00
34.02	139.11	2.00	0.00	0.42	0.00	34.08	57.22	2.00	0.00	0.42	0.00
34.14	50.70	2.00	0.00	0.42	0.00	34.23	43.33	2.00	0.00	0.42	0.00
34.28	39.34	1.54	0.00	0.42	0.00	34.34	35.39	1.38	0.00	0.42	0.00
34.41	31.42	1.24	0.00	0.42	0.00	34.49	28.20	1.13	0.00	0.42	0.00
34.53	27.44	1.11	0.00	0.42	0.00	34.61	29.57	1.19	0.00	0.41	0.00
34.70	34.45	1.35	0.00	0.41	0.00	34.75	100.81	0.17	1.31	0.41	0.01
34.83	113.81	0.19	1.15	0.41	0.01	34.88	113.56	0.19	1.15	0.41	0.01
34.92	109.76	0.18	1.19	0.41	0.01	35.01	110.13	0.18	1.18	0.41	0.01
35.10	110.17	2.00	0.00	0.41	0.00	35.13	109.60	2.00	0.00	0.41	0.00
35.20	122.78	2.00	0.00	0.40	0.00	35.29	119.10	2.00	0.00	0.40	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
35.33	120.29	2.00	0.00	0.40	0.00	35.42	128.10	2.00	0.00	0.40	0.00
35.46	130.02	2.00	0.00	0.40	0.00	35.55	130.13	2.00	0.00	0.40	0.00
35.58	129.98	2.00	0.00	0.40	0.00	35.66	130.22	0.24	0.96	0.40	0.01
35.72	134.25	0.26	0.93	0.40	0.01	35.78	136.32	0.27	0.91	0.39	0.01
35.84	133.34	0.26	0.93	0.39	0.01	35.91	133.09	0.26	0.93	0.39	0.01
35.98	133.24	0.26	0.93	0.39	0.01	36.05	133.14	0.26	0.92	0.39	0.01
36.11	136.64	2.00	0.00	0.39	0.00	36.19	139.77	2.00	0.00	0.39	0.00
36.25	133.48	2.00	0.00	0.39	0.00	36.32	123.42	2.00	0.00	0.39	0.00
36.36	120.31	2.00	0.00	0.38	0.00	36.43	116.67	2.00	0.00	0.38	0.00
36.52	121.82	2.00	0.00	0.38	0.00	36.57	127.25	2.00	0.00	0.38	0.00
36.64	133.76	2.00	0.00	0.38	0.00	36.69	138.21	2.00	0.00	0.38	0.00
36.77	143.66	2.00	0.00	0.38	0.00	36.85	151.87	0.38	0.77	0.38	0.01
36.89	151.76	2.00	0.00	0.38	0.00	36.97	163.88	2.00	0.00	0.37	0.00
37.03	155.03	2.00	0.00	0.37	0.00	37.12	144.62	2.00	0.00	0.37	0.00
37.15	144.08	2.00	0.00	0.37	0.00	37.22	144.63	2.00	0.00	0.37	0.00
37.29	148.54	2.00	0.00	0.37	0.00	37.35	167.06	2.00	0.00	0.37	0.00
37.42	204.44	2.00	0.00	0.37	0.00	37.49	251.99	2.00	0.00	0.37	0.00
37.56	245.87	2.00	0.00	0.36	0.00	37.62	223.79	2.00	0.00	0.36	0.00
37.68	194.98	1.90	0.01	0.36	0.00	37.74	173.30	0.74	0.39	0.36	0.00
37.83	194.40	1.85	0.02	0.36	0.00	37.89	179.73	0.95	0.29	0.36	0.00
37.96	188.55	1.40	0.11	0.36	0.00	38.02	186.20	1.27	0.15	0.36	0.00
38.07	174.76	0.78	0.37	0.36	0.00	38.16	168.72	0.63	0.45	0.35	0.00
38.22	167.66	0.61	0.47	0.35	0.00	38.28	167.00	0.59	0.48	0.35	0.00
38.34	166.67	0.59	0.48	0.35	0.00	38.42	167.00	0.59	0.47	0.35	0.00
38.48	165.97	0.57	0.49	0.35	0.00	38.53	159.16	0.46	0.62	0.35	0.00
38.60	177.39	0.87	0.33	0.35	0.00	38.67	173.70	0.75	0.37	0.35	0.00
38.73	178.64	0.91	0.30	0.34	0.00	38.80	189.65	1.47	0.09	0.34	0.00
38.86	233.50	2.00	0.00	0.34	0.00	38.93	254.00	2.00	0.00	0.34	0.00
39.00	254.00	2.00	0.00	0.34	0.00	39.07	237.70	2.00	0.00	0.34	0.00
39.14	204.57	2.00	0.00	0.34	0.00	39.21	186.62	2.00	0.00	0.34	0.00
39.27	178.05	2.00	0.00	0.34	0.00	39.33	176.36	2.00	0.00	0.33	0.00
39.39	173.80	2.00	0.00	0.33	0.00	39.47	171.78	2.00	0.00	0.33	0.00
39.53	167.96	2.00	0.00	0.33	0.00	39.58	166.52	0.58	0.46	0.33	0.00
39.67	166.62	0.58	0.45	0.33	0.00	39.73	167.07	0.59	0.44	0.33	0.00
39.81	166.80	0.59	0.45	0.33	0.00	39.84	174.81	0.78	0.34	0.33	0.00
39.92	185.82	2.00	0.00	0.32	0.00	40.00	175.44	2.00	0.00	0.32	0.00
40.04	168.50	2.00	0.00	0.32	0.00	40.12	173.69	2.00	0.00	0.32	0.00
40.20	167.90	2.00	0.00	0.32	0.00	40.24	164.86	2.00	0.00	0.32	0.00
40.32	155.82	2.00	0.00	0.32	0.00	40.37	154.15	2.00	0.00	0.32	0.00
40.44	150.46	0.37	0.65	0.32	0.01	40.52	148.33	0.35	0.66	0.31	0.01
40.56	148.33	2.00	0.00	0.31	0.00	40.64	148.91	2.00	0.00	0.31	0.00
40.71	156.33	2.00	0.00	0.31	0.00	40.78	164.06	2.00	0.00	0.31	0.00
40.83	160.49	2.00	0.00	0.31	0.00	40.93	149.42	2.00	0.00	0.31	0.00
40.97	150.07	2.00	0.00	0.31	0.00	41.05	148.58	0.35	0.64	0.30	0.01
41.10	149.89	0.36	0.63	0.30	0.00	41.18	144.66	0.32	0.65	0.30	0.01
41.23	144.65	0.32	0.65	0.30	0.00	41.30	145.57	0.33	0.65	0.30	0.01
41.36	147.17	0.34	0.64	0.30	0.00	41.42	146.07	0.33	0.64	0.30	0.00
41.49	162.39	0.51	0.47	0.30	0.00	41.55	153.42	0.40	0.60	0.30	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
41.63	155.53	0.42	0.59	0.30	0.01	41.69	164.57	0.55	0.43	0.29	0.00
41.75	171.12	0.68	0.34	0.29	0.00	41.82	163.62	0.53	0.45	0.29	0.00
41.88	161.35	0.50	0.48	0.29	0.00	41.95	162.12	0.51	0.47	0.29	0.00
42.01	160.69	0.49	0.49	0.29	0.00	42.09	160.04	0.48	0.50	0.29	0.00
42.15	164.14	0.54	0.43	0.29	0.00	42.22	169.76	0.65	0.35	0.29	0.00
42.30	165.67	0.57	0.40	0.28	0.00	42.34	169.41	0.64	0.35	0.28	0.00
42.42	167.03	0.59	0.38	0.28	0.00	42.50	169.16	0.64	0.35	0.28	0.00
42.54	167.07	0.59	0.38	0.28	0.00	42.62	171.30	0.69	0.33	0.28	0.00
42.70	171.45	0.69	0.32	0.28	0.00	42.74	173.28	0.74	0.30	0.28	0.00
42.82	181.36	1.02	0.19	0.27	0.00	42.86	189.95	1.49	0.07	0.27	0.00
42.94	181.27	1.01	0.19	0.27	0.00	43.01	183.69	1.13	0.15	0.27	0.00
43.07	181.57	1.03	0.19	0.27	0.00	43.15	185.41	1.22	0.13	0.27	0.00
43.21	180.49	0.98	0.20	0.27	0.00	43.26	178.41	0.90	0.24	0.27	0.00
43.32	180.83	0.99	0.20	0.27	0.00	43.41	177.64	0.87	0.25	0.27	0.00
43.47	177.23	0.86	0.25	0.26	0.00	43.54	181.37	1.02	0.19	0.26	0.00
43.61	185.98	1.25	0.12	0.26	0.00	43.67	190.14	1.50	0.06	0.26	0.00
43.74	195.11	1.91	0.01	0.26	0.00	43.82	199.94	2.00	0.00	0.26	0.00
43.86	197.97	2.00	0.00	0.26	0.00	43.94	191.23	1.58	0.05	0.26	0.00
43.99	184.66	1.17	0.13	0.26	0.00	44.07	179.02	0.92	0.22	0.25	0.00
44.11	180.08	0.96	0.20	0.25	0.00	44.20	172.65	0.72	0.28	0.25	0.00
44.24	171.55	0.69	0.29	0.25	0.00	44.33	174.05	0.76	0.26	0.25	0.00
44.38	177.71	0.88	0.23	0.25	0.00	44.46	178.07	2.00	0.00	0.25	0.00
44.51	178.78	2.00	0.00	0.25	0.00	44.59	162.41	2.00	0.00	0.24	0.00
44.64	155.27	2.00	0.00	0.24	0.00	44.72	139.87	2.00	0.00	0.24	0.00
44.81	133.60	2.00	0.00	0.24	0.00	44.85	133.47	0.26	0.57	0.24	0.00
44.93	135.67	0.27	0.56	0.24	0.01	44.97	137.55	0.28	0.55	0.24	0.00
45.06	148.52	0.35	0.50	0.24	0.01	45.11	157.80	0.45	0.44	0.24	0.00
45.17	171.97	0.70	0.27	0.24	0.00	45.23	166.45	0.58	0.32	0.23	0.00
45.29	167.12	0.60	0.32	0.23	0.00	45.36	164.22	2.00	0.00	0.23	0.00
45.43	156.65	2.00	0.00	0.23	0.00	45.49	254.00	2.00	0.00	0.23	0.00
45.56	182.45	2.00	0.00	0.23	0.00	45.62	254.00	2.00	0.00	0.23	0.00
45.69	254.00	2.00	0.00	0.23	0.00	45.76	254.00	2.00	0.00	0.23	0.00
45.81	254.00	2.00	0.00	0.22	0.00	45.88	254.00	2.00	0.00	0.22	0.00
45.95	237.82	2.00	0.00	0.22	0.00	46.02	205.53	2.00	0.00	0.22	0.00
46.08	195.88	2.00	0.00	0.22	0.00	46.15	188.65	2.00	0.00	0.22	0.00
46.21	182.28	2.00	0.00	0.22	0.00	46.28	183.43	2.00	0.00	0.22	0.00
46.34	210.16	2.00	0.00	0.22	0.00	46.41	228.42	2.00	0.00	0.21	0.00
46.47	232.84	2.00	0.00	0.21	0.00	46.54	220.55	2.00	0.00	0.21	0.00
46.61	206.26	2.00	0.00	0.21	0.00	46.69	228.78	2.00	0.00	0.21	0.00
46.75	245.00	2.00	0.00	0.21	0.00	46.80	249.23	2.00	0.00	0.21	0.00
46.87	247.68	2.00	0.00	0.21	0.00	46.93	249.10	2.00	0.00	0.21	0.00
46.99	248.58	2.00	0.00	0.20	0.00	47.06	232.28	2.00	0.00	0.20	0.00
47.15	211.74	2.00	0.00	0.20	0.00	47.20	211.31	2.00	0.00	0.20	0.00
47.27	214.84	2.00	0.00	0.20	0.00	47.35	220.09	2.00	0.00	0.20	0.00
47.40	215.65	2.00	0.00	0.20	0.00	47.48	194.12	2.00	0.00	0.20	0.00
47.53	194.67	2.00	0.00	0.20	0.00	47.59	188.90	2.00	0.00	0.19	0.00
47.66	193.10	2.00	0.00	0.19	0.00	47.73	189.82	2.00	0.00	0.19	0.00
47.80	187.08	2.00	0.00	0.19	0.00	47.85	195.14	2.00	0.00	0.19	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
47.93	221.33	2.00	0.00	0.19	0.00	47.98	233.79	2.00	0.00	0.19	0.00
48.06	250.85	2.00	0.00	0.19	0.00	48.12	238.46	2.00	0.00	0.19	0.00
48.18	221.15	2.00	0.00	0.18	0.00	48.26	199.70	2.00	0.00	0.18	0.00
48.32	192.64	2.00	0.00	0.18	0.00	48.37	189.19	2.00	0.00	0.18	0.00
48.46	186.30	2.00	0.00	0.18	0.00	48.52	187.31	2.00	0.00	0.18	0.00
48.59	194.96	2.00	0.00	0.18	0.00	48.66	219.50	2.00	0.00	0.18	0.00
48.70	234.32	2.00	0.00	0.18	0.00	48.79	238.35	2.00	0.00	0.17	0.00
48.83	237.53	2.00	0.00	0.17	0.00	48.91	249.54	2.00	0.00	0.17	0.00
48.98	238.99	2.00	0.00	0.17	0.00	49.04	224.99	2.00	0.00	0.17	0.00
49.10	241.36	2.00	0.00	0.17	0.00	49.17	233.07	2.00	0.00	0.17	0.00
49.24	240.57	2.00	0.00	0.17	0.00	49.29	222.94	2.00	0.00	0.17	0.00
49.38	193.68	2.00	0.00	0.16	0.00	49.44	184.69	2.00	0.00	0.16	0.00
49.51	185.47	2.00	0.00	0.16	0.00	49.57	188.08	2.00	0.00	0.16	0.00
49.64	184.85	2.00	0.00	0.16	0.00	49.70	180.30	2.00	0.00	0.16	0.00
49.77	214.27	2.00	0.00	0.16	0.00	49.84	254.00	2.00	0.00	0.16	0.00
49.88	254.00	2.00	0.00	0.16	0.00	49.97	254.00	2.00	0.00	0.15	0.00
50.06	254.00	2.00	0.00	0.15	0.00	50.11	254.00	2.00	0.00	0.15	0.00
50.16	228.90	2.00	0.00	0.15	0.00	50.21	205.13	2.00	0.00	0.15	0.00
50.28	204.20	2.00	0.00	0.15	0.00	50.35	188.64	2.00	0.00	0.15	0.00
50.41	200.80	2.00	0.00	0.15	0.00	50.47	188.92	2.00	0.00	0.15	0.00
50.56	197.92	2.00	0.00	0.14	0.00	50.62	219.37	2.00	0.00	0.14	0.00
50.68	238.63	2.00	0.00	0.14	0.00	50.74	231.66	2.00	0.00	0.14	0.00
50.81	206.88	2.00	0.00	0.14	0.00	50.87	202.00	2.00	0.00	0.14	0.00
50.94	207.35	2.00	0.00	0.14	0.00	51.02	193.72	2.00	0.00	0.14	0.00
51.10	185.70	2.00	0.00	0.13	0.00	51.15	183.14	2.00	0.00	0.13	0.00
51.23	185.00	2.00	0.00	0.13	0.00	51.26	178.58	2.00	0.00	0.13	0.00
51.33	201.71	2.00	0.00	0.13	0.00	51.40	197.88	2.00	0.00	0.13	0.00
51.46	182.61	2.00	0.00	0.13	0.00	51.53	173.86	2.00	0.00	0.13	0.00
51.60	171.73	2.00	0.00	0.13	0.00	51.66	176.00	2.00	0.00	0.13	0.00
51.74	186.61	2.00	0.00	0.12	0.00	51.80	192.20	2.00	0.00	0.12	0.00
51.85	190.86	2.00	0.00	0.12	0.00	51.92	181.69	2.00	0.00	0.12	0.00
52.01	166.89	2.00	0.00	0.12	0.00	52.07	163.78	2.00	0.00	0.12	0.00
52.13	164.09	2.00	0.00	0.12	0.00	52.19	160.70	2.00	0.00	0.12	0.00
52.26	157.21	2.00	0.00	0.12	0.00	52.34	165.02	2.00	0.00	0.11	0.00
52.38	170.25	2.00	0.00	0.11	0.00	52.47	177.89	2.00	0.00	0.11	0.00
52.51	179.99	2.00	0.00	0.11	0.00	52.60	178.59	2.00	0.00	0.11	0.00
52.64	197.79	2.00	0.00	0.11	0.00	52.73	234.01	2.00	0.00	0.11	0.00
52.77	253.69	2.00	0.00	0.11	0.00	52.86	219.80	2.00	0.00	0.11	0.00
52.90	187.91	2.00	0.00	0.10	0.00	52.97	215.97	2.00	0.00	0.10	0.00
53.04	210.74	2.00	0.00	0.10	0.00	53.10	190.89	2.00	0.00	0.10	0.00
53.17	207.90	2.00	0.00	0.10	0.00	53.24	198.46	2.00	0.00	0.10	0.00
53.31	205.63	2.00	0.00	0.10	0.00	53.36	196.80	2.00	0.00	0.10	0.00
53.43	178.60	2.00	0.00	0.10	0.00	53.50	176.92	2.00	0.00	0.09	0.00
53.56	180.73	2.00	0.00	0.09	0.00	53.63	181.41	2.00	0.00	0.09	0.00
53.71	177.46	2.00	0.00	0.09	0.00	53.77	174.87	2.00	0.00	0.09	0.00
53.84	172.20	2.00	0.00	0.09	0.00	53.91	175.87	2.00	0.00	0.09	0.00
53.99	173.71	2.00	0.00	0.09	0.00	54.03	175.96	2.00	0.00	0.09	0.00
54.12	187.29	2.00	0.00	0.08	0.00	54.16	195.93	2.00	0.00	0.08	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
54.25	208.77	2.00	0.00	0.08	0.00	54.29	211.01	2.00	0.00	0.08	0.00
54.38	240.57	2.00	0.00	0.08	0.00	54.41	254.00	2.00	0.00	0.08	0.00
54.49	254.00	2.00	0.00	0.08	0.00	54.56	247.56	2.00	0.00	0.08	0.00
54.63	207.68	2.00	0.00	0.07	0.00	54.70	184.34	2.00	0.00	0.07	0.00
54.76	179.64	2.00	0.00	0.07	0.00	54.82	178.96	2.00	0.00	0.07	0.00
54.89	177.33	2.00	0.00	0.07	0.00	54.97	176.44	2.00	0.00	0.07	0.00
55.01	176.59	2.00	0.00	0.07	0.00	55.10	178.18	2.00	0.00	0.07	0.00
55.14	179.31	2.00	0.00	0.07	0.00	55.20	207.07	2.00	0.00	0.07	0.00
55.27	206.08	2.00	0.00	0.06	0.00	55.34	197.41	2.00	0.00	0.06	0.00
55.41	198.00	2.00	0.00	0.06	0.00	55.48	198.38	2.00	0.00	0.06	0.00
55.54	188.49	2.00	0.00	0.06	0.00	55.61	177.81	2.00	0.00	0.06	0.00
55.67	171.74	2.00	0.00	0.06	0.00	55.74	177.64	2.00	0.00	0.06	0.00
55.82	176.39	2.00	0.00	0.05	0.00	55.86	194.41	2.00	0.00	0.05	0.00
55.94	251.17	2.00	0.00	0.05	0.00	56.01	254.00	2.00	0.00	0.05	0.00
56.08	254.00	2.00	0.00	0.05	0.00	56.12	254.00	2.00	0.00	0.05	0.00
56.19	254.00	2.00	0.00	0.05	0.00	56.25	244.00	2.00	0.00	0.05	0.00
56.32	196.77	2.00	0.00	0.05	0.00	56.38	189.47	2.00	0.00	0.05	0.00
56.45	183.69	2.00	0.00	0.04	0.00	56.52	177.90	2.00	0.00	0.04	0.00
56.59	174.21	2.00	0.00	0.04	0.00	56.66	170.79	2.00	0.00	0.04	0.00
56.73	200.10	2.00	0.00	0.04	0.00	56.79	221.56	2.00	0.00	0.04	0.00
56.84	226.95	2.00	0.00	0.04	0.00	56.92	203.01	2.00	0.00	0.04	0.00
56.99	182.81	2.00	0.00	0.04	0.00	57.04	204.15	2.00	0.00	0.03	0.00
57.11	195.42	2.00	0.00	0.03	0.00	57.17	199.72	2.00	0.00	0.03	0.00
57.24	195.96	2.00	0.00	0.03	0.00	57.30	185.53	2.00	0.00	0.03	0.00
57.38	175.05	2.00	0.00	0.03	0.00	57.44	169.27	2.00	0.00	0.03	0.00
57.51	167.29	2.00	0.00	0.03	0.00	57.56	167.52	2.00	0.00	0.03	0.00
57.64	175.15	2.00	0.00	0.02	0.00	57.70	177.52	2.00	0.00	0.02	0.00
57.77	173.83	2.00	0.00	0.02	0.00	57.83	172.52	2.00	0.00	0.02	0.00
57.90	181.54	2.00	0.00	0.02	0.00	57.97	221.89	2.00	0.00	0.02	0.00
58.06	254.00	2.00	0.00	0.02	0.00	58.10	254.00	2.00	0.00	0.02	0.00
58.16	254.00	2.00	0.00	0.02	0.00	58.23	240.95	2.00	0.00	0.01	0.00
58.28	198.04	2.00	0.00	0.01	0.00	58.36	180.24	2.00	0.00	0.01	0.00
58.42	174.82	2.00	0.00	0.01	0.00	58.49	170.12	2.00	0.00	0.01	0.00
58.56	172.75	2.00	0.00	0.01	0.00	58.63	195.14	2.00	0.00	0.01	0.00
58.68	202.20	2.00	0.00	0.01	0.00	58.76	197.27	2.00	0.00	0.01	0.00
58.81	182.67	2.00	0.00	0.00	0.00	58.90	161.17	2.00	0.00	0.00	0.00
58.96	162.21	2.00	0.00	0.00	0.00	59.02	161.63	2.00	0.00	0.00	0.00
59.07	162.53	2.00	0.00	0.00	0.00	59.15	163.27	2.00	0.00	0.00	0.00
59.21	167.92	2.00	0.00	0.00	0.00	59.29	166.05	2.00	0.00	0.00	0.00
59.34	166.87	2.00	0.00	0.00	0.00	59.41	166.96	2.00	0.00	0.00	0.00
59.48	163.79	2.00	0.00	0.00	0.00	59.54	161.06	2.00	0.00	0.00	0.00
59.60	157.33	2.00	0.00	0.00	0.00	59.69	156.96	2.00	0.00	0.00	0.00
59.73	161.53	2.00	0.00	0.00	0.00	59.81	172.79	2.00	0.00	0.00	0.00
59.89	202.01	2.00	0.00	0.00	0.00	59.93	211.88	2.00	0.00	0.00	0.00
60.02	211.69	2.00	0.00	0.00	0.00	60.06	201.46	2.00	0.00	0.00	0.00
60.12	181.75	2.00	0.00	0.00	0.00	60.19	175.81	2.00	0.00	0.00	0.00
60.26	169.95	2.00	0.00	0.00	0.00	60.32	170.74	2.00	0.00	0.00	0.00
60.39	169.13	2.00	0.00	0.00	0.00	60.46	168.42	2.00	0.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
60.53	175.92	2.00	0.00	0.00	0.00	60.58	189.23	2.00	0.00	0.00	0.00
60.66	212.84	2.00	0.00	0.00	0.00	60.72	212.18	2.00	0.00	0.00	0.00
60.78	199.23	2.00	0.00	0.00	0.00	60.87	175.16	2.00	0.00	0.00	0.00
60.93	169.17	2.00	0.00	0.00	0.00	61.01	169.00	2.00	0.00	0.00	0.00
61.04	168.29	2.00	0.00	0.00	0.00	61.11	183.59	2.00	0.00	0.00	0.00
61.18	197.67	2.00	0.00	0.00	0.00	61.24	204.73	2.00	0.00	0.00	0.00
61.31	197.64	2.00	0.00	0.00	0.00	61.37	187.99	2.00	0.00	0.00	0.00
61.45	165.59	2.00	0.00	0.00	0.00	61.50	167.19	2.00	0.00	0.00	0.00
61.56	176.95	2.00	0.00	0.00	0.00	61.64	178.80	2.00	0.00	0.00	0.00
61.69	174.22	2.00	0.00	0.00	0.00	61.77	172.49	2.00	0.00	0.00	0.00
61.83	179.38	2.00	0.00	0.00	0.00	61.91	221.89	2.00	0.00	0.00	0.00
61.97	237.77	2.00	0.00	0.00	0.00	62.02	238.16	2.00	0.00	0.00	0.00
62.12	194.57	2.00	0.00	0.00	0.00	62.18	177.78	2.00	0.00	0.00	0.00
62.22	177.07	2.00	0.00	0.00	0.00	62.28	172.45	2.00	0.00	0.00	0.00
62.36	181.20	2.00	0.00	0.00	0.00	62.42	177.02	2.00	0.00	0.00	0.00
62.49	179.93	2.00	0.00	0.00	0.00	62.55	180.15	2.00	0.00	0.00	0.00
62.62	183.36	2.00	0.00	0.00	0.00	62.69	198.74	2.00	0.00	0.00	0.00
62.75	210.21	2.00	0.00	0.00	0.00	62.83	189.31	2.00	0.00	0.00	0.00
62.88	175.01	2.00	0.00	0.00	0.00	62.96	158.47	2.00	0.00	0.00	0.00
63.01	158.92	2.00	0.00	0.00	0.00	63.07	164.27	2.00	0.00	0.00	0.00
63.14	156.52	2.00	0.00	0.00	0.00	63.20	166.59	2.00	0.00	0.00	0.00
63.27	182.90	2.00	0.00	0.00	0.00	63.34	221.99	2.00	0.00	0.00	0.00
63.40	248.56	2.00	0.00	0.00	0.00	63.47	235.44	2.00	0.00	0.00	0.00
63.53	212.39	2.00	0.00	0.00	0.00	63.61	177.70	2.00	0.00	0.00	0.00
63.67	180.57	2.00	0.00	0.00	0.00	63.74	190.80	2.00	0.00	0.00	0.00
63.80	188.65	2.00	0.00	0.00	0.00	63.86	167.38	2.00	0.00	0.00	0.00
63.93	167.14	2.00	0.00	0.00	0.00	64.00	164.46	2.00	0.00	0.00	0.00
64.05	166.40	2.00	0.00	0.00	0.00	64.13	161.71	2.00	0.00	0.00	0.00
64.19	164.37	2.00	0.00	0.00	0.00	64.25	163.34	2.00	0.00	0.00	0.00
64.33	165.71	2.00	0.00	0.00	0.00	64.39	165.64	2.00	0.00	0.00	0.00
64.46	160.96	2.00	0.00	0.00	0.00	64.51	156.55	2.00	0.00	0.00	0.00
64.58	154.91	2.00	0.00	0.00	0.00	64.65	158.25	2.00	0.00	0.00	0.00
64.72	163.55	2.00	0.00	0.00	0.00	64.79	152.92	2.00	0.00	0.00	0.00
64.85	175.54	2.00	0.00	0.00	0.00	64.91	196.29	2.00	0.00	0.00	0.00
64.98	228.55	2.00	0.00	0.00	0.00	65.05	239.11	2.00	0.00	0.00	0.00
65.11	232.64	2.00	0.00	0.00	0.00	65.18	207.29	2.00	0.00	0.00	0.00
65.24	193.67	2.00	0.00	0.00	0.00	65.31	175.51	2.00	0.00	0.00	0.00
65.37	174.04	2.00	0.00	0.00	0.00	65.44	184.70	2.00	0.00	0.00	0.00
65.51	204.22	2.00	0.00	0.00	0.00	65.57	207.97	2.00	0.00	0.00	0.00
65.63	200.93	2.00	0.00	0.00	0.00	65.70	183.88	2.00	0.00	0.00	0.00
65.77	168.71	2.00	0.00	0.00	0.00	65.84	178.16	2.00	0.00	0.00	0.00
65.89	189.58	2.00	0.00	0.00	0.00	65.96	188.46	2.00	0.00	0.00	0.00
66.04	163.85	2.00	0.00	0.00	0.00	66.09	167.79	2.00	0.00	0.00	0.00
66.16	165.20	2.00	0.00	0.00	0.00	66.23	178.79	2.00	0.00	0.00	0.00
66.29	179.44	2.00	0.00	0.00	0.00	66.36	195.34	2.00	0.00	0.00	0.00
66.43	187.61	2.00	0.00	0.00	0.00	66.48	175.57	2.00	0.00	0.00	0.00
66.55	174.12	2.00	0.00	0.00	0.00	66.62	166.45	2.00	0.00	0.00	0.00
66.68	163.23	2.00	0.00	0.00	0.00	66.75	164.39	2.00	0.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

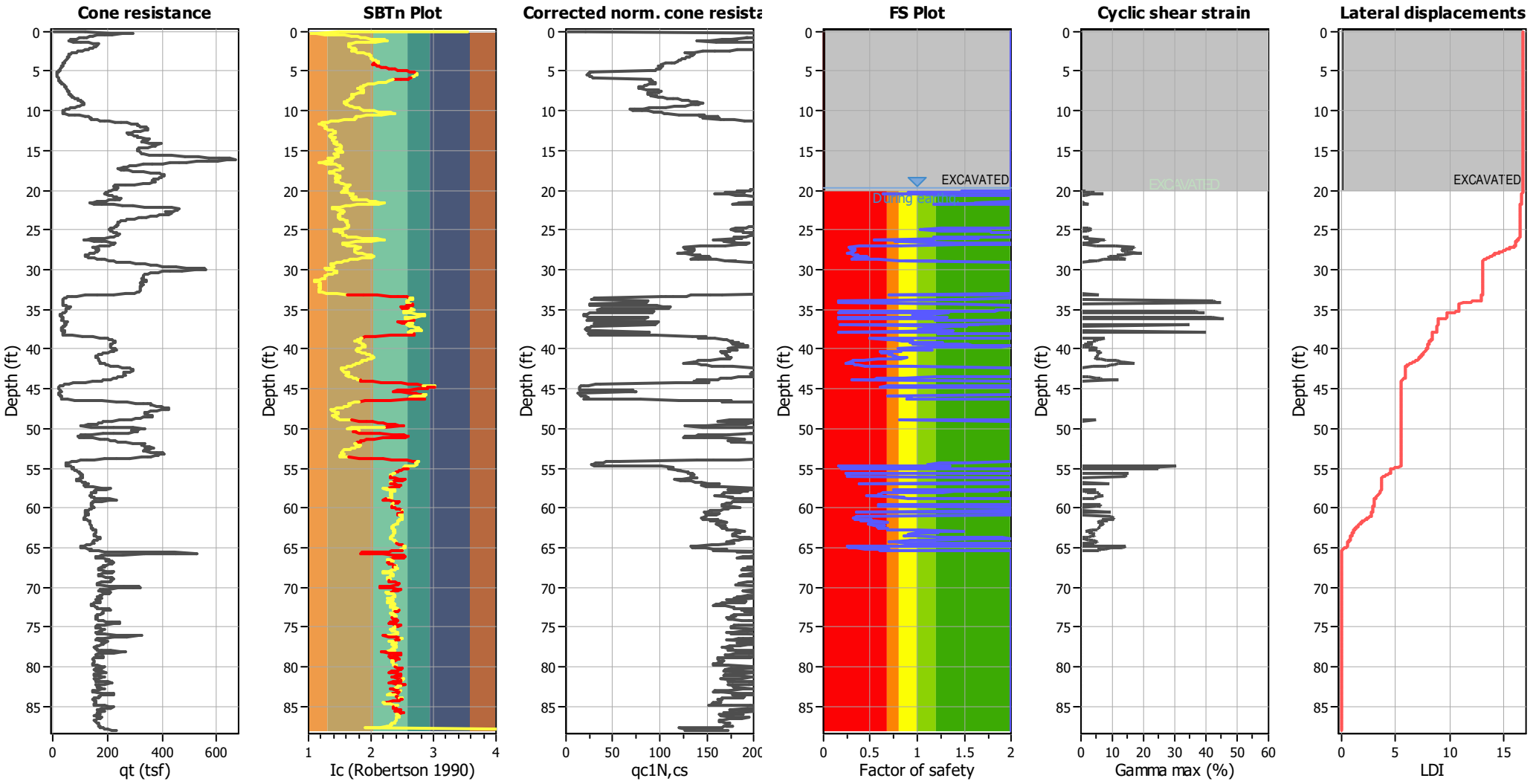
Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$q_{c1N,cs}$	FS	e_v (%)	DF	Settlement (in)
66.82	163.08	2.00	0.00	0.00	0.00	66.88	164.83	2.00	0.00	0.00	0.00
66.95	167.27	2.00	0.00	0.00	0.00	67.01	169.18	2.00	0.00	0.00	0.00
67.08	172.43	2.00	0.00	0.00	0.00	67.14	174.87	2.00	0.00	0.00	0.00
67.21	171.58	2.00	0.00	0.00	0.00	67.28	171.16	2.00	0.00	0.00	0.00
67.35	172.35	2.00	0.00	0.00	0.00	67.40	171.03	2.00	0.00	0.00	0.00
67.47	177.04	2.00	0.00	0.00	0.00	67.53	168.39	2.00	0.00	0.00	0.00
67.61	166.23	2.00	0.00	0.00	0.00	67.67	120.13	2.00	0.00	0.00	0.00
67.73	126.51	2.00	0.00	0.00	0.00	67.80	128.41	2.00	0.00	0.00	0.00
67.87	136.35	2.00	0.00	0.00	0.00	67.93	126.73	2.00	0.00	0.00	0.00
68.00	172.57	2.00	0.00	0.00	0.00						

Total estimated settlement: 0.67

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Estimation of post-earthquake lateral Displacements



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$q_{c1N,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

:: Lateral displacement index calculation ::

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
19.70	188.95	0.03	1.56	-0.29	0.01	0.01
19.79	181.48	0.04	1.11	-0.18	0.03	0.03
19.83	172.88	0.05	0.79	-0.06	0.05	0.03
19.92	173.08	0.05	0.79	-0.06	0.05	0.05
20.00	178.58	0.04	0.98	-0.14	0.04	0.04
20.05	181.01	0.04	1.09	-0.18	0.03	0.02
20.09	182.42	0.04	1.16	-0.20	0.03	0.01
20.18	174.36	0.05	0.83	-0.08	0.05	0.05
20.23	174.22	0.05	0.83	-0.08	0.05	0.03
20.30	169.32	0.06	0.69	-0.01	0.06	0.05
20.38	164.99	0.06	0.60	0.05	0.06	0.06
20.43	166.38	0.06	0.62	0.03	0.06	0.04
20.51	165.93	0.06	0.61	0.04	0.06	0.06
20.56	169.15	0.06	0.68	-0.01	0.06	0.04
20.62	171.25	0.05	0.74	-0.04	0.05	0.03
20.70	169.85	0.05	0.70	-0.02	0.05	0.06
20.76	170.56	0.05	0.72	-0.03	0.05	0.04
20.82	171.59	0.05	0.75	-0.04	0.05	0.04
20.89	172.42	0.05	0.77	-0.05	0.05	0.05
20.98	173.26	0.05	0.79	-0.07	0.05	0.05
21.02	173.82	0.05	0.81	-0.07	0.05	0.03
21.11	176.36	0.05	0.89	-0.11	0.04	0.05
21.15	174.42	0.05	0.83	-0.08	0.05	0.03
21.24	173.59	0.05	0.80	-0.07	0.05	0.05
21.28	164.40	0.06	0.58	0.06	0.06	0.03
21.37	154.39	0.08	0.43	0.19	0.08	0.09
21.41	148.15	0.10	0.37	0.27	0.10	0.05
21.50	141.45	0.12	0.32	0.36	0.12	0.12
21.55	137.37	0.13	0.29	0.41	0.13	0.07
21.63	136.31	0.13	0.29	0.42	0.13	0.14
21.68	136.39	0.13	0.29	0.42	0.13	0.07
21.74	124.83	0.17	0.24	0.55	0.17	0.12
21.80	134.20	0.14	0.28	0.44	0.14	0.11
21.87	140.46	0.12	0.31	0.37	0.12	0.10
21.94	144.57	0.11	0.34	0.32	0.11	0.09
22.02	148.50	0.10	0.37	0.27	0.10	0.08
22.09	155.54	0.08	0.44	0.18	0.08	0.07
22.16	168.26	0.06	0.66	0.00	0.06	0.05
22.20	177.94	0.04	0.94	-0.13	0.04	0.02
22.29	200.03	0.02	2.00	-0.45	0.00	0.00
22.33	209.86	0.02	2.00	-0.60	0.00	0.00
22.42	224.66	0.01	2.00	-0.82	0.00	0.00
22.46	230.13	0.01	2.00	-0.91	0.00	0.00
22.55	232.59	0.01	2.00	-0.94	0.00	0.00
22.60	232.90	0.01	2.00	-0.95	0.00	0.00
22.66	233.20	0.01	2.00	-0.95	0.00	0.00
22.74	233.76	0.01	2.00	-0.96	0.00	0.00
22.82	223.62	0.01	2.00	-0.81	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
22.87	216.17	0.01	2.00	-0.69	0.00	0.00
22.96	203.21	0.02	2.00	-0.50	0.00	0.00
23.00	199.17	0.02	2.00	-0.44	0.00	0.00
23.09	203.09	0.02	2.00	-0.50	0.00	0.00
23.13	197.13	0.02	2.00	-0.41	0.00	0.00
23.21	202.97	0.02	2.00	-0.50	0.00	0.00
23.26	206.64	0.02	2.00	-0.55	0.00	0.00
23.34	204.57	0.02	2.00	-0.52	0.00	0.00
23.38	199.76	0.02	2.00	-0.45	0.00	0.00
23.47	188.22	0.03	1.47	-0.28	0.01	0.01
23.52	183.69	0.04	1.19	-0.21	0.02	0.01
23.60	175.96	0.05	0.86	-0.10	0.05	0.05
23.65	171.76	0.05	0.74	-0.04	0.05	0.03
23.74	164.67	0.06	0.58	0.05	0.06	0.07
23.78	162.50	0.07	0.54	0.08	0.07	0.03
23.83	139.52	0.12	0.30	0.38	0.12	0.08
23.91	148.58	0.10	0.37	0.27	0.10	0.09
24.00	136.68	0.13	2.00	0.41	0.00	0.00
24.04	152.13	0.09	2.00	0.22	0.00	0.00
24.13	152.02	0.09	2.00	0.22	0.00	0.00
24.17	151.87	0.09	2.00	0.22	0.00	0.00
24.26	127.12	0.16	2.00	0.53	0.00	0.00
24.30	117.34	0.21	2.00	0.63	0.00	0.00
24.39	36.18	0.00	2.00	0.00	0.00	0.00
24.44	32.20	0.00	2.00	0.00	0.00	0.00
24.53	23.04	0.00	2.00	0.00	0.00	0.00
24.57	19.81	0.00	2.00	0.00	0.00	0.00
24.66	15.13	0.00	0.69	0.00	0.00	0.00
24.70	14.36	0.00	0.60	0.00	0.00	0.00
24.79	14.08	0.00	2.00	0.00	0.00	0.00
24.83	14.07	0.00	2.00	0.00	0.00	0.00
24.92	14.19	0.00	2.00	0.00	0.00	0.00
24.96	14.25	0.00	2.00	0.00	0.00	0.00
25.05	14.42	0.00	2.00	0.00	0.00	0.00
25.09	14.99	0.00	2.00	0.00	0.00	0.00
25.18	71.01	0.61	2.00	0.94	0.00	0.00
25.22	70.09	0.62	2.00	0.94	0.00	0.00
25.31	73.39	0.58	2.00	0.94	0.00	0.00
25.35	74.17	0.57	2.00	0.94	0.00	0.00
25.42	65.84	0.69	2.00	0.94	0.00	0.00
25.48	13.26	0.00	2.00	0.00	0.00	0.00
25.56	13.67	0.00	2.00	0.00	0.00	0.00
25.62	14.09	0.00	2.00	0.00	0.00	0.00
25.68	14.44	0.00	2.00	0.00	0.00	0.00
25.74	14.72	0.00	2.00	0.00	0.00	0.00
25.80	14.66	0.00	2.00	0.00	0.00	0.00
25.88	16.23	0.00	0.68	0.00	0.00	0.00
25.95	18.41	0.00	0.77	0.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
26.00	20.87	0.00	0.88	0.00	0.00	0.00
26.07	23.07	0.00	0.94	0.00	0.00	0.00
26.13	22.67	0.00	0.91	0.00	0.00	0.00
26.21	18.78	0.00	0.89	0.00	0.00	0.00
26.30	22.29	0.00	2.00	0.00	0.00	0.00
26.34	78.74	0.51	2.00	0.92	0.00	0.00
26.43	120.77	0.19	2.00	0.60	0.00	0.00
26.47	136.82	0.13	2.00	0.41	0.00	0.00
26.55	175.60	0.05	2.00	-0.10	0.00	0.00
26.59	167.34	0.06	2.00	0.02	0.00	0.00
26.67	209.82	0.02	2.00	-0.60	0.00	0.00
26.76	246.39	0.00	2.00	-1.16	0.00	0.00
26.80	254.00	0.00	2.00	-1.28	0.00	0.00
26.88	254.00	0.00	2.00	-1.28	0.00	0.00
26.92	254.00	0.00	2.00	-1.28	0.00	0.00
27.00	254.00	0.00	2.00	-1.28	0.00	0.00
27.05	254.00	0.00	2.00	-1.28	0.00	0.00
27.12	254.00	0.00	2.00	-1.28	0.00	0.00
27.18	254.00	0.00	2.00	-1.28	0.00	0.00
27.25	254.00	0.00	2.00	-1.28	0.00	0.00
27.32	254.00	0.00	2.00	-1.28	0.00	0.00
27.38	254.00	0.00	2.00	-1.28	0.00	0.00
27.44	254.00	0.00	2.00	-1.28	0.00	0.00
27.52	254.00	0.00	2.00	-1.28	0.00	0.00
27.58	254.00	0.00	2.00	-1.28	0.00	0.00
27.65	254.00	0.00	2.00	-1.28	0.00	0.00
27.71	254.00	0.00	2.00	-1.28	0.00	0.00
27.78	254.00	0.00	2.00	-1.28	0.00	0.00
27.84	254.00	0.00	2.00	-1.28	0.00	0.00
27.91	254.00	0.00	2.00	-1.28	0.00	0.00
27.97	254.00	0.00	2.00	-1.28	0.00	0.00
28.04	254.00	0.00	2.00	-1.28	0.00	0.00
28.12	254.00	0.00	2.00	-1.28	0.00	0.00
28.17	254.00	0.00	2.00	-1.28	0.00	0.00
28.25	254.00	0.00	2.00	-1.28	0.00	0.00
28.33	254.00	0.00	2.00	-1.28	0.00	0.00
28.37	254.00	0.00	2.00	-1.28	0.00	0.00
28.46	254.00	0.00	2.00	-1.28	0.00	0.00
28.50	254.00	0.00	2.00	-1.28	0.00	0.00
28.56	251.51	0.00	2.00	-1.24	0.00	0.00
28.63	254.00	0.00	2.00	-1.28	0.00	0.00
28.69	250.06	0.00	2.00	-1.21	0.00	0.00
28.76	238.88	0.00	2.00	-1.04	0.00	0.00
28.84	216.69	0.01	2.00	-0.70	0.00	0.00
28.90	200.34	0.02	2.00	-0.46	0.00	0.00
28.98	174.89	0.05	0.80	-0.09	0.05	0.05
29.03	161.91	0.07	2.00	0.09	0.00	0.00
29.09	177.37	0.04	2.00	-0.12	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
29.18	191.42	0.03	2.00	-0.33	0.00	0.00
29.21	197.93	0.02	2.00	-0.42	0.00	0.00
29.30	197.04	0.02	2.00	-0.41	0.00	0.00
29.38	191.93	0.03	2.00	-0.33	0.00	0.00
29.42	187.05	0.03	2.00	-0.26	0.00	0.00
29.50	170.71	0.05	2.00	-0.03	0.00	0.00
29.58	148.68	0.10	2.00	0.26	0.00	0.00
29.62	140.53	0.12	2.00	0.37	0.00	0.00
29.69	127.16	0.16	2.00	0.53	0.00	0.00
29.76	146.08	0.10	2.00	0.30	0.00	0.00
29.82	192.26	0.03	2.00	-0.34	0.00	0.00
29.89	248.05	0.00	2.00	-1.18	0.00	0.00
29.95	254.00	0.00	2.00	-1.28	0.00	0.00
30.03	254.00	0.00	2.00	-1.28	0.00	0.00
30.07	254.00	0.00	2.00	-1.28	0.00	0.00
30.15	228.15	0.01	2.00	-0.88	0.00	0.00
30.20	231.17	0.01	2.00	-0.92	0.00	0.00
30.27	213.13	0.01	2.00	-0.65	0.00	0.00
30.33	223.90	0.01	2.00	-0.81	0.00	0.00
30.39	234.52	0.01	2.00	-0.97	0.00	0.00
30.47	254.00	0.00	2.00	-1.28	0.00	0.00
30.54	196.14	0.02	2.00	-0.39	0.00	0.00
30.59	238.83	0.00	2.00	-1.04	0.00	0.00
30.66	198.93	0.02	2.00	-0.44	0.00	0.00
30.73	173.16	0.05	2.00	-0.06	0.00	0.00
30.80	150.18	0.09	2.00	0.25	0.00	0.00
30.86	142.04	0.11	2.00	0.35	0.00	0.00
30.93	137.73	0.13	2.00	0.40	0.00	0.00
30.99	127.78	0.16	2.00	0.52	0.00	0.00
31.06	125.15	0.17	2.00	0.55	0.00	0.00
31.13	147.97	0.10	2.00	0.27	0.00	0.00
31.18	167.15	0.06	2.00	0.02	0.00	0.00
31.26	191.25	0.03	2.00	-0.32	0.00	0.00
31.33	180.81	0.04	2.00	-0.17	0.00	0.00
31.38	179.57	0.04	2.00	-0.15	0.00	0.00
31.45	178.83	0.04	2.00	-0.14	0.00	0.00
31.52	172.99	0.05	2.00	-0.06	0.00	0.00
31.61	175.86	0.05	2.00	-0.10	0.00	0.00
31.65	176.73	0.04	2.00	-0.11	0.00	0.00
31.73	186.32	0.03	2.00	-0.25	0.00	0.00
31.80	228.14	0.01	2.00	-0.88	0.00	0.00
31.87	254.00	0.00	2.00	-1.28	0.00	0.00
31.93	254.00	0.00	2.00	-1.28	0.00	0.00
31.99	254.00	0.00	2.00	-1.28	0.00	0.00
32.06	254.00	0.00	2.00	-1.28	0.00	0.00
32.11	254.00	0.00	2.00	-1.28	0.00	0.00
32.17	254.00	0.00	2.00	-1.28	0.00	0.00
32.24	254.00	0.00	2.00	-1.28	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
32.30	254.00	0.00	2.00	-1.28	0.00	0.00
32.37	254.00	0.00	2.00	-1.28	0.00	0.00
32.44	254.00	0.00	2.00	-1.28	0.00	0.00
32.50	254.00	0.00	2.00	-1.28	0.00	0.00
32.56	254.00	0.00	2.00	-1.28	0.00	0.00
32.63	254.00	0.00	2.00	-1.28	0.00	0.00
32.70	254.00	0.00	2.00	-1.28	0.00	0.00
32.76	254.00	0.00	2.00	-1.28	0.00	0.00
32.83	251.38	0.00	2.00	-1.24	0.00	0.00
32.89	254.00	0.00	2.00	-1.28	0.00	0.00
32.95	254.00	0.00	2.00	-1.28	0.00	0.00
33.02	254.00	0.00	2.00	-1.28	0.00	0.00
33.10	254.00	0.00	2.00	-1.28	0.00	0.00
33.16	254.00	0.00	2.00	-1.28	0.00	0.00
33.25	254.00	0.00	2.00	-1.28	0.00	0.00
33.29	254.00	0.00	2.00	-1.28	0.00	0.00
33.37	254.00	0.00	2.00	-1.28	0.00	0.00
33.45	254.00	0.00	2.00	-1.28	0.00	0.00
33.50	254.00	0.00	2.00	-1.28	0.00	0.00
33.59	254.00	0.00	2.00	-1.28	0.00	0.00
33.63	254.00	0.00	2.00	-1.28	0.00	0.00
33.68	214.61	0.01	2.00	-0.67	0.00	0.00
33.76	227.71	0.01	2.00	-0.87	0.00	0.00
33.82	212.06	0.01	2.00	-0.63	0.00	0.00
33.88	184.90	0.04	2.00	-0.23	0.00	0.00
33.96	156.74	0.08	2.00	0.16	0.00	0.00
34.02	139.11	0.12	2.00	0.38	0.00	0.00
34.08	57.22	0.00	2.00	0.00	0.00	0.00
34.14	50.70	0.00	2.00	0.00	0.00	0.00
34.23	43.33	0.00	2.00	0.00	0.00	0.00
34.28	39.34	0.00	1.54	0.00	0.00	0.00
34.34	35.39	0.00	1.38	0.00	0.00	0.00
34.41	31.42	0.00	1.24	0.00	0.00	0.00
34.49	28.20	0.00	1.13	0.00	0.00	0.00
34.53	27.44	0.00	1.11	0.00	0.00	0.00
34.61	29.57	0.00	1.19	0.00	0.00	0.00
34.70	34.45	0.00	1.35	0.00	0.00	0.00
34.75	100.81	0.30	0.17	0.79	0.30	0.16
34.83	113.81	0.23	0.19	0.67	0.23	0.24
34.88	113.56	0.23	0.19	0.67	0.23	0.12
34.92	109.76	0.25	0.18	0.71	0.25	0.13
35.01	110.13	0.25	0.18	0.70	0.25	0.26
35.10	110.17	0.25	2.00	0.70	0.00	0.00
35.13	109.60	0.25	2.00	0.71	0.00	0.00
35.20	122.78	0.18	2.00	0.57	0.00	0.00
35.29	119.10	0.20	2.00	0.61	0.00	0.00
35.33	120.29	0.19	2.00	0.60	0.00	0.00
35.42	128.10	0.16	2.00	0.51	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
35.46	130.02	0.15	2.00	0.49	0.00	0.00
35.55	130.13	0.15	2.00	0.49	0.00	0.00
35.58	129.98	0.15	2.00	0.49	0.00	0.00
35.66	130.22	0.15	0.24	0.49	0.15	0.14
35.72	134.25	0.14	0.26	0.44	0.14	0.10
35.78	136.32	0.13	0.27	0.42	0.13	0.10
35.84	133.34	0.14	0.26	0.45	0.14	0.11
35.91	133.09	0.14	0.26	0.46	0.14	0.11
35.98	133.24	0.14	0.26	0.46	0.14	0.13
36.05	133.14	0.14	0.26	0.46	0.14	0.11
36.11	136.64	0.13	2.00	0.41	0.00	0.00
36.19	139.77	0.12	2.00	0.38	0.00	0.00
36.25	133.48	0.14	2.00	0.45	0.00	0.00
36.32	123.42	0.18	2.00	0.57	0.00	0.00
36.36	120.31	0.19	2.00	0.60	0.00	0.00
36.43	116.67	0.21	2.00	0.64	0.00	0.00
36.52	121.82	0.19	2.00	0.58	0.00	0.00
36.57	127.25	0.16	2.00	0.52	0.00	0.00
36.64	133.76	0.14	2.00	0.45	0.00	0.00
36.69	138.21	0.13	2.00	0.40	0.00	0.00
36.77	143.66	0.11	2.00	0.33	0.00	0.00
36.85	151.87	0.09	0.38	0.22	0.09	0.09
36.89	151.76	0.09	2.00	0.22	0.00	0.00
36.97	163.88	0.06	2.00	0.06	0.00	0.00
37.03	155.03	0.08	2.00	0.18	0.00	0.00
37.12	144.62	0.11	2.00	0.32	0.00	0.00
37.15	144.08	0.11	2.00	0.32	0.00	0.00
37.22	144.63	0.11	2.00	0.32	0.00	0.00
37.29	148.54	0.10	2.00	0.27	0.00	0.00
37.35	167.06	0.06	2.00	0.02	0.00	0.00
37.42	204.44	0.02	2.00	-0.52	0.00	0.00
37.49	251.99	0.00	2.00	-1.24	0.00	0.00
37.56	245.87	0.00	2.00	-1.15	0.00	0.00
37.62	223.79	0.01	2.00	-0.81	0.00	0.00
37.68	194.98	0.03	1.90	-0.38	0.00	0.00
37.74	173.30	0.05	0.74	-0.07	0.05	0.04
37.83	194.40	0.03	1.85	-0.37	0.00	0.00
37.89	179.73	0.04	0.95	-0.16	0.04	0.03
37.96	188.55	0.03	1.40	-0.28	0.02	0.01
38.02	186.20	0.03	1.27	-0.25	0.02	0.01
38.07	174.76	0.05	0.78	-0.09	0.05	0.03
38.16	168.72	0.06	0.63	0.00	0.06	0.06
38.22	167.66	0.06	0.61	0.01	0.06	0.04
38.28	167.00	0.06	0.59	0.02	0.06	0.04
38.34	166.67	0.06	0.59	0.03	0.06	0.04
38.42	167.00	0.06	0.59	0.02	0.06	0.06
38.48	165.97	0.06	0.57	0.03	0.06	0.04
38.53	159.16	0.07	0.46	0.13	0.07	0.04

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
38.60	177.39	0.04	0.87	-0.12	0.04	0.03
38.67	173.70	0.05	0.75	-0.07	0.05	0.04
38.73	178.64	0.04	0.91	-0.14	0.04	0.03
38.80	189.65	0.03	1.47	-0.30	0.01	0.01
38.86	233.50	0.01	2.00	-0.96	0.00	0.00
38.93	254.00	0.00	2.00	-1.28	0.00	0.00
39.00	254.00	0.00	2.00	-1.28	0.00	0.00
39.07	237.70	0.00	2.00	-1.02	0.00	0.00
39.14	204.57	0.02	2.00	-0.52	0.00	0.00
39.21	186.62	0.03	2.00	-0.26	0.00	0.00
39.27	178.05	0.04	2.00	-0.13	0.00	0.00
39.33	176.36	0.05	2.00	-0.11	0.00	0.00
39.39	173.80	0.05	2.00	-0.07	0.00	0.00
39.47	171.78	0.05	2.00	-0.05	0.00	0.00
39.53	167.96	0.06	2.00	0.01	0.00	0.00
39.58	166.52	0.06	0.58	0.03	0.06	0.04
39.67	166.62	0.06	0.58	0.03	0.06	0.06
39.73	167.07	0.06	0.59	0.02	0.06	0.05
39.81	166.80	0.06	0.59	0.02	0.06	0.05
39.84	174.81	0.05	0.78	-0.09	0.05	0.02
39.92	185.82	0.03	2.00	-0.24	0.00	0.00
40.00	175.44	0.05	2.00	-0.10	0.00	0.00
40.04	168.50	0.06	2.00	0.00	0.00	0.00
40.12	173.69	0.05	2.00	-0.07	0.00	0.00
40.20	167.90	0.06	2.00	0.01	0.00	0.00
40.24	164.86	0.06	2.00	0.05	0.00	0.00
40.32	155.82	0.08	2.00	0.17	0.00	0.00
40.37	154.15	0.08	2.00	0.19	0.00	0.00
40.44	150.46	0.09	0.37	0.24	0.09	0.08
40.52	148.33	0.10	0.35	0.27	0.10	0.09
40.56	148.33	0.10	2.00	0.27	0.00	0.00
40.64	148.91	0.10	2.00	0.26	0.00	0.00
40.71	156.33	0.08	2.00	0.16	0.00	0.00
40.78	164.06	0.06	2.00	0.06	0.00	0.00
40.83	160.49	0.07	2.00	0.11	0.00	0.00
40.93	149.42	0.09	2.00	0.26	0.00	0.00
40.97	150.07	0.09	2.00	0.25	0.00	0.00
41.05	148.58	0.10	0.35	0.27	0.10	0.10
41.10	149.89	0.09	0.36	0.25	0.09	0.05
41.18	144.66	0.11	0.32	0.32	0.11	0.11
41.23	144.65	0.11	0.32	0.32	0.11	0.06
41.30	145.57	0.10	0.33	0.30	0.10	0.09
41.36	147.17	0.10	0.34	0.28	0.10	0.07
41.42	146.07	0.10	0.33	0.30	0.10	0.07
41.49	162.39	0.07	0.51	0.08	0.07	0.05
41.55	153.42	0.09	0.40	0.20	0.09	0.07
41.63	155.53	0.08	0.42	0.18	0.08	0.08
41.69	164.57	0.06	0.55	0.05	0.06	0.05

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
41.75	171.12	0.05	0.68	-0.04	0.05	0.04
41.82	163.62	0.06	0.53	0.07	0.06	0.05
41.88	161.35	0.07	0.50	0.10	0.07	0.05
41.95	162.12	0.07	0.51	0.09	0.07	0.05
42.01	160.69	0.07	0.49	0.11	0.07	0.05
42.09	160.04	0.07	0.48	0.12	0.07	0.07
42.15	164.14	0.06	0.54	0.06	0.06	0.05
42.22	169.76	0.05	0.65	-0.02	0.05	0.05
42.30	165.67	0.06	0.57	0.04	0.06	0.06
42.34	169.41	0.06	0.64	-0.01	0.06	0.03
42.42	167.03	0.06	0.59	0.02	0.06	0.06
42.50	169.16	0.06	0.64	-0.01	0.06	0.05
42.54	167.07	0.06	0.59	0.02	0.06	0.03
42.62	171.30	0.05	0.69	-0.04	0.05	0.05
42.70	171.45	0.05	0.69	-0.04	0.05	0.05
42.74	173.28	0.05	0.74	-0.07	0.05	0.02
42.82	181.36	0.04	1.02	-0.18	0.03	0.03
42.86	189.95	0.03	1.49	-0.30	0.01	0.01
42.94	181.27	0.04	1.01	-0.18	0.03	0.03
43.01	183.69	0.04	1.13	-0.21	0.03	0.02
43.07	181.57	0.04	1.03	-0.18	0.03	0.03
43.15	185.41	0.03	1.22	-0.24	0.02	0.02
43.21	180.49	0.04	0.98	-0.17	0.04	0.03
43.26	178.41	0.04	0.90	-0.14	0.04	0.03
43.32	180.83	0.04	0.99	-0.17	0.04	0.02
43.41	177.64	0.04	0.87	-0.13	0.04	0.05
43.47	177.23	0.04	0.86	-0.12	0.04	0.03
43.54	181.37	0.04	1.02	-0.18	0.03	0.03
43.61	185.98	0.03	1.25	-0.25	0.02	0.02
43.67	190.14	0.03	1.50	-0.31	0.01	0.01
43.74	195.11	0.03	1.91	-0.38	0.00	0.00
43.82	199.94	0.02	2.00	-0.45	0.00	0.00
43.86	197.97	0.02	2.00	-0.42	0.00	0.00
43.94	191.23	0.03	1.58	-0.32	0.01	0.01
43.99	184.66	0.04	1.17	-0.23	0.03	0.01
44.07	179.02	0.04	0.92	-0.15	0.04	0.04
44.11	180.08	0.04	0.96	-0.16	0.04	0.02
44.20	172.65	0.05	0.72	-0.06	0.05	0.05
44.24	171.55	0.05	0.69	-0.04	0.05	0.03
44.33	174.05	0.05	0.76	-0.08	0.05	0.05
44.38	177.71	0.04	0.88	-0.13	0.04	0.02
44.46	178.07	0.04	2.00	-0.13	0.00	0.00
44.51	178.78	0.04	2.00	-0.14	0.00	0.00
44.59	162.41	0.07	2.00	0.08	0.00	0.00
44.64	155.27	0.08	2.00	0.18	0.00	0.00
44.72	139.87	0.12	2.00	0.38	0.00	0.00
44.81	133.60	0.14	2.00	0.45	0.00	0.00
44.85	133.47	0.14	0.26	0.45	0.14	0.07

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
44.93	135.67	0.13	0.27	0.43	0.13	0.13
44.97	137.55	0.13	0.28	0.40	0.13	0.06
45.06	148.52	0.10	0.35	0.27	0.10	0.10
45.11	157.80	0.08	0.45	0.15	0.08	0.04
45.17	171.97	0.05	0.70	-0.05	0.05	0.04
45.23	166.45	0.06	0.58	0.03	0.06	0.04
45.29	167.12	0.06	0.60	0.02	0.06	0.05
45.36	164.22	0.06	2.00	0.06	0.00	0.00
45.43	156.65	0.08	2.00	0.16	0.00	0.00
45.49	254.00	0.00	2.00	-1.28	0.00	0.00
45.56	182.45	0.04	2.00	-0.20	0.00	0.00
45.62	254.00	0.00	2.00	-1.28	0.00	0.00
45.69	254.00	0.00	2.00	-1.28	0.00	0.00
45.76	254.00	0.00	2.00	-1.28	0.00	0.00
45.81	254.00	0.00	2.00	-1.28	0.00	0.00
45.88	254.00	0.00	2.00	-1.28	0.00	0.00
45.95	237.82	0.00	2.00	-1.02	0.00	0.00
46.02	205.53	0.02	2.00	-0.53	0.00	0.00
46.08	195.88	0.02	2.00	-0.39	0.00	0.00
46.15	188.65	0.03	2.00	-0.29	0.00	0.00
46.21	182.28	0.04	2.00	-0.19	0.00	0.00
46.28	183.43	0.04	2.00	-0.21	0.00	0.00
46.34	210.16	0.02	2.00	-0.60	0.00	0.00
46.41	228.42	0.01	2.00	-0.88	0.00	0.00
46.47	232.84	0.01	2.00	-0.95	0.00	0.00
46.54	220.55	0.01	2.00	-0.76	0.00	0.00
46.61	206.26	0.02	2.00	-0.54	0.00	0.00
46.69	228.78	0.01	2.00	-0.89	0.00	0.00
46.75	245.00	0.00	2.00	-1.14	0.00	0.00
46.80	249.23	0.00	2.00	-1.20	0.00	0.00
46.87	247.68	0.00	2.00	-1.18	0.00	0.00
46.93	249.10	0.00	2.00	-1.20	0.00	0.00
46.99	248.58	0.00	2.00	-1.19	0.00	0.00
47.06	232.28	0.01	2.00	-0.94	0.00	0.00
47.15	211.74	0.01	2.00	-0.63	0.00	0.00
47.20	211.31	0.01	2.00	-0.62	0.00	0.00
47.27	214.84	0.01	2.00	-0.67	0.00	0.00
47.35	220.09	0.01	2.00	-0.75	0.00	0.00
47.40	215.65	0.01	2.00	-0.69	0.00	0.00
47.48	194.12	0.03	2.00	-0.36	0.00	0.00
47.53	194.67	0.03	2.00	-0.37	0.00	0.00
47.59	188.90	0.03	2.00	-0.29	0.00	0.00
47.66	193.10	0.03	2.00	-0.35	0.00	0.00
47.73	189.82	0.03	2.00	-0.30	0.00	0.00
47.80	187.08	0.03	2.00	-0.26	0.00	0.00
47.85	195.14	0.03	2.00	-0.38	0.00	0.00
47.93	221.33	0.01	2.00	-0.77	0.00	0.00
47.98	233.79	0.01	2.00	-0.96	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
48.06	250.85	0.00	2.00	-1.23	0.00	0.00
48.12	238.46	0.00	2.00	-1.03	0.00	0.00
48.18	221.15	0.01	2.00	-0.77	0.00	0.00
48.26	199.70	0.02	2.00	-0.45	0.00	0.00
48.32	192.64	0.03	2.00	-0.34	0.00	0.00
48.37	189.19	0.03	2.00	-0.29	0.00	0.00
48.46	186.30	0.03	2.00	-0.25	0.00	0.00
48.52	187.31	0.03	2.00	-0.27	0.00	0.00
48.59	194.96	0.03	2.00	-0.38	0.00	0.00
48.66	219.50	0.01	2.00	-0.74	0.00	0.00
48.70	234.32	0.01	2.00	-0.97	0.00	0.00
48.79	238.35	0.00	2.00	-1.03	0.00	0.00
48.83	237.53	0.00	2.00	-1.02	0.00	0.00
48.91	249.54	0.00	2.00	-1.21	0.00	0.00
48.98	238.99	0.00	2.00	-1.04	0.00	0.00
49.04	224.99	0.01	2.00	-0.83	0.00	0.00
49.10	241.36	0.00	2.00	-1.08	0.00	0.00
49.17	233.07	0.01	2.00	-0.95	0.00	0.00
49.24	240.57	0.00	2.00	-1.07	0.00	0.00
49.29	222.94	0.01	2.00	-0.80	0.00	0.00
49.38	193.68	0.03	2.00	-0.36	0.00	0.00
49.44	184.69	0.04	2.00	-0.23	0.00	0.00
49.51	185.47	0.03	2.00	-0.24	0.00	0.00
49.57	188.08	0.03	2.00	-0.28	0.00	0.00
49.64	184.85	0.04	2.00	-0.23	0.00	0.00
49.70	180.30	0.04	2.00	-0.17	0.00	0.00
49.77	214.27	0.01	2.00	-0.66	0.00	0.00
49.84	254.00	0.00	2.00	-1.28	0.00	0.00
49.88	254.00	0.00	2.00	-1.28	0.00	0.00
49.97	254.00	0.00	2.00	-1.28	0.00	0.00
50.06	254.00	0.00	2.00	-1.28	0.00	0.00
50.11	254.00	0.00	2.00	-1.28	0.00	0.00
50.16	228.90	0.01	2.00	-0.89	0.00	0.00
50.21	205.13	0.02	2.00	-0.53	0.00	0.00
50.28	204.20	0.02	2.00	-0.51	0.00	0.00
50.35	188.64	0.03	2.00	-0.28	0.00	0.00
50.41	200.80	0.02	2.00	-0.46	0.00	0.00
50.47	188.92	0.03	2.00	-0.29	0.00	0.00
50.56	197.92	0.02	2.00	-0.42	0.00	0.00
50.62	219.37	0.01	2.00	-0.74	0.00	0.00
50.68	238.63	0.00	2.00	-1.04	0.00	0.00
50.74	231.66	0.01	2.00	-0.93	0.00	0.00
50.81	206.88	0.02	2.00	-0.55	0.00	0.00
50.87	202.00	0.02	2.00	-0.48	0.00	0.00
50.94	207.35	0.02	2.00	-0.56	0.00	0.00
51.02	193.72	0.03	2.00	-0.36	0.00	0.00
51.10	185.70	0.03	2.00	-0.24	0.00	0.00
51.15	183.14	0.04	2.00	-0.21	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
51.23	185.00	0.04	2.00	-0.23	0.00	0.00
51.26	178.58	0.04	2.00	-0.14	0.00	0.00
51.33	201.71	0.02	2.00	-0.48	0.00	0.00
51.40	197.88	0.02	2.00	-0.42	0.00	0.00
51.46	182.61	0.04	2.00	-0.20	0.00	0.00
51.53	173.86	0.05	2.00	-0.07	0.00	0.00
51.60	171.73	0.05	2.00	-0.04	0.00	0.00
51.66	176.00	0.05	2.00	-0.10	0.00	0.00
51.74	186.61	0.03	2.00	-0.26	0.00	0.00
51.80	192.20	0.03	2.00	-0.34	0.00	0.00
51.85	190.86	0.03	2.00	-0.32	0.00	0.00
51.92	181.69	0.04	2.00	-0.18	0.00	0.00
52.01	166.89	0.06	2.00	0.02	0.00	0.00
52.07	163.78	0.06	2.00	0.06	0.00	0.00
52.13	164.09	0.06	2.00	0.06	0.00	0.00
52.19	160.70	0.07	2.00	0.11	0.00	0.00
52.26	157.21	0.08	2.00	0.15	0.00	0.00
52.34	165.02	0.06	2.00	0.05	0.00	0.00
52.38	170.25	0.05	2.00	-0.02	0.00	0.00
52.47	177.89	0.04	2.00	-0.13	0.00	0.00
52.51	179.99	0.04	2.00	-0.16	0.00	0.00
52.60	178.59	0.04	2.00	-0.14	0.00	0.00
52.64	197.79	0.02	2.00	-0.42	0.00	0.00
52.73	234.01	0.01	2.00	-0.97	0.00	0.00
52.77	253.69	0.00	2.00	-1.27	0.00	0.00
52.86	219.80	0.01	2.00	-0.75	0.00	0.00
52.90	187.91	0.03	2.00	-0.27	0.00	0.00
52.97	215.97	0.01	2.00	-0.69	0.00	0.00
53.04	210.74	0.01	2.00	-0.61	0.00	0.00
53.10	190.89	0.03	2.00	-0.32	0.00	0.00
53.17	207.90	0.02	2.00	-0.57	0.00	0.00
53.24	198.46	0.02	2.00	-0.43	0.00	0.00
53.31	205.63	0.02	2.00	-0.53	0.00	0.00
53.36	196.80	0.02	2.00	-0.40	0.00	0.00
53.43	178.60	0.04	2.00	-0.14	0.00	0.00
53.50	176.92	0.04	2.00	-0.12	0.00	0.00
53.56	180.73	0.04	2.00	-0.17	0.00	0.00
53.63	181.41	0.04	2.00	-0.18	0.00	0.00
53.71	177.46	0.04	2.00	-0.12	0.00	0.00
53.77	174.87	0.05	2.00	-0.09	0.00	0.00
53.84	172.20	0.05	2.00	-0.05	0.00	0.00
53.91	175.87	0.05	2.00	-0.10	0.00	0.00
53.99	173.71	0.05	2.00	-0.07	0.00	0.00
54.03	175.96	0.05	2.00	-0.10	0.00	0.00
54.12	187.29	0.03	2.00	-0.27	0.00	0.00
54.16	195.93	0.02	2.00	-0.39	0.00	0.00
54.25	208.77	0.02	2.00	-0.58	0.00	0.00
54.29	211.01	0.01	2.00	-0.62	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
54.38	240.57	0.00	2.00	-1.07	0.00	0.00
54.41	254.00	0.00	2.00	-1.28	0.00	0.00
54.49	254.00	0.00	2.00	-1.28	0.00	0.00
54.56	247.56	0.00	2.00	-1.18	0.00	0.00
54.63	207.68	0.02	2.00	-0.57	0.00	0.00
54.70	184.34	0.04	2.00	-0.22	0.00	0.00
54.76	179.64	0.04	2.00	-0.16	0.00	0.00
54.82	178.96	0.04	2.00	-0.15	0.00	0.00
54.89	177.33	0.04	2.00	-0.12	0.00	0.00
54.97	176.44	0.05	2.00	-0.11	0.00	0.00
55.01	176.59	0.05	2.00	-0.11	0.00	0.00
55.10	178.18	0.04	2.00	-0.14	0.00	0.00
55.14	179.31	0.04	2.00	-0.15	0.00	0.00
55.20	207.07	0.02	2.00	-0.56	0.00	0.00
55.27	206.08	0.02	2.00	-0.54	0.00	0.00
55.34	197.41	0.02	2.00	-0.41	0.00	0.00
55.41	198.00	0.02	2.00	-0.42	0.00	0.00
55.48	198.38	0.02	2.00	-0.43	0.00	0.00
55.54	188.49	0.03	2.00	-0.28	0.00	0.00
55.61	177.81	0.04	2.00	-0.13	0.00	0.00
55.67	171.74	0.05	2.00	-0.04	0.00	0.00
55.74	177.64	0.04	2.00	-0.13	0.00	0.00
55.82	176.39	0.05	2.00	-0.11	0.00	0.00
55.86	194.41	0.03	2.00	-0.37	0.00	0.00
55.94	251.17	0.00	2.00	-1.23	0.00	0.00
56.01	254.00	0.00	2.00	-1.28	0.00	0.00
56.08	254.00	0.00	2.00	-1.28	0.00	0.00
56.12	254.00	0.00	2.00	-1.28	0.00	0.00
56.19	254.00	0.00	2.00	-1.28	0.00	0.00
56.25	244.00	0.00	2.00	-1.12	0.00	0.00
56.32	196.77	0.02	2.00	-0.40	0.00	0.00
56.38	189.47	0.03	2.00	-0.30	0.00	0.00
56.45	183.69	0.04	2.00	-0.21	0.00	0.00
56.52	177.90	0.04	2.00	-0.13	0.00	0.00
56.59	174.21	0.05	2.00	-0.08	0.00	0.00
56.66	170.79	0.05	2.00	-0.03	0.00	0.00
56.73	200.10	0.02	2.00	-0.45	0.00	0.00
56.79	221.56	0.01	2.00	-0.78	0.00	0.00
56.84	226.95	0.01	2.00	-0.86	0.00	0.00
56.92	203.01	0.02	2.00	-0.50	0.00	0.00
56.99	182.81	0.04	2.00	-0.20	0.00	0.00
57.04	204.15	0.02	2.00	-0.51	0.00	0.00
57.11	195.42	0.03	2.00	-0.38	0.00	0.00
57.17	199.72	0.02	2.00	-0.45	0.00	0.00
57.24	195.96	0.02	2.00	-0.39	0.00	0.00
57.30	185.53	0.03	2.00	-0.24	0.00	0.00
57.38	175.05	0.05	2.00	-0.09	0.00	0.00
57.44	169.27	0.06	2.00	-0.01	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
57.51	167.29	0.06	2.00	0.02	0.00	0.00
57.56	167.52	0.06	2.00	0.01	0.00	0.00
57.64	175.15	0.05	2.00	-0.09	0.00	0.00
57.70	177.52	0.04	2.00	-0.13	0.00	0.00
57.77	173.83	0.05	2.00	-0.07	0.00	0.00
57.83	172.52	0.05	2.00	-0.06	0.00	0.00
57.90	181.54	0.04	2.00	-0.18	0.00	0.00
57.97	221.89	0.01	2.00	-0.78	0.00	0.00
58.06	254.00	0.00	2.00	-1.28	0.00	0.00
58.10	254.00	0.00	2.00	-1.28	0.00	0.00
58.16	254.00	0.00	2.00	-1.28	0.00	0.00
58.23	240.95	0.00	2.00	-1.07	0.00	0.00
58.28	198.04	0.02	2.00	-0.42	0.00	0.00
58.36	180.24	0.04	2.00	-0.16	0.00	0.00
58.42	174.82	0.05	2.00	-0.09	0.00	0.00
58.49	170.12	0.05	2.00	-0.02	0.00	0.00
58.56	172.75	0.05	2.00	-0.06	0.00	0.00
58.63	195.14	0.03	2.00	-0.38	0.00	0.00
58.68	202.20	0.02	2.00	-0.48	0.00	0.00
58.76	197.27	0.02	2.00	-0.41	0.00	0.00
58.81	182.67	0.04	2.00	-0.20	0.00	0.00
58.90	161.17	0.07	2.00	0.10	0.00	0.00
58.96	162.21	0.07	2.00	0.09	0.00	0.00
59.02	161.63	0.07	2.00	0.09	0.00	0.00
59.07	162.53	0.07	2.00	0.08	0.00	0.00
59.15	163.27	0.07	2.00	0.07	0.00	0.00
59.21	167.92	0.06	2.00	0.01	0.00	0.00
59.29	166.05	0.06	2.00	0.03	0.00	0.00
59.34	166.87	0.06	2.00	0.02	0.00	0.00
59.41	166.96	0.06	2.00	0.02	0.00	0.00
59.48	163.79	0.06	2.00	0.06	0.00	0.00
59.54	161.06	0.07	2.00	0.10	0.00	0.00
59.60	157.33	0.08	2.00	0.15	0.00	0.00
59.69	156.96	0.08	2.00	0.16	0.00	0.00
59.73	161.53	0.07	2.00	0.10	0.00	0.00
59.81	172.79	0.05	2.00	-0.06	0.00	0.00
59.89	202.01	0.02	2.00	-0.48	0.00	0.00
59.93	211.88	0.01	2.00	-0.63	0.00	0.00
60.02	211.69	0.01	2.00	-0.63	0.00	0.00
60.06	201.46	0.02	2.00	-0.47	0.00	0.00
60.12	181.75	0.04	2.00	-0.19	0.00	0.00
60.19	175.81	0.05	2.00	-0.10	0.00	0.00
60.26	169.95	0.05	2.00	-0.02	0.00	0.00
60.32	170.74	0.05	2.00	-0.03	0.00	0.00
60.39	169.13	0.06	2.00	-0.01	0.00	0.00
60.46	168.42	0.06	2.00	0.00	0.00	0.00
60.53	175.92	0.05	2.00	-0.10	0.00	0.00
60.58	189.23	0.03	2.00	-0.29	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
60.66	212.84	0.01	2.00	-0.64	0.00	0.00
60.72	212.18	0.01	2.00	-0.63	0.00	0.00
60.78	199.23	0.02	2.00	-0.44	0.00	0.00
60.87	175.16	0.05	2.00	-0.09	0.00	0.00
60.93	169.17	0.06	2.00	-0.01	0.00	0.00
61.01	169.00	0.06	2.00	-0.01	0.00	0.00
61.04	168.29	0.06	2.00	0.00	0.00	0.00
61.11	183.59	0.04	2.00	-0.21	0.00	0.00
61.18	197.67	0.02	2.00	-0.42	0.00	0.00
61.24	204.73	0.02	2.00	-0.52	0.00	0.00
61.31	197.64	0.02	2.00	-0.42	0.00	0.00
61.37	187.99	0.03	2.00	-0.28	0.00	0.00
61.45	165.59	0.06	2.00	0.04	0.00	0.00
61.50	167.19	0.06	2.00	0.02	0.00	0.00
61.56	176.95	0.04	2.00	-0.12	0.00	0.00
61.64	178.80	0.04	2.00	-0.14	0.00	0.00
61.69	174.22	0.05	2.00	-0.08	0.00	0.00
61.77	172.49	0.05	2.00	-0.06	0.00	0.00
61.83	179.38	0.04	2.00	-0.15	0.00	0.00
61.91	221.89	0.01	2.00	-0.78	0.00	0.00
61.97	237.77	0.00	2.00	-1.02	0.00	0.00
62.02	238.16	0.00	2.00	-1.03	0.00	0.00
62.12	194.57	0.03	2.00	-0.37	0.00	0.00
62.18	177.78	0.04	2.00	-0.13	0.00	0.00
62.22	177.07	0.04	2.00	-0.12	0.00	0.00
62.28	172.45	0.05	2.00	-0.05	0.00	0.00
62.36	181.20	0.04	2.00	-0.18	0.00	0.00
62.42	177.02	0.04	2.00	-0.12	0.00	0.00
62.49	179.93	0.04	2.00	-0.16	0.00	0.00
62.55	180.15	0.04	2.00	-0.16	0.00	0.00
62.62	183.36	0.04	2.00	-0.21	0.00	0.00
62.69	198.74	0.02	2.00	-0.43	0.00	0.00
62.75	210.21	0.02	2.00	-0.60	0.00	0.00
62.83	189.31	0.03	2.00	-0.29	0.00	0.00
62.88	175.01	0.05	2.00	-0.09	0.00	0.00
62.96	158.47	0.07	2.00	0.14	0.00	0.00
63.01	158.92	0.07	2.00	0.13	0.00	0.00
63.07	164.27	0.06	2.00	0.06	0.00	0.00
63.14	156.52	0.08	2.00	0.16	0.00	0.00
63.20	166.59	0.06	2.00	0.03	0.00	0.00
63.27	182.90	0.04	2.00	-0.20	0.00	0.00
63.34	221.99	0.01	2.00	-0.78	0.00	0.00
63.40	248.56	0.00	2.00	-1.19	0.00	0.00
63.47	235.44	0.01	2.00	-0.99	0.00	0.00
63.53	212.39	0.01	2.00	-0.64	0.00	0.00
63.61	177.70	0.04	2.00	-0.13	0.00	0.00
63.67	180.57	0.04	2.00	-0.17	0.00	0.00
63.74	190.80	0.03	2.00	-0.32	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
63.80	188.65	0.03	2.00	-0.29	0.00	0.00
63.86	167.38	0.06	2.00	0.02	0.00	0.00
63.93	167.14	0.06	2.00	0.02	0.00	0.00
64.00	164.46	0.06	2.00	0.06	0.00	0.00
64.05	166.40	0.06	2.00	0.03	0.00	0.00
64.13	161.71	0.07	2.00	0.09	0.00	0.00
64.19	164.37	0.06	2.00	0.06	0.00	0.00
64.25	163.34	0.07	2.00	0.07	0.00	0.00
64.33	165.71	0.06	2.00	0.04	0.00	0.00
64.39	165.64	0.06	2.00	0.04	0.00	0.00
64.46	160.96	0.07	2.00	0.10	0.00	0.00
64.51	156.55	0.08	2.00	0.16	0.00	0.00
64.58	154.91	0.08	2.00	0.18	0.00	0.00
64.65	158.25	0.08	2.00	0.14	0.00	0.00
64.72	163.55	0.07	2.00	0.07	0.00	0.00
64.79	152.92	0.09	2.00	0.21	0.00	0.00
64.85	175.54	0.05	2.00	-0.10	0.00	0.00
64.91	196.29	0.02	2.00	-0.40	0.00	0.00
64.98	228.55	0.01	2.00	-0.88	0.00	0.00
65.05	239.11	0.00	2.00	-1.04	0.00	0.00
65.11	232.64	0.01	2.00	-0.94	0.00	0.00
65.18	207.29	0.02	2.00	-0.56	0.00	0.00
65.24	193.67	0.03	2.00	-0.36	0.00	0.00
65.31	175.51	0.05	2.00	-0.10	0.00	0.00
65.37	174.04	0.05	2.00	-0.08	0.00	0.00
65.44	184.70	0.04	2.00	-0.23	0.00	0.00
65.51	204.22	0.02	2.00	-0.51	0.00	0.00
65.57	207.97	0.02	2.00	-0.57	0.00	0.00
65.63	200.93	0.02	2.00	-0.46	0.00	0.00
65.70	183.88	0.04	2.00	-0.22	0.00	0.00
65.77	168.71	0.06	2.00	0.00	0.00	0.00
65.84	178.16	0.04	2.00	-0.13	0.00	0.00
65.89	189.58	0.03	2.00	-0.30	0.00	0.00
65.96	188.46	0.03	2.00	-0.28	0.00	0.00
66.04	163.85	0.06	2.00	0.06	0.00	0.00
66.09	167.79	0.06	2.00	0.01	0.00	0.00
66.16	165.20	0.06	2.00	0.05	0.00	0.00
66.23	178.79	0.04	2.00	-0.14	0.00	0.00
66.29	179.44	0.04	2.00	-0.15	0.00	0.00
66.36	195.34	0.03	2.00	-0.38	0.00	0.00
66.43	187.61	0.03	2.00	-0.27	0.00	0.00
66.48	175.57	0.05	2.00	-0.10	0.00	0.00
66.55	174.12	0.05	2.00	-0.08	0.00	0.00
66.62	166.45	0.06	2.00	0.03	0.00	0.00
66.68	163.23	0.07	2.00	0.07	0.00	0.00
66.75	164.39	0.06	2.00	0.06	0.00	0.00
66.82	163.08	0.07	2.00	0.07	0.00	0.00
66.88	164.83	0.06	2.00	0.05	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	$q_{c1N,cs}$	$Gamma_{lim}$ (%)	FS	Fa	$Gamma_{max}$ (%)	LDI
66.95	167.27	0.06	2.00	0.02	0.00	0.00
67.01	169.18	0.06	2.00	-0.01	0.00	0.00
67.08	172.43	0.05	2.00	-0.05	0.00	0.00
67.14	174.87	0.05	2.00	-0.09	0.00	0.00
67.21	171.58	0.05	2.00	-0.04	0.00	0.00
67.28	171.16	0.05	2.00	-0.04	0.00	0.00
67.35	172.35	0.05	2.00	-0.05	0.00	0.00
67.40	171.03	0.05	2.00	-0.03	0.00	0.00
67.47	177.04	0.04	2.00	-0.12	0.00	0.00
67.53	168.39	0.06	2.00	0.00	0.00	0.00
67.61	166.23	0.06	2.00	0.03	0.00	0.00
67.67	120.13	0.19	2.00	0.60	0.00	0.00
67.73	126.51	0.00	2.00	0.00	0.00	0.00
67.80	128.41	0.00	2.00	0.00	0.00	0.00
67.87	136.35	0.00	2.00	0.00	0.00	0.00
67.93	126.73	0.00	2.00	0.00	0.00	0.00
68.00	172.57	0.00	2.00	0.00	0.00	0.00

Total estimated displacement: 7.99

Abbreviations

Depth: Depth of test point
$q_{c1N,cs}$: Adjusted and corrected cone resistance due to fines
$Gamma_{lim}$: Limiting shear strain
FS: Calculated factor of safety against liquefaction
Fa:
$Gamma_{max}$: Maximum cyclic shear strain
Lat. disp.: Lateral displacement

:: Strength loss calculation Idriss & Boulanger (2008) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.02	213.38	186.43	1.00	186.43	1.62	0.92	0.92
0.10	208.35	182.06	1.00	182.06	1.60	0.67	0.92
0.15	206.17	180.49	1.00	180.49	1.55	0.62	0.91
0.23	202.71	177.42	1.00	177.42	1.53	0.81	0.91
0.29	198.38	173.15	1.00	173.15	1.57	0.50	0.91
0.36	192.59	167.49	1.00	167.49	1.61	0.44	0.90
0.43	187.23	162.08	1.02	165.02	1.67	0.49	0.90
0.47	188.50	162.80	1.04	169.27	1.70	0.34	0.90
0.54	191.50	165.24	1.04	171.78	1.70	0.48	0.90
0.62	203.45	175.71	1.02	179.21	1.67	0.62	0.91
0.68	214.49	185.07	1.02	189.57	1.68	0.87	0.92
0.75	223.04	192.00	1.04	199.69	1.70	0.92	0.92
0.81	229.21	196.81	1.06	208.54	1.73	0.93	0.93
0.88	233.37	199.82	1.08	215.80	1.76	0.93	0.93
0.94	237.30	202.89	1.09	220.25	1.77	0.93	0.93
1.00	243.51	208.19	1.08	224.07	1.76	0.94	0.94
1.07	249.18	213.60	1.04	221.69	1.70	0.94	0.94
1.14	243.30	207.98	1.05	219.11	1.72	0.94	0.94
1.21	227.74	193.33	1.11	215.04	1.81	0.92	0.92
1.27	206.13	173.42	1.21	209.40	1.92	0.91	0.91
1.34	192.44	161.06	1.27	203.96	1.97	0.72	0.90
1.41	180.40	150.43	1.30	195.89	2.00	0.59	0.89
1.47	161.34	133.61	1.41	188.12	2.07	0.50	0.87
1.53	144.95	119.14	1.56	185.66	2.15	0.27	0.85
1.59	132.96	108.56	1.71	185.45	2.22	0.29	0.84
1.65	131.99	107.60	1.71	184.51	2.22	0.29	0.84
1.72	149.62	122.86	1.48	181.68	2.11	0.24	0.86
1.80	179.66	149.24	1.24	185.06	1.95	0.56	0.89
1.86	220.29	185.32	1.09	202.06	1.78	0.92	0.92
1.92	255.95	217.03	1.01	220.06	1.67	0.94	0.94
1.98	293.89	250.56	1.00	250.56	1.59	0.97	0.97
2.05	337.81	289.69	1.00	289.69	1.50	0.99	0.99
2.12	389.98	336.28	1.00	336.28	1.42	1.01	1.01
2.20	434.07	375.36	1.00	375.36	1.38	1.03	1.03
2.26	461.75	399.29	1.00	399.29	1.37	1.04	1.04
2.33	461.78	398.17	1.00	398.17	1.39	1.04	1.04
2.39	458.12	393.72	1.00	393.72	1.43	1.04	1.04
2.44	453.96	388.19	1.00	388.19	1.48	1.04	1.04
2.51	455.34	387.50	1.00	387.50	1.53	1.04	1.04
2.58	453.56	384.75	1.00	384.75	1.56	1.04	1.04
2.65	442.09	374.52	1.00	374.52	1.56	1.03	1.03
2.71	429.03	363.49	1.00	363.49	1.55	1.03	1.03
2.77	415.55	351.66	1.00	351.66	1.55	1.02	1.02
2.84	416.72	352.54	1.00	352.54	1.54	1.02	1.02
2.90	429.00	363.38	1.00	363.38	1.52	1.03	1.03
2.97	434.30	368.32	1.00	368.32	1.49	1.03	1.03
3.04	422.05	357.79	1.00	357.79	1.48	1.02	1.02
3.10	405.68	343.56	1.00	343.56	1.48	1.02	1.02

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
3.17	388.91	328.73	1.00	328.73	1.49	1.01	1.01
3.23	378.51	319.84	1.00	319.84	1.49	1.01	1.01
3.31	355.86	300.03	1.00	300.03	1.50	0.99	0.99
3.37	341.64	287.95	1.00	287.95	1.49	0.99	0.99
3.43	327.04	275.60	1.00	275.60	1.48	0.98	0.98
3.50	312.78	263.33	1.00	263.33	1.48	0.97	0.97
3.57	296.21	248.84	1.00	248.84	1.49	0.96	0.96
3.62	282.42	236.34	1.00	236.34	1.52	0.96	0.96
3.70	273.50	228.01	1.00	228.01	1.55	0.95	0.95
3.76	263.94	219.22	1.00	219.22	1.58	0.94	0.94
3.82	257.13	212.96	1.00	212.96	1.60	0.94	0.94
3.88	250.79	207.30	1.00	207.30	1.61	0.94	0.94
3.96	246.12	203.21	1.00	203.21	1.61	0.93	0.93
4.02	242.97	200.57	1.00	200.57	1.61	0.93	0.93
4.10	240.65	198.41	1.00	198.41	1.61	0.93	0.93
4.16	240.15	197.83	1.00	197.83	1.61	0.93	0.93
4.24	239.28	196.84	1.00	196.84	1.61	0.93	0.93
4.29	240.05	197.32	1.00	197.32	1.61	0.93	0.93
4.35	238.73	195.93	1.00	195.93	1.62	0.93	0.93
4.42	237.55	194.68	1.00	194.68	1.63	0.93	0.93
4.48	234.33	191.67	1.00	191.67	1.63	0.92	0.92
4.56	230.49	188.17	1.00	187.76	1.64	0.92	0.92
4.62	226.40	184.64	1.00	184.39	1.64	0.92	0.92
4.67	222.37	181.44	1.00	181.44	1.63	0.89	0.91
4.74	217.14	177.26	1.00	177.26	1.62	0.78	0.91
4.81	211.30	172.60	1.00	172.60	1.60	0.59	0.91
4.88	208.39	170.84	1.00	170.84	1.55	0.53	0.91
4.95	206.79	170.69	1.00	170.69	1.48	0.60	0.91
5.01	208.46	173.16	1.00	173.16	1.41	0.52	0.91
5.08	211.33	175.46	1.00	175.46	1.41	0.60	0.91
5.15	216.01	178.55	1.00	178.55	1.45	0.76	0.91
5.21	218.93	180.42	1.00	180.42	1.47	0.76	0.91
5.26	221.41	181.94	1.00	181.94	1.49	0.77	0.92
5.34	225.56	184.75	1.00	184.75	1.52	0.92	0.92
5.39	232.47	189.90	1.00	189.90	1.54	0.92	0.92
5.48	239.68	195.53	1.00	195.53	1.54	0.93	0.93
5.54	245.28	200.07	1.00	200.07	1.54	0.93	0.93
5.60	245.15	199.83	1.00	199.83	1.54	0.93	0.93
5.66	238.91	194.26	1.00	194.26	1.55	0.93	0.93
5.74	231.13	187.03	1.00	187.03	1.59	0.92	0.92
5.79	224.42	180.54	1.00	180.54	1.63	0.89	0.91
5.86	218.21	174.27	1.03	179.43	1.69	0.75	0.91
5.93	208.91	165.25	1.08	178.62	1.76	0.59	0.90
5.99	191.17	149.32	1.15	172.43	1.86	0.50	0.89
6.05	168.29	129.54	1.27	164.15	1.97	0.33	0.86
6.12	140.17	106.04	1.46	154.52	2.10	0.26	0.84
6.19	121.25	90.49	1.65	149.40	2.19	0.19	0.81
6.26	114.58	85.10	1.71	145.91	2.22	0.18	0.80

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
6.32	127.93	96.01	1.51	145.38	2.13	0.20	0.82
6.39	150.15	114.37	1.31	149.66	2.01	0.27	0.85
6.45	176.07	136.28	1.16	158.68	1.87	0.32	0.87
6.51	197.32	154.76	1.08	166.75	1.76	0.43	0.89
6.57	214.48	170.28	1.00	171.09	1.65	0.66	0.90
6.65	224.10	179.36	1.00	179.36	1.58	0.91	0.91
6.72	227.25	182.61	1.00	182.61	1.54	0.92	0.92
6.78	224.00	179.75	1.00	179.75	1.54	0.87	0.91
6.85	215.38	172.01	1.00	172.01	1.57	0.68	0.91
6.92	203.04	161.13	1.00	161.13	1.61	0.45	0.90
6.97	187.91	147.95	1.02	150.54	1.67	0.33	0.88
7.03	170.20	132.67	1.06	141.19	1.74	0.25	0.87
7.13	155.00	119.59	1.11	132.88	1.81	0.18	0.85
7.19	147.90	113.52	1.14	128.87	1.84	0.17	0.85
7.23	149.01	114.40	1.13	129.29	1.83	0.19	0.85
7.31	155.34	119.69	1.10	132.24	1.80	0.19	0.85
7.37	160.43	123.98	1.08	134.39	1.77	0.21	0.86
7.43	164.65	127.55	1.07	136.24	1.74	0.22	0.86
7.50	165.86	128.48	1.06	136.67	1.74	0.22	0.86
7.56	165.65	128.23	1.06	136.26	1.74	0.22	0.86
7.63	165.25	127.88	1.06	135.48	1.73	0.22	0.86
7.70	164.00	126.84	1.06	134.12	1.73	0.21	0.86
7.76	161.95	125.10	1.06	132.51	1.73	0.21	0.86
7.82	157.59	121.34	1.07	129.88	1.75	0.20	0.85
7.90	151.45	116.06	1.09	126.31	1.77	0.18	0.85
7.96	143.60	109.37	1.11	121.95	1.81	0.17	0.84
8.02	135.41	102.23	1.16	118.63	1.87	0.16	0.83
8.10	127.56	95.34	1.22	116.39	1.93	0.16	0.82
8.15	120.51	89.16	1.30	115.74	2.00	0.16	0.81
8.23	117.29	86.20	1.35	116.54	2.04	0.16	0.81
8.29	118.30	86.71	1.37	119.16	2.05	0.16	0.81
8.36	123.33	90.48	1.36	122.81	2.04	0.18	0.81
8.43	130.61	96.21	1.31	126.13	2.01	0.18	0.82
8.48	139.44	103.54	1.24	128.04	1.95	0.19	0.83
8.56	150.27	112.73	1.16	130.76	1.87	0.19	0.84
8.65	161.41	122.23	1.10	134.74	1.79	0.21	0.86
8.69	176.44	134.89	1.05	142.28	1.73	0.24	0.87
8.78	190.70	146.82	1.02	149.36	1.67	0.35	0.88
8.82	205.61	159.54	1.00	159.54	1.61	0.45	0.90
8.91	210.13	163.33	1.00	163.33	1.59	0.60	0.90
8.95	219.52	171.28	1.00	171.28	1.56	0.48	0.91
9.01	234.36	183.58	1.00	183.58	1.53	0.92	0.92
9.07	258.41	203.55	1.00	203.55	1.49	0.93	0.93
9.14	281.06	222.60	1.00	222.60	1.45	0.95	0.95
9.20	301.36	240.18	1.00	240.18	1.40	0.96	0.96
9.28	320.85	257.20	1.00	257.20	1.36	0.97	0.97
9.33	337.76	271.06	1.00	271.06	1.35	0.98	0.98
9.40	356.28	285.08	1.00	285.08	1.37	0.99	0.99

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
9.48	377.79	301.19	1.00	301.19	1.39	1.00	1.00
9.54	401.21	319.77	1.00	319.77	1.39	1.01	1.01
9.61	426.00	338.93	1.00	338.93	1.40	1.02	1.02
9.68	451.20	358.57	1.00	358.57	1.40	1.02	1.02
9.73	488.64	390.58	1.00	390.58	1.36	1.04	1.04
9.80	524.50	422.45	1.00	422.45	1.30	1.05	1.05
9.88	554.16	449.31	1.00	449.31	1.25	1.06	1.06
9.93	560.87	452.95	1.00	452.95	1.28	1.07	1.07
10.00	554.03	444.44	1.00	444.44	1.32	1.06	1.06
10.06	520.05	413.27	1.00	413.27	1.38	1.05	1.05
10.12	474.49	374.04	1.00	374.04	1.42	1.03	1.03
10.20	428.50	335.72	1.00	335.72	1.46	1.01	1.01
10.26	404.31	316.63	1.00	316.63	1.45	1.00	1.00
10.32	387.40	303.60	1.00	303.60	1.44	1.00	1.00
10.39	372.70	292.22	1.00	292.22	1.43	0.99	0.99
10.45	358.00	281.18	1.00	281.18	1.42	0.98	0.98
10.52	349.58	275.84	1.00	275.84	1.38	0.98	0.98
10.58	343.14	272.38	1.00	272.38	1.33	0.98	0.98
10.64	336.80	268.56	1.00	268.56	1.30	0.98	0.98
10.71	332.64	265.77	1.00	265.77	1.28	0.97	0.97
10.78	329.82	263.62	1.00	263.62	1.27	0.97	0.97
10.84	329.42	263.34	1.00	263.34	1.27	0.97	0.97
10.92	329.36	263.34	1.00	263.34	1.26	0.97	0.97
10.98	329.22	263.24	1.00	263.24	1.26	0.97	0.97
11.04	325.47	259.99	1.00	259.99	1.26	0.97	0.97
11.12	326.31	260.74	1.00	260.74	1.26	0.97	0.97
11.18	328.95	263.95	1.00	263.95	1.23	0.97	0.97
11.25	338.35	274.30	1.00	274.30	1.16	0.98	0.98
11.33	342.47	279.68	1.00	279.68	1.10	0.98	0.98
11.37	343.10	280.88	1.00	280.88	1.09	0.98	0.98
11.46	340.85	278.06	1.00	278.06	1.11	0.98	0.98
11.50	332.39	269.99	1.00	269.99	1.13	0.98	0.98
11.58	325.48	263.07	1.00	263.07	1.16	0.97	0.97
11.64	319.91	257.24	1.00	257.24	1.19	0.97	0.97
11.71	322.19	258.78	1.00	258.78	1.19	0.97	0.97
11.79	324.47	260.78	1.00	260.78	1.18	0.97	0.97
11.83	327.22	263.51	1.00	263.51	1.17	0.97	0.97
11.91	328.33	264.35	1.00	264.35	1.17	0.97	0.97
11.96	328.29	264.22	1.00	264.22	1.17	0.97	0.97
12.04	326.25	262.09	1.00	262.09	1.17	0.97	0.97
12.09	322.66	258.62	1.00	258.62	1.19	0.97	0.97
12.16	320.64	256.71	1.00	256.71	1.19	0.97	0.97
12.24	318.36	254.67	1.00	254.67	1.19	0.97	0.97
12.29	318.49	254.96	1.00	254.96	1.18	0.97	0.97
12.37	319.53	255.81	1.00	255.81	1.18	0.97	0.97
12.43	320.43	256.62	1.00	256.62	1.17	0.97	0.97
12.50	321.91	257.88	1.00	257.88	1.17	0.97	0.97
12.57	321.74	257.64	1.00	257.64	1.17	0.97	0.97

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
12.61	320.60	256.68	1.00	256.68	1.17	0.97	0.97
12.70	318.55	254.84	1.00	254.84	1.17	0.97	0.97
12.75	317.11	253.64	1.00	253.64	1.17	0.97	0.97
12.83	316.67	253.08	1.00	253.08	1.17	0.97	0.97
12.87	311.94	247.77	1.00	247.77	1.20	0.96	0.96
12.96	300.87	235.97	1.00	235.97	1.27	0.96	0.96
13.01	265.17	202.02	1.00	202.02	1.44	0.93	0.93
13.10	220.18	162.23	1.00	162.23	1.63	0.41	0.90
13.15	160.03	112.52	1.17	131.87	1.88	0.24	0.84
13.23	118.70	80.16	1.43	115.02	2.09	0.14	0.80
13.29	85.08	54.95	1.97	108.30	2.31	0.14	0.75
13.35	69.95	44.01	2.41	105.90	2.42	0.12	0.72
13.41	59.25	36.47	2.84	103.46	2.51	0.11	0.69
13.46	51.60	31.21	3.20	99.84	2.58	0.11	0.68
13.55	45.83	27.31	3.50	95.56	2.63	0.10	1.89
13.60	41.17	24.23	3.74	90.54	2.66	0.10	1.69
13.67	38.76	22.70	3.75	85.04	2.66	0.10	1.58
13.75	37.31	21.82	3.67	80.07	2.65	0.09	1.52
13.79	36.98	21.70	3.48	75.56	2.62	0.09	1.50
13.88	37.31	21.97	3.32	72.84	2.60	0.09	0.63
13.96	37.82	22.36	3.16	70.63	2.57	0.09	0.64
13.99	37.55	22.21	3.11	69.06	2.56	0.09	0.63
14.06	36.85	21.70	3.19	69.13	2.58	0.09	0.63
14.13	35.81	20.99	3.24	67.94	2.59	0.09	0.63
14.20	35.10	20.49	3.31	67.74	2.60	0.09	0.63
14.28	34.80	20.23	3.38	68.46	2.61	0.09	1.40
14.33	34.80	20.03	3.72	74.57	2.66	0.09	1.39
14.41	38.16	22.06	3.72	82.03	2.66	0.09	1.53
14.48	42.73	24.94	3.55	88.46	2.63	0.10	1.73
14.51	49.31	29.25	3.20	93.55	2.58	0.10	0.67
14.60	54.51	32.65	2.98	97.15	2.54	0.11	0.68
14.68	59.44	35.94	2.76	99.18	2.50	0.11	0.69
14.72	62.02	37.69	2.64	99.44	2.47	0.12	0.70
14.80	60.11	36.25	2.78	100.83	2.50	0.12	0.69
14.88	55.81	33.16	3.10	102.92	2.56	0.11	0.68
14.92	49.88	29.00	3.67	106.31	2.65	0.11	2.01
15.00	48.20	27.79	3.87	107.46	2.68	0.10	1.94
15.05	47.74	27.48	3.87	106.31	2.68	0.11	1.92
15.13	48.91	28.38	3.56	101.03	2.64	0.11	1.97
15.20	47.64	27.75	3.34	92.58	2.60	0.10	1.91
15.27	46.30	27.07	3.12	84.52	2.57	0.10	0.66
15.30	45.02	26.43	2.94	77.67	2.53	0.10	0.66
15.37	43.41	25.41	2.94	74.66	2.53	0.10	0.65
15.44	40.32	23.32	3.14	73.29	2.57	0.09	0.64
15.50	35.83	20.25	3.65	73.91	2.65	0.09	1.41
15.57	31.13	17.10	4.35	74.32	2.75	0.09	1.21
15.64	27.81	14.96	5.00	74.72	2.82	0.09	1.07
15.71	26.47	14.15	5.34	75.61	2.86	0.09	1.01

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
15.78	26.78	14.31	5.30	75.85	2.86	0.09	1.02
15.84	28.96	15.58	4.78	74.56	2.80	0.09	1.11
15.92	32.45	17.91	4.02	71.92	2.70	0.09	1.26
16.00	36.21	20.47	3.37	68.99	2.61	0.09	1.41
16.04	37.55	21.46	3.08	66.15	2.56	0.09	0.63
16.12	36.81	20.99	3.06	64.25	2.55	0.09	0.63
16.16	34.49	19.45	3.27	63.54	2.59	0.09	0.62
16.24	34.08	19.07	3.45	65.74	2.62	0.09	1.32
16.33	33.01	18.22	3.80	69.18	2.67	0.09	1.27
16.37	34.01	18.72	3.97	74.35	2.70	0.09	1.31
16.45	35.58	19.61	3.98	78.00	2.70	0.09	1.37
16.49	41.89	23.74	3.32	78.74	2.60	0.09	0.64
16.58	48.02	27.96	2.70	75.43	2.49	0.10	0.66
16.62	51.58	30.40	2.47	74.95	2.44	0.10	0.67
16.70	48.99	28.42	2.77	78.82	2.50	0.10	0.66
16.79	44.63	25.22	3.37	84.93	2.61	0.10	1.74
16.83	41.38	22.95	3.84	88.12	2.68	0.10	1.60
16.90	43.23	24.17	3.60	87.08	2.64	0.10	1.68
16.97	45.49	25.68	3.33	85.49	2.60	0.10	1.77
17.01	45.80	25.93	3.22	83.57	2.58	0.10	0.65
17.10	42.41	23.69	3.48	82.35	2.62	0.10	1.64
17.14	38.19	20.96	3.84	80.53	2.68	0.09	1.46
17.23	35.61	19.31	4.07	78.62	2.71	0.09	1.36
17.27	33.09	17.74	4.27	75.75	2.74	0.09	1.25
17.36	31.18	16.55	4.43	73.34	2.76	0.09	1.17
17.40	30.14	15.93	4.46	71.00	2.76	0.09	1.13
17.49	29.30	15.37	4.61	70.81	2.78	0.09	1.09
17.53	29.91	15.67	4.71	73.76	2.79	0.09	1.12
17.62	31.02	16.25	4.77	77.57	2.80	0.09	1.16
17.67	35.88	19.32	4.08	78.75	2.71	0.09	1.36
17.75	39.51	21.70	3.54	76.73	2.63	0.10	1.50
17.83	41.18	22.86	3.24	74.02	2.59	0.09	0.64
17.89	39.21	21.57	3.39	73.19	2.61	0.09	1.48
17.93	36.35	19.68	3.74	73.67	2.66	0.09	1.37
18.02	35.60	19.14	3.89	74.47	2.69	0.09	1.34
18.06	35.27	18.87	4.00	75.54	2.70	0.09	1.32
18.15	36.51	19.62	3.88	76.20	2.68	0.09	1.37
18.19	38.34	20.73	3.76	77.85	2.67	0.09	1.44
18.28	44.68	24.75	3.23	79.84	2.58	0.10	0.65
18.32	69.74	41.51	2.01	83.53	2.32	0.10	0.71
18.41	108.42	68.57	1.41	96.35	2.07	0.14	0.78
18.49	147.67	96.90	1.20	116.29	1.91	0.20	0.82
18.53	174.01	115.90	1.14	132.37	1.85	0.22	0.85
18.62	186.89	124.87	1.13	141.03	1.83	0.28	0.86
18.66	197.89	132.29	1.13	149.25	1.83	0.31	0.87
18.74	204.10	136.10	1.13	154.44	1.84	0.38	0.87
18.79	211.78	141.59	1.12	159.21	1.82	0.40	0.88
18.87	218.05	146.77	1.10	161.01	1.79	0.47	0.88

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
18.92	224.19	151.91	1.07	163.09	1.75	0.51	0.89
19.01	226.54	153.50	1.07	164.30	1.75	0.55	0.89
19.05	226.44	152.42	1.09	166.27	1.78	0.56	0.89
19.14	224.83	150.34	1.11	166.85	1.80	0.54	0.89
19.18	219.23	145.47	1.14	165.15	1.84	0.57	0.88
19.27	216.00	142.65	1.15	163.81	1.85	0.44	0.88
19.32	212.24	139.63	1.16	162.10	1.87	0.50	0.88
19.40	212.10	139.27	1.16	162.12	1.87	0.48	0.87
19.44	209.74	137.23	1.18	161.45	1.89	0.48	0.87
19.53	209.07	136.38	1.18	161.53	1.90	0.46	0.87
19.57	208.59	135.78	1.19	161.76	1.90	0.50	0.87
19.66	209.39	136.13	1.19	162.26	1.90	0.48	0.87
19.70	210.56	137.25	1.18	161.66	1.89	0.47	0.87
19.79	213.01	139.56	1.15	160.78	1.86	0.47	0.88
19.83	217.03	143.16	1.13	161.07	1.82	0.45	0.88
19.92	222.56	147.47	1.11	163.14	1.80	0.49	0.88
20.00	228.39	151.76	1.09	166.04	1.78	0.58	0.89
20.05	232.71	155.11	1.08	167.94	1.77	0.62	0.89
20.09	231.40	154.13	1.08	166.92	1.77	0.65	0.89
20.18	228.82	152.10	1.09	165.16	1.77	0.51	0.89
20.23	223.55	148.13	1.09	161.97	1.78	0.51	0.88
20.30	218.32	144.13	1.10	158.84	1.79	0.45	0.88
20.38	210.67	138.24	1.12	154.56	1.82	0.38	0.87
20.43	201.38	131.12	1.14	149.70	1.85	0.35	0.87
20.51	192.76	124.50	1.17	145.30	1.88	0.30	0.86
20.56	184.74	118.44	1.19	141.35	1.90	0.29	0.85
20.62	177.80	113.22	1.22	138.02	1.93	0.27	0.84
20.70	171.49	108.45	1.25	135.06	1.95	0.25	0.84
20.76	165.95	104.30	1.27	132.68	1.98	0.24	0.83
20.82	161.86	101.13	1.30	131.43	2.00	0.24	0.83
20.89	158.47	98.34	1.33	131.16	2.02	0.24	0.82
20.98	156.26	96.36	1.37	131.64	2.05	0.23	0.82
21.02	156.86	96.59	1.37	132.61	2.05	0.24	0.82
21.11	159.81	98.59	1.35	133.40	2.04	0.25	0.83
21.15	164.67	102.34	1.31	133.56	2.00	0.25	0.83
21.24	167.72	104.81	1.27	132.92	1.97	0.26	0.83
21.28	168.31	105.90	1.23	130.33	1.94	0.24	0.84
21.37	167.93	106.11	1.21	127.88	1.92	0.21	0.84
21.41	167.72	106.58	1.18	125.57	1.89	0.21	0.84
21.50	169.20	107.88	1.16	125.24	1.87	0.20	0.84
21.55	171.31	109.65	1.15	125.56	1.85	0.20	0.84
21.63	174.09	111.78	1.13	126.42	1.83	0.21	0.84
21.68	172.99	111.13	1.13	125.23	1.83	0.21	0.84
21.74	175.17	112.85	1.12	125.88	1.81	0.18	0.84
21.80	179.62	116.24	1.10	127.80	1.79	0.21	0.85
21.87	188.88	123.17	1.08	132.46	1.76	0.24	0.86
21.94	194.85	127.64	1.06	135.36	1.73	0.25	0.86
22.02	200.69	131.94	1.05	138.33	1.72	0.27	0.87

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
22.09	209.78	138.57	1.03	143.22	1.69	0.31	0.87
22.16	220.95	146.67	1.02	149.32	1.67	0.42	0.88
22.20	237.53	159.25	1.00	159.25	1.63	0.55	0.89
22.29	252.83	171.20	1.00	171.20	1.58	0.91	0.91
22.33	269.80	184.67	1.00	184.67	1.54	0.92	0.92
22.42	280.61	192.76	1.00	192.76	1.52	0.92	0.92
22.46	288.76	198.44	1.00	198.44	1.52	0.93	0.93
22.55	291.74	200.00	1.00	200.00	1.52	0.93	0.93
22.60	292.91	200.40	1.00	200.40	1.53	0.93	0.93
22.66	293.42	200.30	1.00	200.30	1.54	0.93	0.93
22.74	290.27	197.18	1.00	197.18	1.56	0.93	0.93
22.82	284.36	191.93	1.00	191.93	1.58	0.92	0.92
22.87	273.62	183.14	1.00	183.14	1.61	0.92	0.92
22.96	264.97	176.09	1.00	176.09	1.64	0.91	0.91
23.00	260.39	172.54	1.00	172.72	1.65	0.91	0.91
23.09	258.28	171.01	1.00	171.05	1.65	0.91	0.91
23.13	259.76	172.62	1.00	172.62	1.63	0.91	0.91
23.21	261.11	174.01	1.00	174.01	1.61	0.91	0.91
23.26	263.90	176.29	1.00	176.29	1.60	0.91	0.91
23.34	262.82	175.21	1.00	175.21	1.61	0.91	0.91
23.38	256.25	169.43	1.00	169.43	1.64	0.90	0.90
23.47	248.73	163.20	1.01	165.44	1.66	0.76	0.90
23.52	240.11	156.40	1.03	161.51	1.69	0.66	0.89
23.60	234.11	151.84	1.04	158.11	1.71	0.52	0.89
23.65	227.13	146.42	1.06	154.67	1.73	0.47	0.88
23.74	221.73	141.98	1.07	152.18	1.75	0.39	0.88
23.78	208.41	132.01	1.10	145.23	1.79	0.38	0.87
23.83	199.25	125.60	1.11	139.57	1.81	0.23	0.86
23.91	186.13	116.48	1.13	131.44	1.83	0.26	0.85
24.00	179.32	111.85	1.13	126.85	1.84	0.21	0.84
24.04	162.35	99.23	1.20	119.20	1.91	0.21	0.83
24.13	144.40	85.79	1.33	113.69	2.02	0.18	0.81
24.17	118.66	67.66	1.60	108.22	2.17	0.17	0.77
24.26	96.45	52.83	1.99	104.95	2.31	0.13	0.74
24.30	72.80	37.92	2.66	100.94	2.48	0.13	0.70
24.39	58.24	29.12	3.34	97.31	2.60	0.10	2.00
24.44	44.53	21.14	4.37	92.37	2.75	0.10	1.50
24.53	36.88	17.16	5.16	88.51	2.84	0.09	1.23
24.57	28.83	13.10	6.30	82.58	2.96	0.09	0.94
24.66	24.67	11.00	6.93	76.18	3.02	0.08	0.79
24.70	21.93	9.61	7.00	67.25	3.02	0.08	0.69
24.79	21.42	9.35	6.40	59.81	2.97	0.08	0.67
24.83	21.36	9.31	5.82	54.13	2.91	0.08	0.66
24.92	21.46	9.35	5.66	52.94	2.90	0.08	0.67
24.96	21.66	9.44	5.25	49.56	2.85	0.08	0.67
25.05	22.10	9.65	4.52	43.59	2.77	0.08	0.69
25.09	23.34	10.67	3.39	36.13	2.61	0.08	0.73
25.18	24.82	11.68	2.85	33.31	2.52	0.07	0.56

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
25.22	27.90	13.62	2.42	32.99	2.43	0.07	0.58
25.31	30.22	15.11	1.00	15.11	2.36	0.07	0.59
25.35	28.24	13.93	2.24	31.18	2.38	0.07	0.58
25.42	24.32	11.53	2.62	30.20	2.47	0.07	0.56
25.48	20.53	9.16	3.40	31.19	2.61	0.07	0.63
25.56	20.90	9.24	3.71	34.25	2.66	0.08	0.64
25.62	21.47	9.41	4.06	38.21	2.71	0.08	0.66
25.68	21.98	9.55	4.42	42.17	2.76	0.08	0.68
25.74	22.24	9.64	4.98	48.00	2.82	0.08	0.69
25.80	23.12	10.07	5.42	54.55	2.87	0.08	0.72
25.88	24.93	10.95	5.34	58.54	2.86	0.08	0.78
25.95	27.99	12.45	4.70	58.52	2.79	0.08	0.89
26.00	31.34	14.41	3.85	55.49	2.68	0.09	1.01
26.07	33.42	15.68	3.45	54.04	2.62	0.09	1.08
26.13	32.41	14.94	3.83	57.27	2.68	0.09	1.04
26.21	32.01	14.39	4.53	65.14	2.77	0.08	1.03
26.30	31.61	14.18	5.18	73.48	2.85	0.09	1.01
26.34	50.40	24.47	3.27	79.95	2.59	0.08	0.65
26.43	80.40	42.62	2.02	86.05	2.32	0.13	0.71
26.47	134.31	77.32	1.37	105.61	2.05	0.15	0.79
26.55	180.37	107.82	1.20	129.57	1.91	0.31	0.84
26.59	230.35	141.90	1.11	157.57	1.81	0.42	0.88
26.67	269.51	169.41	1.06	178.97	1.73	0.90	0.90
26.76	304.97	194.75	1.01	197.58	1.67	0.93	0.93
26.80	331.00	212.91	1.00	212.91	1.64	0.94	0.94
26.88	346.10	222.46	1.00	222.46	1.64	0.95	0.95
26.92	356.70	228.78	1.00	228.98	1.65	0.95	0.95
27.00	358.73	229.19	1.01	231.37	1.66	0.95	0.95
27.05	358.90	228.59	1.02	232.34	1.67	0.95	0.95
27.12	364.84	232.89	1.01	234.88	1.66	0.95	0.95
27.18	378.64	243.58	1.00	243.58	1.63	0.96	0.96
27.25	395.55	257.16	1.00	257.16	1.58	0.97	0.97
27.32	406.93	266.97	1.00	266.97	1.54	0.98	0.98
27.38	415.55	275.36	1.00	275.36	1.50	0.98	0.98
27.44	422.59	283.68	1.00	283.68	1.45	0.99	0.99
27.52	423.60	287.94	1.00	287.94	1.40	0.99	0.99
27.58	413.60	283.24	1.00	283.24	1.37	0.99	0.99
27.65	397.16	271.90	1.00	271.90	1.36	0.98	0.98
27.71	380.68	259.59	1.00	259.59	1.38	0.97	0.97
27.78	367.46	249.32	1.00	249.32	1.39	0.96	0.96
27.84	356.46	241.22	1.00	241.22	1.40	0.96	0.96
27.91	347.03	233.32	1.00	233.32	1.42	0.95	0.95
27.97	339.71	226.63	1.00	226.63	1.45	0.95	0.95
28.04	334.71	220.83	1.00	220.83	1.49	0.95	0.95
28.12	336.59	221.94	1.00	221.94	1.49	0.95	0.95
28.17	343.43	228.30	1.00	228.30	1.45	0.95	0.95
28.25	353.32	237.43	1.00	237.43	1.41	0.96	0.96
28.33	360.46	243.43	1.00	243.43	1.39	0.96	0.96

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
28.37	363.81	245.24	1.00	245.24	1.40	0.96	0.96
28.46	361.90	242.99	1.00	242.99	1.41	0.96	0.96
28.50	346.70	230.63	1.00	230.63	1.44	0.95	0.95
28.56	333.48	220.46	1.00	220.46	1.46	0.94	0.94
28.63	320.90	211.46	1.00	211.46	1.47	0.94	0.94
28.69	316.64	209.38	1.00	209.38	1.45	0.94	0.94
28.76	303.18	200.10	1.00	200.10	1.46	0.93	0.93
28.84	285.77	186.62	1.00	186.62	1.49	0.92	0.92
28.90	262.85	167.68	1.00	167.68	1.58	0.90	0.90
28.98	241.58	149.58	1.03	153.41	1.68	0.51	0.89
29.03	218.13	130.45	1.11	144.92	1.81	0.36	0.87
29.09	200.11	115.79	1.21	140.31	1.92	0.31	0.85
29.18	185.85	104.45	1.33	139.28	2.02	0.32	0.83
29.21	176.90	97.00	1.48	143.27	2.11	0.34	0.82
29.30	168.68	90.53	1.63	147.65	2.19	0.33	0.81
29.38	160.16	84.30	1.80	151.65	2.25	0.31	0.80
29.42	148.25	76.59	1.99	152.15	2.31	0.29	0.79
29.50	131.67	66.46	2.25	149.48	2.38	0.23	0.77
29.58	114.56	56.35	2.58	145.37	2.46	0.18	0.75
29.62	99.57	47.94	2.89	138.37	2.52	0.16	0.73
29.69	102.45	50.03	2.62	130.96	2.47	0.14	0.73
29.76	142.68	75.25	1.70	127.87	2.21	0.16	0.79
29.82	219.28	126.72	1.19	150.49	1.90	0.49	0.86
29.89	294.86	181.20	1.03	185.81	1.68	0.91	0.91
29.95	330.26	206.61	1.00	206.61	1.62	0.93	0.93
30.03	334.04	206.74	1.01	208.08	1.65	0.93	0.93
30.07	318.07	192.32	1.06	204.38	1.74	0.92	0.92
30.15	307.49	183.65	1.09	200.30	1.78	0.92	0.92
30.20	291.01	172.00	1.12	191.81	1.81	0.91	0.91
30.27	289.71	171.90	1.10	189.53	1.79	0.91	0.91
30.33	292.84	174.86	1.08	189.65	1.77	0.91	0.91
30.39	310.19	187.77	1.05	197.18	1.72	0.92	0.92
30.47	297.78	178.47	1.07	191.22	1.75	0.91	0.91
30.54	275.53	161.71	1.12	181.43	1.82	0.90	0.90
30.59	223.46	124.76	1.29	160.68	1.99	0.86	0.86
30.66	184.28	98.23	1.54	151.40	2.14	0.35	0.82
30.73	142.27	71.52	2.07	147.95	2.34	0.23	0.78
30.80	117.78	56.81	2.59	147.12	2.46	0.18	0.75
30.86	104.03	49.00	2.94	144.06	2.53	0.17	0.73
30.93	95.68	44.45	3.14	139.73	2.57	0.16	0.72
30.99	90.05	41.47	3.26	135.33	2.59	0.14	0.71
31.06	95.05	44.45	2.96	131.46	2.54	0.14	0.72
31.13	113.17	55.28	2.30	126.99	2.40	0.17	0.75
31.18	144.71	75.09	1.66	124.91	2.20	0.21	0.79
31.26	170.57	92.21	1.39	127.80	2.06	0.31	0.82
31.33	190.46	105.88	1.25	132.87	1.96	0.30	0.84
31.38	201.06	113.08	1.21	136.95	1.92	0.33	0.84
31.45	210.35	119.35	1.18	140.88	1.89	0.37	0.85

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
31.52	219.85	125.79	1.15	145.11	1.86	0.38	0.86
31.61	227.60	130.95	1.14	148.72	1.84	0.45	0.87
31.65	239.41	138.30	1.13	155.62	1.82	0.50	0.87
31.73	262.92	153.32	1.10	168.83	1.79	0.74	0.89
31.80	294.73	173.72	1.08	186.90	1.76	0.91	0.91
31.87	323.88	192.47	1.06	203.40	1.73	0.92	0.92
31.93	335.59	198.87	1.06	211.34	1.74	0.93	0.93
31.99	333.67	195.69	1.09	212.53	1.77	0.93	0.93
32.06	331.80	192.85	1.11	213.35	1.80	0.92	0.92
32.11	326.96	188.42	1.13	212.34	1.83	0.92	0.92
32.17	330.35	190.37	1.13	214.23	1.83	0.92	0.92
32.24	336.76	194.76	1.11	216.97	1.81	0.93	0.93
32.30	353.67	206.82	1.09	224.48	1.77	0.93	0.93
32.37	367.05	216.61	1.06	230.11	1.74	0.94	0.94
32.44	371.82	220.82	1.05	230.91	1.71	0.95	0.95
32.50	363.33	216.71	1.03	223.96	1.69	0.94	0.94
32.56	350.72	211.06	1.01	213.07	1.66	0.94	0.94
32.63	338.67	206.53	1.00	206.53	1.61	0.93	0.93
32.70	335.28	206.98	1.00	206.98	1.56	0.93	0.93
32.76	331.39	205.00	1.00	205.00	1.55	0.93	0.93
32.83	330.89	204.56	1.00	204.56	1.55	0.93	0.93
32.89	337.73	208.75	1.00	208.75	1.55	0.94	0.94
32.95	356.22	220.93	1.00	220.93	1.54	0.95	0.95
33.02	380.54	236.69	1.00	236.69	1.53	0.96	0.96
33.10	401.81	250.94	1.00	250.94	1.52	0.97	0.97
33.16	406.91	252.61	1.00	252.61	1.53	0.97	0.97
33.25	402.92	247.73	1.00	247.73	1.56	0.96	0.96
33.29	392.05	240.06	1.00	240.06	1.58	0.96	0.96
33.37	384.33	237.54	1.00	237.54	1.54	0.96	0.96
33.45	374.37	234.02	1.00	234.02	1.50	0.95	0.95
33.50	360.72	225.04	1.00	225.04	1.50	0.95	0.95
33.59	349.75	215.06	1.00	215.06	1.55	0.94	0.94
33.63	323.61	193.12	1.00	193.28	1.65	0.92	0.92
33.68	283.99	161.32	1.11	179.52	1.81	0.90	0.90
33.76	232.83	124.42	1.31	162.50	2.00	0.80	0.86
33.82	189.11	95.42	1.63	155.89	2.19	0.45	0.82
33.88	153.48	73.88	2.05	151.16	2.33	0.28	0.79
33.96	124.73	57.37	2.58	147.80	2.46	0.19	0.75
34.02	102.36	45.16	3.20	144.38	2.58	0.16	0.72
34.08	87.60	37.38	3.78	141.42	2.67	0.14	2.62
34.14	76.19	31.71	4.23	134.02	2.73	0.13	2.26
34.23	68.01	28.09	4.38	123.11	2.75	0.12	2.01
34.28	60.90	24.98	4.30	107.43	2.74	0.11	1.78
34.34	55.27	22.57	4.17	94.14	2.72	0.11	1.61
34.41	49.90	20.21	4.17	84.29	2.72	0.10	1.44
34.49	46.04	18.47	4.33	79.91	2.74	0.10	1.32
34.53	45.17	18.08	4.31	77.96	2.74	0.10	1.29
34.61	48.29	19.65	3.92	77.09	2.69	0.10	1.39

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
34.70	54.26	22.80	3.36	76.59	2.61	0.10	1.57
34.75	64.03	27.71	2.97	82.23	2.54	0.11	0.66
34.83	71.14	31.10	2.87	89.18	2.52	0.12	0.68
34.88	74.20	32.29	2.97	96.01	2.54	0.12	0.68
34.92	72.44	31.17	3.15	98.21	2.57	0.12	0.68
35.01	70.96	30.33	3.24	98.19	2.59	0.12	0.67
35.10	71.26	30.46	3.21	97.94	2.58	0.12	0.67
35.13	76.52	33.36	2.90	96.74	2.53	0.12	0.68
35.20	80.74	35.65	2.71	96.52	2.49	0.13	0.69
35.29	85.28	38.07	2.55	97.02	2.45	0.13	0.70
35.33	87.79	39.31	2.51	98.79	2.45	0.13	0.70
35.42	92.29	41.68	2.41	100.46	2.42	0.14	0.71
35.46	96.49	44.01	2.29	100.69	2.39	0.14	0.72
35.55	97.70	44.69	2.24	100.10	2.38	0.14	0.72
35.58	98.10	44.91	2.23	99.93	2.38	0.14	0.72
35.66	99.98	45.86	2.19	100.66	2.37	0.14	0.72
35.72	102.90	47.51	2.12	100.61	2.35	0.15	0.73
35.78	104.81	48.71	2.04	99.38	2.33	0.15	0.73
35.84	104.98	48.95	1.99	97.61	2.31	0.14	0.73
35.91	104.11	48.49	1.99	96.63	2.31	0.14	0.73
35.98	103.98	48.32	2.01	96.97	2.32	0.14	0.73
36.05	105.15	48.79	2.02	98.43	2.32	0.14	0.73
36.11	107.23	49.78	2.01	100.18	2.32	0.15	0.73
36.19	106.56	49.22	2.05	101.10	2.33	0.15	0.73
36.25	100.35	45.52	2.24	101.76	2.38	0.15	0.72
36.32	91.53	40.39	2.55	102.87	2.45	0.13	0.71
36.36	84.15	36.19	2.90	104.91	2.53	0.13	0.69
36.43	83.14	35.56	2.97	105.52	2.54	0.13	0.69
36.52	86.36	37.30	2.81	104.73	2.51	0.13	0.70
36.57	93.88	41.47	2.49	103.37	2.44	0.14	0.71
36.64	101.50	45.77	2.25	102.91	2.38	0.15	0.72
36.69	108.91	49.92	2.07	103.45	2.34	0.15	0.73
36.77	116.26	53.81	1.98	106.37	2.31	0.16	0.74
36.85	121.44	56.34	1.95	110.13	2.30	0.18	0.75
36.89	127.92	59.45	1.95	115.69	2.30	0.18	0.76
36.97	127.95	58.96	2.03	119.43	2.32	0.21	0.76
37.03	123.81	56.11	2.20	123.44	2.37	0.19	0.75
37.12	115.56	51.14	2.46	125.82	2.43	0.17	0.74
37.15	111.13	48.61	2.61	126.68	2.47	0.17	0.73
37.22	112.37	49.17	2.59	127.41	2.46	0.17	0.73
37.29	121.00	53.38	2.49	132.89	2.44	0.17	0.74
37.35	142.98	64.70	2.21	142.99	2.37	0.22	0.77
37.42	179.31	84.32	1.84	155.13	2.26	0.38	0.80
37.49	207.19	99.76	1.65	164.92	2.19	0.83	0.83
37.56	213.09	102.73	1.64	168.51	2.19	0.83	0.83
37.62	192.72	90.55	1.83	166.12	2.26	0.58	0.81
37.68	166.72	75.73	2.15	162.73	2.36	0.33	0.79
37.74	155.77	69.85	2.28	158.98	2.39	0.24	0.78

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
37.83	151.55	67.92	2.26	153.47	2.39	0.33	0.77
37.89	157.66	71.98	2.04	147.05	2.33	0.26	0.78
37.96	156.54	71.83	1.98	141.97	2.31	0.29	0.78
38.02	155.13	71.29	1.95	139.02	2.30	0.28	0.78
38.07	148.39	67.62	2.02	136.47	2.32	0.24	0.77
38.16	142.01	64.19	2.08	133.67	2.34	0.22	0.77
38.22	139.62	63.18	2.05	129.80	2.33	0.22	0.76
38.28	139.43	63.32	2.01	127.16	2.32	0.21	0.77
38.34	139.47	63.39	1.99	126.17	2.31	0.21	0.77
38.42	138.78	62.86	2.01	126.49	2.32	0.21	0.76
38.48	135.94	61.02	2.10	127.99	2.34	0.21	0.76
38.53	139.03	62.48	2.08	130.12	2.34	0.19	0.76
38.60	141.92	63.80	2.07	132.35	2.34	0.25	0.77
38.67	148.41	67.06	2.02	135.48	2.32	0.23	0.77
38.73	153.10	68.97	2.05	141.50	2.33	0.25	0.78
38.80	173.34	79.21	1.92	152.33	2.29	0.30	0.80
38.86	204.60	95.59	1.74	166.76	2.23	0.74	0.82
38.93	230.44	109.36	1.63	178.32	2.18	0.84	0.84
39.00	230.57	108.69	1.67	182.01	2.20	0.84	0.84
39.07	206.74	94.83	1.88	178.65	2.28	0.82	0.82
39.14	177.85	78.77	2.22	174.54	2.38	0.39	0.79
39.21	157.22	67.84	2.50	169.33	2.44	0.29	0.77
39.27	147.80	63.32	2.56	162.23	2.46	0.26	0.77
39.33	144.44	62.25	2.46	153.03	2.43	0.25	0.76
39.39	143.74	62.79	2.28	143.06	2.39	0.24	0.76
39.47	142.40	62.79	2.15	134.99	2.36	0.23	0.76
39.53	140.82	62.44	2.08	129.62	2.34	0.22	0.76
39.58	139.40	61.68	2.09	128.75	2.34	0.21	0.76
39.67	138.88	61.28	2.10	128.92	2.35	0.21	0.76
39.73	138.85	60.99	2.14	130.71	2.36	0.22	0.76
39.81	141.62	62.25	2.13	132.58	2.35	0.21	0.76
39.84	147.81	65.29	2.08	135.99	2.34	0.24	0.77
39.92	150.33	66.24	2.10	139.26	2.35	0.28	0.77
40.00	147.37	64.22	2.21	141.98	2.37	0.24	0.77
40.04	142.34	61.21	2.36	144.15	2.41	0.22	0.76
40.12	138.95	59.05	2.48	146.39	2.44	0.24	0.76
40.20	136.97	57.76	2.57	148.20	2.46	0.22	0.75
40.24	130.60	54.42	2.71	147.57	2.49	0.22	0.75
40.32	125.66	52.01	2.78	144.40	2.50	0.19	0.74
40.37	120.80	49.79	2.81	140.03	2.51	0.19	0.73
40.44	118.28	48.67	2.81	136.79	2.51	0.18	0.73
40.52	116.40	47.80	2.82	134.65	2.51	0.18	0.73
40.56	116.13	47.69	2.81	133.77	2.51	0.18	0.73
40.64	119.46	49.39	2.70	133.26	2.49	0.18	0.73
40.71	125.63	52.65	2.51	132.23	2.45	0.19	0.74
40.78	130.13	55.10	2.38	131.37	2.42	0.21	0.75
40.83	127.75	53.81	2.43	130.58	2.43	0.20	0.74
40.93	122.41	50.88	2.57	130.74	2.46	0.18	0.74

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
40.97	117.89	48.44	2.71	131.35	2.49	0.18	0.73
41.05	117.75	48.34	2.70	130.77	2.49	0.18	0.73
41.10	115.91	47.46	2.73	129.50	2.49	0.18	0.73
41.18	114.44	46.71	2.75	128.34	2.50	0.17	0.73
41.23	112.89	45.85	2.81	128.78	2.51	0.17	0.72
41.30	113.73	46.17	2.80	129.43	2.51	0.17	0.72
41.36	114.67	46.61	2.78	129.34	2.50	0.17	0.73
41.42	120.81	49.76	2.59	129.03	2.46	0.17	0.73
41.49	123.46	51.00	2.55	129.98	2.45	0.21	0.74
41.55	126.75	52.45	2.52	132.41	2.45	0.19	0.74
41.63	127.76	52.68	2.56	134.86	2.46	0.19	0.74
41.69	133.97	55.73	2.45	136.43	2.43	0.21	0.75
41.75	137.09	57.35	2.38	136.65	2.42	0.23	0.75
41.82	136.08	56.81	2.40	136.09	2.42	0.21	0.75
41.88	133.06	55.19	2.45	135.09	2.43	0.20	0.75
41.95	132.19	54.82	2.44	133.50	2.43	0.21	0.75
42.01	132.26	55.09	2.38	131.04	2.42	0.20	0.75
42.09	133.80	56.09	2.29	128.54	2.39	0.20	0.75
42.15	137.73	58.33	2.17	126.76	2.36	0.21	0.75
42.22	140.41	59.76	2.12	126.40	2.35	0.22	0.76
42.30	142.44	60.77	2.08	126.57	2.34	0.21	0.76
42.34	141.67	60.26	2.11	126.97	2.35	0.22	0.76
42.42	142.75	60.71	2.10	127.41	2.34	0.21	0.76
42.50	142.06	60.29	2.11	127.12	2.35	0.22	0.76
42.54	143.30	60.84	2.10	127.82	2.34	0.22	0.76
42.62	143.77	60.73	2.15	130.28	2.36	0.23	0.76
42.70	145.38	61.12	2.19	133.77	2.37	0.23	0.76
42.74	148.57	62.32	2.21	138.00	2.38	0.24	0.76
42.82	154.58	65.11	2.17	141.09	2.36	0.26	0.77
42.86	157.33	66.27	2.16	143.45	2.36	0.30	0.77
42.94	157.83	66.36	2.17	144.33	2.36	0.26	0.77
43.01	154.98	64.68	2.24	144.98	2.38	0.28	0.77
43.07	156.09	65.13	2.24	145.66	2.38	0.27	0.77
43.15	155.22	64.65	2.24	144.96	2.38	0.28	0.77
43.21	154.45	64.42	2.22	142.74	2.38	0.26	0.77
43.26	153.38	64.08	2.19	140.10	2.37	0.25	0.77
43.32	152.86	63.98	2.16	137.97	2.36	0.26	0.77
43.41	152.89	64.08	2.13	136.46	2.35	0.25	0.77
43.47	153.60	64.51	2.10	135.43	2.34	0.25	0.77
43.54	156.87	66.20	2.05	135.53	2.33	0.26	0.77
43.61	161.50	68.41	2.01	137.38	2.32	0.28	0.78
43.67	166.20	70.46	2.00	140.80	2.32	0.30	0.78
43.74	170.79	72.49	1.98	143.87	2.31	0.33	0.78
43.82	173.34	73.62	1.97	145.24	2.31	0.36	0.79
43.86	171.83	72.82	1.99	144.61	2.31	0.34	0.78
43.94	166.33	69.87	2.05	143.43	2.33	0.31	0.78
43.99	159.55	66.40	2.13	141.59	2.35	0.28	0.77
44.07	155.36	64.27	2.18	139.84	2.37	0.26	0.77

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
44.11	151.07	62.14	2.22	138.16	2.38	0.26	0.76
44.20	148.15	60.59	2.27	137.42	2.39	0.23	0.76
44.24	145.86	59.24	2.34	138.50	2.41	0.23	0.76
44.33	147.34	59.75	2.35	140.15	2.41	0.24	0.76
44.38	149.65	60.78	2.33	141.35	2.40	0.25	0.76
44.46	151.20	61.55	2.29	140.74	2.39	0.25	0.76
44.51	145.83	58.95	2.35	138.50	2.41	0.26	0.76
44.59	137.24	54.65	2.49	136.03	2.44	0.21	0.75
44.64	123.22	47.90	2.76	132.32	2.50	0.19	0.73
44.72	112.48	43.15	2.89	124.80	2.52	0.16	0.72
44.81	104.67	39.66	3.02	119.91	2.55	0.15	0.70
44.85	102.96	38.97	3.02	117.68	2.55	0.15	0.70
44.93	104.43	39.36	3.08	121.26	2.56	0.15	0.70
44.97	109.84	41.70	2.99	124.48	2.54	0.16	0.71
45.06	117.89	45.08	2.89	130.50	2.52	0.18	0.72
45.11	129.83	50.22	2.76	138.82	2.50	0.20	0.73
45.17	136.17	52.80	2.74	144.62	2.49	0.24	0.74
45.23	139.36	54.15	2.71	146.60	2.49	0.22	0.74
45.29	136.95	53.08	2.72	144.51	2.49	0.22	0.74
45.36	135.61	52.53	2.71	142.38	2.49	0.21	0.74
45.43	167.45	68.77	2.08	143.12	2.34	0.19	0.78
45.49	190.73	80.22	1.88	150.98	2.28	0.80	0.80
45.56	331.07	156.87	1.26	197.45	1.97	0.30	0.89
45.62	444.95	219.63	1.15	253.06	1.86	0.94	0.94
45.69	526.04	262.86	1.13	296.04	1.83	0.97	0.97
45.76	450.40	212.75	1.27	270.76	1.98	0.94	0.94
45.81	338.50	148.06	1.63	240.84	2.18	0.88	0.88
45.88	256.80	105.02	2.15	225.77	2.36	0.83	0.83
45.95	205.45	79.95	2.68	213.88	2.48	0.80	0.80
46.02	180.36	68.68	2.93	201.45	2.53	0.42	0.78
46.08	165.21	62.30	3.03	189.08	2.55	0.35	0.76
46.15	158.27	59.79	2.97	177.77	2.54	0.31	0.76
46.21	155.49	59.18	2.84	167.99	2.51	0.28	0.76
46.28	164.32	64.06	2.52	161.24	2.45	0.28	0.77
46.34	181.73	73.36	2.15	157.45	2.36	0.44	0.78
46.41	199.65	82.88	1.89	157.04	2.28	0.65	0.80
46.47	203.48	84.79	1.86	157.64	2.27	0.73	0.80
46.54	195.56	79.94	2.01	160.84	2.32	0.55	0.80
46.61	192.98	77.78	2.14	166.31	2.36	0.41	0.79
46.69	200.56	81.13	2.10	170.35	2.34	0.67	0.80
46.75	214.76	88.35	1.95	171.91	2.30	0.81	0.81
46.80	221.70	91.95	1.88	172.48	2.28	0.82	0.82
46.87	223.33	92.68	1.86	172.78	2.27	0.82	0.82
46.93	222.83	92.16	1.88	173.69	2.28	0.82	0.82
46.99	217.19	89.25	1.93	172.09	2.29	0.81	0.81
47.06	204.58	82.66	2.06	170.55	2.33	0.73	0.80
47.15	191.96	76.27	2.21	168.40	2.37	0.46	0.79
47.20	186.16	73.28	2.29	168.02	2.40	0.45	0.78

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
47.27	188.92	74.79	2.22	166.26	2.38	0.49	0.79
47.35	190.66	75.88	2.16	163.84	2.36	0.55	0.79
47.40	184.19	72.97	2.19	159.85	2.37	0.49	0.78
47.48	175.67	68.86	2.28	156.99	2.39	0.33	0.78
47.53	166.94	64.56	2.40	154.92	2.42	0.33	0.77
47.59	166.54	64.61	2.35	152.05	2.41	0.30	0.77
47.66	165.47	64.37	2.32	149.24	2.40	0.32	0.77
47.73	165.30	64.48	2.28	146.94	2.39	0.30	0.77
47.80	166.88	65.23	2.25	146.67	2.38	0.29	0.77
47.85	178.49	70.92	2.09	148.35	2.34	0.33	0.78
47.93	196.14	79.80	1.89	150.75	2.28	0.55	0.80
47.98	216.37	90.26	1.71	154.22	2.22	0.75	0.81
48.06	223.51	94.10	1.64	154.73	2.19	0.82	0.82
48.12	218.67	91.57	1.67	153.06	2.20	0.81	0.81
48.18	200.32	81.87	1.83	149.76	2.26	0.55	0.80
48.26	183.11	72.96	2.02	147.34	2.32	0.36	0.78
48.32	171.38	67.22	2.15	144.28	2.36	0.32	0.77
48.37	166.64	65.05	2.18	141.78	2.37	0.30	0.77
48.46	165.27	64.67	2.14	138.56	2.36	0.29	0.77
48.52	168.05	66.09	2.09	138.08	2.34	0.29	0.77
48.59	179.77	71.55	1.99	142.12	2.31	0.33	0.78
48.66	195.63	78.89	1.88	148.51	2.28	0.53	0.79
48.70	209.72	85.13	1.84	156.48	2.26	0.76	0.80
48.79	215.32	87.32	1.84	160.76	2.26	0.81	0.81
48.83	219.42	88.85	1.85	164.43	2.27	0.81	0.81
48.91	218.81	88.15	1.88	166.06	2.28	0.81	0.81
48.98	214.15	85.38	1.96	167.30	2.30	0.81	0.81
49.04	211.10	83.62	2.01	167.85	2.32	0.61	0.80
49.10	209.86	83.12	2.00	166.20	2.32	0.80	0.80
49.17	215.16	86.22	1.90	163.43	2.28	0.74	0.81
49.24	209.86	83.95	1.90	159.35	2.28	0.80	0.80
49.29	196.34	77.49	2.00	154.60	2.31	0.58	0.79
49.38	177.12	68.05	2.22	150.93	2.38	0.32	0.77
49.44	163.73	61.45	2.43	149.44	2.43	0.28	0.76
49.51	161.15	60.04	2.50	150.31	2.44	0.29	0.76
49.57	161.32	60.11	2.49	149.72	2.44	0.30	0.76
49.64	160.37	60.12	2.41	144.76	2.42	0.28	0.76
49.70	170.47	64.74	2.28	147.85	2.39	0.26	0.77
49.77	206.44	81.13	1.99	161.15	2.31	0.47	0.80
49.84	257.98	105.07	1.73	182.03	2.23	0.83	0.83
49.88	312.06	131.79	1.52	200.94	2.14	0.87	0.87
49.97	317.82	133.77	1.54	205.84	2.14	0.87	0.87
50.06	291.88	119.54	1.69	202.01	2.21	0.85	0.85
50.11	240.28	93.33	2.08	194.04	2.34	0.82	0.82
50.16	204.32	76.16	2.46	187.40	2.43	0.69	0.79
50.21	185.21	67.70	2.66	180.38	2.48	0.41	0.77
50.28	173.11	62.96	2.70	169.69	2.49	0.40	0.76
50.35	172.81	64.02	2.45	157.08	2.43	0.30	0.77

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
50.41	169.63	63.59	2.32	147.27	2.40	0.37	0.77
50.47	173.89	65.97	2.19	144.42	2.37	0.30	0.77
50.56	181.64	69.59	2.09	145.77	2.34	0.35	0.78
50.62	199.29	78.24	1.89	148.20	2.28	0.53	0.79
50.68	211.30	84.30	1.77	149.63	2.24	0.80	0.80
50.74	207.11	82.08	1.82	148.99	2.26	0.71	0.80
50.81	193.98	75.29	1.96	147.87	2.30	0.41	0.79
50.87	184.49	70.32	2.11	148.29	2.35	0.37	0.78
50.94	179.19	67.51	2.20	148.84	2.37	0.42	0.77
51.02	173.52	65.08	2.23	145.28	2.38	0.32	0.77
51.10	166.14	61.98	2.26	140.20	2.39	0.28	0.76
51.15	163.83	61.60	2.17	133.90	2.36	0.27	0.76
51.23	162.89	61.40	2.14	131.19	2.35	0.28	0.76
51.26	170.38	65.46	1.97	129.09	2.31	0.25	0.77
51.33	176.12	68.43	1.88	128.62	2.28	0.37	0.78
51.40	177.46	69.16	1.85	128.08	2.27	0.34	0.78
51.46	167.33	64.08	1.97	126.50	2.31	0.27	0.77
51.53	157.36	59.18	2.11	125.01	2.35	0.24	0.76
51.60	154.95	58.04	2.14	124.15	2.36	0.23	0.75
51.66	160.29	60.75	2.03	123.46	2.33	0.24	0.76
51.74	168.85	65.03	1.90	123.55	2.28	0.28	0.77
51.80	174.82	68.09	1.82	123.63	2.26	0.31	0.77
51.85	172.70	66.90	1.85	123.70	2.27	0.30	0.77
51.92	162.57	61.71	1.99	123.03	2.31	0.26	0.76
52.01	151.80	56.43	2.16	121.63	2.36	0.22	0.75
52.07	145.10	53.41	2.23	119.03	2.38	0.21	0.74
52.13	142.88	52.66	2.20	116.11	2.37	0.21	0.74
52.19	140.90	51.89	2.20	114.15	2.37	0.20	0.74
52.26	141.64	52.25	2.18	113.70	2.37	0.19	0.74
52.34	145.73	54.12	2.11	114.34	2.35	0.21	0.74
52.38	153.59	57.76	2.01	116.11	2.32	0.22	0.75
52.47	158.18	59.68	1.98	118.26	2.31	0.25	0.76
52.51	159.39	58.69	2.20	129.14	2.37	0.26	0.76
52.60	163.99	59.12	2.41	142.34	2.42	0.26	0.76
52.64	180.70	65.25	2.41	157.39	2.42	0.35	0.77
52.73	204.41	75.81	2.17	164.25	2.36	0.77	0.79
52.77	211.46	78.87	2.11	166.77	2.35	0.79	0.79
52.86	196.40	71.49	2.32	165.59	2.40	0.55	0.78
52.90	184.15	65.77	2.50	164.57	2.44	0.30	0.77
52.97	181.47	64.84	2.48	160.97	2.44	0.51	0.77
53.04	183.48	66.49	2.32	154.22	2.40	0.45	0.77
53.10	182.36	66.92	2.19	146.72	2.37	0.31	0.77
53.17	180.02	66.39	2.13	141.60	2.35	0.42	0.77
53.24	185.49	69.38	2.01	139.25	2.32	0.35	0.78
53.31	182.25	68.00	2.02	137.14	2.32	0.40	0.77
53.36	174.87	64.50	2.10	135.59	2.35	0.34	0.77
53.43	164.50	59.57	2.25	134.28	2.39	0.26	0.76
53.50	158.84	56.96	2.33	132.93	2.41	0.25	0.75

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
53.56	160.22	57.91	2.25	130.19	2.38	0.26	0.75
53.63	161.42	58.91	2.15	126.55	2.36	0.26	0.76
53.71	160.25	58.83	2.08	122.55	2.34	0.25	0.76
53.77	157.53	57.75	2.08	120.37	2.34	0.24	0.75
53.84	156.86	57.39	2.09	120.13	2.34	0.23	0.75
53.91	156.16	56.87	2.13	120.91	2.35	0.24	0.75
53.99	156.56	56.70	2.17	122.99	2.36	0.24	0.75
54.03	159.32	56.84	2.32	131.68	2.40	0.25	0.75
54.12	165.59	58.60	2.39	140.20	2.42	0.29	0.75
54.16	175.66	62.09	2.42	150.12	2.43	0.34	0.76
54.25	183.14	64.77	2.41	156.12	2.42	0.43	0.77
54.29	197.36	70.20	2.36	165.94	2.41	0.45	0.78
54.38	218.73	79.35	2.19	173.62	2.37	0.80	0.80
54.41	242.38	90.26	1.97	177.95	2.31	0.81	0.81
54.49	245.23	92.07	1.90	174.94	2.28	0.82	0.82
54.56	223.85	82.52	2.03	167.22	2.32	0.80	0.80
54.63	191.38	67.87	2.34	158.68	2.41	0.42	0.77
54.70	168.81	58.28	2.59	150.94	2.46	0.28	0.75
54.76	159.56	54.92	2.60	142.56	2.46	0.26	0.75
54.82	158.29	55.22	2.43	134.14	2.43	0.26	0.75
54.89	158.53	56.17	2.27	127.50	2.39	0.25	0.75
54.97	158.53	56.53	2.20	124.24	2.37	0.25	0.75
55.01	158.90	56.55	2.21	125.14	2.37	0.25	0.75
55.10	160.11	56.67	2.26	127.91	2.39	0.25	0.75
55.14	170.62	61.21	2.14	131.11	2.36	0.26	0.76
55.20	180.73	65.67	2.04	133.69	2.33	0.41	0.77
55.27	186.98	68.31	1.99	135.99	2.31	0.40	0.78
55.34	183.96	66.62	2.05	136.82	2.33	0.34	0.77
55.41	181.01	65.21	2.09	136.12	2.34	0.35	0.77
55.48	177.59	63.74	2.11	134.40	2.35	0.35	0.77
55.54	170.21	60.40	2.20	132.61	2.37	0.30	0.76
55.61	160.68	56.01	2.33	130.72	2.41	0.25	0.75
55.67	156.42	54.21	2.38	128.85	2.42	0.23	0.74
55.74	155.75	53.64	2.43	130.56	2.43	0.25	0.74
55.82	163.26	56.35	2.41	136.08	2.42	0.25	0.75
55.86	187.16	65.39	2.32	151.88	2.40	0.33	0.77
55.94	234.60	85.25	2.01	171.37	2.32	0.81	0.81
56.01	290.49	109.78	1.74	191.33	2.23	0.84	0.84
56.08	323.56	124.93	1.62	201.96	2.18	0.86	0.86
56.12	312.94	119.57	1.67	199.99	2.20	0.85	0.85
56.19	271.83	99.98	1.91	191.11	2.29	0.83	0.83
56.25	220.40	76.72	2.35	180.25	2.41	0.79	0.79
56.32	186.93	62.75	2.70	169.57	2.49	0.35	0.76
56.38	167.94	55.63	2.82	156.87	2.51	0.31	0.75
56.45	162.39	54.40	2.66	144.51	2.48	0.28	0.75
56.52	158.20	53.42	2.54	135.81	2.45	0.26	0.74
56.59	154.78	52.27	2.52	131.85	2.45	0.24	0.74
56.66	163.28	55.92	2.38	133.05	2.42	0.23	0.75

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
56.73	180.63	63.63	2.14	135.95	2.35	0.36	0.77
56.79	200.12	72.42	1.93	139.64	2.29	0.56	0.78
56.84	200.93	72.43	1.95	141.56	2.30	0.63	0.78
56.92	187.01	65.54	2.17	142.18	2.36	0.38	0.77
56.99	178.26	61.16	2.34	143.22	2.41	0.27	0.76
57.04	175.78	60.05	2.38	142.77	2.42	0.40	0.76
57.11	182.00	63.32	2.21	139.84	2.37	0.33	0.77
57.17	180.63	63.28	2.13	135.07	2.35	0.36	0.76
57.24	177.71	62.47	2.09	130.81	2.34	0.33	0.76
57.30	169.25	58.90	2.16	127.51	2.36	0.28	0.76
57.38	159.62	54.69	2.29	124.99	2.39	0.24	0.75
57.44	152.98	51.85	2.36	122.31	2.41	0.22	0.74
57.51	150.60	51.00	2.36	120.10	2.41	0.22	0.74
57.56	153.32	52.46	2.26	118.73	2.39	0.22	0.74
57.64	157.82	54.59	2.16	118.02	2.36	0.24	0.75
57.70	160.77	56.09	2.08	116.91	2.34	0.25	0.75
57.77	159.90	55.81	2.07	115.66	2.34	0.24	0.75
57.83	160.74	55.45	2.17	120.39	2.36	0.23	0.75
57.90	176.42	60.77	2.20	133.82	2.37	0.27	0.76
57.97	212.25	75.34	1.98	148.98	2.31	0.56	0.79
58.06	248.35	91.26	1.75	159.43	2.23	0.81	0.81
58.10	267.86	100.85	1.61	162.13	2.17	0.83	0.83
58.16	254.84	94.86	1.66	157.72	2.20	0.82	0.82
58.23	223.78	80.22	1.89	151.45	2.28	0.80	0.80
58.28	188.99	64.33	2.27	146.27	2.39	0.35	0.77
58.36	165.61	54.37	2.61	141.68	2.47	0.27	0.75
58.42	156.04	50.92	2.64	134.65	2.47	0.25	0.74
58.49	154.94	51.28	2.47	126.82	2.44	0.23	0.74
58.56	164.00	55.97	2.19	122.54	2.37	0.23	0.75
58.63	176.99	62.03	1.98	122.59	2.31	0.33	0.76
58.68	186.12	66.05	1.89	124.63	2.28	0.37	0.77
58.76	181.08	63.54	1.96	124.50	2.30	0.34	0.77
58.81	165.24	56.19	2.20	123.36	2.37	0.27	0.75
58.90	151.42	49.94	2.45	122.14	2.43	0.20	0.73
58.96	143.44	46.59	2.59	120.46	2.46	0.21	0.73
59.02	144.08	47.07	2.51	118.27	2.45	0.20	0.73
59.07	145.50	48.03	2.40	115.21	2.42	0.21	0.73
59.15	148.95	49.99	2.25	112.36	2.38	0.21	0.73
59.21	151.44	51.45	2.13	109.82	2.35	0.22	0.74
59.29	153.44	52.47	2.07	108.82	2.34	0.21	0.74
59.34	153.35	52.41	2.07	108.70	2.34	0.21	0.74
59.41	152.38	51.91	2.09	108.68	2.34	0.21	0.74
59.48	150.09	50.86	2.13	108.16	2.35	0.21	0.74
59.54	146.57	49.44	2.15	106.47	2.36	0.20	0.73
59.60	144.09	48.53	2.15	104.55	2.36	0.19	0.73
59.69	143.69	48.27	2.17	104.64	2.36	0.19	0.73
59.73	148.18	48.98	2.31	113.28	2.40	0.20	0.73
59.81	162.34	53.47	2.37	126.68	2.41	0.24	0.74

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
59.89	178.92	59.25	2.33	138.34	2.41	0.38	0.76
59.93	191.80	64.42	2.22	143.31	2.38	0.46	0.77
60.02	191.49	64.19	2.23	143.28	2.38	0.46	0.77
60.06	180.92	59.50	2.39	141.98	2.42	0.38	0.76
60.12	168.15	54.09	2.59	140.12	2.46	0.27	0.74
60.19	157.29	49.78	2.75	136.66	2.50	0.25	0.73
60.26	153.79	48.86	2.68	130.91	2.48	0.23	0.73
60.32	152.25	48.78	2.57	125.35	2.46	0.23	0.73
60.39	152.49	49.19	2.49	122.28	2.44	0.23	0.73
60.46	155.18	50.42	2.41	121.40	2.42	0.22	0.74
60.53	163.60	54.04	2.27	122.53	2.39	0.25	0.74
60.58	180.15	61.35	2.02	124.12	2.32	0.30	0.76
60.66	193.27	66.87	1.91	127.67	2.29	0.46	0.77
60.72	195.61	67.33	1.95	130.98	2.30	0.45	0.77
60.78	181.08	60.22	2.20	132.78	2.37	0.36	0.76
60.87	164.61	52.76	2.52	132.89	2.45	0.25	0.74
60.93	153.52	48.31	2.69	129.82	2.48	0.23	0.73
61.01	151.37	47.71	2.65	126.60	2.48	0.23	0.73
61.04	157.22	50.37	2.48	125.06	2.44	0.22	0.74
61.11	168.23	54.91	2.31	126.77	2.40	0.28	0.75
61.18	181.49	60.54	2.14	129.35	2.35	0.35	0.76
61.24	186.62	62.61	2.09	130.73	2.34	0.39	0.76
61.31	182.48	60.64	2.16	130.75	2.36	0.35	0.76
61.37	167.78	53.91	2.43	131.09	2.43	0.30	0.74
61.45	155.84	48.54	2.74	132.83	2.49	0.22	0.73
61.50	151.45	46.48	2.90	134.68	2.52	0.22	0.72
61.56	156.06	48.39	2.78	134.27	2.50	0.26	0.73
61.64	158.95	49.74	2.66	132.43	2.48	0.26	0.73
61.69	157.71	49.34	2.65	130.95	2.48	0.24	0.73
61.77	158.59	49.42	2.69	132.92	2.48	0.24	0.73
61.83	175.37	56.17	2.42	135.91	2.43	0.26	0.75
61.91	198.46	65.87	2.12	139.85	2.35	0.57	0.77
61.97	217.95	74.30	1.93	143.16	2.29	0.79	0.79
62.02	208.47	69.62	2.07	144.23	2.34	0.78	0.78
62.12	186.91	59.80	2.41	144.31	2.42	0.33	0.76
62.18	165.51	50.78	2.83	143.59	2.51	0.26	0.74
62.22	157.48	47.71	2.96	141.18	2.54	0.26	0.73
62.28	159.12	48.88	2.78	135.96	2.50	0.24	0.73
62.36	160.24	49.88	2.62	130.70	2.47	0.27	0.73
62.42	163.62	51.62	2.47	127.70	2.44	0.25	0.74
62.49	163.86	51.84	2.44	126.38	2.43	0.26	0.74
62.55	166.45	52.72	2.42	127.73	2.43	0.26	0.74
62.62	173.63	55.57	2.33	129.22	2.40	0.28	0.75
62.69	184.87	60.55	2.14	129.50	2.36	0.35	0.76
62.75	187.95	62.45	2.02	126.05	2.32	0.44	0.76
62.83	179.49	59.19	2.06	121.99	2.33	0.30	0.76
62.88	160.53	50.92	2.36	119.95	2.41	0.24	0.74
62.96	148.43	45.76	2.61	119.54	2.47	0.20	0.72

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
63.01	144.23	44.22	2.66	117.44	2.48	0.20	0.72
63.07	143.91	44.42	2.57	114.26	2.46	0.21	0.72
63.14	146.84	45.66	2.49	113.84	2.44	0.19	0.72
63.20	153.57	47.54	2.55	121.15	2.45	0.22	0.73
63.27	175.79	55.40	2.40	133.14	2.42	0.27	0.75
63.34	203.44	66.04	2.17	143.40	2.36	0.57	0.77
63.40	222.15	74.21	1.95	145.02	2.30	0.79	0.79
63.47	220.10	74.36	1.87	138.77	2.27	0.78	0.79
63.53	197.23	65.05	2.01	131.05	2.32	0.46	0.77
63.61	177.89	56.92	2.24	127.21	2.38	0.25	0.75
63.67	169.81	53.24	2.39	127.37	2.42	0.26	0.74
63.74	172.90	54.59	2.32	126.75	2.40	0.31	0.75
63.80	168.05	52.59	2.39	125.75	2.42	0.30	0.74
63.86	159.11	48.85	2.56	125.13	2.46	0.22	0.73
63.93	150.16	45.14	2.77	124.84	2.50	0.22	0.72
64.00	149.42	44.85	2.77	124.27	2.50	0.21	0.72
64.05	147.86	44.39	2.75	122.29	2.50	0.22	0.72
64.13	148.39	44.89	2.66	119.42	2.48	0.21	0.72
64.19	148.38	45.28	2.56	115.73	2.46	0.21	0.72
64.25	151.52	47.05	2.38	111.91	2.42	0.21	0.73
64.33	155.16	49.61	2.13	105.54	2.35	0.21	0.73
64.39	158.35	52.60	1.84	96.93	2.27	0.21	0.74
64.46	158.66	53.91	1.70	91.54	2.21	0.19	0.74
64.51	156.38	53.43	1.66	88.72	2.20	0.18	0.74
64.58	155.16	52.69	1.69	89.01	2.21	0.18	0.74
64.65	154.94	52.23	1.73	90.22	2.22	0.19	0.74
64.72	150.63	48.78	1.98	96.81	2.31	0.20	0.73
64.79	152.72	47.70	2.27	108.17	2.39	0.18	0.73
64.85	162.01	49.74	2.44	121.62	2.43	0.25	0.73
64.91	186.58	58.16	2.34	135.83	2.41	0.34	0.75
64.98	207.32	65.62	2.22	145.41	2.38	0.67	0.77
65.05	219.26	70.37	2.11	148.82	2.35	0.78	0.78
65.11	213.16	68.39	2.11	144.00	2.35	0.74	0.78
65.18	198.75	63.35	2.14	135.39	2.35	0.41	0.77
65.24	179.70	55.91	2.30	128.75	2.40	0.33	0.75
65.31	167.52	51.11	2.46	125.89	2.44	0.25	0.74
65.37	164.14	49.25	2.62	129.22	2.47	0.24	0.73
65.44	173.86	52.80	2.51	132.35	2.45	0.28	0.74
65.51	185.88	57.46	2.34	134.67	2.41	0.40	0.75
65.57	191.37	59.64	2.27	135.35	2.39	0.42	0.76
65.63	183.96	56.45	2.40	135.25	2.42	0.37	0.75
65.70	169.75	50.55	2.67	135.12	2.48	0.28	0.74
65.77	161.63	47.23	2.86	135.12	2.52	0.23	0.73
65.84	164.33	48.46	2.75	133.32	2.50	0.26	0.73
65.89	172.40	52.58	2.40	126.41	2.42	0.31	0.74
65.96	168.75	51.94	2.30	119.59	2.40	0.30	0.74
66.04	161.08	49.32	2.33	114.79	2.40	0.21	0.73
66.09	152.62	45.44	2.58	117.29	2.46	0.22	0.72

:: Strength loss calculation (Idriss & Boulanger (2008) :: (continued)

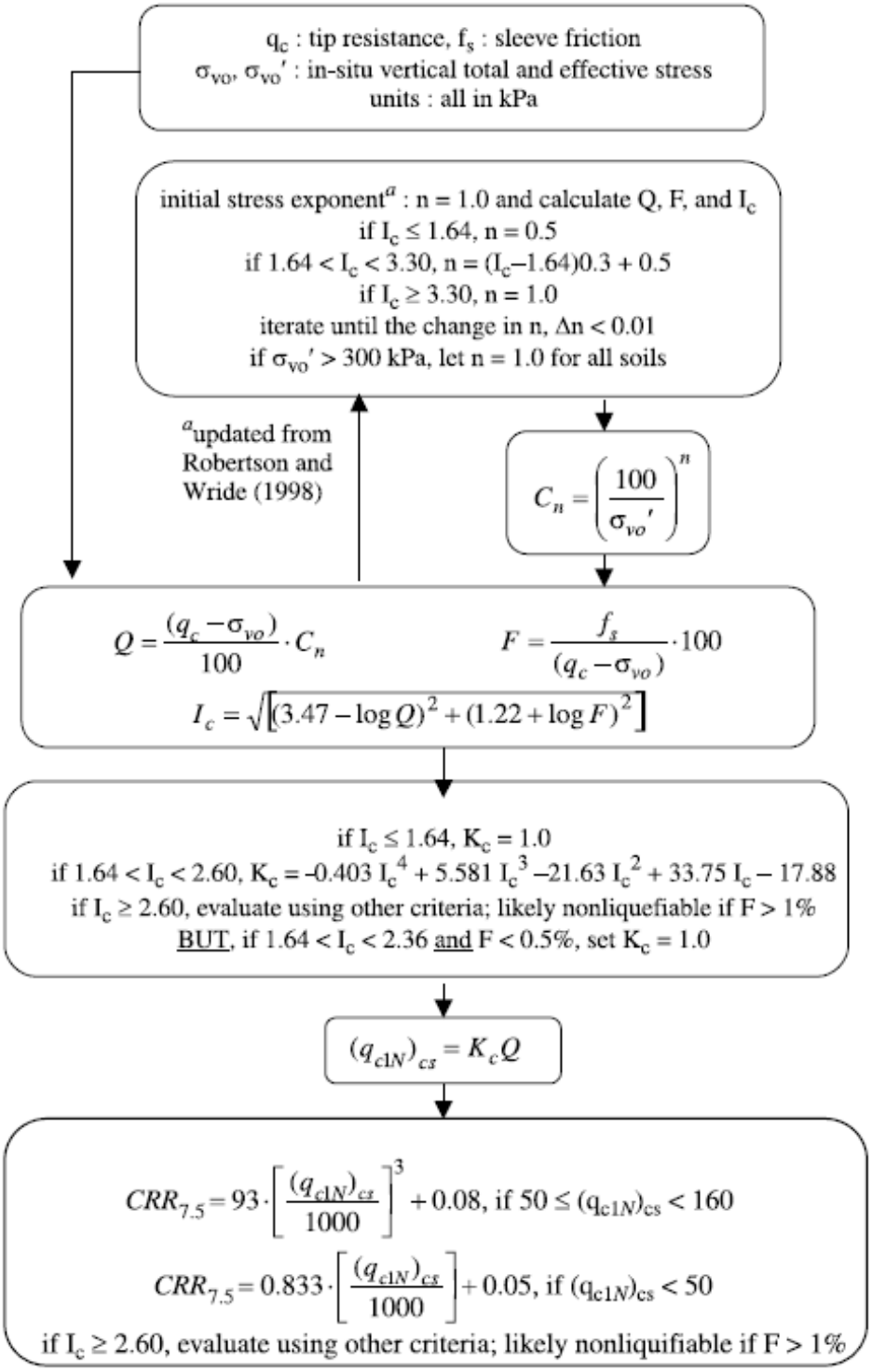
Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
66.16	157.14	46.84	2.57	120.41	2.46	0.22	0.73
66.23	161.83	48.36	2.55	123.20	2.45	0.26	0.73
66.29	172.68	52.63	2.37	124.48	2.41	0.26	0.74
66.36	176.34	54.10	2.30	124.55	2.40	0.33	0.74
66.43	175.22	53.77	2.29	123.19	2.39	0.29	0.74
66.48	168.11	51.29	2.33	119.27	2.40	0.24	0.74
66.55	161.05	48.87	2.35	115.06	2.41	0.24	0.73
66.62	156.83	47.59	2.34	111.23	2.41	0.22	0.73
66.68	153.74	46.52	2.35	109.35	2.41	0.21	0.73
66.75	152.85	46.33	2.32	107.69	2.40	0.21	0.72
66.82	153.92	46.87	2.28	106.71	2.39	0.21	0.73
66.88	155.45	47.61	2.24	106.44	2.38	0.21	0.73
66.95	157.96	48.55	2.20	107.00	2.37	0.22	0.73
67.01	160.99	49.54	2.19	108.68	2.37	0.22	0.73
67.08	164.39	50.86	2.15	109.29	2.36	0.23	0.74
67.14	166.37	52.13	2.04	106.61	2.33	0.24	0.74
67.21	166.85	52.73	1.98	104.19	2.31	0.23	0.74
67.28	166.10	52.40	1.98	103.88	2.31	0.23	0.74
67.35	166.08	52.02	2.03	105.57	2.32	0.23	0.74
67.40	168.70	53.36	1.96	104.45	2.30	0.22	0.74
67.47	168.80	53.82	1.90	102.06	2.28	0.24	0.74
67.53	172.32	55.43	1.84	101.89	2.26	0.22	0.75
67.61	173.94	59.34	1.52	90.03	2.13	0.21	0.76
67.67	183.50	69.51	1.19	82.87	1.90	0.14	0.78
67.73	190.33	52.99	26.61	1409.89	4.06	0.61	3.79
67.80	199.39	55.58	26.61	1478.71	4.06	0.65	3.97
67.87	199.12	55.49	26.61	1476.23	4.06	0.75	3.96
67.93	217.14	60.64	26.61	1613.28	4.06	0.61	4.33
68.00	232.32	64.97	26.61	1728.61	4.06	0.77	4.64

Abbreviations

q_t:	Total cone resistance
K_c:	Cone resistance correction factor due to fines
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
I_c:	Soil behavior type index
$S_{u(liq)}/\sigma'_v$:	Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$:	Calculated peak undrained strength ratio

Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

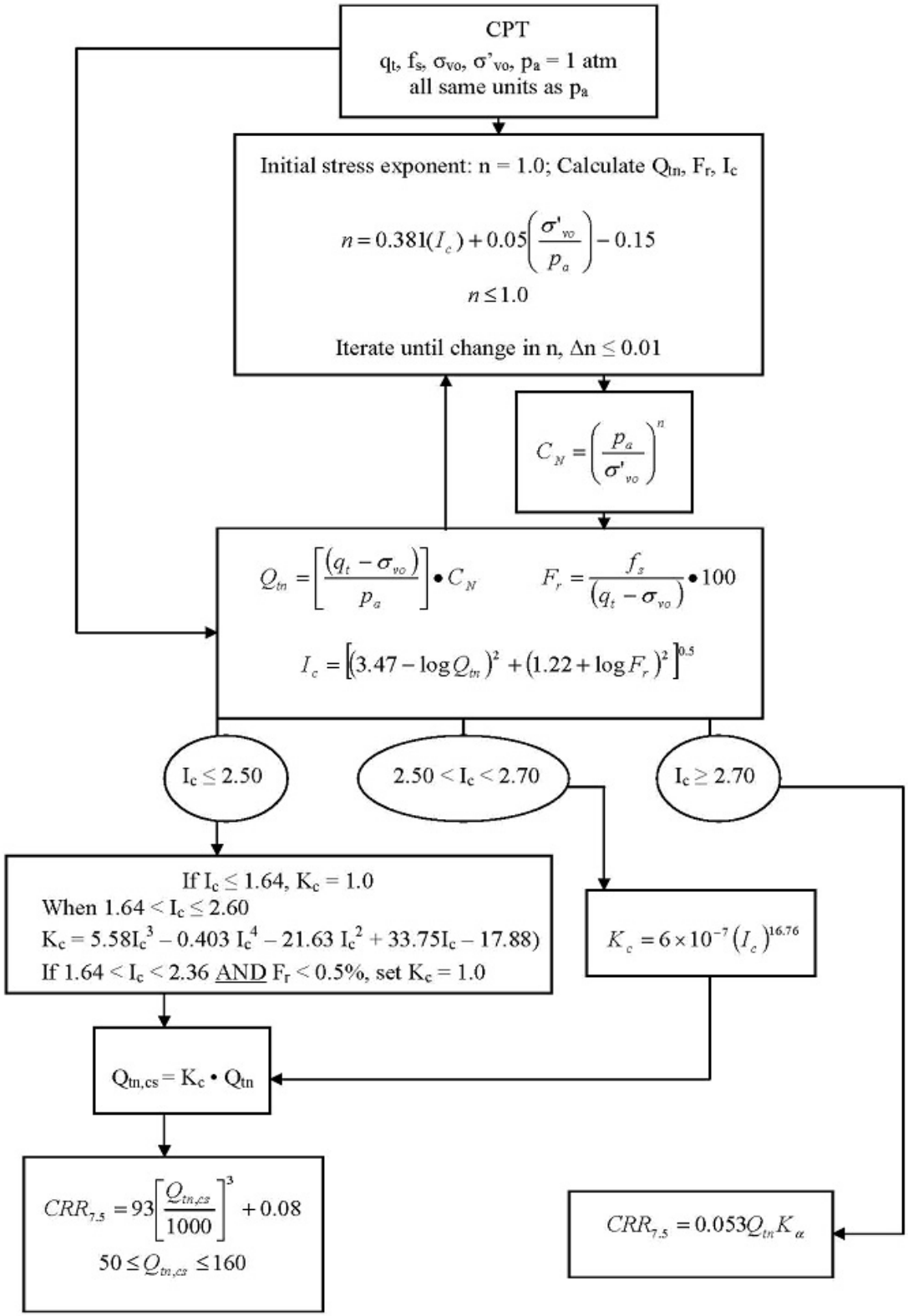
Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

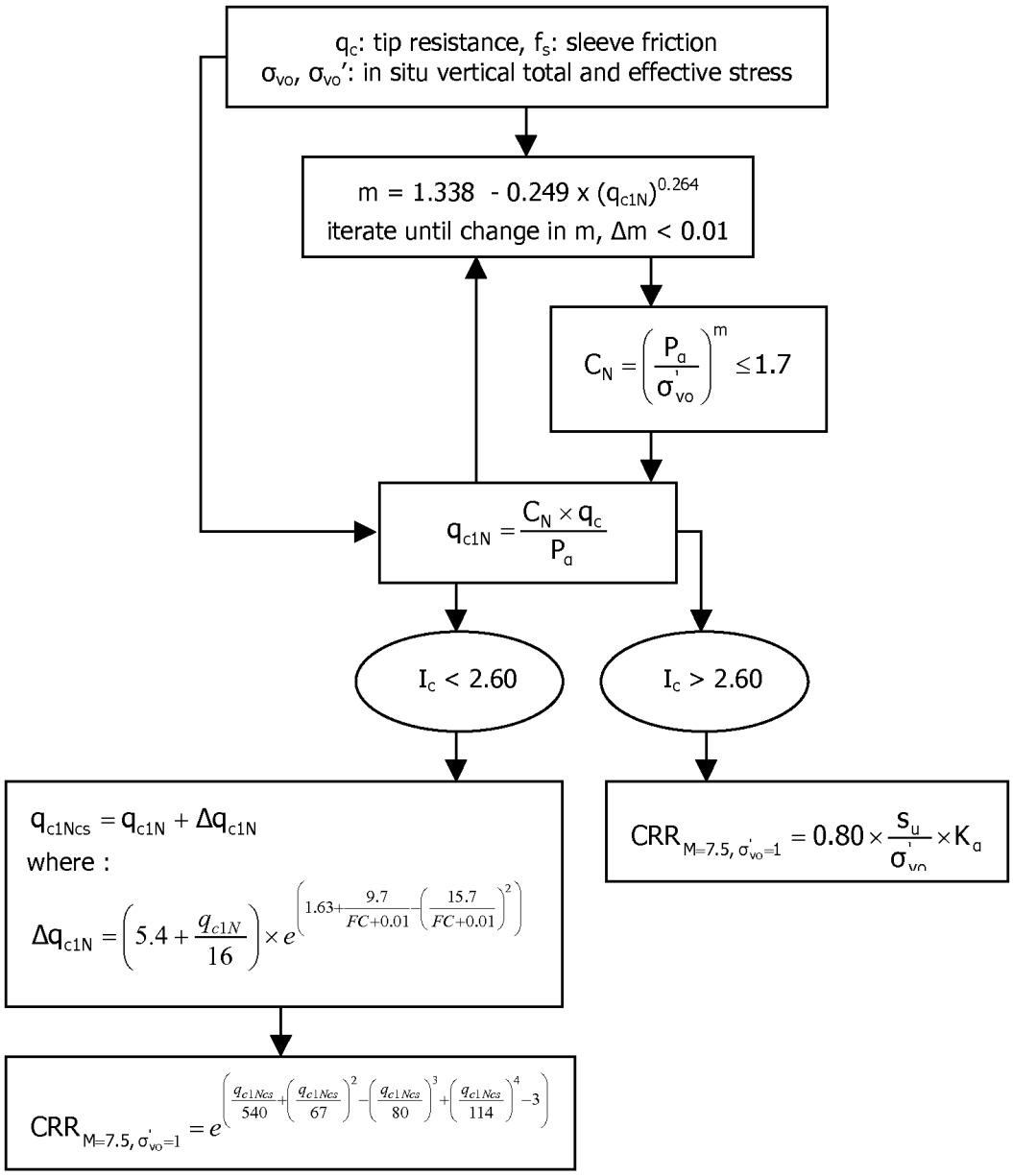
Procedure for the evaluation of soil liquefaction resistance (all soils), Robertson (2010)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. This procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:

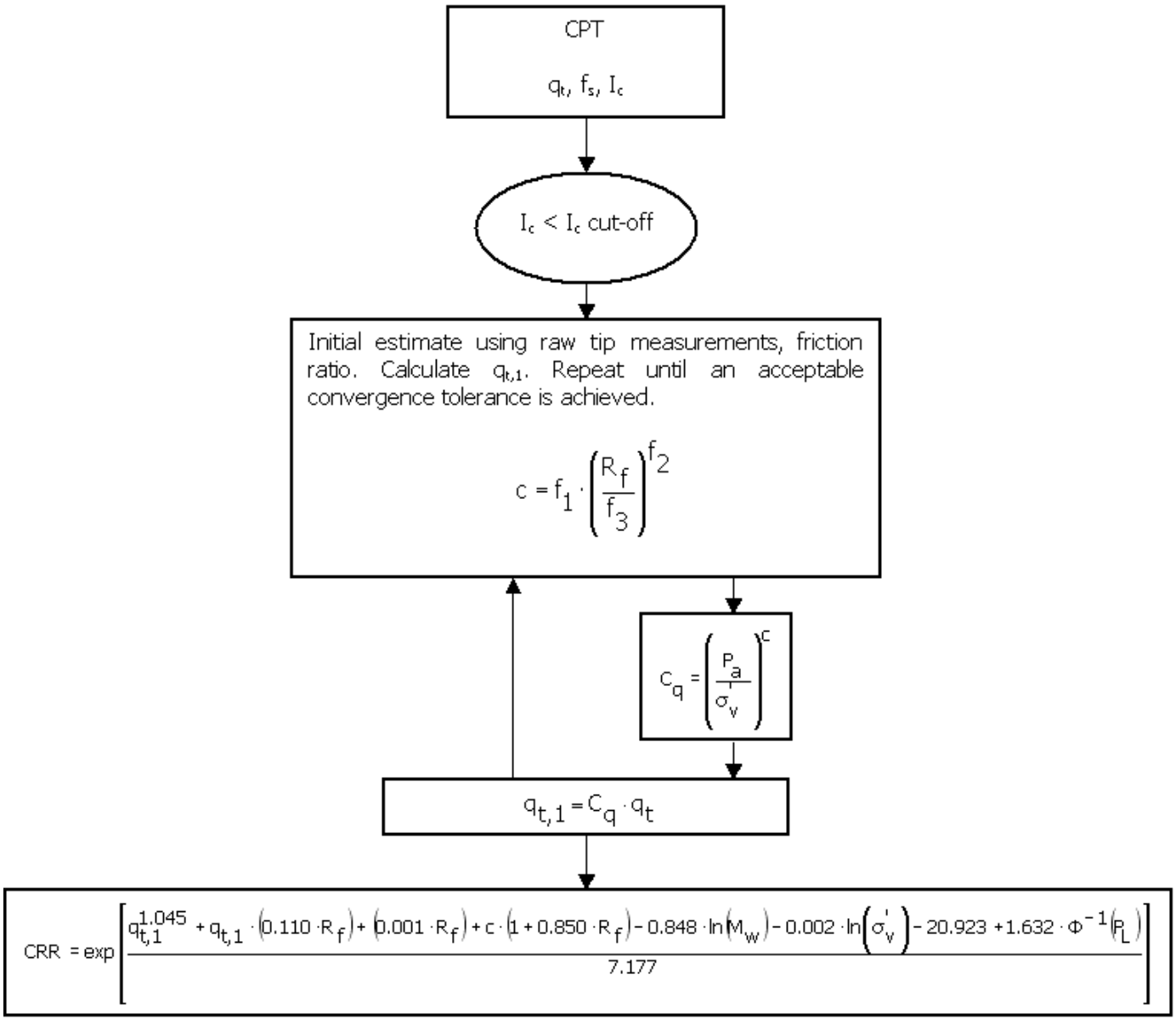


[1] P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering – from case history to practice, IS-Tokyo, June 2009

Procedure for the evaluation of soil liquefaction resistance, Idriss & Boulanger (2008)



Procedure for the evaluation of soil liquefaction resistance (sandy soils), Moss et al. (2006)



Procedure for the evaluation of soil liquefaction resistance, Boulanger & Idriss(2014)

$$FS_{liq} = \frac{CRR_{M=7.5,\sigma'_v=1atm}}{CSR_{M=7.5,\sigma'_v=1atm}}$$

$$CSR_{M=7.5,\sigma'_v=1atm} = 0.65 \frac{\sigma_v}{\sigma'_v} \frac{a_{max}}{g} r_d \frac{1}{MSF} \frac{1}{K_\sigma}$$

$$r_d = \exp\left[\alpha(z) + \beta(z) \cdot M\right]$$

$$\alpha(z) = -1.012 - 1.126 \sin\left(\frac{z}{11.73} + 5.133\right)$$

$$\beta(z) = 0.106 + 0.118 \sin\left(\frac{z}{11.28} + 5.142\right)$$

$$K_\sigma = 1 - C_\sigma \ln\left(\frac{\sigma'_v}{P_a}\right) \le 1.1$$

$$C_\sigma = \frac{1}{37.3 - 8.27\left(q_{c1Ncs}\right)^{0.264}} \le 0.3$$

$$MSF = 1 + \left(MSF_{max} - 1\right)\left(8.64 \exp\left(\frac{-M}{4}\right) - 1.325\right)$$

$$MSF_{max} = 1.09 + \left(\frac{q_{C1Ncs}}{180}\right)^3 \le 2.2$$

σ'_v *and* σ_v *at start of earthquake shaking*

$$CRR_{M=7.5,\sigma'_v=1atm} = \exp\left(\frac{q_{c1Ncs}}{113} + \left(\frac{q_{c1Ncs}}{1000}\right)^2 - \left(\frac{q_{c1Ncs}}{140}\right)^3 + \left(\frac{q_{c1Ncs}}{137}\right)^4 - 2.80\right)$$

$$q_{c1Ncs} = q_{c1N} + \Delta q_{c1N}$$

$$\Delta q_{c1N} = \left(11.9 + \frac{q_{c1N}}{14.6}\right) \exp\left(1.63 - \frac{9.7}{FC+2} - \left(\frac{15.7}{FC+2}\right)^2\right)$$

$$q_{c1N} = C_{Ne} \frac{q_c}{P_a}$$

$$C_{Ne} = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 1.338 - 0.249\left(q_{c1Ncs}\right)^{0.264} \quad with \quad 0.264 \le m \le 0.782$$

$$FC = 80\left(I_C + C_{FC}\right) - 137 \quad with \quad 0\% \le FC \le 100\%$$

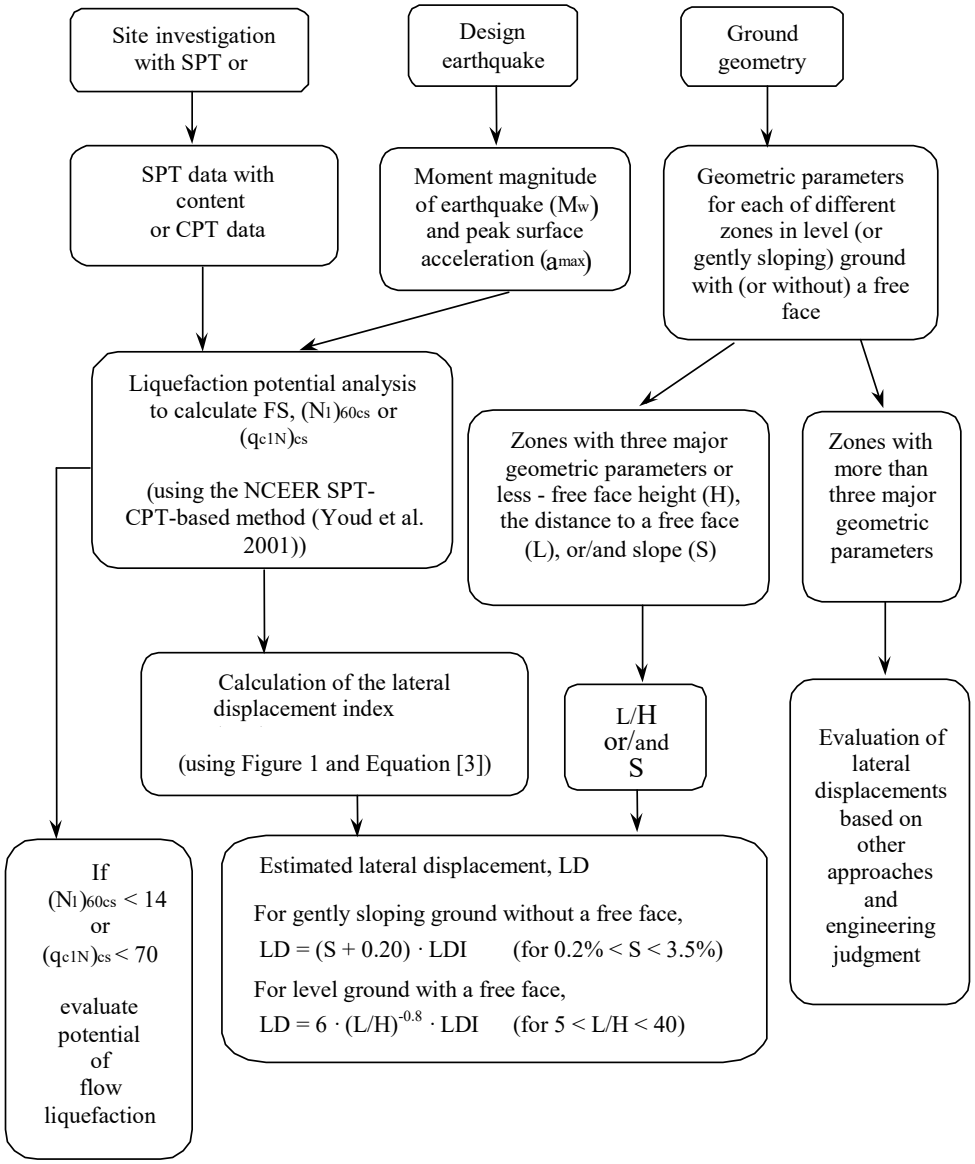
$$I_c = \left[\left(3.47 - \log\left(Q\right)\right)^2 + \left(1.22 + \log\left(F\right)\right)^2\right]^{0.5}$$

$$Q = \left(\frac{q_c - \sigma_{vc}}{P_a}\right)\left(\frac{P_a}{\sigma'_{vc}}\right)^n \; with \; 0.5 \le n \le 1.0 \; per \; Robertson \; \& \; Wride \; (1998)$$

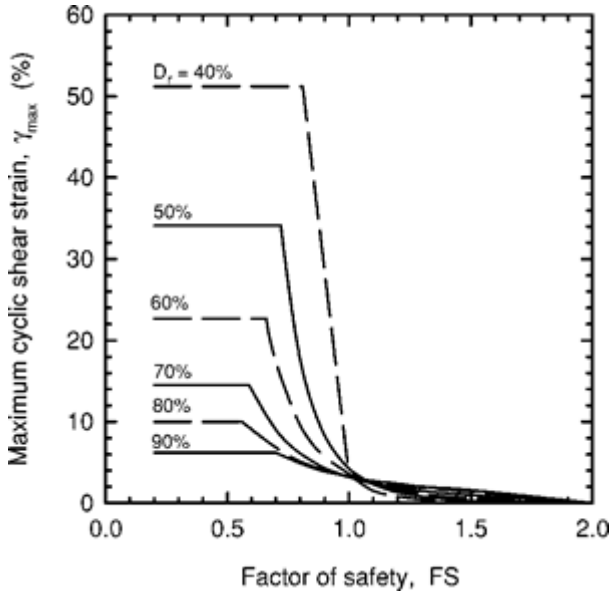
$$F = \left(\frac{f_s}{q_c - \sigma_{vc}}\right) \cdot 100\%$$

σ'_v *at time of CPT sounding*

Procedure for the evaluation of liquefaction-induced lateral spreading displacements



[1] Flow chart illustrating major steps in estimating liquefaction-induced lateral spreading displacements using the proposed approach



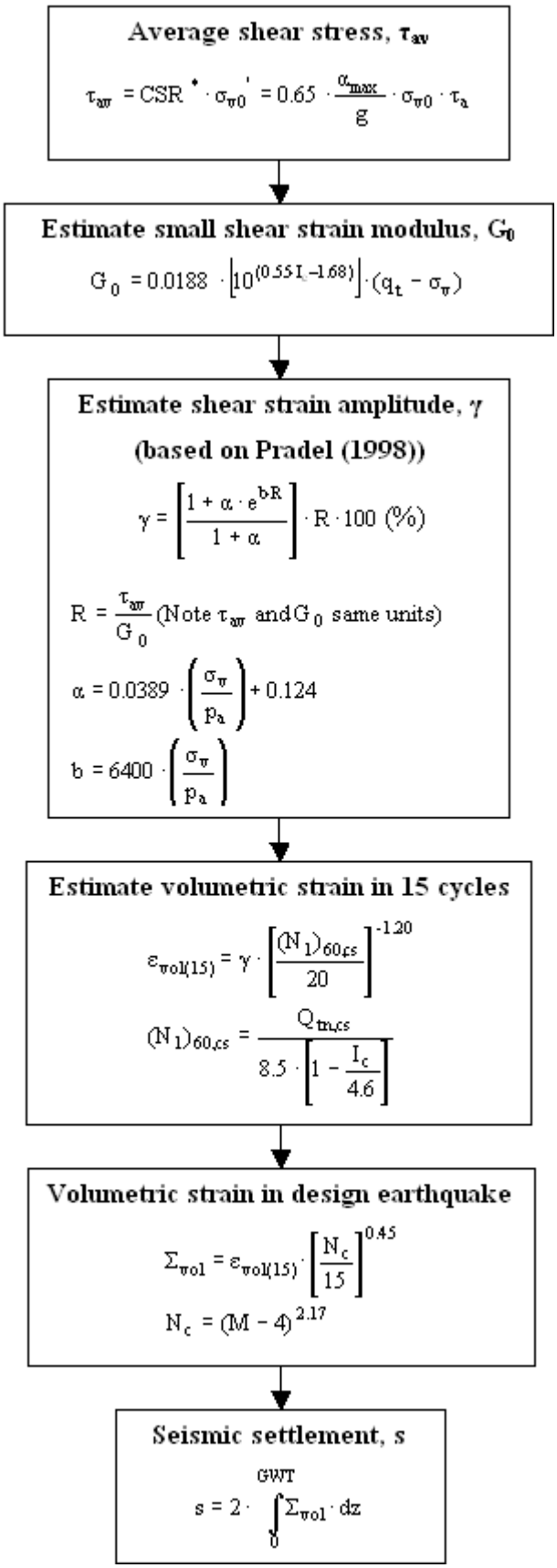
[1] **Figure 1**

$$LDI = \int_0^{z_{max}} \gamma_{max} dz$$

[1] **Equation [3]**

[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands



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 ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

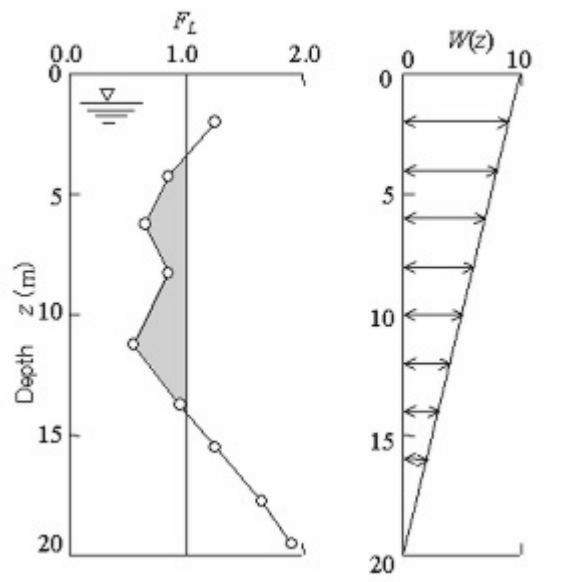
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5z) \times F_L \times dz$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

Shear-Induced Building Settlement (Ds) calculation procedure

The shear-induced building settlement (Ds) due to liquefaction below the building can be estimated using the relationship developed by Bray and Macedo (2017):

$$Ln(Ds) = c1 + c2 * LBS + 0.58 * Ln\left(Tanh\left(\frac{HL}{6}\right)\right) + 4.59 * Ln(Q) - 0.42 * Ln(Q)^2 - 0.02 * B + 0.84 * Ln(CAVdp) + 0.41 * Ln(Sa1) + \varepsilon$$

where Ds is in the units of mm, c1= -8.35 and c2= 0.072 for LBS ≤ 16, and c1= -7.48 and c2= 0.014 otherwise. Q is the building contact pressure in units of kPa, HL is the cumulative thickness of the liquefiable layers in the units of m, B is the building width in the units of m, CAVdp is a standardized version of the cumulative absolute velocity in the units of g-s, Sa1 is 5%-damped pseudo-acceleration response spectral value at a period of 1 s in the units of g, and ε is a normal random variable with zero mean and 0.50 standard deviation in Ln units. The liquefaction-induced building settlement index (LBS) is:

$$LBS = \sum W * \frac{\varepsilon_{shear}}{z} dz$$

where z (m) is the depth measured from the ground surface > 0, W is a foundation-weighting factor wherein W = 0.0 for z less than Df, which is the embedment depth of the foundation, and W = 1.0 otherwise. The shear strain parameter (ε_shear) is the liquefaction-induced free-field shear strain (in %) estimated using Zhang et al. (2004). It is calculated based on the estimated Dr of the liquefied soil layer and the calculated safety factor against liquefaction triggering (FSL).

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SOILS REPORT REVIEW LETTER

March 30, 2023

LOG # 125167
SOILS/GEOLOGY FILE - 2
LIQ

S&R Partners, LLC
737 Lamar Street
Los Angeles, CA 90031

TRACT: FREIGHT DEPOT TRACT (M R 72-75/76) /// BEAUDRY WATER WORKS TRACT (M R 14-60)
LOT(S): D /// 25 / 26 / VAC ORD 9460 / VAC ORD 9460 / 27 / 28 / 30 / 31 / 32 / 33 / 34 / 35 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 10749 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / VAC ORD 9460 / 17 / 16
LOCATION: 130, 114, 110 W College St., 973, 971, 963, 959, 955, 953, 949, 945, 943 N North Main St., 117, 119 W Bruno St.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	721036101	02/17/2023	LANGAN

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed 4-story office space building over 2-story parking podium and 1-level subterranean parking.

The project includes multiple parcels. The site is relatively level and currently occupied by a paved parking lot. Field investigation consisted of four hollow-stem auger borings, drilled to depths ranging from 50-65 feet and four cone penetration tests performed to depths ranging from 14 to 88 feet. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by alluvial deposits.

The consultants recommend to support the proposed structure(s) on mat-type foundations bearing on native undisturbed soils.

The site is located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California.

The review of the subject report cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Revise liquefaction analyses to address the following items:

   a. Provide justification and appropriate laboratory testing for all layers considered non-potentially liquefiable (based on the screening criteria followed by the consultant) to substantiate such argument.

      Note: The Department requires that the criteria for soils "not susceptible" to liquefaction be demonstrated. The soils considered "not susceptible" to liquefaction are soils with a PI >= 18 that are not sensitive or soils having a saturated moisture content <= 80% of the liquid limit.

   b. The consultants used blow counts from California Modified samplers with no reduction. Provide conversion factor to correlate the Cal Mod N-values to SPT N-values. Revise liquefaction analyses accordingly.

   c. Provide liquefaction analyses for all borings where N-values are available. The most critical seismic settlement shall be used for the foundation design.

   d. Provide detailed printouts of the liquefaction analyses showing the C_N (overburden correction factor), r_d (stress reduction coefficient), overburden pressure, the corrected N values, MSF (magnitude scaling factor), $K\sigma$ (confining stress correction factor) and settlement calculation.

2. Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. If onsite infiltration is proposed, liquefaction analyses shall be provided assuming the design ground water table (i.e., the ground water during an earthquake) at the proposed level of infiltration. Clearly indicate if the onsite infiltration is recommended.

3. In the event on-site infiltration is proposed, provide an evaluation on the following items (please refer to Information Bulletin P/BC 2020-118, which can be downloaded from our web site www.ladbs.org):

   a. Potential on creating perched ground water conditions.

   b. Presence of potential expansive soils and/or susceptibility for hydroconsolidation.

   c. Influence of the proposed infiltration system on adjacent proposed/existing foundations and retaining walls.

   d. The "Time Interval" shown on Percolation Test Data sheets is 10 minutes for each trial. However, based on the "Time of Measurement", each trial appears to last 5 minutes. Revise the calculations accordingly.

4. Revise the retaining wall calculations and recommendations to address the following items:

   a. Indicate why a friction angle of 39 degrees was used? The upper soils consist of sand (LB-1), silt/sand (LB-2), clay (LB-3) and silt/sand (LB-4).

   b. Revise the unit weight used in the equivalent fluid pressure calculation. Alternatively, provide justification for using a value of 110 PCF.

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in flash drive, and the appropriate fees will be required for submittal.

DAN L. STOICA
Geotechnical Engineer I

DLS/dls
Log No. 125167
213-482-0480

cc: LANGAN, Project Consultant
LA District Office

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Preliminary Geotechnical Investigation Report

for

Creative Workplace Development
130 West College
Los Angeles, California

Prepared For:

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737 Lamar Street Street
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Principal/ Vice President

LANGAN

17 February 2023
721036101

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E. Liquefaction Output

1. INTRODUCTION

In accordance with our 4 October 2022 engineering services agreement for geotechnical engineering services and subsequent authorization by S&R Partners, LLC (Client), we have completed a preliminary geotechnical engineering investigation for the proposed 130 West College Street Project (Project) located at 130 West College Street (Site) in Los Angeles, California. The purpose of this report is to summarize our understanding of the geotechnical and geological aspects of the Site, including existing site conditions, and to provide preliminary geotechnical, seismic, and foundation recommendations for the proposed Project. Recommendations provided herein have been prepared in accordance with the 2020 City of Los Angeles Building Code (LABC) and with applicable City of Los Angeles Department of Building and Safety (LADBS) design bulletins.

2. PROJECT DESCRIPTION

2.1 Site Conditions

The approximate 2.2-acre Site is located at 110, 114 & 130 West College Street, 117 & 119 West Bruno Street, and 943, 945, 949, 953, 955, 959, 963, 971, & 973 North Main Street[1] within the Chinatown area of Los Angeles, California. The Site is bordered by West College Street to the northeast, North Alameda Street to the northwest, Bruno Street to the southwest and North Main Street to the southeast. The Site is generally rectangular in shape and is occupied by a paved parking lot being used for school buses. The Site's vicinity map is shown on Figure 1.

2.2 Proposed Development

Based on the concept drawings titled "130 West College Street" by Grimshaw Architects, LLP, dated 14 October 2022, the Project includes demolition of existing asphalt and construction of a four-story creative office space (Type III-B) over a Type I-A podium parking garage which consists of two-stories above grade over one-story below grade. The Project would also include ground floor commercial restaurant and retail uses.

The below grade parking structure foundation level typically is 13 to 15 feet below grade. Structural loads were provided via email by Holmes on 21 December 2022 indicated preliminary column loads are up to 850 kips for dead load and 475 kips for live load.

3. REGIONAL GEOLOGIC SETTING

The Site is located near the northwestern portion of the Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of mountain ranges separated by northwest trending valleys that are subparallel to faults that branch from the San Andreas Fault.

More specifically, the Site is within the Central Block of the Los Angeles Basin, an extensive sediment-filled depression bound by the San Gabriel Mountains on the north, Santa Monica Mountains and the Pacific Ocean on the west, the Palos Verdes Peninsula on the southwest, the Santa Ana Mountains on the southeast, and the Puente, San Jose, and Chino Hills on the east. The basin's structural history includes extension and strike-slip faulting, followed by oblique contraction via thrusting and strike-slip faulting (Yerkes et al, 1965). The region has a complex

[1] The Site is associated with the following Los Angeles County Assessor Parcel Numbers (APN): 5409-008-001, 5409-008-002, 5409-008-003, 5409-008-004, 5409-008-005, 5409-008-006, and 5409-008-015

geologic history including periods of uplift, subsidence, sea-level transgression and regression, and folding and faulting.

Locally, the Project is underlain by the late Pleistocene- to Holocene-age older young alluvium deposits (Campbell, 2014). The deposits are described as unconsolidated, generally friable, stream deposited silt, sand and gravel on flood plains. See Figures 2A and 2B.

4. AVAILABLE INFORMATION REVIEW

In addition to the field investigation described in Section 5.1, below, LANGAN reviewed available information to evaluate historic site use, regional and local geology, existing building foundations, site grading, and geologic hazards. The available information reviewed is discussed herein and the sources are listed in the references section.

4.1 Geologic Hazards Review

Our geologic hazard review was performed in general accordance with CGS Special Publication 117A, "Guidelines for Evaluating and Mitigating Seismic Hazards in California." The following subsections present the results of our review of the hazards as they pertain to the Site.

- Regional Faulting and Seismicity – Figure 2A presents a fault and earthquake epicenter map (Figure 2B presents an explanation of the faults and earthquake epicenters on Figure 2A). The closest mapped active faults to the Site are the Upper Elysian Fault, approximately 0.12 miles north of the Site, the Lower Elysian Fault, 3.2 miles south of the Site, and the Hollywood Fault approximately 3.8 miles north of the Site.

  A search of the USGS ANSS Comprehensive Earthquake Catalog indicates that as of 25 October 2022, 41 earthquakes with magnitudes of 5.0 or greater have occurred within a 62-mile radius of the Site since 1900.

  The entire City of Los Angeles, including the Site, is located in an active seismic area that has historically been affected by generally moderate to occasionally strong levels of earthquake-induced ground shaking. Therefore, the Project is expected to experience strong levels of ground shaking from nearby faults as well as ground shaking from other active seismic areas in the southern California region.

- Surface Rupture – Based on our review of the CGS "Earthquake Zones of Required Investigation, Los Angeles Quadrangle", the Site is outside and located approximately 3.6 miles away from the nearest mapped Alquist-Priolo Earthquake Fault Zone for the Hollywood Fault as defined by the Alquist-Priolo Earthquake Fault Zoning (AP) Act. The geologic review does not indicate the presence of active surface faulting within or directly adjacent to the Site as shown in Figure 3. Therefore the potential for surface rupture is very low.

- Liquefaction – Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and low-plasticity clay deposits.

  The Site is located within a state designated liquefaction hazard zone as shown on the "Earthquake Zones of Required Investigation Los Angeles Quadrangle" by the CGS as shown

in Figure 4. Preliminary calculations conducted on cone penetration tests (CPTs) and borings indicate a medium to high potential for liquefaction under seismic loading. Therefore, a site-specific liquefaction potential evaluation was performed for the proposed development and is described in Section 7.1 of this report. As concluded therein, liquefaction-induced settlements are anticipated to range from approximately 0.2 to 1.5 inches.

- Landslides – Based on our review of the "Earthquake Zones of Required Investigation Los Angeles Quadrangle" by the CGS, the Site is not located within an 'Earthquake-Induced Landslide' zone as presented on Figure 5. Therefore the potential for earthquake-induced landslides is very low.

- Subsidence –Land subsidence may be induced from withdrawal of oil, gas, or water from wells. Based on a search of the Cal GEM (formerly the Division of Oil, Gas & Geothermal Resources (DOGGR)) Well Finder online tool, the Site is partially located in an oil and gas field with the closest plugged dry well located at a distance of 0.2 miles north of the Site. However, according to our review of the available information from CalGEM, the likelihood of land subsidence caused by oil, gas, or water withdrawal from oil wells is low because there are no active wells near the Site, and therefore, need not be considered in design. See Figure 6 for the Site location with respect to mapped oil fields. Therefore, the Site is not located in a land subsidence zone.

- Flood Mapping – Based on the FEMA Flood Map 06037C1628F effective 26 September 2008, the Project is not mapped within an area of flood hazard. Additionally, the Site is not mapped at a Dam Failure Inundation Boundary. Refer to Figure 8 and 9. Therefore, the Site is not considered to be inundated under FEMA – 100 year flood event.

- Historical High Groundwater – Based on our review of the "Seismic Hazard Zone Report for the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California" by the CGS, the historical high groundwater depth at the Site is approximately 20 feet. Please see Section 7 of this report for our recommended design groundwater elevation.

- Seismic-Induced Ground Deformations – Seismic-induced ground deformations include ground surface settlement and differential settlement resulting from liquefaction of saturated cohesionless soils and cyclic densification of unsaturated sands and gravels caused by earthquakes. The Site is within a zone of liquefaction hazard and subject to strong ground shaking, as such, an evaluation of the seismic-induced ground deformations at the Site analysis is provided in Section 7.1 of this report. In addition, due to the site being relatively flat with no slopes, there is no risk of lateral spreading due to a seismic event.

- Tsunami and Seiche – A tsunami is a long, high sea wave based by an earthquake, submarine landslide, or other disturbances. A seiche is an oscillation of surface water in an enclosed or semi-enclosed basin such as a lake, bay, or harbor. The California Tsunami Maps and Data Interactive Map, accessed on 25 October, 2022 show that the Site is outside a Hazard Area. Also, no bodies of water are adjacent to the Site and therefore, the potential for a tsunami or seiche to impact the Project is low.

- Expansive Soils – Expansive soils can result in differential movement of structures, including slab heave and cracking, differential movement between foundations, and cracking of

pavements and sidewalks. Potentially expansive soils are defined by the 2020 LABC as soils with expansion indices (EI) greater than 20. Based on our subsurface investigation, the soils at or near the Project's approximate planned foundation level are anticipated to be predominantly granular (non-plastic) and therefore, the potential for expansive soils to be present at the Site is very low.

- Soil Erosion – Soil erosion is the removal of soil by water and/or wind. Factors which influence the erosion potential include the soil type, amount of rainfall, wind, length and steepness of slopes, and the amount and type of vegetation covering the Site and slopes. The Site is fully developed with pavement and has limited landscaping. The Project does not include slopes, or Site features which may be susceptible to erosion; therefore, erosion potential of soils at the Site and loss of topsoil is low.

- Methane Zone - Based on the Los Angeles Building and Safety Department Methane and Methane Buffer Map dated 31 March 2004, the Project is mapped within a methane zone. The potential presence of soil gas and any required mitigations (if any) should be evaluated in accordance with Division 71 of the 2020 LABC and LADBS Information Bulletin No. P/BC 2020-101.

- Collapsible Soils - Collapsible soils, or soils susceptible to hydroconsolidation, are geologically young, unconsolidated, low-density, loose, dry soils commonly present in arid to semi-arid regions, such as Southern California. These soils generally occur within the upper 10 to 15 feet of wind deposited sands or silts, alluvial fans, colluvial soils, stream banks, or residual mudflow soils. Collapsible soils have granular particles that are supported by clay or silt and can be chemically cemented in place creating a porous structure. The bonds supporting this porous structure generally have enough shear strength to support loads, however, once water is introduced, the porous structure collapses and the granular particles are weakened and rearranged. A rise in groundwater or increase in surface water infiltration, combined with the weight of a structure, can cause rapid settlement, resulting in cracking of foundations and walls. Based on the Site geology and results of the subsurface investigation, soils potentially susceptible to collapse are not at the site.

4.2 Aerial Photographs

Several historical aerial photographs dated between 1923 and 2022 were analyzed. Based on our review, the Site was developed as early as 1923 with a railroad spur and what appears to be a small warehouse building on the west side of the site. Between 1923 and 1989 the railroad spur was removed and additional buildings were constructed. By 1994 most of the buildings had been demolished and site graded. The site was paved and being used as a parking lot by 2002.

5. SUBSURFACE INVESTIGATION AND FINDINGS

5.1 Field Investigation

Our subsurface exploration program consisted of four hollow-stem auger (HSA) borings (identified as LB-1 to LB-4), drilled to depths ranging from 50 to 65 feet, and four cone penetration (CPTs) tests (identified as LCPT-1 to LCPT-4), performed to depths ranging from 14 to 88 feet. Prior to drilling, the boring location was marked out by a LANGAN field engineer. Underground Service Alert of Southern California (USA/DigAlert) was contacted to locate and mark known

public underground utilities within the public right-of-way. A private utility-locating subcontractor also confirmed that the boring locations were clear of conductive underground utilities. Refer to Figure 10 for approximate exploration locations.

Borings were drilled by Martini Drilling, Inc., on 15 and 16 October 2022 using a truck-mounted drill rig under the full-time observation of a LANGAN field engineer. The borings were hand-augered to a depth of approximately 5 feet and subsequently advanced with the drill rig using conventional drilling techniques. Standard Penetration Tests (SPT)1 and California Modified Ring samples were generally collected at 5-foot intervals until boring termination depth. California Modified Ring samples were collected at select locations using a 3.0-inch-outer-diameter split-barrel California sampler lined with 2.42-inch-inner-diameter brass rings. SPT N-values were recorded to identify the relative density and stiffness of the cohesionless and cohesive soils, respectively.

Upon completion, the borings were backfilled via tremie method with cement-grout slurry to near ground surface, and the surface was patched with quick-dry set concrete. Excess soil cuttings were temporarily stored on Site in Department of Transportation (DOT) approved 55-gallon drums for subsequent characterization and disposal. Excess soil cuttings encountered are pending characterization and disposal.

CPTs were performed by Kehoe Testing and Engineering, on 15 October 2022 under the full-time observation of a LANGAN field engineer. Cone resistance, sleeve friction and pore pressure measurements were recorded at the CPT locations.

Retrieved soil samples were visually examined and classified in the field following the Unified Soil Classification System (USCS) and confirmed by re-examination in our office. A copy of the boring logs and CPT test results are provided in Appendix B.

5.2 Percolation Testing

Percolation testing was performed in borings LP-1 and LP-2 at depths of approximately 10 to 15 feet. The tests were performed on 15 October 2022 under full-time observation of a LANGAN field engineer. The percolation tests consisted of measuring the drop in water over time in a 2-inch diameter polyvinyl chloride (PVC) pipe with a solid end cap and a minimum of 5 feet of slotted section at the bottom. A filter pack was poured around the slotted PVC section. See Figure 10 for approximate field percolation test location.

The percolation tests were performed in general accordance with the City of Los Angeles Department of Building and Safety), Information Bulletin / Public – Building Code 2020-118: Guidelines for Storm Water Infiltration, Document No.: P/BC 2020-118, Dated Effective 1 January 2020, and LADBS "Planning and Land Development Handbook for Low Impact Development (LID). Percolation test results are provided in Appendix C. Listed below is the summary of the test results.

Table 1 – Percolation Result

Boring Location	Test Type	Field-Infiltration Rates (inch-per-hour)	Soil Type at Test Depth
LP-1	Falling Head	2.5	Sand (SP)

LP-2	Falling Head	2.7	Sand (SP)
Selected Infiltration Rate		**2.5 inches-per-hour**	

Additional design criteria is discussed in Section 7.7 of this report.

Laboratory Investigation

Soil samples obtained from the borings were visually examined in the field, and classifications were confirmed by re-examination in our office. Geotechnical laboratory testing was performed on select soil samples and included the following tests:

- Direct Shear (ASTM D3080)
- Consolidation (ASTM D2435)
- Finer than No. 200 Sieve Analyses (ASTM D1140)
- Expansion Index (ASTM D4829)
- Atterberg Limits (ASTM D4318)
- Sulfate Content (CTM Test 417)
- Electrical Resistivity (CTM Test 643)
- Chloride Content (CTM Test 422)
- Soil pH (CTM Test 643)

The laboratory testing was performed by AP Engineering and Testing, Inc., (License number TA10130) under supervision of a California-licensed Geotechnical Engineer (GE). We reviewed the laboratory testing results provided to Langan Engineering on 28 October 2022 and accept responsibility for the use of the testing in our analysis. Laboratory test results are included in Appendix D.

6. SUBSURFACE CONDITIONS

LANGAN's interpretation of the subsurface conditions is based on the historic data review and soils encountered during our field exploration program. In general, the Site is underlain by artificial fill overlying young alluvial soil deposits. Subsurface cross-sections are presented graphically in Figures 11A and 11B. Details regarding the subsurface materials encountered are presented in the boring logs included in Appendix B.

- Fill: Beneath the 4- to 5-inches thick layer of asphalt, fill soils were generally encountered. The fill stratum generally extended to depths ranging from approximately 1 to 5 feet within the borings explored. Where observed, these soils generally consist of dark brown, moist silty sand, clayey sand, variable amounts of gravel.

  Laboratory testing of select fill samples within boring LB-1 measured minimum resistivity, soil pH, soluble sulfate content, and chloride content which are discussed in Section 7.5. Expansion index (EI) testing of a selected sample in boring LB-1 at approximately 0 to 5 feet below existing grade measured an EI of 15, indicating very low expansion potential.

- Young Alluvium (Qyf): The fill stratum was observed to be underlain by a stratum of young alluvial fan deposits extending to the maximum depth explored of approximately 66.5 feet below existing grade. These soils generally consist of brown, yellow-brown, to whitish brown

typically medium dense to very dense, and moist fine to coarse sand with variable amounts of silt and gravel.

SPT N-values of granular soils typically vary between 10 and 50 blows/foot. SPT N-values of cohesive soils typically vary between 3 and 27 blows/foot. Higher isolated SPT N-values of silty and clayey soils between 34 to 54 blows/foot were observed in borings LB-1 and LB-4.

Direct shear testing of one silty sand sample in boring LB-1 at approximately 20 feet below existing grade measured a peak cohesion and internal friction angle of 200 psf and 39 degrees, respectively, and an ultimate cohesion and internal friction angle of 100 psf and 39 degrees, respectively. Direct shear testing of one clayey sand sample in boring LB-3 at approximately 35 feet below existing grade measured a peak cohesion and internal friction angle of 400 psf and 29 degrees, respectively, and an ultimate cohesion and internal friction angle of 350 psf and 37 degrees, respectively.

Laboratory testing of select samples in the alluvium indicated that the soils have varying silt and clay contents ranging from 5.9 up to over 97 percent of the soil based on ASTM D1140. Laboratory testing of one sample in LB-1, approximately 35 feet below existing grade, measured liquid limit of 30, plastic limits of 24, and a plasticity index of 6. Corrosion test results are summarized in Section 6.5 of this report. Results of consolidation tests performed on four (4) samples at 25, 35, and 40 feet below existing grade are provided in Appendix C.

- Groundwater: Groundwater was encountered in all the borings at a depth between approximately 24 to 27 feet below ground surface. Historic high groundwater depth is reported at approximately 20 feet.

7. PRELIMINARY GEOTECHNICAL EVALUATION AND DESIGN RECOMMENDATIONS

Based on our subsurface investigation and our preliminary engineering analyses, the Project is considered feasible from a geotechnical engineering standpoint. Presented below are the results of our preliminary geotechnical evaluation and recommendations based on data obtained to date. Based on historic ground water levels and observed groundwater levels within our borings, we recommend that the design groundwater level be taken at 20 below ground surface (approximate elevation of 294, NAVD88).

7.1 Liquefaction and Seismically-Induced Settlement

Liquefaction evaluation was performed in accordance with the 2020 LABC and ASCE 7-16 requirements. For this analysis, we utilized a factor of safety (FS) of 1.1 and 1.0 and Design Peak Ground Acceleration (Two-Thirds-PGAM) of 0.690g and (PGAM) of 0.947g as the criteria for determining zones that are potentially liquefiable, respectively, consistent with the recommendations of SP-117A and LADBS Bulletin P/BC 2020-151. We used a Mw 6.74 and Mw 6.85 for a 475 and 2475 Year Return period. To evaluate the liquefaction potential at the Site, we utilized the Boulanger and Idriss (2014) method the computer program CLiq. Based on the results of our analysis using the CPT data from our field investigation, there are potentially liquefiable layers at depth ranging from around 27 to 39 feet below ground surface. In order to estimate the amount of post-earthquake settlement, we used the method by Tokimatsu and Seed (1987) in which the seismically induced cyclic stress ratios and corrected N-values are related to the volumetric strain of the soil. The amount of soil settlement during a strong seismic event will

depend on the thickness of the liquefiable layers and/or consistency of the soil. Using Tokimatsu and Seed (1987) the expected settlement is 0.4 to 0.6 inches. Additionally, we utilized the computer program LiquefyPro, a soil profile from Borings LB-1 and LB-4. Based on our analysis, liquefaction-induced settlements are anticipated to range from approximately 0.2 to 1.5 inches. The results of these analysis are attached in Appendix E.

7.2 Seismic Design Parameters

Structures can be designed in accordance with the provisions of ASCE 7-16 and 2020 LABC. Based on the available subsurface information, site-specific shear wave velocity measurements from seismic CPTs, and in accordance with the seismic provisions of these codes, the soils underlying the Site can be characterized as Site Class D. Our evaluation of the site class considered the residual strength of the potentially liquefiable layers to estimate the average shear wave velocity.

As such, the following seismic design criteria may be used.

Criteria	Mapped Value (Site Class D)
MCE_R Spectral response acceleration at Short Periods, S_S	2.002g
MCE_R Spectral response acceleration at 1 second period, S_1	0.715g
Short Period Site Coefficient, F_a	1.0
Short Period Site Coefficient, F_v	2.5
Site-modified MCE_R Spectral Response Acceleration at Short Periods, S_{MS}	2.002g
Site-modified MCE_R Spectral Response Acceleration at 1 second period, S_{M1}	1.787g
Design Spectral Response Acceleration at short periods, S_{DS}	1.335g
Design Spectral Response Acceleration at 1 second period, S_{D1}	1.191g
MCE_G Peak Ground Acceleration, PGA_M	0.947g

The recommended mapped values of F_v, S_{M1}, and S_{D1} above have been increased by 150 percent in accordance with the exception of Section 11.4.8.1 of Supplement No. 3 to ASCE 7-16. If the structural engineer elects not to use this exception in the seismic design approach, we should be notified so that we may develop site-specific response spectra and seismic design criteria in accordance with Chapter 21 of ASCE 7-16.

Based on our geotechnical evaluation, select layers are potentially liquefiable. However, we assume the fundamental period of the structure is 0.5 second or less based on the proposed number of stories of the structure; therefore, the soils underlying the Site may be characterized as Site Class D and the recommended mapped values above are applicable. If the Project structural engineer determines during the design phase that the fundamental period of the structure is greater than 0.5 second the soils underlying the Site will be characterized as Site Class F and a site-specific ground motion study in accordance with Chapter 21 of ASCE 7-16 will be required. During the design phase of the Project, the Project structural engineer should clarify the seismic design approach so that LANGAN can provide recommendations for seismic design

criteria, either based on mapped values or based on Site-specific ground motion hazard analysis in accordance with Section 11.4.8 of ASCE 7-16.

7.3 Foundation Design

The Project will include one level of subterranean parking, and we assume that foundations will be bearing 13 to 15 feet below grade to allow for up at 3 feet thick mat. Based on the subsurface conditions encountered, the Project's proposed buildings may be supported on a mat foundation bearing on a proof-rolled subgrade. Mat foundations can be designed using a preliminary allowable bearing pressure of 3,000 psf and designed with a preliminary modulus of subgrade reaction, K, equal to 150 pounds per cubic inch (pci). The allowable bearing capacity for mat foundations can be increased by 1/3 for temporary transient loading, such as earthquake or wind. The modulus of subgrade reaction should be adjusted based on the size of the mat using the following equation: K' = K*[(B+1)/2B]2 where B = width of the mat, and K' = design subgrade modulus of a mat.

Total Mat settlements (static and dynamic) are calculated to be less than 4-inches with total differential settlements (static and dynamic) less than 2 inch over 50 feet.

The foundation subgrade should be observed and approved by a qualified Geotechnical Engineer and a City of Los Angeles Deputy Grading Inspector prior to steel or concrete placement. Any areas loosened by excavation should be re-compacted or replaced with lean concrete. Foundations should be constructed as soon as possible following subgrade approval. The contractor shall be responsible for maintaining the subgrade in its approved condition (i.e. free of water, debris, etc.) until the footing is constructed.

Foundations bearing on appropriately prepared subgrade comprised of alluvial soils can be designed to resist lateral sliding using an ultimate coefficient of friction equal to 0.35, respectively.

7.4 Below-Grade Walls

Below-grade walls of the Project's proposed one-story below grade podium structure are presumed to be fixed against rotation as the top of the walls will be connected to the ground floor slab. Below-grade walls can be designed to resist soil and surcharge pressures using the parameters below, and in earth pressure distributions in Figure 12.

- Soil Unit Weight = 110 pounds per cubic foot (pcf)
- Friction Angle = 39 degrees
- At-rest Earth Pressure (restrained wall) = 41 psf / foot
- The vertical distance between the proposed final grade and the proposed top of foundation is anticipated to be greater than 6 feet for the proposed basement level, and the design peak ground acceleration at the Project Site is greater than 0.4g; therefore, additional earth pressures caused by seismic ground shaking should be considered in design. Restrained walls should be designed for seismic loading conditions as defined in the Los Angeles Department of Building and Safety Information Bulletin P/BC 2020-083 "Retaining Wall Design" using a seismic force increment of 26 psf / foot.
- Lateral loads from uniform surcharges on the retaining wall backfill may be considered to impart surcharge to the restrained walls utilizing the above provided respective earth pressure coefficients presuming a rectangular pressure distribution. Surcharge loading

from adjacent foundations should be considered where the adjacent foundations are supported on soil above a 1H:1V theoretical influence line projecting upwards from the base of the below grade wall. Lateral loading from neighboring foundations need not be considered if these foundations bear below the above-mentioned influence line.

- Surcharge loading should consider adjacent streets, vehicular traffic, and sidewalks. Where vehicular traffic will pass within 10 feet of below-grade walls, temporary traffic loads should be considered in the design of walls. Traffic loads may be modeled by a uniform pressure of 100 psf / foot applied on the upper 10 feet of the walls, such as a fire truck or car parked on the street beyond the sidewalk.

The recommended design groundwater level is below the anticipated bottom of the structures foundation. At a minimum, we recommend damp-proofing (such as Grace Water Shield water barrier membrane or equivalent) be utilized in below-grade closed areas that may house equipment, finishes, or occupants that could be adversely impacted by moisture intrusion. A final choice regarding moisture / vapor protection and mitigation for enclosed below-grade areas should be made after reviewing environmental site conditions and below-grade space use and performance criteria during the design phase of the Project. To avoid any undesired vapor accumulation behind walls, prefabricated drainage panels (such as MiraDRAIN or equivalent) are recommended to be placed in uniformly spaced strips behind the walls; for typical 4-foot-wide drainage panel rolls, we recommend a 4-foot edge-to-edge spacing at this time. Final damp-proofing should be coordinated with applicable methane mitigation requirements. In addition, a perimeter foundation drain should be installed to collect and route any accumulated water to the site drainage system. Perimeter foundation drains should consist of perforated, durable and structurally sufficient pipe surrounded with clean gravel and completely encased in geosynthetic filter fabric.

7.5 Expansive Soil Considerations.

Expansive soils swell or shrink when the moisture content of the soil changes. A soil's moisture content can change through cyclic wet/dry weather cycles, variations in the groundwater level, installation of irrigation systems, change in landscape plantings, and changes in site grading. Leaking utilities can also drastically change soil moisture content.

Potentially expansive soils are defined by the 2020 LABC as soils with expansion indices (EI) of greater than 20. Based on laboratory testing of soils within the upper 5-feet from the existing parking lot pavement surface shows a very low expansion potential (i.e. EI=15).

The Site should be designed to promote positive drainage away from the tops of shoring systems and building footprints, and landscaping should consist of mainly drought tolerant native planting that requires limited irrigation.

7.6 Corrosion Considerations

Chemical analyses performed on a select sample obtained from the borings for this study is summarized below.

Sample	Soil Type	Depth (feet)	Resistivity (ohm-cm)	pH	Soluble Sulfate (ppm)	Chloride (ppm)
LB-1/B-1	Clayey Sand	0 - 5	1169	7.8	687	287

Based on the corrosion test results, the alluvial soils in the upper 5 feet of the Site are considered to be noncorrosive to concrete and low to moderately corrosive ferrous metals. Based on ACI 318, the soil as Exposure Class S1 for sulfate and Exposure Class C1 for chloride. A corrosion expert should be consulted if metal pipe is proposed to be in contact with soil. Based on the laboratory data summarized herein, ACI 318requires that concrete should be designed using Type II cement (ASTM C150), a maximum water-to-cement ratio of 0.5, and a minimum specified compressive strength (f'c) of 4,000 pounds per square inch (psi). A copy of the corrosion test results for this study is provided in Appendix E.

7.7 Infiltration Design Support

Based on our field percolation test result and Los Angeles Information Bulletin P/BC: 2020-118 and LADBS "Planning and Land Development Handbook for Low Impact Development (LID)" the Site is not suitable for storm water infiltration based on the following:

- The Site is in a mapped liquefaction hazard zone and storm water infiltration will further impact the Site from a liquefaction hazard point of view.

7.8 Utility Support

Utilities can be supported on native soils. The bedding material should extend at least 12 inches over the top of the utility unless otherwise required by the utility owner. Utility subgrade should be confirmed to be free of standing water, firm, and unyielding prior to placement of bedding material. Utility trenches above pipe bedding should be backfilled in accordance with the recommendations provided herein for fill compaction requirements using either previously excavated soil (if suitable), or with approved imported material. All backfill should be compacted per Section 9.1 of this report.

8. TEMPORARY EXCAVATION SUPPORT

Temporary excavations are anticipated for the proposed development. Temporary excavations will be required to facilitate below-grade excavation for the proposed subterranean parking basement and will need to be constructed in accordance with Cal/OSHA requirements. . Based on our evaluation of subsurface data, proposed temporary excavations at the Site are anticipated to range up to 13 feet to 15 feet. Maximum temporary excavated slopes should be no steeper than 2H:1V (Horizontal:Vertical).

Based on the anticipated depths and limits of excavation, temporary excavation support will be required to excavate the Site to the lowest proposed bottom of excavation level. The excavation support can consist of conventional soldier piles and lagging. The temporary excavation support system can be designed with the following preliminary parameters.

Cantilever Shoring Wall (maximum height of 13ft):

- The soil pressure distribution for excavation support is a function of the type of excavation support system and the any bracing used. For design, the shoring system should be designed using a triangular pressure distribution having a maximum pressure of 25H reducing to zero towards the top of the wall, where H is the height of the wall in feet.
- The design earth pressure on the lagging can be 0.6 times the earth pressure or a maximum of 400 psf in accordance with California Department of Transportation (2011), "Trenching and Shoring Manual," Revision 1, August 2011.

- Surcharge loading along the walls should consider all proposed building conditions on the north and south sides. Surcharge loading should be considered where the neighboring building foundations are supported on material above a 1:1 (horizontal:vertical) theoretical influence line extending upward from the base of the below-grade wall. Surcharge loading from neighboring building foundations need not be considered if these foundations are supported outside the aforementioned influence line.
- Surcharge loading due to temporary traffic and construction loading within a distance of 10 feet from the wall top should be designed based on published documentation, such as Federal Highway Administration (FHWA) or Naval Facilities Engineering Command (NAVFAC) Design Manuals and as set forth in LADBS Information Bulletin 2017-141 "Guidelines for Determining Live Loads Surcharge From Sidewalk Pedestrian Traffic And Street Traffic", whichever is stricter. Development of surcharge distributions other than specified in LADBS Information Bulletin should be developed by the Project shoring engineer and subsequently reviewed by LANGAN for confirmation.
- Passive resistance against soldier beams below the excavated level should be based on an equivalent fluid weight of 150 psf/foot beginning 3 feet below the lowest subgrade level in front of the soldier beams. A maximum of 3 times the width of the soldier beam can be considered as contributing to passive resistance. Care must be taken during construction so as not to excavate any soil providing lateral restraint to the shoring system's toe.
- Deflection at the top of the excavation support system will be a function of the design and sequence of installation. The system should be designed to limit deflections adjacent to existing public streets to less than 1 inch, but in no case should deformations be such that cause damage or loss of support to areas, structures, and utilities beyond the excavation. For temporary excavation walls adjacent to the public right-of-way or a public structure, the allowable maximum deflection of shoring system should be 1 inch. This deflection shall be measured at the top of soldier piles.

9. EXCAVATION AND GRADING

Prior to the commencement of excavation and grading, a meeting should be held at the Site with the owner, city inspector, excavation/grading contractor, civil engineer, and Geotechnical Engineer to discuss the work schedule and geotechnical aspects of the grading.

All pavement, vegetation, and deleterious materials should be disposed of off-site prior to initiation of grading operations.

Any foundation and abandoned utility remnants or construction debris associated with former site structures encountered within excavations should be fully removed, where practical, and any void spaces that may be created should be backfilled with approved compacted structural fill. If utility pipes are too deep to be removed economically in proposed pavement areas, they should be filled with cement and sand grout or equivalent material that will prevent future collapse of the pipe.

After completion of excavation, including removal of all below grade remnants, stripping, grubbing, removal of asphalt, base course material, the soil subgrade should be compacted in-place by proof-rolling with at least 6 passes of a vibratory roller compactor having a minimum

static drum weight of 5 tons. Any areas exhibiting rutting or pumping should be removed and replaced with compacted engineered fill material.

Any soft, loose, or unsuitable soils identified by the City of Los Angeles Deputy Grading Inspector during subgrade preparation should be removed and replaced with approved compacted fill.

Any environmentally unsuitable soils encountered during the excavation process should be removed and properly disposed of off-site in accordance with all state and local regulations.

Surface site elements, such as site pavers, planters, and walkways can be supported on subgrade soils comprised of compacted fill or native alluvial soils prepared in accordance with the recommendations provided herein.

9.1 Fill Material and Compaction Criteria

Fill material (imported or re-used) should be free of organic and other deleterious materials and should have a maximum particle size no greater than 3 inches. The on-site granular portions of the alluvial soils containing less than 12 percent passing the #200 sieve are suitable for use as compacted fill. Any excavated on-site soils not meeting the gradation criteria should be mixed such that the gradation of the excavated soils is acceptable, as determined by the Geotechnical Engineer. All fills should be placed in accordance with the placement and compaction criteria discussed in this report. Imported fill should contain no more than 12 percent passing the #200 sieve by dry weight and have a plasticity index less than 7. Grain size distributions, maximum dry density, and optimum water content determinations should be made on representative samples of the proposed fill material.

Cobbles encountered during grading may be reused as backfill if they are processed to form a well-graded granular mixture comprised of material no larger than 3 inches in its largest diameter.

All primary structural fill beneath proposed structures should be placed in uniform lifts (maximum 12-inches thick prior to compaction) and compacted to a minimum of 95 percent of the maximum dry density at a moisture content within 3 percent of optimum moisture content, as determined by ASTM D1557 (Modified Proctor compaction).

All fill placement should be subject to controlled engineering observation by the City of Los Angeles Deputy Grading Inspector. No fill material should be placed on areas where free water is standing or on surfaces which have not been approved by the City of Los Angeles Deputy Grading Inspector.

All other cohesive backfill should be placed in uniform lifts (maximum 8-inches thick prior to compaction) and compacted to at least 90 percent of its maximum dry density at a moisture content within 3 percent of optimum moisture content, as determined by the ASTM D1557 (Modified Proctor compaction).

All cohesionless backfill should be placed in uniform lifts (maximum 8-inches thick prior to compaction) and compacted to at least 95 percent of its maximum dry density at a moisture content within 3 percent of optimum moisture content, as determined by the ASTM D1557 (Modified Proctor compaction).

9.2 Site Drainage

Proper drainage should be maintained at all times. Ponding or trapping of water in localized areas can cause differing moisture levels in the subsurface soil. Drainage should be directed away from the tops of excavations and existing foundations. Erosion protection and drainage control measures should be implemented during periods of inclement weather. During rainfall events,

backfill operations may need to be restricted to allow for proper moisture control during fill placement.

The Site should be graded to ensure positive drainage away from the locations of the Project.

9.3 Hardscape Elements

Site pavers and walkways can be supported on compacted fill or native soils after excavating to the required subgrade level, then proof-rolled using an approved compactor such as a 5-ton (static drum weight) vibratory roller compactor, or equivalent. Any soft, loose or unsuitable soils identified by the City of Los Angeles Deputy Grading Inspector during proof-rolling should be removed and replaced with approved compacted fill.

10. RECOMMENDED FUTURE TASKS AND INTERACTION

We recommend performing the following supplemental studies during the design phase and prior to the issuance of a building permit:

1. Review structural loading, and confirm or refine preliminary foundation types, bearing capacities, and anticipated settlements.
2. Review of final civil and grading plans, structural plans and loads, perform final foundation analyses, and develop final foundation and temporary excavation recommendations.

To maintain our continuity of responsibility on this Project, we recommend the above work be performed by Langan.

11. SERVICES DURING DESIGN, CONSTRUCTION DOCUMENTS AND CONSTRUCTION QUALITY ASSURANCE

During final design, the Geotechnical engineer of record should be retained to consult with the design team as geotechnical questions arise. Technical specifications and design drawings should incorporate the recommendations in this report. When authorized, Langan will assist the design team in preparing specification sections related to geotechnical issues such as earthwork, ground improvement, shallow foundations, backfill and excavation support. Langan should also, when authorized, review the project plans, as well as Contractor submittals relating to materials and construction procedures for geotechnical work, to confirm the designs incorporate the intent of our recommendations.

Langan has investigated and interpreted the Site subsurface conditions and developed the foundation design recommendations contained herein, and is therefore best suited to perform quality assurance observation and testing of geotechnical-related work during construction. The work requiring quality assurance confirmation and/or special inspections per the Building Code includes, but is not limited to, earthwork, backfill, ground improvement, shallow and deep foundations, and excavation support.

Recognizing that construction observation is the final stage of geotechnical design, quality assurance observation during construction by Langan is necessary to confirm the design assumptions and design elements, to maintain our continuity of responsibility on this project, and allow us to make changes to our recommendations, as necessary. The foundation system and general geotechnical construction methods recommended herein are predicated upon Langan assisting with the final design and providing construction observation services for the Owner.

Should Langan not be retained for these services, we cannot assume the role of geotechnical engineer of record, and the entity providing the final design and construction observation services must serve as the engineer of record.

12. LIMITATIONS

The conclusions and preliminary recommendations provided in this report result from our interpretation of the geotechnical conditions existing at the Site. Recommendations provided are dependent upon one another and no recommendation should be followed independent of the others.

Any proposed changes in structures or their locations should be brought to LANGAN's attention as soon as possible so that we can determine whether such changes affect our recommendations. Information on subsurface strata and groundwater levels shown on the logs represent conditions encountered only at the locations indicated and at the time of investigation. If different conditions are encountered during construction, they should immediately be brought to LANGAN's attention for evaluation, as they may affect our recommendations.

This report has been prepared to assist the owner in their preliminary design process and is only applicable to the design of the specific project identified. The information in this report cannot be utilized or depended on by engineers or contractors who are involved in evaluations or designs of facilities (including underpinning, grouting, stabilization, etc.) on adjacent properties which are beyond the limits of that which is the specific subject of this report.

Environmental issues (such as permitting or potentially contaminated soil and groundwater) are outside the scope of this study and should be addressed in a separate evaluation.

13. REFERENCES

13.1 PUBLICATIONS

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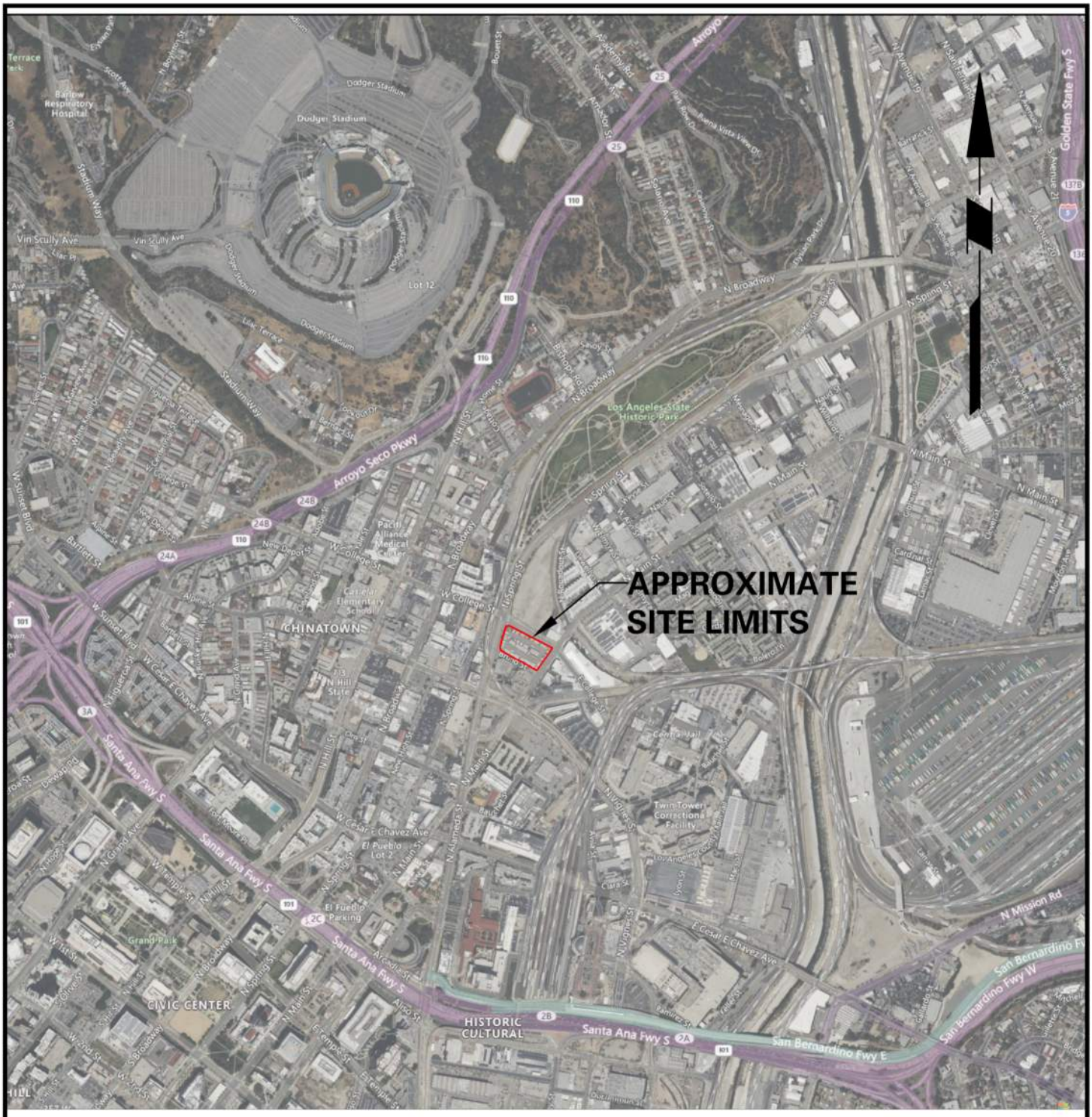
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FIGURES



LEGEND:

— APPROXIMATE SITE LIMITS

NOTES:

1. BACKGROUND REFERENCED FROM BING IMAGES ON 12 SEPTEMBER 2022.

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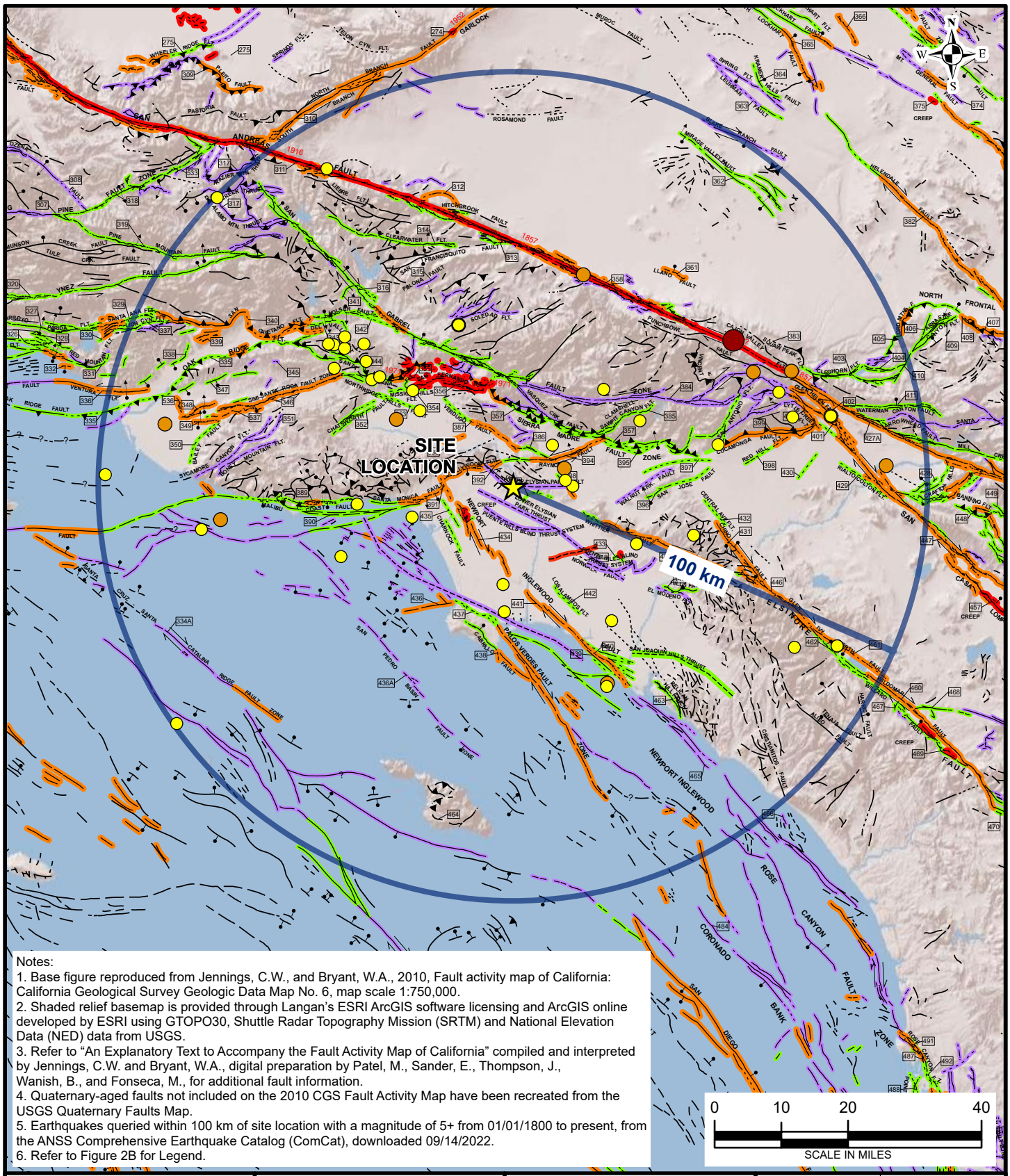
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Figure Title	SITE VICINITY MAP
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Scale	1" = 1000'
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Figure No.	1

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Notes:
1. Base figure reproduced from Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey Geologic Data Map No. 6, map scale 1:750,000.
2. Shaded relief basemap is provided through Langan's ESRI ArcGIS software licensing and ArcGIS online developed by ESRI using GTOPO30, Shuttle Radar Topography Mission (SRTM) and National Elevation Data (NED) data from USGS.
3. Refer to "An Explanatory Text to Accompany the Fault Activity Map of California" compiled and interpreted by Jennings, C.W. and Bryant, W.A., digital preparation by Patel, M., Sander, E., Thompson, J., Wanish, B., and Fonseca, M., for additional fault information.
4. Quaternary-aged faults not included on the 2010 CGS Fault Activity Map have been recreated from the USGS Quaternary Faults Map.
5. Earthquakes queried within 100 km of site location with a magnitude of 5+ from 01/01/1800 to present, from the ANSS Comprehensive Earthquake Catalog (ComCat), downloaded 09/14/2022.
6. Refer to Figure 2B for Legend.

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Figure Title
MAP OF MAJOR FAULTS AND EARTHQUAKE EPICENTERS

Project No. 721036101
Date SEPTEMBER 2022
Scale 1 inch = 20 miles
Drawn By TO

Figure 2A

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LEGEND:

Site Location

Fault Age

- Historic
- Holocene
- Late Quaternary
- Early Quaternary
- Pre-Quaternary Fault
- 100 km Search Radius

Earthquake Epicenter

- Magnitude 5.0 to 5.9
- Magnitude 6.0 to 6.9
- Magnitude 7.0 to 7.4
- Magnitude 7.5 to 8.0

Fault Symbols

Bar and ball on downthrown side (relative or apparent).

Relative or apparent direction of lateral movement.

Direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened.

491 Numbers refer to annotations listed in the appendices of the accompanying report.

Structural discontinuity (offshore) separating differing Neogene structural domains.

Brawley Seismic Zone.

Fault Classification

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:
(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.
(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.
(c) displaced survey lines.

1906 A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

1906 Date bracketed by triangles indicates local fault break.

1906 No triangle by date indicates an intermediate point along fault break.

CREEP Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

1906 / 1906 Square on fault indicates where fault creep slippage has occurred that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

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Figure Title: MAP OF MAJOR FAULTS AND EARTHQUAKE EPICENTERS LEGEND

Project No. 721036101
Date SEPTEMBER 2022
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Drawn By TO

Figure 2B

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Legend

Fault Trace

- Accurately Located
- Approximately Located
- Approximately Located, Queried
- Inferred
- Inferred, Queried
- Concealed
- Concealed, Queried
- Aerial Photo Lineament
- Fault Zone
- Approximate Site Boundary

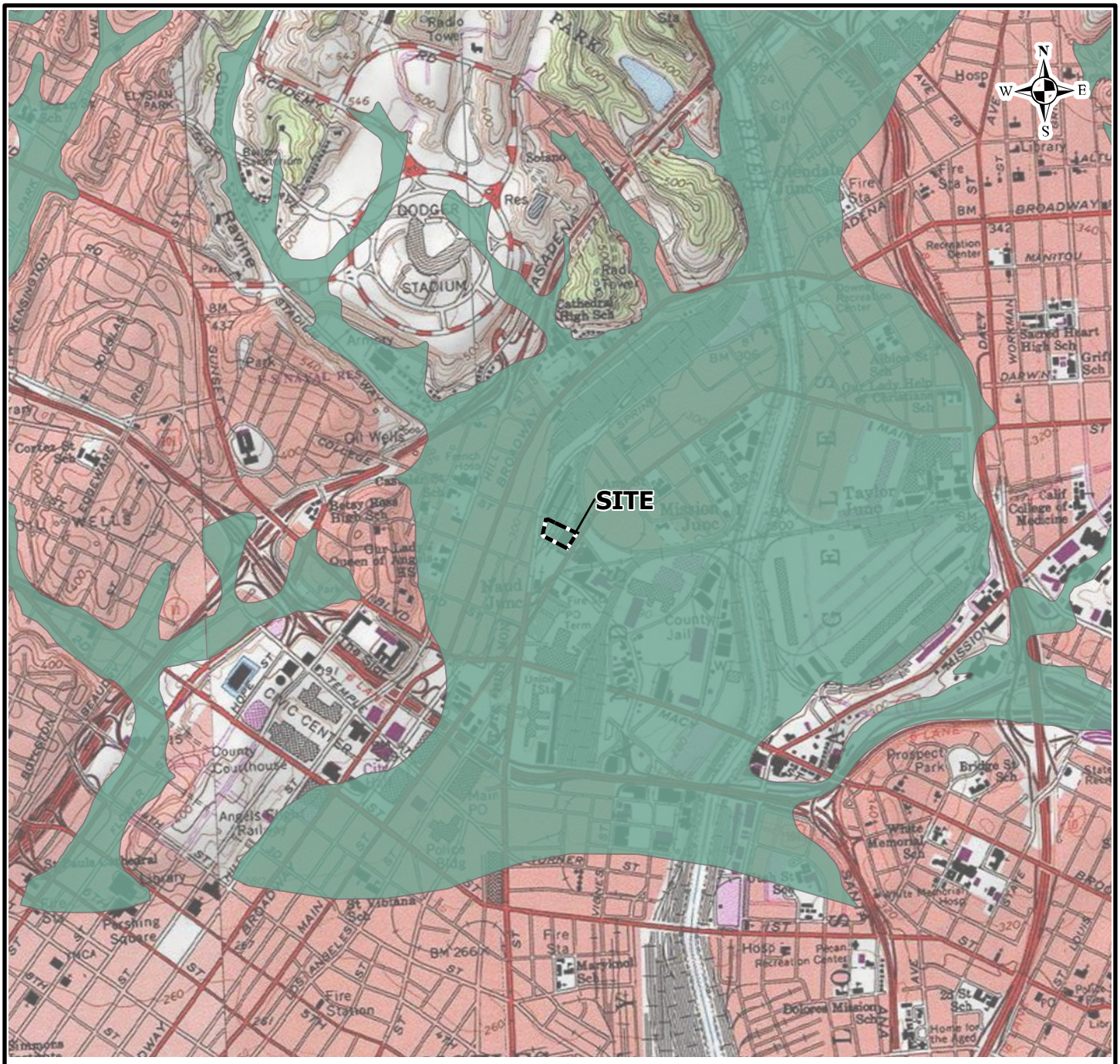
Notes:
1. Alquist-Priolo fault traces, fault zones, landslide zones, and liquefaction zones provided by the CGS.
2. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.

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Legend

Liquefaction Zones

Areas where historical occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. Liquifaction Susceptibility dataset provided in GIS format by the California Department of Conservation. This data is preliminary and has not been reviewed for conformity with United States Geological Survey (USGS) editorial standards or with the North American Stratigraphic Code.

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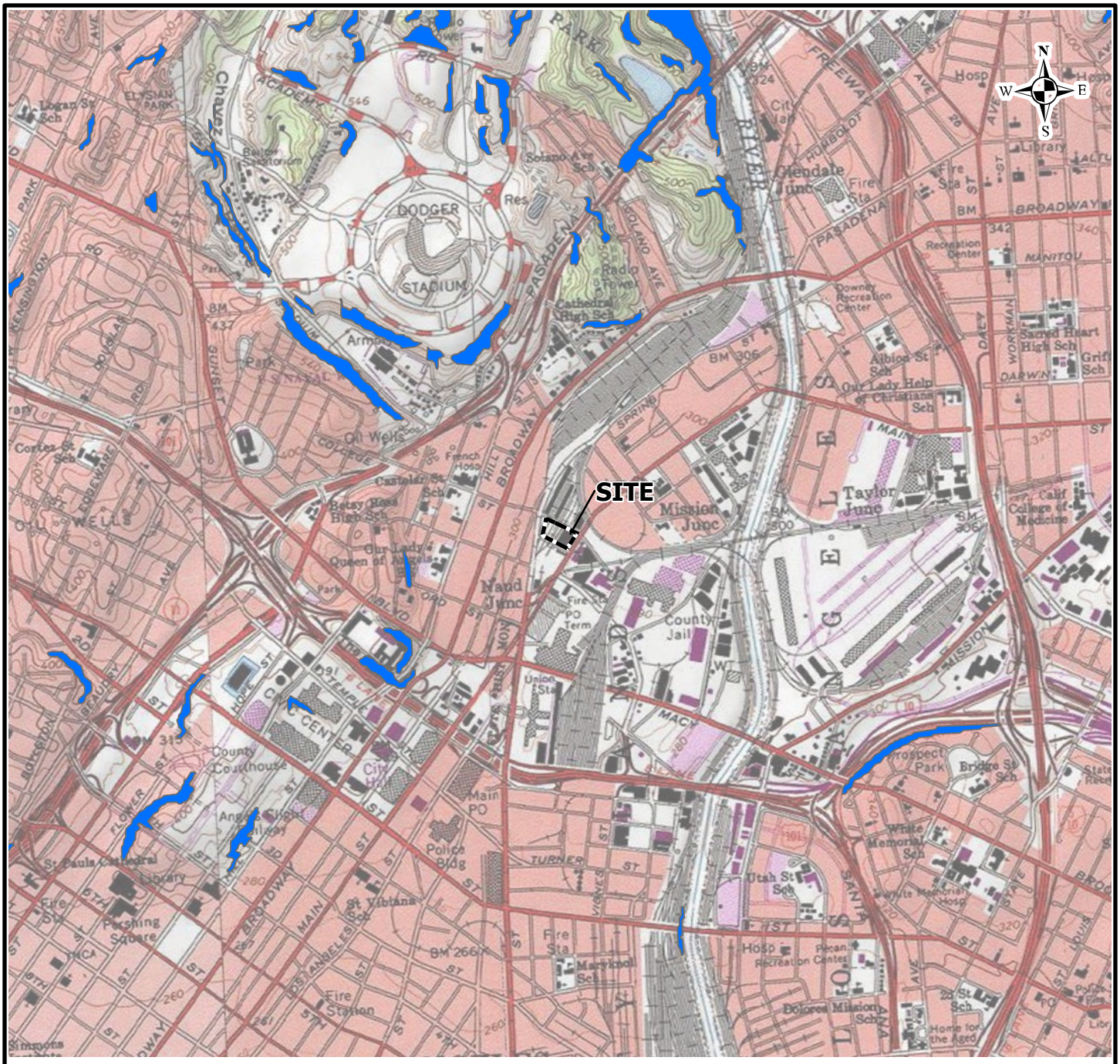
Figure Title
LIQUEFACTION SUSCEPTIBILITY MAP

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Legend

Earthquake-Induced Landslide Zones

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.

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. Liquifaction Susceptibility dataset provided in GIS format by Los Angeles County (lacounty.gov). This data is preliminary and has not been reviewed for conformity with United States Geological Survey (USGS) editorial standards or with the North American Stratigraphic Code.

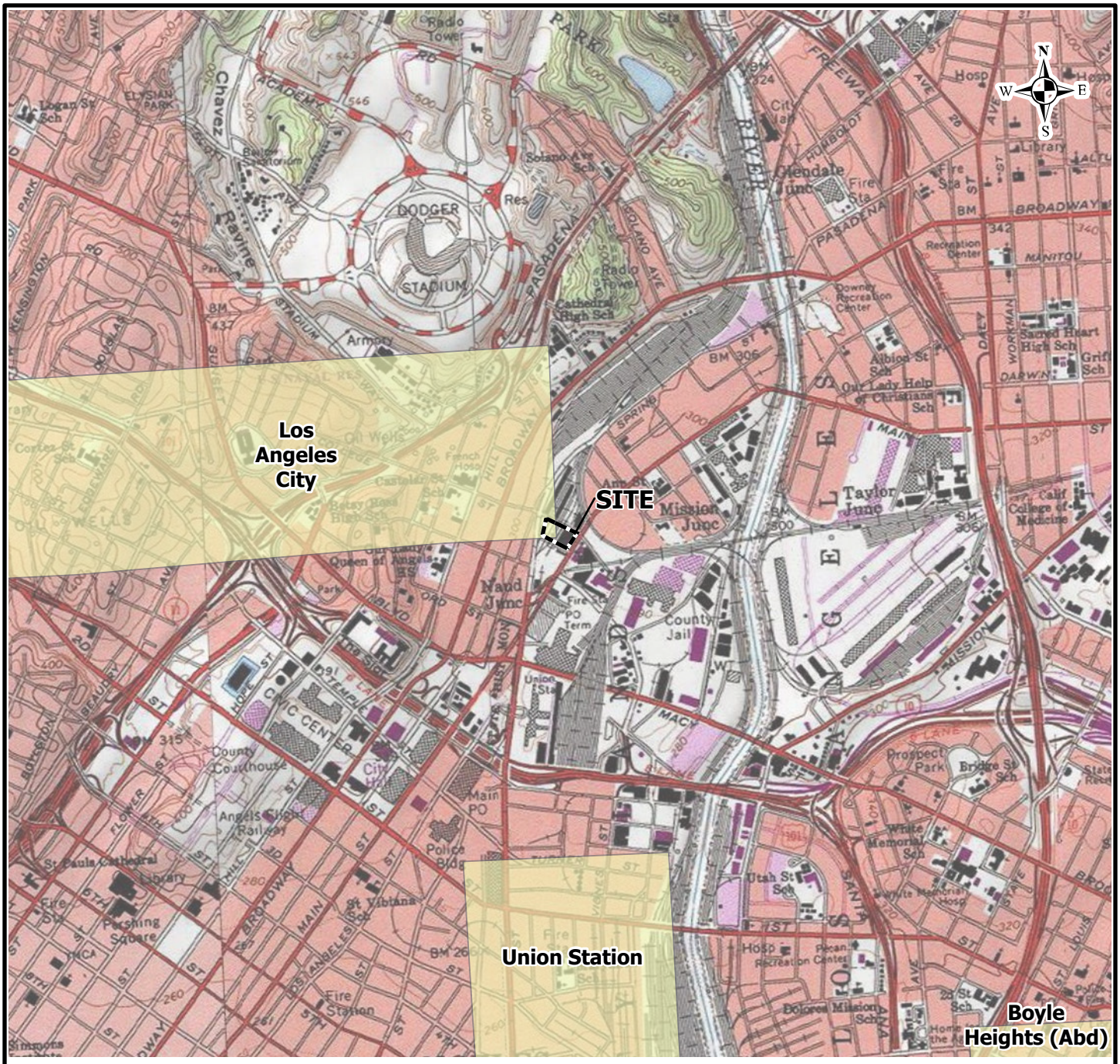
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Figure Title	EARTHQUAKE INDUCED LANDSLIDE MAP
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Legend

- Approximate site boundary
- Boundary of State-Designated Oil/Gas Fields

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. Oil/Gas Fields (Inside LA County) dataset provided in GIS format by the City of Los Angeles GeoHub.

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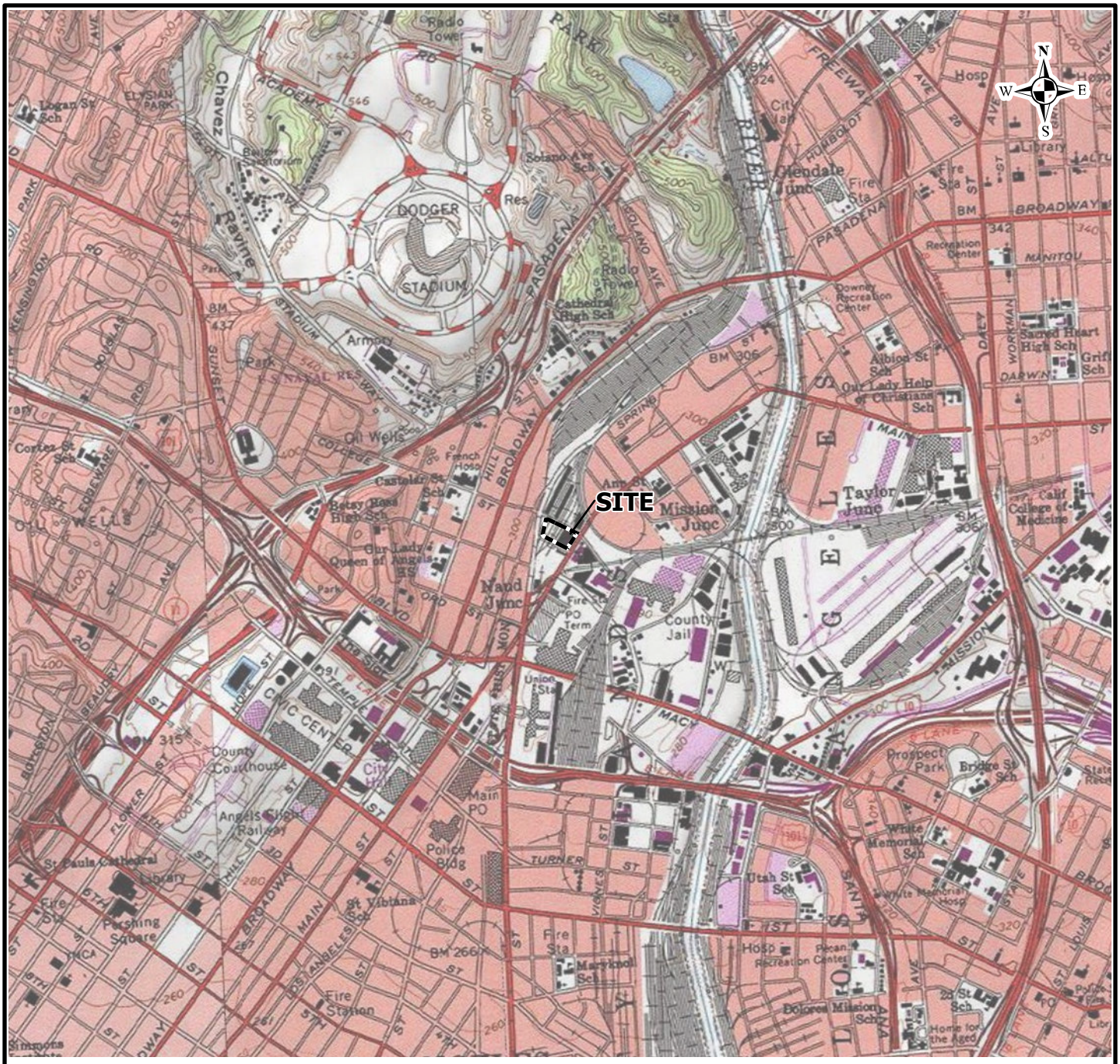
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NEARBY OIL FIELDS

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Legend

- Approximate site boundary
- Los Angeles County - Tsunami Inundation Runup Line
- Los Angeles County - Tsunami Inundation Zones

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. Tsunami Inundation Zone dataset provided in GIS format by the City of Los Angeles GeoHub.

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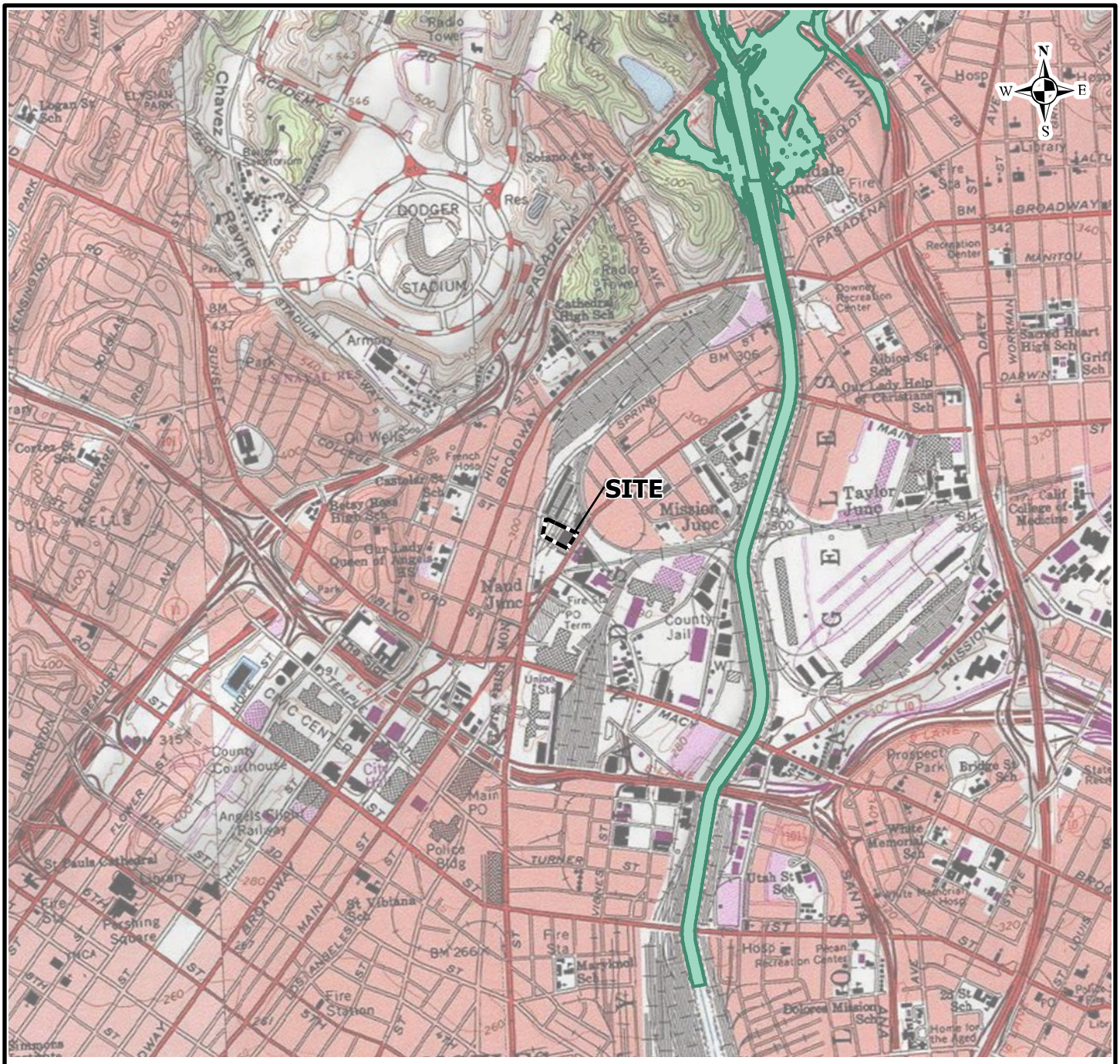
Figure Title
TSUNAMI INUNDATION HAZARD MAP

Project No.	721036101
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Figure 7

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Legend

- Approximate site boundary
- Dam Failure Inundation Boundary

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. Tsunami Inundation Zone dataset provided in GIS format by the City of Los Angeles GeoHub.

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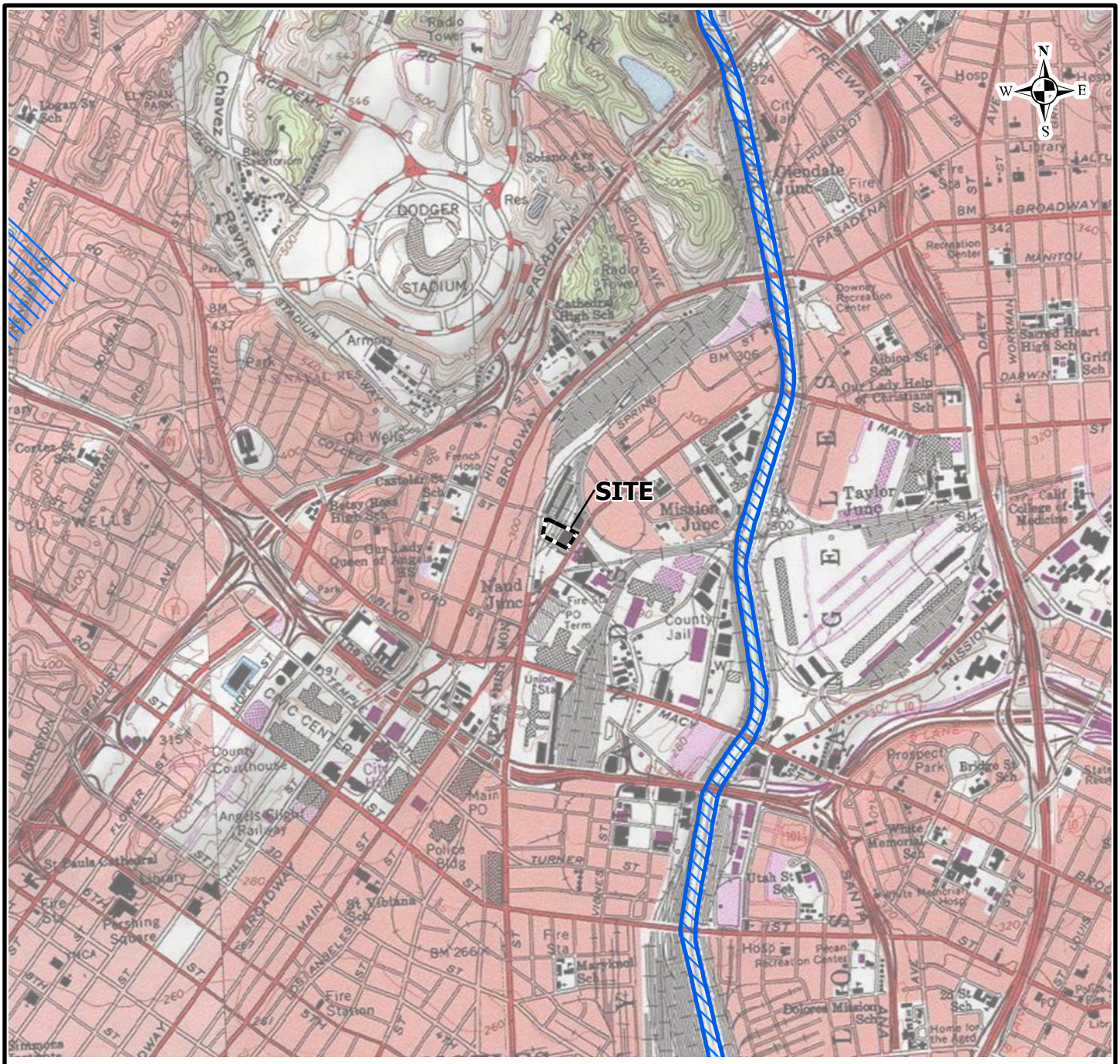
Figure Title
DAM FAILURE INUNDATION HAZARD MAP

Project No.	721036101
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Figure 8

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Legend

Approximate site boundary

FEMA Flood Zone

100 Year Flood Zone

500 Year Flood Zone

Notes:
1. Seamless Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online, National Geographic Society, i-cubed.
2. FEMA Flood Zone dataset provided in GIS format by the City of Los Angeles GeoHub.

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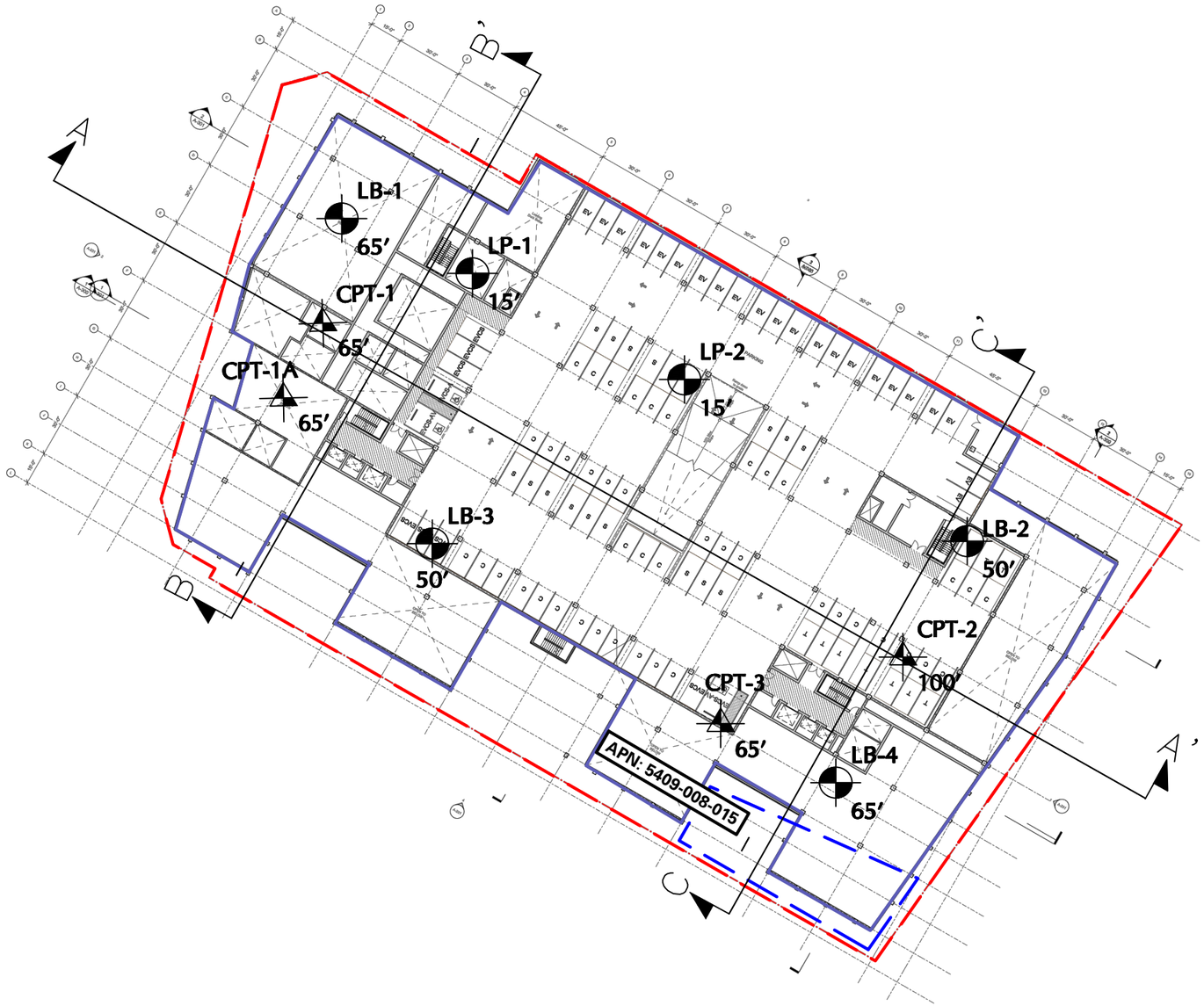
Figure Title
FEMA FLOOD HAZARD MAP

Project No.	721036101
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Figure 9

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LEGEND:

- APPROXIMATE SITE LIMITS
- APPROXIMATE LIMITS OF PARCEL MAP
- LB-4 / 65' — APPROXIMATE BORING LOCATIONS
- LP-1 / 25' — APPROXIMATE PERCOLATION TEST LOCATIONS
- CPT-1 / 50' — APPROXIMATE CPT LOCATIONS
- APPROXIMATE PROPOSED BUILDING LIMITS
- APPROXIMATE LOCATION OF CROSS SECTIONS

NOTES:

1. BACKGROUND IMAGE AND BUILDING LIMITS REFERENCED FROM CONCEPT DESIGN REPORT TITLED "130 WEST COLLEGE" DRAWING A-103 SHEET TITLED "LEVEL P1" PREPARED BY GRIMSHAW DATED SEPTEMBER 2022.
2. BORING LOCATIONS ARE APPROXIMATE

60 0 30 60
SCALE IN FEET

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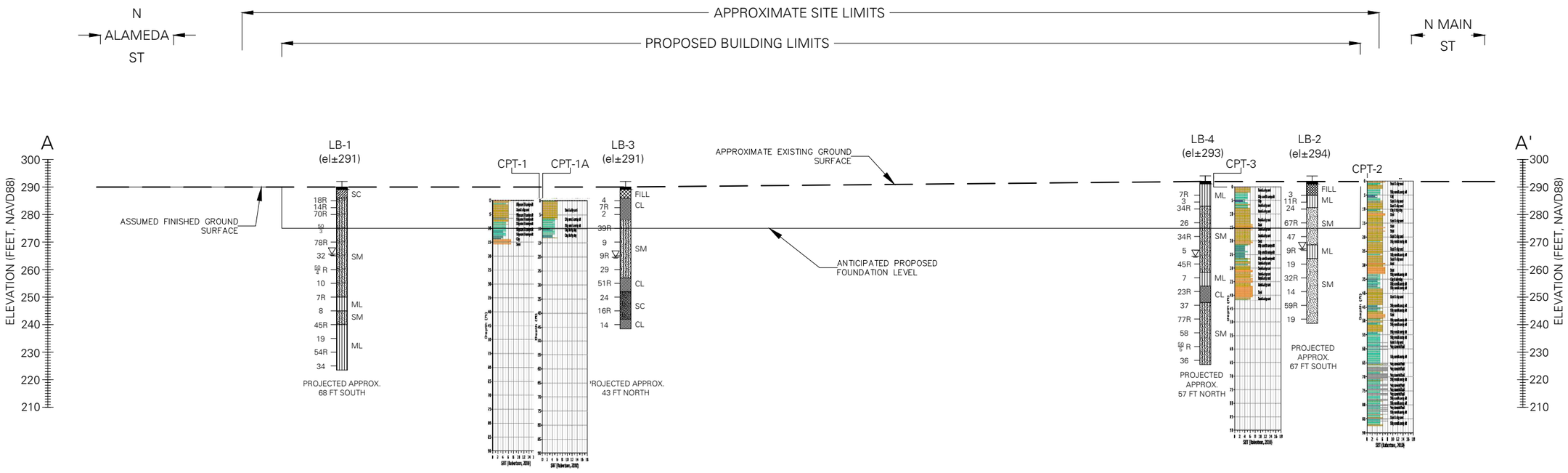
Project	130 W COLLEGE STREET LOS ANGELES LOS ANGELES COUNTY CALIFORNIA
Figure Title	EXPLORATION MAP
Project No.	721036101
Date	NOVEMBER 2022
Scale	AS SHOWN
Drawn By	KT
Figure No.	10

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Filename: \\langan.com\data\LAX\data1\721036101\Project Data\CAD\01\2D-DesignFiles\Proposed Exploration Plan - Copy.dwg Date: 11/21/2022 Time: 10:28 User: jmagana Style Table: Langan.stb Layout: PBLP

E

CROSS SECTION A-A'



LEGEND:

- EXISTING GROUND SURFACE
- PROPOSED FINISHED FLOOR
- FILL
- CLAY (CL)
- SILT (ML)
- SAND (SP)
- SILTY SAND (SM)
- ASPHALT

LB-6
el±55.9
N(R)

LB-6 el±55.9 — BORING ID AND ELEVATION (FEET, NAVD 88)

N — SPT BLOWCOUNT: THE NUMBER OF BLOWS OF A 140 POUND AUTOMATIC HAMMER FREE FALLING FROM A HEIGHT OF 30 INCHES NEEDED TO DRIVE A 2-INCH OUTER DIAMETER SPLIT SPOON SAMPLER 12 INCHES AFTER AN INITIAL PENETRATION OF 6 INCHES, OR UNTIL REFUSAL IS ENCOUNTERED.

N(R) — CALIFORNIA MODIFIED SPLIT-SPOON SAMPLER BLOWCOUNT: THE NUMBER OF BLOWS A 140 POUND AUTOMATIC HAMMER FREE FALLING FROM A HEIGHT 30 INCHES NEEDED TO DRIVE A 3-INCH OUTER DIAMETER CALIFORNIA MODIFIED SAMPLER 12 INCHES AFTER 6 INCHES OF INITIAL PENETRATION, OR UNTIL REFUSAL IS ENCOUNTERED.

40 20 0 40
SCALE IN FEET (VERTICAL)

40 20 0 40
SCALE IN FEET (HORIZONTAL)

NOTES

1. THE FIGURE SHOWS GENERALIZED SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. VARIATIONS IN CONDITIONS SHOULD BE EXPECTED BETWEEN BORING LOCATIONS. FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED SEE BORING LOGS.
2. LANGAN BORINGS LB-1 THROUGH LB-4 WERE DRILLED BY MARTINI DRILLING BETWEEN 15 AND 16 OCTOBER 2022 UNDER FULL-TIME ENGINEERING OBSERVATION OF A LANGAN FIELD ENGINEER.
3. SEE FIGURE 10 FOR LOCATION OF CROSS-SECTION WITH RESPECT TO SITE PLAN.
4. SITE LIMITS ARE APPROXIMATE

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130 W COLLEGE STREET
LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

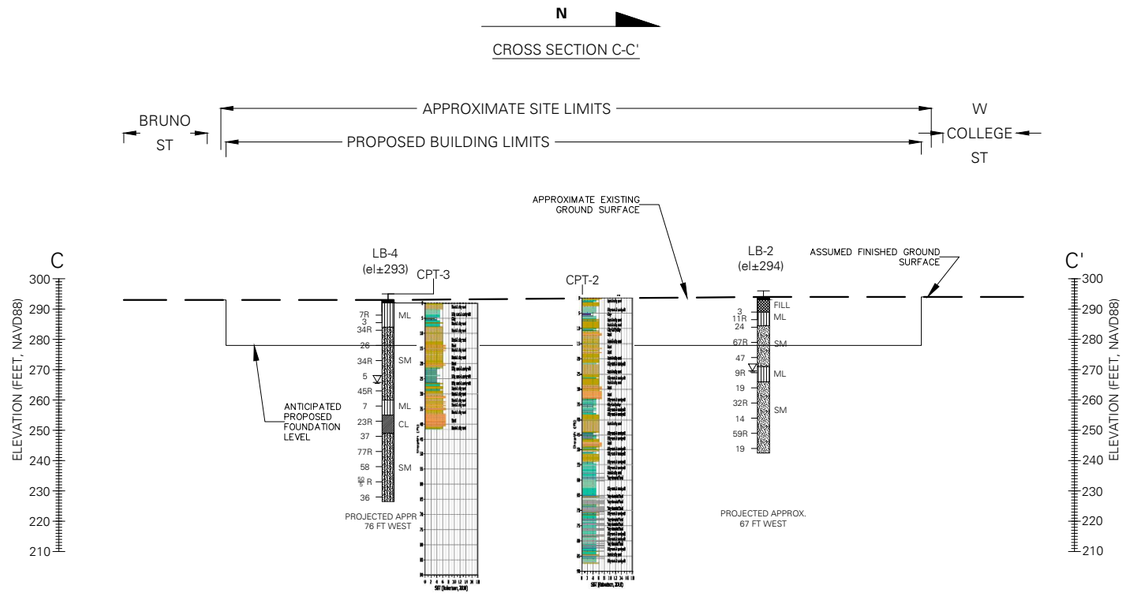
GENERALIZED SUBSURFACE CROSS-SECTION A-A'

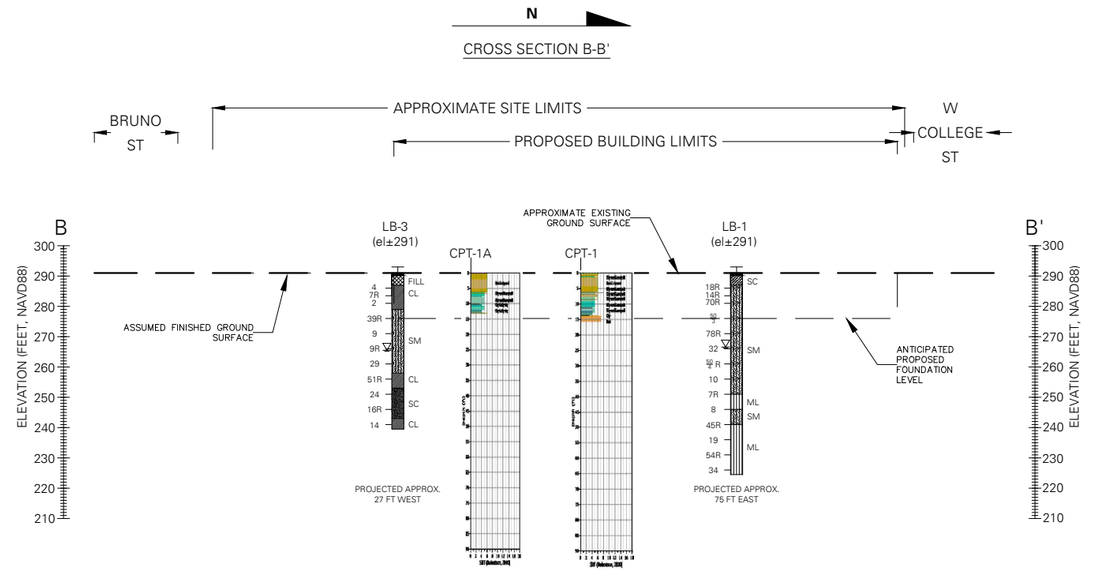
721036101
OCTOBER 2022
1" = 40'
AC

11A

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LEGEND:

- EXISTING GROUND SURFACE
- PROPOSED FINISHED FLOOR
- FILL
- CLAY (CL)
- SILT (ML)
- SAND (SP)
- SILTY SAND (SM)
- ASPHALT

50 25 0 50
SCALE IN FEET (VERTICAL)

50 25 0 50
SCALE IN FEET (HORIZONTAL)

LB-6
el±55.9
N(R)

LB-6 el±55.9 BORING ID AND ELEVATION (FEET, NAVD 88)

N SPT BLOWCOUNT: THE NUMBER OF BLOWS OF A 140 POUND AUTOMATIC HAMMER FREE FALLING FROM A HEIGHT OF 30 INCHES NEEDED TO DRIVE A 2-INCH OUTER DIAMETER SPLIT SPOON SAMPLER 12 INCHES AFTER AN INITIAL PENETRATION OF 6 INCHES, OR UNTIL REFUSAL IS ENCOUNTERED.

N(R) CALIFORNIA MODIFIED SPLIT-SPOON SAMPLER BLOWCOUNT: THE NUMBER OF BLOWS A 140 POUND AUTOMATIC HAMMER FREE FALLING FROM A HEIGHT 30 INCHES NEEDED TO DRIVE A 3-INCH OUTER DIAMETER CALIFORNIA MODIFIED SAMPLER 12 INCHES AFTER 6 INCHES OF INITIAL PENETRATION, OR UNTIL REFUSAL IS ENCOUNTERED.

NOTES

1. THE FIGURE SHOWS GENERALIZED SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. VARIATIONS IN CONDITIONS SHOULD BE EXPECTED BETWEEN BORING LOCATIONS. FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED SEE BORING LOGS.
2. LANGAN BORINGS LB-1 THROUGH LB-4 WERE DRILLED BY MARTINI DRILLING BETWEEN 15 AND 16 OCTOBER 2022 UNDER FULL-TIME ENGINEERING OBSERVATION OF A LANGAN FIELD ENGINEER.
3. SEE FIGURE 10 FOR LOCATION OF CROSS-SECTION WITH RESPECT TO SITE PLAN.
4. SITE LIMITS ARE APPROXIMATE

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130 W COLLEGE STREET
LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

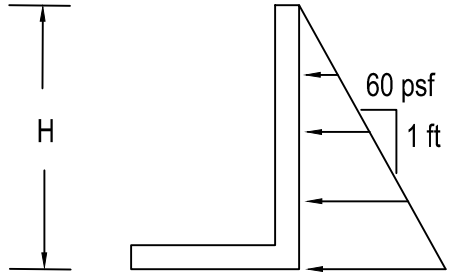
GENERALIZED SUBSURFACE CROSS-SECTION B-B' AND C-C'

721036101
OCTOBER 2022
1" = 60'
AC

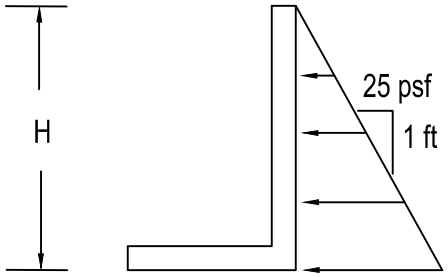
11B

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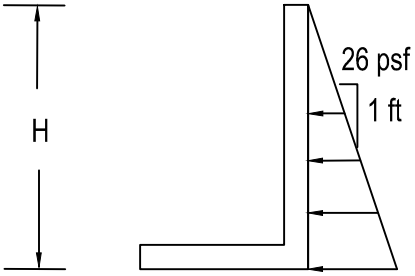
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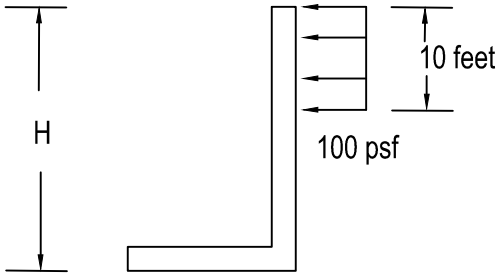
At-Rest Earth Pressure (P_O)



Active Earth Pressure (P_O)



Seismic Earth Pressure Increment (ΔP_{ae})



Minimum Surcharge (q_s)

Symbols:
H = Height of Wall (feet)
psf=pounds per square foot
P_o = At-Rest Earth Pressure (Restrained Walls)
ΔP_{ae} = Earth Pressure Increment
qs = surcharge

Notes:
1. Seismic Earth Pressure Increment should be added to the Active Earth Pressure and any applicable surcharges.
2. Minimum surcharge shown is based on a fire truck or car parked 10 feet beyond the wall. If higher surcharge loads are anticipated (e.g., adjacent buildings, heavy construction equipment, etc.), the surcharge loading should be evaluated on a case by case basis.
3. Seismic Earth pressure is determined in accordance with city of Los Angeles Department of Building and Safety Information Bulletin P/BC 2020-083.

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Project
130 W COLLEGE STREET
LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Figure Title
DESIGN EARTH PRESSURES FOR BASEMENT WALLS

Project No. 721036101
Date OCTOBER 2022
Scale NOT TO SCALE
Drawn By JMG

Figure No. 12

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Filename: \\langan.com\data\LAX\data1\721036101\Project Data\CAD\01\2D-DesignFiles\721036101 Design Earth Pressures.dwg Date: 11/16/2022 Time: 15:21 User: djudge Style Table: ---- Layout: Figure 16 - Design Earth Pressure For New Basement Walls

APPENDIX A
Earthquake Catalog Search Result

TABLE A.1 - USGS ANSS COMPREHENSIVE CATALOG SEARCH RESULTS

Date	Latitude	Longitude	Approximate Magnitude	Magnitude Type	Approximate Distance from Site (km)
3/29/2014	33.9325	-117.9158	5.10	mw	33
7/29/2008	33.9485	-117.7663	5.44	mw	45
4/26/1997	34.3690	-118.6700	5.07	ml	53
6/26/1995	34.3940	-118.6690	5.02	ml	54
3/20/1994	34.2310	-118.4750	5.24	ml	29
1/29/1994	34.3060	-118.5790	5.06	ml	42
1/19/1994	34.3780	-118.6190	5.07	ml	50
1/19/1994	34.3790	-118.7120	5.06	ml	56
1/18/1994	34.3770	-118.6980	5.24	ml	55
1/17/1994	34.3260	-118.6980	5.58	ml	52
1/17/1994	34.3400	-118.6140	5.20	ml	47
1/17/1994	34.2750	-118.4930	5.89	ml	33
1/17/1994	34.2130	-118.5370	6.70	mw	32
6/28/1991	34.2700	-117.9930	5.80	mw	32
2/28/1990	34.1440	-117.6970	5.51	ml	50
12/3/1988	34.1510	-118.1300	5.02	ml	14
10/4/1987	34.0740	-118.0980	5.25	ml	13
10/1/1987	34.0610	-118.0790	5.90	mw	14
9/4/1981	33.5575	-119.1195	5.45	ml	99
1/1/1979	33.9165	-118.6872	5.21	ml	45
2/21/1973	33.9790	-119.0502	5.30	mw	76
2/9/1971	34.4160	-118.3700	5.30	mh	41
2/9/1971	34.4160	-118.3700	5.80	mh	41
2/9/1971	34.4160	-118.3700	5.80	mh	41
2/9/1971	34.4160	-118.3700	6.60	mw	41
9/12/1970	34.2548	-117.5343	5.22	ml	68
11/14/1941	33.7907	-118.2637	5.12	ml	30
5/31/1938	33.6993	-117.5112	5.23	ml	78
3/11/1933	33.8500	-118.2660	5.00	ml	24
3/11/1933	33.6238	-118.0012	5.29	mh	53
3/11/1933	33.7667	-117.9850	5.02	mh	40
3/11/1933	33.6308	-117.9995	6.40	mw	53
8/31/1930	34.0300	-118.6430	5.25	ms	38
4/18/1928	34.1000	-119.3000	5.20	uk	98
8/4/1927	34.0000	-118.5000	5.30	uk	25
7/23/1923	34.0890	-117.2590	6.21	mw	90
3/10/1922	34.2090	-119.1430	6.53	mw	85
10/23/1916	34.7000	-119.0000	5.50	ml	100
5/15/1910	33.7000	-117.4000	5.30	mw	87
5/13/1910	33.7000	-117.4000	5.00	ml	87
4/11/1910	33.7000	-117.4000	5.00	ml	87

Notes:

1. The listed Earthquake Catalog Search results obtained from USGS ANSS Comprehensive Catalog on 03 November 2022.
2. Earthquake Catalog search results include earthquake events within 100 km of the Site with magnitudes of 5.0 or greater since 1900.

DRAFT

APPENDIX B
Langan Boring Logs

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Log of Boring **LB-1** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 291.8
Drilling Company: Martini Drilling	Date Started: 10/15/2022 — Date Finished: 10/15/2022
Drilling Equipment: CME 75	Completion Depth: 66.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 14, Undisturbed ---, Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 24.4, Completion ▼ ---, 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod; Bulk	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+291.8		0					10 20 30 40	
	+291.0	Asphalt 4 inches and Aggregate Base 6 inches.							
		Dark brown, clayey SAND, trace fine gravel, (SC), moist.	2						
	+287.8		4						
		Medium dense, brown, fine to medium coarse silty SAND, trace fine gravel, (SM), moist.	6	S-1	CR	10	8 9 9	18	
		Medium dense, yellow-brown, fine to coarse SAND, trace silt, fine to corase gravel, (SM), moist.	8	S-2	CR	10	11 9 5	14	
		Very dense, white-brown, fine to coarse SAND, some silt, fine to coarse gravel, (SM), moist.	10	S-3	CR	10	11 31 39	70	
			12						
			14						
		Very dense, yellow-brown, fine to coarse SAND, some silt, trace fine gravel, (SM), moist.	16	S-4	SPT	9	22 50/3	50/3	
			18						
		Top: very dense, yellow-brown, fine to coarse SAND, some silt, trace fine gravel, (SM), moist. Bottom: very dense, dark bluish-gray, fine to coarse SAND, some silt, fine to coarse gravel, (SM), moist.	20	S-5	CR	18	18 37 41	78	
			22						
			▽ 24						
		Dense, gray, fine to coarse SAND, some silt, (SM), wet.	26	S-6	SPT	18	7 15 17	32	
			28						
		Dense, gray, fine to coarse SAND, some silt, (SM), wet.	30	S-7	CR	10	42 50/4	50/4	
			32						
			34						
			35						

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Log of Boring **LB-1** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	291.8

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+256.8	Stiff, dark gray, lean silty SAND, trace fine silt, trace clay, low plasticity, (SM), wet.	35						
			36	S-8	SPT	18	3 4 6	10	
			38						
	+251.8	Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, strong odor, (ML), wet.	40	S-9	CR	10	2 3 4	7	
			42						
			44						
	+246.8	Stiff, dark gray, lean silty SAND, some silt, trace clay, low plasticity, strong odor, (SM), wet.	46	S-10	SPT	17	1 3 5	8	
			48						
	+241.8	Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	50	S-11	CR	18	9 18 27	45	
			52						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	54						
			56	S-12	SPT	18	3 7 12	19	
			58						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	60	S-13	CR	18	7 17 37	54	
			62						
			64						
		Stiff, dark gray, lean SILT, some fine sand, trace clay, low plasticity, (ML), wet.	66	S-14	SPT	18	6 14 20	34	
	+225.3	End boring at 66.5 feet. Groundwater encountered at 24.5 feet. Boring backfilled with grout.	68						
			70						
			72						
			74						
			76						
			78						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-2** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 294
Drilling Company: Martini Drilling	Date Started: 10/04/2022 — Date Finished: 10/05/2021
Drilling Equipment: CME 75	Completion Depth: 51.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 11 — Undisturbed --- — Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 27 — Completion ▼ --- — 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+294.0	Asphalt 4 inches and Aggregate Base 6 inches.	0						
	+293.2	Dark brown, silty fine to medium SAND, some gravel, (SM), brikes and asphalt debris, moist. [FILL]	2						
	+288.9	Soft, brown, fine to medium sandy SILT, (ML), moist.	4						
			6	S-1	SPT	18	1 1 2	3	
		Stiff, brown, fine to medium sandy SILT, (ML), moist.	8	S-2	CR	10	5 5 6	11	
	+284.5		10	S-3	SPT	10	8 9 15	24	
		Whitish-brown, fine to coarse SAND, trace silt, some fine to coarse gravel, (SM), moist.	12						
			14						
			16	S-4	CR	10	16 31 36	67	
		Whitish-brown, fine to coarse SAND, trace silt, some fine to coarse gravel, (SM), moist.	18						
	+271.0		20	S-5	SPT	12	24 29 18	47	
		Stiff, gray, SILT, some fine sand, low plasticity, (ML), wet.	22						
			24						
			26	S-6	CR	16	4 4 5	9	
	+266.0		28						
			30						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-2** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	294

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+264.0	Dense, Bluish-gray, silty fine to medium SAND, trace fine gravel, (SM), wet.	30	S-7	SPT	18	11 11 8	19	
			32						
			34						
		Dense, Bluish-gray, silty fine to medium SAND, trace fine gravel, (SM), wet.	36	S-8	CR	10	10 19 13	32	
			38						
		Stiff, bluish-gray, silty SAND, trace fine silt, low plasticity, (SM), wet.	40	S-9	SPT	18	2 6 8	14	
			42						
			44						
		Very dense, bluish-gray, fine to coarse sand, trace silt, (SM), strong odor, wet.	46	S-10	CR	18	5 19 40	59	
			48						
			50						
	+242.5	Very dense, bluish-gray, fine to coarse sand, trace silt, (SM), strong odor, wet.		S-11	SPT	15	4 7 12	19	
		End boring at 51.5 feet. Groundwater encountered at 27 feet. Boring backfilled with grout.	52						
			54						
			56						
			58						
			60						
			62						
			64						
			66						
			67.5						

N-Value (Blows/ft) scale: 10 20 30 40

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Log of Boring **LB-3** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 290.6
Drilling Company: Martini Drilling	Date Started: 10/07/2022 — Date Finished: 10/07/2022
Drilling Equipment: CME 75	Completion Depth: 51.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 12, Undisturbed ---, Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 25.5, Completion ▼ ---, 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+290.6	Asphalt 5 inches and Aggregate Base 5 inches.	0						
	+289.8	Dark brown, fine to coarse clayey SAND, (SC), moist. [FILL]	2						
	+286.6	Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	4	S-1	SPT	18	1 2 2	4	
		Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	6	S-2	CR	10	2 3 4	7	
		Soft, orangish-brown, fine to medium sandy CLAY, (CL), moist.	8	S-3	SPT	17	1 1	2	
	+278.6	Dense, grayish-brown, fine to coarse SAND, some silt, trace fine to coarse gravel, (SP), moist.	10	S-4	CR	10	12 18 21	39	
		Stiff, gray, sandy SILT, (SM), low plasticity, moist.	12	S-5	CR	10	3 3 6	9	
		Medium dense, gray-brown, fine to coarse silty SAND, trace fine to coarse gravel, (SM), moist.	14	S-6	SPT	18	12 15 14	29	
		Very dense, bluish-gray, silty fine SAND, (SM), wet. ▽	16	S-7	CR	16	11 22 29	51	
			18						
			20						
			22						
			24						
			26						
			28						
			30						

N-Value scale: 10 20 30 40

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Log of Boring **LB-3** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	290.6

Material Symbol	Elev. (ft)	Sample Description
	+260.6	Very dense, bluish-gray, silty fine SAND, (SM), wet.
	+257.6	Very stiff, bluish gray, CLAY, trace fine sand, (CL), wet.
	+252.6	Medium dense, bluish-gray, clayey SAND, trace fine gravel, high plasticity clay, (SC), wet.
	+242.6	Dense, bluish-gray, clayey fine to coarse SAND, some fine to coarse gravel, high plasticity clay, (SC), wet.
	+239.1	Very stiff, bluish-gray, fine sandy CLAY, low plasticity, trace fine gracel, (CL), wet.
		End boring at 51.5 feet. Groundwater encountered at Boring backfilled with grout.

Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
30	S-8	SPT	18	3 7 17	24	
32						
34						
36	S-9	CR	18	3 7 9	16	
38						
40	S-10	SPT	18	1 3 11	14	
42						
44						
46	S-11	CR	18	9 22 26	48	
48						
50	S-12	SPT	18	4 12 15	27	
52						
54						
56						
58						
60						
62						
64						
66						
67.5						

Sample Data

N-Value (Blows/ft) 10 20 30 40

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Log of Boring **LB-4** Sheet 1 of 2

Project: Creative Workplace Development	Project No.: 721036103
Location: 130 West College Street	Elevation and Datum: 292.8
Drilling Company: Martini Drilling	Date Started: 10/07/2022 — Date Finished: 10/07/2022
Drilling Equipment: CME 75	Completion Depth: 66.5 ft — Rock Depth: ---
Size and Type of Bit: 6in O.D. Hollow Stem Auger	Number of Samples: Disturbed 14, Undisturbed ---, Core ---
Casing Diameter (in): --- — Casing Depth (ft): ---	Water Level (ft.): First ▽ 27.2, Completion ▼ ---, 24 HR. ▼ ---
Casing Hammer: --- — Weight (lbs): --- — Drop (in): ---	Drilling Foreman: Jeff Frazer
Sampler: 2-inch O.D. split spoon; 3-inch O.D Cal Mod; Bulk	Field Engineer: Khoa Tran
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks
	+292.8		0					10 20 30 40	(Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+292.0	Asphalt 5 inches and Aggregate Base 5 inches.							
		Redish-brown, fine to medium sandy SILT, (ML), moist.	2						
			4						
		Medium stiff, brown, fine to medium sandy SILT, (ML), moist.	6	S-1	CR	10	3 3 4	7	Bulk sample from 0 - 5 feet.
		Soft, brown, fine to medium sandy SILT, (ML), moist.	8	S-2	SPT	18	1 1 2	3	
	+283.8		10	S-3	CR	18	3 12 22	34	
		Dense, whitish-brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, trace fine to coarse gravel, (SM), moist.	12						
			14						
		Medium dense, light brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, (SM), wet.	16	S-4	SPT	16	3 12 14	26	
			18						
		Dense, light brown, fine to coarse SAND, trace fine to coarse gravel, trace silt, (SM), wet.	20	S-5	CR	18	7 13 21	34	
			22						
		Medium stiff, greyish-brown, silty SAND, fine silt, (SM), moist.	24						
			26 ▽	S-6	SPT	18	1 2 3	5	
	+264.8		28						
		Medium stiff, greyish-brown, sandy SILT, fine sand, (ML), wet.	30	S-7	CR	16	3 5 40	45	
	+259.8		32						
			34						
			35						

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Log of Boring **LB-4** Sheet 2 of 2

Project	Project No.
Creative Workplace Development	721036103
Location	**Elevation and Datum**
130 West College Street	292.8

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+257.8	Medium stiff, bluish-gray, silty SAND, trace fine silt, (SM), wet.	35						
			36	S-8	SPT	17	2 4 3	7	
	+254.8		38						
		Very stiff, bluish-gray, CLAY, trace fine sand, high plasticity, (CL), strong odor, wet.	40	S-9	CR	16	6 10 13	23	
	+248.8		42						
		Dense, bluish-gray, fine to coarse SAND, some silt, trace fine gravel, (SM), strong odor, wet.	44						
			46	S-10	SPT	10	5 16 21	37	
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	48						
			50	S-11	CR	10	19 34 43	77	
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	52						
			54						
			56	S-12	SPT	16	13 30 28	58	
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	58						
			60	S-13	CR	11	4 50/5	50/5	
		Very dense, bluish-gray, silty fine to coarse SAND, trace fine gravel, (SM), strong odor, wet.	62						
			64						
	+226.3		66	S-14	SPT	18	23 18 18	36	
		End boring at 66.5 feet. Groundwater encountered at 27 feet. Boring backfilled with grout.	68						
			70						
			72						
			74						
			76						
			78						

N-Value (Blows/ft) scale: 10 20 30 40

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APPENDIX C
Infiltration Results

PERCOLATION TEST DATA SHEET

Project:	LP-1					Project No.:	721036101	Date:	10/15/2022
Test Hole No.:	130 W College Street					Tested By:	JMG		
Depth of Test Hole (ft):	20					USCS Soil Classification:		SP	
PVC Pipe Dimension:	2-in I.D. x 15 ft long with 5 ft screen					Test Hole Diameter (in):		8	
Trial No.	Date	Time of Measurement	Initial Depth to Water (ft)	Time of Measurement	Final Depth to Water (ft)	Volume of Water Infiltrated (cu.in.)	Surface Area (sq.in.)	Time Interval (min)	Percolation Rate (in/hr)
Pre-Soak	10/15/2022	12:50 PM	6.50	1:00 PM	11.60	3076	4122	30	–
Pre-Soak	10/15/2022	1:01 PM	7.30	1:11 PM	12.80	3318	3880	30	–
#1 (Refill)	10/15/2022	1:15 PM	5.10	1:20 PM	8.20	1870	4544	10	2.47
#2 (Refill)	10/15/2022	1:23 PM	6.05	1:28 PM	9.30	1960	4257	10	2.76
#3 (Refill)	10/15/2022	1:28 PM	6.10	1:33 PM	9.10	1810	4242	10	2.56
#4 (Refill)	10/15/2022	1:34 PM	6.20	1:39 PM	9.50	1991	4212	10	2.84
#5 (Refill)	10/15/2022	1:40 PM	6.10	1:45 PM	9.30	1930	4242	10	2.73
#6 (Refill)	10/15/2022	1:47 PM	6.00	1:52 PM	8.95	1779	4273	10	2.50
#7 (Refill)	10/15/2022	1:54 PM	6.30	1:59 PM	9.10	1689	4182	10	2.42
#8 (Refill)	10/15/2022	2:01 PM	6.00	2:06 PM	8.85	1719	4273	10	2.41

Comments:	1. Percolation test was performed in accordance with the Boring Percolation Test Procedure provided in the "Guidelines for Design, Investigation, and Reporting - Low Impact Development Stormwater Infiltration," prepared by County of Los Angeles Department of Public Works, dated 30 June 2021. 2. Weather: Sunny and warm. 3. Updated per remarks as shown on C.U.P No. 201000144	Average Stabilized Rate	2.45

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PERCOLATION TEST DATA SHEET

Project:	LP-1	Project No.:	721036101	Date:	10/15/2022
Test Hole No.:	130 W College Street	Tested By:	JMG		
Depth of Test Hole (ft):	20	USCS Soil Classification:		SP	
PVC Pipe Dimension:	2-in I.D. x 15 ft long with 5 ft screen	Test Hole Diameter (in):		8	

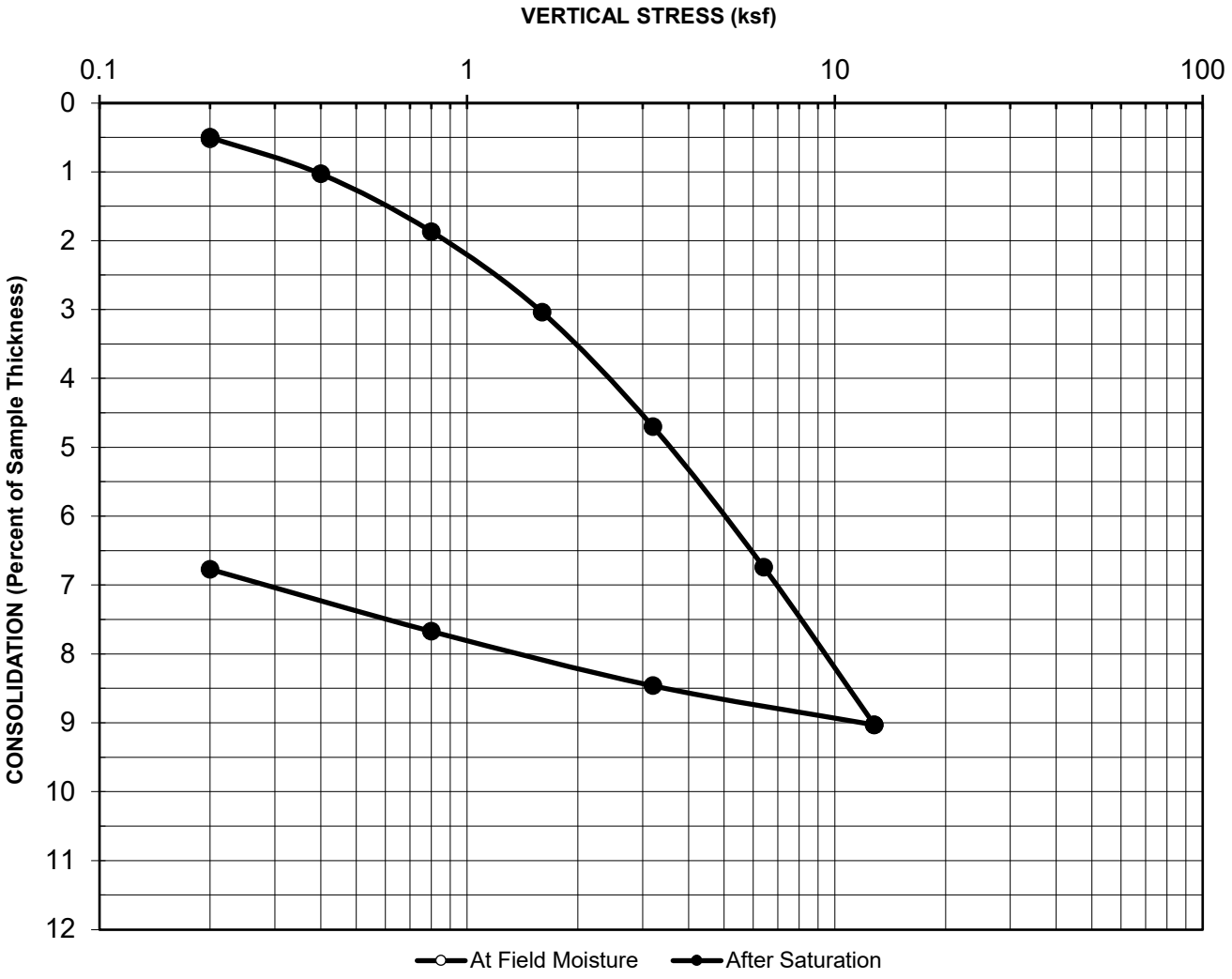
Trial No.	Date	Time of Measurement	Initial Depth to Water (ft)	Time of Measurement	Final Depth to Water (ft)	Volume of Water Infiltrated (cu.in.)	Surface Area (sq.in.)	Time Interval (min)	Percolation Rate (in/hr)
Pre-Soak	10/15/2022	11:18 AM	9.00	11:28 PM	14.00	3016	3368	30	–
#1 (Refill)	10/15/2022	11:48 AM	12.50	11:53 PM	14.00	905	2312	10	2.35
#2 (Refill)	10/15/2022	11:55 AM	6.00	12:00 PM	9.00	1810	4273	10	2.54
#3 (Refill)	10/15/2022	12:03 PM	6.30	12:08 PM	9.30	1810	4182	10	2.60
#4 (Refill)	10/15/2022	12:10 PM	6.00	12:15 PM	9.20	1930	4273	10	2.71
#5 (Refill)	10/15/2022	12:17 PM	5.80	11:22 PM	8.90	1870	4333	10	2.59
#6 (Refill)	10/15/2022	12:25 PM	6.50	12:30 PM	9.60	1870	4122	10	2.72
#7 (Refill)	10/15/2022	12:32 PM	6.00	12:37 PM	9.20	1930	4273	10	2.71
#8 (Refill)	10/15/2022	12:39 AM	6.15	12:44 PM	9.40	1960	4227	10	2.78

Comments:	1. Percolation test was performed in accordance with the Boring Percolation Test Procedure provided in the "Guidelines for Design, Investigation, and Reporting - Low Impact Development Stormwater Infiltration," prepared by County of Los Angeles Department of Public Works, dated 30 June 2021. 2. Weather: Sunny and warm. 3. Updated per remarks as shown on C.U.P No. 201000144	Average Stabilized Rate	2.74

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APPENDIX D
Laboratory Test Results

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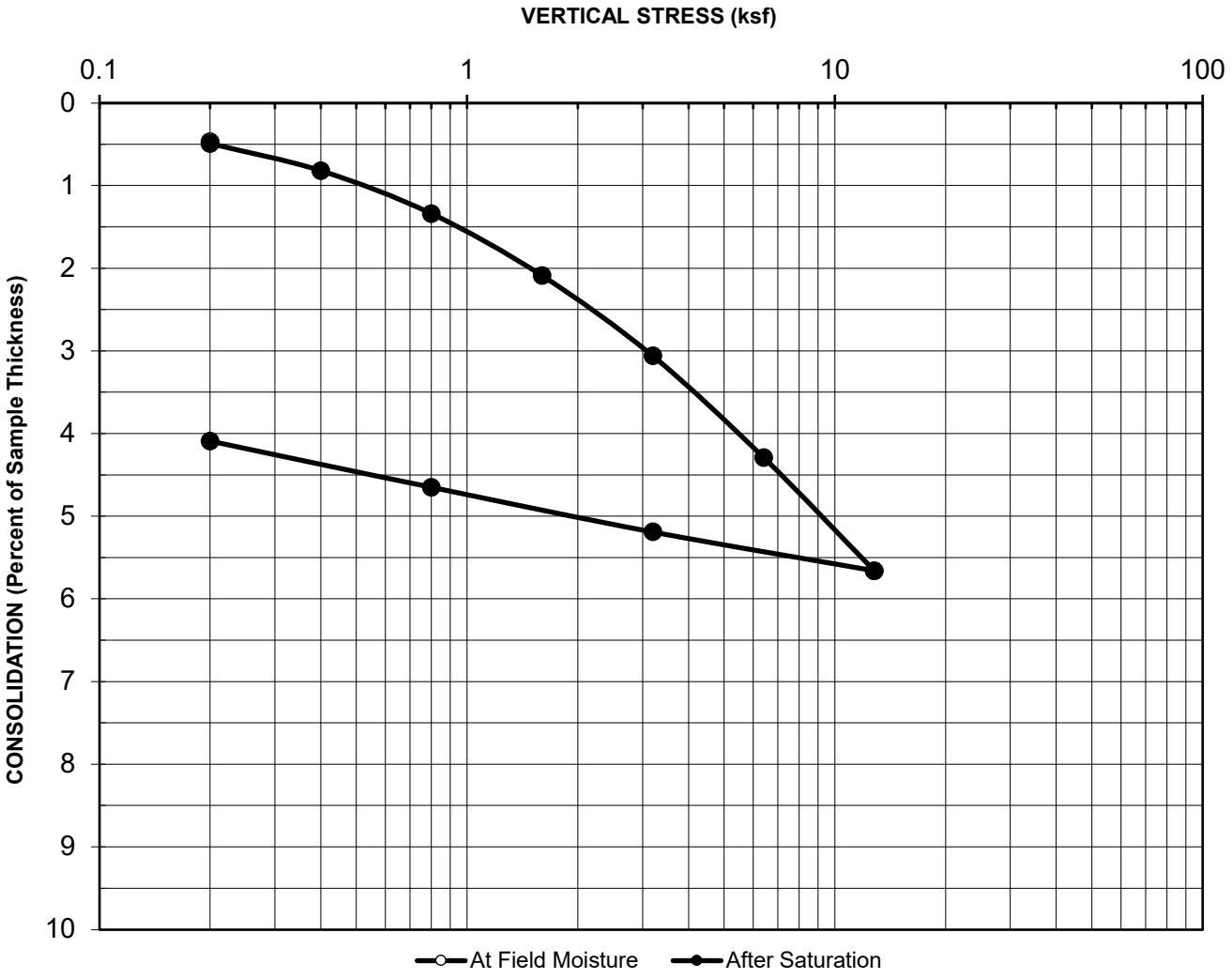


Boring No. :	LB-1	Initial Dry Unit Weight (pcf):	94.6
Sample No.:	S-9	Initial Moisture Content (%):	26.1
Depth (feet):	40	Final Moisture Content (%):	27.5
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Sandy Clay	Initial Void Ratio:	0.78
Remarks:	Swell= 0.02% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

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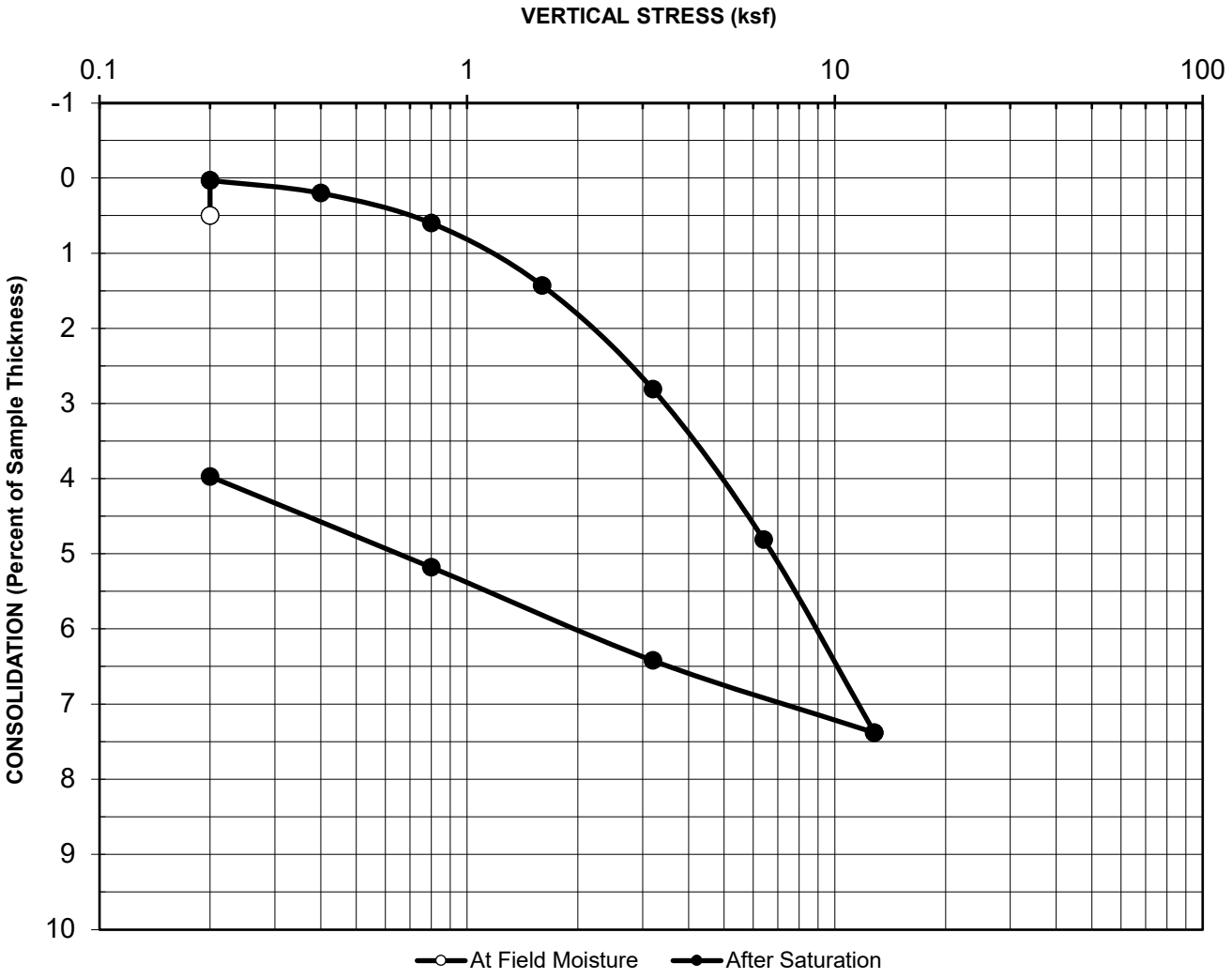


Boring No. :	LB-2	Initial Dry Unit Weight (pcf):	100.6
Sample No.:	S-6	Initial Moisture Content (%):	24.6
Depth (feet):	25	Final Moisture Content (%):	24.7
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Silty Sand	Initial Void Ratio:	0.67
Remarks:	Collapse= 0.02% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

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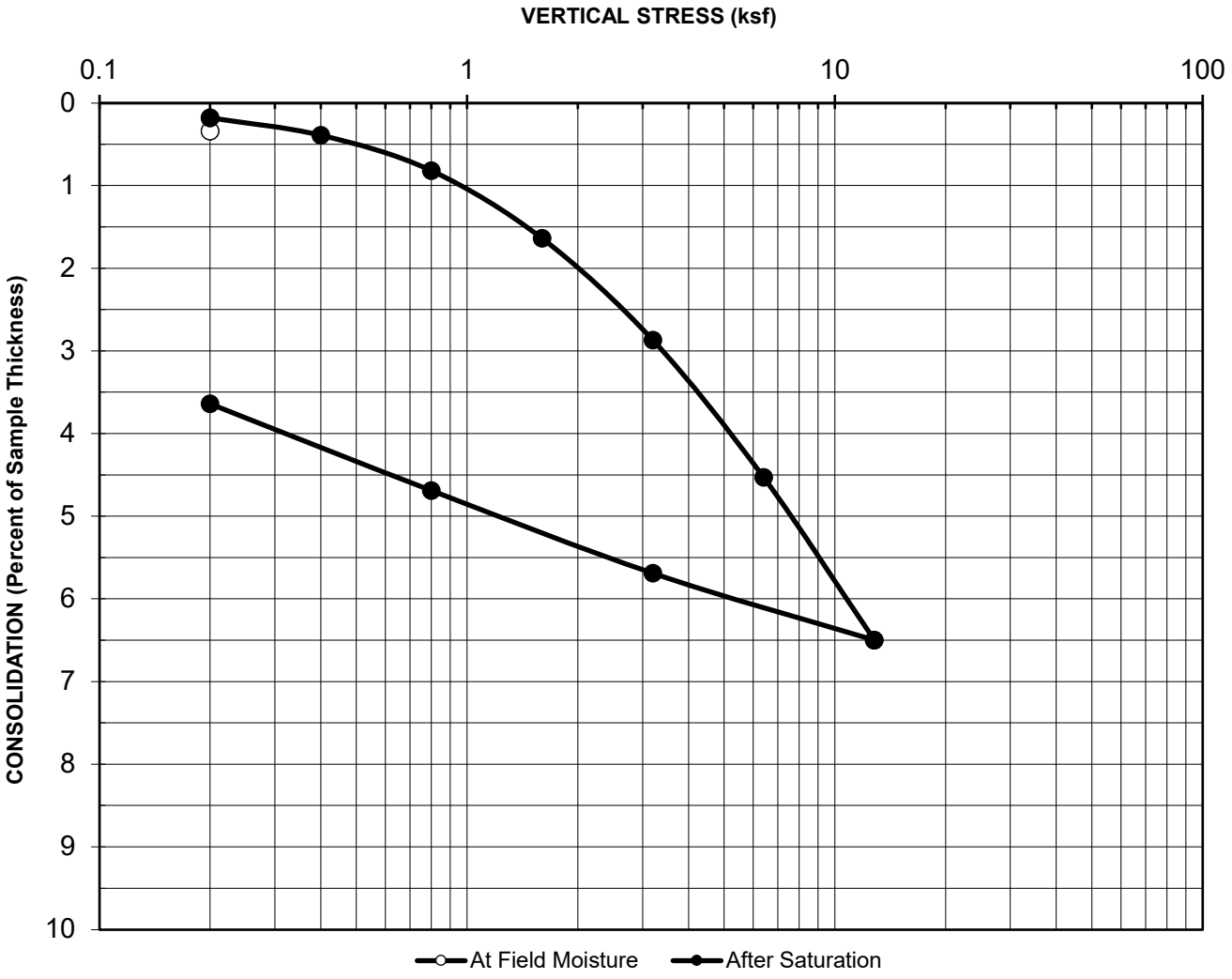


Boring No. :	LB-3	Initial Dry Unit Weight (pcf):	90.8
Sample No.:	S-9	Initial Moisture Content (%):	30.0
Depth (feet):	35	Final Moisture Content (%):	31.8
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Clay w/sand	Initial Void Ratio:	0.86
Remarks:	Swell= 0.47% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

Project Name: 130 W College Street
Project No.: 721036101
Date: 10/20/2022
AP No: 22-1039 **Sheet No:** 1

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Boring No. :	LB-4	Initial Dry Unit Weight (pcf):	94.5
Sample No.:	S-9	Initial Moisture Content (%):	29.7
Depth (feet):	40	Final Moisture Content (%):	29.6
Sample Type:	Mod Cal	Assumed Specific Gravity:	2.7
Soil Description:	Sandy Clay	Initial Void Ratio:	0.78
Remarks:	Swell= 0.16% upon inundation		

CONSOLIDATION CURVE
ASTM D 2435

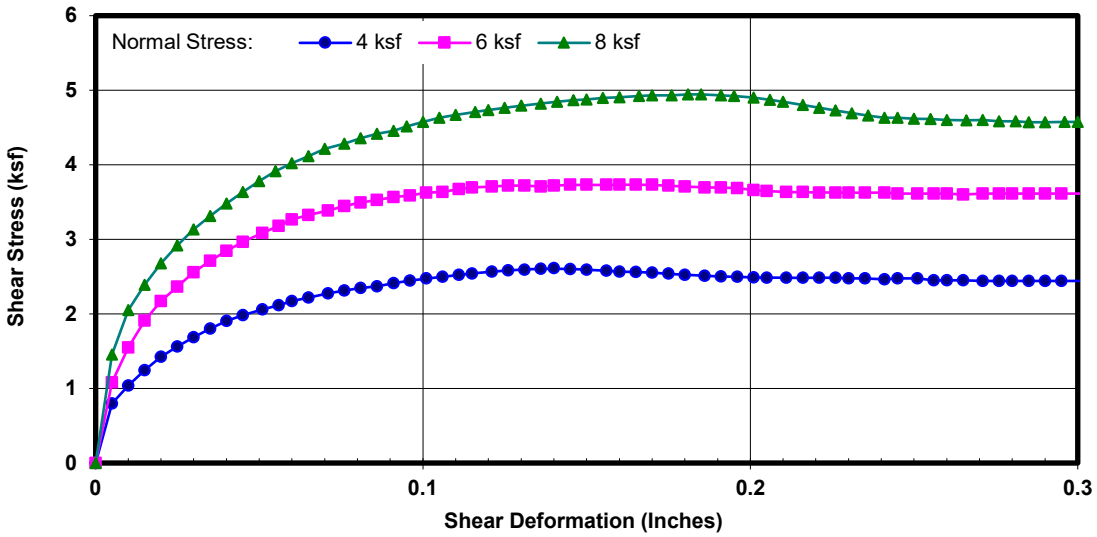
Project Name:	130 W College Street
Project No.:	721036101
Date:	10/20/2022
AP No:	22-1039 **Sheet No:** 1

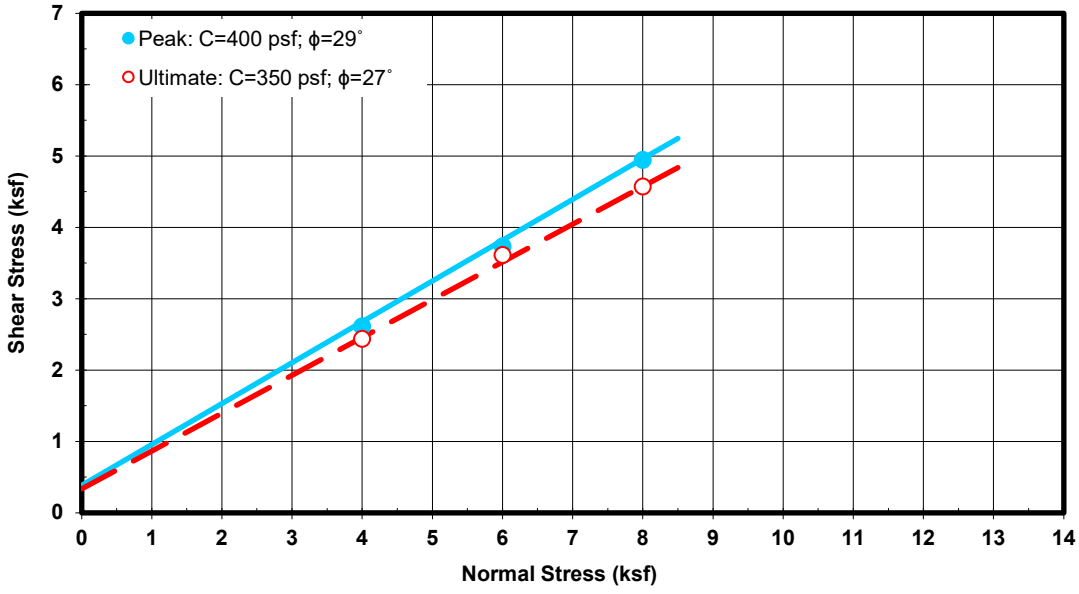
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DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/24/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/25/22
Boring No.:	LB-3		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-9	**Depth (ft):** 35			
Sample Type:	Mod. Cal.				
Soil Description:	Clay w/sand				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.0	89.2	30.0	33.0	91	100	4	2.611	2.440
						6	3.732	3.612
						8	4.944	4.572



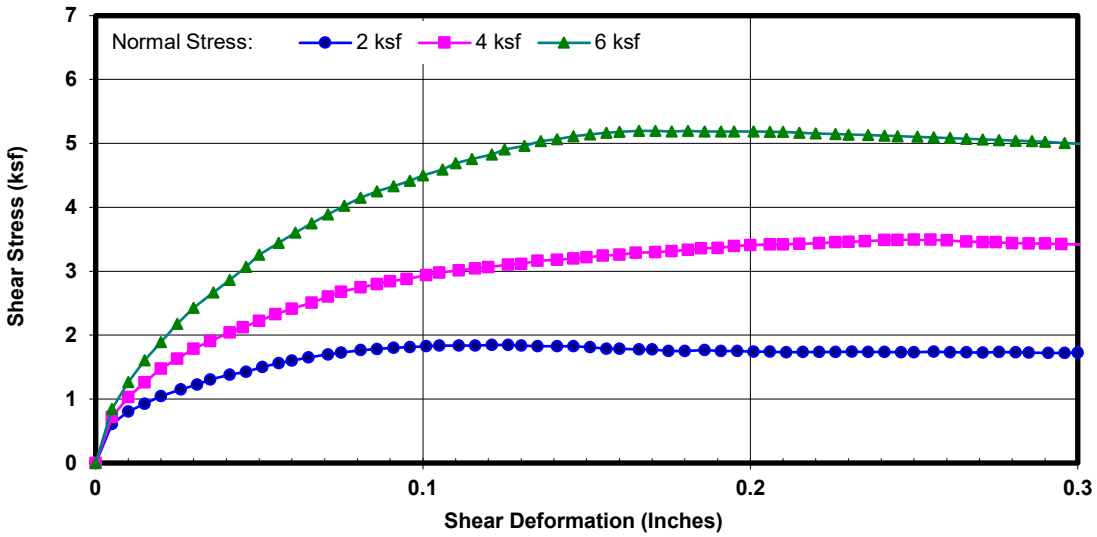


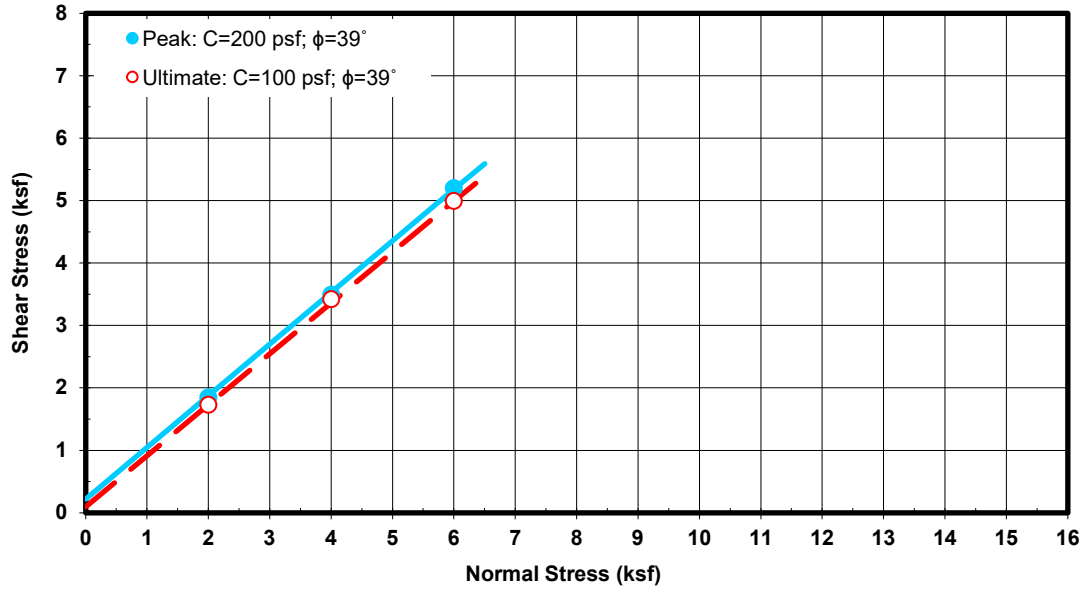
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DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	130 W College Street		**Tested By:**	ST	**Date:** 10/21/22
Project No.:	721036101		**Computed By:**	NR	**Date:** 10/24/22
Boring No.:	LB-1		**Checked by:**	AP	**Date:** 10/26/22
Sample No.:	S-5	**Depth (ft):** 20			
Sample Type:	Mod. Cal.				
Soil Description:	Silty Sand w/gravel				
Test Condition:	Inundated	**Shear Type:** Regular			

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
116.5	111.7	4.3	16.8	23	89	2	1.848	1.728
						4	3.492	3.420
						6	5.198	4.993





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CORROSION TEST RESULTS

Client Name: Langan Engineering
Project Name: 130 W College Street
Project No.: 721036101

AP Job No.: 22-1039
Date: 10/25/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
LB-1	B-1	0-5	Clayey Sand	1,169	7.8	687	287

NOTES: Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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EXPANSION INDEX TEST RESULTS

ASTM D 4829

Client Name: Langan Engineering
Project Name: 130 W College Street
Project No.: 721036101

AP Job No.: 22-1039
Date: 10/24/22

Boring No.	Sample No.	Depth (ft)	Soil Description	Molded Dry Density (pcf)	Molded Moisture Content (%)	Init. Degree Saturation (%)	Measured Expansion Index	Corrected Expansion Index
LB-1	B-1	0-5	Clayey Sand	116.1	8.0	48.0	16	15

ASTM EXPANSION CLASSIFICATION

Expansion Index	Classification
0-20	V. Low
21-50	Low
51-90	Medium
91-130	High
>130	V. High

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PERCENT PASSING NO. 200 SIEVE

ASTM D1140

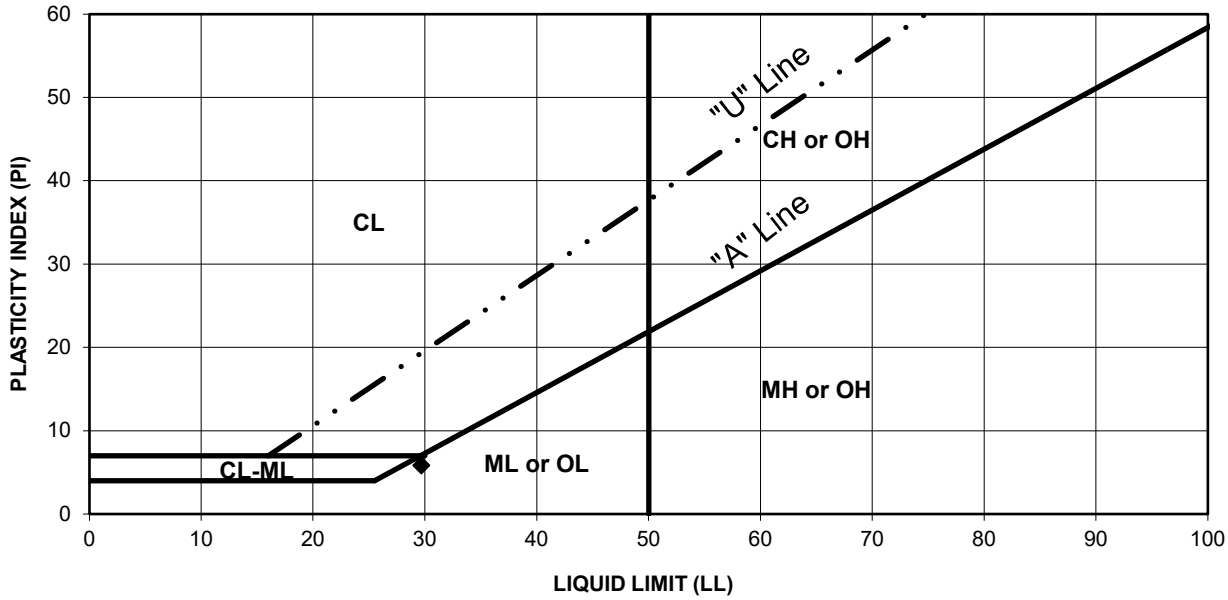
Client:	Langan Engineering	AP Lab No.:	22-1039
Project Name:	130 W College Street	Test Date:	10/21/22
Project Number:	721036101		

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
LB-1	S-8	35	75.0
LB-1	S-10	45	76.9
LB-2	S-9	40	74.1
LB-3	S-5	15	50.8
LB-3	S-6	20	5.9
LB-4	S-6	25	47.7
LB-4	S-8	35	97.5

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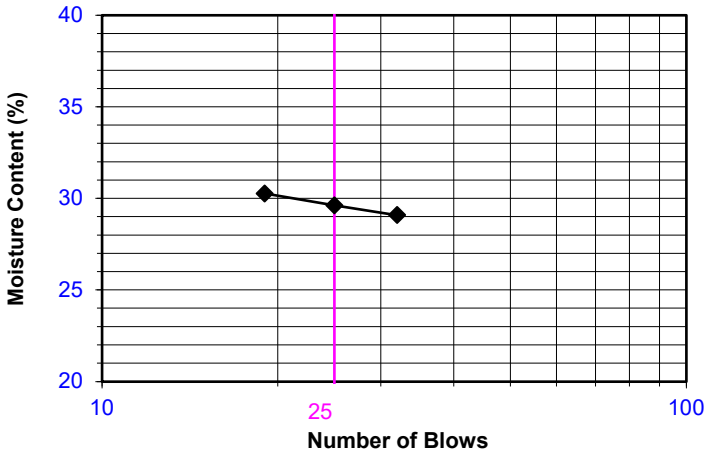
ATTERBERG LIMITS
ASTM D 4318

Client Name:	Langan Engineering	Tested By:	DK	Date:	10/24/22
Project Name:	130 W College Street	Computed By:	NR	Date:	10/25/22
Project No.:	721036101	Checked By:	AP	Date:	10/26/22



PROCEDURE USED

- ☐ Wet Preparation
- ☒ Dry Preparation
- ☒ Procedure A Multipoint Test
- ☐ Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	LB-1	S-8	35	30	24	6	ML

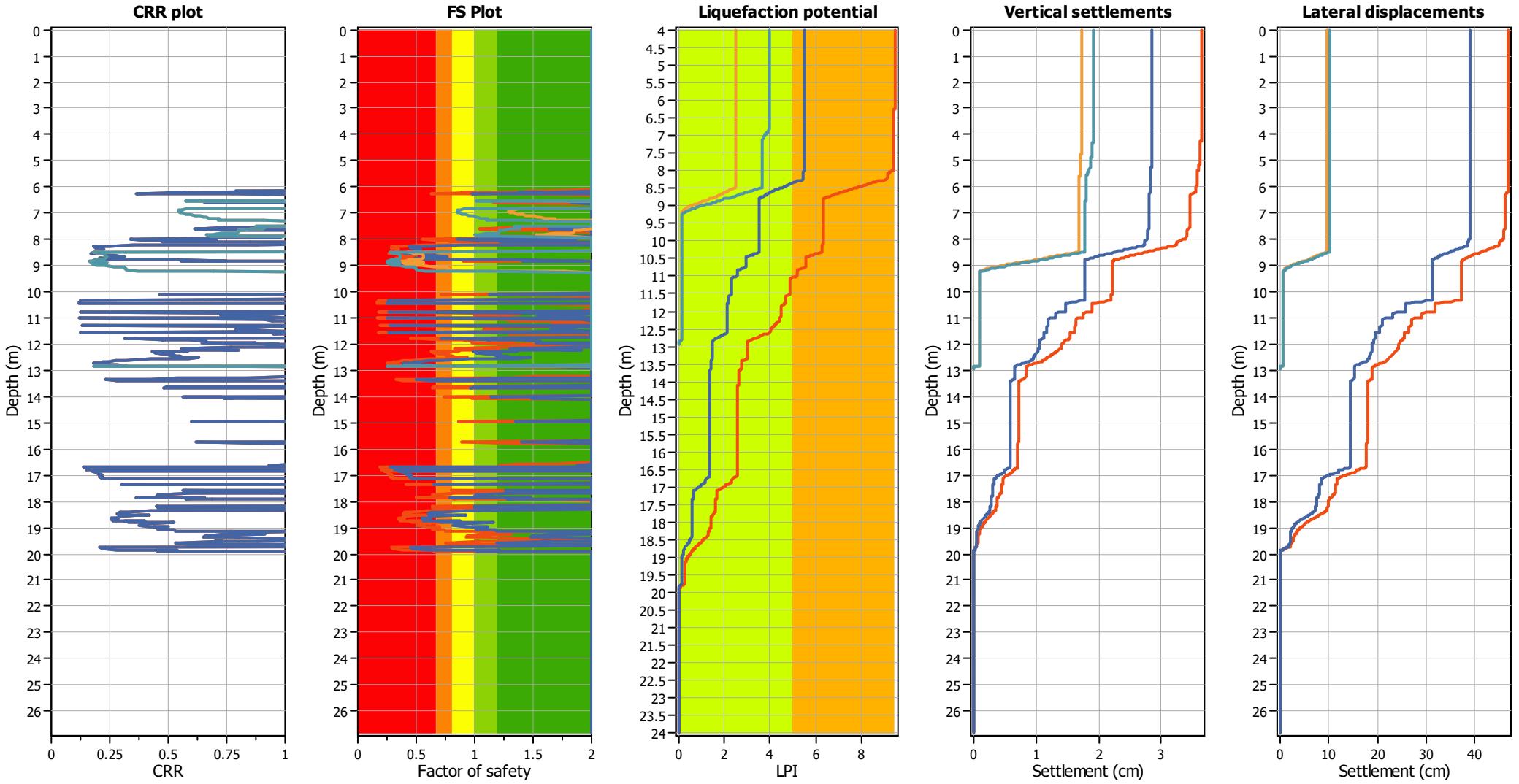
APPENDIX E
Liquefaction Results Output

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT-2 CASE II Excav
CPT-2 Case I Excav
CPT-3 Case I Excav
CPT-3 Case II Excav

Project: Creative Workplace Development

Overlay Cyclic Liquefaction Plots

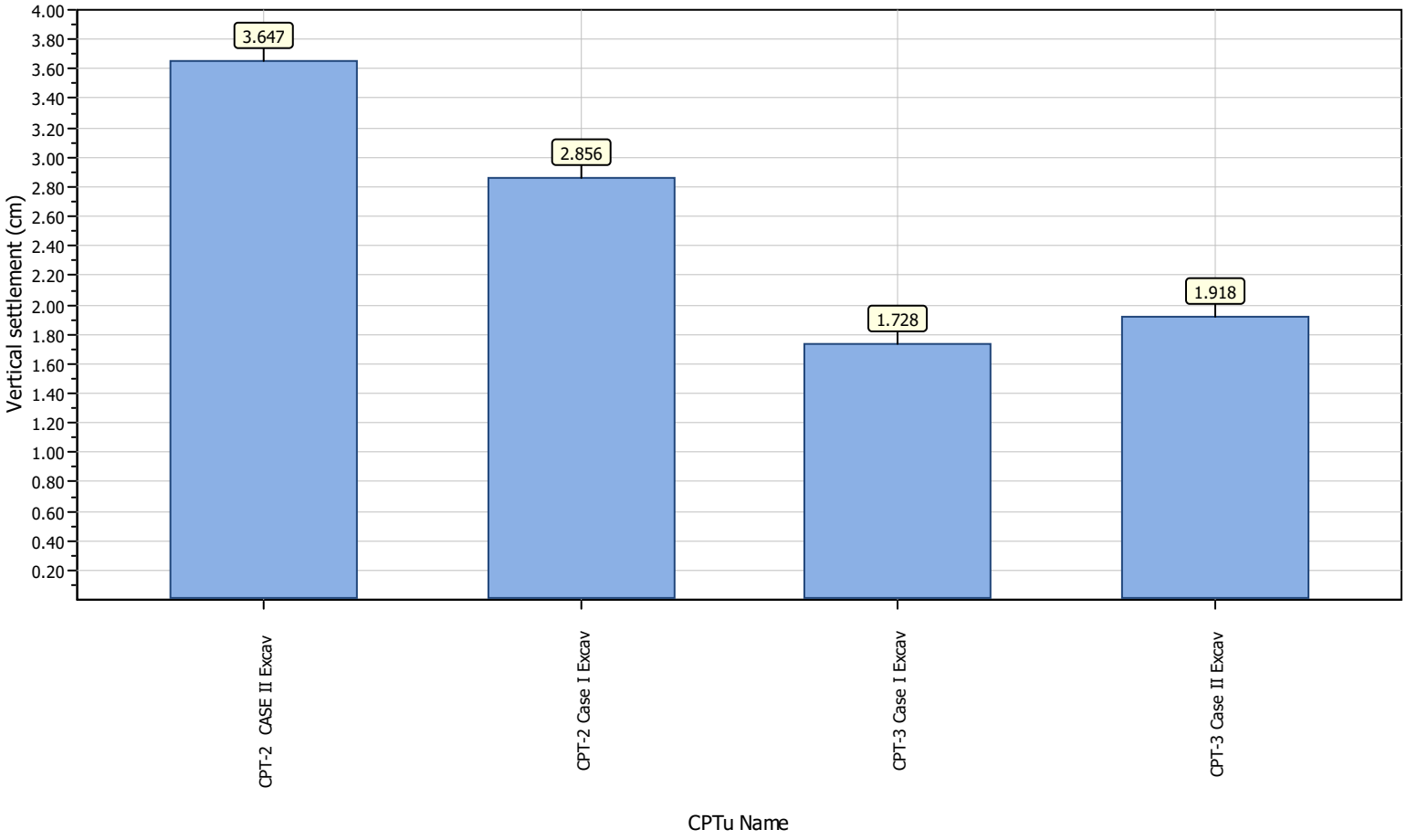


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

Project title : Creative Workplace Development

Location : 130 W College Street

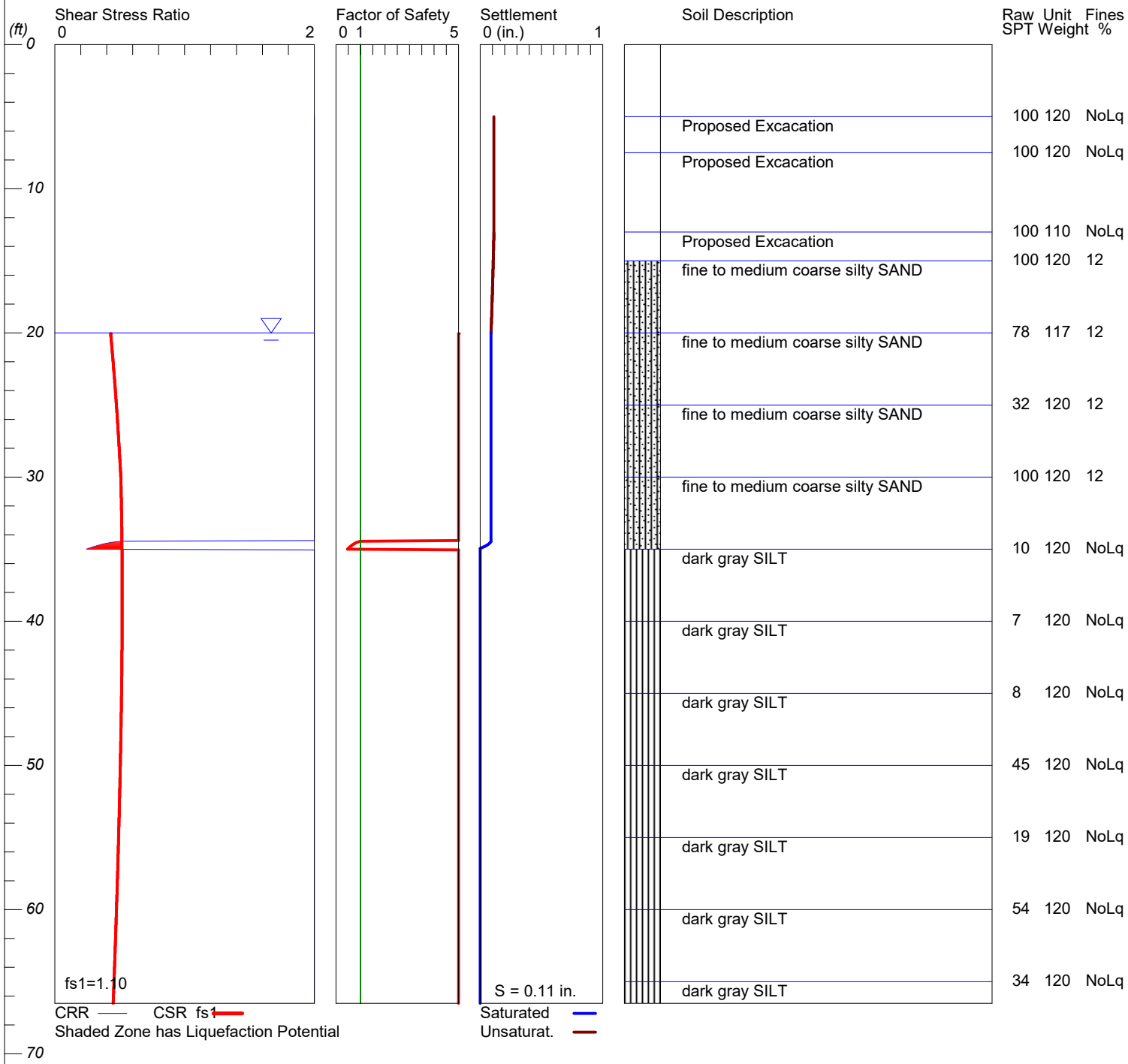
Overall vertical settlements report



LIQUEFACTION ANALYSIS

130 West College Street

Hole No.=LB-1 Case I - E Water Depth=20 ft Surface Elev.=290.7 Magnitude=6.74
Acceleration=0.631g

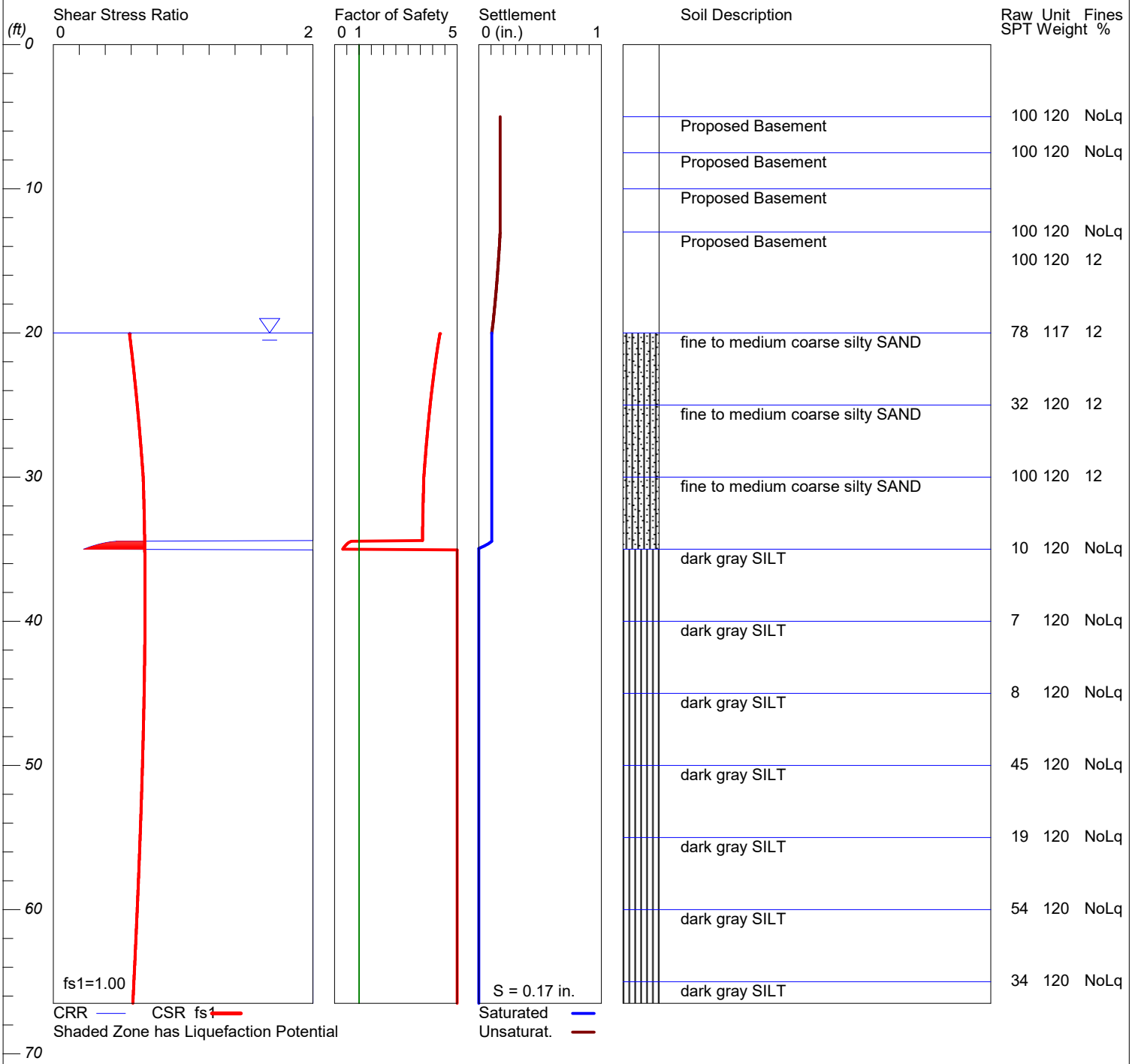


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LIQUEFACTION ANALYSIS

130 West College Street

Hole No.=LB-1 - Case II Excavation Water Depth=20 ft Surface Elev.=290.0 Magnitude=6.85
Acceleration=0.947g

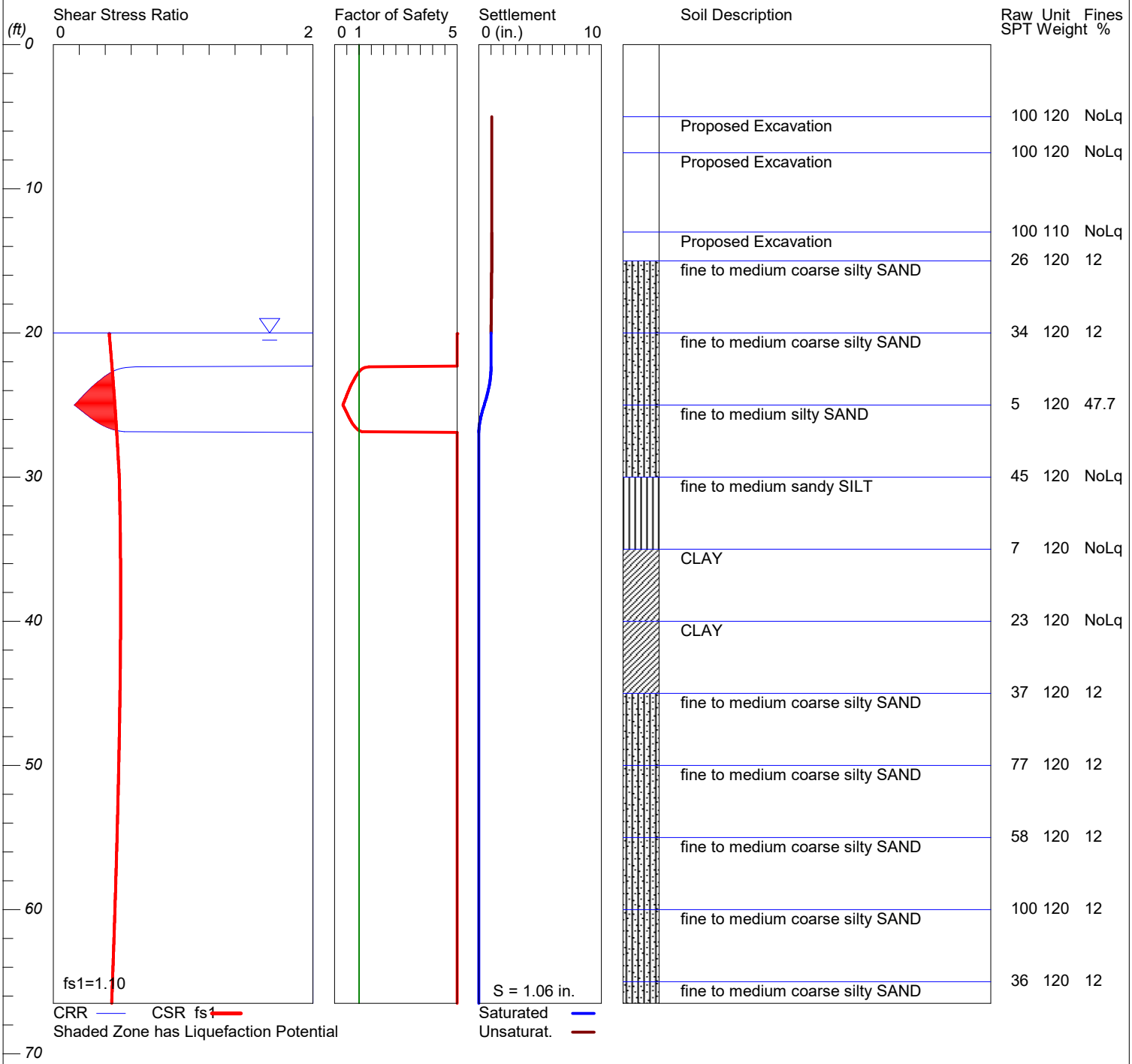


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LIQUEFACTION ANALYSIS

130 West College Street

Hole No.=LB-4 Case I Excav Water Depth=20 ft Surface Elev.=292.8 Magnitude=6.74
Acceleration=0.631g

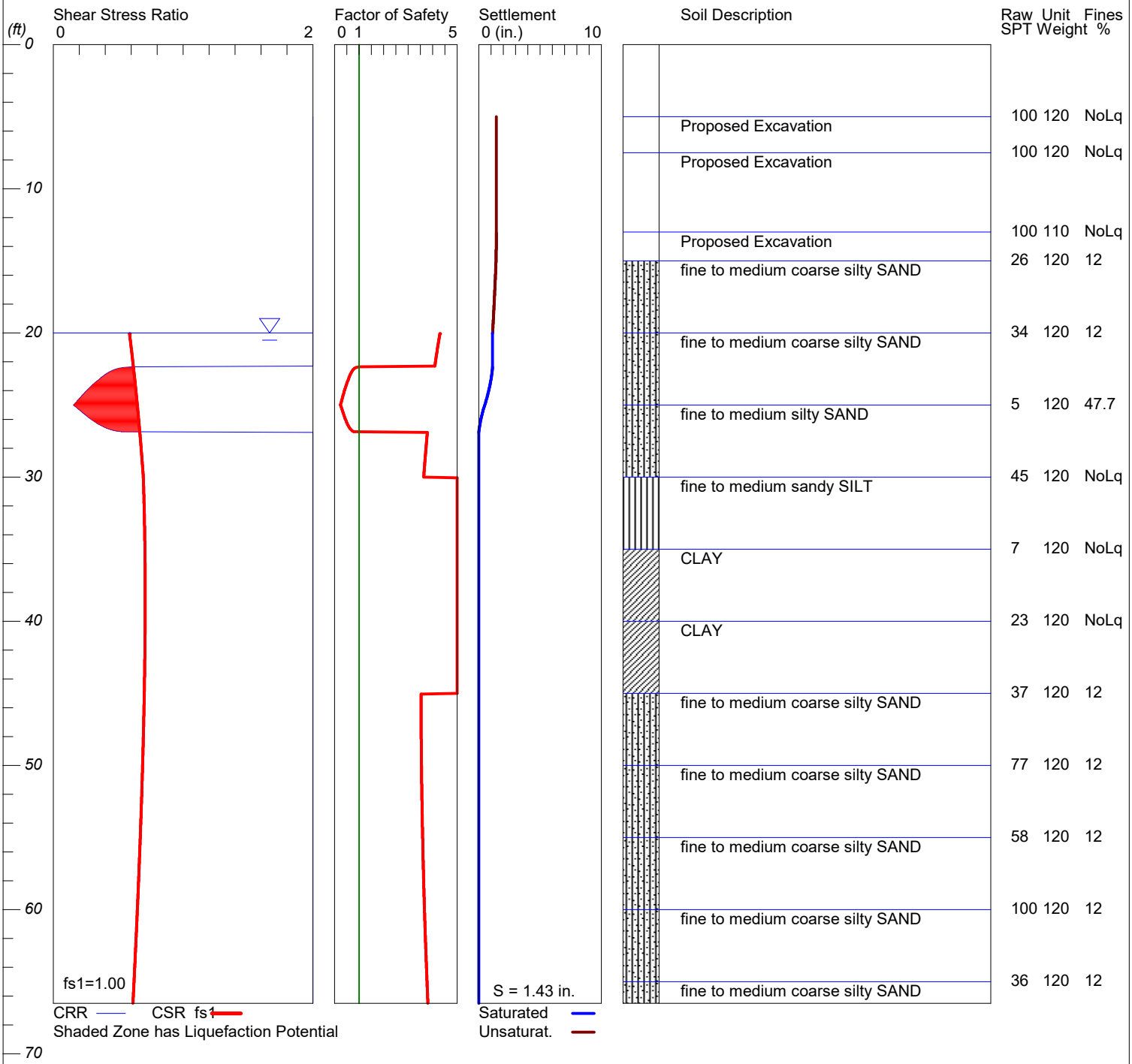


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LIQUEFACTION ANALYSIS

130 West College Street

Hole No.=LB-4 Case II - Exc Water Depth=20 ft Surface Elev.=292.8 Magnitude=6.85
Acceleration=0.947g



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Appendix IS-3

Water Resources Report

HYDROLOGY & WATER RESOURCES TECHNICAL REPORT

for

130 W College Street
Los Angeles, CA

Prepared For:

S&R Partners, LLC c/o Granite Properties
5601 Granite Parkway, Suite 1200
Plano, Texas 75024

Prepared By:

Langan Engineering and Environmental Services, Inc.
515 South Flower Street, Suite 2860
Los Angeles, California 90071

Donald J. Hodson, PE, LEED AP
CA PE Lic. # 78817

30 January 2024
Langan Project No. 721036101

LANGAN

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1.0 INTRODUCTION

1.1 **Project Description**

S&R Partners, LLC (Applicant) is the owner of the property located at 130, 114, 130 West College Street, 117, 119 West Bruno Street, and 973, 971, 963, 959, 955, 953, 949, 945, 943 North Main Street (the Property) in the City of Los Angeles (the City). The Property is associated with Los Angeles County Assessor Parcel Nos. 5409-008-001, 002, 003, 004, 005, 006, and 015. The Property is bounded by Alameda Street to the west, College Street to the north, Main Street to the east, and Bruno Street to the south. The Property contains approximately 96,268 square feet of net lot area (or approximately 2.21 acres) and is currently occupied by a paved parking lot for buses. Applicant intends to develop the Property with a creative workplace that will consist of a podium with one level of at-grade parking and one level of above-grade parking (both podium levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages), and four (4) levels of office uses above, and one level of subterranean parking (the Project). The Project is described in more detail below.

1.2 **Scope of Work**

This technical study provides a description of the existing surface water hydrology, surface water quality, groundwater level and quality at the Property and analyzes the Project's potential impacts related to surface water hydrology, surface water quality and groundwater quality.

2.0 REGULATORY FRAMEWORK

2.1 **Surface Water Hydrology**

Los Angeles County Hydrology Manual
The Los Angeles County (County) Hydrology Manual requires that storm drain conveyance systems be designed for a 25-year storm event and that the combined capacity of the storm drain and street flow system have capacity for flow from a 50-year storm event.

The County also limits the allowable storm flow into existing storm drain facilities based on the municipal separate storm sewer systems (MS4) Permit which is applicable to all new developments that discharge directly into the County's storm drain system. Any proposed drainage improvements of County owned storm drain facilities such as catch basins and storm drain lines require approval and review from the County Flood Control District.

Los Angeles Municipal Code
Any proposed drainage improvement within the right-of-way or any other property owned or under the control of the City requires the approval of a B-permit (Section

62.105, Los Angeles Municipal Code (LAMC)). Under the B-permit process, storm drain installation plans are subject to review and approval by the City's Department of Public Works, Bureau of Engineering (Bureau of Engineering). Additionally, any connections to the City's storm drain system from a private property to a City catch basin or an underground storm drain pipe requires a storm drain connection permit from Bureau of Engineering.

2.2 **Surface Water Quality**

Federal Clean Water Act

The Federal Clean Water Act (CWA) authorizes Federal, state, and local entities to cooperatively create comprehensive programs for eliminating or reducing the pollution of state waters and tributaries. The primary goals of the CWA are to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to make all surface waters fishable and swimmable. As such, the CWA forms the basic national framework for the management of water quality and the control of pollutant discharges. The CWA also sets forth a number of objectives in order to achieve the above-mentioned goals. These objectives include regulating pollutant and toxic pollutant discharges; providing for water quality that protects and fosters the propagation of fish, shellfish and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of non-point sources of pollution.

Since its introduction, major amendments to the CWA have been enacted (e.g., 1961, 1966, 1970, 1972, 1977, and 1987). Amendments enacted in 1970 created the United States Environmental Protection Agency (USEPA), while amendments enacted in 1972 deemed the discharge of pollutants into waters of the United States from any point source unlawful unless authorized by a USEPA National Pollutant Discharge Elimination System (NPDES) permit. Amendments enacted in 1977 mandated development of a "Best Management Practices" Program at the state level and provided the Water Pollution Control Act with the common name of "Clean Water Act," which is universally used today. Amendments enacted in 1987 required the USEPA to create specific requirements for discharges. In response to the 1987 amendments to the CWA and as part of Phase I of its NPDES permit program, the USEPA began requiring NPDES permits for: (1) municipal separate storm sewer systems (MS4) generally serving, or located in, incorporated cities with 100,000 or more people (referred to as municipal permits); (2) 11 specific categories of industrial activity (including landfills); and (3) construction activity that disturbs five acres or more of land. Phase II of the USEPA's NPDES permit program, which went into effect in early 2003, extended the requirements for NPDES permits to: (1) numerous small municipal separate storm sewer systems, (2) construction sites of one to five acres, and (3) industrial facilities owned or operated by small municipal separate storm sewer systems. The NPDES permit program is typically administered by individual authorized states.

In 2008, the USEPA published draft Effluent Limitation Guidelines (ELGs) for the construction and development industry. On December 1, 2009 the USEPA finalized its 2008 Effluent Guidelines Program Plan. In California, the NPDES stormwater permitting

program is administered by the State Water Resources Control Board (SWRCB). The SWRCB was created by the California Legislature in 1967. The joint authority of water distribution and water quality protection allows the SWRCB to provide protection for the State's waters, through its nine Regional Water Quality Control Boards (RWQCBs). The RWQCBs develop and enforce water quality objectives and implement plans that will best protect California's waters, acknowledging areas of different climate, topography, geology, and hydrology. The RWQCBs develop "basin plans" for their hydrologic areas, issue waste discharge requirements, enforce action against stormwater discharge violators, and monitor water quality.

Federal Anti-Degradation Policy

The Federal Anti-degradation Policy (40 Code of Federal Regulations [(CFR)] 131.12) requires states to develop statewide anti-degradation policies and identify methods for implementing them. Pursuant to the CFR, state anti-degradation policies and implementation methods shall, at a minimum, protect and maintain (1) existing in-stream water uses; (2) existing water quality, where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

California Porter-Cologne Act

The California Porter-Cologne Water Quality Control Act established the legal and regulatory framework for California's water quality control. The California Water Code (CWC) authorizes the SWRCB to implement the provisions of the CWA, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

Under the CWC, the State of California is divided into nine RWQCBs, governing the implementation and enforcement of the CWC and CWA. The Property is located within Region 4, also known as the Los Angeles Region. Each RWQCB is required to formulate and adopt a Basin Plan for its region, and must adhere to the policies set forth in the CWC and established by the SWRCB. The RWQCB is also given authority to include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

California Anti-Degradation Policy

The California Anti-degradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the Federal Anti-degradation Policy, the California Anti-degradation Policy applies to all waters of the State, not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxic Rule

In 2000, the USEPA promulgated the California Toxic Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. The USEPA promulgated this rule based on the USEPA's determination that the numeric criteria are necessary in the State to protect human health and the environment. The California Toxic Rule establishes acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by the Los Angeles RWQCB (LARWQCB) as having beneficial uses protective of aquatic life or human health.

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

As required by the CWC, in 1994 the LARWQCB adopted a plan entitled "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal watersheds of Los Angeles and Ventura Counties" (Basin Plan). Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the LARWQCB and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

NPDES Permit Program

The NPDES permit program was first established under authority of the CWA to control the discharge of pollutants from any point source into the waters of the United States. As indicated above, in California, the NPDES stormwater permitting program is administered by the SWRCB through its nine RWQCBs.

The General Permit

SWRCB Order No. 2012-0006-DWQ known as "The General Permit" was adopted on July 17, 2012. This NPDES permit establishes a risk-based approach to stormwater control requirements for construction projects by identifying three project risk levels. The main objectives of the General Permit are to:

1. Reduce erosion;

2. Minimize or eliminate sediment in stormwater discharges;

3. Prevent materials used at a construction site from contacting stormwater;

4. Implement a sampling and analysis program;

5. Eliminate unauthorized non-stormwater discharges from construction sites;

6. Implement appropriate measures to reduce potential impacts on waterways both during and after construction of projects; and

7. Establish maintenance commitments on post-construction pollution control measures.

California mandates all construction activities disturbing more than one acre of land to develop and implement Stormwater Pollution Prevention Plans (SWPPP). The SWPPP documents the selection and implementation of Best Management Practices (BMPs) for a specific construction project, charging owners with stormwater quality management responsibilities. A construction site subject to the General Permit must prepare and implement a SWPPP that meets the requirements of the General Permit.

Los Angeles County Municipal Storm Water System (MS4) Permit

As described above, USEPA regulations require that MS4 permittees implement a program to monitor and control pollutants being discharged to the municipal system from both industrial and commercial projects that contribute a substantial pollutant load to the MS4. On November 8, 2012, the LARWQCB adopted Order No. R4-2012-0175 under the CWA and the Porter-Cologne Act, which is the NPDES permit or MS4 permit for municipal stormwater and urban runoff discharges within the County (Permit). The Permit covers 84 cities and most of the unincorporated areas of Los Angeles County. Under the Permit, the Los Angeles County Flood Control District (LACFCD) is designated as the Principal Permittee. The Permittees are the 84 Los Angeles County cities (including the City of Los Angeles) and Los Angeles County. Collectively, these are the "Co-Permittees". The Principal Permittee helps to facilitate activities necessary to comply with the requirements outlined in the Permit but is not responsible for ensuring compliance of any of the Permittees.

Stormwater Quality Management Program (SQMP)

In compliance with the Permit, the Co-Permittees are required to implement a stormwater quality management program (SQMP) with the goal of accomplishing the requirements of the Permit and reducing the amount of pollutants in stormwater runoff. The SWMP requires the County of Los Angeles and the 84 incorporated cities to:

- Implement a public information and participation program to conduct outreach on storm water pollution;

- Control discharges at commercial/industrial facilities through tracking, inspecting, and ensuring compliance at facilities that are critical sources of pollutants;

- Implement a development planning program for specified development Projects;

- Implement a program to control construction runoff from construction activity at all construction sites within the relevant jurisdictions;

- Implement a public agency activities program to minimize storm water pollution impacts from public agency activities; and

- Implement a program to document, track, and report illicit connections and discharges to the storm drain system.

The Permit contains the following provisions for implementation of the SQMP by the Co-Permittees:

1. General Requirements:

    - Each permittee is required to implement the SQMP in order to comply with applicable stormwater program requirements.

    - The SQMP shall be implemented and each permittee shall implement additional controls so that discharge of pollutants is reduced.

2. Best Management Practice Implementation:
    - Permittees are required to implement the most effective combination of BMPs for stormwater/urban runoff pollution control. This should result in the reduction of storm water runoff.

3. Revision of the SQMP:

    - Permittees are required to revise the SQMP in order to comply with requirements of the RWQCB while complying with regional watershed requirements and/or waste load allocations for implementation of Total Maximum Daily Loads (TMDLs) for impaired waterbodies.

4. Designation and Responsibilities of the Principal Permittee:

The Los Angeles County Flood Control District is designated as the Principal Permittee who is responsible for:

- Coordinating activities that comply with requirements outlined in the NPDES Permit;

- Coordinating activities among Permittees;

- Providing personnel and fiscal resources for necessary updates to the SQMP;

- Providing technical support for committees required to implement the SQMP; and

- Implementing the Countywide Monitoring Program required under this Order and assessing the results of the monitoring program.

5. Responsibilities of Co-Permittees:
Each Co-Permittee is required to comply with the requirements of the SQMP as applicable to the discharges within its geographical boundaries. These requirements include:

- Coordinating among internal departments to facilitate the implementation of the SQMP requirements in an efficient way;

- Participating in coordination with other internal agencies as necessary to successfully implement the requirements of the SQMP; and

- Preparing an annual Budget Summary of expenditures for the storm water management program by providing an estimated breakdown of expenditures for different areas of concern, including budget projections for the following year.

6. Watershed Management Committees (WMCs):

- Each WMC shall be comprised of a voting representative from each Permittee in the Watershed Management Area (WMA).
- Each WMC is required to facilitate exchange of information between co-permittees, establish goals and deadlines for WMAs, prioritize pollution control measures, develop and update adequate information, and recommend appropriate revisions to the SQMP.

7. Legal Authority:

- Co-Permittees are granted the legal authority to prohibit non-storm water discharges to the storm drain system including discharge to the MS4 from various development types.

<u>City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff</u>
The City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff (WQCMP), adopted by the City's Board of Public Works in April 2009, was developed by the City's Bureau of Sanitation, Watershed Protection Division in collaboration with stakeholders as a strategy to comply with current and emerging water quality regulations.

Implementation of the WQCMP was intended over a 20 to 30 year period post-adoption to result in cleaner neighborhoods, rivers, lakes and bays, augmented local water supply, reduced flood risk, more open space, and beaches that are safe for swimming. The WQCMP also supports the Mayor and City Council's efforts to make Los Angeles the greenest major city in the nation.

The WQCMP identifies and describes the various watersheds in the City, summarizes the water quality conditions of the City's waters, identifies known sources of pollutants, describes the governing regulations for water quality, describes the BMPs that are being implemented by the City, discusses existing Total Maximum Daily Load (TMDL) Implementation Plans and Watershed Management Plans. Additionally, the WQCMP provides an implementation strategy that includes the following three initiatives to achieve water quality goals:

- Water Quality Management Initiative, which describes how Water Quality Management Plans for each of the City's watershed and TMDL-specific Implementation Plans will be developed to ensure compliance with water quality regulations.

- The Citywide Collaboration Initiative, which recognizes that urban runoff management and urban (re)development are closely linked, requiring collaborations of many City agencies. This initiative requires the development of City policies, guidelines, and ordinances for green and sustainable approaches for urban runoff management.

- The Outreach Initiative, which promotes public education and community engagement with a focus on preventing urban runoff pollution.

- The Water Quality Compliance Master Plan for Urban Runoff includes a financial plan that provides a review of current sources of revenue, estimates costs for water quality compliance, and identifies new potential sources of revenue.

<u>City of Los Angeles Stormwater Program</u>
The City supports the policies of the General Permit and the Los Angeles County NPDES permit through the Stormwater Low Impact Development Ordinance (LID Ordinance) and the Planning and Land Development Handbook for Low Impact Development (LID Handbook). The City adopted the Stormwater LID Ordinance (Ordinance 181899) in November 2011, which was updated in September 2015 (Ordinance 183833) with the purpose of:

- Requiring the use of Low Impact Development (LID) standards and practices in future developments and redevelopments to encourage the beneficial use of rainwater and urban runoff;
- Reducing stormwater/urban runoff while improving water quality;
- Promoting rainwater harvesting;

- Reducing offsite runoff and providing increased groundwater recharge;
- Reducing erosion and hydrologic impacts downstream; and
- Enhancing the recreational and aesthetic values in our community.

The LID Ordinance requires LID measures to be incorporated into the design of all development and redevelopment projects that have a land disturbance activity and add, create or replace 500 square feet or more of impervious area.

The City, Board of Public Works adopted the LID Handbook, Part B, Planning Activities, 5th Edition in May 2016 (Ordinance 183833). The LID Handbook provides guidance for developers in complying with the requirements of the Development Planning Program regulations of the City's Stormwater Program. The LID Handbook provides specific site design approaches and BMPs that promote the use of natural systems for infiltration, evapotranspiration, and use of stormwater. These LID practices can effectively remove nutrients, bacteria and metals from stormwater while reducing the volume and intensity of stormwater flows.

The City implements the requirements to mitigate stormwater quality impacts through the City's plan review and approval process. Plans and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address stormwater pollution prevention goals.

All new development and redevelopment projects that are not considered small-scale residential development projects shall comply with the following requirements:

- Stormwater runoff must be infiltrated, evapotranspired, captured and used, and/or treated through high removal efficiency BMPs onsite, through stormwater management techniques as identified in the LID Handbook.
- The onsite stormwater management techniques must be properly sized, at a minimum, to infiltrate, evapotranspire, store for use, and/or treat through a high removal efficiency biofiltration/biotreatment system, without any stormwater runoff leaving the site to the maximum extent feasible, for at least the volume of water produced by the stormwater quality design storm event that results from:
    - The 0.75-inch, 24-hour rain event, or
    - The 85th percentile 24-hour runoff event determined from the Los Angeles County 85th percentile precipitation isohyetal map, whichever is greater.

The handbook and ordinances also have specific minimum BMP requirements for all construction activities and require dischargers whose construction Projects disturb one acre or more of soil to prepare a Stormwater Pollution Prevention Plan (SWPPP) and file a Notice of Intent (NOI) with the SWRCB. The NOI informs the SWRCB of a particular Project and results in the issuance of a Waste Discharger Identification (WDID) number, which is needed to demonstrate compliance with the General Permit.

<u>Los Angeles Municipal Code</u>

Section 64.70 of the LAMC sets forth the City's Stormwater and Urban Runoff Pollution Control Ordinance (Ordinance). The Ordinance prohibits the discharge of the following into any storm drain system:

- Any liquids, solids, or gases which by reason of their nature or quantity are flammable, reactive, explosive, corrosive, or radioactive, or by interaction with other materials could result in fire, explosion or injury.
- Any solid or viscous materials, which could cause obstruction to the flow or operation of the storm drain system.
- Any pollutant that injures or constitutes a hazard to human, animal, plant, or fish life, or creates a public nuisance.
- Any noxious or malodorous liquid, gas, or solid in sufficient quantity, either singly or by interaction with other materials, which creates a public nuisance, hazard to life, or inhibits authorized entry of any person into the storm drain system.
- Any medical, infectious, toxic or hazardous material or waste.

Additionally, unless otherwise permitted by a NPDES permit, the Ordinance prohibits industrial and commercial developments from discharging untreated wastewater or untreated runoff into the storm drain system. Furthermore, the Ordinance prohibits trash or any other abandoned objects/materials from being deposited such that they could be carried into the storm drains. Lastly, the Ordinance not only makes it a crime to discharge pollutants into the storm drain system and imposes fines on violators, but also gives City public officers the authority to issue citations or arrest business owners or residents who deliberately and knowingly dump or discharge hazardous chemicals or debris into the storm drain system.

Earthwork activities, including grading, are governed by the Los Angeles Building Code, which is contained in LAMC, Chapter IX, Article 1. Specifically, Section 91.7013 includes regulations pertaining to erosion control and drainage devices, and Section 91.7014 includes general construction requirements, as well as requirements regarding flood and mudflow protection.

2.3 **Groundwater**

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

As required by the CWC, the LARWQCB adopted the Basin Plan. Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the LARWQCB and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

Safe Drinking Water Act (SDWA)
The Federal Safe Drinking Act, established in 1974, sets drinking water standards throughout the country and is administered by the USEPA. The drinking water standards established in the SDWA, as set forth in the CFR, are referred to as the National Primary Drinking Water Regulations (Primary Standards, Title 40, CFR Part 141) and the National Secondary Drinking Water Regulations (Second Standards, 40 CFR Part 143). California passed its own Safe Drinking Water Act in 1986 that authorizes the State's Department of Health Services (DHS) to protect the public from contaminants in drinking water by establishing maximum contaminants levels (MCLs), as set forth in the CCR, Title 22, Division 4, Chapter 15, that are at least as stringent as those developed by the USEPA, as required by the SDWA.

California Water Plan
The California Water Plan (the Plan) provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and Projects to address the State's water needs.

The goal for the California Water Plan Update is to meet Water Code requirements, receive broad support among those participating in California's water planning, and be a useful document for the public, water planners throughout the state, legislators and other decision-makers.

3.0 ENVIRONMENTAL SETTING

3.1 Surface Water Hydrology

The Property is located within the Chinatown of the City, bounded by Alameda Street to the west, College Street to the north, Main Street to the east, and Bruno Street to the south. The Property is within the Los Angeles River Watershed in the Los Angeles Central Basin. Refer to Appendix A for the Property location within the Los Angeles River Watershed Map.

The streets surrounding the Property contain an existing catch basin and underground storm drain pipes. In the existing condition, stormwater drainage from the site will sheet flow mainly from north to south onto Alameda Street and Bruno Street. Stormwater

drainage from the Property will also sheet flow onto College Street and Main Street. The drainage will ultimately discharge into an existing catch basin located at the southwest corner of the Property, where it connects into an existing 66-inch RCP storm drain system that flows south on Alameda Street. See Figure 1 for existing on-site drainage pattern and Appendix D for the existing hydrology calculations.
Table 1 below shows the existing volumetric flow rate generated by the 50-year storm event.

Table 1. Existing Drainage Stormwater 50-Year Volume

Subarea ID	Area (Acres)	Q_{50} (cfs)
A1	0.50	1.64
A2	0.99	3.24
A3	0.24	0.79
A4	0.48	1.57
TOTAL	**2.21**	**7.24**

3.2 Surface Water Quality

The runoff from the Project Site discharges to the Los Angeles River Reach 2. Constituents of concern listed for Los Angeles River Reach 2 under California's CWA Section 303(d) List includes trash, nutrients (algae), ammonia, indicator bacteria, oil, copper, and lead. Listed pollutants with TMDL include trash, nutrients (algae), ammonia, indicator bacteria, copper, and lead. Urban stormwater runoff occurs following precipitation events, with the volume of runoff flowing into the drainage system depending on the intensity and duration of the rain event. Contaminants such as sediments, trash, bacteria, metals, nutrients, organics and pesticides from the surface and air may be carried by rainfall runoff into drainage systems. Therefore, the City has put in place catch basins with screens to capture debris before entering the storm drain system.

The existing Property is currently developed as a parking lot for buses. Based on the existing Property conditions , it is presumed the Property currently does not implement Best Management Practices (BMPs). The runoff currently within the Property is captured by the existing catch basin on Alameda Street. The runoff water does not get treated on site before discharging to the main storm drain facility. See Figure 1 for the existing drainage exhibit.

3.3 Groundwater Hydrology

The Property is located within the northeastern portion of the Central Basin groundwater basin. Based on field investigations conducted by Langan Engineering, in

October 2022, groundwater was encountered at a depth between approximately 24 to 27 feet. Based on Langan Engineering's review of the "Seismic Hazard Zone Report for the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California" by the CGS, the historical high groundwater depth at the Property is approximately 20 feet. The entire Property is impervious, consisting entirely of existing paved surfaces. Given the perviousness of the Property and the existing drainage patterns, the Property does not currently have any significant impact to groundwater. See Appendix B for the Property location within the Central Basin.

3.4 Groundwater Quality

The Property falls under the LARWQCB's jurisdiction. Based on LARWQCB's Basin Plan, constituents of concern listed for the Central Basin include boron, chloride, sulfate, and Total Dissolved Solids (TDS). With existing paved areas, the Property is currently 100% impervious. Given the imperviousness, the depth of existing groundwater, and the existing flow direction, it is unlikely that the Property contributes significantly to groundwater recharge. The Property does not significantly contribute to groundwater pollution or otherwise significantly adversely impact groundwater quality.

4.0 SIGNIFICANCE THRESHOLDS

4.1 Surface Water Hydrology

Appendix G of the State of California's CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water hydrology. These questions are as follows:

Would the project:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - Result in a substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    - Impede or redirect flood flows?

In the context of these questions from Appendix G of the CEQA Guidelines, the City's CEQA Thresholds Guide (L.A. CEQA Thresholds Guide) states that a project would normally have a significant impact on surface water hydrology if it would:

- Cause flooding during the Projected 50-year developed storm event, which would have the potential to harm people or damage property or sensitive biological resources;

- Substantially reduce or increase the amount of surface water in a water body; or

- Result in a permanent, adverse change to the movement of surface water sufficient to produce a substantial change in the current or direction of water flow.

4.2 Surface Water Quality

Appendix G of the CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water quality. These questions are as follows:

Would the project:

- Violate any water quality standard or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In the context of the above questions from Appendix G, the L.A. CEQA Thresholds Guide states that a project would normally have a significant impact on surface water quality if it would result in discharges that would create pollution, contamination or nuisance, as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.

The CWC includes the following definitions:

- "Pollution" means an alteration of the quality of the waters of the state to a degree which unreasonably affects either of the following: 1) the waters for beneficial uses or 2) facilities which serve these beneficial uses. "Pollution" may include "Contamination".

- "Contamination" means an impairment of the quality of the waters of the state by waste to a degree, which creates a hazard to the public health through poisoning or though the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

- "Nuisance" means anything which meets all of the following requirements: 1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; 2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and 3) occurs during, or as a result of, the treatment or disposal of wastes.

4.3 Groundwater Hydrology

Appendix G of the CEQA Guidelines provides a sample question that addresses impacts with regard to groundwater. This question is as follows:

Would the project:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

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

In the context of the above question from Appendix G, the *L.A. CEQA Thresholds Guide* states that a project would normally have a significant impact on groundwater if it would:

- Change potable water levels sufficiently to:

    - Reduce the ability of a water utility to use the groundwater basin for public water supplies, conjunctive use purposes, storage of imported water, summer/winter peaking, or to respond to emergencies and drought;

    - Reduce yields of adjacent wells or well fields (public or private); or

    - Adversely change the rate or direction of flow of groundwater; or

- Result in demonstrable and sustained reduction of groundwater recharge capacity.

4.4 Groundwater Quality

With respect to groundwater quality, and in the context of the above question from Appendix G pertaining to groundwater, the L.A. CEQA Thresholds Guide

states that a project would normally have a significant impact on groundwater quality if it would:

- Affect the rate or change the direction of movement of existing contaminants;
- Expand the area affected by contaminants;
- Result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or
- Cause regulatory water quality standards at an existing production well to be violated, as defined in the CCR, Title 22, Division 4, and Chapter 15 and in the SDWA.

5.0 METHODOLOGY

5.1 Surface Water Hydrology

The Property is located within the City, and all drainage collection, treatment and conveyance are regulated by the City. Per the City's Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual as its basis of design for storm drainage facilities. The LACDPW Hydrology Manual requires projects to have drainage facilities that meet the Urban Flood level of protection. The Urban Flood is runoff from a 25-year frequency design storm falling on a saturated watershed. A 25-year frequency design storm has a probability of 1/25 of being equaled or exceeded in any year. The L.A. CEQA Thresholds Guide, however, establishes the 50-year frequency design storm event as the threshold to analyze potential impacts on surface water hydrology as a result of development. To provide a more conservative analysis, this report analyzes the larger storm event threshold, i.e., the 50-year frequency design storm event.

The Modified Rational Method was used to calculate storm water runoff. The "peak" (maximum value) runoff for a drainage area is calculated using the formula, **Q = CIA**

Where,
Q = Volumetric flow rate (cfs)
C = Runoff coefficient (dimensionless)
I = Rainfall Intensity at a given point in time (in/hr)
A = Basin area (acres)

The Modified Rational Method assumes that a steady, uniform rainfall rate will produce maximum runoff when all parts of the basin area are contributing to outflow. This occurs when the storm event lasts longer than the time of

concentration. The time of concentration (Tc) is the time it takes for rain in the most hydrologically remote part of the basin area to reach the outlet.

The method assumes that the runoff coefficient (C) remains constant during a storm. The runoff coefficient is a function of both the soil characteristics and the percentage of impervious surfaces in the drainage area.

LACDPW has developed a time of concentration calculator, Hydrocalc, to automate time of concentration calculations as well as the peak runoff rates and volumes using the Modified Rational Method design criteria as outlined in the Hydrology Manual. The data input requirements include: sub-area size, soil type, land use, flow path length, flow path slope and rainfall isohyet. The Hydrocalc Calculator was used to calculate the storm water peak runoff flow rate for the Project conditions by evaluating an individual sub-area independent of all adjacent subareas. See Appendix E for the Hydrocalc Calculator results and Appendix C for the Isohyet Map.

5.2 Surface Water Quality

Construction BMPs will be designed and maintained as part of the implementation of the SWPPP in compliance with the General Permit. The SWPPP shall begin when construction commences, before any site clearing and grubbing or demolition activity. During construction, the SWPPP will be referred to regularly and amended as changes occur throughout the construction process. The NOI, Amendments to the SWPPP, Annual Reports, Rain Event Action Plans (REAPs), and Non-Compliance Reporting will be posted to the State's SMARTS website in compliance with the requirements of the General Permit.

The Project will meet the requirements of the City's LID standards. Under section 3.1.3. of the LID manual, post-construction stormwater runoff from a new development must be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMPs onsite for at least the volume of water produced by the greater of the 85th percentile storm or the 0.75 inch storm event. The LID Manual prioritized the selection of BMPs used to comply with stormwater mitigation requirement. The order of priority is:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficient Biofiltration/Bioretention Systems
4. Combination of Any of the Above

Feasibility screening delineated in the LID manual is applied to determine which BMP will best suit the Project.

Per the Preliminary Geotechnical Investigation Report for Creative Workplace Development, 130 West College, Los Angeles, California prepared by Langan Engineering and Environmental Services, Inc., dated February 17, 2023, the Property is located within a liquefaction hazard zone with a historic high groundwater level at approximately 20 feet below the ground surface. In addition, groundwater was observed at a depth between approximately 24 to 27 feet below ground surface. Therefore, infiltration is determined to not be feasible. To meet LID requirements, the Project will be collecting the runoff from the Property for reuse in supplementing the irrigation demand. The Project will convey runoff to two pre-treatment devices and below-grade storage tanks.

Per the LID manual, capture and use BMPs require the Estimated Total Water Usage (ETWU) for irrigation from October 1 to April 30 must be greater than or equal to the volume of the water produced by the stormwater quality design storm event. If the volume of captured stormwater exceeds the Estimated Total Water Use for the rain season ($ETQU_7$), excess stormwater shall, at a minimum establish a schedule to release captured stormwater over landscaping as determined in section 4.5.2. In addition, LID guidelines require that human health concerns should be prioritized, particularly with regards to vector control issues arising from the addition of standing water on site. See Appendix G for LID calculations.

5.3 **Groundwater Quality**

The significance of this Project as it relates to the level of the underlying groundwater table of the Central Basin Groundwater Basin included a review of the following considerations:

Analysis and Description of the Project's Existing Condition

- Identification of the Central Basin as the underlying groundwater basin, and description of the level, quality, direction of flow, and existing uses for the water;

- Description of the location, existing uses, production capacity, quality, and other pertinent data for spreading grounds and potable water wells in the vicinity (usually within a one-mile radius), and;

- Area and degree of permeability of soils on the Property, and;

Analysis of the Project Impact on Groundwater Level

- Description of the rate, duration, location and quantity of extraction, dewatering, spreading, injection, or other activities;

- The projected reduction in groundwater resources and any existing wells in the vicinity (usually within a one-mile radius); and

- The projected change in local or regional groundwater flow patterns.

In addition, this report discusses the impact of both existing and proposed activities at the Property on the groundwater quality of the underlying Central Basin.

Short-term groundwater quality impacts could potentially occur during Project construction as a result of soil or shallow groundwater being exposed to construction materials, wastes, and spilled materials. These potential impacts are quantitatively assessed.

6.0 PROJECT IMPACT ANALYSIS

6.1 Construction

6.1.1 Surface Water Hydrology

Applicant intends to develop the Property with the Project. Project construction activities include site clearing and excavating up to 17-ft below grade for the proposed subterranean garage level.

It is anticipated that approximately 67,686 cubic yards of soil would need to be exported as a result of the Project. These construction activities will temporarily expose the underlying soils and may make the Property temporarily more permeable. Also, exposed and stockpiled soils could be subject to wind and conveyance into nearby storm drains during storm events. In addition, on-site watering activities to reduce airborne dust could contribute to pollutant loading in runoff.

However, as the Property is greater than one acre, the Project would be required to obtain coverage under the NPDES Construction General Permit. In accordance with the requirements of this permit, the Project would implement a SWPPP that specifies BMPs and erosion control measures to be used during construction to manage runoff flows and prevent pollution. BMPs would be designed to reduce runoff and pollutant levels in runoff during construction. The NPDES and SWPPP measures are designed to and would contain and treat, as necessary, stormwater or construction watering on the Property so runoff does not impact off-site drainage facilities or receiving waters. Construction activities are temporary and flow directions and runoff volumes during construction will be controlled.

In addition, the Project will comply with all applicable City grading permit regulations, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with NPDES Construction General Permit requirements,

implementation of BMPs, and compliance with applicable City grading regulations, the Project would not substantially alter the Property drainage patterns in a manner that would result in substantial erosion or siltation. The Project would not result in a permanent adverse change to the movement of surface water. **Therefore, the Project's construction-related impacts to surface water hydrology would be less than significant.**

6.1.2 **Surface Water Quality**

Construction activities such as earth moving, maintenance of construction equipment, handling of construction materials, and dewatering, can contribute to pollutant loading in stormwater runoff.

However, construction contractors disturbing greater than one acre of soil are required to obtain coverage under the NPDES Construction General Permit (order No. 2012-0006-DWQ). In accordance with the requirements of the permit, the Applicant would prepare and implement a site-specific SWPPP adhering to the California Stormwater Quality Association (CASQA) BMP Handbook. The SWPPP would specify BMPs to be used during construction. BMPs would include but not be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs. Refer to Appendix H for typical SWPPP BMPs to be implemented during Project construction.

With implementation of the Erosion Control Plan, site-specific BMPs would reduce or eliminate the discharge of potential pollutants from stormwater runoff. In addition, the Applicant would be required to comply with City grading permit regulations and inspections to reduce sedimentation and erosion. Construction of the Project would not result in discharge that would cause: (1) pollution which would alter the quality of the water of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River Watershed. **Therefore, temporary Project construction-related impacts on surface water quality would be less than significant.**

6.1.3 **Groundwater Hydrology**

As stated in Section 6.1.1, Project construction activities would include excavating up to 17 feet for subterranean parking, building up the structure, and hardscape and landscape around the structure. As mentioned in Section 3.3, groundwater was observed at approximately 24 to 27 feet below ground

surface. Historic high groundwater depth is reported at approximately 20 feet below ground surface. During Project construction, temporary dewatering would occur if required. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. Similar to the Construction General Permit, in order to be authorized to discharge under this Permit, the Applicant must submit an NOI to discharge groundwater generated from dewatering operations during construction. Due to the operation of dewatering systems being temporary, local groundwater hydrology in the immediate vicinity of the Property is minimally affected. The purpose of dewatering operations is for the protection of both existing and proposed building structures. Due to the limited and temporary nature of temporary dewatering operations, regional impacts to groundwater flow and level are not considered to be significant. **Therefore, as Project development would not adversely impact the rate or direction of flow of groundwater and no water supply wells would be affected, the Project would not result in a significant impact on groundwater hydrology during construction.**

6.1.4 **Groundwater Quality**

The Project would include excavations to a maximum depth of 17 feet below ground surface. The Project would also result in a net export of approximately 67,686 cubic yards of existing soil material. In the case that any contaminated soils are found during construction, the contaminated soils would be captured within that volume of excavated material, removed from the Property, and remediated at an approved disposal facility in accordance with LADBS Information Bulletin for Procedures When Hazardous and Contaminated Materials are Encountered During Construction or Geotechnical/Geological Exploration (Document No. P/BC 2020-131).

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater. Compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater contamination, or cause a violation of regulatory water quality standards at an existing production well. Due to compliance with the applicable regulatory requirements and with the implementation of BMPs, Project construction activities would not be anticipated to affect existing wells. **Therefore, Project construction would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.**

6.2 Operation

6.2.1 Surface Water Hydrology

The Project is expected to reduce the percentage of impervious area from the current condition of the Property because the Project will develop a building including subterranean parking and landscaped amenity spaces creating a post-Project condition of approximately 85% of impervious surface area. Due to LID requirements, the Project is required to provide at least the equivalent of 8% of the Property with landscaping or biofiltration planters for treating the runoff water. The Project will be collecting the runoff from the Property for reuse in supplementing the irrigation demand. The Project will convey runoff to two pre-treatment devices and below-grade storage tanks.

Based on the HydroCalc calculations, there will be a reduction in the total flow rates of the stormwater runoff for the 50-year frequency design storm event between the existing and proposed Property conditions. See Figure 2 for the proposed on-site drainage pattern and Appendix E for the proposed hydrology calculations.

Table 2.1 shows the proposed peak flow rates stormwater runoff calculations for the 50-year frequency design storm event.

Table 2.1 Proposed Drainage Stormwater 50-Year Flow

Subarea ID	Area (Acres)	Q_{50} (cfs)
A1	0.03	0.10
A2	0.07	0.23
A3	0.06	0.20
A4	0.10	0.33
A5	0.06	0.20
A6	0.04	0.13
A7	0.05	0.16
A8	0.16	0.51
A9	0.30	0.98
A10	0.40	1.30
A11	0.12	0.39
A12	0.12	0.39
A13	0.28	0.92
A14	0.39	1.27
TOTAL	**2.21**	**7.10**

Due to the reduction in impervious area from the existing Property conditions to the proposed Property conditions, the peak flow of the two conditions would

decrease from 7.24 cfs to 7.10 cfs. As such, it is highly unlikely the Project would cause flooding during a 50-year storm event or result in an adverse change to the movement of surface water because it is capturing the runoff with surface drains and reducing the flow rate. **Therefore, the Project's operation-related impacts to surface water hydrology would be less than significant.**

6.2.2 **Surface Water Quality**

The Project will not increase concentrations of the items listed as constituents of concern for the Los Angeles River Watershed because it will capture and convey the runoff to two pre-treatment devices and storage tanks for reuse on the Property.

Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from new Projects must be infiltrated, evapotranspirated, capture and used, and/or treated through high efficiency BMPs for the volume of water produced by the 85th percentile storm event. The Project will convey runoff to two pre-treatment devices and storage tanks and reuse to supplement the irrigation demand in accordance with current LID requirements. See Appendix F for the 85th percentile storm event of the proposed conditions and Appendix G for the LID calculations for capture and reuse.

Table 2.2 shows the proposed flow rates for the 85th percentile storm event.

Table 2.2 Proposed Stormwater Quality Design Flow (85th Percentile)

Subarea ID	Area (Acres)	Q_{85th} (cfs)
A1	0.03	0.01
A2	0.07	0.03
A3	0.06	0.03
A4	0.10	0.04
A5	0.06	0.03
A6	0.04	0.02
A7	0.05	0.02
A8	0.16	0.01
A9	0.30	0.10
A10	0.40	0.12
A11	0.12	0.04
A12	0.12	0.04
A13	0.28	0.10
A14	0.39	0.12
TOTAL	**2.21**	**0.70**

Operation of the Project would not result in discharges that would cause: (1) pollution which would alter the quality of the waters of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes.

As is typical of most urban developments, stormwater runoff from the Property has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project due to the urban setting include sediment, nutrients, pesticides, metals, pathogens, and oil and grease. However, the potential discharge of the aforementioned pollutants would be offset through the implementation of LID BMPs approved by the City.

The capture and reuse strategy (pre-treatment devices and storage tanks) will be implemented for stormwater mitigation, in compliance with LID BMP requirements, to control and treat stormwater runoff to mitigate the 85th percentile storm event. The installed BMP systems will be designed with an internal bypass overflow system to prevent upstream flooding during major storm events. **Therefore, with implementation of LID BMPs, Project operational impacts on surface water quality would be less than significant.**

6.2.3 **Groundwater Hydrology**

The Project will develop hardscape and structures that cover approximately 85% of the Property with impervious surfaces and would not have any impact on the groundwater recharge potential since any runoff which bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and would not result in infiltration of a large amount of rainfall that would affect groundwater hydrology. Therefore, the Project's operational impact on groundwater recharge would be less than significant.

6.2.4 **Groundwater Quality**

The Project does not include the installation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility.

Operational activities which could typically affect groundwater quality include hazardous material spills and leaking underground storage tanks. However, Project operations do not include the use or storage of hazardous materials. Moreover, the Project does not involve drilling to or through a clean or

contaminated aquifer. **Therefore, the Project's potential impact on groundwater recharge would be less than significant.**

6.3 Cumulative Impact Analysis

6.3.1 Surface Water Hydrology

The Los Angeles River Watershed is geographic context for the Project's cumulative impact analysis on surface water hydrology. Future growth in the Los Angeles River Watershed could cumulatively increase stormwater flows by increasing impervious area. However, in the City where the Project is located, development projects are reviewed by on a case-by-case basis by the City's Department of Public Works to ensure there is sufficient capacity locally and regionally within the Los Angeles River Watershed. Additionally, projects within the Los Angeles River Watershed are subject to NPDES requirements for stormwater discharges for both construction and operation. The Project and other development projects would be required to implement a SWPPP which would identify any hydrologic impacts to the receiving water bodies and would require BMPs to address any impacts during construction. The Project and other development projects would be required to comply with NPDES requirements for stormwater discharges for project operation. In accordance with City requirements, all development projects within the City that have a land disturbance activity and add, create or replace more than 500 square feet of impervious area, including the Project and any other qualifying projects, would be required to implement BMPs to manage stormwater runoff in accordance with LID guidelines. As discussed in Section 6.2.1 Surface Water Hydrology, the Project will capture all stormwater runoff within the Property, capture runoff from the 85th percentile storm event for reuse to supplement the Project's irrigation demand. Any runoff produced from larger storm events than the 85th percentile storm event will be discharged to the City's storm drain main via a piped connection. The Project is reducing the flow from the 50-year storm event discharging off-site from the pre-development condition. Furthermore, the City's Department of Public Works reviews all projects on a case-by-case basis to ensure sufficient local and regional infrastructure is available downstream to accommodate stormwater runoff. **Therefore, the Project's potential cumulative impacts on surface water hydrology would be less than significant.**

6.3.2 Surface Water Quality

The Los Angeles River Watershed is geographic context for the Project's cumulative impact analysis on surface water quality. The Los Angeles River Watershed includes 43 cities and some unincorporated communities that are all subject to the NPDES requirements for stormwater quality for both construction and operation. Each jurisdiction within the Los Angeles River Watershed is required to review projects on a case-by-case basis to ensure they meet NPDES requirements by implementing BMPs to manage stormwater quality for runoff

for both construction and operation. The Project and other development projects that disturb an acre or more are required to implement a SWPPP which would identify any water quality impacts to the receiving water bodies and would require BMPs to address any impacts during construction. The Project and other development projects are required to comply with NPDES requirements for stormwater discharges for project operation by complying with LID requirements.

In accordance with City requirements, all development projects within the City that have a land disturbance activity and add, create or replace more than 500 square feet of impervious area, including the Project and any other qualifying projects, would be required to implement BMPs to minimize pollutant loadings from impervious surfaces such as roof tops, parking lots, and roadways in accordance with LID guidelines. As discussed in Section 6.2.2 Surface Water Quality, the Project will capture all stormwater runoff within the Property and implement BMPs to reduce pollutant loading to meet the NPDES requirements for both construction and operation. The Project and other qualifying development projects would be required to meet LID guidelines, implementing BMPs to minimize pollutant loadings from impervious surfaces such as roof tops, parking lots and roadways.
Therefore, the Project's potential cumulative impacts on surface water quality would be less than significant.

6.3.3 **Groundwater Hydrology**

The Central Basin is the geographic context for the cumulative impact analysis on groundwater level. Based on Los Angeles County Public Works Groundwater Well Maps, there are no groundwater production wells or public water supply wells near the Property so construction activities would not affect any existing wells. The Project will consist primarily of impervious areas, including buildings and hardscape that will not allow for infiltration. The Project will be capturing stormwater on-site through roof drains and area drains, which will have piped connections to below-grade pre-treatment structures designed to meet LID requirements. Any additional runoff, in excess of what is required to be treated per the LID requirements, will be routed via an overflow pipe to the City's storm drain system. There will be very minimal opportunity for the stormwater runoff from the Project to infiltrate and impact the regional groundwater basin. Additionally, the Project is located in a highly urbanized area, which is very developed with impervious area. It is unlikely that other development projects would have any impact on the groundwater hydrology, due to the requirements to meet LID requirements and urbanized setting. **Therefore, the Project's potential cumulative impacts on groundwater hydrology would be less than significant.**

6.3.4 **Groundwater Quality**

The Central Basin is the geographic context for the cumulative impact analysis on groundwater level. In accordance with City requirements, the Project and all future development within the City that are in the Central Basin, would be subject to LARWQCB requirements relating to groundwater quality. The Project will not be infiltrating any water during construction or operation and would not expand any potential areas of contamination, increasing the level of contamination, or cause regulatory water quality standard violations, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Based on the Property conditions, there is minimal opportunity for the stormwater runoff from the Project to infiltrate and impact the regional groundwater basin. The Project and any other development projects with potential to impact groundwater quality would be subject to LARWQCB requirements and would be reviewed prior to construction. **Therefore, the Project's potential cumulative impacts on groundwater quality would be less than significant.**

7.0 LEVEL OF SIGNIFICANCE

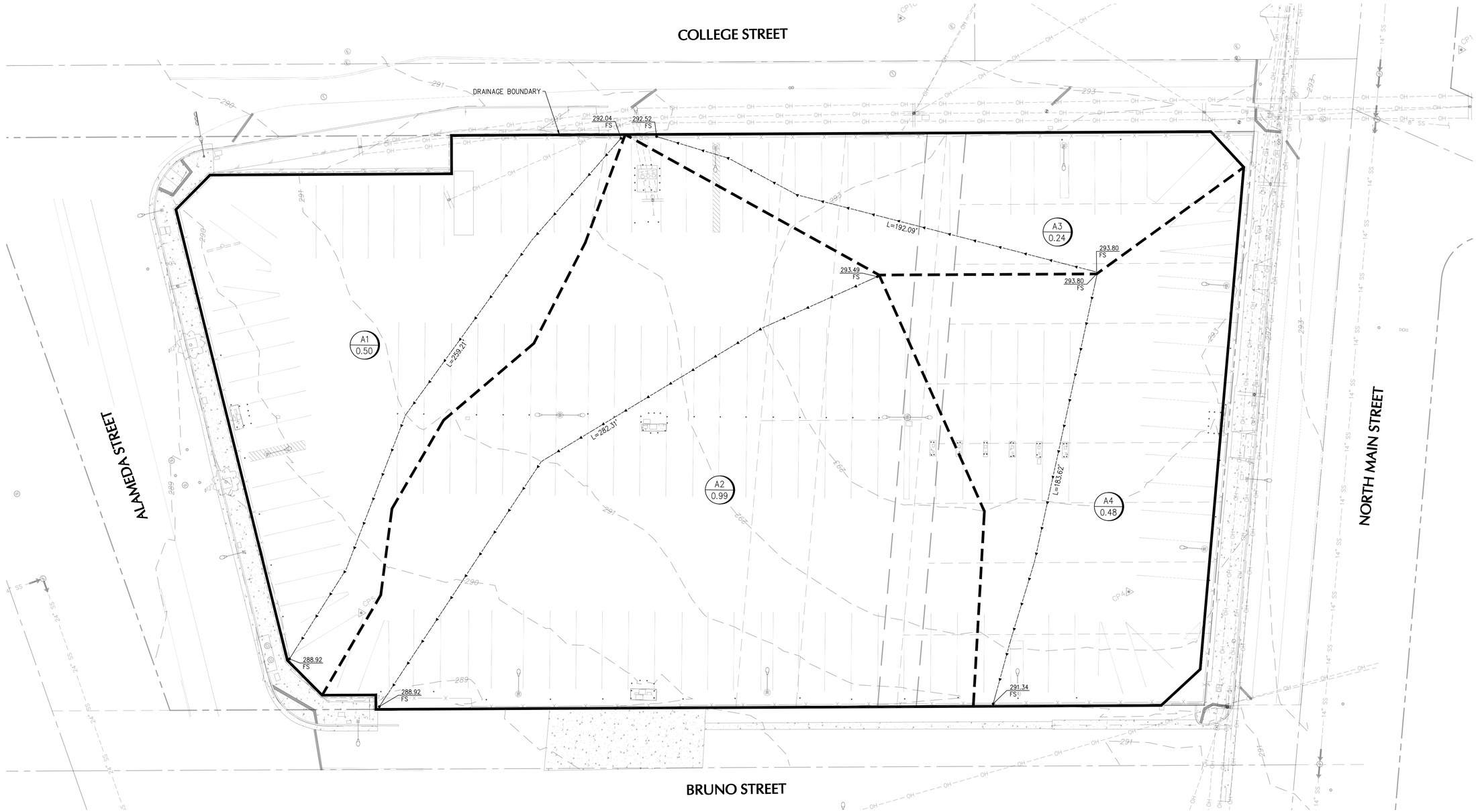
Based on the analysis contained in this report, no significant impacts have been identified for surface water hydrology, surface water quality, groundwater hydrology, or groundwater quality for this Project, and therefore, Project impacts, including cumulative impacts, would be less than significant.

8.0 REFERENCES

1. https://www.waterboards.ca.gov/water_issues/programs/tmdl/2018state_ir_reports_final/apx_c_state_factsheets/01095.shtml

2. City of Los Angeles. LA. CEQA Thresholds Guide. 2006 https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/A07.pdf

FIGURES



SUMMARY TABLE

SUBAREAS ID	RUNOFF COEFFICIENT "C"	TIME OF CONC. Tc (MIN.)	RAINFALL INTENSITY "I" (INCH/HOUR)	DRAINAGE AREA (AC)	RUNOFF FLOW RATE "Q_{100}" (CFS)
A1	0.900	5.00	3.639	0.50	1.64
A2	0.900	5.00	3.639	0.99	3.24
A3	0.900	5.00	3.639	0.24	0.79
A4	0.900	5.00	3.639	0.48	1.57
TOTAL	--	5.00	--	2.21	7.24

LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER (X / X)
- SUB-DRAINAGE SURFACE AREA (ACRE)

GENERAL NOTES

1. SEE HYDROLOGY REPORT, PREPARED BY LANGAN ENGINEERING, FOR THE COMPLETE POST-DEVELOPMENT HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL FOR THE 50-YEAR STORM.

ABBREVIATIONS

FS FINISHED ELEVATION
L LENGTH OF FLOW

20 0 5 10 20
SCALE: 1 INCH = 20 FEET

Date	Description	No.
Revisions		

LANGAN
Langan Engineering and Environmental Services, Inc.
515 South Flower Street, Suite 2860
Los Angeles, CA 90071
T: 213.314.8100 F: 213.314.8101 www.langan.com

Project: 130 W COLLEGE
CITY OF LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Drawing Title: EXISTING HYDROLOGY EXHIBIT

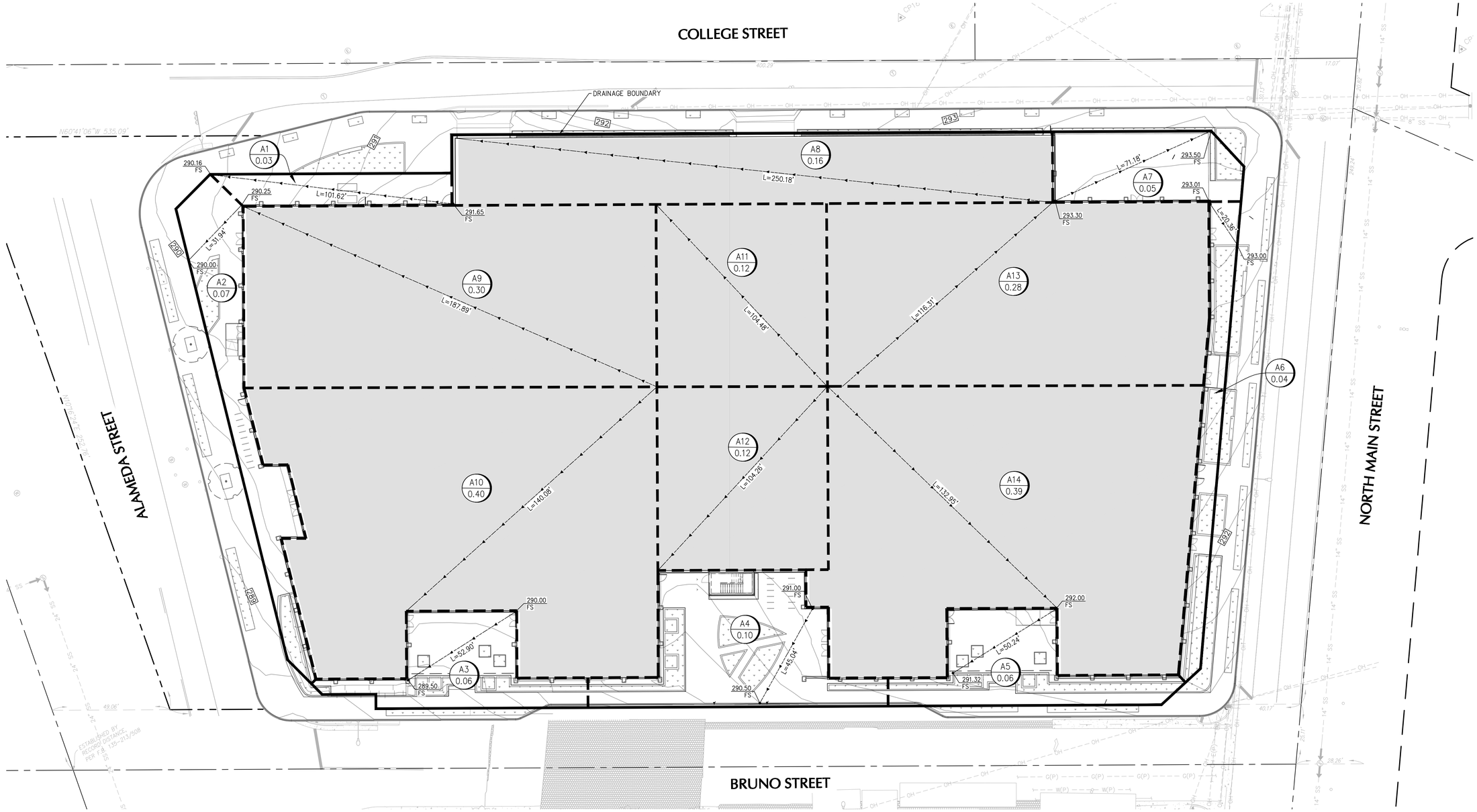
Project No. 721036101
Date DECEMBER 1, 2022
Drawn By MW
Checked By KR

Figure No. 1

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Filename: C:\bms\langan-pw-01\d02691047\721036101-0101-CA104-0101.dwg Date: 12/1/2022 Time: 08:26 User: mwong Style Table: Langan.stb Layout: Layout1

LANGAN Project No. 721036101



SUMMARY TABLE

SUBAREAS ID	RUNOFF COEFFICIENT "C"	TIME OF CONC. Tc (MIN.)	RAINFALL INTENSITY "I" (INCH/HOUR)	DRAINAGE AREA (AC)	RUNOFF FLOW RATE "Q_{100}" (CFS)
A1	0.900	5.00	3.639	0.03	0.10
A2	0.896	5.00	3.639	0.07	0.23
A3	0.894	5.00	3.639	0.06	0.20
A4	0.893	5.00	3.639	0.10	0.33
A5	0.894	5.00	3.639	0.06	0.20
A6	0.887	5.00	3.639	0.04	0.13
A7	0.894	5.00	3.639	0.05	0.16
A8	0.874	5.00	3.639	0.16	0.51
A9	0.900	5.00	3.639	0.30	0.98
A10	0.895	5.00	3.639	0.40	1.30
A11	0.892	5.00	3.639	0.12	0.39
A12	0.893	5.00	3.639	0.12	0.39
A13	0.900	5.00	3.639	0.28	0.92
A14	0.895	5.00	3.639	0.39	1.27
TOTAL	--	5.00	--	2.21	7.10

LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- X / X — SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)

GENERAL NOTES

1. SEE HYDROLOGY REPORT, PREPARED BY LANGAN ENGINEERING, FOR THE COMPLETE PROPOSED HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL FOR THE 50-YEAR STORM.

ABBREVIATIONS

FS FINISHED ELEVATION
L LENGTH OF FLOW

20 0 5 10 20
SCALE: 1 INCH = 20 FEET

Date	Description	No.
Revisions		

LANGAN
Langan Engineering and Environmental Services, Inc.
515 South Flower Street, Suite 2860
Los Angeles, CA 90071
T: 213.314.8100 F: 213.314.8101 www.langan.com

Project: 130 W COLLEGE
CITY OF LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Drawing Title: PROPOSED HYDROLOGY EXHIBIT

Project No. 721036101
Date JANUARY 30, 2024
Drawn By MW
Checked By KR
Figure No. 3

Filename: C:\bms\langan-pw-01\d0269104\721036101-0101-CA104-0102.dwg Date: 1/30/2024 Time: 16:02 User: llin Style Table: Langan.stb Layout: Layout1

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LANGAN Project No. 721036101

APPENDIX A

Los Angeles River Watershed Map

COUNTY OF LOS ANGELES

LOS ANGELES RIVER WATERSHED

Los Angeles River Watershed

APPROXIMATE SITE LOCATION

PACIFIC OCEAN

MILES
0 1 2 4

LEGEND

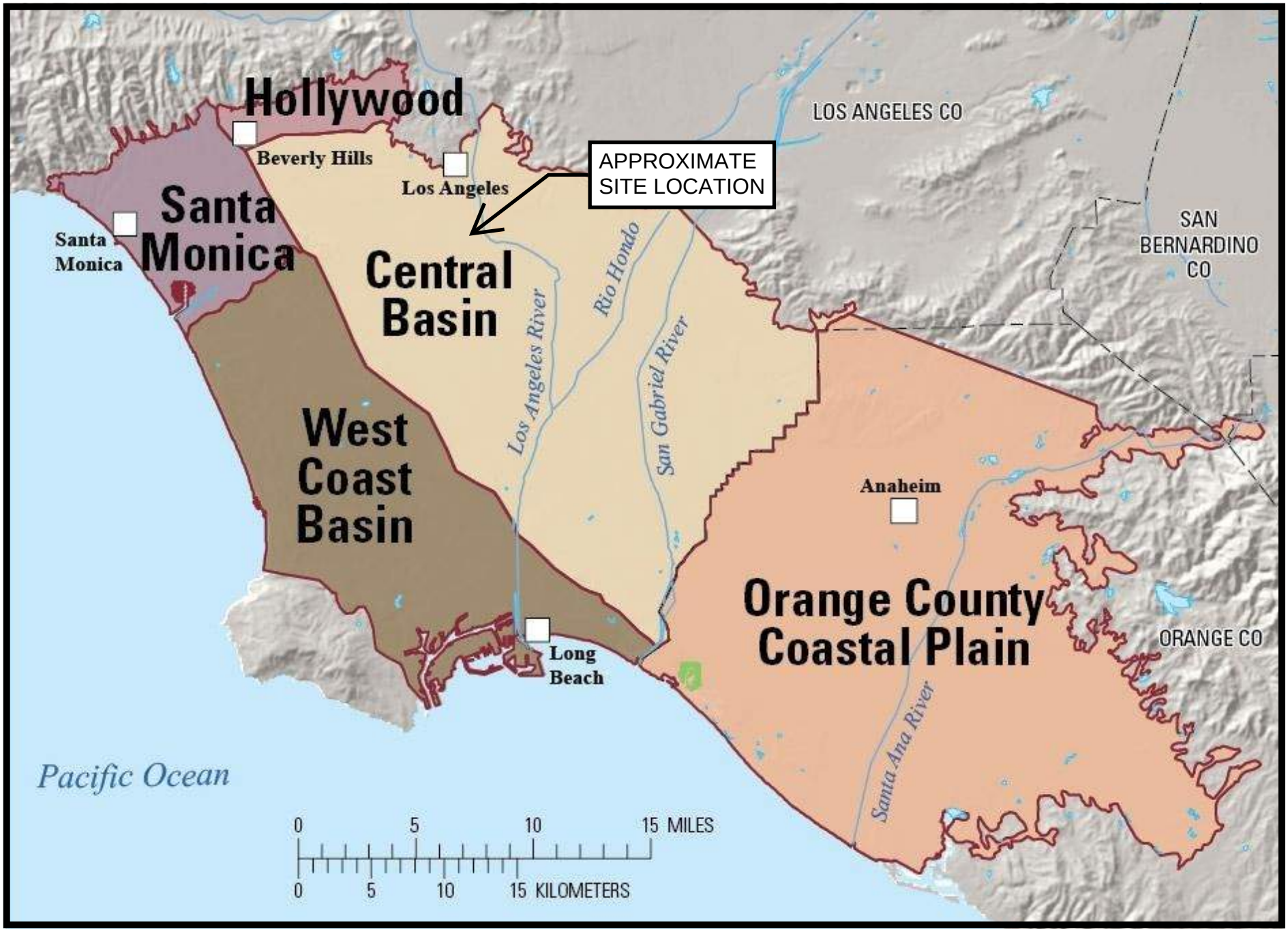
- LOS ANGELES RIVER WATERSHED
- UNINCORPORATED AREA
- DAM / LAKE / RESERVOIR
- MAJOR RIVER
- MAJOR CHANNEL

Data contained in this map is produced in whole or part from the Los Angeles County Department of Public Works' digital database.

APPENDIX B

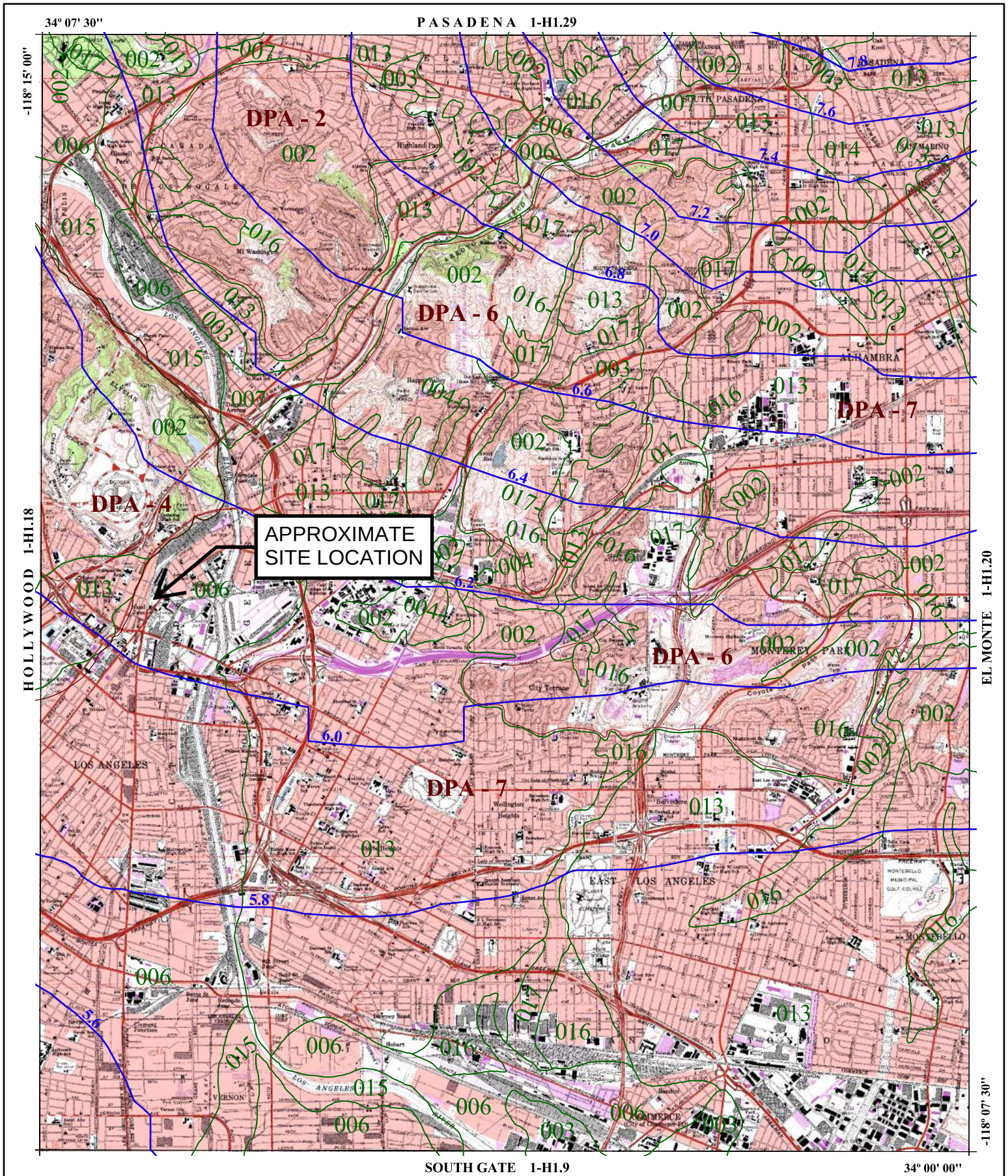
Coastal Plain of Los Angeles Groundwater Basin Map

Figure 5. Coastal Plain of Los Angeles Groundwater Basin



APPENDIX C

Los Angeles County Hydrology Manual – 50-Year 24-Hour Isohyet Map



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

N W E S

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

LOS ANGELES 50-YEAR 24-HOUR ISOHYET

1-H1.19

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

APPENDIX D

Existing HydroCalc Hydrology Results

Peak Flow Hydrologic Analysis

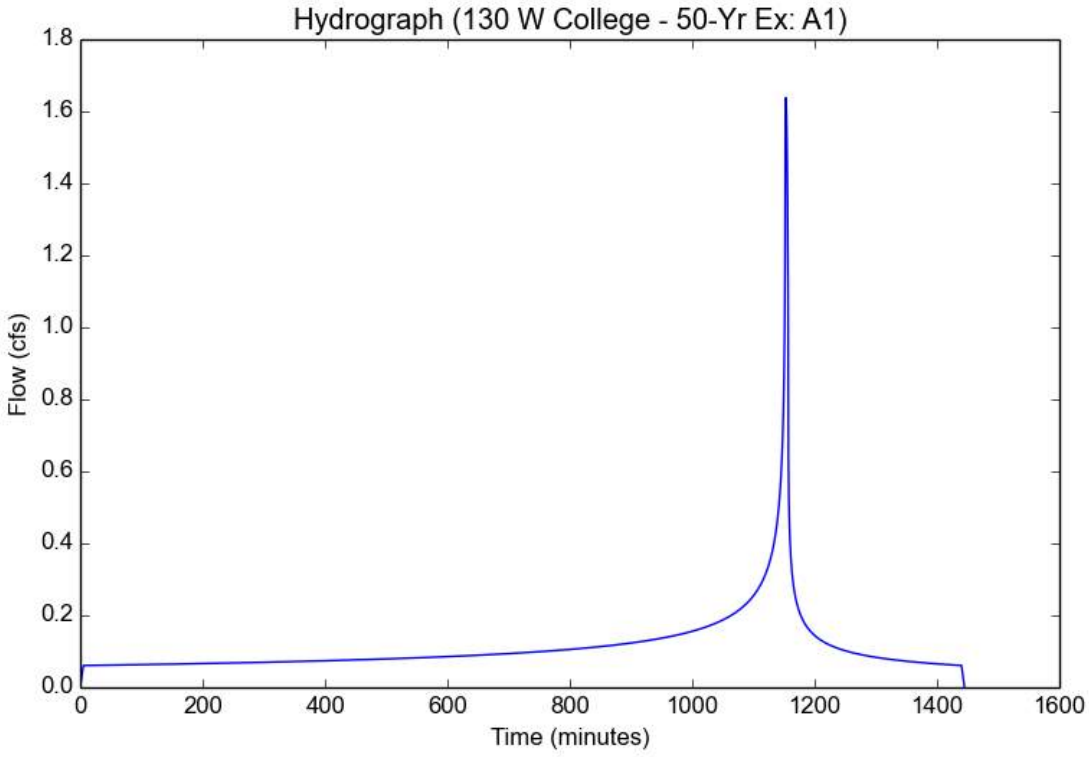
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A1
Area (ac)	0.5
Flow Path Length (ft)	259.21
Flow Path Slope (vft/hft)	0.012036
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.6377
Burned Peak Flow Rate (cfs)	1.6377
24-Hr Clear Runoff Volume (ac-ft)	0.2269
24-Hr Clear Runoff Volume (cu-ft)	9882.0031



Peak Flow Hydrologic Analysis

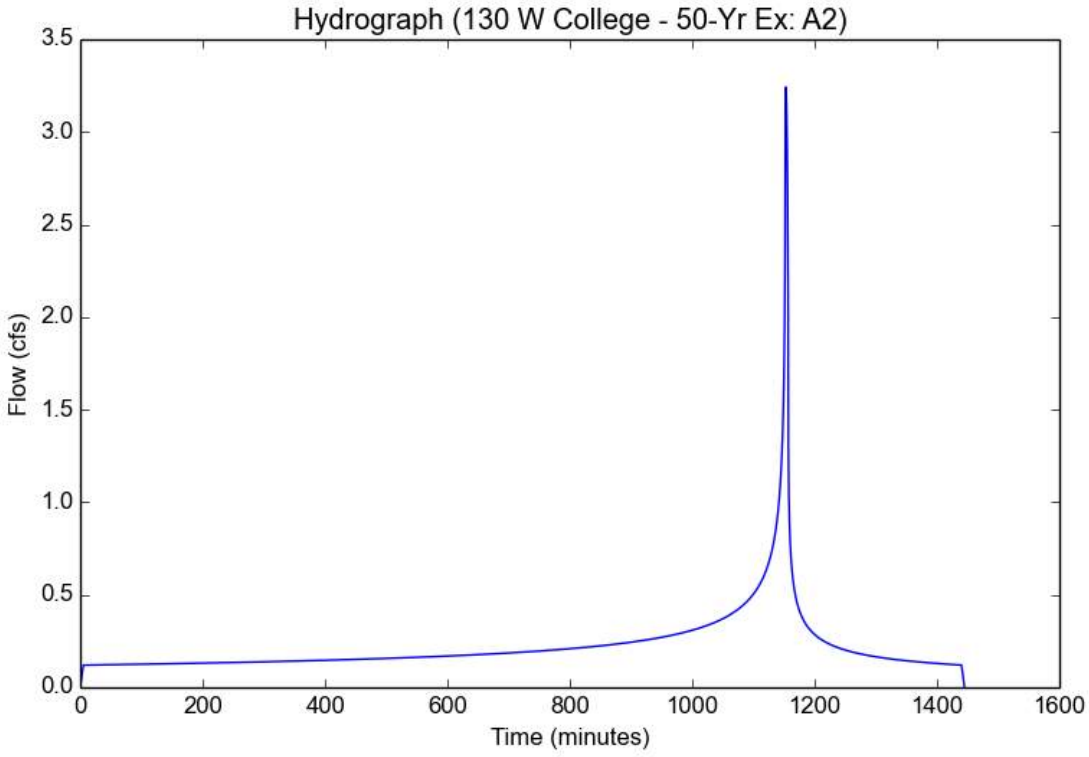
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A2
Area (ac)	0.99
Flow Path Length (ft)	282.31
Flow Path Slope (vft/hft)	0.016187
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.2427
Burned Peak Flow Rate (cfs)	3.2427
24-Hr Clear Runoff Volume (ac-ft)	0.4492
24-Hr Clear Runoff Volume (cu-ft)	19566.3661



Peak Flow Hydrologic Analysis

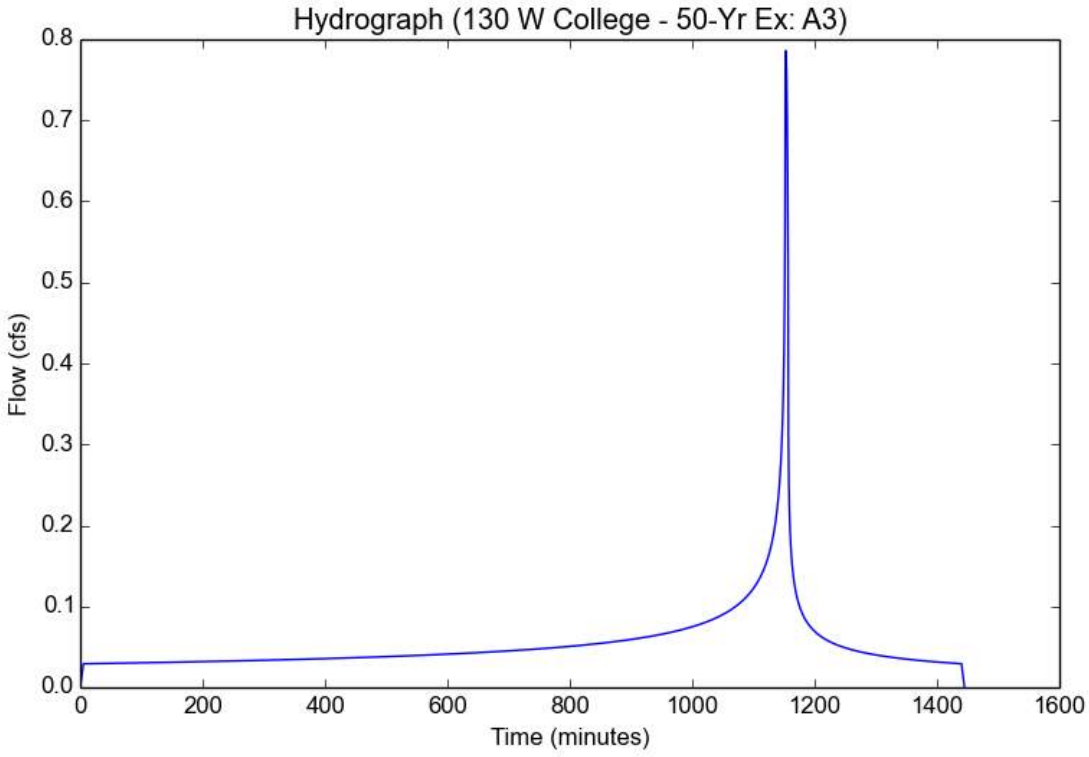
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A3
Area (ac)	0.24
Flow Path Length (ft)	192.09
Flow Path Slope (vft/hft)	0.006663
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.7861
Burned Peak Flow Rate (cfs)	0.7861
24-Hr Clear Runoff Volume (ac-ft)	0.1089
24-Hr Clear Runoff Volume (cu-ft)	4743.3615



Peak Flow Hydrologic Analysis

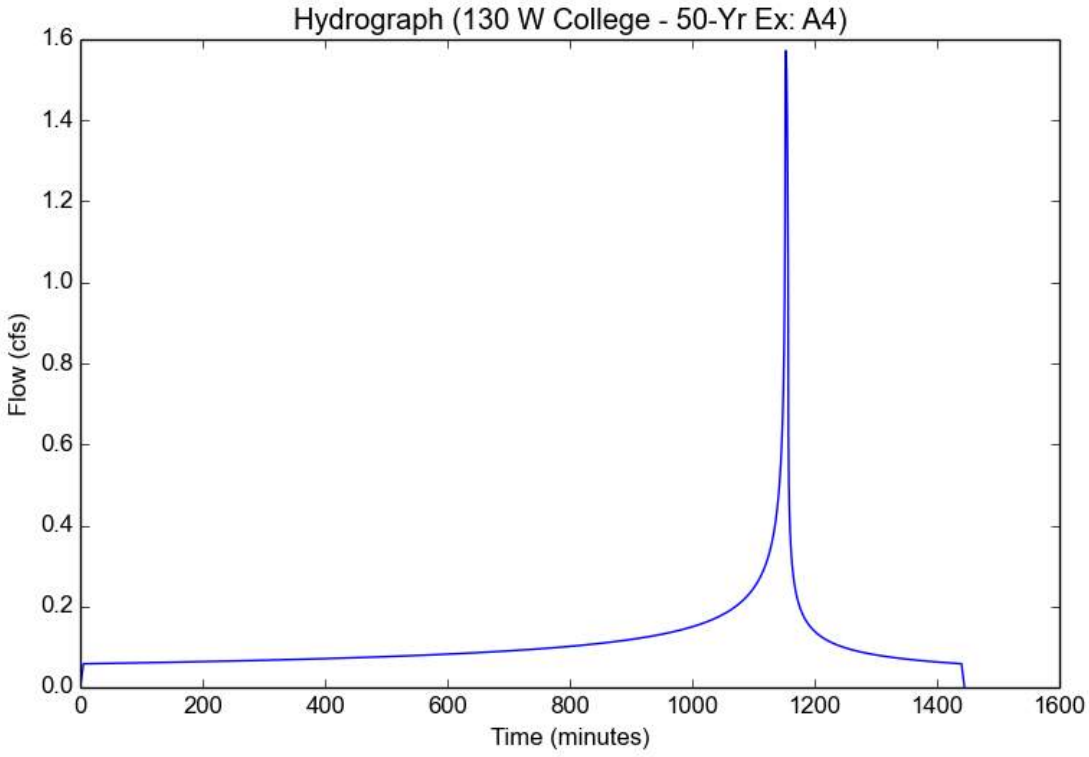
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A4
Area (ac)	0.48
Flow Path Length (ft)	183.62
Flow Path Slope (vft/hft)	0.013397
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.5722
Burned Peak Flow Rate (cfs)	1.5722
24-Hr Clear Runoff Volume (ac-ft)	0.2178
24-Hr Clear Runoff Volume (cu-ft)	9486.723



APPENDIX E

Proposed HydroCalc Hydrology Results – 50 Year Storm

Peak Flow Hydrologic Analysis

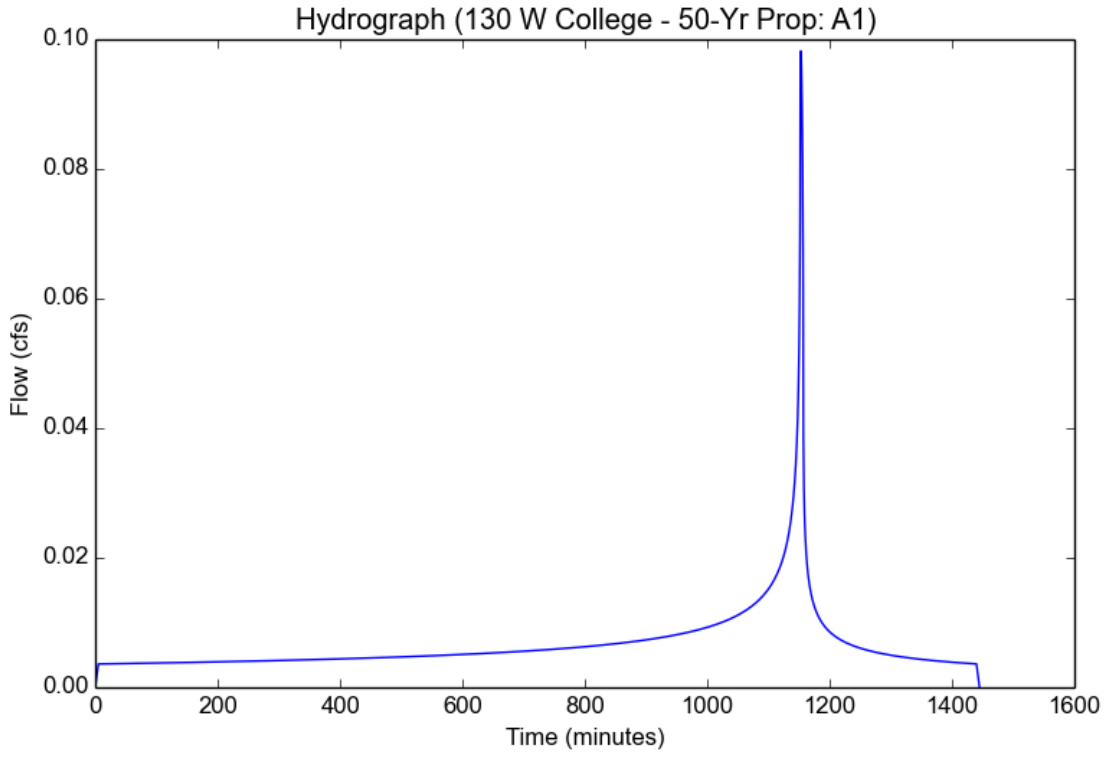
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A1
Area (ac)	0.03
Flow Path Length (ft)	101.62
Flow Path Slope (vft/hft)	0.001869
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8996
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0982
Burned Peak Flow Rate (cfs)	0.0982
24-Hr Clear Runoff Volume (ac-ft)	0.0135
24-Hr Clear Runoff Volume (cu-ft)	588.4329



Peak Flow Hydrologic Analysis

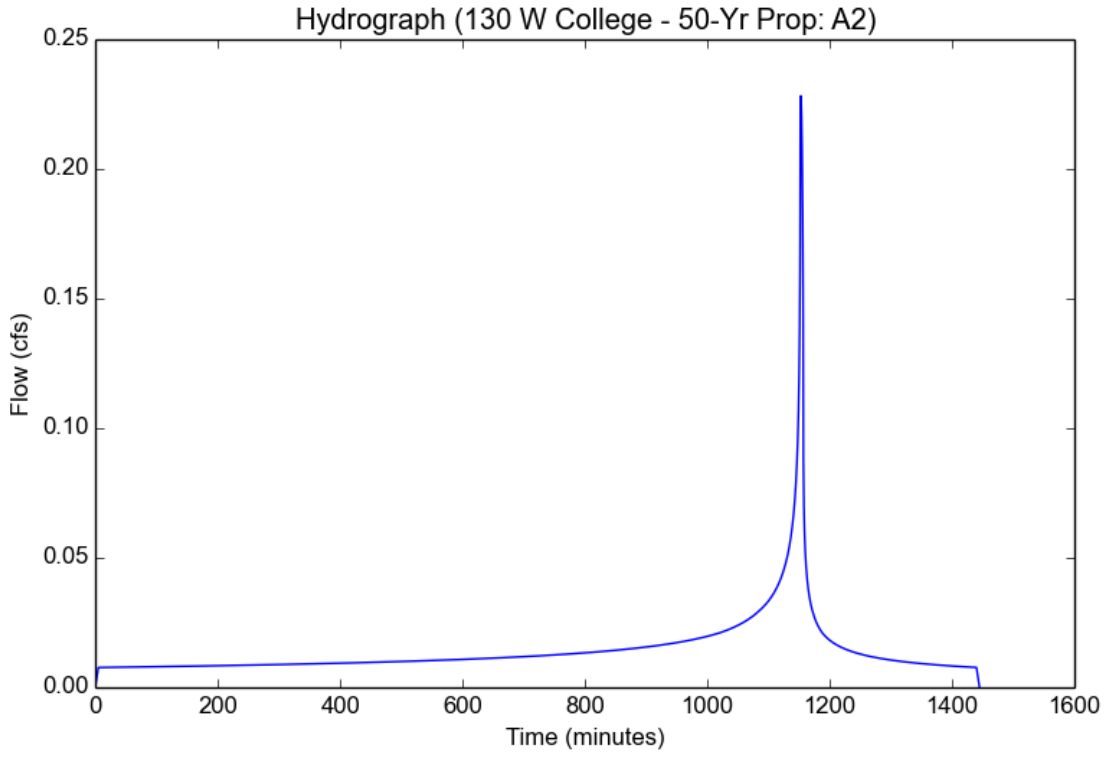
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A2
Area (ac)	0.07
Flow Path Length (ft)	31.94
Flow Path Slope (vft/hft)	0.007827175
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.89
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8959
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2282
Burned Peak Flow Rate (cfs)	0.2282
24-Hr Clear Runoff Volume (ac-ft)	0.0291
24-Hr Clear Runoff Volume (cu-ft)	1268.3075



Peak Flow Hydrologic Analysis

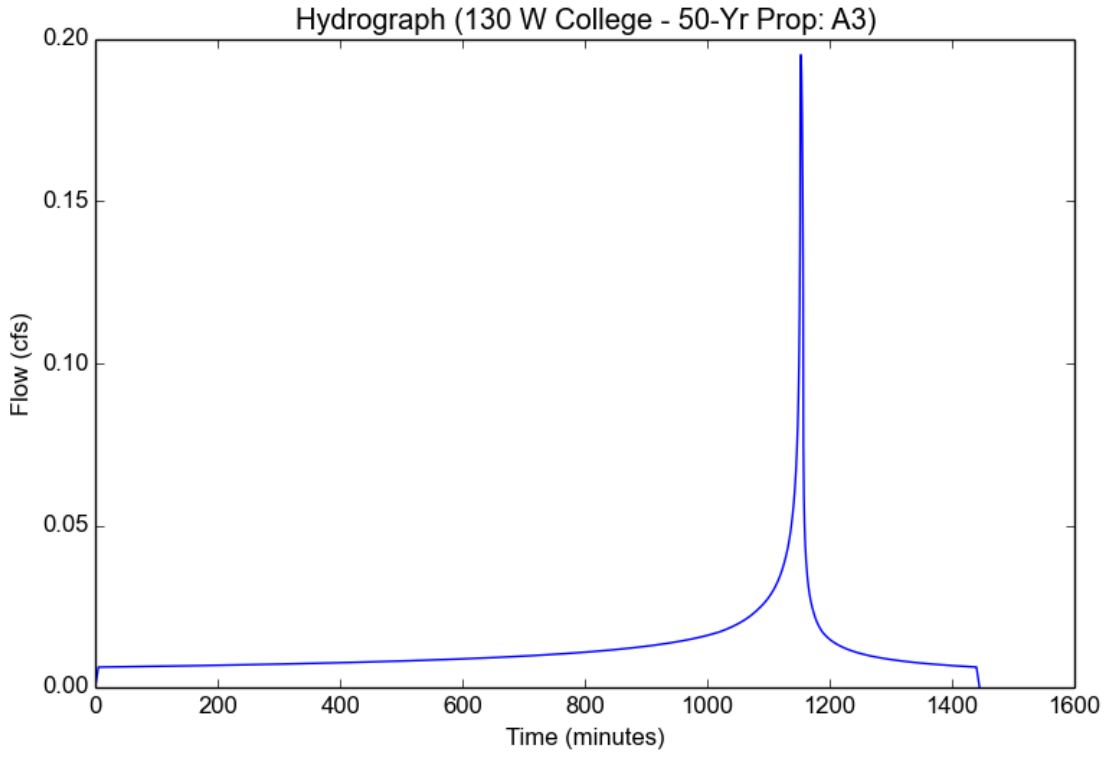
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A3
Area (ac)	0.06
Flow Path Length (ft)	52.9
Flow Path Slope (vft/hft)	0.009451796
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.894
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1952
Burned Peak Flow Rate (cfs)	0.1952
24-Hr Clear Runoff Volume (ac-ft)	0.0239
24-Hr Clear Runoff Volume (cu-ft)	1042.2481



Peak Flow Hydrologic Analysis

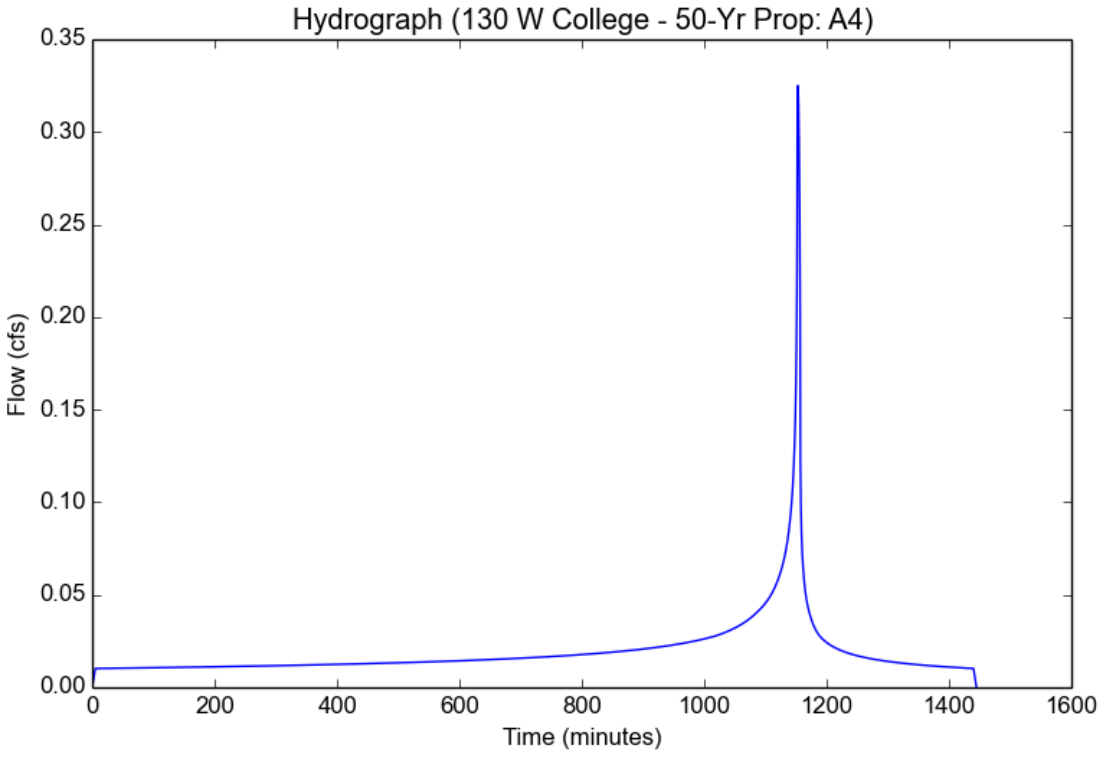
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A4
Area (ac)	0.1
Flow Path Length (ft)	45.04
Flow Path Slope (vft/hft)	0.011101243
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.82
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8933
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3251
Burned Peak Flow Rate (cfs)	0.3251
24-Hr Clear Runoff Volume (ac-ft)	0.0392
24-Hr Clear Runoff Volume (cu-ft)	1707.1652



Peak Flow Hydrologic Analysis

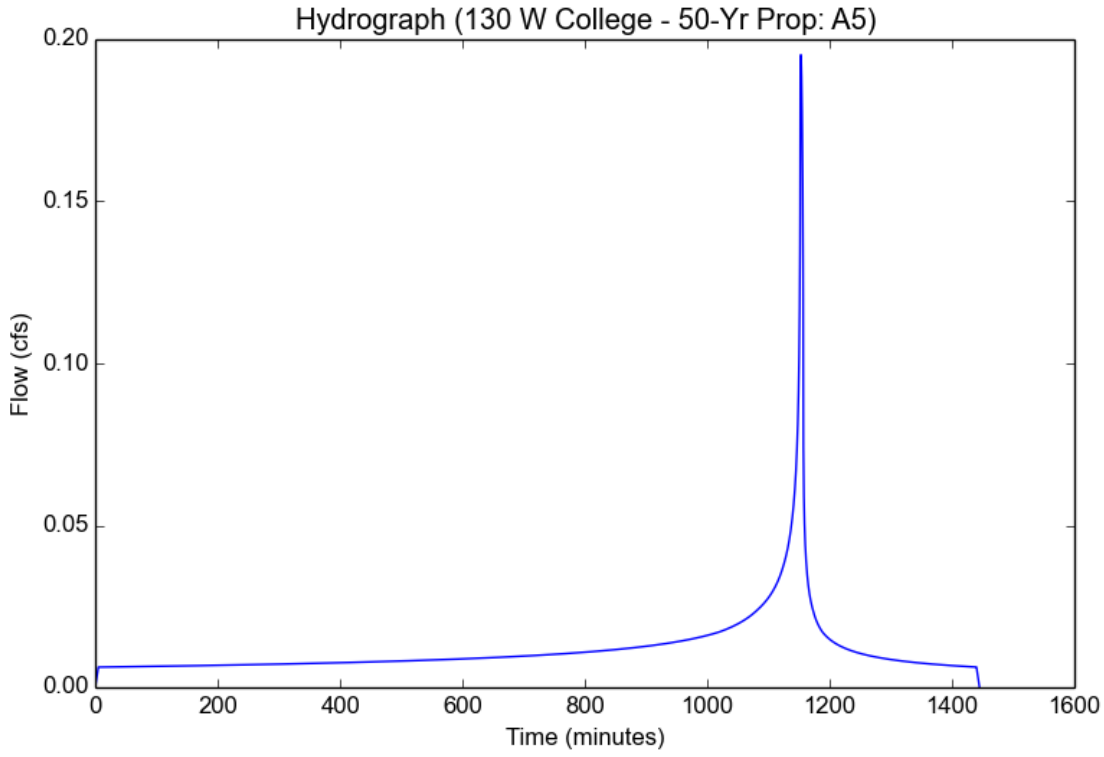
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A5
Area (ac)	0.06
Flow Path Length (ft)	50.24
Flow Path Slope (vft/hft)	0.013535032
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.894
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1952
Burned Peak Flow Rate (cfs)	0.1952
24-Hr Clear Runoff Volume (ac-ft)	0.0239
24-Hr Clear Runoff Volume (cu-ft)	1042.2481



Peak Flow Hydrologic Analysis

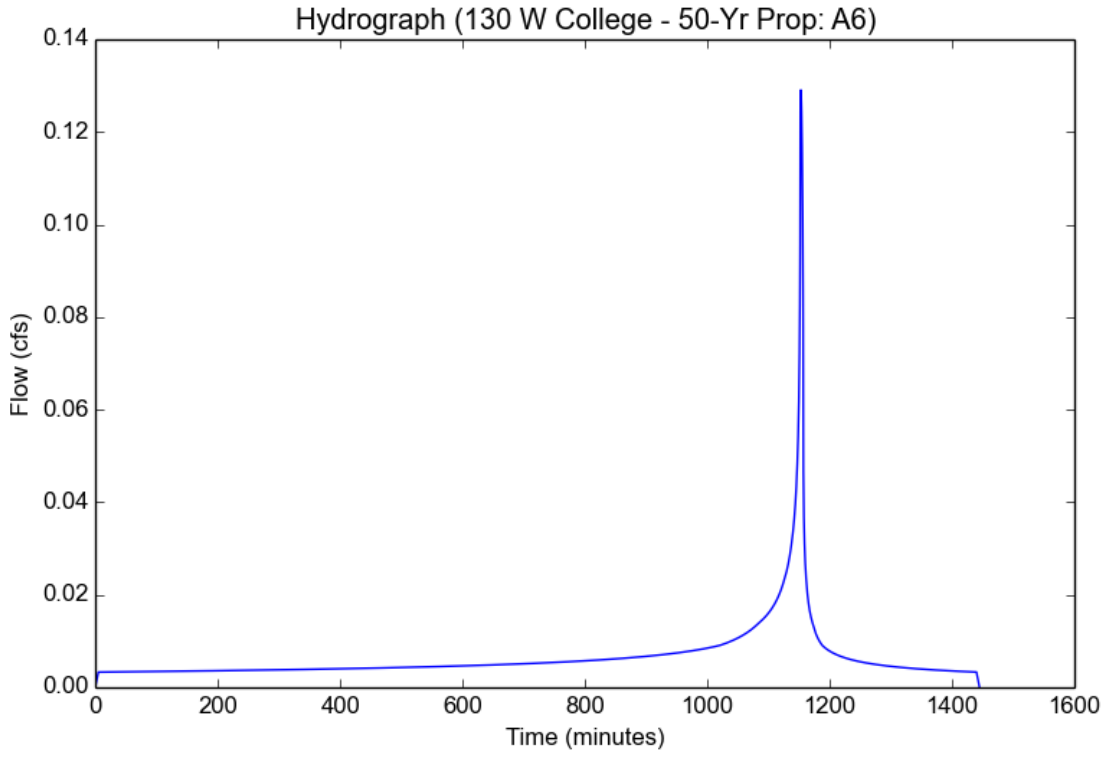
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A6
Area (ac)	0.04
Flow Path Length (ft)	20.36
Flow Path Slope (vft/hft)	0.027013
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.64
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8866
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1291
Burned Peak Flow Rate (cfs)	0.1291
24-Hr Clear Runoff Volume (ac-ft)	0.0132
24-Hr Clear Runoff Volume (cu-ft)	575.1719



Peak Flow Hydrologic Analysis

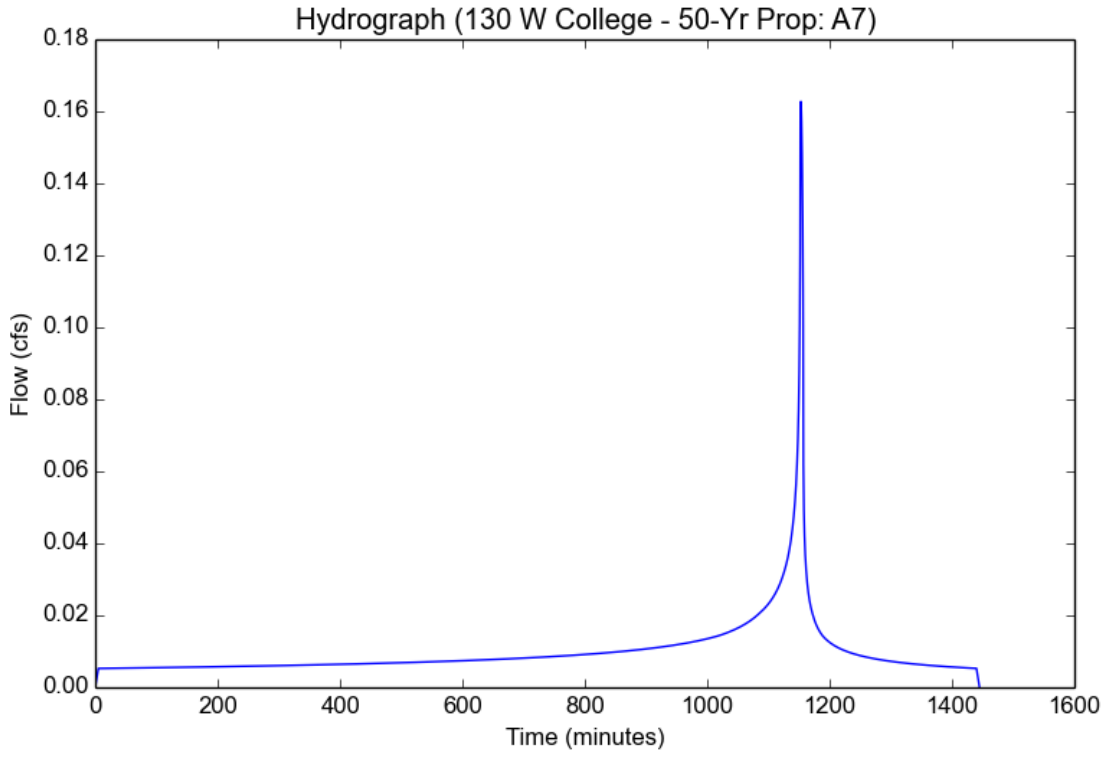
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A7
Area (ac)	0.05
Flow Path Length (ft)	71.18
Flow Path Slope (vft/hft)	0.013627
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.85
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8944
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1628
Burned Peak Flow Rate (cfs)	0.1628
24-Hr Clear Runoff Volume (ac-ft)	0.0201
24-Hr Clear Runoff Volume (cu-ft)	876.0189



Peak Flow Hydrologic Analysis

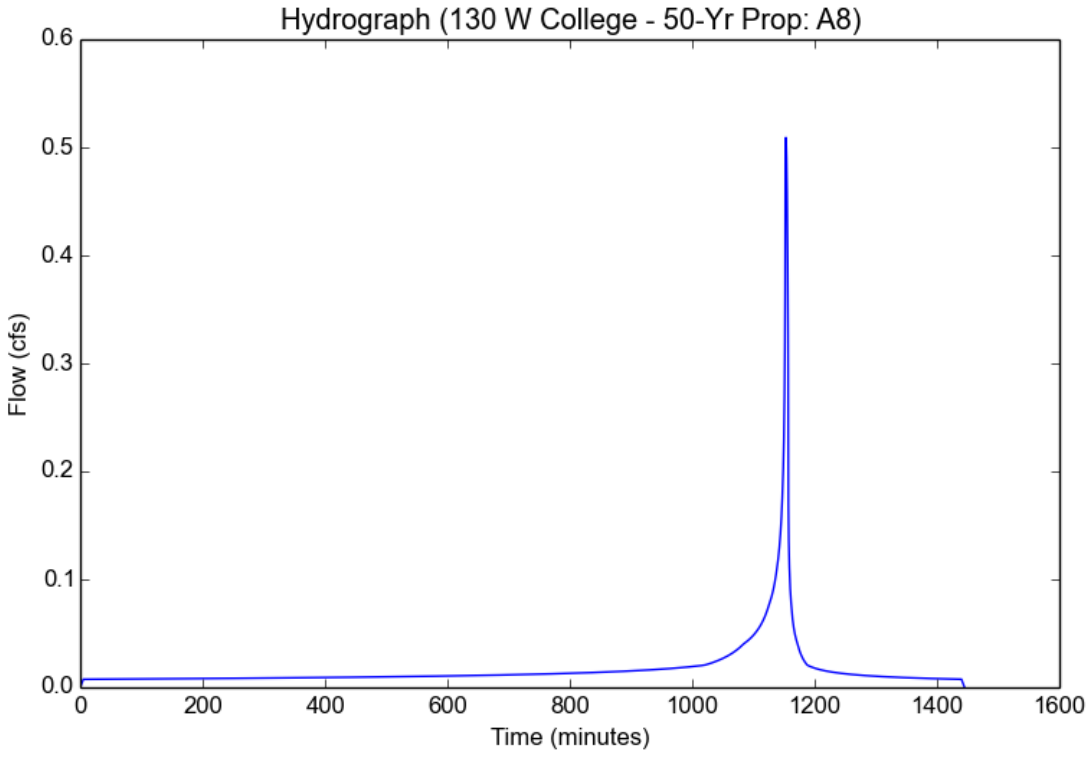
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A8
Area (ac)	0.16
Flow Path Length (ft)	250.18
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.31
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8743
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.5091
Burned Peak Flow Rate (cfs)	0.5091
24-Hr Clear Runoff Volume (ac-ft)	0.0347
24-Hr Clear Runoff Volume (cu-ft)	1510.9302



Peak Flow Hydrologic Analysis

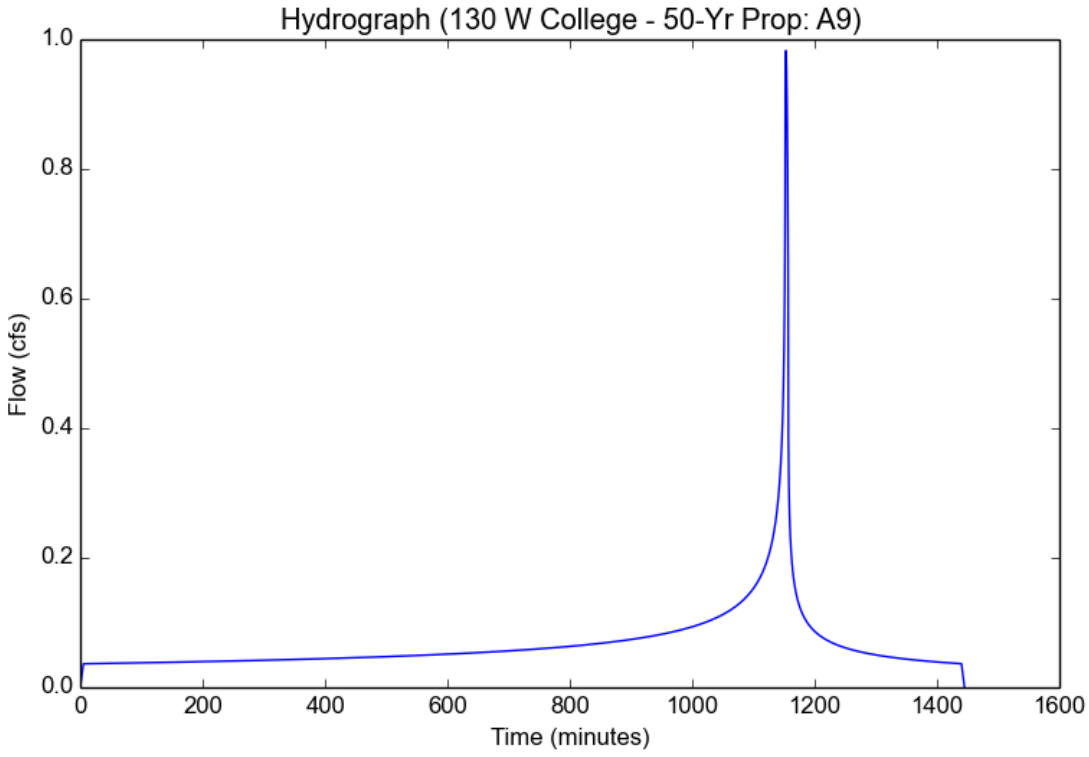
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A9
Area (ac)	0.3
Flow Path Length (ft)	187.89
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9826
Burned Peak Flow Rate (cfs)	0.9826
24-Hr Clear Runoff Volume (ac-ft)	0.1361
24-Hr Clear Runoff Volume (cu-ft)	5929.2019



Peak Flow Hydrologic Analysis

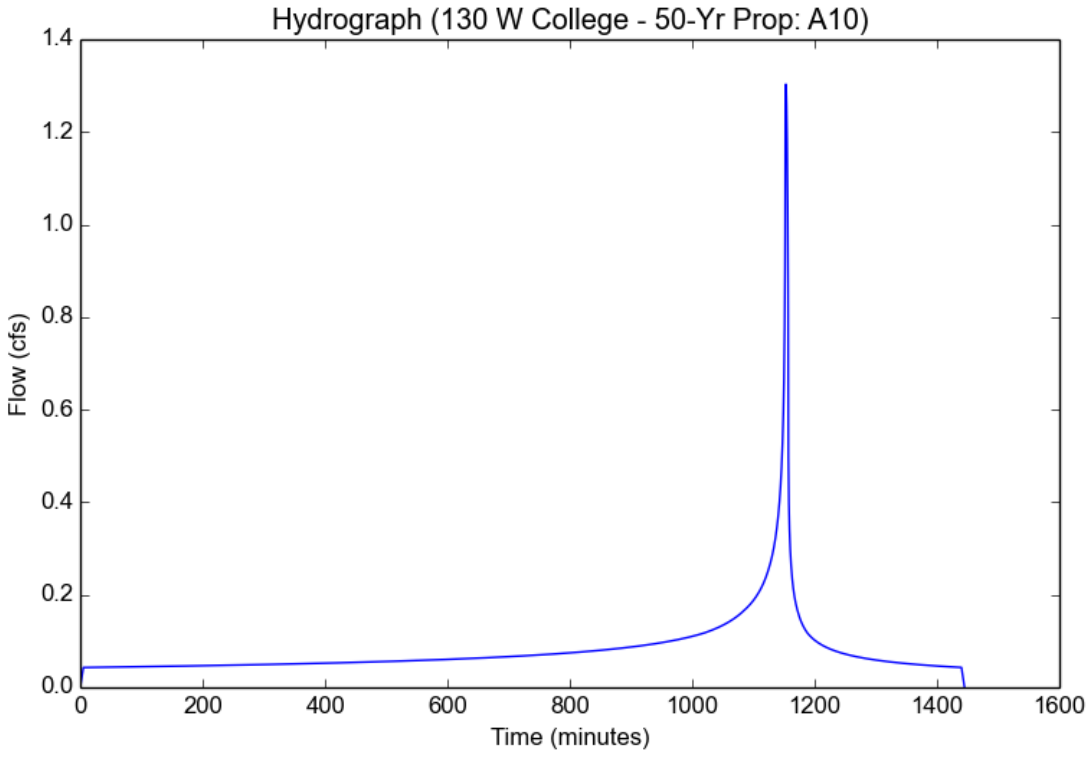
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A10
Area (ac)	0.4
Flow Path Length (ft)	140.08
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.3031
Burned Peak Flow Rate (cfs)	1.3031
24-Hr Clear Runoff Volume (ac-ft)	0.1636
24-Hr Clear Runoff Volume (cu-ft)	7127.8112



Peak Flow Hydrologic Analysis

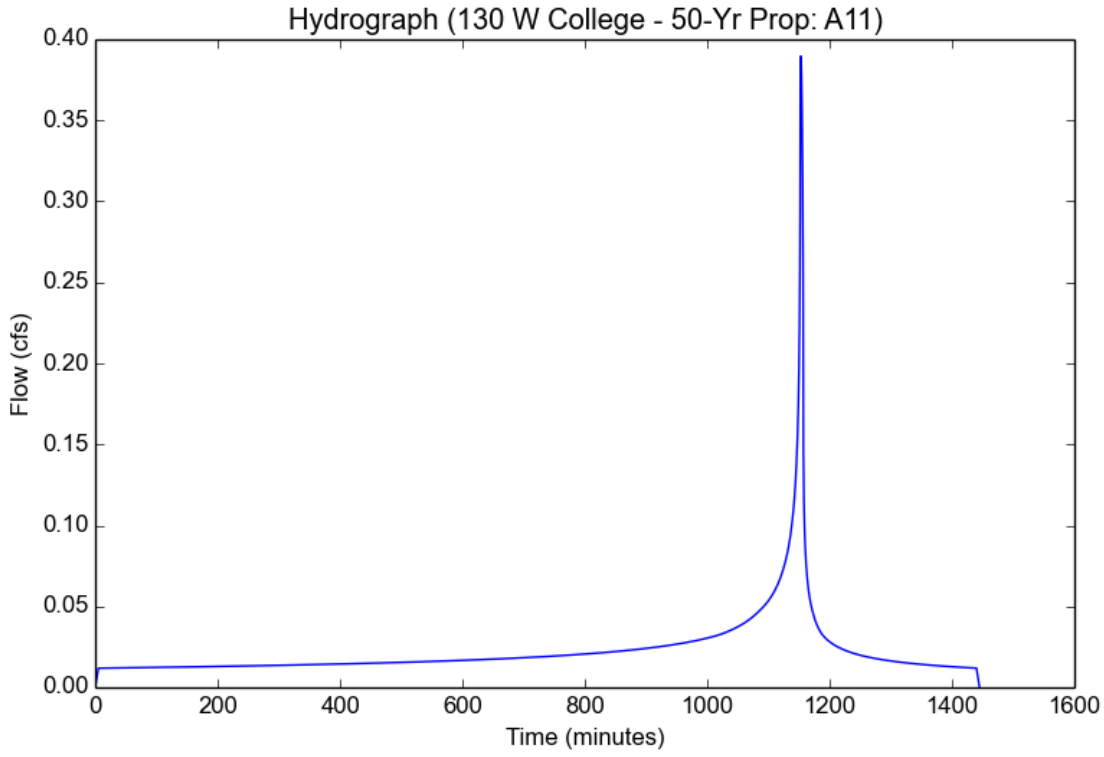
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A11
Area (ac)	0.12
Flow Path Length (ft)	104.48
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.79
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8922
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3896
Burned Peak Flow Rate (cfs)	0.3896
24-Hr Clear Runoff Volume (ac-ft)	0.0458
24-Hr Clear Runoff Volume (cu-ft)	1994.7511



Peak Flow Hydrologic Analysis

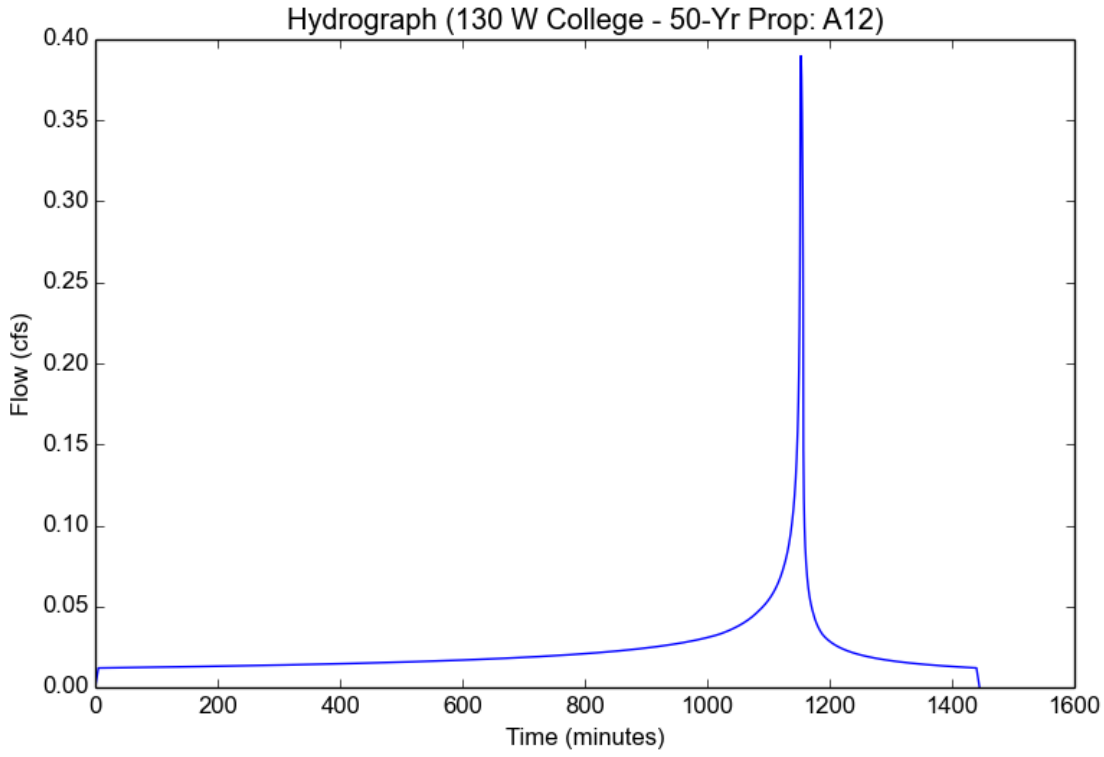
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A12
Area (ac)	0.12
Flow Path Length (ft)	104.26
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8925
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3898
Burned Peak Flow Rate (cfs)	0.3898
24-Hr Clear Runoff Volume (ac-ft)	0.0462
24-Hr Clear Runoff Volume (cu-ft)	2012.7001



Peak Flow Hydrologic Analysis

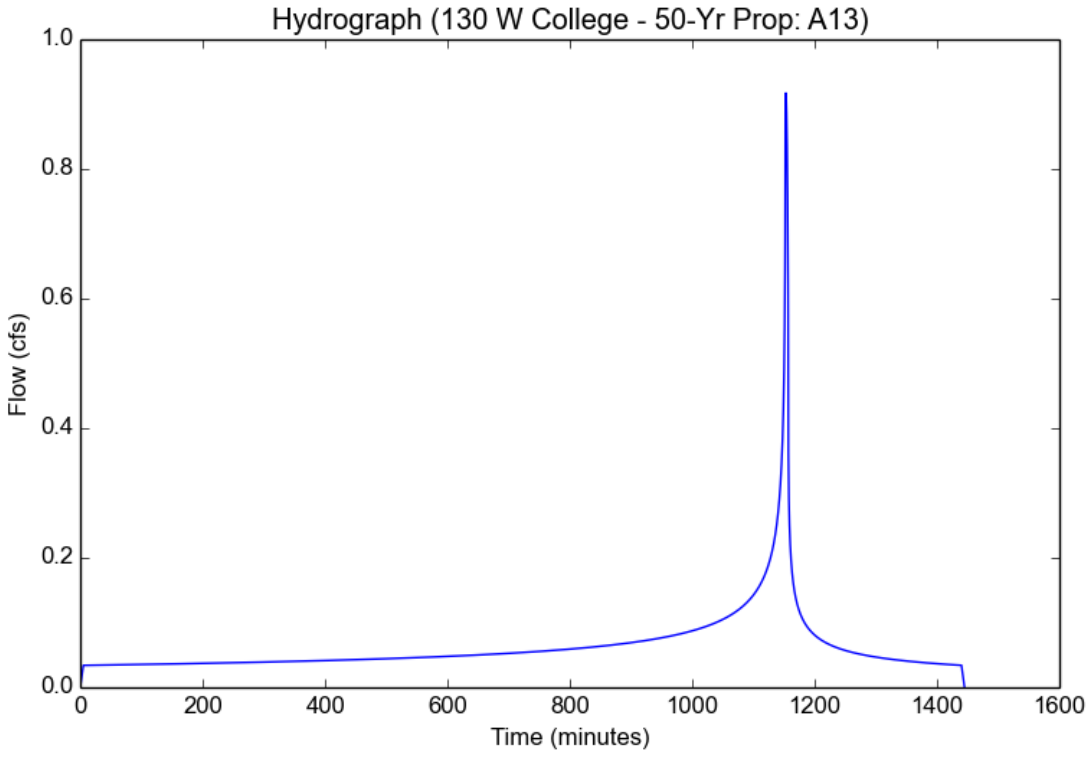
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A13
Area (ac)	0.28
Flow Path Length (ft)	116.31
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9171
Burned Peak Flow Rate (cfs)	0.9171
24-Hr Clear Runoff Volume (ac-ft)	0.127
24-Hr Clear Runoff Volume (cu-ft)	5533.9217



Peak Flow Hydrologic Analysis

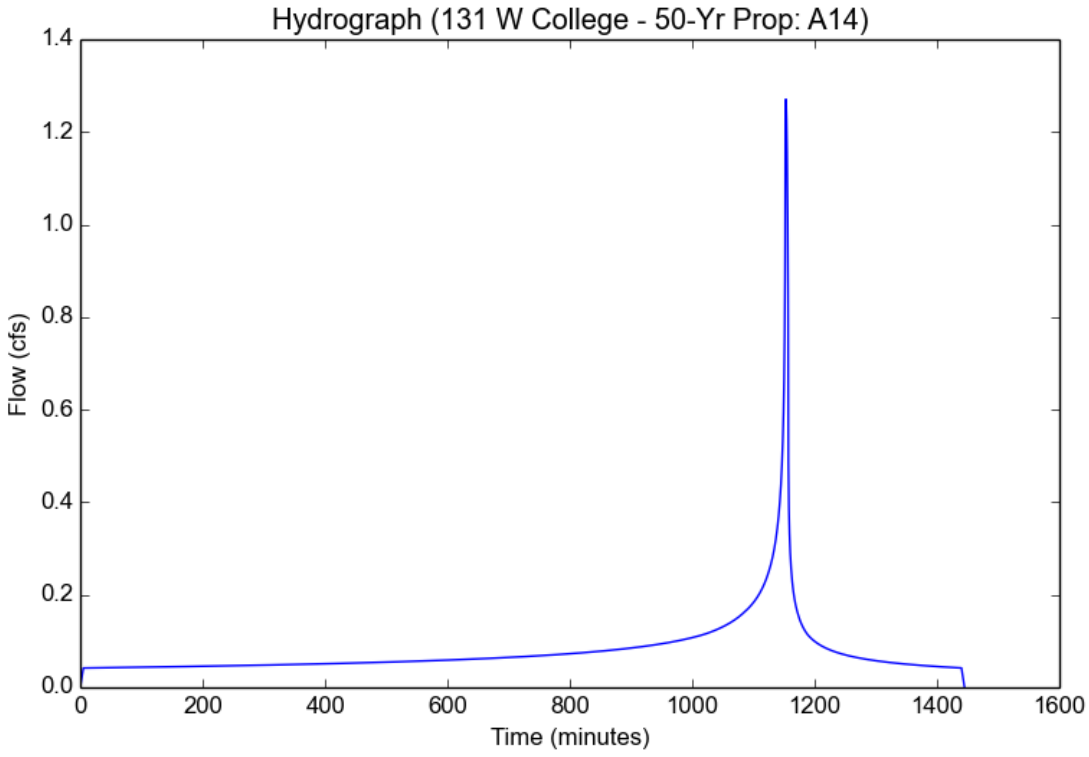
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	131 W College - 50-Yr Prop
Subarea ID	A14
Area (ac)	0.39
Flow Path Length (ft)	132.95
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.2706
Burned Peak Flow Rate (cfs)	1.2706
24-Hr Clear Runoff Volume (ac-ft)	0.1595
24-Hr Clear Runoff Volume (cu-ft)	6949.6159



APPENDIX F

Proposed HydroCalc Hydrology Results – 85th Percentile

Peak Flow Hydrologic Analysis

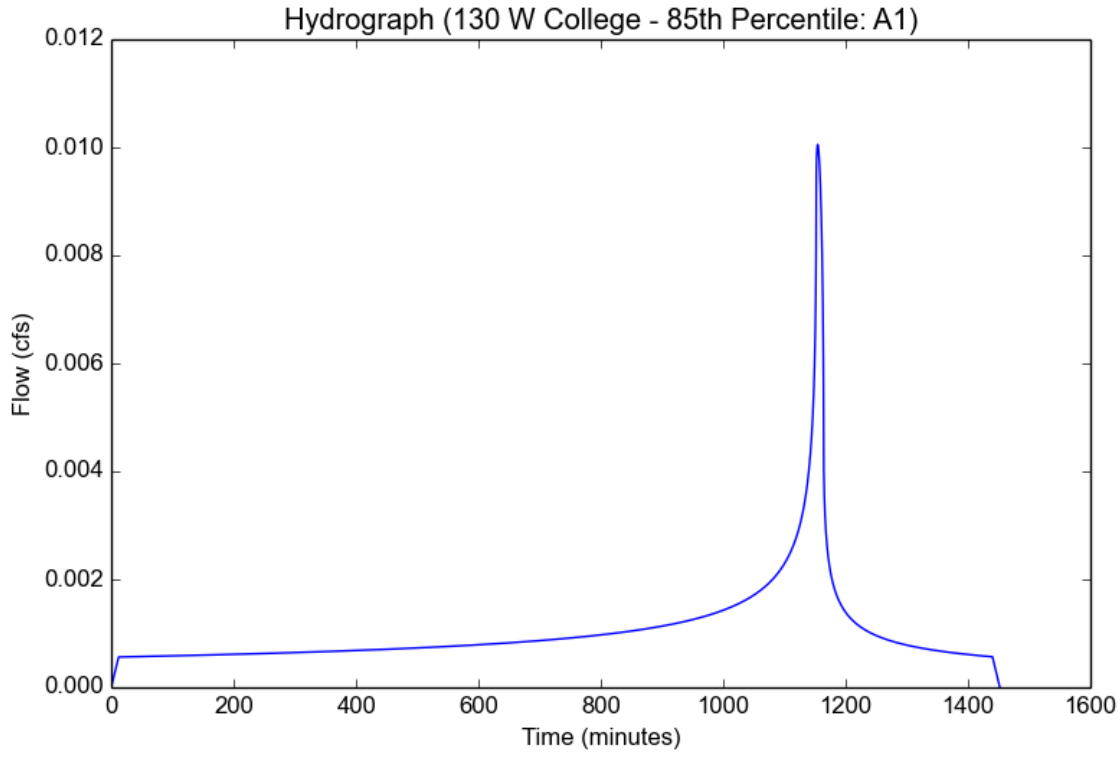
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A1
Area (ac)	0.03
Flow Path Length (ft)	101.62
Flow Path Slope (vft/hft)	0.001869
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.99
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3756
Undeveloped Runoff Coefficient (Cu)	0.1096
Developed Runoff Coefficient (Cd)	0.8921
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	0.0101
Burned Peak Flow Rate (cfs)	0.0101
24-Hr Clear Runoff Volume (ac-ft)	0.0021
24-Hr Clear Runoff Volume (cu-ft)	91.5195



Peak Flow Hydrologic Analysis

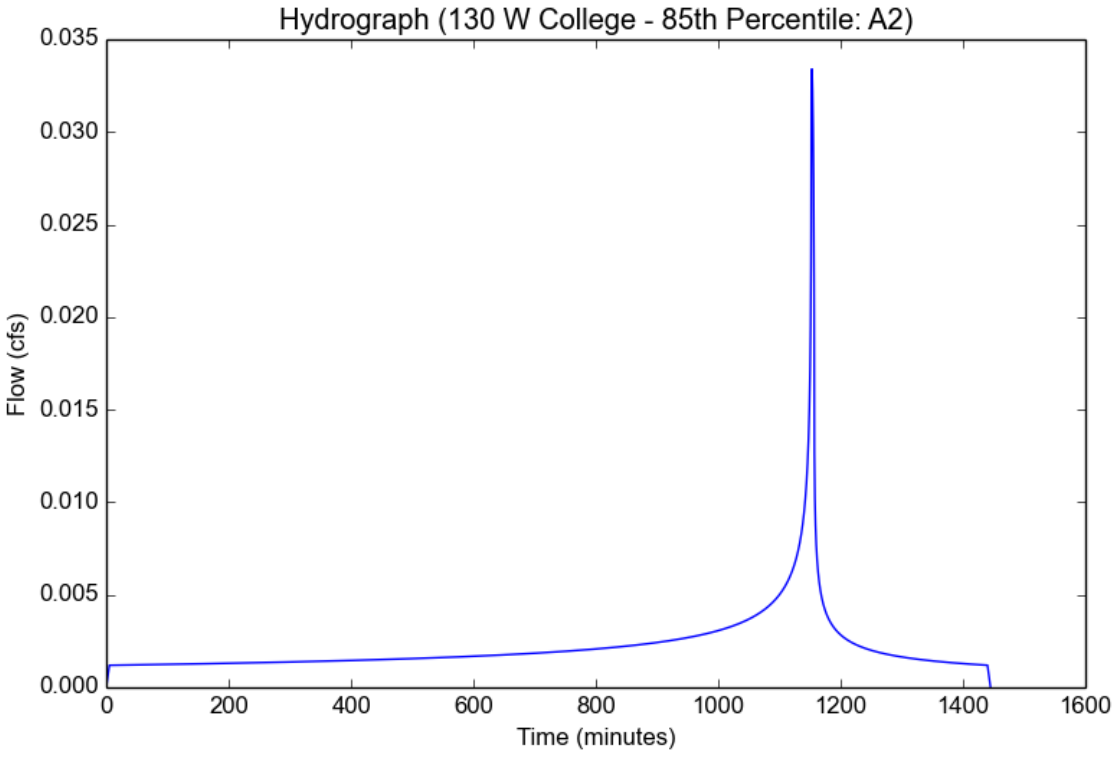
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A2
Area (ac)	0.07
Flow Path Length (ft)	31.94
Flow Path Slope (vft/hft)	0.007827175
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.89
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5668
Undeveloped Runoff Coefficient (Cu)	0.3705
Developed Runoff Coefficient (Cd)	0.8418
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0334
Burned Peak Flow Rate (cfs)	0.0334
24-Hr Clear Runoff Volume (ac-ft)	0.0045
24-Hr Clear Runoff Volume (cu-ft)	194.6598



Peak Flow Hydrologic Analysis

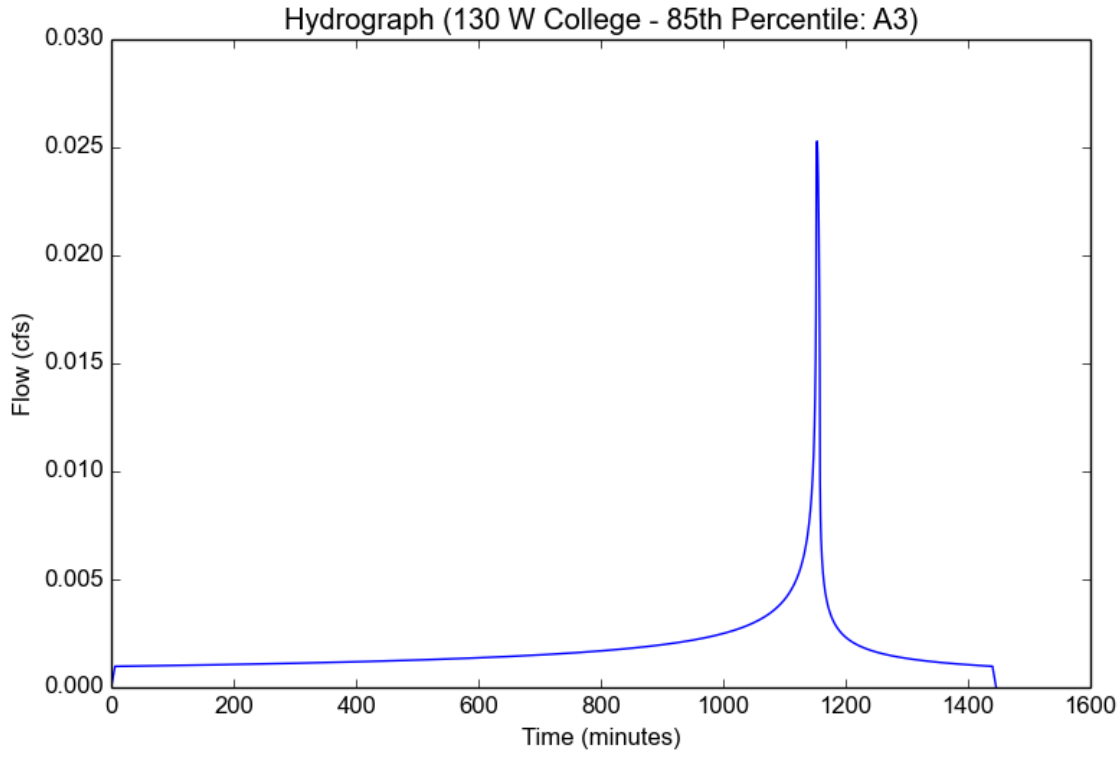
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A3
Area (ac)	0.06
Flow Path Length (ft)	52.9
Flow Path Slope (vft/hft)	0.009451796
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.81
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0253
Burned Peak Flow Rate (cfs)	0.0253
24-Hr Clear Runoff Volume (ac-ft)	0.0036
24-Hr Clear Runoff Volume (cu-ft)	158.7048



Peak Flow Hydrologic Analysis

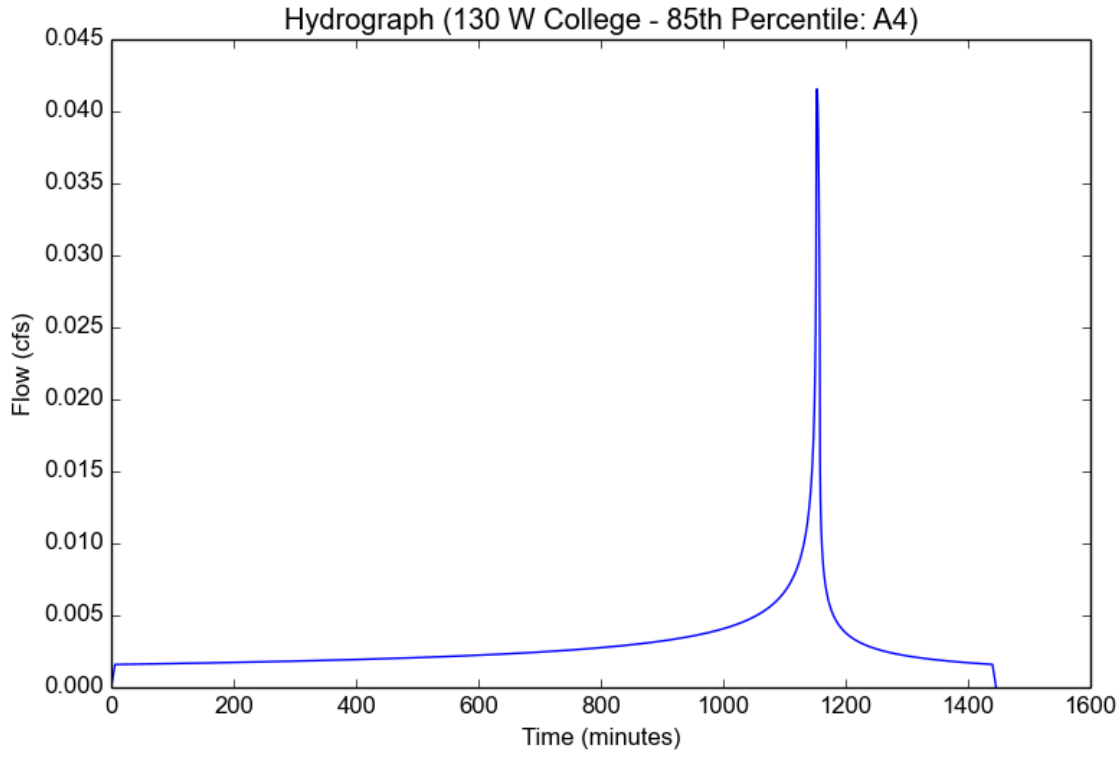
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A4
Area (ac)	0.1
Flow Path Length (ft)	45.04
Flow Path Slope (vft/hft)	0.011101243
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.82
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.7988
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0416
Burned Peak Flow Rate (cfs)	0.0416
24-Hr Clear Runoff Volume (ac-ft)	0.0059
24-Hr Clear Runoff Volume (cu-ft)	259.0965



Peak Flow Hydrologic Analysis

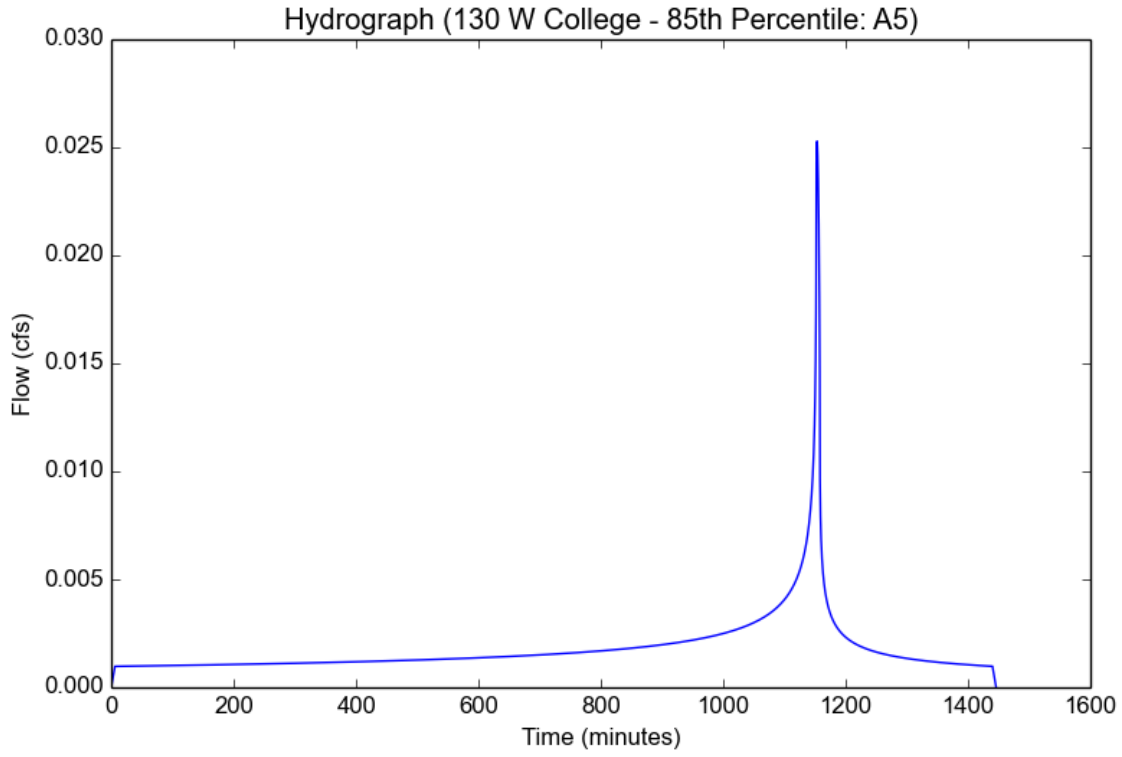
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A5
Area (ac)	0.06
Flow Path Length (ft)	50.24
Flow Path Slope (vft/hft)	0.013535032
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.81
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0253
Burned Peak Flow Rate (cfs)	0.0253
24-Hr Clear Runoff Volume (ac-ft)	0.0036
24-Hr Clear Runoff Volume (cu-ft)	158.7048



Peak Flow Hydrologic Analysis

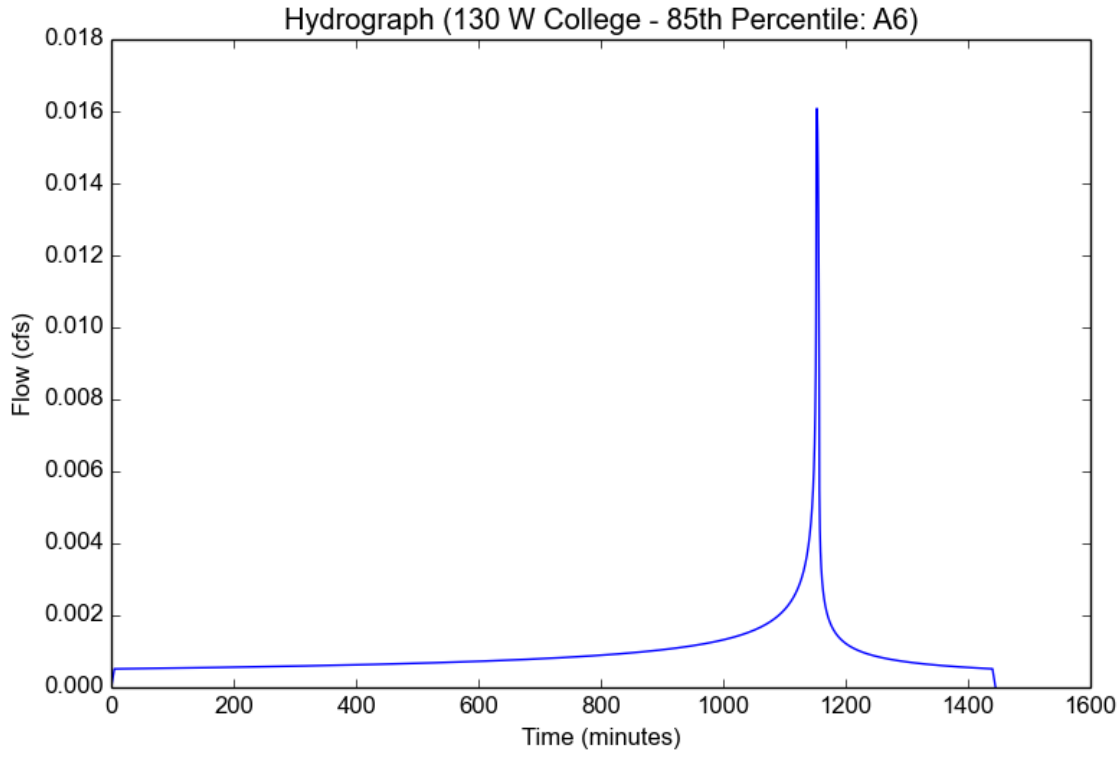
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A6
Area (ac)	0.04
Flow Path Length (ft)	20.36
Flow Path Slope (vft/hft)	0.027013
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.64
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5668
Undeveloped Runoff Coefficient (Cu)	0.3705
Developed Runoff Coefficient (Cd)	0.7094
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0161
Burned Peak Flow Rate (cfs)	0.0161
24-Hr Clear Runoff Volume (ac-ft)	0.0019
24-Hr Clear Runoff Volume (cu-ft)	84.2209



Peak Flow Hydrologic Analysis

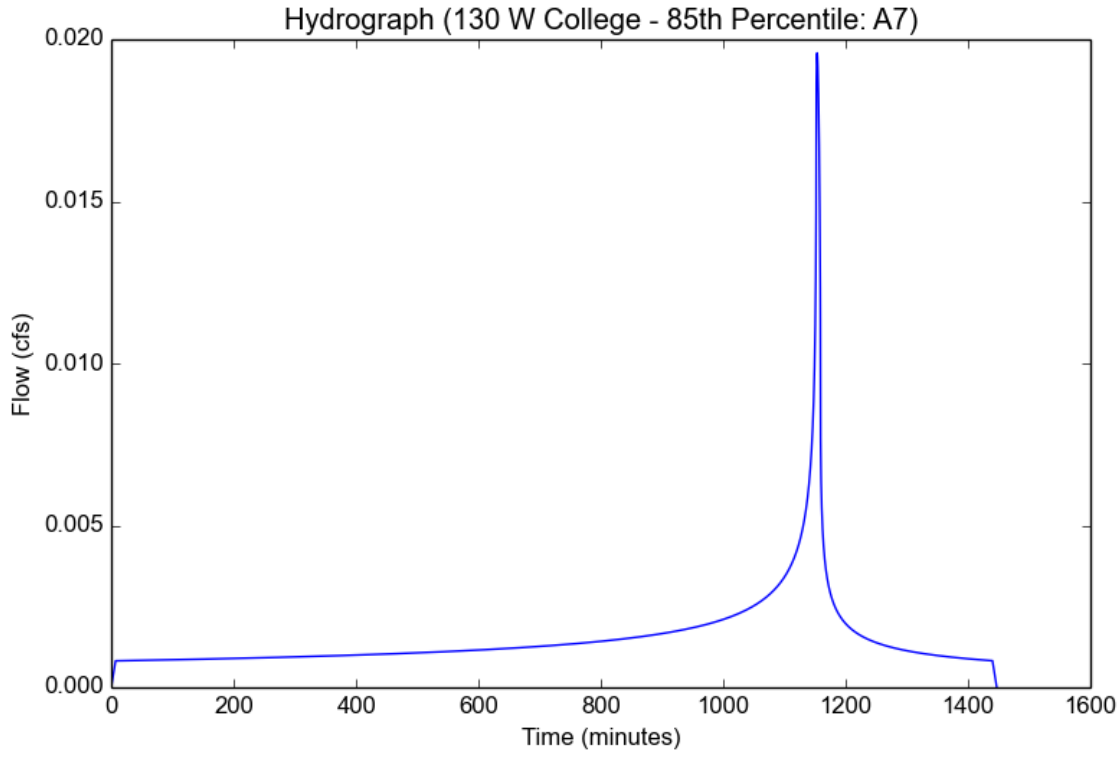
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A7
Area (ac)	0.05
Flow Path Length (ft)	71.18
Flow Path Slope (vft/hft)	0.013627
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.85
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4839
Undeveloped Runoff Coefficient (Cu)	0.2957
Developed Runoff Coefficient (Cd)	0.8094
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	0.0196
Burned Peak Flow Rate (cfs)	0.0196
24-Hr Clear Runoff Volume (ac-ft)	0.0031
24-Hr Clear Runoff Volume (cu-ft)	133.5595



Peak Flow Hydrologic Analysis

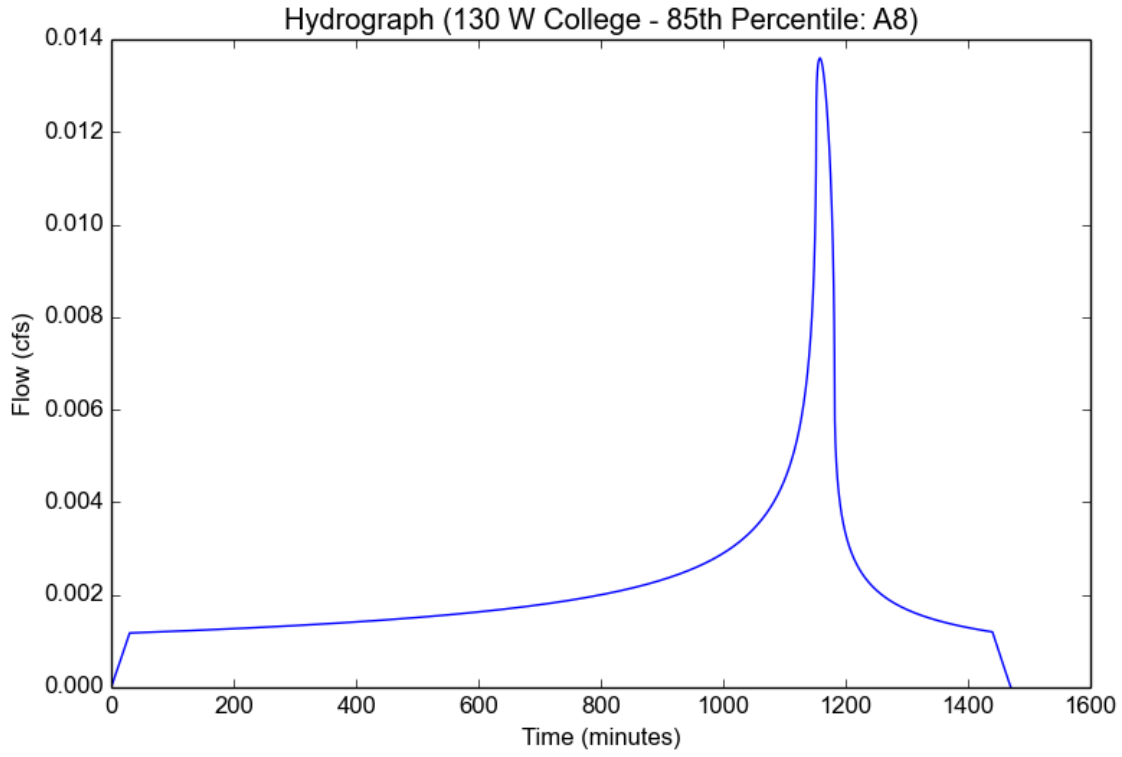
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A8
Area (ac)	0.16
Flow Path Length (ft)	250.18
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.31
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2442
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.348
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.0136
Burned Peak Flow Rate (cfs)	0.0136
24-Hr Clear Runoff Volume (ac-ft)	0.0044
24-Hr Clear Runoff Volume (cu-ft)	190.4278



Peak Flow Hydrologic Analysis

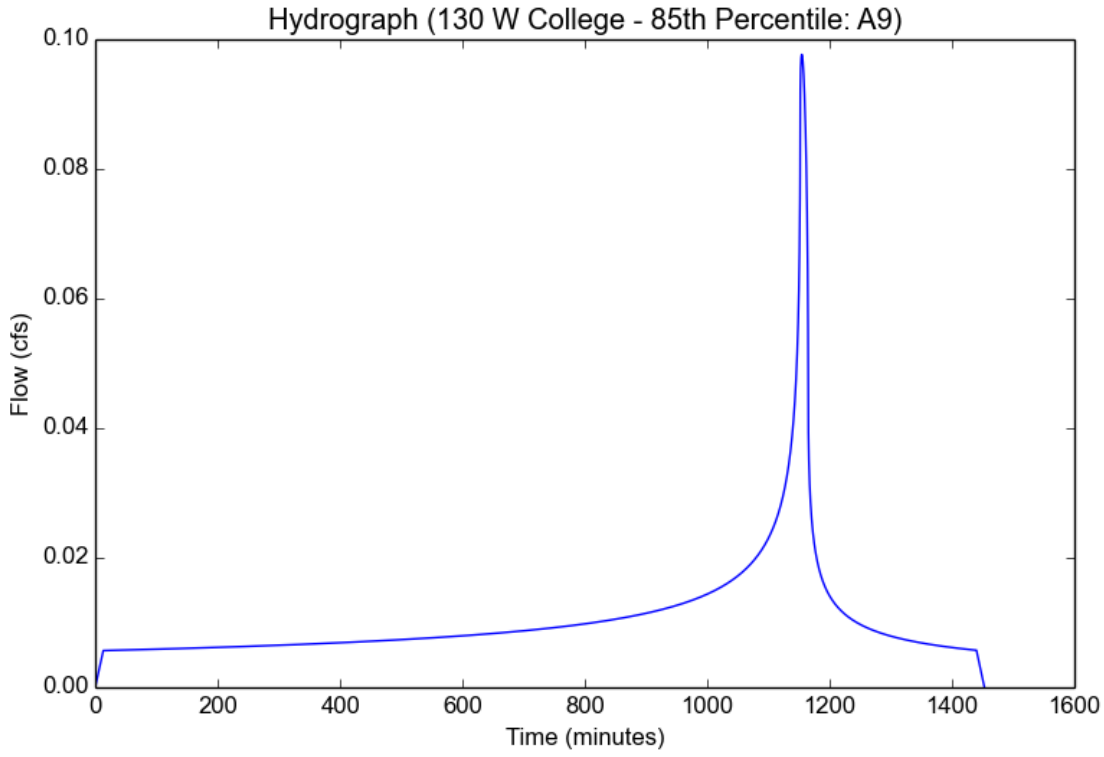
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A9
Area (ac)	0.3
Flow Path Length (ft)	187.89
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3617
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	0.0977
Burned Peak Flow Rate (cfs)	0.0977
24-Hr Clear Runoff Volume (ac-ft)	0.0212
24-Hr Clear Runoff Volume (cu-ft)	923.402



Peak Flow Hydrologic Analysis

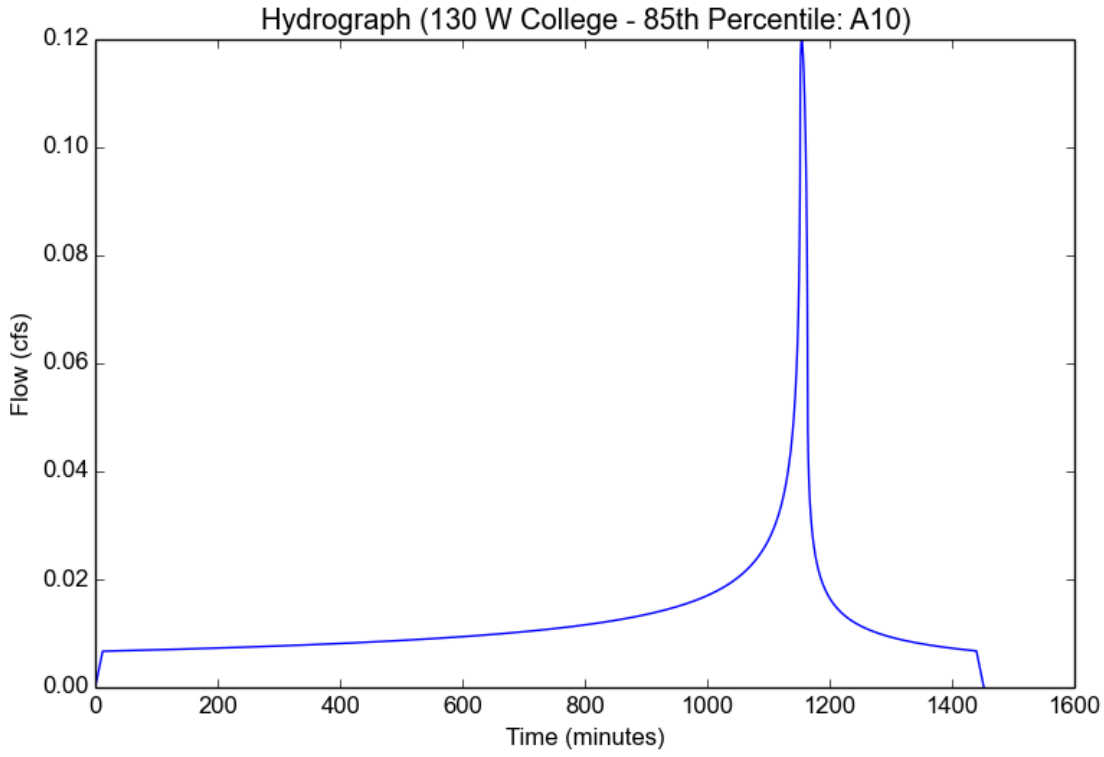
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A10
Area (ac)	0.4
Flow Path Length (ft)	140.08
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3756
Undeveloped Runoff Coefficient (Cu)	0.1096
Developed Runoff Coefficient (Cd)	0.7973
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	0.1198
Burned Peak Flow Rate (cfs)	0.1198
24-Hr Clear Runoff Volume (ac-ft)	0.025
24-Hr Clear Runoff Volume (cu-ft)	1088.9546



Peak Flow Hydrologic Analysis

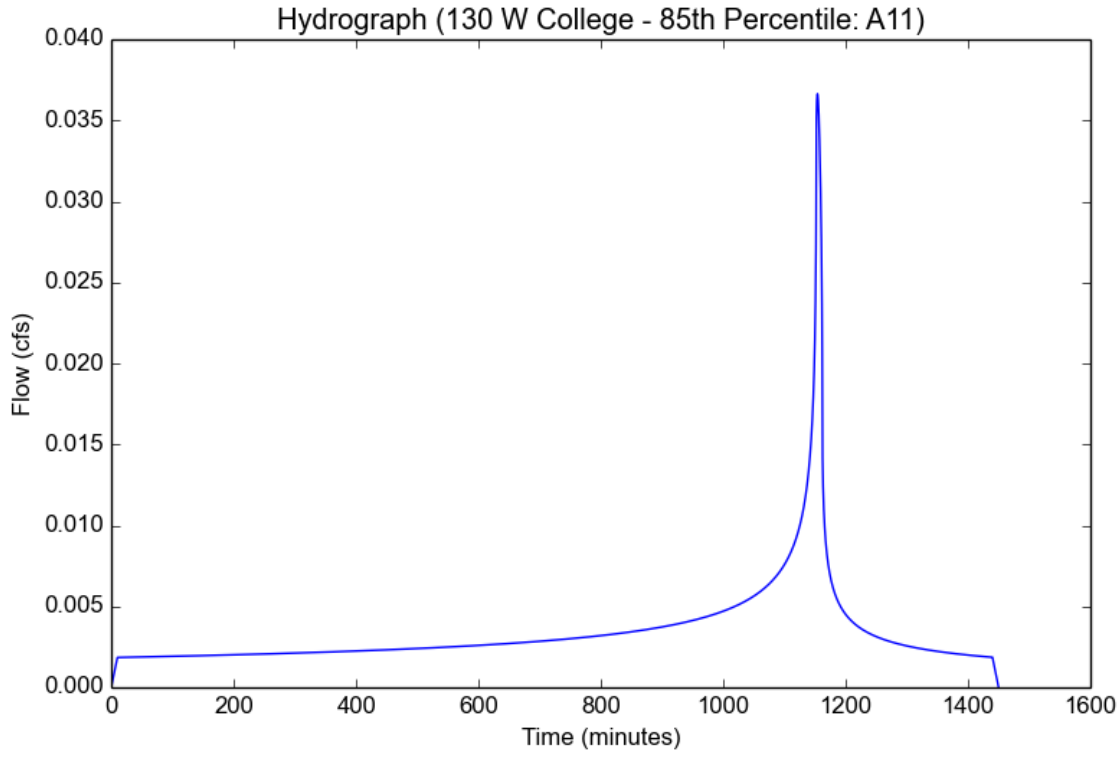
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A11
Area (ac)	0.12
Flow Path Length (ft)	104.48
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.79
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.7461
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.0366
Burned Peak Flow Rate (cfs)	0.0366
24-Hr Clear Runoff Volume (ac-ft)	0.0069
24-Hr Clear Runoff Volume (cu-ft)	300.5904



Peak Flow Hydrologic Analysis

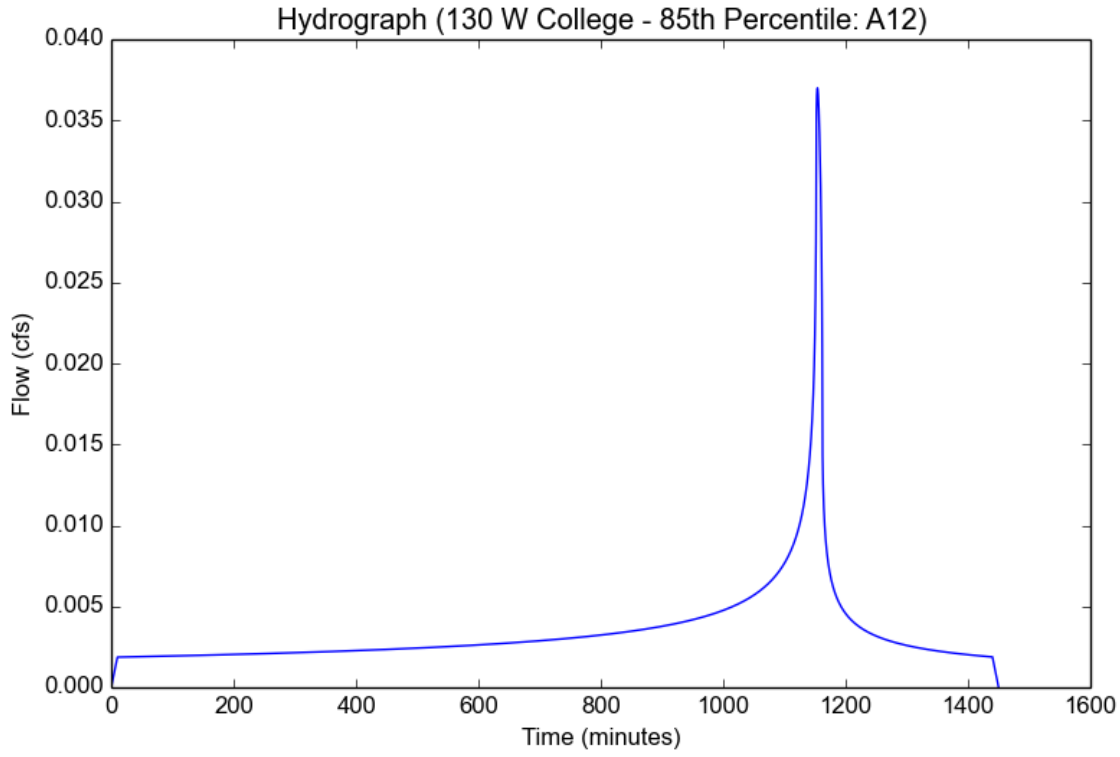
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A12
Area (ac)	0.12
Flow Path Length (ft)	104.26
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.7535
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.037
Burned Peak Flow Rate (cfs)	0.037
24-Hr Clear Runoff Volume (ac-ft)	0.007
24-Hr Clear Runoff Volume (cu-ft)	303.8651



Peak Flow Hydrologic Analysis

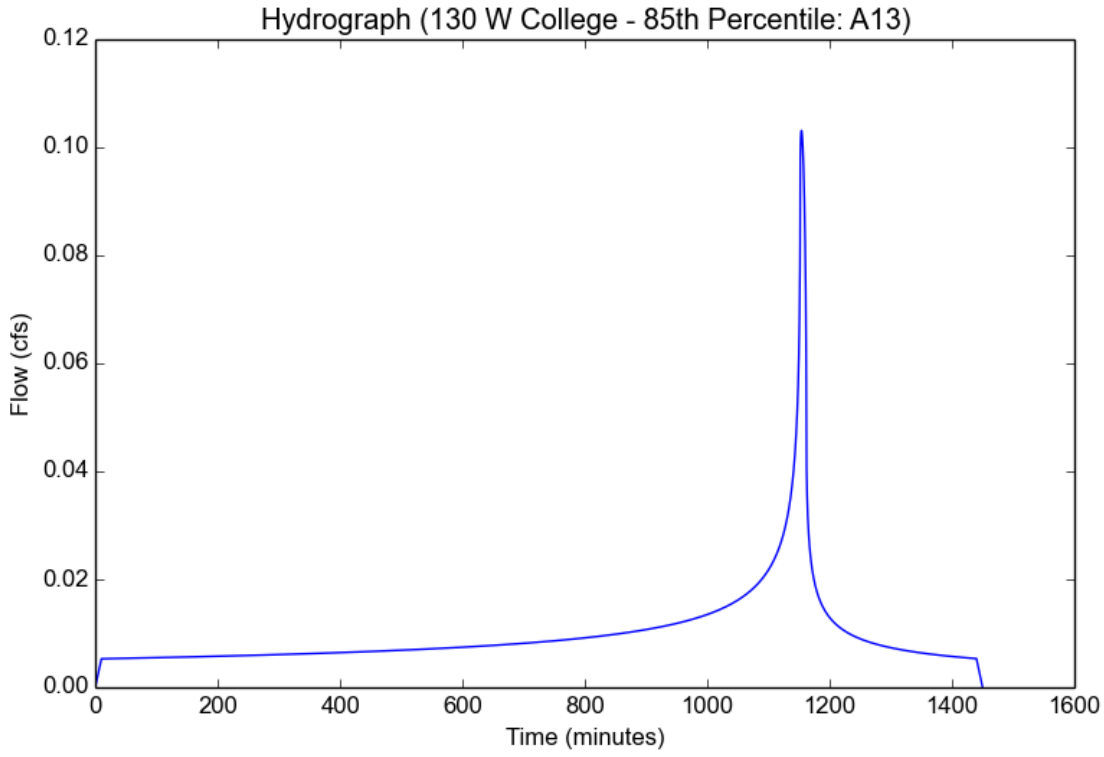
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A13
Area (ac)	0.28
Flow Path Length (ft)	116.31
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.1031
Burned Peak Flow Rate (cfs)	0.1031
24-Hr Clear Runoff Volume (ac-ft)	0.0198
24-Hr Clear Runoff Volume (cu-ft)	861.8411



Peak Flow Hydrologic Analysis

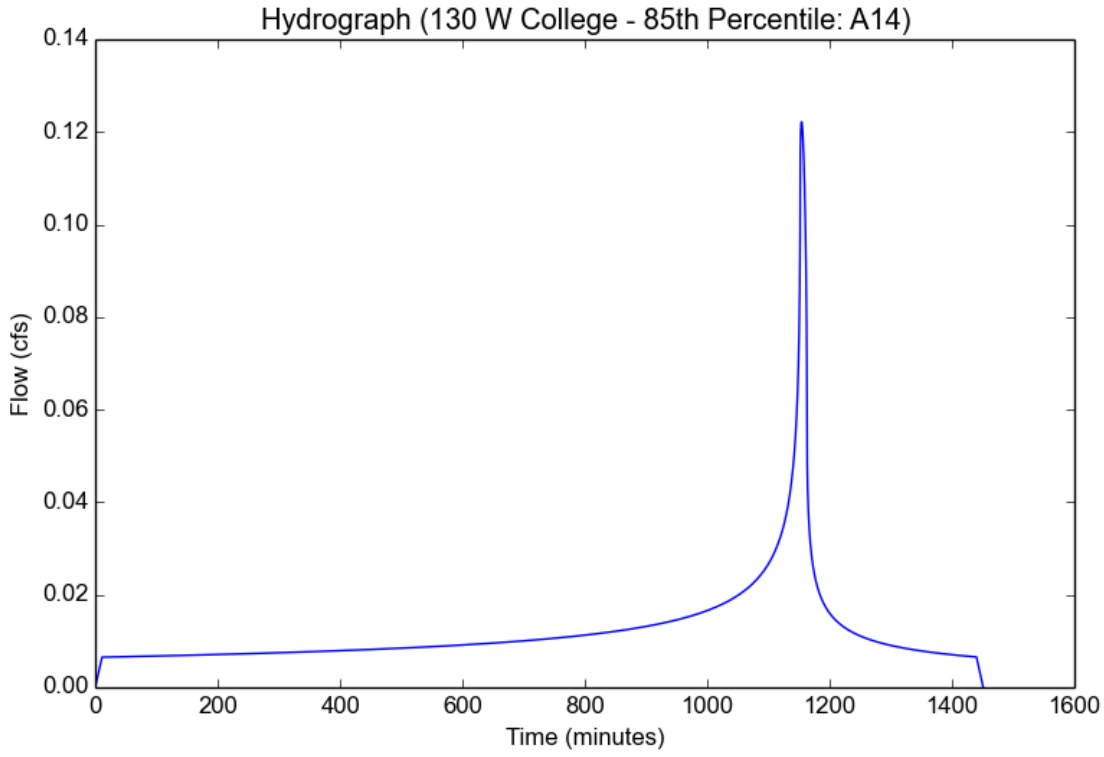
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A14
Area (ac)	0.39
Flow Path Length (ft)	132.95
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3913
Undeveloped Runoff Coefficient (Cu)	0.1366
Developed Runoff Coefficient (Cd)	0.8008
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.1222
Burned Peak Flow Rate (cfs)	0.1222
24-Hr Clear Runoff Volume (ac-ft)	0.0244
24-Hr Clear Runoff Volume (cu-ft)	1061.8665



APPENDIX G

Proposed LID Calculations

Capture and Reuse

DMA ID:	**Phase 1**	
BMP No.:	**1**	
DMA Area:	**1.32**	**acres**

Project Name: 130 W College
Location: Los Angeles, CA

Notes

DESIGN CAPTURE VOLUME (DCV)		
Total Area (A)	57,392	ft^2
Impervious Area (A_I)	48,755	ft^2
Pervious Area (A_P)	8,637	ft^2
Undeveloped Area (A_u)	0	ft^2
85th Percentile Rainfall Depth (P)	0.95	inches
V_0 =	**3,542**	**cubic feet**

$V_m = (P/12\ ft) \times [(A_I)(0.9)+(A_P+A_U)(0.1)]$

Capture and Reuse

DMA ID:	**Phase 2**	
BMP No.:	**2**	
DMA Area:	**0.89**	**acres**

Project Name: 130 W College
Location: Los Angeles, CA

Notes

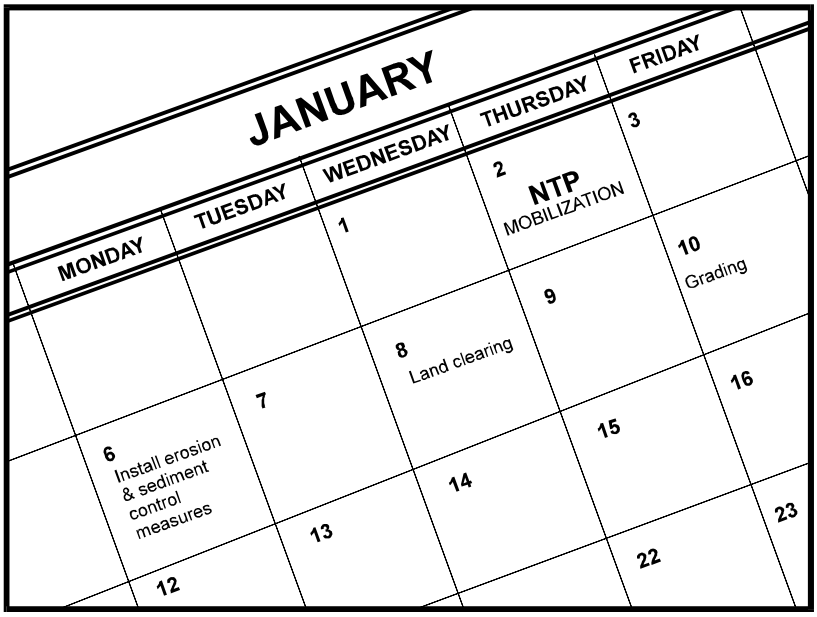
DESIGN CAPTURE VOLUME (DCV)		
Total Area (A)	38,885	ft^2
Impervious Area (A_I)	32,904	ft^2
Pervious Area (A_P)	5,981	ft^2
Undeveloped Area (A_u)	0	ft^2
85th Percentile Rainfall Depth (P)	0.95	inches
V_0 =	**2,392**	**cubic feet**

$V_m = (P/12\ ft) \times [(A_I)(0.9)+(A_P+A_U)(0.1)]$

APPENDIX H

Typical SWPPP BMPs

Scheduling EC-1



Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

Categories

EC	Erosion Control	☑
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

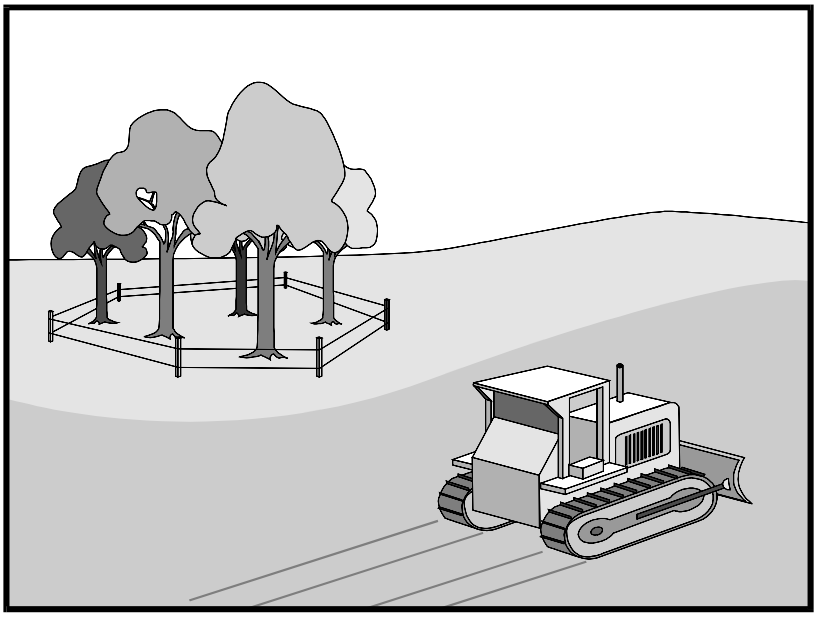
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Preservation Of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

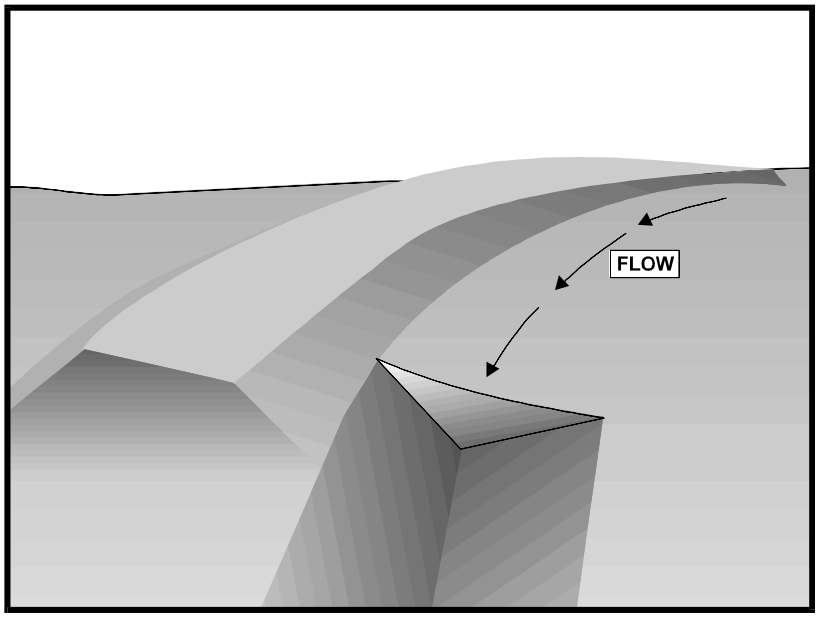
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Earth Dikes and Drainage Swales EC-9



Description and Purpose

An earth dike is a temporary berm or ridge of compacted soil used to divert runoff or channel water to a desired location. A drainage swale is a shaped and sloped depression in the soil surface used to convey runoff to a desired location. Earth dikes and drainage swales are used to divert off site runoff around the construction site, divert runoff from stabilized areas and disturbed areas, and direct runoff into sediment basins or traps.

Suitable Applications

Earth dikes and drainage swales are suitable for use, individually or together, where runoff needs to be diverted from one area and conveyed to another.

- Earth dikes and drainage swales may be used:
  - To convey surface runoff down sloping land
  - To intercept and divert runoff to avoid sheet flow over sloped surfaces
  - To divert and direct runoff towards a stabilized watercourse, drainage pipe or channel
  - To intercept runoff from paved surfaces
  - Below steep grades where runoff begins to concentrate
  - Along roadways and facility improvements subject to flood drainage

Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

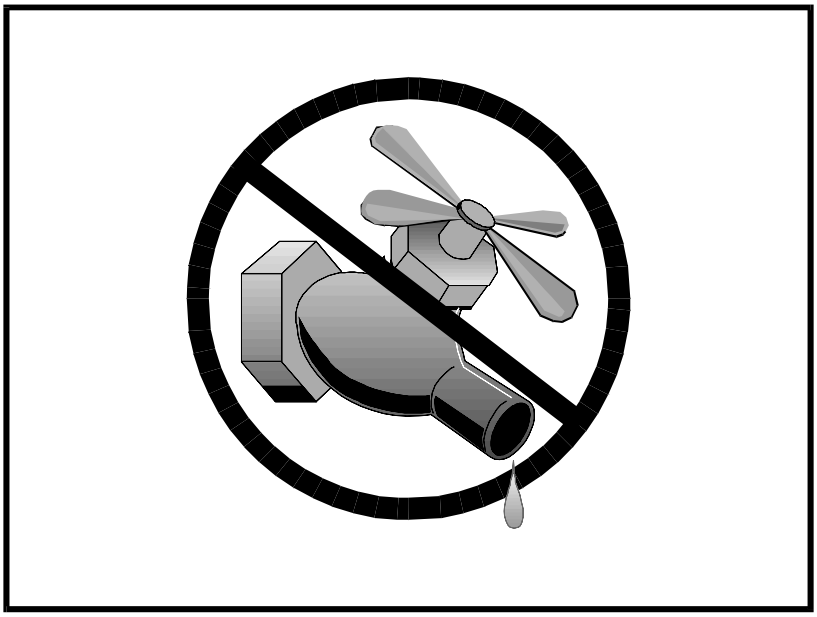
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Water Conservation Practices NS-1



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

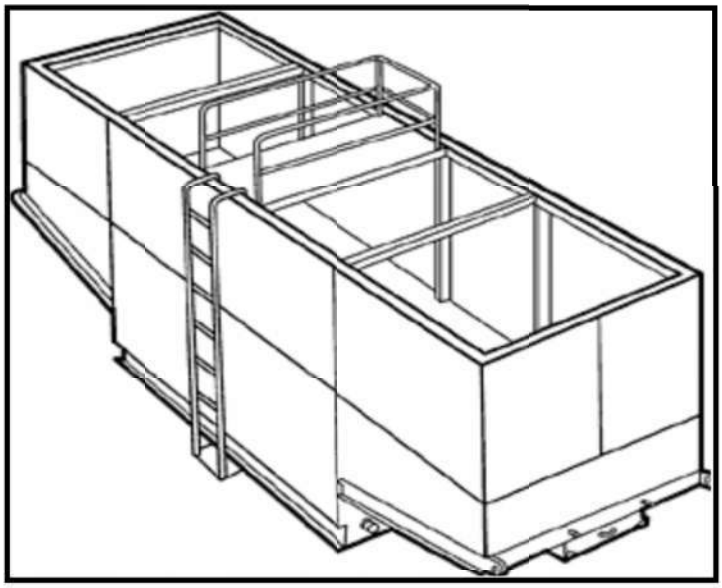
- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

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Dewatering Operations NS-2



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

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Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation (stormwater) must be removed from a work location to proceed with construction work or to provide vector control.

The General Permit incorporates Numeric Action Levels (NAL) for turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Discharges from dewatering operations can contain high levels of fine sediment that, if not properly treated, could lead to exceedances of the General Permit requirements or Basin Plan standards.

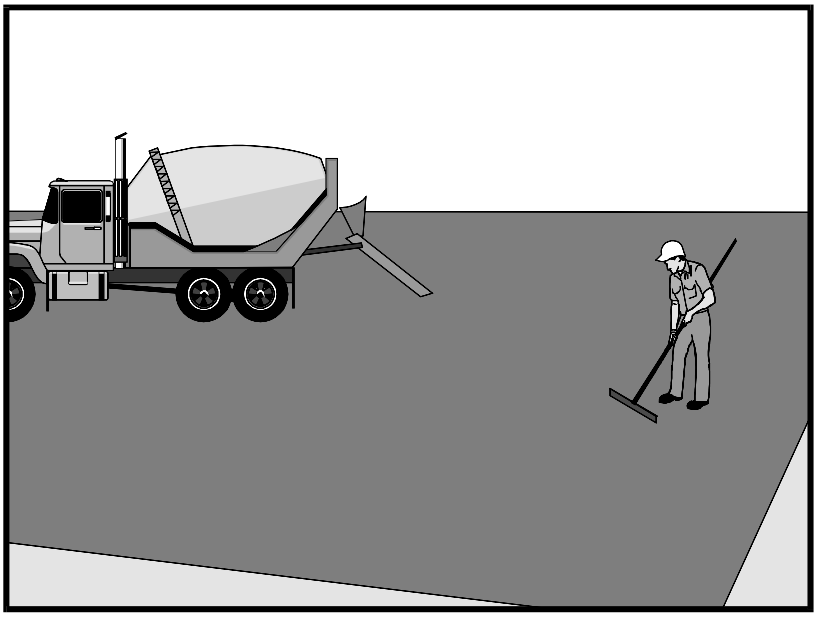
The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated

Paving and Grinding Operations NS-3



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

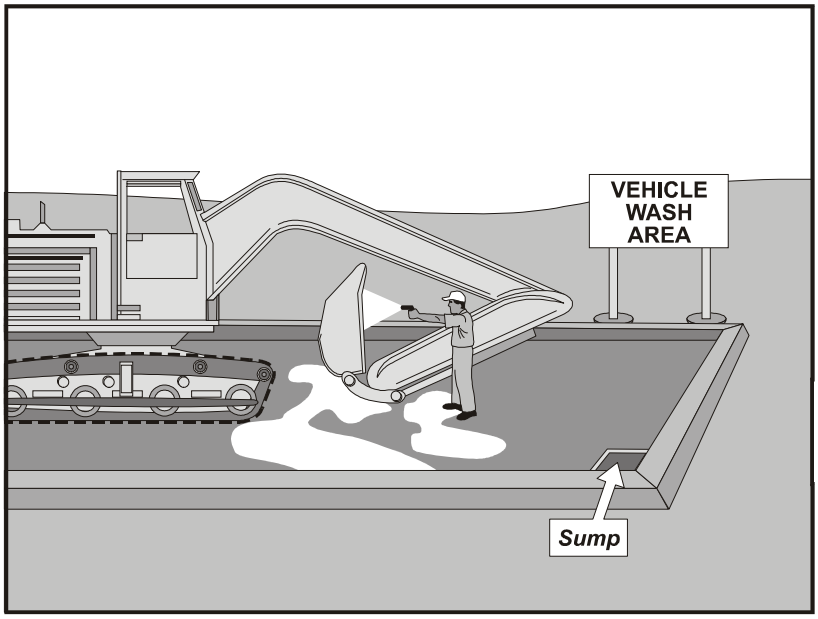
These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.

  Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

Vehicle and Equipment Cleaning NS-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

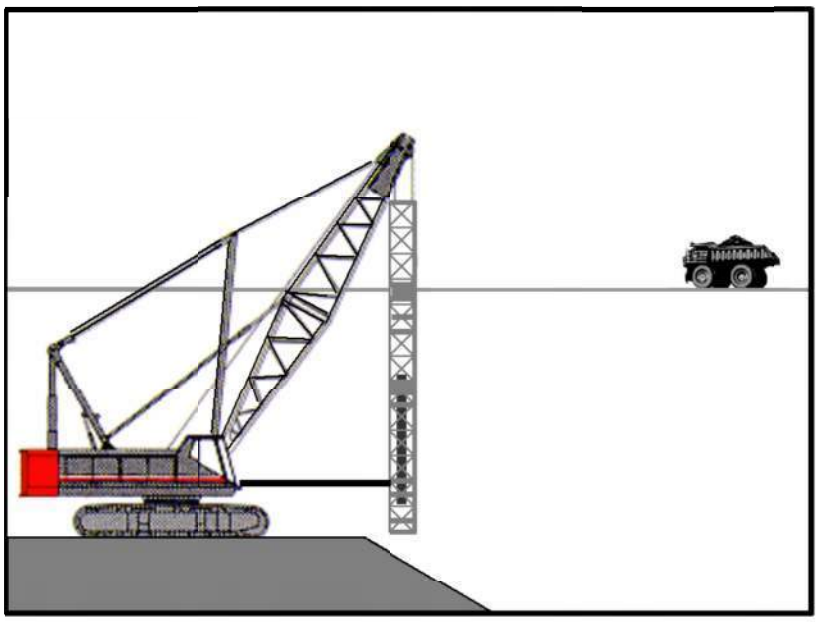
Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

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CALIFORNIA STORMWATER QUALITY ASSOCIATION

Pile Driving Operations NS-11



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

The construction and retrofit of bridges and retaining walls often include driving piles for foundation support and shoring operations. Driven piles are typically constructed of precast concrete, steel, or timber. Driven sheet piles are also used for shoring and cofferdam construction. Proper control and use of equipment, materials, and waste products from pile driving operations will reduce or eliminate the discharge of potential pollutants to the storm drain system, watercourses, and waters of the United States.

Suitable Applications

These procedures apply to all construction sites near or adjacent to a watercourse or groundwater where permanent and temporary pile driving (impact and vibratory) takes place, including operations using pile shells as well as construction of cast-in-steel-shell and cast-in-drilled-hole piles.

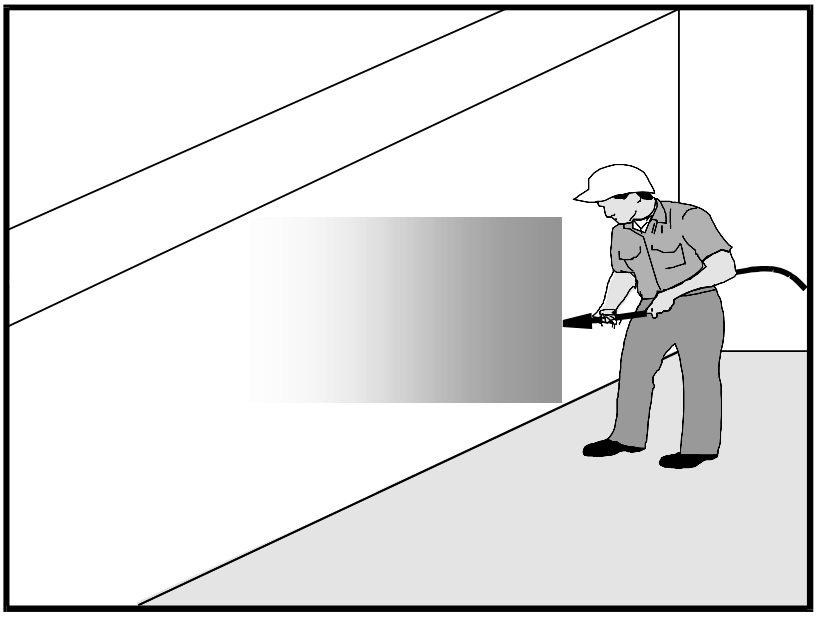
Limitations

None identified.

Implementation

- Use drip pans or absorbent pads during vehicle and equipment operation, maintenance, cleaning, fueling, and storage. Refer to NS-8, Vehicle and Equipment Cleaning, NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance.

Concrete Curing NS-12



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods.

Concrete and its associated curing materials have basic chemical properties that can raise the pH of water to levels outside of the permitted range. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Proper procedures and care should be taken when managing concrete curing materials to prevent them from coming into contact with stormwater flows, which could result in a high pH discharge.

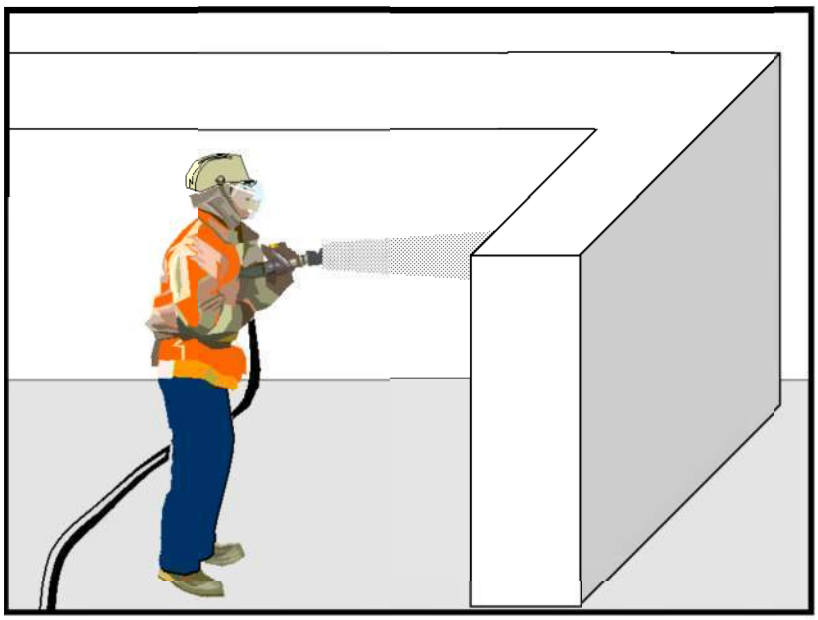
Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

Concrete Finishing NS-13



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

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Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

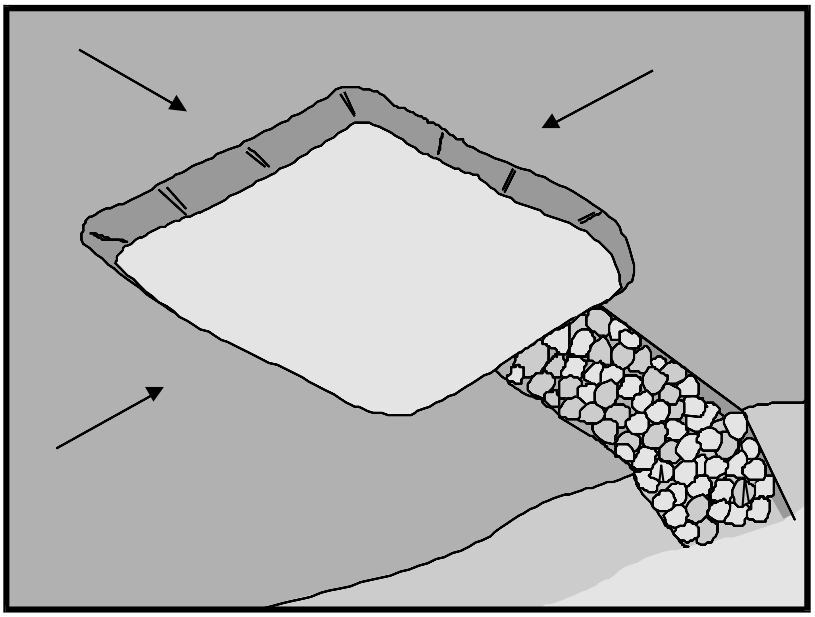
The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Concrete and its associated curing materials have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

Sediment Trap SE-3



Categories		
EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

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Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged by gravity flow. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

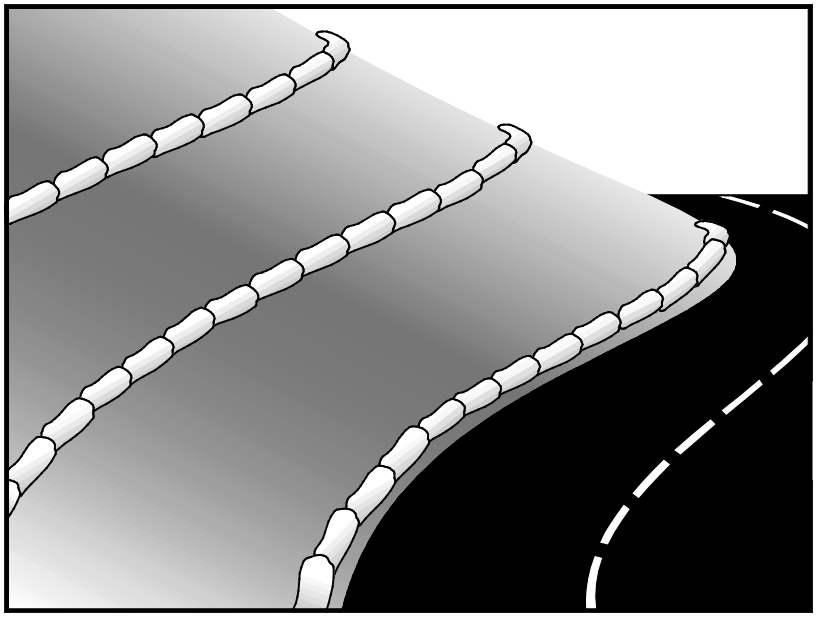
Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. Therefore, optimally designed and maintained sediment traps should be used in conjunction with a comprehensive system of BMPs.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be

Gravel Bag Berm SE-6



Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As a linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Roll

SE-8 Sandbag Barrier

SE-12 Temporary Silt Dike

SE-14 Biofilter Bags

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Street Sweeping and Vacuuming SE-7



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

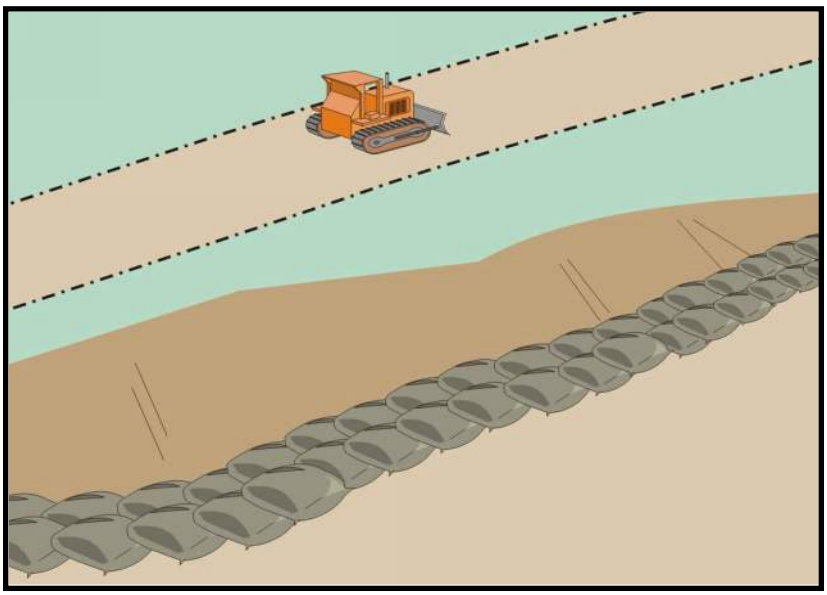
Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

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Sandbag Barrier SE-8



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be a suitable control measure for the applications described below. It is important to consider that sand bags are less porous than gravel bags and ponding or flooding can occur behind the barrier. Also, sand is easily transported by runoff if bags are damaged or ruptured. The SWPPP Preparer should select the location of a sandbag barrier with respect to the potential for flooding, damage, and the ability to maintain the BMP.

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes.
  - As sediment traps at culvert/pipe outlets.
  - Below other small cleared areas.
  - Along the perimeter of a site.
  - Down slope of exposed soil areas.
  - Around temporary stockpiles and spoil areas.
  - Parallel to a roadway to keep sediment off paved areas.
  - Along streams and channels.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

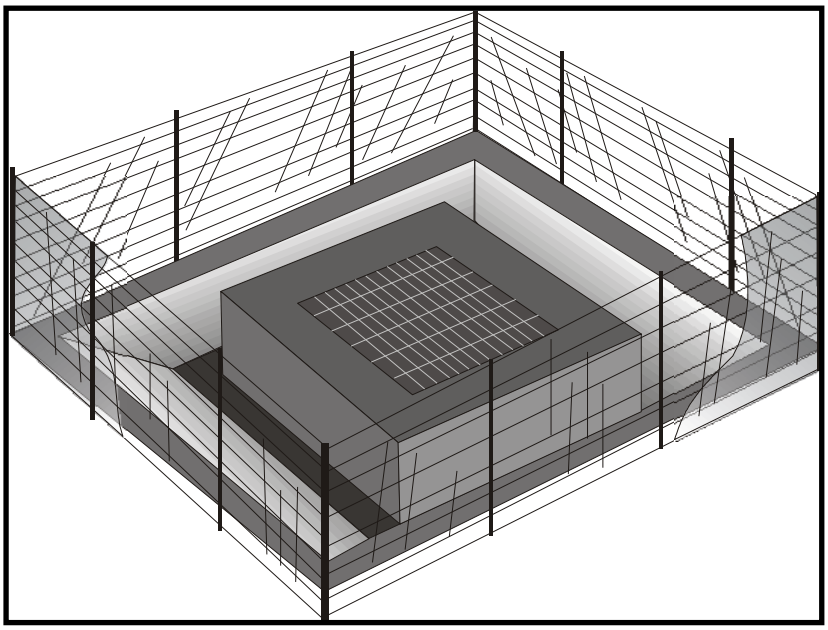
SE-6 Gravel Bag Berm

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

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Storm Drain Inlet Protection SE-10



Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

- Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Sediment removal may be inadequate to prevent sediment discharges in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use

Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

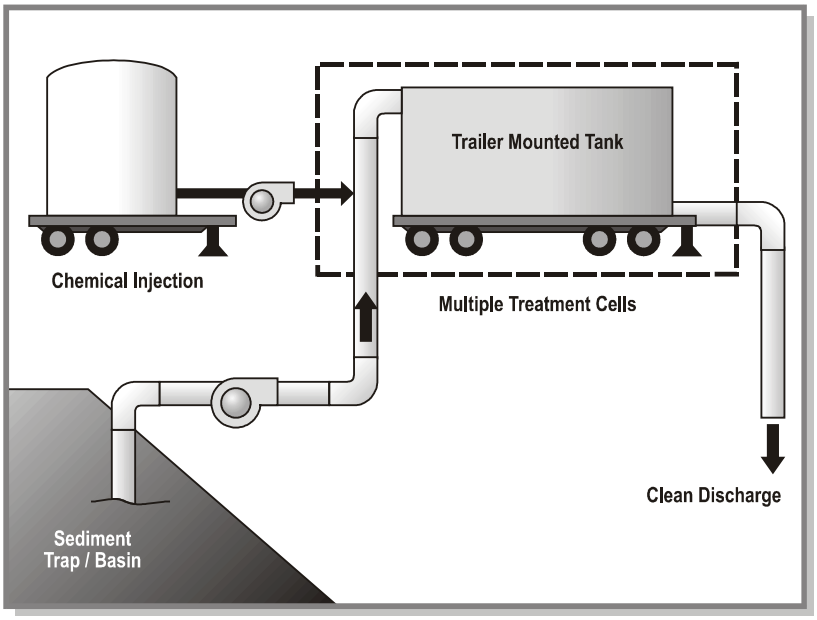
SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms

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Active Treatment Systems SE-11



Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Active Treatment Systems (ATS) reduce turbidity of construction site runoff by introducing chemicals to stormwater through direct dosing or an electrical current to enhance flocculation, coagulation, and settling of the suspended sediment. Coagulants and flocculants are used to enhance settling and removal of suspended sediments and generally include inorganic salts and polymers (USACE, 2001). The increased flocculation aids in sedimentation and ability to remove fine suspended sediments, thus reducing stormwater runoff turbidity and improving water quality.

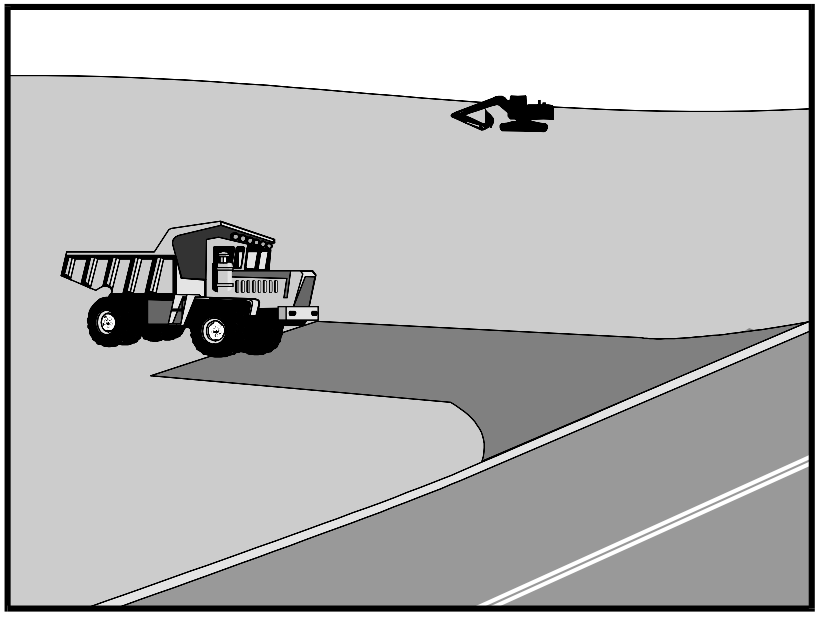
Suitable Applications

ATS can reliably provide exceptional reductions of turbidity and associated pollutants and should be considered where turbid discharges to sediment and turbidity sensitive waters cannot be avoided using traditional BMPs. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.

Limitations

Dischargers choosing to utilize chemical treatment in an ATS must follow all guidelines of the Construction General Permit Attachment F – Active Treatment System Requirements. General limitations are as follows:

Stabilized Construction Entrance/Exit TC-1



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

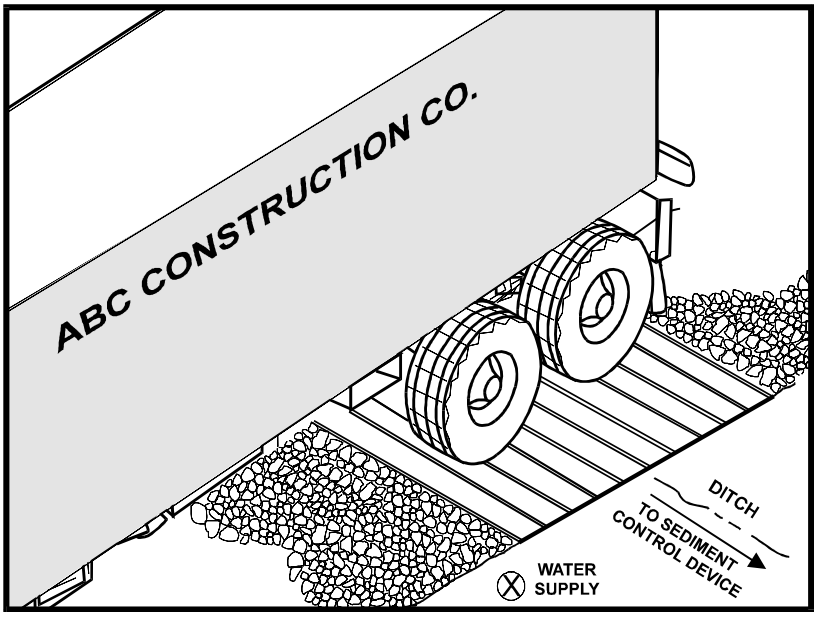
Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Entrance/Outlet Tire Wash TC-3



Description and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and under carriages and to prevent sediment from being transported onto public roadways.

Suitable Applications

Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.

Limitations

- The tire wash requires a supply of wash water.
- A turnout or doublewide exit is required to avoid having entering vehicles drive through the wash area.
- Do not use where wet tire trucks leaving the site leave the road dangerously slick.

Implementation

- Incorporate with a stabilized construction entrance/exit. See TC-1, Stabilized Construction Entrance/Exit.
- Construct on level ground when possible, on a pad of coarse aggregate greater than 3 in. but smaller than 6 in. A geotextile fabric should be placed below the aggregate.
- Wash rack should be designed and constructed/manufactured for anticipated traffic loads.

Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

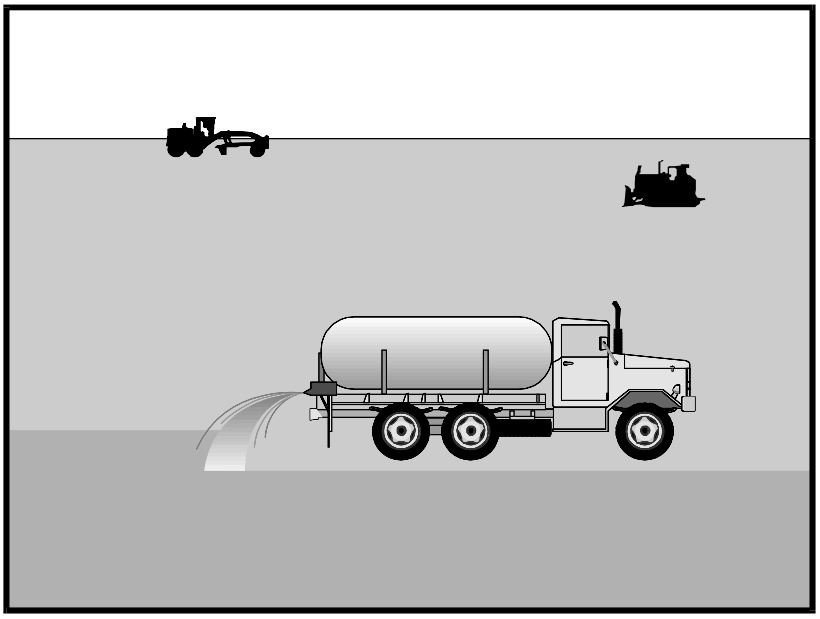
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

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Wind Erosion Control WE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

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Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

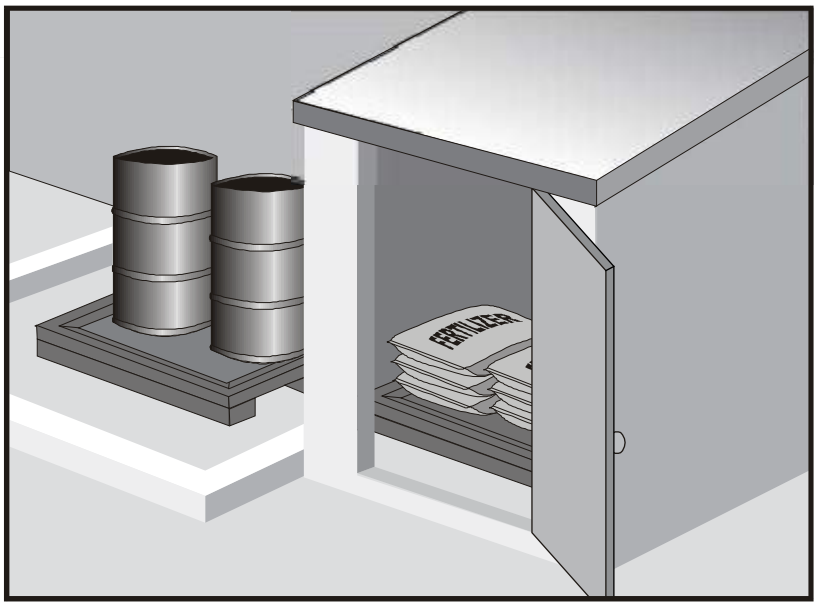
California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

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Material Delivery and Storage WM-1



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

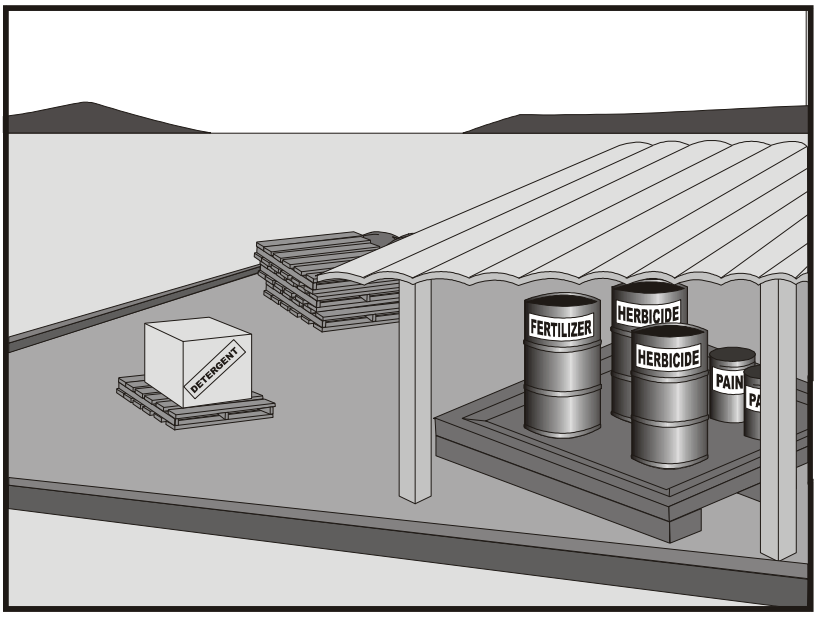
Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Material Use WM-2



Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

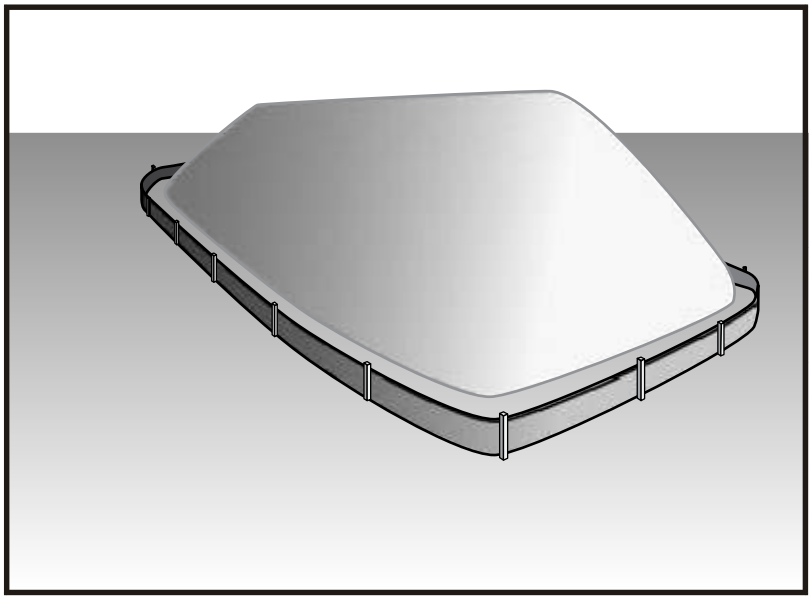
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Stockpile Management WM-3



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

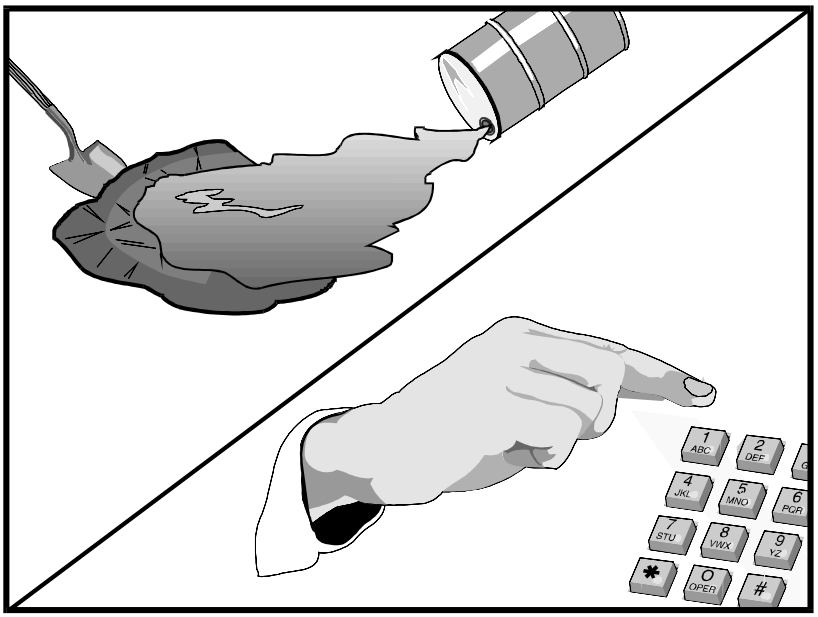
Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Spill Prevention and Control WM-4



Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

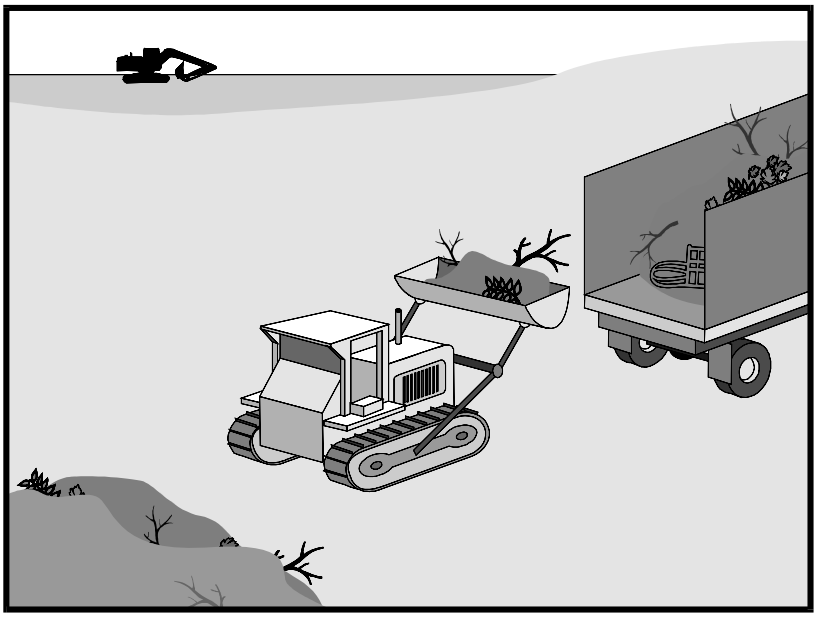
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Solid Waste Management WM-5



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

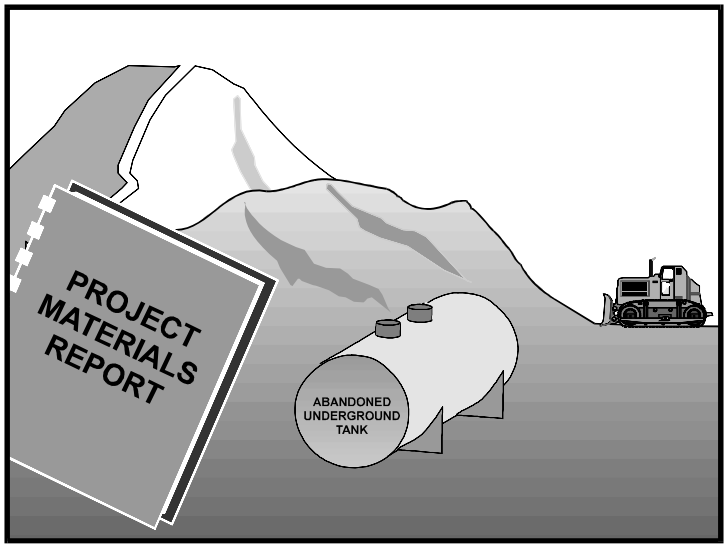
Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

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Contaminated Soil Management WM-7



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

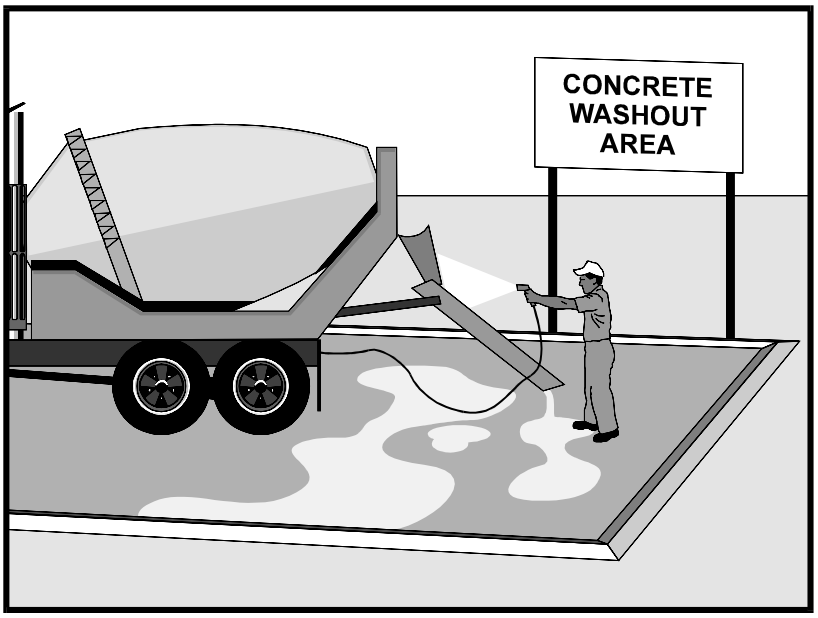
Potential Alternatives

None

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Concrete Waste Management WM-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

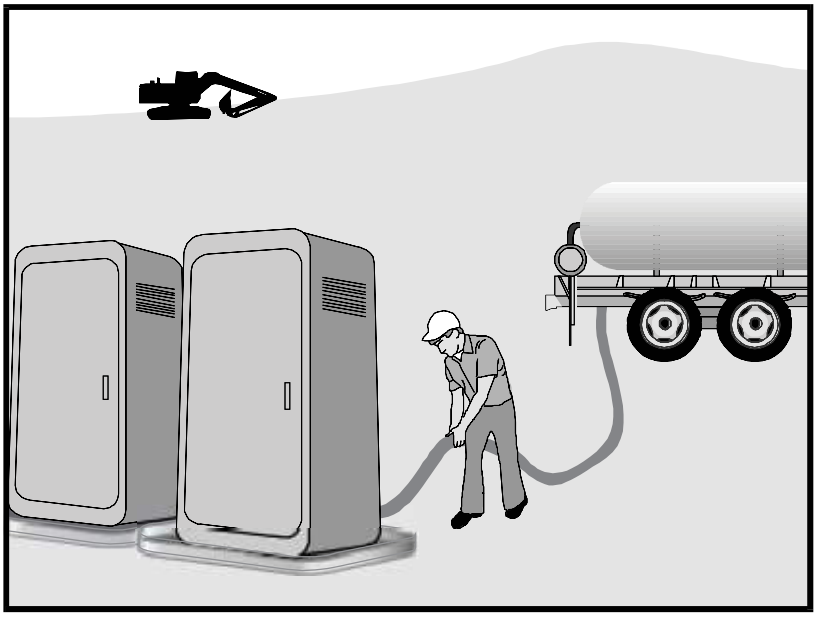
Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.
- Concrete trucks and other concrete-coated equipment are washed onsite.

Sanitary/Septic Waste Management WM-9



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

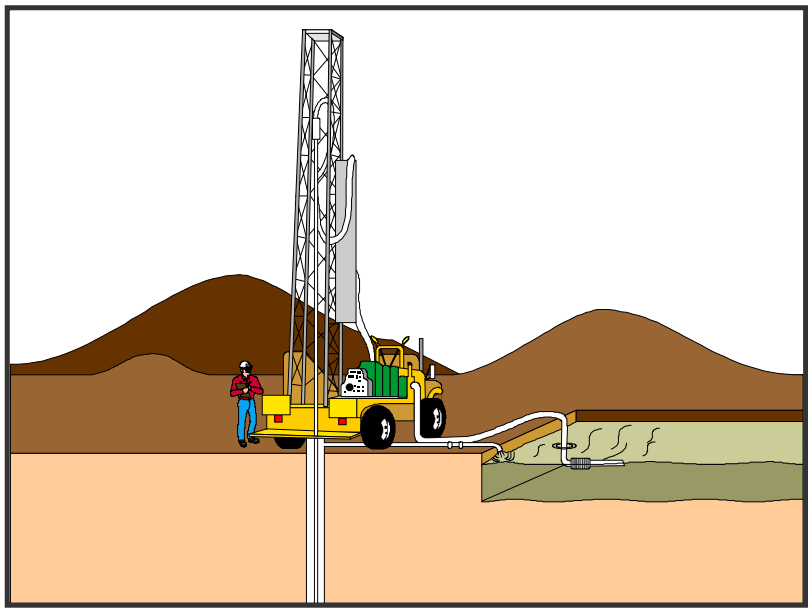
Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

Liquid Waste Management WM-10



Description and Purpose

Liquid waste management includes procedures and practices to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes.

Suitable Applications

Liquid waste management is applicable to construction projects that generate any of the following non-hazardous by-products, residuals, or wastes:

- Drilling slurries and drilling fluids
- Grease-free and oil-free wastewater and rinse water
- Dredgings
- Other non-stormwater liquid discharges not permitted by separate permits

Limitations

- Disposal of some liquid wastes may be subject to specific laws and regulations or to requirements of other permits secured for the construction project (e.g., NPDES permits, Army Corps permits, Coastal Commission permits, etc.).
- Liquid waste management does not apply to dewatering operations (NS-2 Dewatering Operations), solid waste management (WM-5, Solid Waste Management), hazardous wastes (WM-6, Hazardous Waste Management), or

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Appendix IS-4

LAFD Correspondence

FORM. GEN. 160 (Rev. 6-80)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

April 23, 2024

To: Eyestone Environmental
Attention: Brad Napientek
2121 Rosecrans Ave Ste 3355
El Segundo CA 90245

From: Los Angeles City Fire Department

Subject: Environmental Impact letter

CASE NO.: **130 w. College**
PROJECT NAME: **130 College Project**
PROJECT APPLICANT: **Eyestone Environmental**
PROJECT LOCATION: **130 w. College St. LA CA 90012**

PROPOSED PROJECT:

The Project is located at 114 and 130 W. College Street, 119 W. Bruno Street, and 943, 949, 955, and 973 N. Main Street (Project Site) within the City's Central City North Community Plan area.

As summarized in Table 1 on page 3, the Project would comprise a total floor area of approximately 232,802 square feet, consisting of 224,597 square feet of office uses, 4,095 square feet of restaurant uses, and 4,110 square feet of retail uses, with a floor area ratio (FAR) of approximately 2.42:1. The Project would also include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the City's Municipal Code (LAMC), but is nevertheless counted toward the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of the environmental analysis, the Project would include 5,894 square feet of restaurant space. The Project would have five stories comprised of a podium with one level of at-grade parking and one level of above-grade parking (both podium levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages and new street trees along College Street where primary vehicle access would be provided), and four levels of office uses above, and 88 feet measured from grade to the top of the mechanical penthouse. The Project would include approximately total of 52,716 square feet of outdoor areas. Approximately 440 vehicular parking spaces would be provided for the Project's proposed uses. Additionally, utility lines for water, sewer, and electric services will require as many as seven trenches be excavated in the Project Site's adjacent public right-of-way to complete. The Project Site is currently occupied by a surface parking lot, which would be demolished to accommodate the Project. There are no buildings or landscaping within the Project Site but there is a billboard, parking lights, cargo storage container, six electric bus chargers, and fencing.

Vehicular access to the Project Site would only be provided through two driveways which would be located along West College Street and would conform to LADOT standards. The driveway closer to the western section of the Project Site along West College Street would be exclusively for loading access, while the other driveway would be the only entrance that would serve to access the Project's parking garage. A passenger drop-ff and pick-up area would also be provided along Bruno Street, which is designed to preserve the Granite Block Paving (HCM #211) along Bruno Street consistent with City Planning policy.

LAFD would provide fire protection services for the Project's proposed uses on the Project Site. Based on employee generation rates published by City Planning and the City's Department of Transportation, the Project is estimated to generate approximately 946 new employees.

The following comments are furnished in response to your request for this Department to review the proposed development:

FIRE FLOW:

The adequacy of fire protection for a given area is based on required fire-flow, response distance from existing fire stations, and this Department's judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard.

> Fire-flow requirements vary from 2,000 gallons per minute (G.P.M.) in low density residential areas to 12,000 G.P.M. in high-density commercial or industrial areas. A minimum residual water pressure of 20 pounds per square inch (P.S.I.) is to remain in the water system, with the required gallons per minute flowing. The required fire-flow for this project has been set at **6,000 to 9,000 G.P.M. from four to six fire hydrants flowing simultaneously (where local conditions indicate that consideration must be given to simultaneous fires, and additional 2,000 to 8,000 G.P.M. will be required).**

Improvements to the water system in this area may be required to provide 6-9,000 G.P.M. fire-flow. The cost of improving the water system may be charged to the developer. For more detailed information regarding water main improvements, the developer shall contact the Water Services Section of the Department of Water and Power.

RESPONSE DISTANCE:

Based on a required fire-flow of 6-9,000 G.P.M., the first-due Engine Company should be within 1 mile, the first-due Truck Company within 1^1/2 mile.

FIRE STATIONS:

The Fire Department has existing fire stations at the following locations for initial response into the area of the proposed development: **130 w College St LA CA 90012**

DISTANCE 1.1	**Fire Station No. 4** 450 E Temple LA CA 90012	**SERVICES & EQUIPMENT** Assessment Engine, Battalion Chief, BLS Rescue Ambulance, ALS Rescue Ambulance, EMS Battalion Captain	**STAFF** 11
1.4	Fire Station No. 3 108 N Fremont Ave LA CA 90012	Task Force, Paramedic Rescue Ambulance, BLS Rescue Ambulance, Emergency Lighting Unit, Command Post Vehicle, Medical Supply Trailer and Back-up US&R Apparatus	16
1.5	Fire Station No. 1 2230 Pasadena Ave LA CA 90031	Light Force, Assessment Engine, Paramedic Rescue Ambulance, BLS Rescue Ambulance	14
1.7	Fire Station No. 2 1962 e Cesar E Chavez Ave LA CA 90033	Assessment Light Force, BLS Engine, Paramedic Rescue Ambulance	12
2.0	**Fire Station No. 9** 430 E 7th St LA CA 90014	2 Assessment Engines, BLS Truck and 2 Paramedic Rescue Ambulances, BLS Rescue Ambulance	19

Based on these criteria (response distance from existing fire stations), fire protection would be considered **adequate**.

At present, there are no immediate plans to increase Fire Department staffing or resources in those areas, which will serve the proposed project.

FIREFIGHTING PERSONNEL & APPARATUS ACCESS:

Access for Fire Department apparatus and personnel to and into all structures shall be required.

Address identification. New and existing buildings shall have approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property.

One or more Knox Boxes will be required to be installed for LAFD access to project. Location and number to be determined by LAFD Field Inspector. (Refer to FPB Req # 75).

No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

Where access for a given development requires accommodation of Fire Department apparatus, overhead clearance shall not be less than 14 feet.

The Fire Department may require additional vehicular access where buildings exceed 28 feet in height.

The Fire Department may require additional roof access via parapet access roof ladders where buildings exceed 28 feet in height, and when overhead wires or other obstructions block aerial ladder access.

Entrance to the main lobby shall be located off the address side of the building.

Any required Fire Annunciator panel or Fire Control Room shall be located within 20ft visual line of site of the main entrance stairwell or to the satisfaction of the Fire Department.

Site plans shall include all overhead utility lines adjacent to the site.

Fire Lane Requirements:
1) Fire lane width shall not be less than 20 feet. When a fire lane must accommodate the operation of Fire Department aerial ladder apparatus or where fire hydrants are installed, those portions shall not be less than 28 feet in width.
2) The width of private roadways for general access use and fire lanes shall not be less than 20 feet, and the fire lane must be clear to the sky.
3) Fire lanes, where required and dead ending streets shall terminate in a cul-de-sac or other approved turning area. No dead ending street or fire lane shall be greater than 700 feet in length or secondary access shall be required.
4) Submit plot plans indicating access road and turning area for Fire Department approval.
5) All parking restrictions for fire lanes shall be posted and/or painted prior to any Temporary Certificate of Occupancy being issued.
6) Plans showing areas to be posted and/or painted, “FIRE LANE NO PARKING” shall be submitted and approved by the Fire Department prior to building permit application sign-off.
7) Electric Gates approved by the Fire Department shall be tested by the Fire Department prior to Building and Safety granting a Certificate of Occupancy.

8) All public street and fire lane cul-de-sacs shall have the curbs painted red and/or be posted “No Parking at Any Time” prior to the issuance of a Certificate of Occupancy or Temporary Certificate of Occupancy for any structures adjacent to the cul-de-sac.
9) No framing shall be allowed until the roadway is installed to the satisfaction of the Fire Department.

Construction of public or private roadway in the proposed development shall not exceed 10 percent in grade.

Private streets shall be recorded as Private Streets, **AND** Fire Lane. All private street plans shall show the words "Private Street and Fire Lane” within the private street easement.

Private streets and entry gates will be built to City standards to the satisfaction of the City Engineer and the Fire Department.

Construction of public or private roadway in the proposed development shall not exceed 10 percent in grade.

Private development shall conform to the standard street dimensions shown on Department of Public Works Standard Plan S-470-0.

Standard cut-corners will be used on all turns.

Private roadways for general access use shall have a minimum width of 20 feet.

All access roads, including fire lanes, shall be maintained in an unobstructed manner, removal of obstructions shall be at the owner's expense. The entrance to all required fire lanes or required private driveways shall be posted with a sign no less than three square feet in area in accordance with Section 503 of the City of Los Angeles Municipal Code.

Any required fire hydrants to be installed shall be fully operational and accepted by the Fire Department prior to any building construction.

FPB #105
5101.1 Emergency responder radio coverage in new buildings. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

That in order to provide assurance that the proposed common fire lane and fire protection facilities, for the project, not maintained by the City, are properly and adequately maintained, the sub-divider shall record with the County Recorder, prior to the recordation of the final map, a covenant and agreement (Planning Department General Form CP-6770) to assure the following:

A. The establishment of a property owners association, which shall cause a yearly inspection to be, made by a registered civil engineer of all common fire lanes and fire protection facilities. The association will undertake any necessary maintenance and corrective measures. Each future property owner shall automatically become a member of the association or organization required above and is automatically subject to a proportionate share of the cost.

B. The future owners of affected lots with common fire lanes and fire protection facilities shall be informed or their responsibility for the maintenance of the devices on their lots. The future owner and all successors will be presented with a copy of the maintenance program for their lot. Any amendment or modification that would defeat the obligation of said association as the Advisory Agency must approve required hereinabove in writing after consultation with the Fire Department.

C. In the event that the property owners association fails to maintain the common property and easements as required by the CC and R's, the individual property owners shall be responsible for their proportional share of the maintenance.

D. Prior to any building permits being issued, the applicant shall improve, to the satisfaction of the Fire Department, all common fire lanes and install all private fire hydrants to be required.

E. That the Common Fire Lanes and Fire Protection facilities be shown on the Final Map.

The plot plans shall be approved by the Fire Department showing fire hydrants and access for each phase of the project prior to the recording of the final map for that phase. Each phase shall comply independently with code requirements.

Adequate off-site public and on-site private fire hydrants may be required. Their number and location to be determined after the Fire Department’s review of the plot plan.

The inclusion of the above listed recommendations, along with any additional recommendations made during later reviews of the proposed project will reduce the impacts to an acceptable level.

Definitive plans and specifications shall be submitted to this Department and requirements for necessary permits satisfied prior to commencement of any portion of this project.

The Los Angeles Fire Department continually evaluates fire station placement and overall Department services for the entire City, as well as specific areas. The development of this proposed project, along with other approved and planned projects in the immediate area, may result in the need for the following:

1. Increased staffing for existing facilities. (I.E., Paramedic Rescue Ambulance and EMT Rescue Ambulance resources.)
2. Additional fire protection facilities.
3. Relocation of present fire protection facilities.

For additional information, please contact the Fire Development Services Section, Hydrants & Access Unit at **(213) 482-6543.**

Kristin M Crowley,
Fire Chief

David A. Perez, Fire Marshal
Bureau of Fire Prevention and Public Safety

DP:MRC:mrc

Appendix IS-5

LAPD Correspondence

LOS ANGELES POLICE DEPARTMENT

DOMINIC H. CHOI
Chief of Police

Karen Bass
Mayor

P.O. Box 30158
Los Angeles, CA 90030
Telephone: (213) 486-0150
TTY: (877) 275-5273
Ref #:11.3

April 30, 2024

Michael Gatheru
Department of City Planning
201 N. Figueroa Street, 4th Floor
Los Angeles, CA 90012

Dear Michael Gatheru, [ENV-0000-0000-EIR]

The proposed, "130 College Project" will be located at 114 and 130 College Street, Los Angeles, CA 90012. The project's Reporting District (RD 0118) is within the geographical boundaries of the Los Angeles Police Department's, Central Area. A project of this size could have an impact on police services within Central Area. The Department is available for advisement on crime prevention features appropriate for the design of the porperties within the project.

Upon completion of your project, it is encouraged that the Area Commanding Officer (ACO) of Central Community Police Station be provided with a diagram copy of each portion of the property. Central Community Police Station's ACO is Captain III Raul Jovel. Central Community Police Station is located, at 251 East 6th Street, Los Angeles, CA 90014 (RD 0153). The diagrams should include access routes and any additional information that might facilitate and expedite police response.

Should you have any further questions, please contact Police Officer James Nichols, Public Engagement Section, Office of Opeations, Crime Prevention Through Environmental Design, at (213) 486-6000 or via e-mail at CPTED@lapd.online.

Respectfully,

DOMINIC H. CHOI
Chief of Police

GISSELLE ESPINOZA, Commander
Department Homeless Coordinator
Office of Operations

The following report was prepared for the "130 College Project" in accordance with Section 15083 of the California Environmental Quality Act (CEQA). This report is prepared to adequately identify and assess the project's potential public impact in accordance with Section 15083 of California State CEQA guidelines.

Project Location and Purpose:

The "130 College Project" will be constructed within the boundaries of the City of Los Angeles, serving the Downtown areas of Los Angeles. The addresses covered under this project will be 114 and 130 West College Street, 119 West Bruno Street and 943, 949, 955 and 973 North Main Street.

A summarization of the project's Environmental Impact Report (EIR) is to identify and assess the project's potential impact on public quality of life issues and concerns and to address the projects' impact on police response and protective services. This is in accordance with section 15083 of the California Environmental Quality Act (CEQA). This EIR will also assess the projects' potential impact on the resources needed, the resources available and the impact these services and resources will have on the immediate community.

Description of Proposed Project:

The proposed "130 College Project" is considered a new build. The project would have a total floor area of approximately 232,802 square feet, consisting of 224,597 square feet of usable office space. 4,095 square feet will be restaurant usage and 4,110 square feet will be of retail uses. The project would also include approximately 1,799 square feet of outdoor, uncovered dining area next to the ground floor restaurant. Because of the 1,799 square feet of uncovered restaurant dining area, the total restaurant square footage will be 5,894 square feet of restaurant space. The project would have five stories comprised of a podium build with one level of at-grade parking and one level of above-grade parking.

This build will measure 88 feet in height from grade level to the top of the mechanical penthouse. The project will have approximately 52,716 square feet of outdoor area and 440 vehicle parking space. The existing parking lot will be demolished in preparation for a surface parking lot.

Project Distance and Times:

The measured distances and times using Central Division Community Police Station as a starting point to 114 West College Street is approximately 1.8 miles @ 11 minutes. To 130 West College Street is approximately 1.7 miles@10 minutes. To 119 West Bruno Street is 1.7 miles@10 minutes. To 943 North Main Street is 1.9 miles@12 minutes. To 949 North Main Street is 1.8 miles@12 minutes. To 955 North Main Street is 1.8 miles@11 minutes. To 973 North Main Street is 1.7 miles@11 minutes.

These distances and times were calculated from a departure point starting from Central Division Community Police Station. The arrival times were also configured utilizing some traffic delays.

Estimated times of arrival can vary depending on divisional call load, time of the day, traffic delays and types of calls officers are responding to.

The reporting district for Central Division Community Police Station is RD 0153. Their phone number is (213) 833-3703.

Divisional Geographic's / Demographics:

Central Division Community Police Station's geographical area of patrol is approximately 4.5 square miles and consists of 62 Reporting Districts. The service boundaries for Central Division are as follows:

To the ***West*** is CA-110 Harbor Freeway, Sunset Boulevard and Douglas Street.

To the ***North*** is Douglas Street, Lilac Place, Vin Scully Avenue, Stadium Way, Lilac Terrace, Lookout Drive and the CA-110 Harbor Freeway.

To the **East** is CA-110 Harbor Freeway and the Los Angeles River.

To the ***South*** is the Los Angeles River, East 7th Street, South San Pedro, East 9th Street, Maple Avenue, Washington Boulevard and the CA-110 Harbor Freeway.

The proposed, "130 College Project", will be in ***RD 0118*** *(Los Angeles Police Department's Central Division).* The borders for ***RD 0118*** are as follows:

Reporting District 0118:

To the ***West*** is North Alameda Street, West College Street and North Broadway.

To the ***North*** is North Broadway and the Los Angeles River.

To the ***East*** is North Broadway, the Los Angeles River and Alhambra Avenue.

To the ***South*** is Los Angeles River, Union Pacific Rail Road, East Alhambra Avenue, Alpine Street and North Alameda Street.

Central Division:

Central Division has approximately 325 full time sworn personnel, 11 Sworn Reserve Police Officers and 13 civilian support staff. The Central Area of Los Angeles is a culturally diverse community, concentrated in the downtown section of Los Angeles (DTLA). Points of interest in the Downtown areas of Los Angeles consist of the downtown communities of Chinatown, Little Tokyo, South Park, Central City East, Historic Core Los Angeles, the Financial Districts, the Jewelry District, Artist Lofts, Historic Spanish Olvera Street, the Fashion District, the Los Angeles Convention Center, the Crypto Stadium and L.A. Live.

Central Division borders LAPD's Rampart Division to the west, Hollenbeck Division to the east, Newton Division to the south and Northeast Division to the north. The residential population in Central area (DTLA) is roughly 85,000 people, plus or minus. This populous can swell to over 200,000 people during the daytime hours in Downtown Los Angeles (WIKIPEDIA and the 2020 US Census).

The officer to resident ratio is 1 officer to every 252 residents (252:1). This is a given residential impact for a 5.84 square mile area that could affect Central Division's patrol duties. This population amount does not reflect citizens from outside the area visiting local businesses, churches, residences and educational institutions.

The Los Angeles Police Department:

The Los Angeles Police Department currently has 8,861 sworn personnel and 2,830 civilian support personnel (as of April 7, 2024). These city employees cater services to a Los Angeles City residential, Census population of approximately 3,985,516. This population amount is current as of October 1st, 2021 (according to 2010-2019 American Community Survey and the 2020 US Census for year 2022). Additionally, this amount does not include all residents and non-residents, but only reflects those individuals that responded to the 2020 Census.

This population equates to a resident to officer ratio of 450 residents for every 1 officer (450:1). The 3,985,516 population depicts a firm registered value of the population for the City of Los Angeles. However, this number can also be fluid.

The ethnic break down of The City of Los Angeles, according to the 2010-2019 American Community Survey and Wikipedia is:

- 46.9% Hispanic / Latin
- 28.9% White (Non-Hispanic)
- 11.7% Asian
- 8.3% Black / African American
- 0.73% Native American
- 0.16% Native Hawaiian / Pacific Islander
- 3.4% Other / two or more races

Divisional Support and Communication:

There are many specialized support units, divisions, sections and services available to Central Division within the LAPD i.e., Air Support, Detective investigative sections, Specialized Units, Motor Units, Bike Units, K9, Emergency Operations, Bomb Squad and Metro / SWAT, to support any additional policing needs Central Division may encounter. These services are available to supplement and complement Central's policing services. In utilizing these available resources, the Los Angeles Police Department can meet the demands for police services for the 130 College Project.

Central Community Police Station's emergency response system is directly linked to the Los Angeles Police Department's Communication and Dispatch Center. Communication Division has the responsibility to staff this Dispatch Center. The staff are incident trained personnel that will respond to radioed and telephoned calls for service. They would then dispatch these requests to the proper emergency and non-emergency personnel required or requested. Then they would provide the city personnel involved with the necessary information to execute the duties of their office for any prevailing incidents.

These operations are performed on a 24 hour a day, 7 days a week, 365 days a year basis. This includes 9-1-1 emergency calls (police, fire and medical). In referencing Communication Division, their main area of concentration is the dispatching and follow-up of police calls for service. Communication Division's, "Emergency Operations Center" (EOC / DOC), also works in concert with the Los Angeles Fire Department's (LAFD), "Metropolitan Fire Communications Center" (MFC).

Additional emergency response entities that Communication Division interacts with are, but not limited to, is the Los Angeles County Fire Department (LACoFD), the Los Angeles County Sheriff's Department (LASD) and other regional city police and fire agencies. This interaction is performed to ensure coordinated responses to all emergencies and incidents that occurred, will occur or are occurring in the Los Angeles City and Los Angeles County regions.

Divisional and Citywide Response Times:

According to the Los Angeles Police Department's Computer Statistics (COMPSTAT) Division, the average police response time to emergency, high priority calls in the Central area (Code 3 calls) was 3.6 minutes (as of April 6, 2024). This was done with a dispatch median time of 1.8 minutes. The medium high priority response time (Code 2) as of April 6, 2024 was 18.4 minutes. This was done with a dispatch median time of 10.1 minutes. Low priority, non-emergency response times, as of April 6, 2024 was 46.5 minutes. These low priority calls had a dispatch median time of 26.1 minutes.

Citywide response times during this same 4-week period was 4.6 minutes for emergency, high priority calls. The dispatch median time was 1.5 minutes. The medium high priority response times were 16.8 minutes with a dispatch time of 5.1 minutes. Low priority response times were 32.3 minutes with a dispatch time of 13.5 minutes.

These response times were taken from the statistics submitted by Central Division to COMPSTAT for a 4-week period between March 10, 2024 through April 6, 2024. During this same 4-week period, Central Division answered 471 emergency calls for service, 1,864 medium high priority calls and 1,053 low priority calls.

Citywide, for the same 4-week period, the Los Angeles Police Department answered 6,611 emergency calls for service, 25,595 medium high priority calls and 19,837 low priority calls. The response times stated are adequate performance times for this police division.

Statistics:

The following is one month of crime statistics for RD 0118 (130 College Project) and 5-year crime statistics for Central Division (CENT) for the years 2020-2024. Also included are 5-year Citywide crime statistic totals.

Central Division Crime YTD and 5-year totals	**2024**	**2023**	**2022**	**2021**	**2020**	**Crime in RD 0118** 02-04-2024 / 03-02-2024
Violent Crime	373	376	410	355	316	0
Property Crime	1,210	1,560	1,210	772	1,025	11
Homicide	1	8	5	6	4	0
Rape	15	18	24	24	25	0
Robbery	111	108	136	120	106	0
Aggravated Assault	246	242	245	205	181	0
Burglary	96	101	106	103	81	0
Motor Vehicle Theft	203	182	169	138	76	3
Burglary Theft from Vehicle	374	727	526	301	397	5
Personal / Other Theft	537	550	409	230	471	3
Child/Spousal Abuse	111	118	108	128	147	--

Supplemental Divisions, 5-year crime totals. This graph left blank intentionally:

Division --- Crime YTD and 5-year totals	**2023**	**2022**	**2021**	**2020**	**2019**	**Crime in RD 0000** 0-0-2024 / 0-0-2024
Violent Crime	--	--	--	--	--	--
Property Crime	--	--	--	--	--	--
Homicide	--	--	--	--	--	--
Rape	--	--	--	--	--	--
Robbery	--	--	--	--	--	--
Aggravated Assault	--	--	--	--	--	--
Burglary	--	--	--	--	--	--
Motor Vehicle Theft	--	--	--	--	--	--
Burglary Theft from Vehicle	--	--	--	--	--	--
Personal / Other Theft	--	--	--	--	--	--
Child/Spousal Abuse	--	--	--	--	--	--

Citywide 5-year crime totals:

Citywide Crime Statistics Crime YTD and 5-year totals	2024	2023	2022	2021	2020	Crime in RD 0000 00-00-2024 / 00-00-2024
Violent Crime	4,694	30,257	31,259	30,078	28,359	--
Property Crime	17,258	107,139	103,550	90,090	86,474	--
Homicide	50	327	392	397	355	--
Rape	156	1,356	1,579	1,368	1,465	--
Robbery	1,460	8,678	9,118	8,453	8,013	--
Aggravated Assault	3,028	19,896	20,170	19,860	18,526	--
Burglary	2,611	15,124	14,979	12,752	13,726	--
Motor Vehicle Theft	4,544	26,651	26,093	24,303	21,441	--
Burglary Theft from Vehicle	4,730	30,400	32,370	29,068	27,597	--
Personal / Other Theft	5,373	34,964	30,108	23,967	23,710	--
Child/Spousal Abuse	2,139	14,735	15,071	14,441	14,679	--

Supplemental Division RD's. This graph left blank intentionally:

Division	Crime in RD 0000 0-00-2024 / 0-00-2024	Crime in RD 0000 0-00-2024 / 0-00-2024
Violent Crime		
Property Crime		
Homicide		
Rape		
Robbery		
Aggravated Assault		
Burglary		
Motor Vehicle Theft		
Burglary Theft from Vehicle		
Personal / Other Theft		

Divisional year totals, month to month: **(Print charts for the following pages)**

12 Month CENT (part 1) Crimes 2024	*Violent Crime*	*Property Crime*	*Homicide*	*Rape*	*Robbery*	*Aggravated Assault*
JAN						
FEB						
MAR						
APR						
MAY						
JUN						
JUL						
AUG						
SEP						
OCT						
NOV						
DEC						

Divisional year totals, month to month continued:

12 Month CENT (part 2) Crimes 2024	*Burglary*	*Motor Vehicle Theft*	*Burglary Theft from Vehicle*	*Personal/Other Theft*	*Simple Assault*
JAN					
FEB					
MAR					
APR					
MAY					
JUN					
JUL					
AUG					
SEP					
OCT					
NOV					
DEC					

Supplemental Divisions. This section left blank intentionally:

0 Month DIV (part 1) Crimes 2024	*Violent Crime*	*Property Crime*	*Homicide*	*Rape*	*Robbery*	*Aggravated Assault*
JAN	--	--	--	--	--	--
FEB	--	--	--	--	--	--
MAR	--	--	--	--	--	--
APR	--	--	--	--	--	--
MAY	--	--	--	--	--	--
JUN	--	--	--	--	--	--
JUL	--	--	--	--	--	--
AUG	--	--	--	--	--	--
SEP	--	--	--	--	--	--
OCT	--	--	--	--	--	--
NOV	--	--	--	--	--	--
DEC	--	--	--	--	--	--

Supplemental Divisions continued. This section left blank intentionally:

0 Month DIV (part 2) Crimes 2024	*Burglary*	*Motor Vehicle Theft*	*Burglary Theft from Vehicle*	*Personal/Other Theft*	*Simple Assault*
JAN	--	--	--	--	--
FEB	--	--	--	--	--
MAR	--	--	--	--	--
APR	--	--	--	--	--
MAY	--	--	--	--	--
JUN	--	--	--	--	--
JUL	--	--	--	--	--
AUG	--	--	--	--	--
SEP	--	--	--	--	--
OCT	--	--	--	--	--
NOV	--	--	--	--	--
DEC	--	--	--	--	--

Divisional year totals month to month: (Print charts for the following pages)

12 Month CENT Crime 2023	Violent Crime	Property Crime	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Motor Vehicle Theft	Burglary Theft from Vehicle	Personal / Other Theft
JAN										
FEB										
MAR										
APR										
MAY										
JUN										
JUL										
AUG										
SEP										
OCT										
NOV										
DEC										

Supplemental Divisions. This graph left blank intentionally:

12 Month DIV Crime 2023	Violent Crime	Property Crime	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Motor Vehicle Theft	Burglary Theft from Vehicle	Personal / Other Theft
JAN	--	--	--	--	--	--	--	--	--	--
FEB	--	--	--	--	--	--	--	--	--	--
MAR	--	--	--	--	--	--	--	--	--	--
APR	--	--	--	--	--	--	--	--	--	--
MAY	--	--	--	--	--	--	--	--	--	--
JUN	--	--	--	--	--	--	--	--	--	--
JUL	--	--	--	--	--	--	--	--	--	--
AUG	--	--	--	--	--	--	--	--	--	--
SEP	--	--	--	--	--	--	--	--	--	--
OCT	--	--	--	--	--	--	--	--	--	--
NOV	--	--	--	--	--	--	--	--	--	--
DEC	--	--	--	--	--	--	--	--	--	--

Citywide yearly crime statistics, month to month, year 2024:

2024 City Wide Crime Statistics	Violent Crimes	Property Crimes	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Motor Vehicle Theft	Burglary Theft from Vehicle	Personal Other Theft	Child / Spousal Abuse
JAN	2,156	8,164	26	72	674	1,384	1,206	2,129	2,230	2,599	986
FEB	2,065	7,405	22	70	640	1,333	1,153	1,982	2,033	2,237	930
MAR											
APR											
MAY											
JUN											
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											

Citywide yearly crime statistics, month to month, year 2023:

2023 City Wide Crime Statistics	Violent Crimes	Property Crimes	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Motor Vehicle Theft	Burglary Theft from Vehicle	Personal Other Theft	Child / Spousal Abuse
JAN	1,953	6,738	19	78	588	1,268	1,017	1,769	2,282	1,670	980
FEB	2,057	8,092	15	93	576	1,373	1,118	1,876	2,585	2,513	1,060
MAR	2,141	7,619	25	87	628	1,401	1,096	1,887	2,233	2,403	1,038
APR	2,208	7,713	23	90	637	1,457	1,130	1,744	2,244	2,595	1,116
MAY	2,232	6,817	13	94	610	1,515	922	1,711	1,824	2,360	1,010
JUN	2,165	6,800	18	74	611	1,462	915	1,789	1,866	2,230	1,044
JUL	2,489	7,040	25	88	675	1,701	1,047	2,055	1,836	2,102	1,168
AUG	2,494	8,161	30	89	722	1,653	1,215	2,173	2,246	2,527	1,212
SEP	2,387	6,819	28	86	719	1,154	1,057	2,119	1,730	1,913	1,112
OCT	2,414	8,522	28	113	722	1,551	1,179	2,278	2,376	2,689	1,159
NOV	2,197	8,745	29	73	681	1,414	1,233	2,264	2,409	2,839	1,003
DEC	2,105	7,901	16	84	661	1,344	1,220	2,141	2,099	2,441	1,081

Divisional year totals, month to month: (Print charts for the following pages)

12 Month CENT (part 1) Crimes 2021	Violent Crime	Property Crime	Homicide	Rape	Robbery	Aggravated Assault
JAN						
FEB						
MAR						
APR						
MAY						
JUN						
JUL						
AUG						
SEP						
OCT						
NOV						
DEC						

Divisional year totals, month to month continued:

12 Month CENT (part 2) Crimes 2021	Burglary	Motor Vehicle Theft	Burglary Theft from Motor Vehicle	Personal / Other Theft	Child / Spousal Abuse
JAN					
FEB					
MAR					
APR					
MAY					
JUN					
JUL					
AUG					
SEP					
OCT					
NOV					
DEC					

Supplemental Divisions. This graph left blank intentionally:

12 Month DIV (part 1) Crimes 2021	Violent Crimes	Property Crimes	Homicide	Rape	Robbery	Aggravated Assault
JAN	--	--	--	--	--	--
FEB	--	--	--	--	--	--
MAR	--	--	--	--	--	--
APR	--	--	--	--	--	--
MAY	--	--	--	--	--	--
JUN	--	--	--	--	--	--
JUL	--	--	--	--	--	--
AUG	--	--	--	--	--	--
SEP	--	--	--	--	--	--
OCT	--	--	--	--	--	--
NOV	--	--	--	--	--	--
DEC	--	--	--	--	--	--

Supplemental Divisions. This graph left blank intentionally:

12 Month DIV (part 2) Crimes 2021	Burglary	Motor Vehicle Theft	Burglary Theft from Motor Vehicle	Personal Other Theft	Child / Spousal Abuse
JAN	--	--	--	--	--
FEB	--	--	--	--	--
MAR	--	--	--	--	--
APR	--	--	--	--	--
MAY	--	--	--	--	--
JUN	--	--	--	--	--
JUL	--	--	--	--	--
AUG	--	--	--	--	--
SEP	--	--	--	--	--
OCT	--	--	--	--	--
NOV	--	--	--	--	--
DEC	--	--	--	--	--

Currently, there are no planned improvements to the Central Area Community Police Station and its police protection facilities. If there are any planned project improvements or non-planned improvements, they are only intended for the service areas of the "130 College Project" site.

Additionally, at this time, there are no special police protection requirements needed by law enforcement because of the specific attributes of the 130 College Project, site.

The 130 College Project, individually or combined with other past or present projects, will not result in the need for new or altered police facilities.

This concludes the 130 College Project, Environmental Impact Report. If there are any further questions regarding this report, please email them to CPTED@lapd.online for the fastest response time.

Thank You for your patience,

Prepared by:

Officer James Nichols, CPD
Los Angeles Police Department
Public Engagement Section
Crime Prevention Through Environmental Design Unit

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Los Angeles, CA. 90012
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213-486-6000

2024

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 03/04/24

For the 4 Weeks Ending: March 2, 2024

CRIME	02/04-03/02	01/07-02/03	% CHG	01/07-02/03	12/10-01/06	% CHG	YTD 24	YTD 23	% CHG	YTD 24	YTD 22	% CHG
Homicide	0	1	-100.0%	1	2	-50.0%	1	8	-87.5%	1	5	-80.0%
Rape	2	5	-60.0%	5	7	-28.6%	8	10	-20.0%	8	15	-46.7%
Rape (815,820,821)	2	4	-50.0%	4	1	300.0%	7	8	-12.5%	7	9	-22.2%
Total Rapes	**4**	**9**	**-55.6%**	**9**	**8**	**12.5%**	**15**	**18**	**-16.7%**	**15**	**24**	**-37.5%**
Robbery	51	48	6.3%	48	60	-20.0%	111	108	2.8%	111	136	-18.4%
Aggravated Assault*	96	120	-20.0%	120	134	-10.4%	246	242	1.7%	246	245	0.4%
Total Violent Crimes	**151**	**178**	**-15.2%**	**178**	**204**	**-12.7%**	**373**	**376**	**-0.8%**	**373**	**410**	**-9.0%**
Burglary	35	52	-32.7%	52	58	-10.3%	96	101	-5.0%	96	106	-9.4%
Motor Vehicle Theft	89	101	-11.9%	101	103	-1.9%	203	182	11.5%	203	169	20.1%
BTFV	166	173	-4.0%	173	171	1.2%	374	727	-48.6%	374	526	-28.9%
Personal/Other Theft	244	239	2.1%	239	254	-5.9%	537	550	-2.4%	537	409	31.3%
Total Property Crimes	**534**	**565**	**-5.5%**	**565**	**586**	**-3.6%**	**1,210**	**1,560**	**-22.4%**	**1,210**	**1,210**	**0.0%**
Total Part I Crimes	**685**	**743**	**-7.8%**	**743**	**790**	**-5.9%**	**1,583**	**1,936**	**-18.2%**	**1,583**	**1,620**	**-2.3%**
Child/Spousal Abuse(Part I & II**	55	46	19.6%	46	53	-13.2%	111	118	-5.9%	111	108	2.8%
Shots Fired	7	6	16.7%	6	11	-45.5%	16	25	-36.0%	16	31	-48.4%
Victim Shot	2	4	-50.0%	4	6	-33.3%	6	13	-53.8%	6	14	-57.1%
ARREST	**02/04-03/02**	**01/07-02/03**	**% CHG**	**01/07-02/03**	**12/10-01/06**	**%CHG**	**YTD 24**	**YTD 23**	**%CHG**	**YTD 24**	**YTD 22**	**%CHG**
Homicide	2	1	100.0%	1	4	-75.0%	3	5	-40.0%	3	3	0.0%
Rape	0	1	-100.0%	1	2	-50.0%	3	2	50.0%	3	1	200.0%
Robbery	12	12	0.0%	12	16	-25.0%	26	26	0.0%	26	22	18.2%
Aggravated Assaults***	35	32	9.4%	32	49	-34.7%	79	89	-11.2%	79	79	0.0%
Burglary	6	15	-60.0%	15	7	114.3%	21	21	0.0%	21	14	50.0%
Larceny	85	67	26.9%	67	71	-5.6%	164	117	40.2%	164	33	397.0%
Motor Vehicle Theft	9	9	0.0%	9	18	-50.0%	25	19	31.6%	25	34	-26.5%
Total Violent Crime Arrests	**49**	**46**	**6.5%**	**46**	**71**	**-35.2%**	**111**	**122**	**-9.0%**	**111**	**105**	**5.7%**
Total Part I Arrests	**149**	**137**	**8.8%**	**137**	**167**	**-18.0%**	**321**	**279**	**15.1%**	**321**	**186**	**72.6%**
Total All Arrests	**481**	**565**	**-14.9%**	**565**	**562**	**0.5%**	**1,156**	**707**	**63.5%**	**1,156**	**607**	**90.4%**
Total Part II Arrests	332	428	-22.4%	428	395	8.4%	835	428	95.1%	835	421	98.3%
Weapon Arrests (Possession)	10	14	-28.6%	14	14	0.0%	28	32	-12.5%	28	47	-40.4%
NED Arrests	18	3	500.0%	3	2	50.0%	21	12	75.0%	21	18	16.7%
GED Arrests	4	2	100.0%	2	2	0.0%	7	13	-46.2%	7	12	-41.7%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

2023

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 02/27/23

For the 4 Weeks Ending: February 25, 2023

CRIME	01/29-02/25	01/01-01/28	% CHG	01/01-01/28	12/04-12/31	% CHG	YTD 23	YTD 22	% CHG	YTD 23	YTD 21	% CHG
Homicide	5	3	66.7%	3	3	0.0%	8	5	60.0%	8	4	100.0%
Rape	2	4	-50.0%	4	8	-50.0%	6	10	-40.0%	6	14	-57.1%
Rape (815,820,821)	4	4	0.0%	4	3	33.3%	8	8	0.0%	8	8	0.0%
Total Rapes	**6**	**8**	**-25.0%**	**8**	**11**	**-27.3%**	**14**	**18**	**-22.2%**	**14**	**22**	**-36.4%**
Robbery	54	46	17.4%	46	48	-4.2%	100	122	-18.0%	100	112	-10.7%
Aggravated Assault*	118	95	24.2%	95	115	-17.4%	213	222	-4.1%	213	195	9.2%
Total Violent Crimes	**183**	**152**	**20.4%**	**152**	**177**	**-14.1%**	**335**	**367**	**-8.7%**	**335**	**333**	**0.6%**
Burglary	37	49	-24.5%	49	46	6.5%	86	96	-10.4%	86	95	-9.5%
Motor Vehicle Theft	87	74	17.6%	74	79	-6.3%	161	156	3.2%	161	132	22.0%
BTFV	269	392	-33.9%	392	379	3.4%	651	483	34.8%	651	278	134.2%
Personal/Other Theft	236	228	3.5%	228	193	18.1%	464	364	27.5%	464	204	127.5%
Total Property Crimes	**619**	**743**	**-16.7%**	**743**	**697**	**6.6%**	**1,362**	**1,099**	**23.9%**	**1,362**	**709**	**92.1%**
Total Part I Crimes	**802**	**895**	**-10.4%**	**895**	**874**	**2.4%**	**1,697**	**1,466**	**15.8%**	**1,697**	**1,042**	**62.9%**
Child/Spousal Abuse(Part I & II**	49	58	-15.5%	58	60	-3.3%	107	98	9.2%	107	119	-10.1%
Shots Fired	10	12	-16.7%	12	16	-25.0%	22	30	-26.7%	22	20	10.0%
Victim Shot	6	5	20.0%	5	8	-37.5%	11	14	-21.4%	11	8	37.5%
ARREST	01/29-02/25	01/01-01/28	% CHG	01/01-01/28	12/04-12/31	%CHG	YTD 23	YTD 22	%CHG	YTD 23	YTD 21	%CHG
Homicide	3	1	200.0%	1	1	0.0%	4	3	33.3%	4	3	33.3%
Rape	1	0		0	3	-100.0%	1	1	0.0%	1	4	-75.0%
Robbery	15	10	50.0%	10	5	100.0%	25	20	25.0%	25	27	-7.4%
Aggravated Assaults***	37	42	-11.9%	42	34	23.5%	79	66	19.7%	79	82	-3.7%
Burglary	11	11	0.0%	11	11	0.0%	22	14	57.1%	22	17	29.4%
Larceny	64	38	68.4%	38	37	2.7%	102	31	229.0%	102	20	410.0%
Motor Vehicle Theft	10	8	25.0%	8	10	-20.0%	18	33	-45.5%	18	26	-30.8%
Total Violent Crime Arrests	**56**	**53**	**5.7%**	**53**	**43**	**23.3%**	**109**	**90**	**21.1%**	**109**	**116**	**-6.0%**
Total Part I Arrests	**141**	**110**	**28.2%**	**110**	**101**	**8.9%**	**251**	**168**	**49.4%**	**251**	**179**	**40.2%**
Total All Arrests	**333**	**309**	**7.8%**	**309**	**306**	**1.0%**	**642**	**552**	**16.3%**	**642**	**560**	**14.6%**
Total Part II Arrests	192	199	-3.5%	199	205	-2.9%	391	384	1.8%	391	381	2.6%
Weapon Arrests (Possession)	14	15	-6.7%	15	22	-31.8%	29	44	-34.1%	29	20	45.0%
NED Arrests	3	8	-62.5%	8	7	14.3%	11	17	-35.3%	11	17	-35.3%
GED Arrests	6	6	0.0%	6	3	100.0%	12	11	9.1%	12	6	100.0%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

For the 4 Weeks Ending: May 20, 2023

Prepared by:ADSD,LAPD: 05/22/23

CRIME	04/23-05/20	03/26-04/22	% CHG	03/26-04/22	02/26-03/25	% CHG	YTD 23	YTD 22	% CHG	YTD 23	YTD 21	% CHG
Homicide	1	2	-50.0%	2	1	100.0%	12	9	33.3%	12	9	33.3%
Rape	7	4	75.0%	4	8	-50.0%	28	25	12.0%	28	38	-26.3%
Rape (815,820,821)	1	3	-66.7%	3	4	-25.0%	16	23	-30.4%	16	14	14.3%
Total Rapes	**8**	**7**	**14.3%**	**7**	**12**	**-41.7%**	**44**	**48**	**-8.3%**	**44**	**52**	**-15.4%**
Robbery	49	59	-16.9%	59	61	-3.3%	270	327	-17.4%	270	259	4.2%
Aggravated Assault*	120	122	-1.6%	122	124	-1.6%	582	597	-2.5%	582	496	17.3%
Total Violent Crimes	**178**	**190**	**-6.3%**	**190**	**198**	**-4.0%**	**908**	**981**	**-7.4%**	**908**	**816**	**11.3%**
Burglary	50	32	56.3%	32	40	-20.0%	217	262	-17.2%	217	196	10.7%
Motor Vehicle Theft	85	118	-28.0%	118	95	24.2%	468	463	1.1%	468	312	50.0%
BTFV	160	195	-17.9%	195	177	10.2%	1,223	1,355	-9.7%	1,223	642	90.5%
Personal/Other Theft	185	221	-16.3%	221	259	-14.7%	1,164	1,019	14.2%	1,164	627	85.6%
Total Property Crimes	**480**	**566**	**-15.2%**	**566**	**571**	**-0.9%**	**3,072**	**3,099**	**-0.9%**	**3,072**	**1,777**	**72.9%**
Total Part I Crimes	**658**	**756**	**-13.0%**	**756**	**769**	**-1.7%**	**3,980**	**4,080**	**-2.5%**	**3,980**	**2,593**	**53.5%**
Child/Spousal Abuse(Part I & II**	59	67	-11.9%	67	55	21.8%	290	271	7.0%	290	279	3.9%
Shots Fired	7	12	-41.7%	12	5	140.0%	46	57	-19.3%	46	42	9.5%
Victim Shot	2	5	-60.0%	5	3	66.7%	21	22	-4.5%	21	21	0.0%
ARREST	**04/23-05/20**	**03/26-04/22**	**% CHG**	**03/26-04/22**	**02/26-03/25**	**%CHG**	**YTD 23**	**YTD 22**	**%CHG**	**YTD 23**	**YTD 21**	**%CHG**
Homicide	0	10	-100.0%	10	2	400.0%	16	5	220.0%	16	14	14.3%
Rape	2	5	-60.0%	5	4	25.0%	12	6	100.0%	12	5	140.0%
Robbery	9	10	-10.0%	10	9	11.1%	53	49	8.2%	53	66	-19.7%
Aggravated Assaults***	43	43	0.0%	43	50	-14.0%	215	198	8.6%	215	211	1.9%
Burglary	6	4	50.0%	4	3	33.3%	34	43	-20.9%	34	49	-30.6%
Larceny	30	39	-23.1%	39	49	-20.4%	220	76	189.5%	220	55	300.0%
Motor Vehicle Theft	6	3	100.0%	3	16	-81.3%	43	75	-42.7%	43	61	-29.5%
Total Violent Crime Arrests	**54**	**68**	**-20.6%**	**68**	**65**	**4.6%**	**296**	**258**	**14.7%**	**296**	**296**	**0.0%**
Total Part I Arrests	**96**	**114**	**-15.8%**	**114**	**133**	**-14.3%**	**593**	**452**	**31.2%**	**593**	**461**	**28.6%**
Total All Arrests	**307**	**338**	**-9.2%**	**338**	**357**	**-5.3%**	**1,643**	**1,386**	**18.5%**	**1,643**	**1,558**	**5.5%**
Total Part II Arrests	211	224	-5.8%	224	224	0.0%	1,050	934	12.4%	1,050	1,097	-4.3%
Weapon Arrests (Possession)	10	15	-33.3%	15	16	-6.3%	70	83	-15.7%	70	75	-6.7%
NED Arrests	11	8	37.5%	8	12	-33.3%	42	40	5.0%	42	38	10.5%
GED Arrests	2	3	-33.3%	3	9	-66.7%	26	32	-18.8%	26	27	-3.7%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 08/14/23

For the 4 Weeks Ending: August 12, 2023

CRIME	07/16-08/12	06/18-07/15	% CHG	06/18-07/15	05/21-06/17	% CHG	YTD 23	YTD 22	% CHG	YTD 23	YTD 21	% CHG
Homicide	1	4	-75.0%	4	3	33.3%	20	14	42.9%	20	13	53.8%
Rape	8	13	-38.5%	13	6	116.7%	55	39	41.0%	55	56	-1.8%
Rape (815,820,821)	1	5	-80.0%	5	7	-28.6%	29	35	-17.1%	29	26	11.5%
Total Rapes	**9**	**18**	**-50.0%**	**18**	**13**	**38.5%**	**84**	**74**	**13.5%**	**84**	**82**	**2.4%**
Robbery	63	52	21.2%	52	53	-1.9%	441	506	-12.8%	441	447	-1.3%
Aggravated Assault*	118	118	0.0%	118	143	-17.5%	961	982	-2.1%	961	835	15.1%
Total Violent Crimes	**191**	**192**	**-0.5%**	**192**	**212**	**-9.4%**	**1,506**	**1,576**	**-4.4%**	**1,506**	**1,377**	**9.4%**
Burglary	39	41	-4.9%	41	48	-14.6%	352	412	-14.6%	352	321	9.7%
Motor Vehicle Theft	115	86	33.7%	86	102	-15.7%	782	785	-0.4%	782	474	65.0%
BTFV	213	206	3.4%	206	254	-18.9%	1,920	2,202	-12.8%	1,920	1,116	72.0%
Personal/Other Theft	195	210	-7.1%	210	200	5.0%	1,805	1,712	5.4%	1,805	1,169	54.4%
Total Property Crimes	**562**	**543**	**3.5%**	**543**	**604**	**-10.1%**	**4,859**	**5,111**	**-4.9%**	**4,859**	**3,080**	**57.8%**
Total Part I Crimes	**753**	**735**	**2.4%**	**735**	**816**	**-9.9%**	**6,365**	**6,687**	**-4.8%**	**6,365**	**4,457**	**42.8%**
Child/Spousal Abuse(Part I & II**	46	67	-31.3%	67	57	17.5%	463	455	1.8%	463	434	6.7%
Shots Fired	6	13	-53.8%	13	10	30.0%	76	91	-16.5%	76	66	15.2%
Victim Shot	3	12	-75.0%	12	9	33.3%	45	48	-6.3%	45	35	28.6%
ARREST	**07/16-08/12**	**06/18-07/15**	**% CHG**	**06/18-07/15**	**05/21-06/17**	**%CHG**	**YTD 23**	**YTD 22**	**%CHG**	**YTD 23**	**YTD 21**	**%CHG**
Homicide	2	0		0	3	-100.0%	21	8	162.5%	21	16	31.3%
Rape	2	2	0.0%	2	2	0.0%	18	12	50.0%	18	9	100.0%
Robbery	17	11	54.5%	11	10	10.0%	91	76	19.7%	91	99	-8.1%
Aggravated Assaults***	33	42	-21.4%	42	50	-16.0%	340	318	6.9%	340	340	0.0%
Burglary	5	6	-16.7%	6	13	-53.8%	58	63	-7.9%	58	83	-30.1%
Larceny	23	25	-8.0%	25	25	0.0%	293	146	100.7%	293	93	215.1%
Motor Vehicle Theft	17	6	183.3%	6	9	-33.3%	75	106	-29.2%	75	88	-14.8%
Total Violent Crime Arrests	**54**	**55**	**-1.8%**	**55**	**65**	**-15.4%**	**470**	**414**	**13.5%**	**470**	**464**	**1.3%**
Total Part I Arrests	**99**	**92**	**7.6%**	**92**	**112**	**-17.9%**	**896**	**729**	**22.9%**	**896**	**728**	**23.1%**
Total All Arrests	**337**	**348**	**-3.2%**	**348**	**291**	**19.6%**	**2,620**	**2,267**	**15.6%**	**2,620**	**2,521**	**3.9%**
Total Part II Arrests	238	256	-7.0%	256	179	43.0%	1,724	1,538	12.1%	1,724	1,793	-3.8%
Weapon Arrests (Possession)	21	17	23.5%	17	19	-10.5%	126	127	-0.8%	126	128	-1.6%
NED Arrests	5	2	150.0%	2	12	-83.3%	61	64	-4.7%	61	57	7.0%
GED Arrests	9	1	800.0%	1	3	-66.7%	39	44	-11.4%	39	44	-11.4%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 11/06/23

For the 4 Weeks Ending: November 4, 2023

CRIME	10/08-11/04	09/10-10/07	% CHG	09/10-10/07	08/13-09/09	% CHG	YTD 23	YTD 22	% CHG	YTD 23	YTD 21	% CHG
Homicide	2	1	100.0%	1	1	0.0%	24	21	14.3%	24	21	14.3%
Rape	10	5	100.0%	5	6	-16.7%	79	72	9.7%	79	90	-12.2%
Rape (815,820,821)	0	3	-100.0%	3	0		33	42	-21.4%	33	42	-21.4%
Total Rapes	**10**	**8**	**25.0%**	**8**	**6**	**33.3%**	**112**	**114**	**-1.8%**	**112**	**132**	**-15.2%**
Robbery	63	61	3.3%	61	64	-4.7%	631	719	-12.2%	631	655	-3.7%
Aggravated Assault*	117	127	-7.9%	127	117	8.5%	1,325	1,351	-1.9%	1,325	1,185	11.8%
Total Violent Crimes	**192**	**197**	**-2.5%**	**197**	**188**	**4.8%**	**2,092**	**2,205**	**-5.1%**	**2,092**	**1,993**	**5.0%**
Burglary	47	57	-17.5%	57	54	5.6%	522	539	-3.2%	522	444	17.6%
Motor Vehicle Theft	109	117	-6.8%	117	100	17.0%	1,113	1,112	0.1%	1,113	683	63.0%
BTFV	241	213	13.1%	213	241	-11.6%	2,647	3,040	-12.9%	2,647	1,713	54.5%
Personal/Other Theft	213	202	5.4%	202	237	-14.8%	2,498	2,686	-7.0%	2,498	1,727	44.6%
Total Property Crimes	**610**	**589**	**3.6%**	**589**	**632**	**-6.8%**	**6,780**	**7,377**	**-8.1%**	**6,780**	**4,567**	**48.5%**
Total Part I Crimes	**802**	**786**	**2.0%**	**786**	**820**	**-4.1%**	**8,872**	**9,582**	**-7.4%**	**8,872**	**6,560**	**35.2%**
Child/Spousal Abuse(Part I & II**	72	46	56.5%	46	43	7.0%	625	639	-2.2%	625	580	7.8%
Shots Fired	12	6	100.0%	6	8	-25.0%	102	125	-18.4%	102	96	6.3%
Victim Shot	9	3	200.0%	3	3	0.0%	60	69	-13.0%	60	47	27.7%
ARREST	**10/08-11/04**	**09/10-10/07**	**% CHG**	**09/10-10/07**	**08/13-09/09**	**%CHG**	**YTD 23**	**YTD 22**	**%CHG**	**YTD 23**	**YTD 21**	**%CHG**
Homicide	4	2	100.0%	2	2	0.0%	29	15	93.3%	29	18	61.1%
Rape	2	1	100.0%	1	2	-50.0%	23	16	43.8%	23	13	76.9%
Robbery	9	23	-60.9%	23	11	109.1%	134	115	16.5%	134	126	6.3%
Aggravated Assaults***	53	31	71.0%	31	39	-20.5%	463	450	2.9%	463	467	-0.9%
Burglary	12	8	50.0%	8	7	14.3%	85	106	-19.8%	85	113	-24.8%
Larceny	59	39	51.3%	39	23	69.6%	414	209	98.1%	414	129	220.9%
Motor Vehicle Theft	12	10	20.0%	10	12	-16.7%	109	136	-19.9%	109	125	-12.8%
Total Violent Crime Arrests	**68**	**57**	**19.3%**	**57**	**54**	**5.6%**	**649**	**596**	**8.9%**	**649**	**624**	**4.0%**
Total Part I Arrests	**151**	**114**	**32.5%**	**114**	**96**	**18.8%**	**1,257**	**1,047**	**20.1%**	**1,257**	**991**	**26.8%**
Total All Arrests	**433**	**403**	**7.4%**	**403**	**322**	**25.2%**	**3,778**	**3,127**	**20.8%**	**3,778**	**3,540**	**6.7%**
Total Part II Arrests	282	289	-2.4%	289	226	27.9%	2,521	2,080	21.2%	2,521	2,549	-1.1%
Weapon Arrests (Possession)	9	9	0.0%	9	19	-52.6%	163	168	-3.0%	163	196	-16.8%
NED Arrests	9	5	80.0%	5	3	66.7%	78	99	-21.2%	78	75	4.0%
GED Arrests	2	1	100.0%	1	5	-80.0%	47	59	-20.3%	47	48	-2.1%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 01/08/24

For the 4 Weeks Ending: December 31, 2023

CRIME	12/04-12/31	11/06-12/03	% CHG	11/06-12/03	10/09-11/05	% CHG	YTD 23	YTD 22	% CHG	YTD 23	YTD 21	% CHG
Homicide	2	2	0.0%	2	2	0.0%	29	27	7.4%	29	25	16.0%
Rape	8	5	60.0%	5	10	-50.0%	93	91	2.2%	93	102	-8.8%
Rape (815,820,821)	1	4	-75.0%	4	1	300.0%	39	49	-20.4%	39	46	-15.2%
Total Rapes	**9**	**9**	**0.0%**	**9**	**11**	**-18.2%**	**132**	**140**	**-5.7%**	**132**	**148**	**-10.8%**
Robbery	65	70	-7.1%	70	63	11.1%	768	828	-7.2%	768	806	-4.7%
Aggravated Assault*	136	121	12.4%	121	120	0.8%	1,593	1,581	0.8%	1,593	1,390	14.6%
Total Violent Crimes	**212**	**202**	**5.0%**	**202**	**196**	**3.1%**	**2,522**	**2,576**	**-2.1%**	**2,522**	**2,369**	**6.5%**
Burglary	54	45	20.0%	45	53	-15.1%	630	641	-1.7%	630	539	16.9%
Motor Vehicle Theft	110	114	-3.5%	114	111	2.7%	1,348	1,297	3.9%	1,348	862	56.4%
BTFV	210	230	-8.7%	230	259	-11.2%	3,114	3,749	-16.9%	3,114	2,202	41.4%
Personal/Other Theft	243	220	10.5%	220	240	-8.3%	3,000	3,127	-4.1%	3,000	2,115	41.8%
Total Property Crimes	**617**	**609**	**1.3%**	**609**	**663**	**-8.1%**	**8,092**	**8,814**	**-8.2%**	**8,092**	**5,718**	**41.5%**
Total Part I Crimes	**829**	**811**	**2.2%**	**811**	**859**	**-5.6%**	**10,614**	**11,390**	**-6.8%**	**10,614**	**8,087**	**31.2%**
Child/Spousal Abuse(Part I & II**	56	66	-15.2%	66	75	-12.0%	755	749	0.8%	755	695	8.6%
Shots Fired	10	18	-44.4%	18	14	28.6%	134	152	-11.8%	134	115	16.5%
Victim Shot	5	12	-58.3%	12	10	20.0%	80	84	-4.8%	80	60	33.3%
ARREST	**12/04-12/31**	**11/06-12/03**	**% CHG**	**11/06-12/03**	**10/09-11/05**	**%CHG**	**YTD 23**	**YTD 22**	**%CHG**	**YTD 23**	**YTD 21**	**%CHG**
Homicide	4	0		0	5	-100.0%	34	19	78.9%	34	20	70.0%
Rape	0	1	-100.0%	1	2	-50.0%	24	20	20.0%	24	15	60.0%
Robbery	16	14	14.3%	14	9	55.6%	164	129	27.1%	164	147	11.6%
Aggravated Assaults***	48	40	20.0%	40	53	-24.5%	553	542	2.0%	553	549	0.7%
Burglary	14	6	133.3%	6	13	-53.8%	106	121	-12.4%	106	131	-19.1%
Larceny	81	56	44.6%	56	58	-3.4%	553	278	98.9%	553	169	227.2%
Motor Vehicle Theft	13	10	30.0%	10	11	-9.1%	132	165	-20.0%	132	153	-13.7%
Total Violent Crime Arrests	**68**	**55**	**23.6%**	**55**	**69**	**-20.3%**	**775**	**710**	**9.2%**	**775**	**731**	**6.0%**
Total Part I Arrests	**176**	**127**	**38.6%**	**127**	**151**	**-15.9%**	**1,566**	**1,274**	**22.9%**	**1,566**	**1,184**	**32.3%**
Total All Arrests	**559**	**491**	**13.8%**	**491**	**439**	**11.8%**	**4,849**	**3,765**	**28.8%**	**4,849**	**4,126**	**17.5%**
Total Part II Arrests	383	364	5.2%	364	288	26.4%	3,283	2,491	31.8%	3,283	2,942	11.6%
Weapon Arrests (Possession)	13	15	-13.3%	15	11	36.4%	193	203	-4.9%	193	240	-19.6%
NED Arrests	5	2	150.0%	2	9	-77.8%	85	124	-31.5%	85	88	-3.4%
GED Arrests	2	2	0.0%	2	3	-33.3%	52	68	-23.5%	52	52	0.0%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

2022

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 01/31/22

For the 4 Weeks Ending: January 29, 2022

CRIME	01/02-01/29	12/05-01/01	% CHG	12/05-01/01	11/07-12/04	% CHG	YTD 22	YTD 21	% CHG	YTD 22	YTD 20	% CHG
Homicide	3	2	50.0%	2	2	0.0%	3	2	50.0%	3	3	0.0%
Rape	5	3	66.7%	3	7	-57.1%	5	9	-44.4%	5	6	-16.7%
Rape (815,820,821)	3	2	50.0%	2	2	0.0%	3	7	-57.1%	3	4	-25.0%
Total Rapes	**8**	**5**	**60.0%**	**5**	**9**	**-44.4%**	**8**	**16**	**-50.0%**	**8**	**10**	**-20.0%**
Robbery	61	79	-22.8%	79	72	9.7%	65	46	41.3%	65	50	30.0%
Aggravated Assault*	120	114	5.3%	114	88	29.5%	125	95	31.6%	125	91	37.4%
Total Violent Crimes	**192**	**200**	**-4.0%**	**200**	**171**	**17.0%**	**201**	**159**	**26.4%**	**201**	**154**	**30.5%**
Burglary	38	47	-19.1%	47	43	9.3%	38	46	-17.4%	38	23	65.2%
Motor Vehicle Theft	68	83	-18.1%	83	84	-1.2%	69	70	-1.4%	69	42	64.3%
BTFV	232	242	-4.1%	242	236	2.5%	234	133	75.9%	234	177	32.2%
Personal/Other Theft	144	153	-5.9%	153	208	-26.4%	154	101	52.5%	154	230	-33.0%
Total Property Crimes	**482**	**525**	**-8.2%**	**525**	**571**	**-8.1%**	**495**	**350**	**41.4%**	**495**	**472**	**4.9%**
Total Part I Crimes	**674**	**725**	**-7.0%**	**725**	**742**	**-2.3%**	**696**	**509**	**36.7%**	**696**	**626**	**11.2%**
Child/Spousal Abuse(Part I & II**	47	55	-14.5%	55	58	-5.2%	48	53	-9.4%	48	73	-34.2%
Shots Fired	17	10	70.0%	10	10	0.0%	18	8	125.0%	18	7	157.1%
Victim Shot	7	7	0.0%	7	6	16.7%	7	1	600.0%	7	6	16.7%
ARREST	**01/02-01/29**	**12/05-01/01**	**% CHG**	**12/05-01/01**	**11/07-12/04**	**%CHG**	**YTD 22**	**YTD 21**	**%CHG**	**YTD 22**	**YTD 20**	**%CHG**
Homicide	1	0		0	2	-100.0%	1	1	0.0%	1	1	0.0%
Rape	0	0	0.0%	0	2	-100.0%	0	3	-100.0%	0	1	-100.0%
Robbery	13	12	8.3%	12	9	33.3%	13	6	116.7%	13	13	0.0%
Aggravated Assaults***	32	37	-13.5%	37	39	-5.1%	33	39	-15.4%	33	45	-26.7%
Burglary	9	10	-10.0%	10	7	42.9%	9	9	0.0%	9	5	80.0%
Larceny	16	14	14.3%	14	23	-39.1%	17	12	41.7%	17	58	-70.7%
Motor Vehicle Theft	15	19	-21.1%	19	9	111.1%	15	11	36.4%	15	6	150.0%
Total Violent Crime Arrests	**46**	**49**	**-6.1%**	**49**	**52**	**-5.8%**	**47**	**49**	**-4.1%**	**47**	**60**	**-21.7%**
Total Part I Arrests	**86**	**92**	**-6.5%**	**92**	**91**	**1.1%**	**88**	**81**	**8.6%**	**88**	**129**	**-31.8%**
Total All Arrests	**259**	**288**	**-10.1%**	**288**	**281**	**2.5%**	**264**	**251**	**5.2%**	**264**	**673**	**-60.8%**
Total Part II Arrests	173	196	-11.7%	196	190	3.2%	176	170	3.5%	176	544	-67.6%
Weapon Arrests (Possession)	19	24	-20.8%	24	20	20.0%	20	8	150.0%	20	14	42.9%
NED Arrests	8	9	-11.1%	9	4	125.0%	8	6	33.3%	8	12	-33.3%
GED Arrests	4	4	0.0%	4	1	300.0%	5	2	150.0%	5	5	0.0%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

For the 4 Weeks Ending: April 23, 2022

Prepared by:ADSD,LAPD: 04/25/22

CRIME	03/27-04/23	02/27-03/26	% CHG	02/27-03/26	01/30-02/26	% CHG	YTD 22	YTD 21	% CHG	YTD 22	YTD 20	% CHG
Homicide	1	1	0.0%	1	2	-50.0%	7	8	-12.5%	7	4	75.0%
Rape	3	6	-50.0%	6	5	20.0%	19	32	-40.6%	19	26	-26.9%
Rape (815,820,821)	3	5	-40.0%	5	2	150.0%	14	11	27.3%	14	15	-6.7%
Total Rapes	**6**	**11**	**-45.5%**	**11**	**7**	**57.1%**	**33**	**43**	**-23.3%**	**33**	**41**	**-19.5%**
Robbery	68	69	-1.4%	69	59	16.9%	262	208	26.0%	262	177	48.0%
Aggravated Assault*	136	137	-0.7%	137	99	38.4%	496	396	25.3%	496	321	54.5%
Total Violent Crimes	**211**	**218**	**-3.2%**	**218**	**167**	**30.5%**	**798**	**655**	**21.8%**	**798**	**543**	**47.0%**
Burglary	55	50	10.0%	50	54	-7.4%	201	160	25.6%	201	173	16.2%
Motor Vehicle Theft	103	85	21.2%	85	75	13.3%	345	242	42.6%	345	133	159.4%
BTFV	271	279	-2.9%	279	229	21.8%	1,034	506	104.3%	1,034	629	64.4%
Personal/Other Theft	174	221	-21.3%	221	189	16.9%	757	467	62.1%	757	711	6.5%
Total Property Crimes	**603**	**635**	**-5.0%**	**635**	**547**	**16.1%**	**2,337**	**1,375**	**70.0%**	**2,337**	**1,646**	**42.0%**
Total Part I Crimes	**814**	**853**	**-4.6%**	**853**	**714**	**19.5%**	**3,135**	**2,030**	**54.4%**	**3,135**	**2,189**	**43.2%**
Child/Spousal Abuse(Part I & II**	57	61	-6.6%	61	46	32.6%	214	229	-6.6%	214	217	-1.4%
Shots Fired	5	12	-58.3%	12	11	9.1%	47	34	38.2%	47	20	135.0%
Victim Shot	2	2	0.0%	2	6	-66.7%	18	15	20.0%	18	11	63.6%
ARREST	**03/27-04/23**	**02/27-03/26**	**% CHG**	**02/27-03/26**	**01/30-02/26**	**%CHG**	**YTD 22**	**YTD 21**	**%CHG**	**YTD 22**	**YTD 20**	**%CHG**
Homicide	1	0		0	2	-100.0%	4	13	-69.2%	4	9	-55.6%
Rape	1	4	-75.0%	4	1	300.0%	6	4	50.0%	6	4	50.0%
Robbery	10	10	0.0%	10	7	42.9%	40	54	-25.9%	40	68	-41.2%
Aggravated Assaults***	35	55	-36.4%	55	34	61.8%	157	172	-8.7%	157	157	0.0%
Burglary	14	11	27.3%	11	5	120.0%	39	36	8.3%	39	51	-23.5%
Larceny	13	18	-27.8%	18	14	28.6%	62	42	47.6%	62	147	-57.8%
Motor Vehicle Theft	14	10	40.0%	10	18	-44.4%	57	53	7.5%	57	38	50.0%
Total Violent Crime Arrests	**47**	**69**	**-31.9%**	**69**	**44**	**56.8%**	**207**	**243**	**-14.8%**	**207**	**238**	**-13.0%**
Total Part I Arrests	**88**	**108**	**-18.5%**	**108**	**81**	**33.3%**	**365**	**374**	**-2.4%**	**365**	**474**	**-23.0%**
Total All Arrests	**269**	**298**	**-9.7%**	**298**	**291**	**2.4%**	**1,127**	**1,269**	**-11.2%**	**1,127**	**2,156**	**-47.7%**
Total Part II Arrests	181	190	-4.7%	190	210	-9.5%	762	895	-14.9%	762	1,682	-54.7%
Weapon Arrests (Possession)	12	10	20.0%	10	26	-61.5%	68	67	1.5%	68	54	25.9%
NED Arrests	7	5	40.0%	5	9	-44.4%	29	31	-6.5%	29	45	-35.6%
GED Arrests	5	7	-28.6%	7	6	16.7%	23	24	-4.2%	23	27	-14.8%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

For the 4 Weeks Ending: July 16, 2022

Prepared by:ADSD,LAPD: 07/18/22

CRIME	06/19-07/16	05/22-06/18	% CHG	05/22-06/18	04/24-05/21	% CHG	YTD 22	YTD 21	% CHG	YTD 22	YTD 20	% CHG
Homicide	3	1	200.0%	1	2	-50.0%	13	10	30.0%	13	12	8.3%
Rape	3	3	0.0%	3	3	0.0%	30	46	-34.8%	30	43	-30.2%
Rape (815,820,821)	0	6	-100.0%	6	3	100.0%	24	19	26.3%	24	19	26.3%
Total Rapes	**3**	**9**	**-66.7%**	**9**	**6**	**50.0%**	**54**	**65**	**-16.9%**	**54**	**62**	**-12.9%**
Robbery	67	52	28.8%	52	66	-21.2%	446	384	16.1%	446	307	45.3%
Aggravated Assault*	143	112	27.7%	112	105	6.7%	856	718	19.2%	856	644	32.9%
Total Violent Crimes	**216**	**174**	**24.1%**	**174**	**179**	**-2.8%**	**1,369**	**1,177**	**16.3%**	**1,369**	**1,025**	**33.6%**
Burglary	40	49	-18.4%	49	61	-19.7%	354	282	25.5%	354	384	-7.8%
Motor Vehicle Theft	117	88	33.0%	88	114	-22.8%	672	423	58.9%	672	284	136.6%
BTFV	261	243	7.4%	243	276	-12.0%	1,849	959	92.8%	1,849	956	93.4%
Personal/Other Theft	201	211	-4.7%	211	194	8.8%	1,416	1,001	41.5%	1,416	1,012	39.9%
Total Property Crimes	**619**	**591**	**4.7%**	**591**	**645**	**-8.4%**	**4,291**	**2,665**	**61.0%**	**4,291**	**2,636**	**62.8%**
Total Part I Crimes	**835**	**765**	**9.2%**	**765**	**824**	**-7.2%**	**5,660**	**3,842**	**47.3%**	**5,660**	**3,661**	**54.6%**
Child/Spousal Abuse(Part I & II**	56	44	27.3%	44	55	-20.0%	370	392	-5.6%	370	341	8.5%
Shots Fired	14	8	75.0%	8	10	-20.0%	79	53	49.1%	79	41	92.7%
Victim Shot	8	4	100.0%	4	4	0.0%	34	28	21.4%	34	28	21.4%
ARREST	**06/19-07/16**	**05/22-06/18**	**% CHG**	**05/22-06/18**	**04/24-05/21**	**%CHG**	**YTD 22**	**YTD 21**	**%CHG**	**YTD 22**	**YTD 20**	**%CHG**
Homicide	0	1	-100.0%	1	1	0.0%	6	15	-60.0%	6	15	-60.0%
Rape	2	1	100.0%	1	0		9	7	28.6%	9	9	0.0%
Robbery	10	7	42.9%	7	9	-22.2%	66	87	-24.1%	66	98	-32.7%
Aggravated Assaults***	45	36	25.0%	36	43	-16.3%	281	305	-7.9%	281	298	-5.7%
Burglary	6	8	-25.0%	8	4	100.0%	57	71	-19.7%	57	118	-51.7%
Larceny	19	26	-26.9%	26	14	85.7%	121	76	59.2%	121	173	-30.1%
Motor Vehicle Theft	8	14	-42.9%	14	18	-22.2%	97	76	27.6%	97	70	38.6%
Total Violent Crime Arrests	**57**	**45**	**26.7%**	**45**	**53**	**-15.1%**	**362**	**414**	**-12.6%**	**362**	**420**	**-13.8%**
Total Part I Arrests	**90**	**93**	**-3.2%**	**93**	**89**	**4.5%**	**637**	**637**	**0.0%**	**637**	**781**	**-18.4%**
Total All Arrests	**271**	**302**	**-10.3%**	**302**	**266**	**13.5%**	**1,967**	**2,191**	**-10.2%**	**1,967**	**3,011**	**-34.7%**
Total Part II Arrests	181	209	-13.4%	209	177	18.1%	1,330	1,554	-14.4%	1,330	2,230	-40.4%
Weapon Arrests (Possession)	8	18	-55.6%	18	16	12.5%	110	108	1.9%	110	93	18.3%
NED Arrests	8	9	-11.1%	9	11	-18.2%	57	46	23.9%	57	54	5.6%
GED Arrests	2	8	-75.0%	8	9	-11.1%	42	41	2.4%	42	62	-32.3%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 10/10/22

For the 4 Weeks Ending: October 8, 2022

CRIME	09/11-10/08	08/14-09/10	% CHG	08/14-09/10	07/17-08/13	% CHG	YTD 22	YTD 21	% CHG	YTD 22	YTD 20	% CHG
Homicide	0	6	-100.0%	6	1	500.0%	20	19	5.3%	20	15	33.3%
Rape	12	7	71.4%	7	5	40.0%	54	80	-32.5%	54	60	-10.0%
Rape (815,820,821)	2	3	-33.3%	3	1	200.0%	32	34	-5.9%	32	38	-15.8%
Total Rapes	**14**	**10**	**40.0%**	**10**	**6**	**66.7%**	**86**	**114**	**-24.6%**	**86**	**98**	**-12.2%**
Robbery	59	84	-29.8%	84	58	44.8%	647	586	10.4%	647	436	48.4%
Aggravated Assault*	133	115	15.7%	115	123	-6.5%	1,231	1,063	15.8%	1,231	953	29.2%
Total Violent Crimes	**206**	**215**	**-4.2%**	**215**	**188**	**14.4%**	**1,984**	**1,782**	**11.3%**	**1,984**	**1,502**	**32.1%**
Burglary	46	44	4.5%	44	50	-12.0%	504	410	22.9%	504	489	3.1%
Motor Vehicle Theft	106	109	-2.8%	109	99	10.1%	997	604	65.1%	997	433	130.3%
BTFV	239	278	-14.0%	278	271	2.6%	2,717	1,492	82.1%	2,717	1,269	114.1%
Personal/Other Theft	264	394	-33.0%	394	236	66.9%	2,367	1,528	54.9%	2,367	1,361	73.9%
Total Property Crimes	**655**	**825**	**-20.6%**	**825**	**656**	**25.8%**	**6,585**	**4,034**	**63.2%**	**6,585**	**3,552**	**85.4%**
Total Part I Crimes	**861**	**1,040**	**-17.2%**	**1,040**	**844**	**23.2%**	**8,569**	**5,816**	**47.3%**	**8,569**	**5,054**	**69.5%**
Child/Spousal Abuse(Part I & II**	51	68	-25.0%	68	82	-17.1%	575	531	8.3%	575	509	13.0%
Shots Fired	10	10	0.0%	10	15	-33.3%	114	89	28.1%	114	61	86.9%
Victim Shot	10	5	100.0%	5	15	-66.7%	64	41	56.1%	64	39	64.1%
ARREST	**09/11-10/08**	**08/14-09/10**	**% CHG**	**08/14-09/10**	**07/17-08/13**	**%CHG**	**YTD 22**	**YTD 21**	**%CHG**	**YTD 22**	**YTD 20**	**%CHG**
Homicide	1	4	-75.0%	4	2	100.0%	13	17	-23.5%	13	17	-23.5%
Rape	1	2	-50.0%	2	3	-33.3%	15	12	25.0%	15	13	15.4%
Robbery	12	16	-25.0%	16	10	60.0%	104	120	-13.3%	104	125	-16.8%
Aggravated Assaults***	39	48	-18.8%	48	39	23.1%	407	423	-3.8%	407	426	-4.5%
Burglary	17	12	41.7%	12	6	100.0%	92	104	-11.5%	92	147	-37.4%
Larceny	16	20	-20.0%	20	27	-25.9%	184	109	68.8%	184	197	-6.6%
Motor Vehicle Theft	8	13	-38.5%	13	9	44.4%	127	109	16.5%	127	105	21.0%
Total Violent Crime Arrests	**53**	**70**	**-24.3%**	**70**	**54**	**29.6%**	**539**	**572**	**-5.8%**	**539**	**581**	**-7.2%**
Total Part I Arrests	**94**	**115**	**-18.3%**	**115**	**96**	**19.8%**	**942**	**894**	**5.4%**	**942**	**1,030**	**-8.5%**
Total All Arrests	**279**	**299**	**-6.7%**	**299**	**302**	**-1.0%**	**2,853**	**3,225**	**-11.5%**	**2,853**	**4,062**	**-29.8%**
Total Part II Arrests	185	184	0.5%	184	206	-10.7%	1,911	2,331	-18.0%	1,911	3,032	-37.0%
Weapon Arrests (Possession)	15	16	-6.3%	16	18	-11.1%	159	178	-10.7%	159	125	27.2%
NED Arrests	14	9	55.6%	9	7	28.6%	87	67	29.9%	87	77	13.0%
GED Arrests	4	10	-60.0%	10	2	400.0%	58	46	26.1%	58	81	-28.4%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Central Area

WEEKLY CRIME AND ARREST COMPARISON REPORT

Prepared by:ADSD,LAPD: 01/12/23

For the 4 Weeks Ending: December 31, 2022

CRIME	12/04-12/31	11/06-12/03	% CHG	11/06-12/03	10/09-11/05	% CHG	YTD 22	YTD 21	% CHG	YTD 22	YTD 20	% CHG
Homicide	3	3	0.0%	3	1	200.0%	27	25	8.0%	27	21	28.6%
Rape	6	10	-40.0%	10	9	11.1%	80	101	-20.8%	80	75	6.7%
Rape (815,820,821)	3	3	0.0%	3	1	200.0%	42	45	-6.7%	42	49	-14.3%
Total Rapes	**9**	**13**	**-30.8%**	**13**	**10**	**30.0%**	**122**	**146**	**-16.4%**	**122**	**124**	**-1.6%**
Robbery	48	59	-18.6%	59	66	-10.6%	823	806	2.1%	823	563	46.2%
Aggravated Assault*	114	109	4.6%	109	116	-6.0%	1,574	1,390	13.2%	1,574	1,255	25.4%
Total Violent Crimes	**174**	**184**	**-5.4%**	**184**	**193**	**-4.7%**	**2,546**	**2,367**	**7.6%**	**2,546**	**1,963**	**29.7%**
Burglary	43	52	-17.3%	52	39	33.3%	635	538	18.0%	635	617	2.9%
Motor Vehicle Theft	76	96	-20.8%	96	110	-12.7%	1,286	859	49.7%	1,286	611	110.5%
BTFV	364	314	15.9%	314	262	19.8%	3,711	2,202	68.5%	3,711	1,625	128.4%
Personal/Other Theft	188	223	-15.7%	223	252	-11.5%	3,092	2,109	46.6%	3,092	1,723	79.5%
Total Property Crimes	**671**	**685**	**-2.0%**	**685**	**663**	**3.3%**	**8,724**	**5,708**	**52.8%**	**8,724**	**4,576**	**90.6%**
Total Part I Crimes	**845**	**869**	**-2.8%**	**869**	**856**	**1.5%**	**11,270**	**8,075**	**39.6%**	**11,270**	**6,539**	**72.4%**
Child/Spousal Abuse(Part I & II**	61	44	38.6%	44	57	-22.8%	742	695	6.8%	742	669	10.9%
Shots Fired	15	10	50.0%	10	12	-16.7%	151	115	31.3%	151	85	77.6%
Victim Shot	8	6	33.3%	6	7	-14.3%	84	60	40.0%	84	57	47.4%
ARREST	**12/04-12/31**	**11/06-12/03**	**% CHG**	**11/06-12/03**	**10/09-11/05**	**%CHG**	**YTD 22**	**YTD 21**	**%CHG**	**YTD 22**	**YTD 20**	**%CHG**
Homicide	1	3	-66.7%	3	2	50.0%	19	20	-5.0%	19	20	-5.0%
Rape	3	1	200.0%	1	1	0.0%	20	15	33.3%	20	18	11.1%
Robbery	5	8	-37.5%	8	12	-33.3%	129	147	-12.2%	129	145	-11.0%
Aggravated Assaults***	34	56	-39.3%	56	45	24.4%	542	549	-1.3%	542	547	-0.9%
Burglary	11	4	175.0%	4	15	-73.3%	122	131	-6.9%	122	179	-31.8%
Larceny	37	31	19.4%	31	26	19.2%	278	169	64.5%	278	222	25.2%
Motor Vehicle Theft	10	18	-44.4%	18	10	80.0%	165	153	7.8%	165	139	18.7%
Total Violent Crime Arrests	**43**	**68**	**-36.8%**	**68**	**60**	**13.3%**	**710**	**731**	**-2.9%**	**710**	**730**	**-2.7%**
Total Part I Arrests	**101**	**121**	**-16.5%**	**121**	**111**	**9.0%**	**1,275**	**1,184**	**7.7%**	**1,275**	**1,270**	**0.4%**
Total All Arrests	**306**	**323**	**-5.3%**	**323**	**285**	**13.3%**	**3,767**	**4,128**	**-8.7%**	**3,767**	**4,989**	**-24.5%**
Total Part II Arrests	205	202	1.5%	202	174	16.1%	2,492	2,944	-15.4%	2,492	3,719	-33.0%
Weapon Arrests (Possession)	22	14	57.1%	14	9	55.6%	204	240	-15.0%	204	143	42.7%
NED Arrests	7	18	-61.1%	18	12	50.0%	124	88	40.9%	124	88	40.9%
GED Arrests	3	6	-50.0%	6	1	500.0%	68	52	30.8%	68	93	-26.9%

Note: Data is based on date of occurrence. *Aggravated Assaults: Crime Classes: 230,231,235,236,250,251,761,926 ***Includes Domestic Violence

** Part II Child/Spousal Abuse Simple Assaults not included in Part I Aggravated Assaults above to comply with the FBI's Uniform Crime Reporting guidelines.

Appendix IS-6

Utility Report

UTILITY TECHNICAL REPORT

for

130 W College Street
Los Angeles, CA

Prepared For:

S&R Partners, LLC c/o Granite Properties
5601 Granite Parkway, Suite 1200
Plano, Texas 75024

Prepared By:

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11 July 2023
Langan Project No. 721036101

LANGAN

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APPENDICES

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1.0 INTRODUCTION

1.1 Project Description

The Project proposes a new infill commercial development on 2.2 acre site (Project Site or Property) in the Central City North Community Plan area of the City of Los Angeles (the Project). The Project would comprise a total floor area of 232,802 square feet consisting of 224,597 square feet of office uses, 4,095 square feet of restaurant uses, and 4,110 square feet of retail uses, with a floor area ratio (FAR) of 2.42:1. The Project would also include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area" as defined in the City's Municipal Code (LAMC), but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of this environmental analysis, the Project would include 5,894 square feet of restaurant space. The proposed building would have a maximum height of five stories (plus a mezzanine) and 85 feet measured to the top of the mechanical screening. The Project would include a total of 52,716 square feet of outdoor areas. A total of 429 vehicular parking spaces would be provided for the proposed uses within one level of below grade parking, one level of at-grade parking, and one above grade level within the proposed building. An existing surface parking lot would be removed to accommodate the Project.

The Project Site is located at 114 and 130 W. College Street, 119 W. Bruno Street, and 943, 949, 955, and 973 N. Main Street within the Central City North Community Plan of the City of Los Angeles. The Project Site is bounded by West College Street to the north, North Main Street to the east, Bruno Street to the south, and North Alameda Street to the west.

1.2 Scope of Work

This technical study provides a description of the existing water and wastewater infrastructure at the Property and analyzes the Project's potential impacts related to the water and wastewater infrastructure systems.

2.0 REGULATORY FRAMEWORK

2.1 Water

The City of Los Angeles Department of Water and Power (LADWP) is responsible for providing water supply to the City while complying with local, state, and federal regulations.

Below are the state and regional water supply regulations:

- Metropolitan Water District (MWD) official reports and policies as outlined in its Regional Urban Water Management Plan, Water Surplus and Drought Management Plan, Water Supply Allocation Plan, and Integrated Resources Plan.

- California Code of Regulations, Title 20, Chapter 5, Article 4, Section 1605 establishes water efficiency standards for all new plumbing fixtures and Section 1608 prohibits the sale of fixtures that do not comply with the regulations.

- 2022 California Green Building Standards Code, CCR, Title 24, Part 11, effective January 1, 2023, requires a water use reduction of 20% above the baseline cited in the CALgreen code book. The code applies to family homes, state buildings, health facilities, and commercial buildings.

- California Urban Water Management Planning Act of 1984 requires water suppliers to adopt an Urban Water Management Plan (UWMP).

- LADWP's 2020 Urban Water Management Plan outlines the City's long-term water resources management strategy. The Plan was approved by the LADWP Board of Water and Power Commissioners on May 25, 2021.

- Senate Bill 610 and Senate Bill 221, approved on October 9, 2001, require land use agencies to perform a detailed analysis of available water supply when approving large developments. Historically, public water suppliers (PWS) simply provided a "will serve" letter to developers. SB 610, Public Resources Code (PRC) and Section 20910-10915 of the State Water Code requires lead agencies to request a Water Supply Assessment (WSA) from local water purveyor prior to project approval. If the projected water demand associated with a proposed development is included in the most recent UWMP, the development is considered to have sufficient water supply per California Water Code Section 10910, and a WSA is not required. All projects that meet any of the following criteria require a WSA.

    1) A proposed residential development of more than 500 dwelling units.

    2) A proposed shopping center or business establishment of more than 500,000 square feet of floor space or employing more than 1,000 persons

    3) A proposed commercial office building of more than 250,000 square feet of floor space or employing more than 1,000 persons

    4) A proposed hotel or motel of more than 500 rooms

    5) A proposed industrial, manufacturing, or processing plant or industrial park of more than 40 acres of land, more than 650,000 square feet of floor area, or employing more than 1,000 person

6) A mixed use project that falls in one or more of the above-identified categories

7) A project not falling in one of the above-identified categories but that would demand water equal or greater than the amount required by a 500-dwelling unit project

By utilizing the Los Angeles Bureau of Sanitation's (BOS) wastewater generation rates for a residential development: 1 Bedroom apartment (110 gallons per day [gpd]/dwelling unit [DU]) as the dwelling unit rate[1], the proposed water demand can be estimated. From this value, the water demand estimated of a 500-dwelling unit project will be 55,000 gpd. The Project is a commercial development with less than 250,000 square feet and has an estimated total proposed water consumption of 31,135 gpd (See Table 1 under Section 6.1) which is below the water demand of a 500-dwelling unit project. Therefore, the Project does not meet any of the criteria above, and a WSA is not required.

- One Water LA 2040 Plan, Final Draft issued in April 2018, takes a holistic and collaborative approach to consider all of the City's water resources from surface water, groundwater, potable water, wastewater, recycled water, dry-weather runoff, and stormwater as "One Water". The plan will help guide strategic decisions for integrated water projects, programs and policies within the City and increase sustainable water management.

2.2 Wastewater

The City's BOS operates more than 6,700 miles of public sewers that convey about 400 million gallons per day (mgd) of flow from residences and businesses to the City's four wastewater treatment and water reclamation plants. The City's sewer system is comprised of three systems that distribute flow into the four wastewater treatment and water reclamation plants: Hyperion Sanitary Sewer System, Terminal Island Water Reclamation Plant Sanitary Sewer System, and Regional Sanitary Sewer System. To comply with waste discharge requirements (WDRs), a Sewer System Management Plan (SSMP) was prepared for each of these systems.

The Property lies within the Hyperion Service Area and is served by the Hyperion Sanitary Sewer System. In January 2019, a SSMP was prepared for the Hyperion Sanitary Sewer System pursuant to the State Water Resources Control Board's (SWRCB) May 2, 2006 Statewide General WDRs[2].

[1] The water generation rate for a 1-bedroom apartment is a conservative analysis because a 1-bedroom apartment generates less water as compared to 2-, 3-, or 4-bedroom apartments.

[2] City of Los Angeles Department of Public Works, Bureau of Sanitation, Sewer System Management Plan Hyperion Sanitary Sewer System, January 2019

Sewer permit allocation for projects that discharge into the Hyperion Water Reclamation Plant is regulated by Ordinance No. 166,060 adopted by the City in 1990. The Ordinance established an additional annual allotment of 5.0 million gallons per day, of which 34.5 percent (1.725 million gallons per day) is allocated for priority projects, 8 percent (0.4 million gallons per day) for public benefit projects, and 57.5 percent (2.875) million gallons per day) for non-priority projects (of which 65 percent is for residential project and 35 percent for non-residential projects).

The LAMC includes regulations that allow the City to assure available sewer capacity for new projects and fees for improvements to the infrastructure system. LAMC Section 64.15 requires that the City perform a Sewer Capacity Availability Request (SCAR) when any person seeks a sewer permit to connect a property to the City's sewer collection system, proposes additional discharge through their existing public sewer connection, or proposes a future sewer connection or future development that is anticipated to generate 10,000 gallons or more of sewage per day. A SCAR is an analysis of the existing sewer collection system to determine if there is adequate capacity existing in the sewer collection system to safely convey the newly generated sewage to the appropriate sewage treatment plant. In addition, the City has begun requiring a Wastewater Service Inquiry (WWSI) for projects in the entitlement phase. A WWSI documents the projected wastewater requirement and the sewer availability in the vicinity of a proposed project area.

The City also establishes design criteria for sewer systems to assure that new infrastructure provides sewer capacity and operating characteristics to meet City Standards (Bureau of Engineering Special Order No. SO06-0691). Per the Special Order, lateral sewers which are sewers 18 inches or less in diameter, must be designated for a planning period of 100 years. The Special Order also requires that sewers be designated so that the peak dry weather flow depth during their planning period shall not exceed one-half the pipe diameter[3].

LAMC Section 64.11.2 requires the payment of fees for new connections to the City's sewer system to assure the sufficiency of sewer infrastructure. New connections to the City's sewer system are assessed a Sewerage Facilities Charge which is based upon wastewater flow strength and volume. The wastewater flow strength is determined by City guidelines for the average biological oxygen demand and suspended solids for each type of land use.

In 2006 the City approved the Integrated Resources Plan, which incorporates a Wastewater Facilities Plan[4]. The Integrated Resources Program was developed to meet future wastewater needs of more than 4.3 million residents expected to live within the City by 2020. In order to meet future demands posed by increased wastewater generation, the City has chosen to expand its current overall treatment capacity, while

[3] City of Los Angeles, L.A. CEQA Thresholds Guide, Your Resource for Planning CEQA Analysis in Los Angeles, M-Public Utilities, 2006.

[4] City of Los Angeles, Department of Public Works, LA Sewers Website, Integrated Resources Plan Facilities Plan, Summary Report, December 2006.

maximizing the potential to reuse recycled water through irrigation, and other approved uses.

3.0 ENVIRONMENTAL SETTING

The Property is located within the Chinatown neighborhood of the City, bounded by Alameda Street to the west, College Street to the north, Main Street to the east, and Bruno Street to the south. The Property is currently developed with a surface parking lot for buses, and as discussed below, there is no regular water and wastewater use at the Property as compared to the Project.

3.1 Water

Primary sources of water for the LADWP service area are the Los Angeles Aqueducts (LAA), local groundwater, State Water Project (supplied by MWD), and Colorado River Aqueduct (supplied by MWD)[5]. LADWP maintains water infrastructure to the Property. Based on the Water Service Map 134-216 provided by LADWP, there is a 36-inch diameter water main in Alameda Street, a 10-inch diameter water main in North Main Street, a 6-inch diameter water main that extends approximately 180 feet from the northeast Property corner towards the northwest Property corner in College Street, and a 2-inch diameter water line that extends approximately 140 feet from the southeast Property corner towards the southwest Property corner in Bruno Street. The Property has two existing water meters on College Street, one existing water meters on North Main Street, and one existing water meter on Bruno Street. There is no regular water usage on the Property, with only minimal active water usage on the Property from existing hose bibs, as observed by Langan. The Project will remove and replace the existing water meters with new connections. The Project will consist of new connections to the mains in Alameda Street and North Main Street to serve the Project. Water consumption estimates are unavailable as the current land use is a parking lot with no active water uses.

There is an existing fire hydrant located on the east side of Alameda Street, just south of the College Street intersection according to the Information of Fire Flow Availability (IFFAR) provided. There are no existing Fire Department Connections or buildings with sprinklers currently on the Property since it is developed with a surface parking lot for buses. New fire hydrants connections will be installed to meet all City Fire Department and Department of Building and Safety regulations to serve the Project. Multiple additional fire hydrants are in the greater vicinity of the Property.

3.2 Wastewater

BOS operates and maintains the wastewater treatment, reclamation, and collection facilities serving most of the City's incorporated areas as well as several other cities and unincorporated areas in the Los Angeles basin and San Fernando Valley. The collection

[5] LADWP, 2020 Urban Water Management Plan, March 2021

infrastructure consists of over 6,700 miles of local, trunk, mainline, and major interceptor sewers, five major outfall sewers, and 46 pumping plants. The wastewater generated by the Project will ultimately flow to the Hyperion Water Reclamation Plant for treatment. The existing design capacity of the Hyperion Service Area is approximately 450 mgd and the existing average daily flow for the system is approximately 260 mgd[6].

Sanitary sewer is provided by BOS. Based on information provided by BOS in the Wastewater Service Information (WWSI), there is a 15-inch sanitary sewer main in North Alameda Street that flows south to an 18-inch sanitary sewer main in North Alameda Street before discharging into a 30-inch sanitary sewer main in Los Angeles Street. Additionally, based on City of Los Angeles Bureau of Engineering maps there is a 12-inch sanitary sewer that flows south in North Main Street. The City sewer network ultimately conveys wastewater to the Hyperion Water Reclamation Plant. The 50% design capacity determined by the BOS for the existing sewer lines are as listed: 1.16 mgd for the 15-inch line on North Alameda Street, 2.36 mgd for the 18-inch line on North Alameda Street, and 7.78 mgd for the 30-inch line on Los Angeles Street. The WWSI did not include the 12-inch line in North Main Street. The proposed total flows for the Project (see Table 2 - 130 W College Street Estimated Proposed Wastewater Generation under Section 6.2.2 for calculations) is 31,135 gpd. The BOS has determined, based on the estimated flows summarized above, there is sufficient service to accommodate the total flows of the Project. The information above can be found in more detail in the WWSI received from the BOS in Appendix C.

Existing wastewater generation estimates at the Property are unavailable as the Property is currently developed with a parking lot with no fixture units draining to any sanitary sewer connections to the existing sanitary sewer mains.

4.0 SIGNIFICANCE THRESHOLDS

4.1 Water

The City considers the questions listed in Appendix G of the State of California's California Environmental Quality Act (CEQA) Guidelines as the thresholds for CEQA compliance regarding impacts to water. These questions are as follows:

Would the project:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

[6] City of Los Angeles Department of Public Works, Bureau of Sanitation, Sewer System Management Plan Hyperion Sanitary Sewer System, January 2019

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

In the context of these questions from Appendix G of the CEQA Guidelines, the City considers the following factors from the 2006 L.A. CEQA Thresholds Guide (CEQA Thresholds Guide) in the determination of significance regarding impacts on water:

- The total estimated water demand for the project;
- Whether sufficient capacity exists in the water infrastructure that would serve the project, considering the anticipated conditions at project buildout;
- The amount by which the project would cause the projected growth in populations, housing or employment for the Community Plan area to be exceeded in the year of the project completion; and
- The degree to which scheduled water infrastructure improvements or project design features would reduce or offset service impacts.

Based on these factors, the Project would have a significant impact if the City's water supplies would not adequately serve the Project or water distribution capacity would be inadequate to serve the proposed uses after the appropriate infrastructure improvements have been installed.

4.2 Wastewater

The City considers the questions listed in Appendix G of the CEQA Guidelines as significance thresholds for CEQA compliances regarding impacts to wastewater. These questions are as follows:

Would the project:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation 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 has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

In the context of the above questions from Appendix G of the CEQA Guidelines, the City considers the following factors from the CEQA Thresholds Guide with regard to impacts on wastewater:

- The project would cause a measurable increase in wastewater flows at a point where, and a time when, a sewer's capacity is already constrained or that would cause a sewer's capacity to become constrained; or

- The project's additional wastewater flows would substantially or incrementally exceed the future scheduled capacity of any one treatment plant by generating flows greater than those anticipated in the Wastewater Facilities Plan or General Plan and its elements.

Based on these factors, the Project would have a significant impact if the City's wastewater infrastructure would not adequately serve the Project and would results in an increase in wastewater such that it exceeds available capacity requiring the construction of new facilities.

5.0 METHODOLOGY

5.1 Water

The methodology for determining the significance of a project as it relates to a project's impact on water supply and distribution infrastructure is based on the L.A. CEQA Thresholds Guide. This methodology involves a review of the project's environmental setting, project impacts, cumulative impacts, and mitigation measures (if required). The following has been considered as part of the determination for this project:

Environmental Setting

- Description of major water infrastructure serving the Property, including the type of facilities, location and sizes, and any planned improvements.

- Description of the water conditions for the project area and known improvement plans.

- The existing population, housing, and employment for the Community Plan area in which the project site is located.

Project Impacts

- Evaluate the project's water demand, taking into account design or operational features that would reduce or offset water demand.

- Determine what improvements would be needed, if any, to adequately serve the project.

- Describe the degree to which presently scheduled off-site improvements offset impacts.

LADWP performed a hydraulic analysis of their water system to determine if adequate fire flow is available to the fire hydrants surrounding the Property for the Project as part of the IFFAR LADWP's approach consists of analyzing their water system model near the Property Based on the results, LADWP determines whether they can meet the Project's fire hydrant flow needs with the existing infrastructure. In the IFFAR provided, fire hydrant F-9931 located East of Alameda Street and South of the centerline of College Street with a 1500 gpm flow at 20 psi has adequate fire flow availability for the Project. See Appendix A for the results of the Information of (IFFAR).

In addition, LADWP performed a hydraulic analysis to determine if adequate water supply exists for future development of the Project as part of the Service Advisory Request (SAR). LADWP's hydraulic analysis provides flow and pressure data for the approximate connection locations. Based on the results, LADWP determines whether they can meet the projected needs based on existing infrastructure. In the approved SAR for the Project, a proposed 8-inch connection off of the 20-inch main in Alameda Street will have a flow of up to 2500 gpm at a pressure of 48 psi. In addition, a proposed 8-inch connection off of the 10-inch main in Main Street will have a flow of up to 2500 gpm at a pressure of 42 psi. See Appendix B for the approved (SAR).

5.2 Wastewater

The methodology for determining the significance of a project as it relates to a project's impact on wastewater collection and treatment infrastructure is based on the L.A. CEQA Thresholds Guide. This methodology involves a review of the project's environmental setting, project impacts, cumulative impacts, and mitigation measures (if required). The following has been considered as part of the determination for this project:

Environmental Setting

- Location of the project and appropriate points of connection to the wastewater collection system on the pertinent Wye Map;
- Description of the existing wastewater system which would serve the project, including its capacity and current flows.
- Summary of adopted wastewater-related plans and policies that are relevant to the project area.

Project Impacts

- Evaluate the project wastewater needs (anticipated daily average wastewater flow), taking into account design or operational features that would reduce or offset service impacts;

- Compare the project's wastewater needs to the appropriate sewer's capacity and/or the wastewater flows anticipated in the Wastewater Facilities Plan or General Plan.

This report analyzes the potential impacts of the Project on the existing public sewer infrastructure by comparing the estimated Project wastewater generation with the calculated available capacity of the existing facilities.

Pursuant to LAMC Section 64.15, the BOS Engineering Division created a preliminary analysis of the local and regional sewer conditions to determine if available wastewater conveyance and treatment capacity exists for future development of the Project. BOS's approach consisted of the study of a worst-case scenario envisioning peak demands from the relevant facilities occurring simultaneously on the wastewater system. A combination of flow gauging data and computed results from the City's hydrodynamic model were used to project current and future impacts due to additional sewer discharge. The data used in this report are based on the findings of the BOS preliminary analysis. According to the WWSI received from the BOS attached in Appendix C, there exists a 15-inch line on North Alameda Street that feeds south into an 18-inch line on North Alameda Street before discharging into a 30-inch sewer line on Los Angeles Street. The 50% design capacity determined by the BOS for the existing sewer lines are as listed: 1.16 mgd for the 15-inch line on North Alameda Street, 2.36 mgd for the 18-inch line on North Alameda Street, and 7.78 mgd for the 30-inch line on Los Angeles Street. The proposed total flows for the Project (see Table 2 - 130 W College Street Estimated Proposed Wastewater Generation under Section 6.2.2 for calculations) is 31,135 gpd. BOS has determined, based on the estimated flows summarized above, there is sufficient service to accommodate the total flows of the Project.

6.0 PROJECT IMPACT ANALYSIS

6.1 Construction

6.1.1 Water

Water demand for construction of the Project would be temporary and would be required for dust control, cleaning of equipment, excavation/export, removal and re-compaction, etc. Based on a review of other construction projects of similar size to the Project, a conservative estimate of construction water use ranges from 1,000 to 2,000 gpd.

There are two existing water meters located on Bruno Street and Main Street and there is little to no water usage on-site. A temporary construction water service would be required for the Project construction. In terms of water

capacity, the approved SARs allow a proposed 8-inch connection off the 20-inch main in Alameda Street with a flowrate of up to 2,500 gpm at a pressure of 48 psi. In addition, a proposed 8-inch connection off the 10-inch main in Main Street with a flowrate of up to 2,500 gpm at a pressure of 42 psi. As described above, a conservative estimate of the construction water use is up to 2,000 gpd, which at the approved SAR flowrates can be achieved (i.e. hose running at 20gpm for 100 minutes). Therefore, according to the results from the SARs, the capacity of the existing water infrastructure is sufficient to serve the Project's construction activities.

The Project will require construction of new, on-site water laterals to serve the new Project building. Construction impacts associated with the installation of new water laterals would primarily involve trenching in order to place the water lines below surface and would be limited to on-site water distribution, and minor off-site work associated with connections to the public main. Prior to ground disturbance, Project contractors would coordinate with LADWP to identify the locations and depth of all lines. Further, LADWP would be notified in advance of proposed ground disturbance activities to avoid water lines and disruption of water service. A Construction Traffic Management Plan (CTMP) would be implemented to reduce any temporary pedestrian and traffic impacts. The contractor would implement the CTMP, which would ensure access and safety for pedestrians and vehicles.

The Project's construction impact to existing water infrastructure would be limited to the trenching and installation of laterals as mentioned above. In addition, the water demand of the Project under construction is expected to be met by the capacity described previously. Therefore, the impact on water infrastructure associated with the Project's construction activities would be less than significant.

6.1.2 Wastewater

Construction activities for the Project would not result in wastewater generation as construction workers would typically utilize temporary facilities (such as portable toilets and hand wash areas), which would be provided by the Project contractor and not contribute to the City's wastewater system. Sewage from these facilities would be collected and hauled offsite and not discharged directly into the public sewer system within the immediate Project vicinity. Thus, wastewater generation from the Project construction is not anticipated to cause a measurable increase in wastewater flows. Construction impacts associated with the installation of new sewer laterals would primarily involve trenching in order to place the sewer lines below surface and would be limited to on-site wastewater distribution, and minor off-site work associated with connections to the public main. Additionally, as noted above, a CTMP would be implemented to reduce any temporary pedestrian and traffic impacts. The contractor would implement the CTMP, which would ensure access and safety for pedestrians

and vehicles. Therefore, Project impacts associated with construction-period wastewater generation would be less than significant.

The Project will require construction of new on-site infrastructure to serve the new buildings. Construction impacts associated with wastewater infrastructure would primarily be confined to trenching for connections to public infrastructure. Installation of wastewater infrastructure will be limited to on-site wastewater distribution, and minor off-site work associated with connections to the public main.

6.2 Operation

6.2.1 Water

When analyzing the Project for infrastructure capacity, the projected demands for both fire suppression and domestic water are considered. Although domestic water demand (shown in Table 1) is the Project's main contributor of water consumption, fire flow demands have a much greater instantaneous impact on infrastructure. Therefore, fire flow demands are the primary means for analyzing infrastructure capacity.

Based on fire flow standards set forth in Section 57.507.3 of the LAMC, the Project falls within the industrial and commercial category, which has a required flow of 6,000 to 9,000 gpm from four adjacent hydrants flowing simultaneously with a residual pressure of 20 pounds per square inch. This translates to a required flow of 1,500 to 2,250 gpm for each hydrant. In the IFFAR provided by LADWP, fire hydrant F-9931 located East of Alameda Street and South of the centerline of College Street with a 1,500 gpm flow at 20 psi. Since there is currently one fire hydrant adjacent to the Project Site, additional fire hydrants may be proposed in offsite plans to meet LAMC requirements. In addition, the Project will incorporate a fire sprinkler suppression system to reduce the public hydrant demands, which will be subject to Fire Department review and approval during the design and permitting of the Project. In Section 94.2020.0 of the LAMC, that refers to NFPA 14-2013 including Section 7.10.1.1.5, the maximum allowable fire sprinkler demand for a fully or partially sprinklered building would be 1,250 gpm. In the SAR for the Project approved by LADWP, a proposed 8-inch connection off of the 20-inch main in Alameda Street will have a flow of up to 2,500 gpm at a pressure of 48 psi. In addition, a proposed 8-inch connection off of the 10-inch main in Main Street will have a flow of up to 2,500 gpm at a pressure of 42 psi. Based on the SAR results, the existing water infrastructure will be able to provide the necessary flow and pressure to service the Project. The approved IFFAR & SAR attached in Appendix A & B, respectively, demonstrate that there exists adequate flow and pressure from the existing water infrastructure for the Project serving the Property.

The table below demonstrates the estimated proposed water demand for the Project. According to the information previously stated from the SAR, the Project will have a sufficient supply of water to meet the demand of 31,135 gpd.

Table 1 : 130 W College Street Estimated Proposed Water Demand

Building Use	Quantity	Units	Quantity Rate (GPD/unit)	Total Generation (GPD)
Restaurant	136	Seat	30	4,080
Office Building	113,939	SF	0.12	13,673
Retail Area (Less than or equal to 100,000 SF)	4,110	SF	0.025	103
Office Building	110,658	SF	0.12	13,279
			Total GPD	31,135

Note: Water demand rates are from Bureau of Sanitation Sewer Generation Rates.

6.2.2 Wastewater

In accordance with the L.A. CEQA Thresholds Guide, the base estimated sewer flows were based on the sewer generation factors for the Project's uses. Based on the type of use and generation factors, the project will generate approximately 31,135 gpd of wastewater. Wastewater generation estimates have been prepared based on BOS sewage generation factors for residential and commercial categories and are summarized in the tables below.

Table 2 : 130 W College Street Estimated Proposed Wastewater Generation

Building Use	Quantity	Units	Quantity Rate (GPD/unit)	Total Generation (GPD)
Restaurant	136	Seat	30	4,080
Office Building	113,939	SF	0.12	13,673
Retail Area (Less than or equal to 100,000 SF)	4,110	SF	0.025	103
Office Building	110,658	SF	0.12	13,279
			Total GPD	31,135

Note: Wastewater demand rates are from Bureau of Sanitation Sewer Generation Rates.

A WWSI (Appendix C) was submitted to determine if the existing public infrastructure can accommodate the project. BOS has analyzed the Project demands along with existing conditions and forecasted growth and has determined that there is sufficient service to accommodate the total flows of the Project as previously stated in Section 6.2. As typical, further gauging and

evaluation will be required as part of the permit process to identify a specific sewer connection point. With the information and analysis provided by the BOS in the WWSI, there are no required upgrades to either existing sanitary sewer main to which the Project is connecting.

The proposed wastewater generation is not expected to have a significant impact on the existing sanitary sewer infrastructure as the proposed generation represents less than one percent of the existing design capacity of the Hyperion Service Area (design capacity of the Hyperion Service Area is approximately 450 million gallons per day) and is less than 50% of the existing capacity of the sewer lines along Alameda Street and North Main Street.

6.3 Cumulative Impact Analysis

6.3.1 Water

The geographic context for the cumulative impact analysis on water supply is the LADWP service area. LADWP, as a public water service provider, is required to prepare and periodically update a (UWMP to plan and provide for water supplies to serve existing and projected demands. The 2020 UWMP prepared by LADWP accounts for existing development within the City, as well as projected growth through the year 2045.

Additionally, through the LADWP's 2020 UWMP process, the City will meet all new demand for water due to projected population growth to the year of 2045, through a combination of water conservation and water recycling. These plans outline the creation of sustainable sources of water for the City in order to reduce the dependence on imported supplies. LADWP plans to achieve these goals by expanding the recycled water distribution system and increasing stormwater capture.

The Project's compliance, along with other future development projects' compliance, with regulatory requirements that promote water conservation such as the LAMC and the Green Building Code, would help assure that sufficient water supply is available in the City.

Based on the above, LADWP would be able to supply the water demands of the Project as well as future growth. Additionally, with the approval of the IFFAR (Appendix A) and the two SARs (Appendix B), which would also be required of other future development projects, it is anticipated that LADWP would be able to supply the water demand of the Project as well as future growth through the year 2045. Therefore, cumulative Project impacts on water supply would be less than significant.

6.3.2 Wastewater

The Project will produce additional generation of sewer flow, however as discussed previously, BOS has conducted an analysis of existing and planned capacity and has determine that adequate capacity exists to serve the Project. A SCAR will be submitted to the BOS and a sewer connection permit will be required prior to installing the Project's sewer connections, which will also be required of other future development projects. If system upgrades are determined to be required following the SCAR or during the permitting process for the Project or other future development projects, arrangements will be made with the BOS to construct the necessary improvements.

The Project's wastewater generation would be conveyed via the existing wastewater infrastructure for treatment at the Hyperion Treatment Plant System. As previously stated, according to the BOS, the existing design capacity of the Hyperion Service Area is approximately 400 million mgd. The estimated wastewater generation of the Project (i.e., 31,135 gpd) is less than the available capacity in the system.

According to the analysis provided by the BOS in the WWSI (Appendix C) and the projected forecasts of wastewater generation of the Project, the Project's increase in wastewater generation would be adequately accommodated within the Hyperion Service Area. Similar to the Project, other future development project will also be required to obtain a WWSI from BOS to analyze the wastewater generation rates and ensure there is sufficient capacity to accommodate the wastewater demands for these projects. Therefore, the Project's wastewater generation would have a less than significant cumulative impact on existing wastewater treatment infrastructure and facilities.

7.0 LEVEL OF SIGNIFICANCE

Based on the analysis contained in this report, no significant impacts have been identified for water or wastewater for the Project.

8.0 REFERENCES

1. City of Los Angeles Department of Public Works, Bureau of Sanitation, Sewer System Management Plan Hyperion Sanitary Sewer System, January 2019

2. City of Los Angeles, Department of Public Works, LA Sewers Website, Integrated Resources Plan Facilities Plan, Summary Report, December 2006

3. City of Los Angeles. LA. CEQA Thresholds Guide. 2006 https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/A07.pdf

4. City of Los Angeles. Urban water Management Plan. 2020 https://www.ladwp.com/cs/groups/ladwp/documents/pdf/mdaw/nzyy/~edisp/opladwpccb762836.pdf

APPENDIX A

Information of Fire Flow Availability Request (IFFAR)

City of Los Angeles
Los Angeles Department of Water and Power - Water System

INFORMATION OF FIRE FLOW AVAILABILITY

Water Service Map No.: 134-216

LAFD Fire Flow Requirement: _____ LAFD Signature: _____

Date Signed: _____

Applicant: Kaier Lao

Company Name: Langan Engineering and Environmental Services

Address: 18575 Jamboree Road Suite 150

Telephone: 949-561-9200

Email Address: klao@langan.com

	F- 9931	F-_____	F-_____	F-_____
Location:	East of Alameda St South of centerline of College St			
Distance from Neareast Pipe Location (feet):	78.42 Feet			
Hydrant Size:	2 1/2 X 4D			
Water Main Size (in):	36			
Static Pressure (psi):	41			
Residual Pressure (psi):	38			
Flow at 20 psi (gpm):	1500 GPM			

NOTE: Data obtained from hydraulic analysis using peak hour.

Remarks: **ECMR No.** W20230315020

IFFAR approved for F-9931.

Water Purveyor: **Los Angeles Department of Water & Power** *Date:* 3/20/23

Signtature: _____ *Title:* Civil Engineering Associate II

Requests must be made by submitting this completed application, along with a $215.00 check payable to:
"Los Angeles Department of Water and Power", and mailed to:
Los Angeles Department of Water and Power
Distribution Engineering Section - Water
Attn: Business Arrangements
P.O. Box 51111 - Room 1425
Los Angeles, CA 90051-5700

*** If you have any questions, please contact us at (213) 367-2130 or visit our web site at http://www.ladwp.com.**

APPENDIX B

Service Advisory Request (SAR)

City of Los Angeles

Los Angeles Department of Water and Power - Water System

SAR NUMBER **102416**

Fire Service Pressure Flow Report

SERVICE NUMBER **641744**

For: **130 W COLLEGE ST** Approved Date: **3-21-2023**

Proposed Service **8 INCH** off of the

20 inch main in **ALAMEDA ST** on the **EAST** side approximately

100 feet **NORTH** of **NORTH** of **BRUNO ST** The System maximum pressure is

82 psi based on street curb elevation of **290** feet above sea level at this location.

The distance from the DWP street main to the property line is **81** feet

System maximum pressure should be used only for determining class of piping and fittings.

Residual Flow/Pressure Table for water system street main at this location

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	53				
1050	52				
1525	51				
1895	50				
2215	49				
2500	48				

Meter Assembly Capacities

Domestic Meters	
1 inch =	56 gpm
1-1/2 inch =	96 gpm
2 inch =	160 gpm
3 inch =	220 gpm
4 inch =	400 gpm
6 inch =	700 gpm
8 inch =	1500 gpm
10 inch =	2500 gpm

Fire Service	
2 inch =	250 gpm
4 inch =	600 gpm
6 inch =	1400 gpm
8 inch =	2500 gpm
10 inch =	5000 gpm

FM Services	
8 inch =	2500 gpm
10 inch =	5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes: OK to sell 8-inch FS + 6-inch DS combo. Please note further coordination is needed for design/construction and further costs may be incurred.

This information will be sent to the Department of Building and Safety for plan checking.

This SAR is valid for one year from 03-21-23. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **CENTRAL (213) 367-1216**

SAMUEL OLIDEN	**SAMUEL OLIDEN**	**134-216**
Prepared by	**Approved by**	**Water Service Map**

City of Los Angeles

Los Angeles Department of Water and Power - Water System

SAR NUMBER **102417**

Fire Service Pressure Flow Report

SERVICE NUMBER **641745**

For: **130 W COLLEGE ST** Approved Date: **3-21-2023**

Proposed Service **8 INCH** off of the

10 inch main in **MAIN ST** on the **WEST** side approximately

70 feet **NORTH** of **NORTH** of **BRUNO ST** The System maximum pressure is

81 psi based on street curb elevation of **292** feet above sea level at this location.

The distance from the DWP street main to the property line is **58** feet

System maximum pressure should be used only for determining class of piping and fittings.

Residual Flow/Pressure Table for water system street main at this location

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	51				
765	50				
1110	49				
1380	48				
1615	47				
1820	46				
2010	45				
2185	44				
2345	43				
2500	42				

These values are subject to change due to changes in system facilities or demands.

Meter Assembly Capacities

Domestic Meters	
1 inch =	56 gpm
1-1/2 inch =	96 gpm
2 inch =	160 gpm
3 inch =	220 gpm
4 inch =	400 gpm
6 inch =	700 gpm
8 inch =	1500 gpm
10 inch =	2500 gpm

Fire Service	
2 inch =	250 gpm
4 inch =	600 gpm
6 inch =	1400 gpm
8 inch =	2500 gpm
10 inch =	5000 gpm

FM Services	
8 inch =	2500 gpm
10 inch =	5000 gpm

Notes: OK to sell 8-inch FS + 6-inch DS combo

This information will be sent to the Department of Building and Safety for plan checking.

This SAR is valid for one year from 03-21-23. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **CENTRAL (213) 367-1216**

SAMUEL OLIDEN	**SAMUEL OLIDEN**	**134-216**
Prepared by	**Approved by**	**Water Service Map**

APPENDIX C

Wastewater Service Inquiry (WWSI)

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ASSISTANT DIRECTORS

TIMEYIN DAFETA
HYPERION EXECUTIVE PLANT MANAGER

WASTEWATER ENGINEERING
SERVICES DIVISION
2714 MEDIA CENTER DRIVE
LOS ANGELES, CA 90065
FAX: (323) 342-6210
WWW.LACITYSAN.ORG

June 26, 2023

Mr. Louis Lin, Staff Engineer
LANGAN
515 South Flower Street, Suite 1060
Los Angeles, CA 90071

Dear Mr. Lin,

130 W COLLEGE - REQUEST FOR WASTEWATER SERVICE INFORMATION

This is in response to your June 19, 2023 letter requesting a review of your proposed project located at 130, 114 West College Street and 117, 119 West Bruno Street and 973, 971, 963, 959, 955, 953, 949, 945, 943 North Main Street, Los Angeles, CA 90012. The project will consist of office building. LA Sanitation has conducted a preliminary evaluation of the potential impacts to the wastewater and stormwater systems for the proposed project.

.

WASTEWATER REQUIREMENT

LA Sanitation, Wastewater Engineering Services Division (WESD) is charged with the task of evaluating the local sewer conditions and to determine if available wastewater capacity exists for future developments. The evaluation will determine cumulative capacity impacts and guide the planning process for any future sewer improvement projects needed to provide future capacity as the City grows and develops.

Projected Wastewater Discharges for the Proposed Project:

Type Description	Average Daily Flow per Type Description (GPD/UNIT)	Proposed No. of Units	Average Daily Flow (GPD)
Proposed			
Restaurant	30 GPD/1 Seat	30 Seats	4,080

Office Building	120 GPD/1000 SQ.FT	113,939 SQ.FT	13,673
Office Building	120 GPD/1000 SQ.FT	110,658 SQ.FT	13,279
Retail	25 GPD/1000 SQ.FT	4,110 SQ.FT	103
Total			**31,135 GPD**

SEWER AVAILABILITY

The sewer infrastructure in the vicinity of the proposed project includes an existing 15-inch line on N Alameda St. The sewage from the existing 15-inch line feeds into an 18-inch line on Alameda St before discharging into a 30-inch sewer line on Los Angeles St. Figure 1 shows the details of the sewer system within the vicinity of the project. The current flow level (d/D) in the 18-inch line cannot be determined at this time without additional gauging.

The current approximate flow level (d/D) and the design capacities at d/D of 50% in the sewer system are as follows:

Pipe Diameter (in)	Pipe Location	Current Gauging d/D (%)	50% Design Capacity
15	N Alameda St.	*	1.16 MGD
18	Alameda St.	25	2.36 MGD
30	Los Angeles St.	17	7.78 MGD

* No gauging available

Based on estimated flows, it appears the sewer system might be able to accommodate the total flow for your proposed project. Further detailed gauging and evaluation will be needed as part of the permit process to identify a specific sewer connection point. If the public sewer lacks sufficient capacity, then the developer will be required to build sewer lines to a point in the sewer system with sufficient capacity. A final approval for sewer capacity and connection permit will be made at the time. Ultimately, this sewage flow will be conveyed to the Hyperion Water Reclamation Plant, which has sufficient capacity for the project.

All sanitary wastewater ejectors and fire tank overflow ejectors shall be designed, operated, and maintained as separate systems. All sanitary wastewater ejectors with ejection rates greater than 30 GPM shall be reviewed and must be approved by LASAN WESD staff prior to other City plan check approvals. Lateral connection of development shall adhere to Bureau of Engineering Sewer Design Manual Section F 480.

This response letter is not intended to address any potential utility conflicts associated with the wastewater or stormwater conveyance systems. Construction of any type near any wastewater or stormwater conveyance infrastructure in the public right of way, or in/near any conveyance easement must be evaluated separately.

If you have any questions, please call Than Win at (323) 342-6268 or email at than.win@lacity.org.

STORMWATER REQUIREMENTS

LA Sanitation, Stormwater Program is charged with the task of ensuring the implementation of the Municipal Stormwater Permit requirements within the City of Los Angeles. We anticipate the following requirements would apply for this project.

POST-CONSTRUCTION MITIGATION REQUIREMENTS

In accordance with the Municipal Separate Storm Sewer (MS4) National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R4-2012-0175, NPDES No. CAS004001) and the City of Los Angeles Stormwater and Urban Runoff Pollution Control requirements (Chapter VI, Article 4.4, of the Los Angeles Municipal Code), the Project shall comply with all mandatory provisions to the Stormwater Pollution Control Measures for Development Planning (also known as Low Impact Development [LID] Ordinance). Prior to issuance of grading or building permits, the applicant shall submit a LID Plan to the City of Los Angeles, Public Works, LA Sanitation, Stormwater Program for review and approval. The LID Plan shall be prepared consistent with the requirements of the Planning and Land Development Handbook for Low Impact Development.

Current regulations prioritize infiltration, capture/use, and then biofiltration as the preferred stormwater control measures. The relevant documents can be found at: www.lacitysan.org. It is advised that input regarding LID requirements be received in the preliminary design phases of the project from plan-checking staff. Additional information regarding LID requirements can be found at: www.lacitysan.org or by visiting the stormwater public counter at 201 N. Figueroa, 2nd Fl, Suite 280.

GREEN STREETS

The City is developing a Green Street Initiative that will require projects to implement Green Street elements in the parkway areas between the roadway and sidewalk of the public right-of-way to capture and retain stormwater and urban runoff to mitigate the impact of stormwater runoff and other environmental concerns. The goals of the Green Street elements are to improve the water quality of stormwater runoff, recharge local groundwater basins, improve air quality, reduce the heat island effect of street pavement, enhance pedestrian use of sidewalks, and encourage alternate means of transportation. The Green Street elements may include infiltration systems, biofiltration swales, and permeable pavements where stormwater can be easily directed from the streets into the parkways and can be implemented in conjunction with the LID requirements. Green Street standard plans can be found at: https://eng2.lacity.org/techdocs/stdplans/index.htm

CONSTRUCTION REQUIREMENTS

All construction sites are required to implement a minimum set of BMPs for erosion control, sediment control, non-stormwater management, and waste management. In addition, construction sites with active grading permits are required to prepare and implement a Wet Weather Erosion Control Plan during the rainy season between October 1 and April 15. Construction sites that disturb more than one-acre of land are subject to the NPDES Construction General Permit issued by the State of California, and are required to prepare, submit, and implement the Storm Water Pollution Prevention Plan (SWPPP).

If there are questions regarding the stormwater requirements, please call WPP's plan-checking counter at (213) 482-7066. WPD's plan-checking counter can also be visited at 201 N. Figueroa, 2nd Fl, Suite 280.

GROUNDWATER DEWATERING REUSE OPTIONS

The Los Angeles Department of Water and Power (LADWP) is charged with the task of supplying water and power to the residents and businesses in the City of Los Angeles. One of the sources of water includes groundwater. The majority of groundwater in the City of Los Angeles is adjudicated, and the rights of which are owned and managed by various parties. Extraction of groundwater within the City from any depth by law requires metering and regular reporting to the appropriate

Court-appointed Watermaster. LADWP facilitates this reporting process, and may assess and collect associated fees for the usage of the City's water rights. The party performing the dewatering should inform the property owners about the reporting requirement and associated usage fees.

On April 22, 2016 the City of Los Angeles Council passed Ordinance 184248 amending the City of Los Angeles Building Code, requiring developers to consider beneficial reuse of groundwater as a conservation measure and alternative to the common practice of discharging groundwater to the storm drain (SEC. 99.04.305.4). It reads as follows: "Where groundwater is being extracted and discharged, a system for onsite reuse of the groundwater, shall be developed and constructed. Alternatively, the groundwater may be discharged to the sewer."

Groundwater may be beneficially used as landscape irrigation, cooling tower make-up, and construction (dust control, concrete mixing, soil compaction, etc.). Different applications may require various levels of treatment ranging from chemical additives to filtration systems. When onsite reuse is not available the groundwater may be discharged to the sewer system. This allows the water to be potentially reused as recycled water once it has been treated at a water reclamation plant. If groundwater is discharged into the storm drain it offers no potential for reuse. The onsite beneficial reuse of groundwater can reduce or eliminate costs associated with sewer and storm drain permitting and monitoring. Opting for onsite reuse or discharge to the sewer system are the preferred methods for disposing of groundwater.

To help offset costs of water conservation and reuse systems, LADWP offers a Technical Assistance Program (TAP), which provides engineering and technical assistance for qualified projects. Financial incentives are also available. Currently, LADWP provides an incentive of $1.75 for every 1,000 gallons of water saved during the first two years of a five-year conservation project. Conservation projects that last 10 years are eligible to receive the incentive during the first four years. Other water conservation assistance programs may be available from the Metropolitan Water District of Southern California. To learn more about available water conservation assistance programs, please contact LADWP Rebate Programs 1-888-376-3314 and LADWP TAP 1-800-544-4498, selection "3".

For more information related to beneficial reuse of groundwater, please contact Greg Reed, Manager of Water Rights and Groundwater Management, at (213)367-2117 or greg.reed@ladwp.com.

SOLID RESOURCE REQUIREMENTS

The City has a standard requirement that applies to all proposed residential developments of four or more units or where the addition of floor areas is 25 percent or more, and all other development projects where the addition of floor area is 30 percent or more. Such developments must set aside a recycling area or room for onsite recycling activities. For more details of this requirement, please contact LA Sanitation Solid Resources Recycling hotline 213-922-8300.

Sincerely,

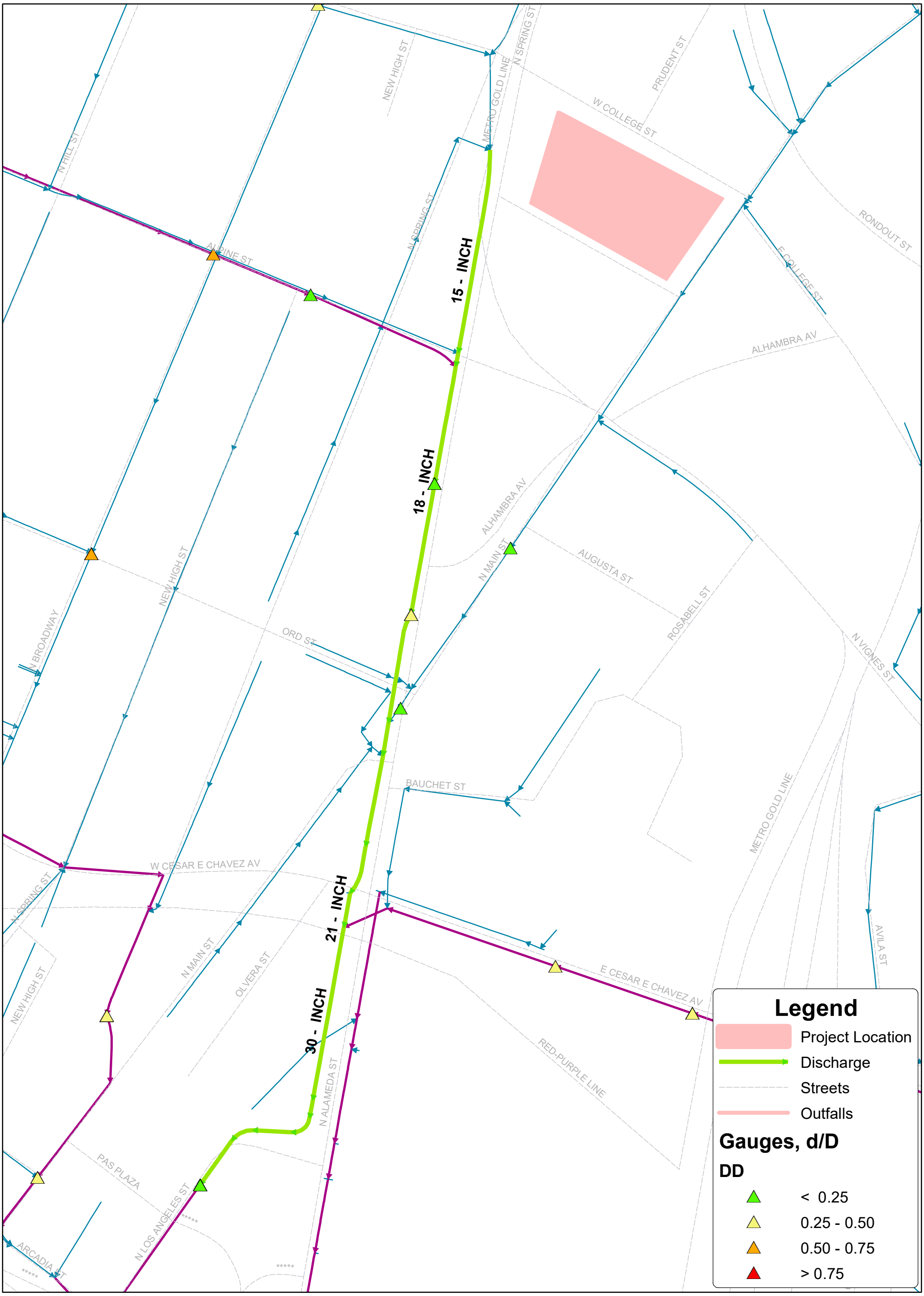
Rowena Lau, Division Manager
Wastewater Engineering Services Division
LA Sanitation and Environment

RL/TW: sa

File Location: CEQA Review\FINAL CEQA Response LTRs\FINAL DRAFT\130 W College - Request for WWSI.docx

Attachment: Figure 1 - Sewer Map

c: Julie Allen, LASAN
Michael Scaduto, LASAN
Spencer Yu, LASAN
Than Win, LASAN



Wastewater Engineering Services Division
Bureau of Sanitation
City of Los Angeles

Figure 1
130 W COLLEGE ST
Sewer Map

N
W E
S

0 62.5125 250 375 500
Feet

Thomas Brother Data reproduced with permission granted by THOMAS BROS MAP

Appendix A.2

Notice of Preparation (NOP)

LOS ANGELES DEPARTMENT OF CITY PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

NOTICE OF PREPARATION
OF ENVIRONMENTAL IMPACT REPORT AND PUBLIC SCOPING MEETING

June 04, 2024

Puede obtener información en Español acerca de esta junta llamando al (213) 847-3625.

ENVIRONMENTAL CASE NO.:	ENV-2023-2307-EIR
PROJECT NAME:	130 College Project
PROJECT APPLICANT:	S&R Partners, LLC
PROJECT ADDRESS:	110–130 West College Street, 117-119 West Bruno Street, and 943–973 North Main Street, Los Angeles, CA 90012
COMMUNITY PLAN AREA:	Central City North
COUNCIL DISTRICT:	1—Hernandez
PUBLIC COMMENT PERIOD:	June 04, 2024–July 5, 2024
PUBLIC SCOPING MEETINGS:	June 12,2024: English; June 13, 2024: Spanish; June 18, 2024: Mandarin; June 20, 2024: Cantonese; Start time for all meetings: 5:30 P.M. See below for additional information.

The City of Los Angeles (City) intends to prepare an Environmental Impact Report (EIR) for the 130 College Project (Project). In accordance with Section 15082 of the California Environmental Quality Act (CEQA) Guidelines, the City has prepared this Notice of Preparation to provide the public, nearby residents and property owners, responsible agencies, and other interested parties with information regarding the Project and its potential environmental effects. The EIR will be prepared by outside consultants under the supervision of the City of Los Angeles, Department of City Planning.

The City requests your written comments as to the scope and contents of the EIR, including mitigation measures or project alternatives to reduce potential environmental impacts from the Project. Comments must be submitted in writing according to the directions below. If you represent a public agency, the City seeks written comments as to the scope and content of the environmental information in the EIR that are germane to your agency's statutory responsibilities in connection with the Project. Your agency may need to use the EIR prepared by the City when considering your permit or other approval for the Project.

A Public Scoping Meeting will be held to receive input as to what environmental topics the EIR should study. No decisions about the Project are made at the Public Scoping Meeting. Additional Project details, meeting information, and instructions for public comment submittal are listed below.

PROJECT LOCATION AND EXISTING ON-SITE USES:
The Project is comprised of approximately 2.2 acres. The Project Site is bounded by West College Street to the north, North Main Street to the east, Bruno Street to the south, and North Alameda Street to the west, within the Central City North Community Plan (see attached Project Location Map). The Project Site is currently developed with a surface parking lot used for bus storage, a billboard, parking lights, a cargo storage container, electric bus chargers, and fencing. There are no existing buildings, landscaping, or trees on the Project Site.

PROJECT DESCRIPTION:

The Project proposes the removal of the existing surface parking lot, to construct a new five-story with one mezzanine parking level, 232,802-square-foot commercial development consisting of 224,597 square feet of office, 4,095 square feet of restaurants, and 4,110 square feet of retail on an approximately 2.2-acre site, resulting in a Floor Area Ratio (FAR) of 2.42:1. The Project would have a maximum height of 88 feet and includes parking in one subterranean level, one at-grade level, and one above-grade mezzanine level.

Summary of Existing and Proposed Floor Area[1]

Land Use	Floor Area
Existing (All to Be Removed)	
Surface Parking Lot	0 sf
Total Existing Floor Area to Be Removed	*0 sf*
New Construction (per LAMC)	
General Office	224,597 sf
Restaurant	4,095 sf
Retail	4,110 sf
Total New Construction	*232,802 sf*
Total Floor Area Upon Completion (LAMC)	**232,802 sf**
New Construction (Non-LAMC)[2]	
Restaurant (Outdoor Seating)	1,799 sf
Total Square Footage Upon Completion (Non-LAMC)	**234,601 sf**

sf = square feet

[1] *Square footage is calculated pursuant to the LAMC definition of floor area for the purpose of calculating FAR. In accordance with LAMC Section 12.03, floor area is defined as "[t]he area in square feet confined within the exterior walls of a building, but not including the area of the following: exterior walls, stairways, shafts, rooms housing building-operating equipment or machinery, parking areas with associated driveways and ramps, space for the landing and storage of helicopters, and basement storage areas."*

[2] *The Project would include approximately 1,799 square feet of outdoor uncovered dining area adjacent to the ground floor restaurant, which is not considered "Floor Area", as defined in the LAMC, but is nevertheless counted towards the Project's restaurant area for purposes of this environmental analysis. As such, for purposes of this environmental analysis, the Project would include 5,894 square feet of restaurant space.*

Source: Eyestone Environmental, 2024.

REQUESTED ACTIONS:

1. Pursuant to LAMC Section 11.5.6, a General Plan Amendment to amend Central City North Community Plan Footnote No. 7 to allow the FAR for commercial development at the Project Site to exceed 1.5:1;

2. Pursuant to LAMC Sections 12.32 F and 12.32 Q, a Vesting Zone and Height District Change to change the zoning for the Project Site from [Q]C2-2-RIO and [T][Q]C2-2-RIO to (T)(Q)C2-2D-RIO;

3. Pursuant to LAMC Section 12.24 W.1, a Main Conditional Use Permit for the sale and dispensing of a full-line of alcohol beverages for on- and off-site consumption within up to three establishments, in connection with the proposed restaurant and retail spaces;

4. Pursuant to LAMC Section 16.05, Site Plan Review for a development which creates, or results in an increase of, 50,000 gross square feet or more of nonresidential floor area;

5. Pursuant to LAMC Sections 17.03 and 17.15, a Vesting Tentative Tract Map for the merger and re-subdivision of 17 lots into one (1) ground lot and 16 airspace lots; and a Haul Route for 67,791 cubic yards of soil export; and

6. Other discretionary and ministerial permits that may be deemed necessary, including, but not limited to, temporary street closure permits, grading permits, excavation permits, foundation permits, building permits, off-site or right-of-way encroachment permits, on-site and off-site tree removal permits, and sign permits.

POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROJECT:
Based on the Initial Study, the Project could have potentially significant environmental impacts in the following topic areas, which will be addressed in the EIR: Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Noise, Transportation, Tribal Cultural Resources, and Utilities and Service Systems.

PUBLIC SCOPING MEETING:
A Public Scoping Meeting will be held in an online virtual format to share information regarding the Project and the environmental review process. City staff, translators, environmental consultants, and Project representatives will be available during this meeting which will begin with a presentation. The City encourages all interested individuals and organizations to attend this meeting. After the Public Scoping Meeting has ended, a copy of the recorded meeting will be available on the Project website. A separate more detailed instructions page is included in this communication with details on where to access materials in Spanish, Mandarin, and Cantonese. No decisions about the Project will be made at the Public Scoping Meeting. A separate public hearing for LAMC entitlement requests will be scheduled after the completion of the EIR. The date, time, and virtual location of the Public Scoping Meetings are as follows:

English
Date: June 12, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/84623923558 or by phone dial US: +1 213 338 8477 or +1 669 900 9128, and enter Webinar ID: 846 2392 3558 followed by #. If asked for Participant ID, enter #.

Spanish
Date: June 13, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/85059361215 or by phone dial US: +1 669 900 9128 or +1 213 338 8477, and enter Webinar ID: 850 5936 1215 followed by #. If asked for Participant ID, enter #.

Mandarin
Date: June 18, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/88625149073 or by phone dial US: +1 669 900 9128 or +1 213 338 8477, and enter Webinar ID: 886 2514 9073 followed by #. If asked for Participant ID, enter #.

Cantonese
Date: June 20, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/86249313543 or by phone dial US: +1 669 900 9128 or +1 213 338 8477, and enter Webinar ID: 862 4931 3543 followed by #. If asked for Participant ID, enter #.

FILE REVIEW AND COMMENTS:

A copy of this notice, the Initial Study prepared for the Project, appendices, and translated materials may be viewed with the environmental file or online at https://planning.lacity.gov/development-services/eir/130-College-project.

The environmental file also may be available for public review, by appointment only, at the City of Los Angeles, Department of City Planning, 221 North Figueroa Street, Suite 1350, Los Angeles, CA 90012, during office hours Monday–Friday, 9:00 A.M.–4:00 P.M. Please contact the Staff Planner listed below to schedule an appointment.

The City will consider all written comments regarding the potential environmental impacts of the Project and issues to be addressed in the EIR. If you wish to submit comments, please reference the Environmental Case Number above, and submit them in writing by **July 05, 2024, no later than 4:30 P.M.**

Please direct your written comments to:

Mail:	Michael Gatheru City of Los Angeles, Department of City Planning 221 North Figueroa Street, Room 1350 Los Angeles, CA 90012
E-mail:	michael.gatheru@lacity.org

ACCOMMODATIONS:
As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability. Sign language interpreters, assistive listening devices, or other auxiliary aids and/or services may be provided upon request. Other services, such as translation between English and other languages, may also be provided upon written request submitted a minimum of seven (7) working days in advance to: per.planning@lacity.org. Be sure to identify the language you need English to be translated into, and indicate if the request is for oral or written translation services. If translation of a written document is requested, please include the document to be translated as an attachment to your email.

VINCENT P. BERTONI, AICP
Director of Planning



Michael Gatheru, Planning Assistant
Department of City Planning
(213) 756-1699

Attachments:

Project Location Map
Conceptual Site Plan
Zoom Instructions



Figure 1
Project Location Map

Source: ArcGIS, 2023; Eyestone Environmental, 2023.

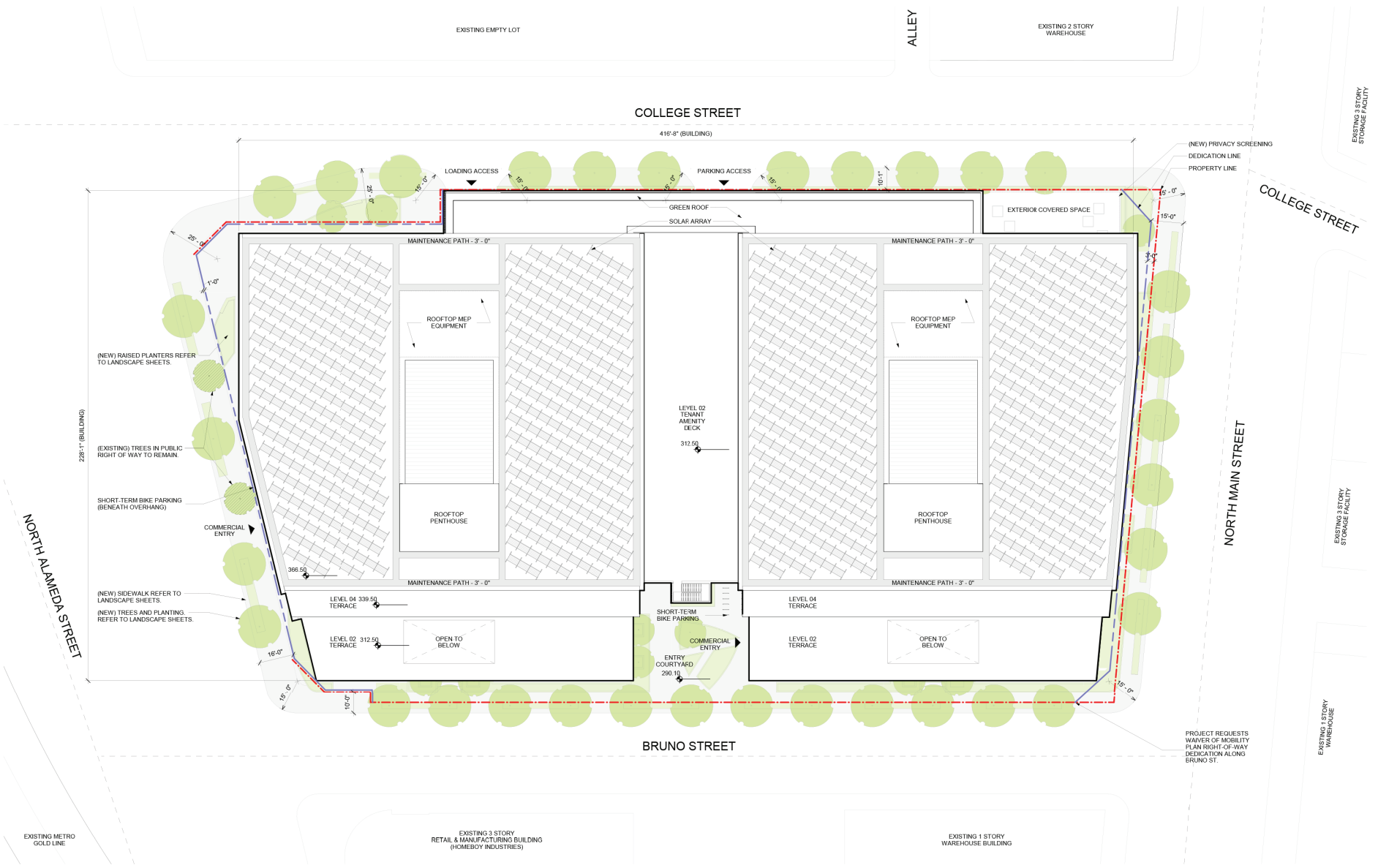


Figure 2
Conceptual Site Plan

Source: Grimshaw Architects, LLP.

DEPARTMENT OF CITY PLANNING

COMMISSION OFFICE
(213) 978-1300

CITY PLANNING COMMISSION

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CALIFORNIA

KAREN BASS
MAYOR

EXECUTIVE OFFICES
200 N. SPRING STREET, ROOM 525
LOS ANGELES, CA 90012-4801
(213) 978-1271

VINCENT P. BERTONI, AICP
DIRECTOR

SHANA M.M. BONSTIN
DEPUTY DIRECTOR

HAYDEE URITA-LOPEZ
DEPUTY DIRECTOR

ARTHI L. VARMA, AICP
DEPUTY DIRECTOR

LISA M. WEBBER, AICP
DEPUTY DIRECTOR

RE: **Zoom Meeting Instructions for (130 College Project) Scoping Meeting** – (110-130 West College Street, 117-119 West Bruno Street, and 943-973 North Main Street, Los Angeles, CA 90012 (Case No. ENV-2023-2307-EIR)

How to participate in the Virtual Public Scoping Meeting

Thank you for participating in the Virtual Public Scoping Meeting. In this meeting you will learn more about the 130 College Project (ENV-2023-2307-EIR) and have an opportunity to ask questions about the Project as well as provide input as to what environmental topics the Environmental Impact Report of the Project should study. For this Virtual Public Scoping Meeting we will be using Zoom as our virtual platform. To participate you will need access to a computer, tablet, smartphone, or telephone. Please follow the instructions below to participate.

English Language Instructions:

1. To join the Scoping Meeting via your computer, smartphone, or tablet, use the link on the Notice of Preparation or go to zoom.us and enter the Webinar ID 846 2392 3558**.**
2. Or, join the meeting via phone dial: US: +1 669 900 9128 or +1 213 338 8477, and when prompted, enter the Webinar ID 846 2392 3558 followed by #. When prompted for a participant ID, please press #.
3. After the presentation has ended, raise your hand via the “raise hand” button on the Zoom platform (or press *9 on your phone). City Staff will call out each person wishing to speak and will unmute you for the duration of your comment or question. If you require translation, please indicate so after you are called on to speak, Translation staff will assist you in both commenting and translating responses from City Staff and members of the Applicant Team.
4. Public Comment may be provided during the Scoping meeting or submitted after the Scoping Meeting to City Planning Staff through regular mail or e-mail. Please follow the instructions provided on the Notice of Preparation. Comments will be accepted in any language and will be translated and added to the record for the Project.

Note: If you experience any technical difficulties during the meeting: Click the hand raise button (if using a computer) or press *9 if using a telephone.

LOS ANGELES DEPARTMENT OF CITY PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

NOTICE OF PREPARATION
OF ENVIRONMENTAL IMPACT REPORT AND PUBLIC SCOPING MEETING

04 de junio de 2024

Puede obtener información en Español acerca de esta junta llamando al (213) 847-3625.

CASO AMBIENTAL Nº:	ENV-2023-2307-EIR
NOMBRE DEL PROYECTO:	130 College
SOLICITANTE DEL PROYECTO:	S&R Partners, LLC
DIRECCIÓN DEL PROYECTO:	110–130 West College Street, 117-119 West Bruno Street y 943–973 North Main Street, Los Ángeles, CA 90012
ÁREA DEL PLAN COMUNITARIO:	Centro de la Ciudad Norte
DISTRITO DEL CONCEJO:	1—Hernandez
PERÍODO DE COMENTARIOS PÚBLICOS:	Del 04 de junio de 2024 al 5 de julio de 2024
REUNIONES PÚBLICAS DE ALCANCE:	12 de junio de 2024: inglés; 13 de junio de 2024: español; 18 de junio de 2024: mandarín; 20 de junio de 2024: cantonés; Hora de inicio de todas las reuniones: 5:30 P.M. Consulte a continuación para obtener información adicional.

La Ciudad de Los Ángeles (Ciudad) tiene la intención de preparar un Informe de Impacto Ambiental (EIR, por sus siglas en inglés) para el Proyecto 130 College (Proyecto). De acuerdo con la Sección 15082 de las Pautas de la Ley de Calidad Ambiental de California (CEQA, por sus siglas en inglés), la Ciudad ha preparado este Aviso de Preparación para proporcionar al público, a los residentes y propietarios cercanos, a las agencias responsables y a otras partes interesadas información sobre el Proyecto y sus posibles efectos ambientales. El EIR será preparado por consultores externos bajo la supervisión del Departamento de Planificación Urbana de la Ciudad de Los Ángeles.

La Ciudad solicita sus comentarios por escrito sobre el alcance y el contenido del EIR, incluidas las medidas de mitigación o las alternativas del Proyecto para reducir los posibles impactos ambientales del Proyecto. Los comentarios deben enviarse por escrito de acuerdo con las instrucciones a continuación. Si usted representa a una agencia pública, la Ciudad busca comentarios por escrito sobre el alcance y el contenido de la información ambiental en el EIR que estén relacionados con las responsabilidades estatutarias de su agencia en relación con el Proyecto. Es posible que su agencia necesite usar el EIR preparado por la Ciudad al considerar su permiso u otra aprobación para el Proyecto.

Se llevará a cabo una reunión pública de alcance para recibir comentarios sobre los temas ambientales que debe estudiar el EIR. No se toman decisiones sobre el Proyecto en la Reunión Pública de Alcance. A continuación se enumeran detalles adicionales del proyecto, información de la reunión e instrucciones para la presentación de comentarios públicos.

UBICACIÓN DEL PROYECTO Y USOS EXISTENTES EN EL SITIO:
El sitio del proyecto se compone de aproximadamente 2.2 acres. El sitio del proyecto está delimitado por West College Street al norte, North Main Street al este, Bruno Street al sur y North Alameda Street al oeste, dentro del Plan Comunitario Central City North (consulte el Mapa de ubicación del proyecto adjunto). El sitio del proyecto se desarrolla actualmente con un estacionamiento de superficie utilizado para almacenamiento de autobuses, una valla publicitaria, luces de estacionamiento, un contenedor de almacenamiento de carga, cargadores de autobuses eléctricos y cercas. No hay edificios, jardines o árboles existentes en el sitio del proyecto.

DESCRIPCIÓN DEL PROYECTO:

El Proyecto propone la remoción del estacionamiento de superficie existente, para construir un nuevo edificio de cinco pisos con un nivel de estacionamiento en el entrepiso, un desarrollo comercial de 232,802 pies cuadrados que consta de 224,597 pies cuadrados de oficinas, 4,095 pies cuadrados de restaurantes y 4,110 pies cuadrados de tiendas en un sitio de aproximadamente 2.2 acres, lo que resulta en una Relación de Área de Piso (FAR) de 2.42:1. El proyecto tendría una altura máxima de 88 pies e incluye estacionamiento en un nivel subterráneo, en un nivel a nivel y en un nivel intermedio sobre el nivel del suelo.

Resumen de la Superficie Existente y Propuesta[1]

Uso de la tierra	Superficie del suelo
Existente (todo por eliminar)	
Estacionamiento en superficie	0 pc
Superficie total existente que se va a eliminar	*0 pc*
Construcción Nueva (según LAMC)	
Oficina General	224,597 pc
Restaurante	4,095 pc
Venta al por menor	4,110 pc
Total de Nueva Construcción	*232,802 pc*
Área total de piso al finalizar (LAMC)	**232,802 pc**
Construcción Nueva (No-LAMC)[2]	
Restaurante (asientos al aire libre)	1,799 pc
Total de pies cuadrados al finalizar (No-LAMC)	**234,601 pc**

pc = pies cuadrados

[1] *Los pies cuadrados se calculan de acuerdo con la definición de LAMC de área de piso con el fin de calcular el FAR. De acuerdo con la Sección 12.03 de LAMC, el área de piso se define como "[l]a área en pies cuadrados confinada dentro de las paredes exteriores de un edificio, pero sin incluir el área de lo siguiente: paredes exteriores, escaleras, pozos, habitaciones que albergan equipos o maquinaria para operar edificios, áreas de estacionamiento con entradas y rampas asociadas, espacio para el aterrizaje y almacenamiento de helicópteros, y áreas de almacenamiento en el sótano."*

[2] *El Proyecto incluiría aproximadamente 1,799 pies cuadrados de área de comedor al aire libre adyacente al restaurante de la planta baja, que no se considera "Área de piso," según se define en el LAMC, pero que, sin embargo, se cuenta para el área de restaurante del Proyecto para fines de este análisis ambiental. Como tal, para los propósitos de este análisis ambiental, el Proyecto incluiría 5,894 pies cuadrados de espacio para restaurantes.*

Fuente: Eyestone Environmental, 2024.

ACCIONES SOLICITADAS:

1. De conformidad con la Sección 11.5.6 de LAMC, una Enmienda al Plan General para enmendar la Nota al Pie de Página No. 7 del Plan Comunitario de Central City North para permitir que el FAR para el desarrollo comercial en el Sitio del Proyecto exceda 1.5:1;

2. De conformidad con las Secciones 12.32 F y 12.32 Q de LAMC, un Cambio de Zona de Adquisición y Distrito de Altura para cambiar la zonificación del Sitio del Proyecto de [Q]C2-2-RIO y [T][Q]C2-2-RIO a (T)(Q)C2-2D-RIO;

3. De conformidad con la Sección 12.24 W.1 de LAMC, un Permiso de Uso Condicional Principal para la venta y dispensación de una línea completa de bebidas alcohólicas para consumo dentro y fuera del sitio dentro de hasta tres establecimientos, en relación con los espacios de restaurante y venta al por menor propuestos;

4. De conformidad con la Sección 16.05 de LAMC, Revisión del Plan del Sitio para un desarrollo que crea, o resulta en un aumento de, 50,000 pies cuadrados brutos o más de área de piso no residencial;

5. De conformidad con las Secciones 17.03 y 17.15 de LAMC, un Mapa de Tracto Tentativo de Adjudicación para la fusión y resubdivisión de 17 lotes en un (1) lote terrestre y 16 lotes de espacio aéreo; y una Ruta de Acarreo para 67,791 yardas cúbicas de exportación de suelo; y

6. Otros permisos discrecionales y ministeriales que se consideren necesarios, incluidos, entre otros, permisos de cierre temporal de calles, permisos de nivelación, permisos de excavación, permisos de cimentación, permisos de construcción, permisos de invasión fuera del sitio o derecho de paso, permisos de remoción de árboles dentro y fuera del sitio y permisos de señalización.

POSIBLES EFECTOS AMBIENTALES DEL PROYECTO:
Sobre la base del Estudio Inicial, el Proyecto podría tener impactos ambientales potencialmente significativos en las siguientes áreas temáticas, que se abordarán en el EIR: Calidad del Aire, Recursos Culturales, Energía, Geología y Suelos, Emisiones de Gases de Efecto Invernadero, Peligros y Materiales Peligrosos, Uso y Planificación de la Tierra, Ruido, Transporte, Recursos Culturales Tribales y Servicios Públicos y Sistemas de Servicios.

REUNIÓN PÚBLICA DE ALCANCE:
Se llevará a cabo una reunión pública de alcance en formato virtual en línea para compartir información sobre el Proyecto y el proceso de revisión ambiental. El personal de la ciudad, los traductores, los consultores ambientales y los representantes del proyecto estarán disponibles durante esta reunión, que comenzará con una presentación. La Ciudad anima a todas las personas y organizaciones interesadas a asistir a esta reunión. Una vez finalizada la Reunión Pública de Alcance, una copia de la reunión grabada estará disponible en el sitio web del Proyecto. En esta comunicación se incluye una página separada de instrucciones más detalladas con detalles sobre dónde acceder a los materiales en español, mandarín y cantonés. No se tomarán decisiones sobre el Proyecto en la Reunión Pública de Alcance. Se programará una audiencia pública separada para las solicitudes de derechos de LAMC después de la finalización del EIR. La fecha, la hora y la ubicación virtual de las Reuniones Públicas de Alcance son las siguientes:

Inglés
Fecha: 12 de junio de 2024
Hora: 5:30 P.M.
Ubicación virtual: Visite https://planning-lacity-org.zoom.us/j/84623923558 o por teléfono, marque EE. UU.: +1 213 338 8477 o +1 669 900 9128, e ingrese el ID del seminario web: 846 2392 3558 seguido de #. Si se le solicita el ID de participante, ingrese #.

Español
Fecha: 13 de junio de 2024
Hora: 5:30 P.M.
Ubicación virtual: Visite https://planning-lacity-org.zoom.us/j/85059361215 o por teléfono, marque EE. UU.: +1 669 900 9128 o +1 213 338 8477, e ingrese el ID del seminario web: 850 5936 1215 seguido de #. Si se le solicita el ID de participante, ingrese #.

Mandarín
Fecha: 18 de junio de 2024
Hora: 5:30 P.M.
Ubicación virtual: Visite https://planning-lacity-org.zoom.us/j/88625149073 o por teléfono, marque EE. UU.: +1 669 900 9128 o +1 213 338 8477, e ingrese el ID del seminario web: 886 2514 9073 seguido de #. Si se le solicita el ID de participante, ingrese #.

Cantonés
Fecha: 20 de junio de 2024
Hora: 5:30 P.M.
Ubicación virtual: Visite https://planning-lacity-org.zoom.us/j/86249313543 o por teléfono, marque EE. UU.: +1 669 900 9128 o +1 213 338 8477, e ingrese el ID del seminario web: 862 4931 3543 seguido de #. Si se le solicita el ID de participante, ingrese #.

REVISIÓN DE ARCHIVOS Y COMENTARIOS:

Una copia de este aviso, el Estudio Inicial preparado para el Proyecto, los apéndices y los materiales traducidos se pueden ver con el archivo ambiental o en línea en https://planning.lacity.gov/development-services/eir/130-College-project.

El archivo ambiental también puede estar disponible para revisión pública, solo con cita previa, en el Departamento de Planificación Urbana de la Ciudad de Los Ángeles, 221 North Figueroa Street, Suite 1350, Los Ángeles, CA 90012, durante el horario de oficina de lunes a viernes, de 9:00 A.M. a 4:00 P.M. Póngase en contacto con el planificador de personal que se indica a continuación para programar una cita.

La Ciudad considerará todos los comentarios escritos con respecto a los posibles impactos ambientales del Proyecto y los problemas que se abordarán en el EIR. Si desea enviar comentarios, consulte el número de caso ambiental anterior y envíelos por escrito antes del **5 de julio de 2024, a más tardar a las 4:30 P.M.**

Por favor dirija sus comentarios por escrito a:

Correo: Michael Gatheru
City of Los Angeles, Department of City Planning
221 North Figueroa Street, Room 1350
Los Angeles, CA 90012
Correo electrónico: michael.gatheru@lacity.org

ADAPTACIONES:
Como entidad cubierta por el Título II de la Ley de Estadounidenses con Discapacidades, la Ciudad de Los Ángeles no discrimina por motivos de discapacidad. Se pueden proporcionar intérpretes de lenguaje de señas, dispositivos de asistencia auditiva u otras ayudas y/o servicios auxiliares a pedido. También se pueden proporcionar otros servicios, como la traducción entre el inglés y otros idiomas, previa solicitud por escrito presentada con un mínimo de siete (7) días hábiles de anticipación a: per.planning@lacity.org. Asegúrese de identificar el idioma al que necesita traducir el inglés e indique si la solicitud es para servicios de traducción oral o escrita. Si se solicita la traducción de un documento escrito, incluya el documento a traducir como archivo adjunto a su correo electrónico.

VINCENT P. BERTONI, AICP
Director de Planificación



Michael Gatheru, Asistente de Planificación
Departamento de Planificación Urbana
(213) 756-1699

Accesorios:

Mapa de ubicación del proyecto
Plano conceptual del sitio
Instrucciones de Zoom



Figure 1
Project Location Map

Source: ArcGIS, 2023; Eyestone Environmental, 2023.

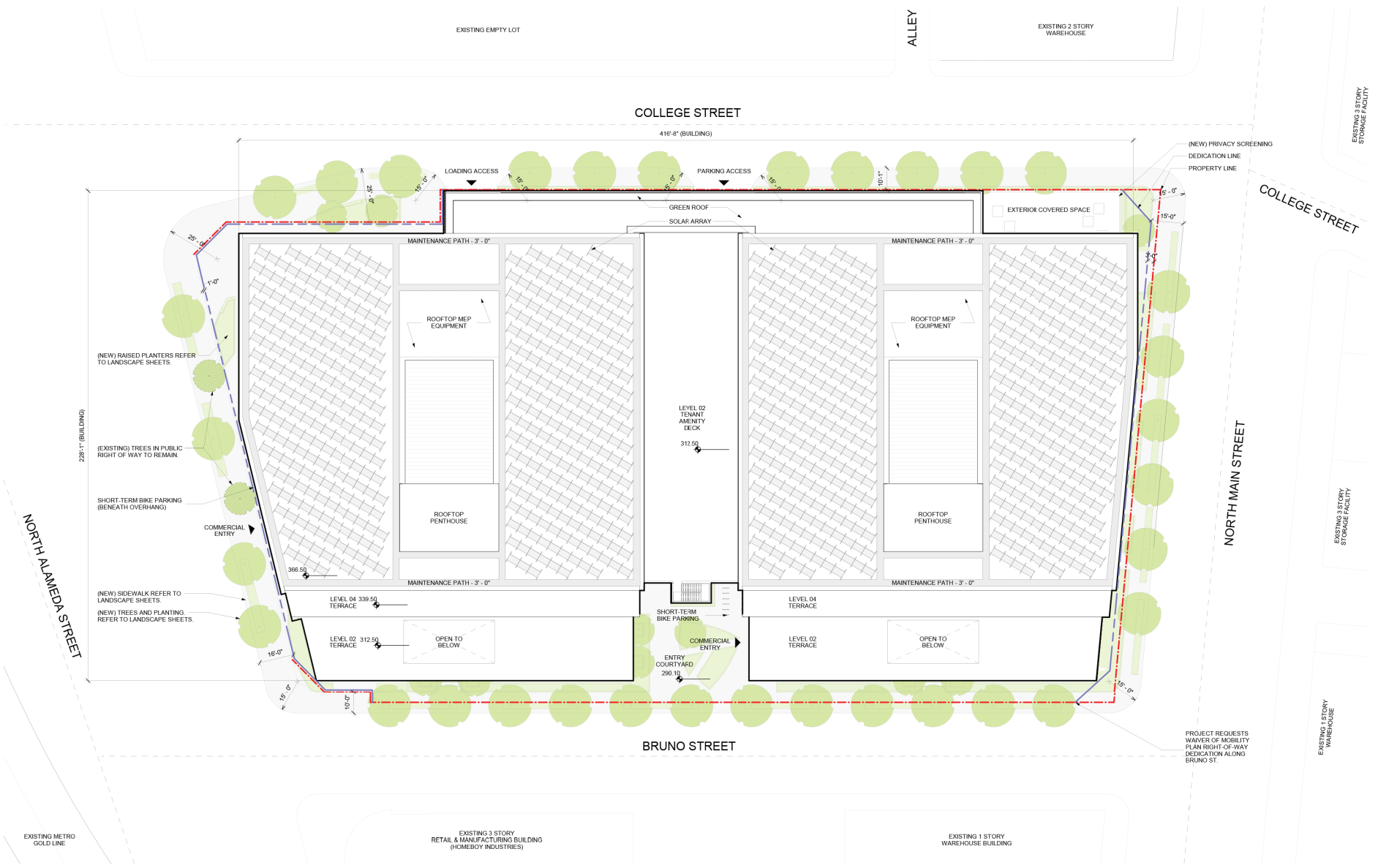


Figure 2
Conceptual Site Plan

Source: Grimshaw Architects, LLP.

DEPARTMENT OF CITY PLANNING

COMMISSION OFFICE
(213) 978-1300

CITY PLANNING COMMISSION

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DEPUTY DIRECTOR

RE: **Instrucciones para la reunión de Zoom para la reunión de alcance (130 College Project)** - (110-130 West College Street, 117-119 West Bruno Street y 943-973 North Main Street, Los Ángeles, CA 90012 (Caso No. ENV-2023-2307-EIR)

Cómo participar en la Reunión Pública Virtual de Alcance

Gracias por participar en la Reunión Pública Virtual de Alcance. En esta reunión, aprenderá más sobre el Proyecto 130 College (ENV-2023-2307-EIR) y tendrá la oportunidad de hacer preguntas sobre el Proyecto, así como proporcionar información sobre qué temas ambientales debe estudiar el Informe de Impacto Ambiental del Proyecto. Para esta Reunión Pública Virtual de Alcance, utilizaremos Zoom como nuestra plataforma virtual. Para participar necesitarás acceso a un ordenador, tableta, smartphone o teléfono. Siga las instrucciones a continuación para participar.

Instrucciones en español:

1. Para su comodidad, la presentación de la reunión de alcance ha sido traducida al español, mandarín y cantonés. Se puede acceder a la presentación para cada idioma a partir de la fecha en que reciba este aviso en la siguiente ubicación: https://planning.lacity.gov/development-services/eir/130-College-project.
2. Para unirse a la reunión de alcance a través de su computadora, teléfono inteligente o tableta, use el enlace en el Aviso de preparación o vaya a zoom.us e ingrese el ID del seminario web 850 5936 1215.
3. O bien, únase a la reunión por teléfono: EE. UU.: +1 669 900 9128 o +1 213 338 8477 y, cuando se le solicite, ingrese el ID del seminario web 850 5936 1215 seguido de #. Cuando se le solicite una identificación de participante, presione #.
4. Una vez finalizada la presentación, levante la mano a través del botón "levantar la mano" en la plataforma Zoom (o presione *9 en su teléfono). El personal de la ciudad llamará a cada persona que desee hablar y lo reactivará durante la duración de su comentario o pregunta. Si necesita traducción, indíquelo después de que se le llame para hablar, el personal de traducción lo ayudará a comentar y traducir las respuestas del personal de la ciudad y los miembros del equipo de solicitantes.
5. Los comentarios públicos pueden proporcionarse durante la reunión de alcance o enviarse después de la reunión de alcance al personal de planificación de la ciudad por correo postal o correo electrónico. Siga las instrucciones proporcionadas en el Aviso de preparación. Los comentarios se aceptarán en cualquier idioma y se traducirán durante la reunión y se agregarán al registro del Proyecto.

Nota: Si experimenta alguna dificultad técnica durante la reunión: Haga clic en el botón de levantar la mano (si usa una computadora) o presione *9 si usa un teléfono.

LOS ANGELES DEPARTMENT OF CITY PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

NOTICE OF PREPARATION
OF ENVIRONMENTAL IMPACT REPORT AND PUBLIC SCOPING MEETING

2024 年 6 月 4 日

环境案件编号.:	ENV-2023-2307-EIR
项目名称:	130 College 项目
项目申请方:	S&R Partners, LLC
项目地址:	110–130 West College Street, 117-119 West Bruno Street, and 943–973 North Main Street, Los Angeles, CA 90012
社区规划区域:	中心城市北部
市议会辖区:	1—Hernandez
公众意见征集期:	2024 年 6 月 4 日至 2024 年 7 月 5 日
公众范围界定会议:	2024 年 6 月 12 日：英语；2024 年 6 月 13 日：西班牙语；2024 年 6 月 18 日：普通话；2024 年 6 月 20 日：粤语；会议开始时间均为：下午 5:30。详情请查看以下信息。

洛杉矶市（以下简称“市政府”）将为 130 College 项目（以下简称“项目”）编制一份环境影响报告（EIR）。市政府根据《加利福尼亚州环境质量法案》（CEQA）准则第 15082 条规定，编制了本项目的立项通知，以向公众、附近居民和业主、相关机构以及其他有关各方提供关于该项目及其潜在环境影响的信息。本项目的环境影响报告（EIR）文件将在洛杉矶市城市规划部门的监督下，由外部顾问编制。

市政府诚邀各界就环境影响报告（EIR）所包含的环境信息范围和内容提出书面意见，其中包括减少该项目的潜在环境影响的缓解措施或项目替代方案。具体意见请按照以下指示以书面形式递交。对于公共机构的代表，市政府会就环境影响报告（EIR）中与您的机构相关法定职责有关的环境信息范围和内容征求您的书面意见。您所在的机构在考虑对该项目授予许可或其他审批时，可能需要参考市政府编制的环境影响报告（EIR）。

市政府将举行一次公众范围界定会议，就环境影响报告（EIR）中应研究哪些环境课题听取意见。公众范围界定会议不会对该项目做出任何决定。关于该项目的详情、会议信息以及如何提供公众意见的说明，请参见下文。

项目位置和现状场地用途:

该项目占地约 2. 2 英亩。项目用地位于中心城市北部社区规划区内，北至 West College Street，东至 North Main Street，南至 Bruno Street，西至 North Alameda Street （请见附带项目位置地图）。目前，该项目用地上有一个地面停车场、一面大型广告牌、停车场照明灯、一个货物储存集装箱、电动公交车充电器以及围栏。项目用地上没有现有建筑、绿化或者树木。

项目描述:

该项目打算拆除现有的地面停车场，在占地约 2.2 英亩的用地上建设一个 5 层高且带有一层停车夹层、建筑面积为 232,802 平方英尺的新的商业开发项目，其中包含了 224,597 平方英尺的办公空间、4,095 平方英尺的餐厅和 4,110 平方英尺的零售空间，建筑容积率（FAR）为 2.42:1。该项目最高建筑高度为 88 英尺，包含一层地下停车场、一层地面停车场以及一层夹层停车场。

现状及拟建建筑面概述 [1]

土地用途	建筑面积
现状（全部拆除）	
地面停车场	0 平方英尺
总的被拆除的现用建筑面积	*0 平方英尺*
新建设（洛杉矶市政法规）	
综合办公	224,597 平方英尺
餐饮	4,095 平方英尺
零售	4,110 平方英尺
总的新建筑面积	*232,802 平方英尺*
完工后的总建筑面积（洛杉矶市政法规）	**232,802 平方英尺**
新建筑面积（非洛杉矶市政法规） [2]	
餐饮（室外座位）	1,799 平方英尺
完工后的总建筑面积（非洛杉矶市政法规）	**234,601 平方英尺**

sf = 平方英尺

[1] *“建筑面积”是根据《洛杉矶市政法规》中为计算建筑容积率对建筑面积定义来进行计算的。根据《洛杉矶市政法规》第 12.03 条规定，建筑面积被定义为：“被建筑外墙围住的平方英尺的面积，但不包括以下面积”外墙、楼梯、竖井、容纳建筑操作设备或机械的房间、附带车道和坡道的停车空间、直升飞机着陆和存放空间、以及地下储藏空间。”*

[2] *该项目将包含约 1,799 平方英尺的毗邻一层餐厅的室外露天餐饮区。这部分区域的面积不被《洛杉矶市政法规》定义为 “建筑面积”，但是在本环境分析中仍算入该项目的餐饮面积。因此，就本环境分析而言，该项目将包括 5,894 平方英尺的餐饮空间。*

来源： Eyestone Environmental, 2024.

申请批准许可:

1. 根据《洛杉矶市政法规》（LAMC）第 11.5.6 条，总体规划修正，以修订中心城市北部的社区规划区的脚注第 7 条，允许在该项目场地的商业发展建筑容积率超过 1.5:1；

2. 根据《洛杉矶市政法规》（LAMC）第 12.32 F 条和第 12.32 Q 条，归属区划和高度分区变更，将项目场地从[Q]C2-2-RIO 和 [T][Q]C2-2-RIO 变更为 (T)(Q)C2-2D-RIO；

3. 根据《洛杉矶市政法规》（LAMC）第 12.24 W.1 条，主要条件使用许可，允许最多三家涉及餐厅或零售空间的场所销售及提供场所内和场所外的所有酒精类饮品；

4. 根据《洛杉矶市政法规》（LAMC）第 16.05 条，对于增加不少于 50,000 平方尺的非住宅建筑面积的开发进行场地规划评审；

5. 根据《洛杉矶市政法规》（LAMC）第 17.03 条和第 17.15 条，归属暂定分区地图，把 17 个地块合并并重新划分为 1 个地面地块和 16 个空中地块；并涉及一条向外运输 67,791 立方码土方的运输路线；以及

6. 其他可能被认为必要的酌情和法定许可，包括但不限于：临时封路许可、平整土地许可、挖掘许可、地基许可、建筑许可、场地外或路权侵占许可、场地内和场地外数目移除许可以及标志许可。

项目的潜在环境影响:
基于初步研究，项目可能在以下方面产生潜在的重大环境影响：空气质量、文化资源、能源、地质与土壤、温室气体排放、危险和有害物质、土地使用与规划、噪声、交通、部落文化资源，以及公共设施与服务系统。环境影响报告（EIR）将对以上这些问题进行分析。

公众范围界定会议:
公众范围界定会议将以线上虚拟形式进行，分享关于项目和环境评审过程的信息。该会议将以项目演示作为开始。市政府工作人员、翻译人员、环境顾问以及项目代表将出席该会议。市政府鼓励所有相关或感兴趣的个人和组织参加这次会议。本通知另外包括了一份更详细的说明页。这份说明页会提供如何获得西班牙语、普通话以及粤语的材料。公众范围界定会议不会对该项目做出任何决定。在环境影响报告（EIR）完成后，将就申请洛杉矶市政法规（LAMC）授权请求另行安排一次公众听证会。公众范围界定会议的日期、时间以及虚拟参会地点如下所示：

English
Date: June 12, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/84623923558 or by phone dial US: +1 213 338 8477 or +1 669 900 9128, and enter Webinar ID: 846 2392 3558 followed by #. If asked for Participant ID, enter #.

Spanish
Date: June 13, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/85059361215 or by phone dial US: +1 669 900 9128 or +1 213 338 8477, and enter Webinar ID: 850 5936 1215 followed by #. If asked for Participant ID, enter #.

普通话
日期: 2024年6月18日
时间: 下午5：30.
虚拟参会地点: 登录 https://planning-lacity-org.zoom.us/j/88625149073 或致电：+1 669 900 9128 或 +1 213 338 8477, 然后输入会议ID: 886 2514 9073，然后输入#号。 如果被要求输入参与者ID，请输入 #号。

Cantonese
Date: June 20, 2024
Time: 5:30 P.M.
Virtual Location: Visit https://planning-lacity-org.zoom.us/j/86249313543 or by phone dial US: +1 669 900 9128 or +1 213 338 8477, and enter Webinar ID: 862 4931 3543 followed by #. If asked for Participant ID, enter #.

文件查阅与意见提交:

本通知、为该项目编制的初步研究报告、副本以及翻译材料可以在环境文件中查看，或者在这个网址查看：https://planning.lacity.gov/development-services/eir/130-College-project.

公众可在洛杉矶市城市规划局通过预约在办公时间查看环境文件，地址为：221 North Figueroa Street, Suite 1350, Los Angeles, CA 90012。办公时间为周一至周五，上午 9：00 至下午 4：00。请联系下方所示规划工作人员进行预约。

市政府将考虑所有有关该项目的潜在环境影响并在环境影响报告（EIR）中需要处理的问题的书面意见。如需要提交意见，请按前文所述的环境案件编号，在 2024 年 7 月 5 日下午 4：30 之前提交。

请将您的书面意见直接提交至：

邮寄: Michael Gatheru
City of Los Angeles, Department of City Planning
221 North Figueroa Street, Room 1350
Los Angeles, CA 90012
电邮: michael.gatheru@lacity.org

便利服务:
作为《美国残疾人法案》第 II 章的涵盖实体，洛杉矶市不可因任何残障状况而歧视，并根据具体要求提供手语翻译、辅助听觉设备，以及其他辅助性援助和/或服务。其他服务，如英语与其他语言之间的翻译，也可在提前至少 7 个工作日前提交书面申请（per.planning@lacity.org）后提供。请务必说明您所需要将英语翻译成哪一种语言，并指明需要口头翻译还是书面翻译服务。如需翻译书面文件，请在您的电子邮件中附上需要翻译的文件。

VINCENT P. BERTONI, AICP
规划局局长



Michael Gatheru, Planning Assistant
城市规划局
(213) 756-1699

附件:

项目位置地图
概念设计场地图
Zoom 会议说明



Figure 1
Project Location Map

Source: ArcGIS, 2023; Eyestone Environmental, 2023.

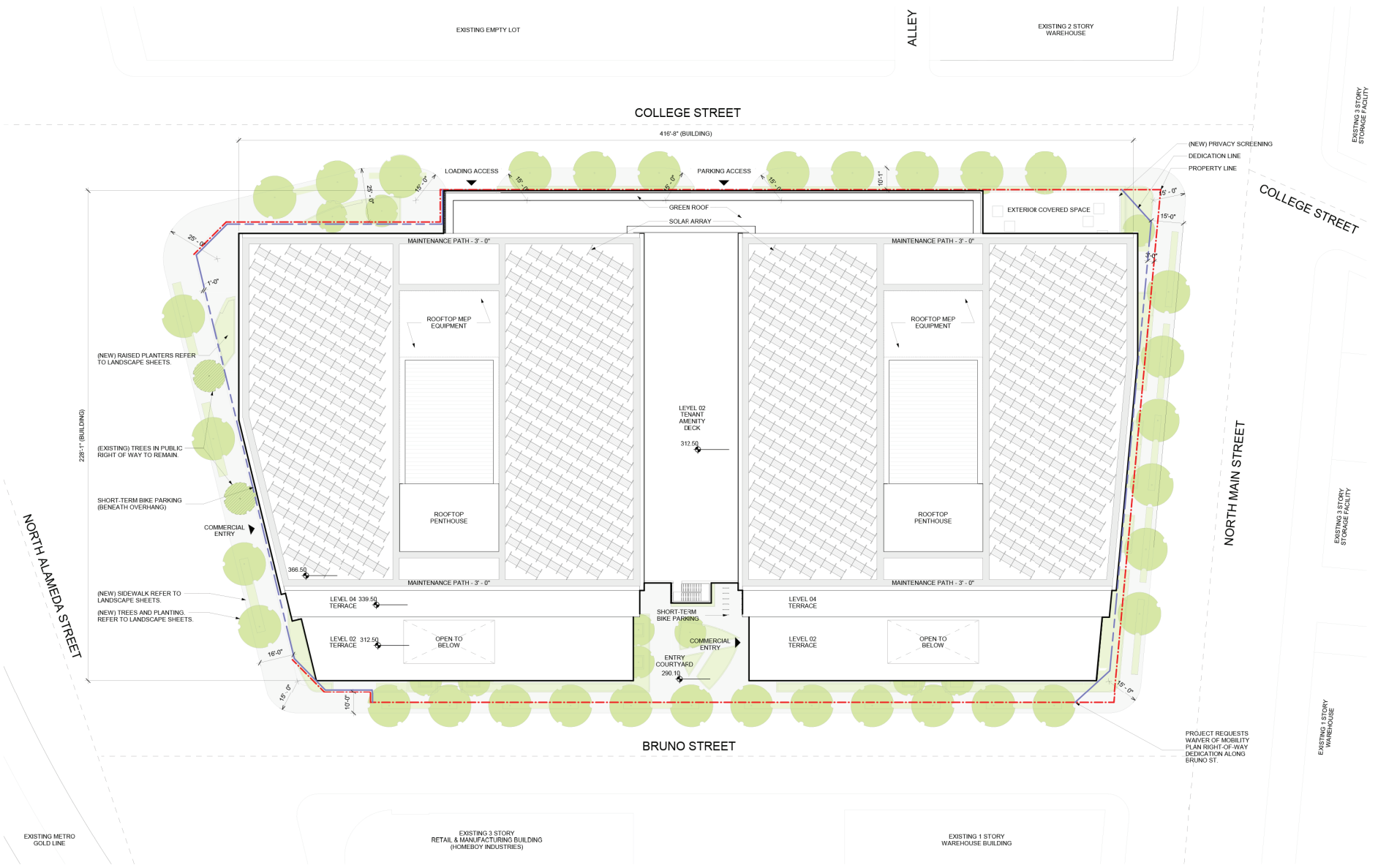


Figure 2
Conceptual Site Plan

Source: Grimshaw Architects, LLP.

DEPARTMENT OF CITY PLANNING

COMMISSION OFFICE
(213) 978-1300

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DEPUTY DIRECTOR

LISA M. WEBBER, AICP
DEPUTY DIRECTOR

关于: **(130 College 项目)范围界定会议的Zoom** —— (110-130 West College Street, 117-119 West Bruno Street, and 943-973 North Main Street, Los Angeles, CA 90012 (环境案件编号：ENV-2023-2307-EIR)

如何参与虚拟公众范围界定会议

感谢您参加虚拟公众范围界定会议。您将在本次会议中了解更多关于130 College项目（ENV-2023-2307-EIR ）的信息，并有机会就该项目提出问题，以及提供关于该项目的环境影响报告应研究哪些环境课题提出意见。我们将使用Zoom作为我们这次虚拟的公众范围界定会议的平台。如需通过计算机、平板电脑、智能手机或者电话参与本会议，请按照以下说明参与：

普通话语言说明:

1. 为了您的方便，关于范围界定会议的演示已翻译成西班牙语、普通话以及粤语。在收到本通知的当天，您可通过以下链接访问各种语言的演示文稿：https://planning.lacity.gov/development-services/eir/130-College-project.
2. 若通过您的计算机、智能手机或平板电脑参加范围界定会议，请使用立项通知中的链接，或者访问 zoom.us 然后输入会议 ID 886 2514 9073。
3. 或者，通过电话拨打 +1 669 900 9128 或 +1 213 338 8477 加入会议。 当提示时，请输入会议ID：886 2514 9073，然后输入 #号。当提示输入参与者ID时, 请输入#号。
4. 当演示结束后，您可以通过点击“举手（raise hand）”按钮（或在您的电话上按*9）来举手。市政府工作人员将依次叫出每一个希望发言的人，并在您提供意见或问题时为您取消静音。如果您需要翻译，请在您被叫到发言后说明。翻译人员将协助您翻译您的意见以及市政府工作人员和申请团队成员的回答。
5. 您可在范围界定会议中或者在会议后通过邮寄或电子邮件的方式提交公众意见至城市规划工作人员处。请按照立项通知中的说明提交意见。任何语言的意见都会被接受，并在会议中翻译以及包含到该项目的记录中。

注意: 如果您在会议中有任何的技术问题，请点击“举手（raise hand）”按钮（若使用计算机）或在电话上按*9（若使用电话）。

LOS ANGELES DEPARTMENT OF CITY PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

環境影響報告
編制通知
及公眾範圍界定會議

2024 年 6 月 04 日

Puede obtener información en Español acerca de esta junta llamando al (213) 847-3625.

環境案件編號：	ENV-2023-2307-EIR
項目名稱：	130 學院項目
項目申請者：	S&R Partners, LLC
項目地址：	110-130 West College Street, 117-119 West Bruno Street, 和943-973 North Main Street, Los Angeles, CA 90012
社區規劃區：	中央城北區
市政區：	1-埃爾南德斯
公眾意見徵詢期：	2024 年 6 月 04 日-2024 年 7 月 5 日
公眾範圍界定會議：	2024 年 6 月 12 日：英語；2024 年 6 月 13 日：西班牙語；2024 年 6 月 18 日：普通話；2024 年 6 月 20 日：廣東話；所有會議的開始時間：下午 5：30 更多信息請參見下文。

洛杉磯市（以下簡稱“市政府”）打算為 130 學院項目（以下簡稱“項目”）準備一份環境影響報告（以下簡稱“EIR”）。 根據《加州環境品質法》（CEQA）準則第 15082 節的規定，市政府編制了本編制通知，以向公眾、附近居民和業主、負責機構以及其他相關方提供有關該項目及其潛在環境影響的信息。環境影響報告將在洛杉磯市城市規劃局的監督下由外部顧問編制。

市政府請你就環境影響報告的範圍和內容提出書面意見，包括減少項目潛在環境影響的緩解措施或項目替代方案。意見必須按照以下說明以書面形式提交。如果你是公共機構的代表，市政府希望你就環境影響報告中與貴機構有關該項目的法定職責相關的環境信息的範圍和內容提出書面意見。貴機構在考慮項目的許可或其他審批時，可能需要使用市政府編制的環境影響報告。

我們將召開一次公眾範圍界定會議，就環境影響報告應研究的環境主題聽取意見。公眾範圍界定會議不會對項目做出任何決定。 其他項目詳情、會議信息以及公眾意見提交說明如下。

項目位置和現有現場用途：
項目占地約 2.2 英畝。項目場地北面以西學院街為界，東面以北大街為界，南面以布魯諾街為界，西面以北阿拉米達街為界，位於中央城北社區規劃範圍內（見所附項目位置圖）。項目場地目前開發有一個用於存放公共汽車的地面停車場、一個看板、停車燈、一個貨物儲存箱、電動公共汽車充電器和圍欄。項目場地上沒有現有建築物、景觀或樹木。

項目說明：

該項目建議拆除現有的地面停車場，在約 2.2 英畝的場地上新建一座五層、帶一個夾層停車場、面積達 232,802 平方英尺的商業開發項目，其中包括 224,597 平方英尺的辦公樓、4,095 平方英尺的餐廳和 4,110 平方英尺的零售店，容積率為 2.42：1。該項目最大高度為 88 英尺，包括一個地下停車層、一個地面停車層和一個地上夾層停車層。

現有和擬建建築面積概要 [1]

土地用途	樓面面積
現有（全部拆除）	
地面停車場	0 平方英尺
將拆除的現有樓面總面積	*0 平方英尺*
新建建築（根據 LAMC）	
一般辦公室	224,597 平方英尺
餐廳	4,095 平方英尺
零售	4,110 平方英尺
新建建築總面積	*232,802 平方英尺*
竣工後的總樓面面積（LAMC）	**232,802 平方英尺**
新建建築（非 LAMC）[2]	
餐廳（室外座位）	1,799 平方英尺
完工後的總樓面面積（不含租賃和租賃管理費）	**234,601 平方英尺**

平方英尺 = 平方英尺

[1] *平方英尺是根據 LAMC 對建築面積的定義計算的，用於計算 FAR。根據 LAMC 第 12.03 節，建築面積定義為“建築物外牆內的面積（平方英尺），但不包括以下面積：外牆、樓梯、豎井、容納建築物運行設備或機械的房間、帶有相關車道和坡道的停車區、供直升機降落和儲存的空間以及地下室儲存區。”*

[2] *該項目將包括毗鄰底層餐廳的約 1,799 平方英尺無遮擋室外用餐區，這不屬於《建築與室內裝飾法》中定義的“樓面面積”，但在本環境分析中被計入項目的餐廳面積。因此，就本環境分析而言，該項目將包括 5,894 平方英尺的餐廳空間。*

資料來源：Eyestone Environmental，2024 年。

要求採取的行動：

1. 根據《聯邦土地管理法》第 11.5.6 節，對總體規劃進行修訂，以修改中央城北社區規劃註腳 7，允許項目用地商業開發的容積率超過 1.5：1；

2. 根據 LAMC 第 12.32 F 條和第 12.32 Q 條的規定，對項目用地的區域和高度進行變更，將項目用地的分區從 [Q]C2-2-RIO 和 [T][Q]C2-2-RIO 變更為 (T)(Q)C2-2D-RIO；

3. 根據《聯邦土地管理法》第 12.24 W.1 節的規定，頒發主有條件使用許可證，允許在最多三個場所內銷售和配發全系列酒類飲料，供現場和場外消費，與擬議的餐廳和零售空間相關聯；

4. 根據《聯邦土地管理法》第 16.05 節的規定，對開發項目進行場地規劃審查，該開發項目將產生或導致非住宅建築面積增加 50,000 平方英尺或以上；

5. 根據 LAMC 第 17.03 節和第 17.15 節，將 17 個地塊合併並重新劃分為一（1）個地面地塊和 16 個空地地塊的“歸屬暫定地塊圖”；以及 67,791 立方碼土壤出口的運輸路線；以及

6. 其他可能被認為必要的酌情部長級許可，包括但不限於臨時街道封閉許可、平整許可、挖掘許可、地基許可、建築許可、場外或道路佔用許可、場內外樹木移除許可以及標誌許可。

項目的潛在環境影響：
根據初步研究，該項目可能會對以下主題領域產生潛在的重大環境影響，這些影響將在環境影響報告中進行闡述：空氣品質、文化資源、能源、地質和土壤、溫室氣體排放、危害和危險材料、土地使用和規劃、噪音、交通、部落文化資源以及公用事業和服務系統。

公眾範圍界定會議：
將以線上虛擬形式召開公眾範圍界定會議，以分享有關項目和環境審查過程的信息。在會議期間，市政府工作人員、翻譯人員、環境顧問和項目代表將出席會議，並首先進行介紹。 市政府鼓勵所有感興趣的個人和組織參加此次會議。 公眾範圍界定會議結束後，將在項目網站上提供會議錄音副本。本函件中另有更詳細的說明頁面，詳細介紹了從何處獲取西班牙語、普通話和廣東話資料。公眾範圍界定會議不會就項目做出任何決定。 在環境影響報告完成後，將另行安排針對 LAMC 權利請求的公聽會。 公眾範圍界定會議的日期、時間和虛擬地點如下：

英語
日期： 2024 年 6 月 12 日
時間： 下午 5:30
虛擬地點： 訪問 https://planning-lacity-org.zoom.us/j/84623923558 或通過撥打電話，美國：+1 213 338 8477 或+1 669 900 9128，輸入網路研討會 ID： 846 2392 3558，然後輸入 #。如果要求輸入參與者 ID，請輸入 #。

西班牙語
日期： 2024 年 6 月 13 日
時間： 下午 5:30
虛擬地點： 訪問 https://planning-lacity-org.zoom.us/j/85059361215 或通過撥打電話，美國：+1 669 900 9128 或+1 213 338 8477，輸入網路研討會 ID：850 5936 1215，然後輸入 #。如果要求輸入參與者 ID，請輸入 #。

普通話
日期： 2024 年 6 月 18日
時間： **P.M.**5:30
虛擬地點： 訪問 https://planning-lacity-org.zoom.us/j/88625149073 或通過撥打電話，美國：+1 669 900 9128 或+1 213 338 8477，輸入網路研討會 ID：886 2514 9073，然後輸入 #。如果要求輸入參與者 ID，請輸入 #。

廣東話
日期：2024 年 6 月 20 日
時間：下午 5：30
虛擬地點： 訪問 https://planning-lacity-org.zoom.us/j/86249313543 或通過撥打電話，美國：+1 669 900 9128 或+1 213 338 8477，輸入網路研討會 ID：862 4931 3543，然後輸入 #。如果要求輸入參與者 ID，請輸入 #。

文件審查和意見：

本通知、為該項目準備的初步研究報告、附錄和翻譯材料的副本可與環境文檔一起查看，或通過 https://planning.lacity.gov/development-services/eir/130-College-project 線上查看。

公眾也可在週一至週五上午 9：00 - 下午 4：00 的辦公時間內，前往洛杉磯市城市規劃局（地址：221 North Figueroa Street, Suite 1350, Los Angeles, CA 90012）查閱環境文檔，但需提前預約。

市政府將考慮所有關於本項目潛在環境影響以及環境影響報告中需要解決的問題的書面意見。 如果你希望提交意見，請注明上述環境案件編號，並在 **2024 年 7 月 5 日下午 4：30** 之前以書面形式提交。

請將書面意見寄至：

郵寄： 迈克尔・加瑟鲁（Michael Gatheru）
洛杉磯市城市規劃局
地址：北菲格羅亞街 221 號 1350 室
加利福尼亞州洛杉磯；郵編：90012

電郵： michael.gatheru@lacity.org

住宿：
作為《美國殘疾人法案》第二章所涵蓋的實體，洛杉磯市不會因殘疾而有所歧視。 可應要求提供手語翻譯、輔助聽力設備或其他輔助工具和/或服務。在至少提前七 (7) 個工作日向 per.planning@lacity.org 提交書面申請的情況下，也可提供其他服務，如英語與其他語言之間的翻譯。請務必指明你需要將英語翻譯成哪種語言，並注明是要求口頭還是書面翻譯服務。 如果要求翻譯書面文檔，請將需要翻譯的文檔作為附件附在電郵中。

VINCENT P. BERTONI, AICP
規劃總監



Michael Gatheru，規劃助理
城市規劃局
(213) 756-1699

附件：

項目位置圖
概念性場地平面圖
放大說明



Figure 1
Project Location Map

Source: ArcGIS, 2023; Eyestone Environmental, 2023.

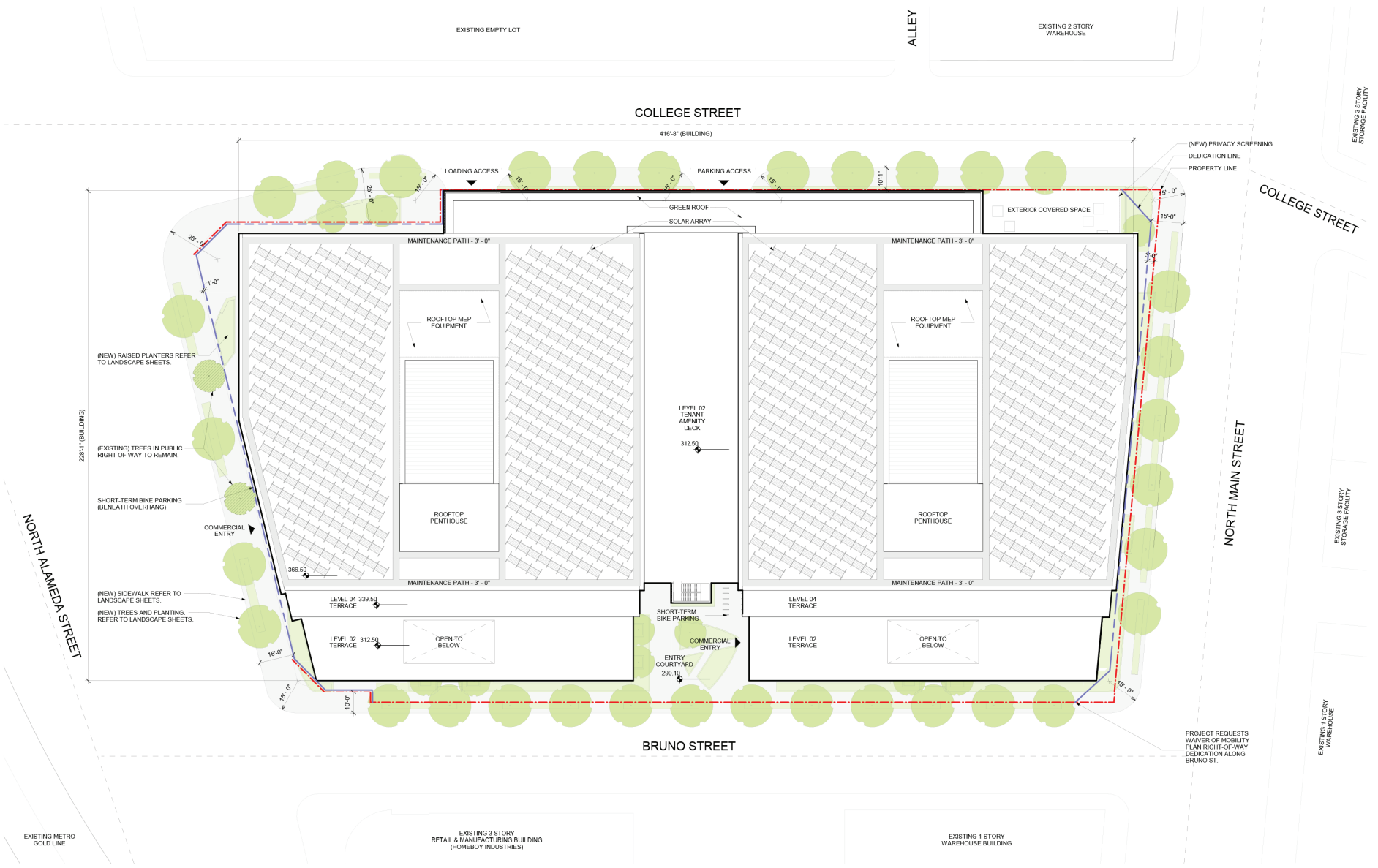


Figure 2
Conceptual Site Plan

Source: Grimshaw Architects, LLP.

城市規劃局

委員會辦公室
(213) 978-1300

城市規劃委員會

莫妮卡・勞什（MONIQUE LAWSHE）
主席

伊莉莎白・紮莫拉（ELIZABETH ZAMORA）
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瑪麗亞・卡比爾多（MARIA CABILDO）
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洛杉磯市

加利福尼亞州

卡倫・巴斯（KAREN BASS）
市長

執行辦公室
地址：200 N. SPRING STREET, ROOM 525
加利福尼亞州洛杉磯；郵編：90012-4801
(213) 978-1271

VINCENT P. BERTONI, AICP
主任

莎娜・邦斯坦（SHANA M.M. BONSTIN）
副主任

海迪・烏裡塔・洛佩斯（HAYDEE URITA-LOPEZ）
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副主任

麗莎・韋伯（LISA M. WEBBER），AICP
副主任

參考：**（130學院項目）範圍界定會議的zoom會議說明** –（地址：110-130 West College Street, 117-119 West Bruno Street, and 943-973 North Main Street, Los Angeles, CA 90012（案件編號：ENV-2023-2307-EIR）

如何參加虛擬公眾範圍界定會議

感謝你參加虛擬公眾範圍界定會議。在此次會議上，你將瞭解更多有關 130 學院項目（ENV-2023-2307-EIR）的信息，並有機會就該項目提出問題，以及就該項目環境影響報告應研究的環境主題提供意見。本次虛擬公眾範圍界定會議將使用 Zoom 作為虛擬平臺。要參加會議，你需要使用電腦、平板電腦、智慧手機或電話。請按照以下說明參與會議。

西班牙語、普通話和廣東話語言說明：

1. 為方便起見，範圍界定會議的演示文稿已翻譯成西班牙語、普通話和廣東話。每種語言的演示文稿可從你收到本通知之日起在以下網址獲取：https://planning.lacity.gov/development-services/eir/130-College-project.
2. 要通過電腦、智慧手機或平板電腦參加範圍界定會議，請使用準備通知上的鏈接，或訪問 zoom.us，輸入網路研討會 ID 862 4931 3543。
3. 或通過電話撥號參加會議： 美國 +1 669 900 9128 或 +1 213 338 8477，按提示輸入網路研討會 ID 862 4931 3543，然後輸入 #。當提示輸入參與者 ID 時，請按 #。
4. 演講結束後，請通過 Zoom 平臺上的“舉手”按鈕舉手（或按電話上的 *9）。市政府工作人員會叫出每一位希望發言的人，並在你發表意見或提問時取消你的靜音。如果你需要翻譯，請在被叫到發言後說明，翻譯人員將協助你發表評論並翻譯市政府工作人員和申請人團隊成員的答覆。
5. 公眾意見可在範圍界定會議期間提出，或在範圍界定會議之後通過普通郵件或電郵提交給城市規劃工作人員。請按照“準備通知”上提供的說明進行操作。我們接受任何語言的意見，並將在會議期間進行翻譯，添加到項目記錄中。

注意：如果你在會議期間遇到任何技術問題： 點擊舉手按鈕（如果使用電腦），或按*9（如果使用電話）。

Appendix A.3

NOP Comment Letters

DEPARTMENT OF TRANSPORTATION
DISTRICT 7
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 269-1124
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life

July 2, 2024

Michael Gatheru
Department of City Planning
City of Los Angeles
221 North Figueroa Street, Room 1350
Los Angeles, CAS 90012

RE: 130 College Project-ENV-2023-2307-EIR
SCH # 2024060069
Vic. LA-110/PM 24.45, LA-101/PM 0.77
LA-05/PM 19.21
GTS # LA-2024-04545-NOP-AL

Dear Michael Gatheru,

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced NOP. The Project proposes the removal of the existing surface parking lot, to construct a new five-story with one mezzanine parking level, 232,802 square-foot commercial development consisting of 224,597 square feet of office, 4,095 square feet of restaurants, and 4,110 square feet of retail on an approximately 2.2-acre site, resulting in a Floor Area Ratio (FAR) of 2.42:1. The Project would have a maximum height of 88 feet and includes parking in one subterranean level, one at-grade level, and one above-grade mezzanine level.

The mission of Caltrans is to provide a safe and reliable transportation network that serves all people and respects the environment. Senate Bill 743 (2013) has codified into CEQA law and mandated that CEQA review of transportation impacts of proposed development be modified by using Vehicle Miles Traveled (VMT) as the primary metric in identifying transportation impacts for all future development projects. You may reference the Governor's Office of Planning and Research (OPR) for more information:

https://opr.ca.gov/ceqa/#guidelines-updates

As a reminder, VMT is the standard transportation analysis metric in CEQA for land use projects after July 1, 2020, which is the statewide implementation date.

Caltrans is aware of the challenges that the region faces in identifying viable solutions to alleviating congestion on State and Local facilities. With limited room to expand vehicular capacity, all developments in the General Plan should incorporate multi-modal and

complete street transportation elements that will actively promote alternatives to car use and better manage existing parking assets. Prioritizing and allocating space to efficient modes of travel such as bicycling and public transit can allow streets to transport more people in a fixed amount of right-of-way.

Caltrans supports the implementation of complete streets and pedestrian safety measures such as road diets and other traffic calming measures. Please note the Federal Highway Administration (FHWA) recognizes the road diet treatment as a proven safety countermeasure, and the cost of a road diet can be significantly reduced if implemented in tandem with routine street resurfacing. Overall, the environmental report should ensure all modes are served well by planning and development activities. This includes reducing single occupancy vehicle trips, ensuring safety, reducing vehicle miles traveled, supporting accessibility, and reducing greenhouse gas emissions.

We encourage the Lead Agency to evaluate the potential of Transportation Demand Management (TDM) strategies and Intelligent Transportation System (ITS) applications in order to better manage the transportation network, as well as transit service and bicycle or pedestrian connectivity improvements. For additional TDM options, please refer to the Federal Highway Administration's *Integrating Demand Management into the Transportation Planning Process: A Desk Reference* (Chapter 8). This reference is available online at:

http://ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf

Also, Caltrans has published the VMT-focused Transportation Impact Study Guide (TISG), dated May 20, 2020 and the Caltrans Interim Land Development and Intergovernmental Review (LD-IGR) Safety Review Practitioners Guidance, prepared on December 18, 2020. You can review those documents at the following link:

https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-05-20-approved-vmt-focused-tisg-a11y.pdf

https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-12-22-updated-interim-ldigr-safety-review-guidance-a11y.pdf

The Transportation section of the Draft Environmental Impact Report should include a VMT analysis to determine if the project will create a significant VMT impact. To address potential transportation safety concerns, for the City's consideration, Caltrans recommends the Lead Agency include a queuing analysis (on the off-ramps to verify the added traffic generated from the project does not exceed the storage length of the ramp and at the intersections turning pockets/lanes) with actual signal timing for existing traffic

conditions plus project net trips at the impacted off-ramps on Freeway 110, 101, and SB Freeway 5 off-ramp to North Broadway, NB Freeway 5 off-ramp to Main Street, and EB Freeway 10 off-ramp to East Cesar E. Chavez Avenue.

Caltrans encourages lead agencies to prepare transportation safety impact analysis for this Specific Plan in the California Environmental Quality Act (CEQA) review process using Caltrans guidelines above on the State facilities so that, through partnerships and collaboration, California can reach zero fatalities and serious injuries by 2050.

If you have any questions, please feel free to contact Mr. Alan Lin the project coordinator at (213) 269-1124 and refer to GTS # LA-2024-04545-NOP-AL.

Sincerely,

Anthony Higgins

ANTHONY HIGGINS
Acting LDR/CEQA Branch Chief

email: State Clearinghouse

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

July 1, 2024

Michael Gatheru
City of Los Angeles
Department of City Planning
221 North Figueroa Street, Room 1350
Los Angeles, CA 90012

Sent by Email: michael.gatheru@lacity.org

RE: 130 College Project – Case No. ENV-2023-2307-EIR
Notice of Preparation of Environmental Impact Report (EIR)

Dear Mr. Gatheru:

Thank you for coordinating with the Los Angeles County Metropolitan Transportation Authority (Metro) regarding the proposed 130 College Project (Project) located at 110-130 West College Street, 117-119 West Bruno Street, and 943 -973 North Main Street in the City of Los Angeles (City). Metro is committed to working with local municipalities, developers, and other stakeholders across Los Angeles County on transit-supportive developments to grow ridership, reduce driving, and promote walkable neighborhoods. Transit Oriented Communities (TOCs) are places (such as corridors or neighborhoods) that, by their design, allow people to drive less and access transit more. TOCs maximize equitable access to a multi-modal transit network as a key organizing principle of land use planning and holistic community development.

Per Metro's area of statutory responsibility pursuant to sections 15082(b) and 15086(a) of the Guidelines for Implementation of the California Environmental Quality Act (CEQA: Cal. Code of Regulations, Title 14, Ch. 3), the purpose of this letter is to provide the City with specific detail on the scope and content of environmental information that should be included in the Environmental Impact Report (EIR) for the Project. In particular, this letter outlines topics regarding the Project's potential impacts on the Metro A Line facilities and services, which should be analyzed in the EIR, and provides recommendations for mitigation measures as appropriate. Effects of a project on transit systems and infrastructure are within the scope of transportation impacts to be evaluated under CEQA.[1]

In addition to the specific comments outlined below, Metro is providing the City and S&R Partners, LLC with the Metro Adjacent Development Handbook (attached), which provides an overview of common concerns for development adjacent to Metro right-of-way (ROW) and transit facilities, available at https://www.metro.net/devreview.

Project Description
The Project includes the development of a new five-story with one mezzanine parking level, 232,802 square-foot commercial development consisting of 224,597 square feet of office, 4,095 square feet of restaurants and 4,110 square feet of retail. The Project proposes parking in one subterranean level, one at-grade level, and one above-grade mezzanine level. Construction of the project is anticipated to be completed in 2028.

[1] See CEQA Guidelines section 15064.3(a); Governor's Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts In CEQA, December 2018, p. 19.

Recommendations for EIR Scope and Content

Light Rail Adjacency

1. Rail Operations: The Metro A Line currently operates weekday peak service as often as every six minutes in both directions. Trains may operate in and out of revenue service, 24 hours a day, seven days a week, in the ROW adjacent to the Project.

2. Impact Analysis: Due to the Project's proximity to the A Line ROW, the EIR must analyze potential effects on light rail operations and identify mitigation measures as appropriate. Critical impacts to be studied should include (without limitation): impacts of Project construction and operation on and potential damage to the structural and systems integrity of tracks and related infrastructure; and disruption to light rail service. Specific impacts and mitigation measures that should be studied include:

    a. Disturbance to Light Rail Structural Support: The Project activities may include excavation and construction of underground structures, which may have the potential to disturb adjoining soils and jeopardize support of the light rail tracks.

        Recommended mitigation measures:

        i. Technical Review: The Applicant shall submit engineering drawings and calculations, as well as construction work plans and methods, to evaluate any impacts to the Metro A Line infrastructure in relationship to the Project. Before issuance of any building permit for the Project, the Applicant shall obtain Metro's approval of final construction plans.

        ii. Construction Safety: The construction and operation of the Project shall not disrupt the operation and maintenance activities of the Metro A Line or the structural and systems integrity of Metro's light rail infrastructure. Not later than two months before Project construction, the Applicant shall contact Metro to schedule a pre-construction meeting with all Project construction personnel and Metro Real Estate, Construction Management, and Construction Safety staff. During Project construction, the Applicant shall:

            1. Work in close coordination with Metro to ensure that Station access, visibility, and structural integrity are not compromised by construction activity or permanent build conditions;

            2. Construct a protection barrier to prevent objects, material, or debris from falling onto the ROW;

            3. Notify Metro of any changes to construction activity that may impact the use of the ROW;

            4. Permit Metro staff to monitor construction activity to ascertain any impact to the A Line ROW.

3. Advisories to Applicant: The Applicant is encouraged to contact Metro Development Review early in the design process to address potential impacts. The Applicant should also be advised of the following:

a. Occupational Safety and Health Administration (OSHA) Requirements: Construction and excavation work in proximity to Metro ROW with potential to damage light rail tracks and related infrastructure may be subject to additional OSHA safety requirements.

b. Technical Review: Metro charges for staff time spent on engineering review and construction monitoring.

c. Cost of Impacts: The Applicant will be responsible for costs incurred resulting from Project construction/operation issues that cause delay or harm to Metro service delivery or infrastructure, including single-tracking or bus bridging around closures.

Transit Supportive Planning: Recommendations and Resources

Considering the Project's proximity to Chinatown Station, Metro would like to identify the potential synergies associated with transit-oriented development:

1. Land Use: Metro supports development of commercial properties near transit stations and understands that increasing development near stations represents a mutually beneficial opportunity to increase ridership and enhance transportation options for the users of developments. Metro encourages the City and Applicant to be mindful of the Project's proximity to Chinatown Station, including orienting pedestrian pathways towards the station.

2. Transit Connections and Access: Metro strongly encourages the Applicant to install Project features that help facilitate safe and convenient connections for pedestrians, people riding bicycles, and transit users to/from the Project site and nearby destinations. The City should consider requiring the installation of such features as part of the conditions of approval for the Project, including:

    a. Walkability: The provision of wide sidewalks, pedestrian lighting, a continuous canopy of shade trees, enhanced crosswalks with ADA-compliant curb ramps, and other amenities along all public street frontages of the development site to improve pedestrian safety and comfort to access the nearby Chinatown Station.

    b. Bicycle Use and Micromobility Devices: The provision of adequate short-term bicycle parking, such as ground-level bicycle racks, and secure, access-controlled, enclosed long-term bicycle parking for residents, employees, and guests. Bicycle parking facilities should be designed with best practices in mind, including highly visible siting, effective surveillance, ease to locate, and equipment installation with preferred spacing dimensions, so bicycle parking can be safely and conveniently accessed. Similar provisions for micro-mobility devices are also encouraged.

    c. First & Last Mile Access: The Project should address first-last mile connections to transit and is encouraged to support these connections with wayfinding signage inclusive of all modes of transportation. For reference, please review the First Last Mile Strategic Plan, authored by Metro and the Southern California Association of Governments (SCAG), available on-line at: http://media.metro.net/docs/sustainability_path_design_guidelines.pdf.

3. Parking: Metro encourages the incorporation of transit-oriented, pedestrian-oriented parking provision strategies such as the reduction or removal of minimum parking requirements and

the exploration of shared parking opportunities. These strategies could be pursued to reduce automobile-orientation in design and travel demand.

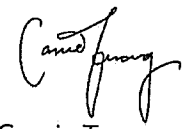
4. Wayfinding: Any temporary or permanent wayfinding signage with content referencing Metro services or featuring the Metro brand and associated graphics (such as Metro Rail pictograms) requires review and approval by Metro Signage and Environmental Graphic Design.

5. Transit Pass Programs: Metro would like to inform the Applicant of Metro's employer transit pass programs, including the Annual Transit Access Pass (A-TAP), the Employer Pass Program (E-Pass), and Small Employer Pass (SEP) Program. These programs offer efficiencies and group rates that businesses can offer employees as an incentive to utilize public transit. The A-TAP can also be used for residential projects. For more information on these programs, please visit the programs' website at https://www.metro.net/riding/eapp/.

If you have any questions regarding this letter, please contact me by phone at 213.547.4326, by email at DevReview@metro.net, or by mail at the following address:

Metro Development Review
One Gateway Plaza
MS 99-22-2
Los Angeles, CA 90012-2952

Sincerely,



Cassie Truong
Senior Transportation Planner
Transit Oriented Communities

cc: Shine Ling, AICP, Director, Development Review Team

Attachments and links:

- Adjacent Development Handbook: https://www.metro.net/devreview

LOS ANGELES CONSERVANCY

523 West Sixth Street, Suite 826
Los Angeles, CA 90014

213 623 2489 OFFICE
213 623 3909 FAX
laconservancy.org

June 25, 2024

Michael Gatheru
City of Los Angeles, Department of City Planning
221 North Figueroa Street, Room 1350
Los Angeles, CA 90012
michael.gatheru@lacity.org

Re: 130 College Project (ENV-2023-2307-EIR)

Dear Michael Gatheru,

The Los Angeles Conservancy is concerned about the potential significant impacts of this project on HCM #211, Granite Block Paving, which was designated as an HCM on March 7, 1979. Though this is a modest historic resource in appearance, it is a rare intact example of hand-hewn granite block paving dating from the early 1900s in Los Angeles. We ask that appropriate mitigation measures be included in the upcoming EIR but also ask that the following mitigation measures be included.

1. A qualified, independent historic preservation consultant shall be retained to verify the project's conformance with the Secretary of the Interior's Standards and to consult on streetscape work adjacent to the research.
2. A resource protection plan shall be devised to ensure damage does not occur to the granite blocks during construction. Trucks, cranes, and other heavy machinery shall be directed away from the Bruno street segment to prevent the crushing of the granite blocks.
3. Interpretive signage shall be included on the Bruno Street frontage that includes both the history of HCM #211 as well as the adjacent historical land uses it supported. This section of Chinatown is undergoing rapid change due to new development, changing from a largely industrial to a mixed-use transit oriented neighborhood. The signage should document that industrial history to help convey the significance of the historic resource.

We hope these mitigation measures will mitigate any impacts of the proposed project on HCM #211, and expect additional measures will be included in the EIR.

About the Los Angeles Conservancy:

The Los Angeles Conservancy is the largest local historic preservation organization in the United States, with nearly 5,000 member households throughout the Los Angeles area. Established in 1978, the Conservancy works to preserve and revitalize the significant architectural and cultural heritage of Los Angeles County through advocacy and education.

Sincerely,



Andrew Salimian
Director of Advocacy

cc:

Mr. Ken Bernstein, Office of Historic Resources
Ms. Helen Campbell, Council Office 1
Dr. Wenli Jen, Chinese American Citizens Alliance Los Angeles Lodge
Mr. Ricky Leo, Chinese Historical Society of Southern California

Michael Gatheru <michael.gatheru@lacity.org>

Written Comment ENV-2023-2307-EIR

1 message

Topher Hendricks <topherthendricks@gmail.com> Mon, Jul 1, 2024 at 12:55 PM
To: "michael.gatheru@lacity.org" <michael.gatheru@lacity.org>

Hello Mr. Gatheru & staff,

I'm a resident of Chinatown who lives within a few blocks of the proposed 130 College Project, and I wanted to **express my support, with a few asterisks**. As a longtime resident of downtown, I've been long frustrated by the exceedingly poor urban land use here, where despite the **great transit accessibility**, the rampant amount of surface parking lots takes away from the density needed to increase walkability. As with many of my friends in the neighborhood, I do not own a car, and am **eager to see more projects that densify areas that are already close to major transit stops**.

However, I was **disappointed to see the incredible volume of parking** attached to this project. The building is close to a number of **large apartment buildings** (with many more on the way shortly), **two major train stations** (meaning riders single-train-direct from as far as Long Beach, Azusa, Koreatown, or North Hollywood), countless **frequent bus routes**, and even within a handful of blocks of the **LA River bike path** (with, which the rapid adoption of e-bikes, means getting to/from Glendale, Atwater, and Burbank is much faster, more reliable, and significantly better for the economy and public health on an e-bike than sitting in traffic on the 5).

Building yet another massive parking lot in Chinatown is the last thing the neighborhood needs. There are already countless communal parking lots that sit empty most days in the neighborhood, and creating yet more induced demand for drivers to come to the neighborhood daily will brutally affect air quality, pedestrian safety, and the insane amount of traffic already here from regular events in the park, various weekly special event markets, downtown cut-through commuters, and constant Dodgers games. While the 130 College Project is a major improvement over the blight of the current school bus parking lot, **the neighborhood cannot and should not handle even more car traffic**. Reducing the amount of parking (in line with the latest recommendations for building within a nearby distance of light rail) will make this project more lucrative and better for everyone involved. **Parking lots like these are incredibly expensive and regularly underutilized** (just look around your own downtown for countless other examples, like **the absolute travesty of the Disney Concert Hall that almost bankrupted the city**); reducing the amount will help with construction costs and greatly improve revenues for tenants. The revitalization of Old Town Pasadena serves as a great example of centralized communal parking over individual lots per each building. For further reading and great deals of data on the problems of parking lots like this one proposed, I highly recommend "The High Cost of Free Parking" by Donald Shoup.

I'm looking forward to the project, but I hope you'll do the right thing and have it live up to its full potential! Please reduce the parking and increase the density and commercial viability of this project.

Thank you!

Topher T. Hendricks
topherthendricks@gmail.com
(908)256-3558