Appendices

Appendix IS-1

Street Tree Report

STREET TREE REPORT

PREPARED FOR

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PROPERTY

8th St and Figueroa St
Los Angeles, CA 90017

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May 1, 2016

PREPARED BY

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TREE REPORT

8th St and Figueroa St
Los Angeles, CA 90017

SUMMARY

This Tree Report was prepared at the request of the agent of the owner, Robert Davidson. The client is preparing to build a new development on this property that includes a high rise residential building and a parking structure.

The subject property is located at the intersection of 8th Street and Figueroa Street in the downtown area of the city of Los Angeles. The property is currently developed with low-rise buildings and a parking lot. The property owner is planning to demolish the two existing buildings on site and build two new high rise towers and six-level parking structure. Most of the site will be re-developed with the new structures and new improvements.

There are a total of six (6) City of Los Angeles street trees, which are all Ficus microcarpa 'Nitida' in the parkway perimeter of the subject property. The proposed construction of this site will require repair of the sidewalk and installation of new driveways. All six (6) street trees will be impacted by construction and will require removal.

There are six (6) street trees recommended for removal and mitigation to the satisfaction of the City of Los Angeles, Urban Forestry Division.

There are NO native protected trees located on the property or in the street sidewalk parkway. Nor are there any native trees on the neighboring properties.

BACKGROUND

These subject street trees appear to have been planted between fifteen and thirty years ago and are in various states of health. These trees are planted in a restricted root zone and are already causing heaving and hardscape damage to the sidewalk and surrounding streets.

ASSIGNMENT

The Assignment included a field observation and inventory of the trees on site. A Tree Location Plot Map is included in Appendix A. Photographs of the subject trees are included in Appendix B. I have made a visual evaluation of these trees as an ISA Certified Arborist and am relaying my observations and recommendations.

TREE CHARACTERISTICS AND SITE CONDITIONS

Detailed information with respect to size, condition, species and recommendations are included in the "Summary of Field Inspections" in Appendix C. The trees are numbered on the Tree Map in Appendix "A".

FIG 1, Tree Inventory Chart

Tree No.	Location	Species	DBH	Height	Spread	Condition	Disposition
1	Street	Ficus microcarpa 'Nitida'	22"	45'	45'	Fair	Remove
2	Street	Ficus microcarpa 'Nitida'	21"	45'	45'	Fair	Remove
3	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove
4	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove
5	Street	Ficus microcarpa 'Nitida'	23"	45'	45'	Poor	Remove
6	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove

IMPACT ANALYSIS AND CONCLUSION

The most critical factors affecting the six (6) trees slated for removal are that they have outgrown their location and will be further impacted by the sidewalk repairs and driveway installations. Root pruning is not possible, due to the tight location and possibility of loss of root stability. Also, these trees are already causing damage to the sidewalk and will not tolerate the encroachments during the driveway and apron installations.

Ultimately, I highly recommend these trees be removed to prevent further damage to the adjacent area and to allow for the proper installation of the sidewalk and driveways as required in their building conditions.

GENERAL RECOMMENDATIONS

During the course of construction, trees can receive much stress, pollution, soil compaction and lack of water. The following general recommendations should be followed to establish and maintain a healthy environment for all retained trees.

PLANTING WITHIN THE PROTECTED ZONE

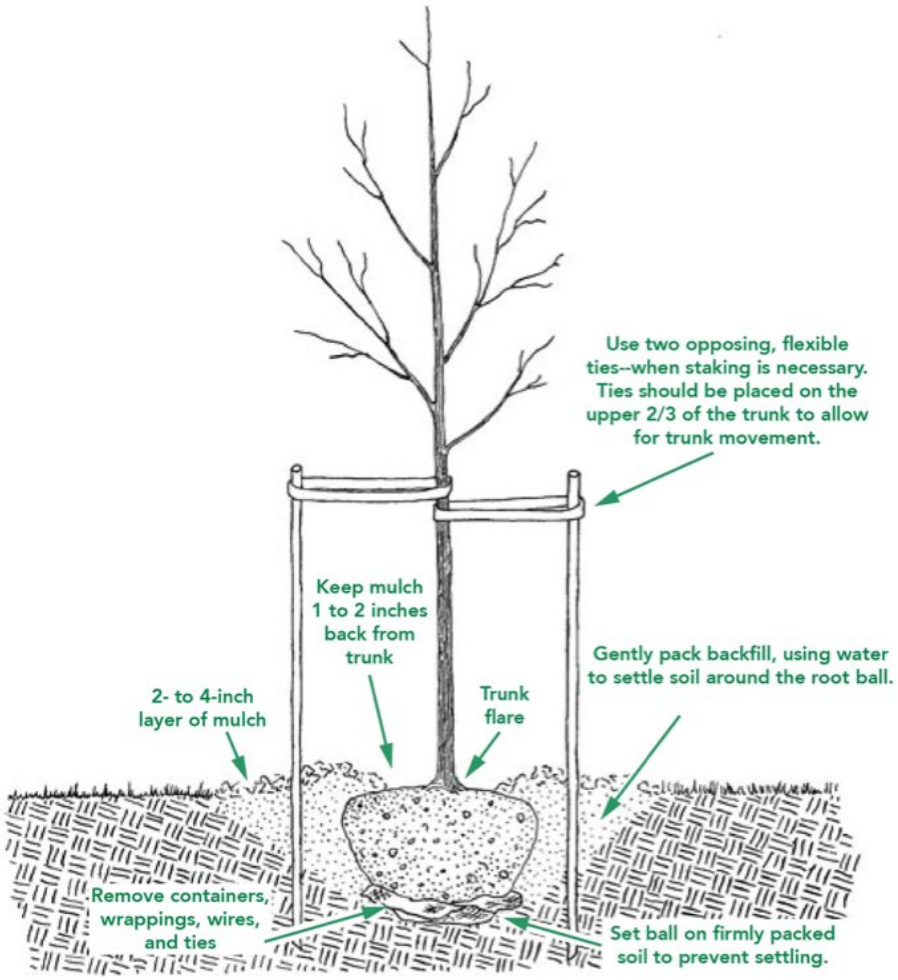
Trees remain healthier and vigorous with NO plantings within the protected zone. The natural leaf litter that the tree provides should be allowed to remain on the ground, to provide natural mulch and nutrients. If planting is desired, please follow these recommendations:

Plant Selection – Only drought tolerant plants that are compatible with the specific trees should be selected. Most importantly, select plants that are resistant to Armillaria or Phytophthora. Some trees are particularly susceptible to these diseases in urban areas and when under construction stress. Please refer to local guides for acceptable plant recommendations

Irrigation – Water should not be spraying toward the base of the trunk or tree; this can encourage rotting of the root crown. Excessive moisture on the base of the trunk can encourage Armillaria mellea (Oak Root Fungus) or Phytophthora cinnamomi (Avocado Root rot). Both of these fungus' can reduce the health and vigor of the tree, thus leading to decline and potential failure of the tree (falling over). It is recommended to only provide irrigation to the roots in the warmer months of spring and early summer, thus extending the natural rainy season. This irrigation should be provided via soaker hoses that do not spray upward.

Mulch - Apply a light layer of organic mulch over the root zone (approx. 3- 4 inches thick). The mulch will reduce loss of moisture from the soil, protect against construction compaction, and moderate soil temperatures. It also has been demonstrated that the addition of mulch reduces soil compaction over time. Do not place mulch against the trunk, instead placing at least 3 inches from base.

NEW TREE PLANTING



The ideal time to plant trees and shrubs is during the dormant season, in the fall after leaf drop or early spring before budbreak. Weather conditions are cool and allow plants to establish roots in the new location before spring rains and summer heat stimulate new top growth. Before you begin planting your tree, be sure you have had all underground utilities located prior to digging.

If the tree you are planting is balled or bare root, it is important to understand that its root system has been reduced by 90 to 95 percent of its original size during transplanting. As a result of the trauma caused by the digging process, trees commonly exhibit what is known as transplant shock. Containerized trees may also experience transplant shock, particularly if they have circling roots that must be cut. Transplant shock is indicated by slow growth and reduced vigor following transplanting. Proper site preparation before and during planting coupled with good follow-up care reduces the amount of time the plant experiences transplant shock and allows the tree to quickly establish in its new location. Carefully follow nine simple steps, and you can significantly reduce the stress placed on the plant at the time of planting.

NEW TREE PLANTING, continued

1. Dig a shallow, broad planting hole. Make the hole wide, as much as three times the diameter of the root ball but only as deep as the root ball. It is important to make the hole wide because the roots on the newly establishing tree must push through surrounding soil in order to establish. On most planting sites in new developments, the existing soils have been compacted and are unsuitable for healthy root growth. Breaking up the soil in a large area around the tree provides the newly emerging roots room to expand into loose soil to hasten establishment.

2. Identify the trunk flare. The trunk flare is where the roots spread at the base of the tree. This point should be partially visible after the tree has been planted (see diagram). If the trunk flare is not partially visible, you may have to remove some soil from the top of the root ball. Find it so you can determine how deep the hole needs for proper planting.

3. Remove tree container for containerized trees. Carefully cutting down the sides of the container may make this easier. Inspect the root ball for circling roots and cut or remove them. Expose the trunk flare, if necessary.

4. Place the tree at the proper height. Before placing the tree in the hole, check to see that the hole has been dug to the proper depth and no more. The majority of the roots on the newly planted tree will develop in the top 12 inches of soil. If the tree is planted too deeply, new roots will have difficulty developing because of a lack of oxygen. It is better to plant the tree a little high, 1-2 inches above the base of the trunk flare, than to plant it at or below the original growing level. This planting level will allow for some settling.

5. Straighten the tree in the hole. Before you begin backfilling, have someone view the tree from several directions to confirm that the tree is straight. Once you begin backfilling, it is difficult to reposition the tree.

6. Fill the hole gently but firmly. Fill the hole about one-third full and gently but firmly pack the soil around the base of the root ball. Be careful not to damage the trunk or roots in the process. Fill the remainder of the hole, taking care to firmly pack soil to eliminate air pockets that may cause roots to dry out. To avoid this problem, add the soil a few inches at a time and settle with water. Continue this process until the hole is filled and the tree is firmly planted. It is not recommended to apply fertilizer at time of planting.

7. Stake the tree, if necessary. If the tree is grown properly at the nursery, staking for support will not be necessary in most home landscape situations. Studies have shown that trees establish more quickly and develop stronger trunk and root systems if they are not staked at the time of planting. However, protective staking may be required on sites where lawn mower damage, vandalism, or windy conditions are concerns. If staking is necessary for support, there are three methods to choose among: staking, guying, and ball stabilizing. One of the most common methods is staking. With this method, two stakes used in conjunction with a wide, flexible tie material on the lower half of the tree will hold the tree upright, provide flexibility, and minimize injury to the trunk (see diagram). Remove support staking and ties after the first year of growth.

8. Mulch the base of the tree. Mulch is simply organic matter applied to the area at the base of the tree. It acts as a blanket to hold moisture, it moderates soil temperature extremes, and it reduces competition from grass and weeds. A 2- to 3-inch layer is ideal. More than 3 inches may cause a problem with oxygen and moisture levels. When placing mulch, be sure that the actual trunk of the tree is not covered. Doing so may cause decay of the living bark at the base of the tree. A mulch-free area, 1 to 2 inches wide at the base of the tree, is sufficient to avoid moist bark conditions and prevent decay.

TREE MAINTENANCE AND PRUNING

Some trees do not generally require pruning. The occasional removal of dead twigs or wood is typical. Occasionally a tree has a defect or structural condition that would benefit from pruning. Any pruning activity should be performed under the guidance of a certified arborist or tree expert.

Because each cut has the potential to change the growth of the tree, no branch should be removed without a reason. Common reasons for pruning are to remove dead branches, to remove crowded or rubbing limbs, and to eliminate hazards. Trees may also be pruned to increase light and air penetration to the inside of the tree's crown or to the landscape below. In most cases, mature trees are pruned as a corrective or preventive measure.

Routine thinning does not necessarily improve the health of a tree. Trees produce a dense crown of leaves to manufacture the sugar used as energy for growth and development. Removal of foliage through pruning can reduce growth and stored energy reserves. Heavy pruning can be a significant health stress for the tree.

Yet if people and trees are to coexist in an urban or suburban environment, then we sometimes have to modify the trees. City environments do not mimic natural forest conditions. Safety is a major concern. Also, we want trees to complement other landscape plantings and lawns. Proper pruning, with an understanding of tree biology, can maintain good tree health and structure while enhancing the aesthetic and economic values of our landscapes.

Pruning Techniques – From the I.S.A. Guideline

Specific types of pruning may be necessary to maintain a mature tree in a healthy, safe, and attractive condition.

Cleaning is the removal of dead, dying, diseased, crowded, weakly attached, and low- vigor branches from the crown of a tree.

Thinning is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.

Raising removes the lower branches from a tree to provide clearance for buildings, vehicles, pedestrians, and vistas.

Reduction reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, reduction helps maintain the form and structural integrity of the tree.

TREE MAINTENANCE AND PRUNING, continued

How Much Should Be Pruned?

Mature trees should require little routine pruning. A widely accepted rule of thumb is never to remove more than one-quarter of a tree's leaf-bearing crown. In a mature tree, pruning even that much could have negative effects. Removing even a single, large- diameter limb can create a wound that the tree may not be able to close. The older and larger a tree becomes, the less energy it has in reserve to close wounds and defend against decay or insect attack. Pruning of mature trees is usually limited to removal of dead or potentially hazardous limbs.

Wound Dressings

Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings do not reduce decay or speed closure and rarely prevent insect or disease infestations. Most experts recommend that wound dressings not be used.

DISEASES AND INSECTS

Continual observation and monitoring of your tree can alert you to any abnormal changes. Some indicators are: excessive leaf drop, leaf discoloration, sap oozing from the trunk and bark with unusual cracks. Should you observe any changes, you should contact a Tree specialist or Certified Arborist to review the tree and provide specific recommendations. Trees are susceptible to hundreds of pests, many of which are typical and may not cause enough harm to warrant the use of chemicals. However, diseases and insects may be indication of further stress that should be identified by a professional.

GRADE CHANGES

The growing conditions and soil level of trees are subject to detrimental stress should they be changed during the course of construction. Raising the grade at the base of a tree trunk can have long-term negative consequences. This grade level should be maintained throughout the protected zone. This will also help in maintaining the drainage in which the tree has become accustomed.

INSPECTION

The property owner should establish an inspection calendar based on the recommendation provided by the tree specialist. This calendar of inspections can be determined based on several factors: the maturity of the tree, location of tree in proximity to high-use areas vs. low-use area, history of the tree, prior failures, external factors (such as construction activity) and the perceived value of the tree to the homeowner.

Assumptions and Limiting Conditions

No warranty is made, expressed or implied, that problems or deficiencies of the trees or the property will not occur in the future, from any cause. The Consultant shall not be responsible for damages or injuries caused by any tree defects, and assumes no responsibility for the correction of defects or tree related problems.

The owner of the trees may choose to accept or disregard the recommendations of the Consultant, or seek additional advice to determine if a tree meets the owner's risk abatement standards.

The Consulting Arborist has no past, present or future interest in the removal or retaining of any tree. Opinions contained herein are the independent and objective judgments of the consultant relating to circumstances and observations made on the subject site.

The recommendations contained in this report are the opinions of the Consulting Arborist at the time of inspection. These opinions are based on the knowledge, experience, and education of the Consultant. The field inspection was a visual, grade level tree assessment.

The Consulting Arborist shall not be required to give testimony, perform site monitoring, provide further documentation, be deposed, or to attend any meeting without subsequent contractual arrangements for this additional employment, including payment of additional fees for such services as described by the Consultant.

The Consultant assumes no responsibility for verification of ownership or locations of property lines, or for results of any actions or recommendations based on inaccurate information.

This Arborist report may not be reproduced without the express permission of the Consulting Arborist and the client to whom the report was issued. Any change or alteration to this report invalidates the entire report.

Should you have any further questions regarding this property, please feel free to contact me at (310) 663-2290.

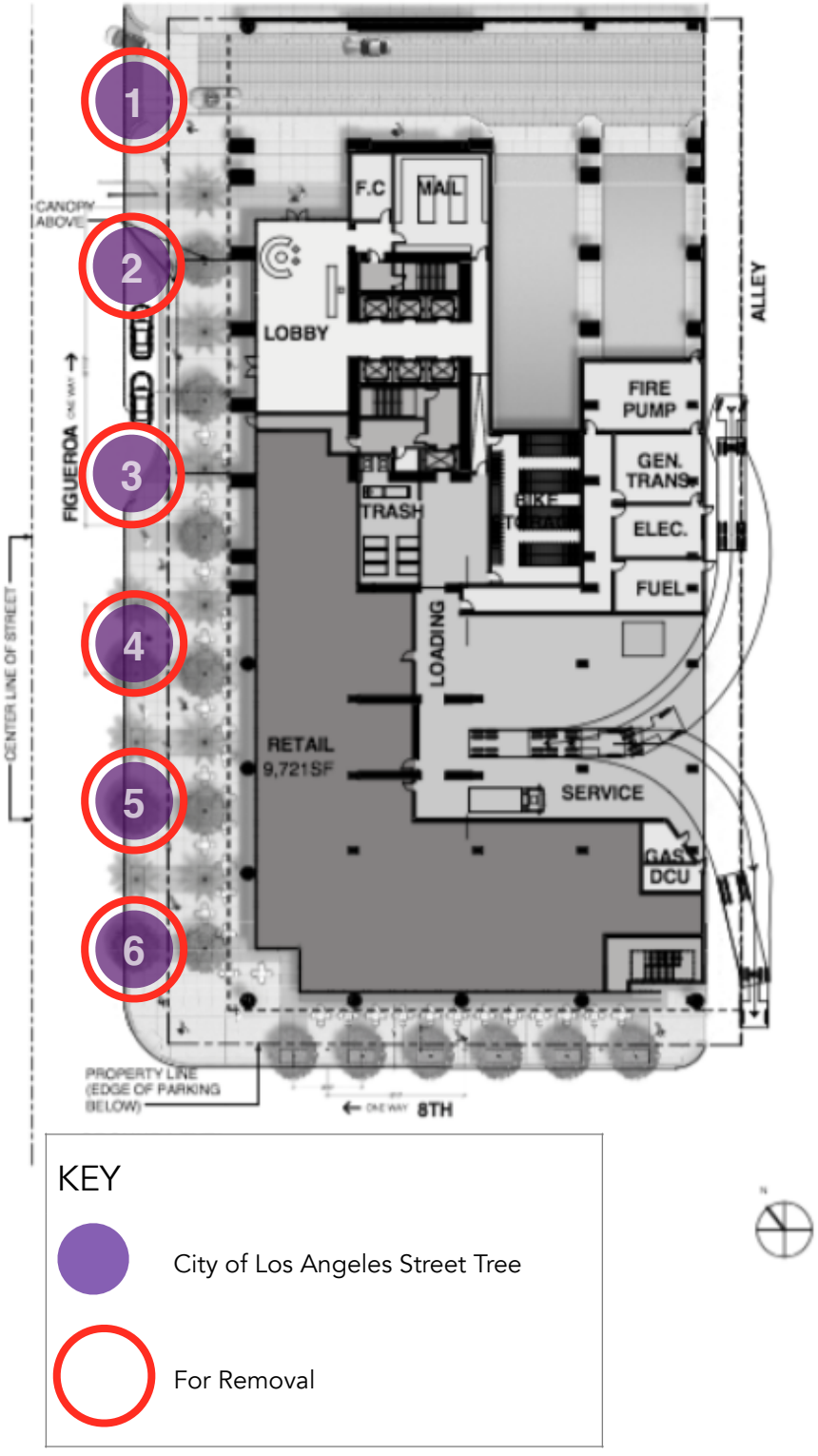
Respectfully submitted,

Lisa Smith

Registered Consulting Arborist #464
ISA Certified Arborist #WE3782
ISA Tree Risk Assessor Qualified
American Society of Consulting Arborists, Member

APPENDIX A - TREE LOCATION MAP

8th St and Figueroa St, Los Angeles, CA 90017



APPENDIX B - PHOTOGRAPHS

8th St and Figueroa St, Los Angeles, CA 90017

PHOTO 1. Shows Street Tree #1, Ficus microcarpa 'Nitida'. This tree will be impacted by site improvements and is recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

PHOTO 2. Shows Street Tree #2, Ficus microcarpa 'Nitida'. This tree will be impacted by site improvements and is recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

PHOTO 3. Shows Street Tree #3 Ficus microcarpa 'Nitida'. This tree will be impacted by site improvements and is recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

PHOTO 4. Shows Street Tree #4 Ficus microcarpa 'Nitida'. This tree will be impacted by site improvements and is recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

PHOTO 5. Shows Street Trees #5 and #6, both Ficus microcarpa 'Nitida'. The root detail pictures are both of Street Tree #5. Both trees will be impacted by site improvements and are recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

PHOTO 6. Shows Street Tree #6, Ficus microcarpa 'Nitida'. This tree will be impacted by site improvements and are recommended for removal and mitigation to the satisfaction of the City of Los Angeles Department of Urban Forestry.

APPENDIX C - TREE INVENTORY CHART

8th St and Figueroa St, Los Angeles, CA 90017

Table 1. Tree Inventory Chart

Tree No.	Location	Species	DBH	Height	Spread	Condition	Disposition
1	Street	Ficus microcarpa 'Nitida'	22"	45'	45'	Fair	Remove
2	Street	Ficus microcarpa 'Nitida'	21"	45'	45'	Fair	Remove
3	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove
4	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove
5	Street	Ficus microcarpa 'Nitida'	23"	45'	45'	Poor	Remove
6	Street	Ficus microcarpa 'Nitida'	24"	45'	45'	Fair	Remove

Appendix IS-2

Historical Resource Report

8TH & FIGUEROA
Los Angeles, California

Historical Resource Report

Prepared by:

CONSULTING
GPA

October 2016

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EXECUTIVE SUMMARY

The purpose of this report was to determine if a project in the Central City Community Plan Area of the City of Los Angeles would directly or indirectly impact any historical resources subject to the California Environmental Quality Act (CEQA). The proposed project involves the parcels located at the northeast corner of W. 8th Street and S. Figueroa Street. GPA Consulting (GPA) was retained to identify historical resources in the vicinity of the project site, to assess any potential impacts the project may have on the identified historical resources, and to recommend mitigation measures, as appropriate. The project site is currently improved with a surface parking lot. One historical resource is adjacent to the project site on the north, the Barker Brothers Building at 818 W. 7th Street, which is listed in the California Register of Historical Resources and designated Los Angeles Historic-Cultural Monument #356.

The threshold for determining significant impacts on historical resources in the State CEQA Guidelines is whether the proposed project will cause a substantial adverse change, which is defined as demolition, destruction, relocation, or alteration of the resource such that the significance of the historical resource is materially impaired.

The project would have no direct impacts on historical resources, as it does not involve the demolition, destruction, relocation, or alteration of any resources. GPA analyzed the indirect impacts on the Barker Brothers Building and concluded that the proposed project would have a less than significant impact. No mitigation measures are required or recommended.

1. INTRODUCTION

1.1 Purpose and Qualifications

The purpose of this report is to determine and set forth whether or not a proposed development project would impact historical resources. The proposed project involves the parcels located at the northeast corner of W. 8th Street and S. Figueroa Street in the Financial Core of Downtown within the Central City Community Plan Area of the City of Los Angeles (see Figure 1 below). The project site is currently occupied by a surface parking lot that includes the following addresses and assessor's parcel numbers:

- 716 S. Figueroa Street, 5144-010-020
- 720 S. Figueroa Street, 5144-010-019
- 734 S. Figueroa Street, 5144-010-014
- 742 S. Figueroa Street, 5144-010-013
- 744 S. Figueroa Street, 5144-010-012
- 746 S. Figueroa Street, 5144-010-011
- 817 W. 8th Street, 5144-010-010

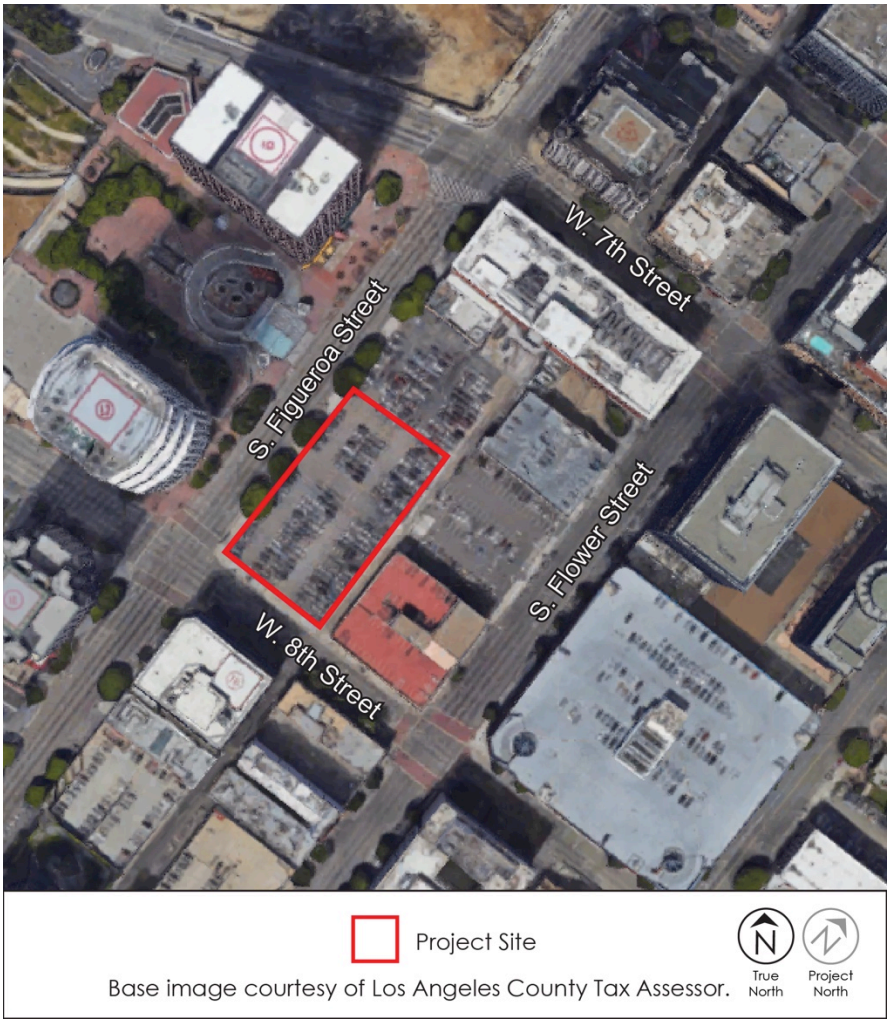

Figure 1: Project location.

The proposed project involves the construction of a 43-story residential tower with ground floor retail, three levels of above ground parking, and four levels of subterranean parking.

GPA Consulting (GPA) was retained to identify historical resources in the vicinity of the project site, to assess any potential impacts the project may have on the identified historical resources, and to recommend mitigation measures, as appropriate, for compliance with the California Environmental Quality Act (CEQA). Teresa Grimes and Laura O'Neill were responsible for the preparation of this report. They each fulfill the qualifications for historic preservation professionals outlined in Title 36 of the Code of Federal Regulations, Part 61. Their résumés are attached in Appendix A.

1.2 Methodology

In preparing this report, the following tasks were performed:

1. Conducted a field inspection of the project site and surrounding area to determine the scope of the study. The study area was identified as the single city block bounded by W. 7th Street on the north, W. 8th Street on the south, S. Figueroa Street on the west, and S. Flower Street on the east (see Figure 2 below). The study area includes the buildings and vacant lots that share the block with the proposed project.

2. Requested and reviewed a records search from the South Central Coastal Information Center at California State University, Fullerton to determine whether or not any of the buildings in the study area are currently listed as landmarks at the national, state, or local levels and whether or not they have been previously evaluated as historical resources. The records search concluded the following (see Figure 4 in Section 3.2 for a map of the historical resource in the study area):

    a. The project site is occupied by a surface parking lot. There are no historical resources on the project site.

    b. The Barker Brothers Building at 818 W. 7th Street is adjacent to the project site on the north. It was formally determine eligible for listing in the National Register of Historic Places in 1979, such properties are automatically included in the California Register of Historical Resources. In additional, it was designated Los Angeles Historic-Cultural Monument #356 in 1988.

3. Reviewed and analyzed the plans and related documents to determine if the proposed project would have and indirect impact on the identified historical resource as defined by CEQA (see Appendix B for a copy of the plan set).

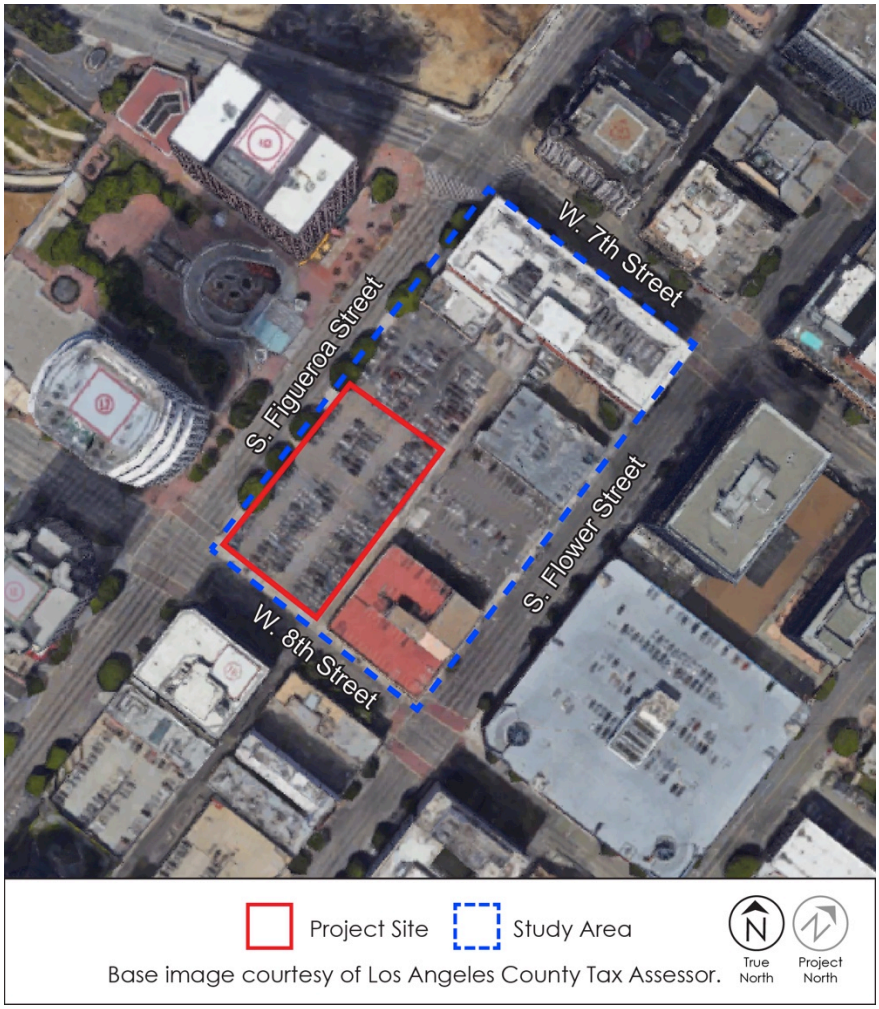

Figure 2: Study Area.

2. REGULATORY FRAMEWORK

Generally, a lead agency must consider a property a historical resource under CEQA if it is eligible for listing in the California Register of Historical Resources (California Register). The California Register is modeled after the National Register of Historic Places (National Register). Furthermore, a property is presumed to be historically significant if it is listed in a local register of historic resources or has been identified as historically significant in a historic resources survey (provided certain criteria and requirements are satisfied) unless a preponderance of evidence demonstrates that the property is not historically or culturally significant.[1] The National Register, California Register, and local designation programs are discussed below.

[1] Public Resources Code Section 5024.1 and 14 CCR Sections 4850 & 15064.5(a)(2).

2.1 National Register of Historic Places

The National Register is "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment."[2]

Criteria

To be eligible for listing in the National Register, a property must be at least 50 years of age (unless the property is of "exceptional importance") and possess significance in American history and culture, architecture, or archaeology. A property of potential significance must meet one or more of the following four established criteria: [3]

A. Associated with events that have made a significant contribution to the broad patterns of our history; or

B. Associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Yield, or may be likely to yield, information important in prehistory or history.

Physical Integrity

According to *National Register Bulletin #15*, "to be eligible for listing in the National Register, a property must not only be shown to be significant under National Register criteria, but it also must have integrity." Integrity is defined in *National Register Bulletin #15* as "the ability of a property to convey its significance."[4] Within the concept of integrity, the National Register recognizes the following seven aspects or qualities that in various combinations define integrity: feeling, association, workmanship, location, design, setting, and materials.

Context

To be eligible for listing in the National Register, a property must also be significant within a historic context. *National Register Bulletin #15* states that the significance of a historic property can be judged only when it is evaluated within its historic context. Historic contexts are "those patterns, themes, or trends in history by which a specific...property or site is understood and its meaning...is made clear."[5] A property must represent an important aspect of the area's history or prehistory and possess the requisite integrity to qualify for the National Register.

[2] Title 36 Code of Federal Regulations Part 60.2.
[3] Title 36 Code of Federal Regulations Part 60.4.
[4] *National Register Bulletin #15: How to Apply the National Register Criteria for Evaluation,* (Washington D.C.: National Park Service, 2002), 44-45.
[5] *National Register Bulletin #15,* 7.

2.2 California Register of Historical Resources

In 1992, Governor Wilson signed Assembly Bill 2881 into law establishing the California Register. The California Register is an authoritative guide used by state and local agencies, private groups, and citizens to identify historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse impacts.[6]

The California Register consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed in the National Register and those formally Determined Eligible for the National Register;
- State Historical Landmarks from No. 0770 onward; and
- Those California Points of Historical Interest that have been evaluated by the State Office of Historic Preservation (SOHP) and have been recommended to the State Historical Resources Commission for inclusion on the California Register.[7]

For properties not automatically listed, the criteria for eligibility of listing in the California Register are based upon National Register criteria, but are identified as 1-4 instead of A-D. To be eligible for listing in the California Register, a property generally must be at least 50 years of age and must possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

Historical resources eligible for listing in the California Register may include buildings, sites, structures, objects, and historic districts. Resources less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historical importance. While the enabling legislation for the California Register is less rigorous with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance.[8]

[6] Public Resources Code Section 5024.1 (a).
[7] Public Resources Code Section 5024.1 (d).
[8] Public Resources Code Section 4852.

The California Register may also include properties identified during historical resource surveys. However, the survey must meet all of the following criteria:[9]

1. The survey has been or will be included in the State Historic Resources Inventory;

2. The survey and the survey documentation were prepared in accordance with office [SOHP] procedures and requirements;

3. The resource is evaluated and determined by the office [SOHP] to have a significance rating of Category 1 to 5 on a DPR Form 523; and

4. If the survey is five or more years old at the time of its nomination for inclusion in the California Register, the survey is updated to identify historical resources which have become eligible or ineligible due to changed circumstances or further documentation and those which have been demolished or altered in a manner that substantially diminishes the significance of the resource.

SOHP Survey Methodology

The evaluation instructions and classification system proscribed by the SOHP in its *Instructions for Recording Historical Resources* provide a three-digit evaluation code for use in classifying potential historical resources. In 2003, the codes were revised to address the California Register. The first digit indicates the general category of evaluation. The second digit is a letter code to indicate whether the resource is separately eligible (S), eligible as part of a district (D), or both (B). The third digit is a number, which is coded to describe some of the circumstances or conditions of the evaluation referred to in the first digit. The general evaluation categories are as follows:

1. Listed in the National Register or the California Register.

2. Determined eligible for listing in the National Register or the California Register.

3. Appears eligible for listing in the National Register or the California Register through survey evaluation.

4. Appears eligible for listing in the National Register or the California Register through other evaluation.

5. Recognized as historically significant by local government.

6. Not eligible for listing or designation as specified.

7. Not evaluated or needs re-evaluation.

2.3 City of Los Angeles Cultural Heritage Ordinance

The Los Angeles City Council adopted the Cultural Heritage Ordinance in 1962 and amended it in 2007 (Sections 22.171 et. seq. of the Administrative Code). The Ordinance created a Cultural

[9] Public Resources Code Section 5024.1.

Heritage Commission and criteria for designating Historic-Cultural Monuments (HCM). The Commission is comprised of five citizens, appointed by the Mayor, who have exhibited knowledge of Los Angeles history, culture and architecture. The four criteria for HCM designation are stated below:

- The proposed HCM reflects the broad cultural, economic, or social history of the nation, state or community; or
- The proposed HCM is identified with historic personages or with important events in the main currents of national, state or local history; or
- The proposed Monument embodies the characteristics of an architectural type specimen inherently valuable for a study of a period, style or method of construction;
- The proposed HCM is the notable work of a master builder, designer, or architect whose individual genius influenced his or her age.[10]

Unlike the National and California Registers, the Ordinance makes no mention of concepts such as physical integrity or period of significance. Moreover, properties do not have to reach a minimum age requirement, such as 50 years, to be designated as HCMs.

3. ENVIRONMENTAL SETTING

3.1 Description of the Project Site and Study Area

The study area is the single city block bounded by W. 7th Street on the north, W. 8th Street on the south, S. Figueroa Street on the west, and S. Flower Street on the east. The topography of the study area is generally flat. The study area includes the surfacing parking lot that is also the project site, which occupies the majority of the west half of the block. The surrounding parcels include the Barker Brothers Building on the north and two buildings and another surface parking lot on the east. The Barker Brothers Building is located at 818 W. 7th Street and is described in greater detail below. The building at 757 S. Flower Street is a seven-story parking structure constructed in 1948. The building at 723 S. Flower Street is a five-story parking structure constructed in 1959. They are separated by a surface parking lot. Across Figueroa Street is the FIGat7th shopping mall, which is flanked by two office towers Up and down Figueroa Street are modern high-rise office buildings, mostly constructed within the past 30 years.

[10] Los Angeles Administrative Code Section 22.171.7.

Figure 3: Looking northeast from corner of 8th Street and Figueroa Street at project site.

Figure 4: Looking southeast from corner of 7th Street and Figueroa Street at project site.

3.2 Historical Resources in the Project Study Area

The only historical resource in the study area is the 12-story Barker Brothers Building, located north of the project site. It was formally determine eligible for listing in the National Register of Historic Places in 1979, such properties are automatically included in the California Register of Historical Resources. In addition, it was designated Los Angeles Historic-Cultural Monument #356 in 1988. Barker Brothers was an upscale furniture store chain that was founded in 1880 by O.T. Barker. A year earlier Barker stopped in Los Angeles for a horticulture show while traveling beween Colorado Springs and San Jose. Los Angeles was a small town of 11,138 then. But it was growing. At the horticulture fair, Barker overheard Otto Mueller complaining about the expense of furnishing his new house from the only furniture store in town. The pair became partners and opened a store near Olvera Street. The business outgrew this space and moved to 722 S. Broadway in 1909. The business expanded even more, and moved to 818 W. Seventh Street in 1926.

In 1925, the distinguished local architecture firm of Curlett and Beelman was retained to design a flagship store for Barker Brothers, which by this time had satellite stores. The building also included office and warehouse space for the company on the upper stories. The Renaissance Revival style building faces 7th Street, and extends the full length of the block from Flower Street to Figueroa Street. The three street-facing elevations are organized horizontally much like a classical column with a base, shaft, and capital. Terra cotta is used to clad the upper and lower stories and to accent vertical elements, while brick is used to clad the middle stories. The main entrance to the building is centrally located on the 7th Street elevation within a monumental arched opening. Storefronts are evenly spaced along the street-facing elevations.

The rear (or south) elevation is visible looking north from Flower Street to Figueroa Street, but is utilitarian in design. It does not include any of the architectural features found on the other elevations. Windows are stacked vertically across the upper stories. In the approximate center, it appears that an elevator shaft or staircase has been added. A driveway from Flower Street provides access to subterranean parking and loading zones. Along Figueroa Street is a three-story addition constructed in 2001.

Barker Brothers filed for bankruptcy in 1991. The building was sold in 1922, and adaptively re-used as an office building with ground floor retail spaces.

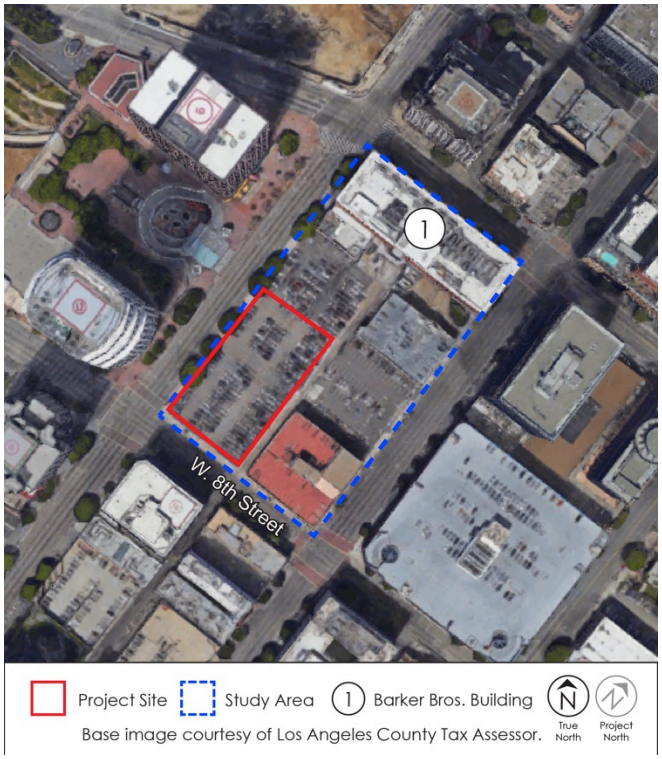

Figure 5: Map of known historical resources in the study area.

Figure 6: Barker Brothers Building, viewed from the corner of 7th Street and Flower Street. East and north elevations depicted.

4. PROJECT IMPACTS

4.1 Determining the Significance of Impacts on Historical Resources

The State CEQA Guidelines set the standard for determining the significance of impacts to historical resources in Title 14 California Code of Regulations Section 15064.5(b), which states:

> A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

Title 14 California Code of Regulations Section 15064.5(b)(1) further clarifies "substantial adverse change" as follows:

> Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

Title 14 California Code of Regulations Section 15064.5(b)(1) in turn explains that a historical resource is "materially impaired" when a project:

> Demolishes or materially alters in an adverse manner those physical characteristics that convey its significance and that justify its inclusion in or eligibility for inclusion in the California Register, local register, or its identification in a historic resources survey.

The following factors are set forth in the City of Los Angeles' "L.A. CEQA Thresholds Guide," which states that a project would normally have a significant impact on a historical resource if it would result in a substantial adverse change in the significance of the historical resource. A substantial adverse change in significance occurs if the project involves:

- Demolition of a significant resource;
- Relocation that does not maintain the integrity and (historical/architectural) significance of a significant resource;
- Conversion, rehabilitation, or alteration of a significant resource which does not conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings; or
- Construction that reduces the integrity or significance of important resources on the site or in the vicinity.

As such, the test for determining whether or not a proposed project will have a significant impact on an identified historical resource is whether or not the project will alter in an adverse manner the physical integrity of the historical resource such that it would no longer be eligible for listing in the National or California Registers or other landmark programs such as the list of Los Angeles Historic-Cultural Monuments.

4.2 Secretary of the Interior's Standards

Projects that may affect historical resources are considered to be mitigated to a level of less than significant if they are consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Standards).[11] Projects with no other potential impacts qualify for a Class 31 exemption under CEQA if they meet the Standards.[12] The Standards were issued by the National Park Service. The Standards are accompanied by Guidelines for four types of treatments for historical resources: Preservation, Rehabilitation, Restoration, and Reconstruction. Though none of the four treatments as a whole applies specifically to new construction in the vicinity of historical resources, Standard #9 of the Standards for Rehabilitation provides relevant guidance for such projects.

The Standards for Rehabilitation are as follows:

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

[11] 14 CCR Section 15126.4(b).
[12] 14 CCR Section 155331.

10. New additions and adjacent or related new construction will be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

It is important to note that the Standards are not intended to be prescriptive, but instead provide general guidance. They are intended to be flexible and adaptable to specific project conditions to balance continuity and change, while retaining materials and features to the maximum extent feasible. Their interpretation requires exercising professional judgment and balancing the various opportunities and constraints of any given project. Not every Standard necessarily applies to every aspect of a project, nor is it necessary to comply with every Standard to achieve compliance.

4.3 Project Description

Figure 7: Rendering of proposed project.

The project involves the construction of a 43-story residential tower with ground floor retail, three levels of above ground parking, and four levels of subterranean parking. The residential tower would be situated over the northwestern portion of a five-level podium. Amenities for the building tenants would be located south and east of the tower on top of the podium and include a pool, landscaped patio, and fitness room. The tower is roughly square in shape and clad in vision, patterned, and spandrel glass, while the podium is rectangular and clad in stone and aluminum. Vehicular ingress and egress would occur at the north end of the building with

access from Figueroa Street on the west and an alley on the east that connects to 8th Street on the south. See Appendix B for project plans, sections, and elevations.

4.4 Analysis of Project Impacts

The proposed project does not involve the demolition, destruction, relocation, or alteration of any historical resources. The project site is occupied by a surface parking lot. However, the project site is located in proximity to the Barker Brothers Building, so it has the potential to indirectly affect a historical resource. In determining impacts of adjacent new construction on an individual resource such as the Barker Brothers Building the central question is whether the new building would affect the physical integrity of the historic building to the degree that it would no longer qualify as a historical resource. Such an effect would only occur if the Barker Brothers Building no longer retained sufficient integrity to convey its significance. According to *National Register Bulletin #15*, there are seven aspects of integrity: feeling, association, workmanship, location, design, setting, and materials. The only relevant aspect with respect to the impact of a new building on a historic building is setting.

The primary visual interaction between the project and the Barker Brothers Building would occur at the side wall of the podium (north elevation) of the new building and the rear wall (south elevation) of the historic building. Between the new building and historic building would be a surface parking lot 106'-2.5" wide as well as a driveway. The visibility of the project from the historic building's primary elevation along 7th Street would be incidental, as the new building would become part of the background. Thus, the relationship between the project and the Barker Brothers Building would be similar to the relationship between the two office towers that flank the FIGat7th shopping mall and the Barker Brothers Building. The new building would introduce a new visual element to the setting of the Barker Brothers Building; however, the setting in the Financial Core of Downtown is already characterized by modern high-rise buildings. Thus, the project would not result in a substantial adverse change to the Barker Brothers Building or its immediate surroundings. It would continue to possess all aspects of integrity, including setting. Accordingly, it would continue to convey its significance.

Given the fact that the new building would be separated from the historic building by over 100' along Figueroa Street, the project would not constitute “related new construction” and Standard #9 does not apply.

5. CONCLUSION

The project would have no direct impacts on historical resources. There are no historical resources on the project site and no historical resources would be demolished, destroyed, altered, or relocated as a result of the project. Indirect impacts on historical resources were also analyzed. The project would have a less than significant impact on the historical resource near the project site, namely the Barker Brothers Building. Although the project would introduce a new visual element to the area, it would be physically separated from the nearby historical resource by more than 100'. The project would not result in a substantial adverse change to the immediate surroundings of the historical resource to the degree its eligibility as a resource would be materially impaired. The integrity of the Barker Brothers Building would not be compromised by the project. It would continue to be eligible for listing as historical resource defined by CEQA. No mitigation is required or recommended.

6. SOURCES

California Code of *Regulations*, California Office of Administrative Law, State of California Government.

Code of Federal Regulations, Title 36: Parks, Forests, and Public Property. Office of the Federal Register, National Archives and Records Administration, United States Government.

National Register Bulletin #15: How to Apply the National Register Criteria for Evaluation. Washington D.C.: National Park Service, 2002.

National Register Bulletin #16: How to Complete the National Register Registration Form. Washington D.C.: National Park Service, 1997.

Appendix A – Résumés

TERESA GRIMES is a Principal Architectural Historian at GPA. She has over 25 years of experience in the field of historic preservation in the private, public, and non-profit sectors. Teresa is widely recognized as an expert in the identification and evaluation of historical resources having successfully prepared dozens of landmark and historic district applications for a wide variety of property types. Her many projects have included historic context statements for Riverside, Calabasas, Glendale, and Carmel-by-the-Sea, and historic resource surveys in Riverside, Whittier, Calabasas, Pasadena, Whittier, and Los Angeles. Teresa has also completed numerous environmental compliance documents involving major landmarks; examples include the Cinerama Dome, Dodger Stadium, Los Angeles Sports Arena, Beverly Hills Post Office, and Baldwin Hills Shopping Center.

Educational Background:

- M.A., Architecture, University of California, Los Angeles, 1992
- B.A., Political Science, University of California, Los Angeles, 1986

Professional Experience:

- GPA Consulting, Principal Architectural Historian, 2009-present
- Christopher A. Joseph & Associates, Senior Architectural Historian, 2006-2009
- Teresa Grimes/Historic Preservation, Principal, 1999-2005, 1993-1994, 1991-1992
- Historic Resources Group, Project Manager/Architectural Historian, 1994-1998
- Getty Conservation Institute, Research Associate, 1992-1993
- Los Angeles Conservancy, Preservation Officer, 1988-1991

Qualifications:

- Meets the Secretary of the Interior's Professional Qualifications Standards for architectural history pursuant to the Code of Federal Regulations, 36 CFR Part 61, Appendix A.

Professional Activities:

- West Hollywood Cultural Heritage Advisory Board, 1990-1994
- Highland Park Heritage Trust, Board Member, 1996-1998
- Pasadena Heritage Board Member, 2008-12

Selected Projects:

- John Anson Ford Theatres, Los Angeles County, CEQA Historical Resource Report, 2011-2015
- City Market of Los Angeles, CEQA Historical Resource Report, 2012-2015
- Hollywood and Cherokee, Los Angeles, CEQA Historical Resource Report, 2014
- LA Biomed, Torrance, CEQA Historical Resource Report, 2013-2014
- Coca Cola Building, Los Angeles, CEQA Historical Resource Report, 2014
- United Artist Theater, Los Angeles, CEQA Historical Resource Report, 2011-2013
- Claremont Graduate University Master Plan, CEQA Historical Resource Report, 2013
- 8899 Beverly Boulevard, West Hollywood, CEQA Historical Resource Report, 2013
- Hillcrest Motors Building, Hollywood, CEQA Historical Resource Report, 2013
- New Pershing Apartments, Los Angeles, CEQA Historical Resource Report, 2012
- Max Factor Building, Hollywood, CEQA Historical Resource Report, 2012
- House of Hope, Duarte, CEQA Historical Resource Report, 2010
- Sunset Bronson Studios, Hollywood, CEQA Historical Resource Report, 2010
- Hirsh Apartments, Los Angeles, CEQA Historical Resource Report, 2010
- Claremont McKenna College Master Plan, CEQA Historical Resource Report, 2008
- Dodger Stadium, Los Angeles, CEQA Historical Resource Report, 2008
- Los Angeles Wholesale Produce Market, CEQA Historical Resource Report, 2007

LAURA O'NEILL is a Senior Architectural Historian at GPA. She has been professionally involved in the field of historic preservation since 2006. Laura uses her educational background in architecture to assist clients in rehabilitating historic buildings in compliance with the Secretary of the Interior's Standards. Her recent projects have included: preparing environmental compliance documents for the Nelles Correctional Facility and Mira Loma Detention Center; preparing a Historic Structures Report for the John Anson Ford Theatres; and completing the Federal Rehabilitation Tax Credit application for the Rosslyn Hotel Annex in Los Angeles. Laura is also adept at a number of software programs including ArcGIS, AutoCAD, Adobe InDesign, Adobe Photoshop, and Microsoft Access. She uses these skills to provide techincal support, maps, illustrations, graphics layouts, and photo simulations on various projects.

Educational Background:

- M.Arch. I, California State Polytechnic University, Pomona, 2009
- B.A., Political Science, Lehigh University, 2002

Professional Experience:

- GPA Consulting, Senior Architectural Historian, 2008-Present
- Philadelphia Historical Commission, Graduate Intern, 2008
- Caldwell Architects, Architectural Intern, 2007
- California State Polytechnic University, Graduate Assistant, 2007-2008

Qualifications:

- Meets the Secretary of the Interior's Professional Qualifications Standards for architectural history and historic architecture pursuant to the Code of Federal Regulations, 36 CFR Part 61, Appendix A.

Professional Activities:

- Santa Monica Landmarks Commissioner, 2014-present

Selected Projects:

- Villa Carlotta, Los Angeles, Character-Defining Features Analysis and Historical Resource Report, 2014-2015
- Nelles Correctional Facility Specific Plan, Whittier, CEQA Historical Resource Report, 2014-2015
- Mira Loma Detention Center Women's Facility, Los Angeles County, CEQA Historical Resource Report, 2014-2015
- Evanston Inn, Pasadena, Window Survey and CEQA Historical Resource Report, 2013
- 500 Broadway, Santa Monica, CEQA Historical Resource Report, 2013
- 21200 Victory Boulevard, Los Angeles, CEQA Historical Resource Evaluation Report, 2013
- 1318 2nd Street, Santa Monica, CEQA Historical Resource Evaluation Report, 2012
- 213 Pomona Avenue, Fullerton, CEQA Historical Resource Report, 2012
- 1012 Cliff Drive, Laguna Beach, CEQA Historical Resource Report, 2011
- 1051 Marine Drive, Laguna Beach, CEQA Historical Resource Report, 2011
- House of Hope, Duarte, CEQA Historical Resource Report, 2010
- Moore House, Palos Verdes Estates, CEQA Historical Resource Report, 2010
- Hollywood Center Studios, Los Angeles, CEQA Historical Resource Evaluation Report, 2010
- Caroline Severance Manor, Los Angeles, CEQA Historical Resource Report, 2009
- Wilshire Grand Hotel, Los Angeles, CEQA Historical Resource Report, 2009

Appendix B – Project Plans

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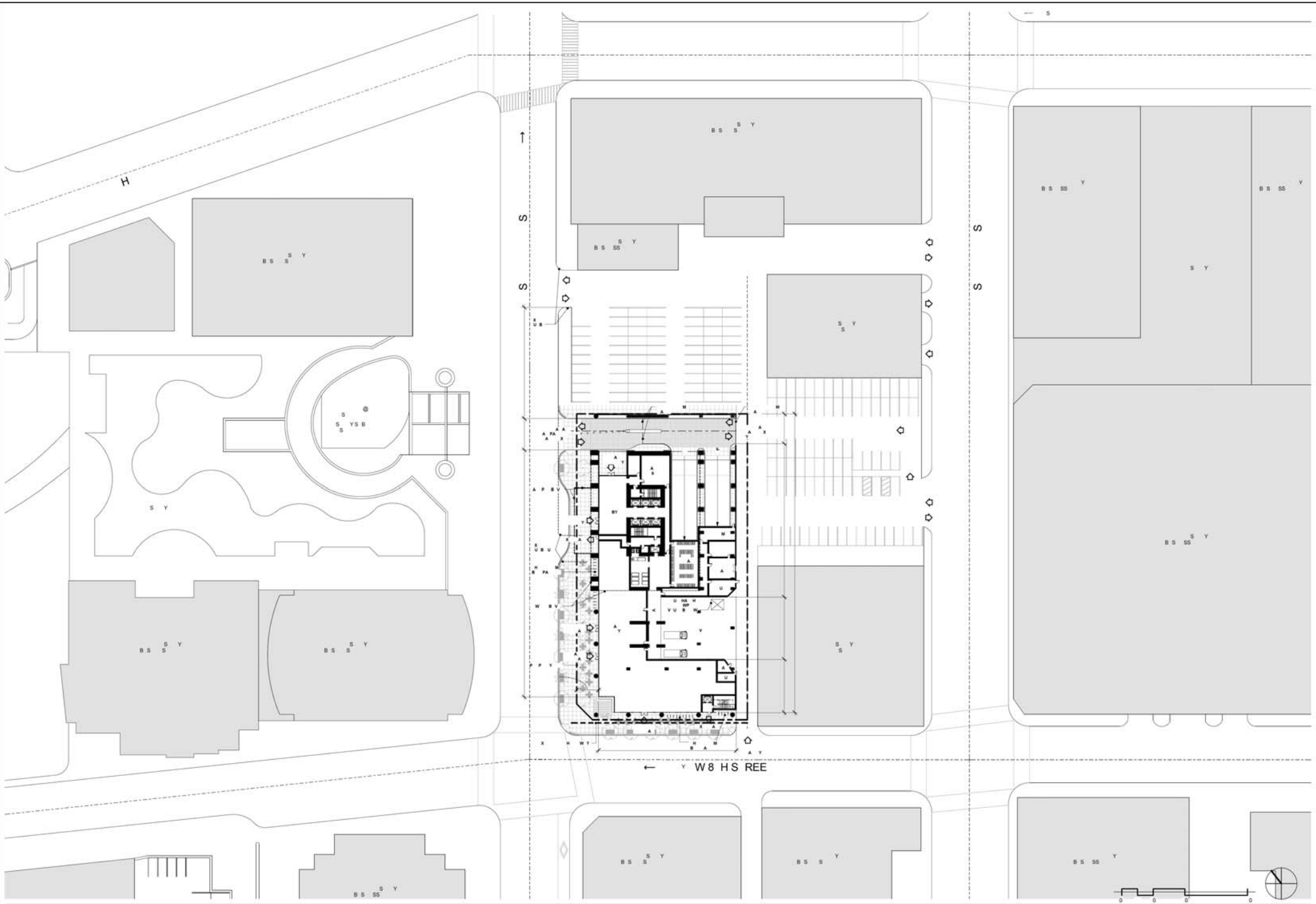
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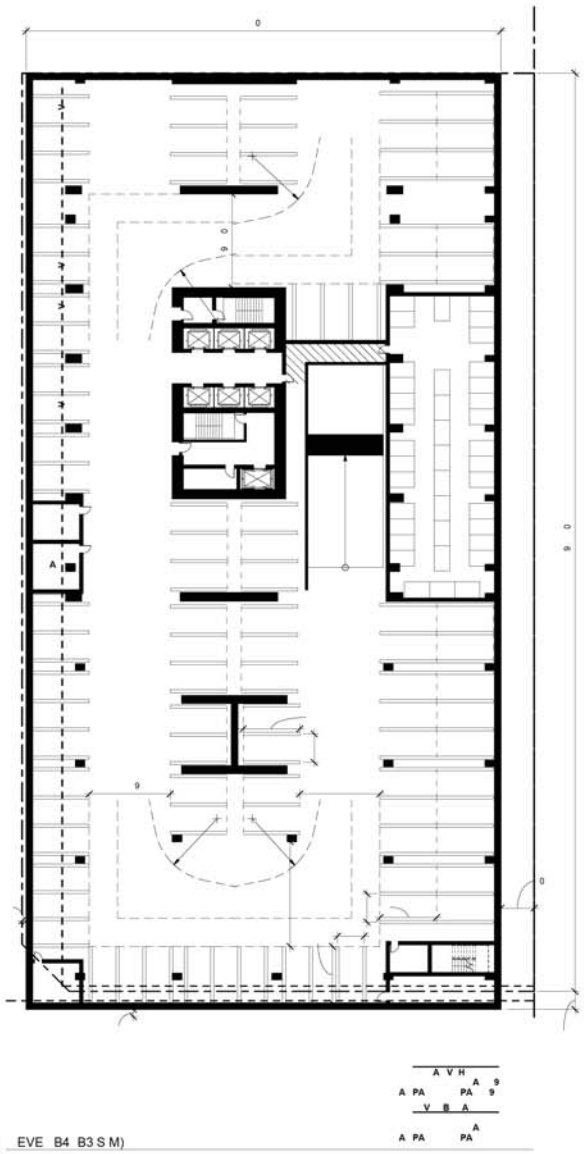

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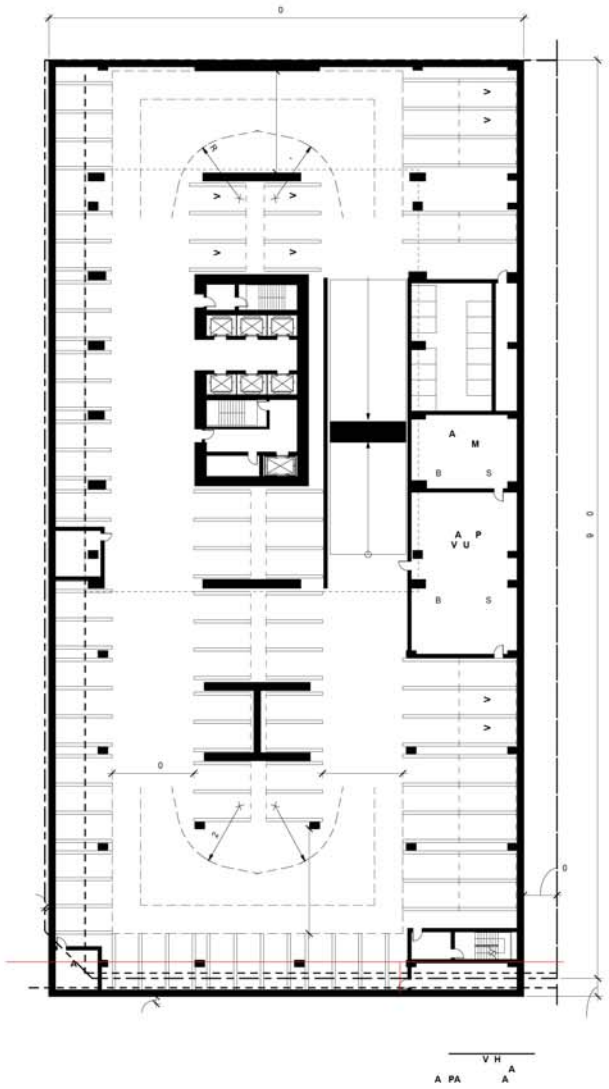

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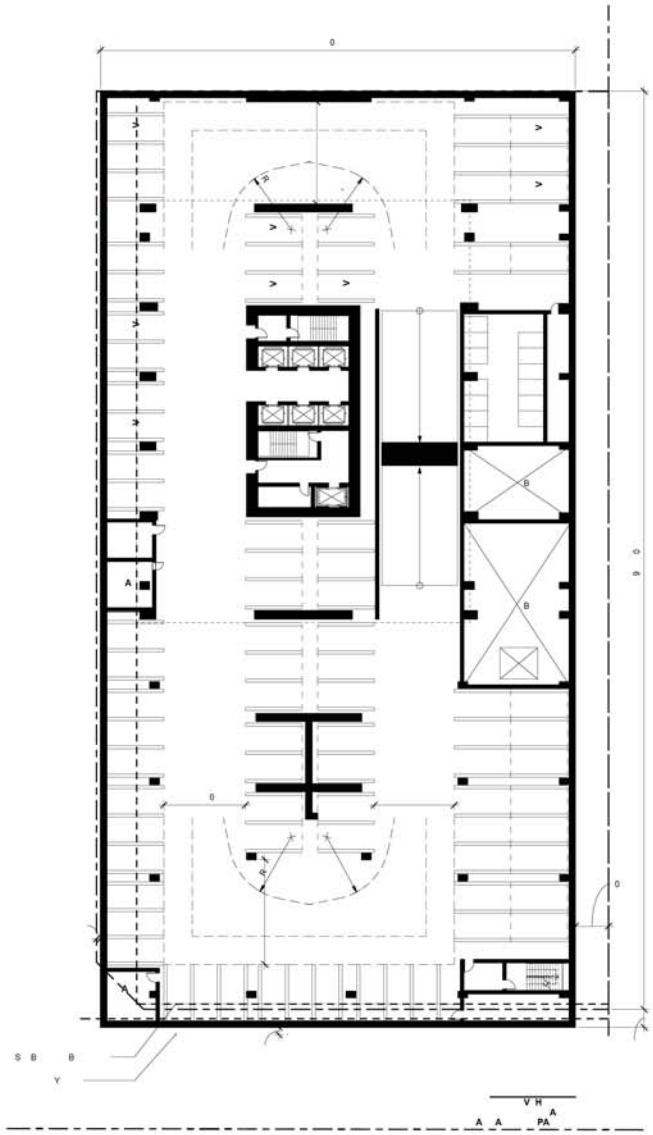

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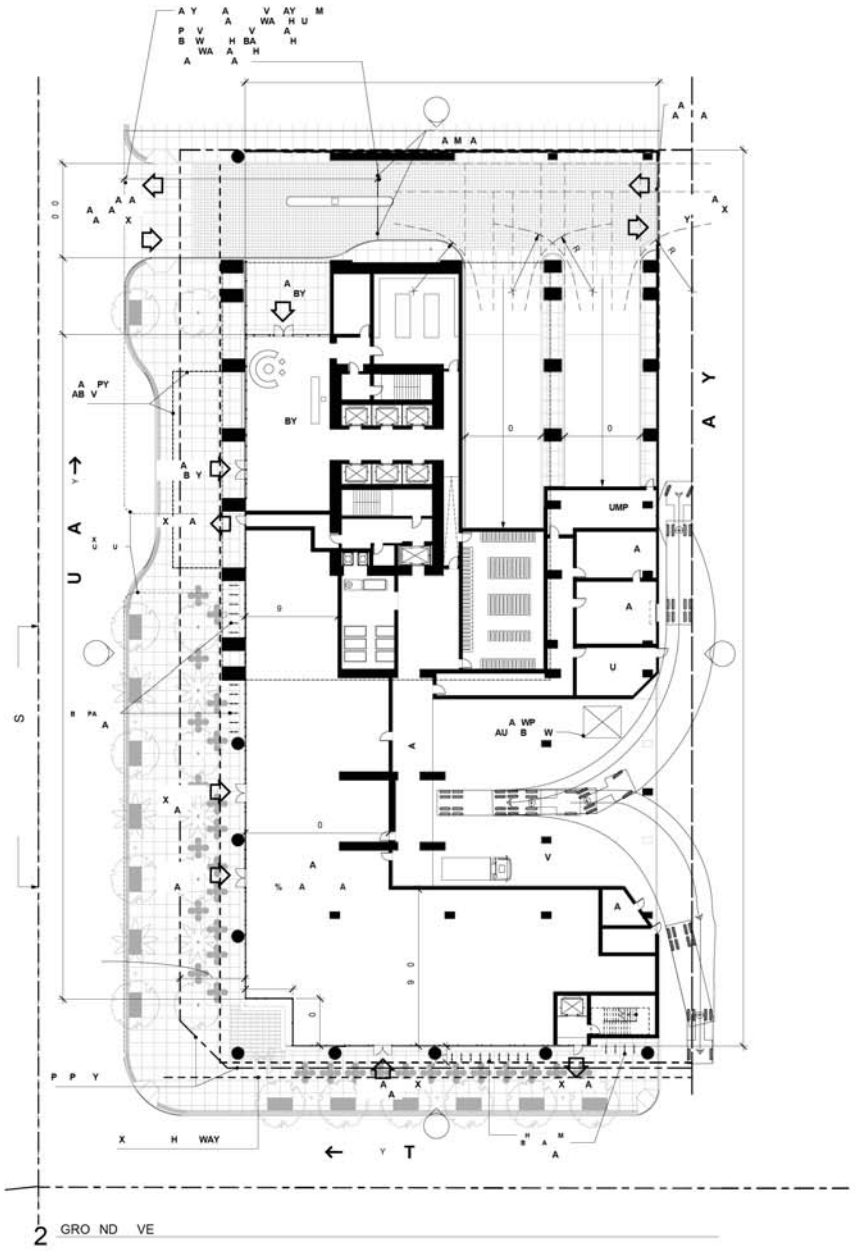

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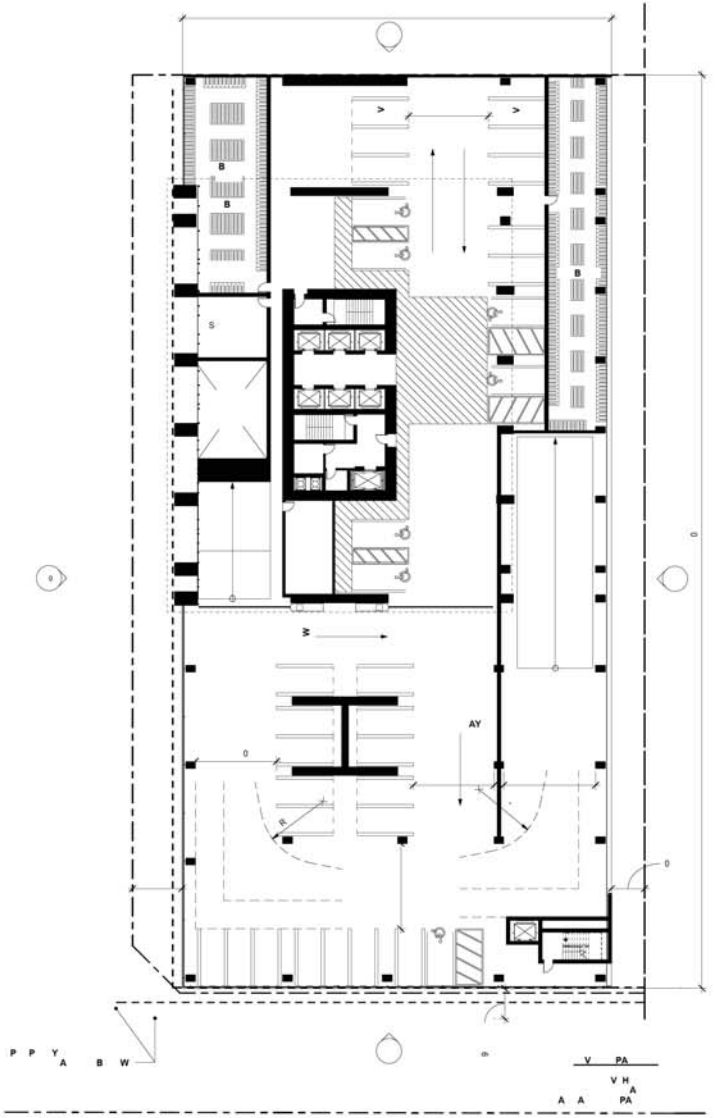

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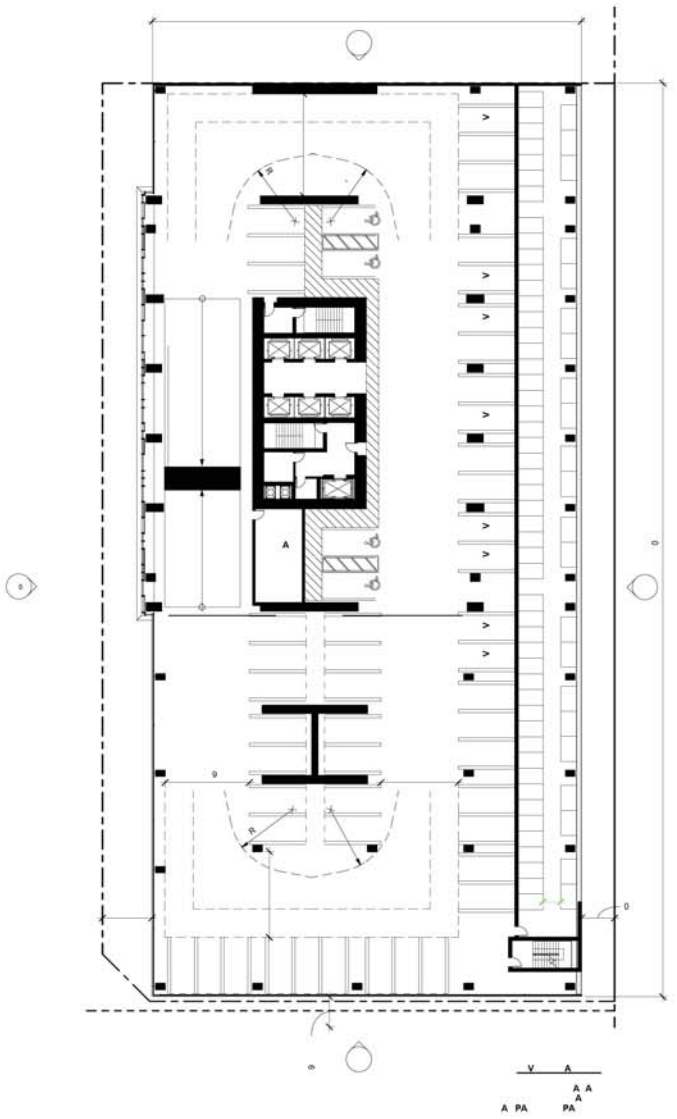

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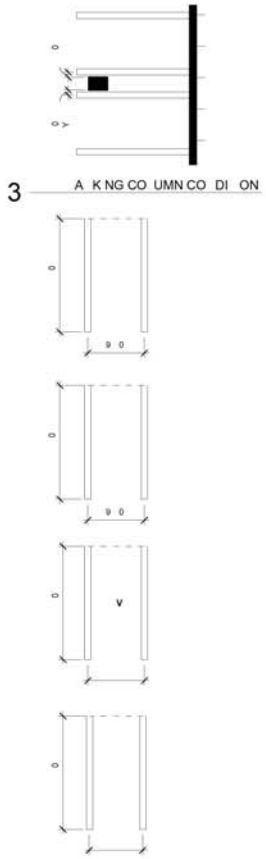

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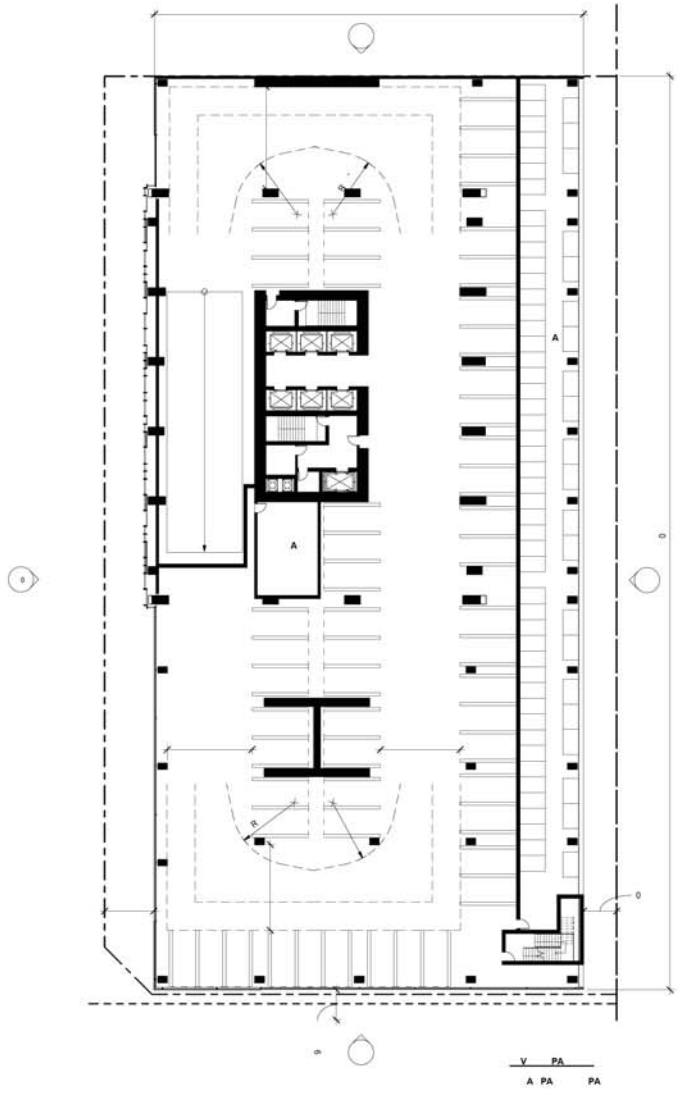

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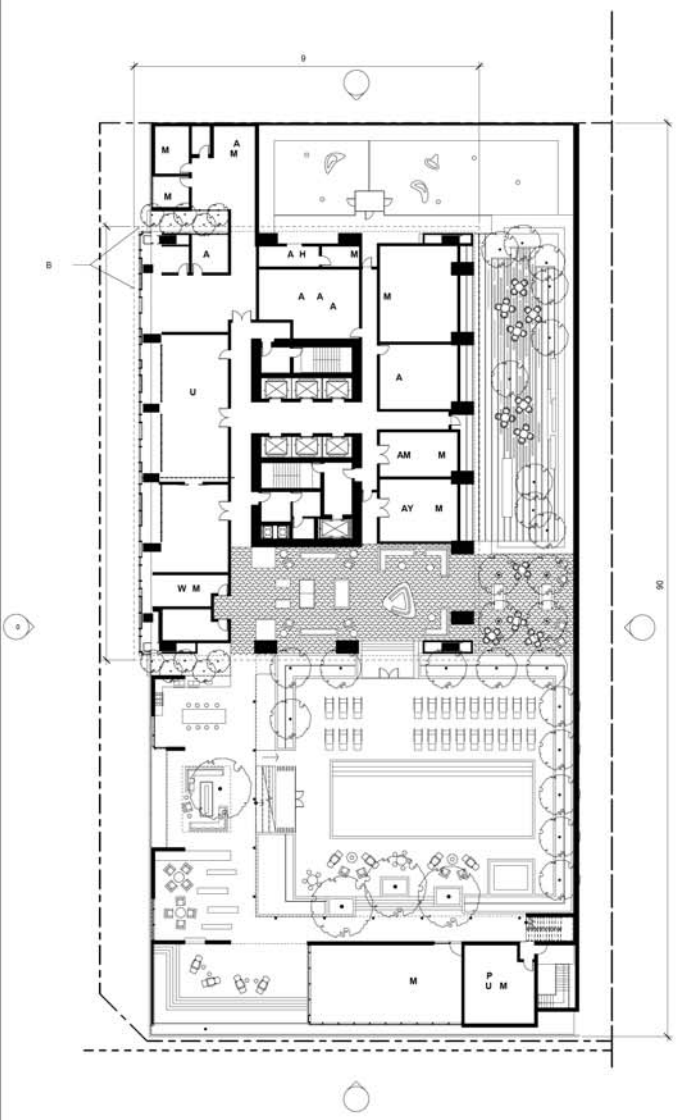

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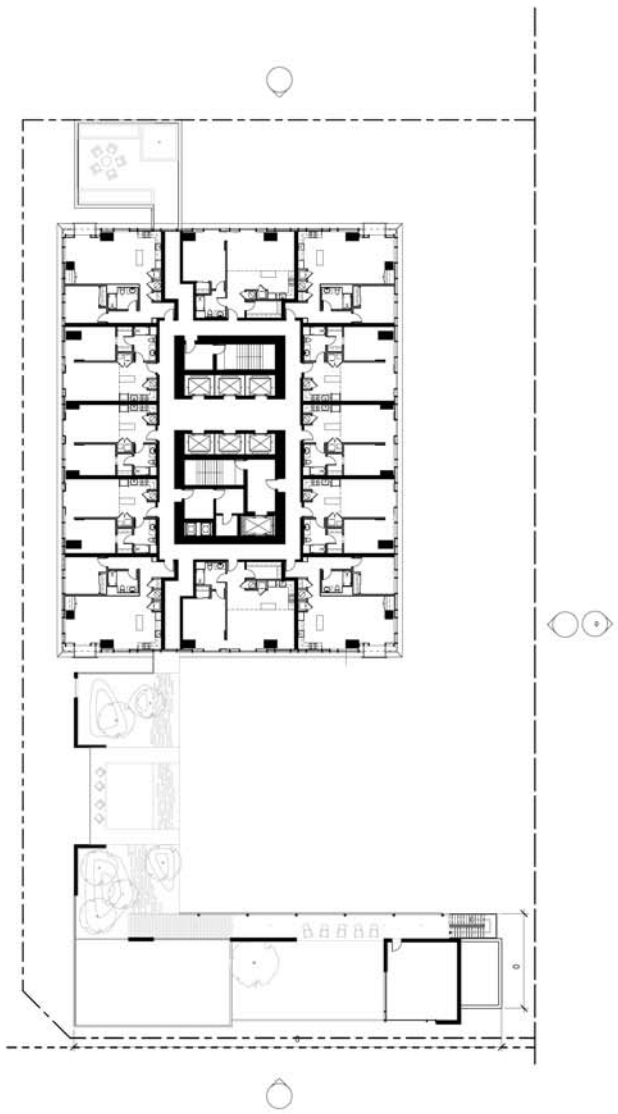

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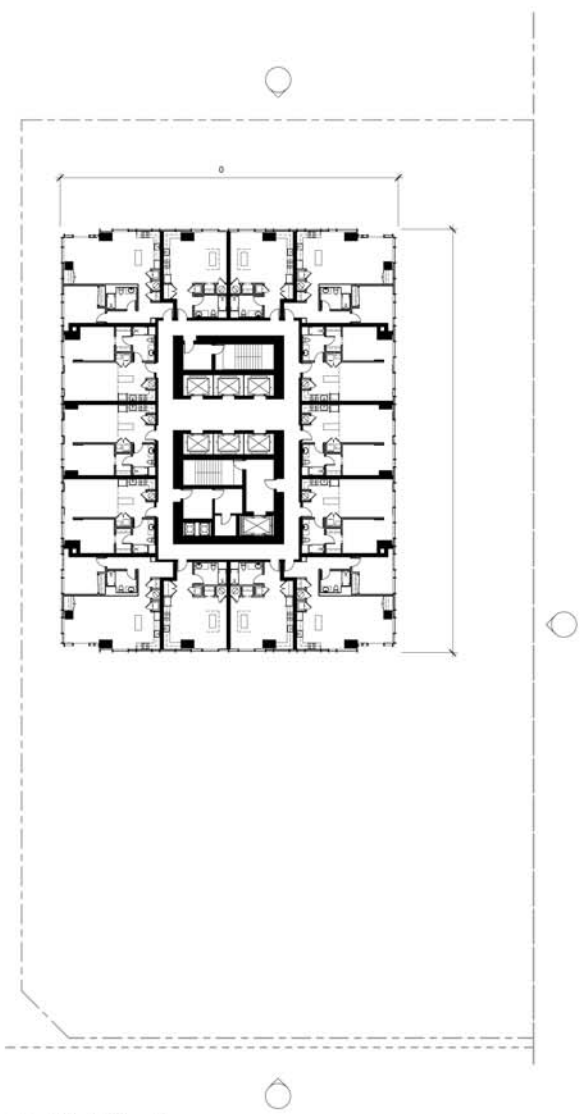

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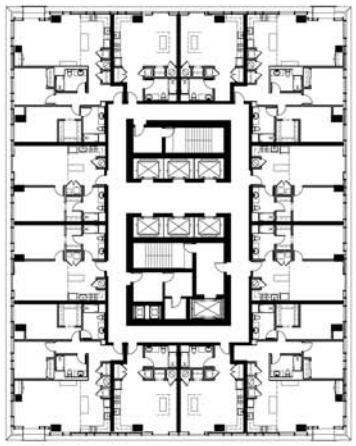

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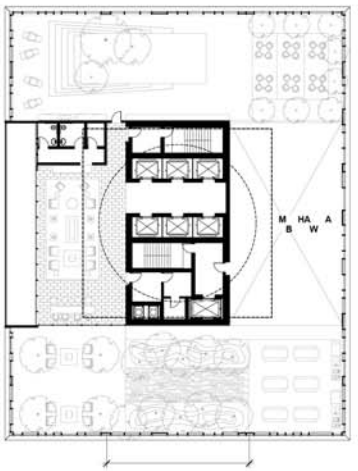

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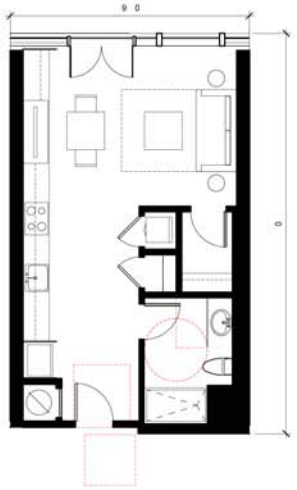

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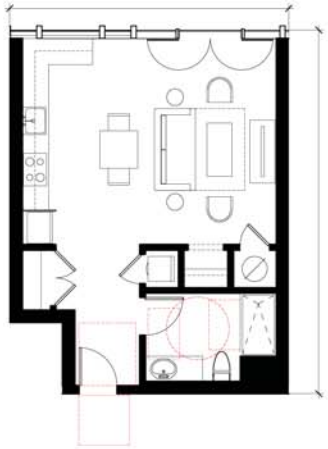

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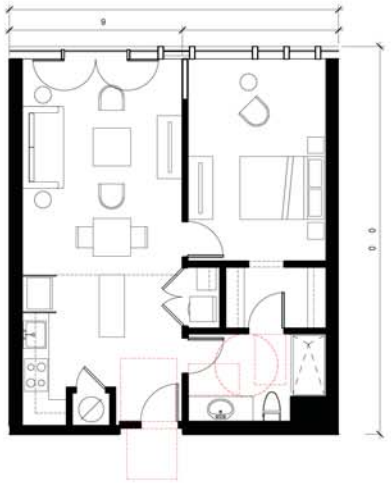

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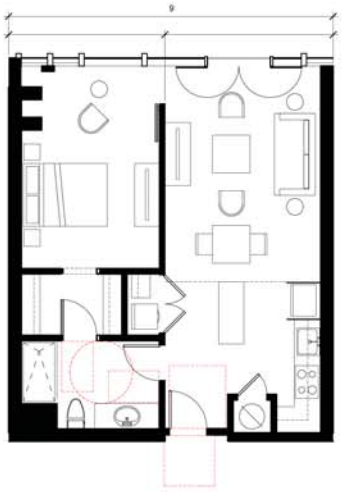

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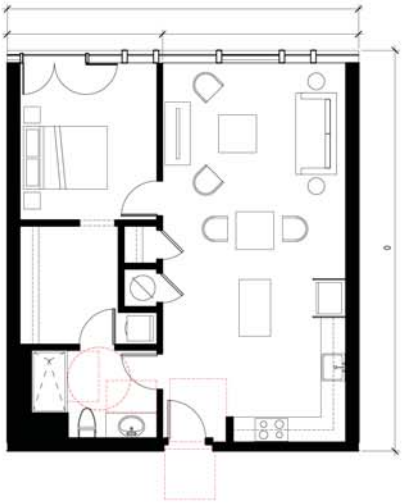

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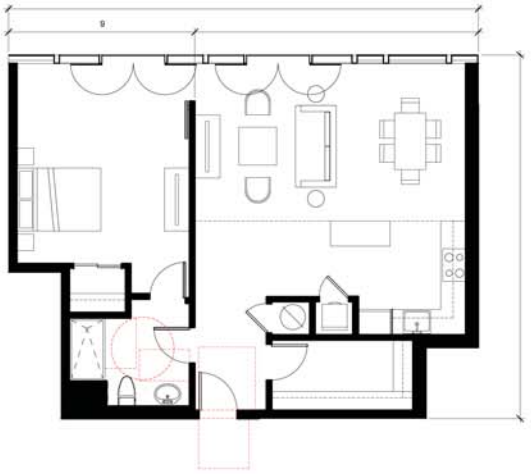

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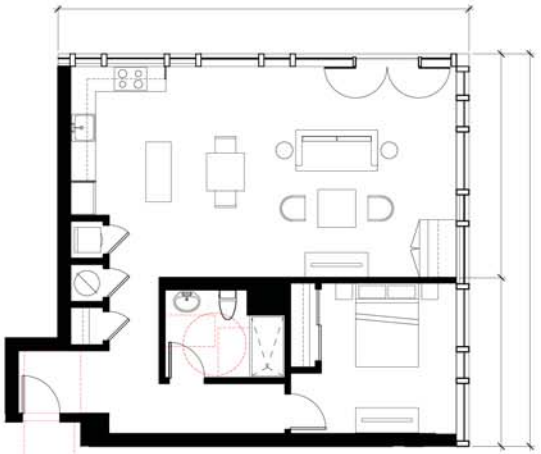

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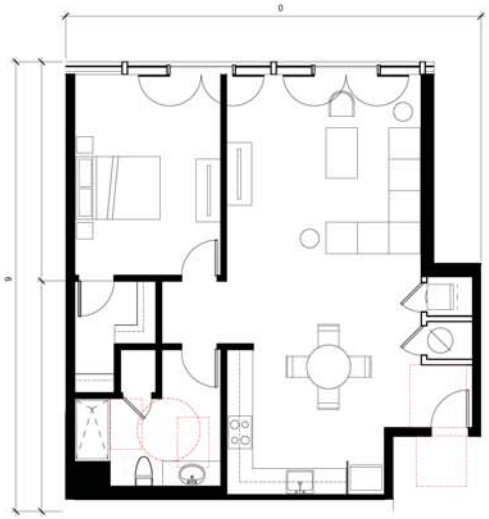

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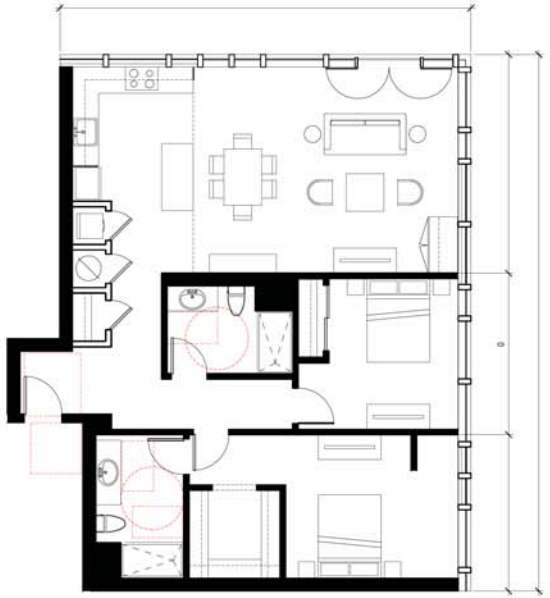

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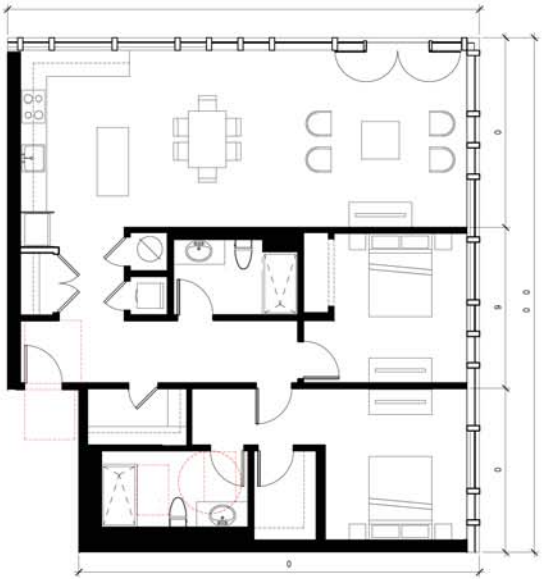

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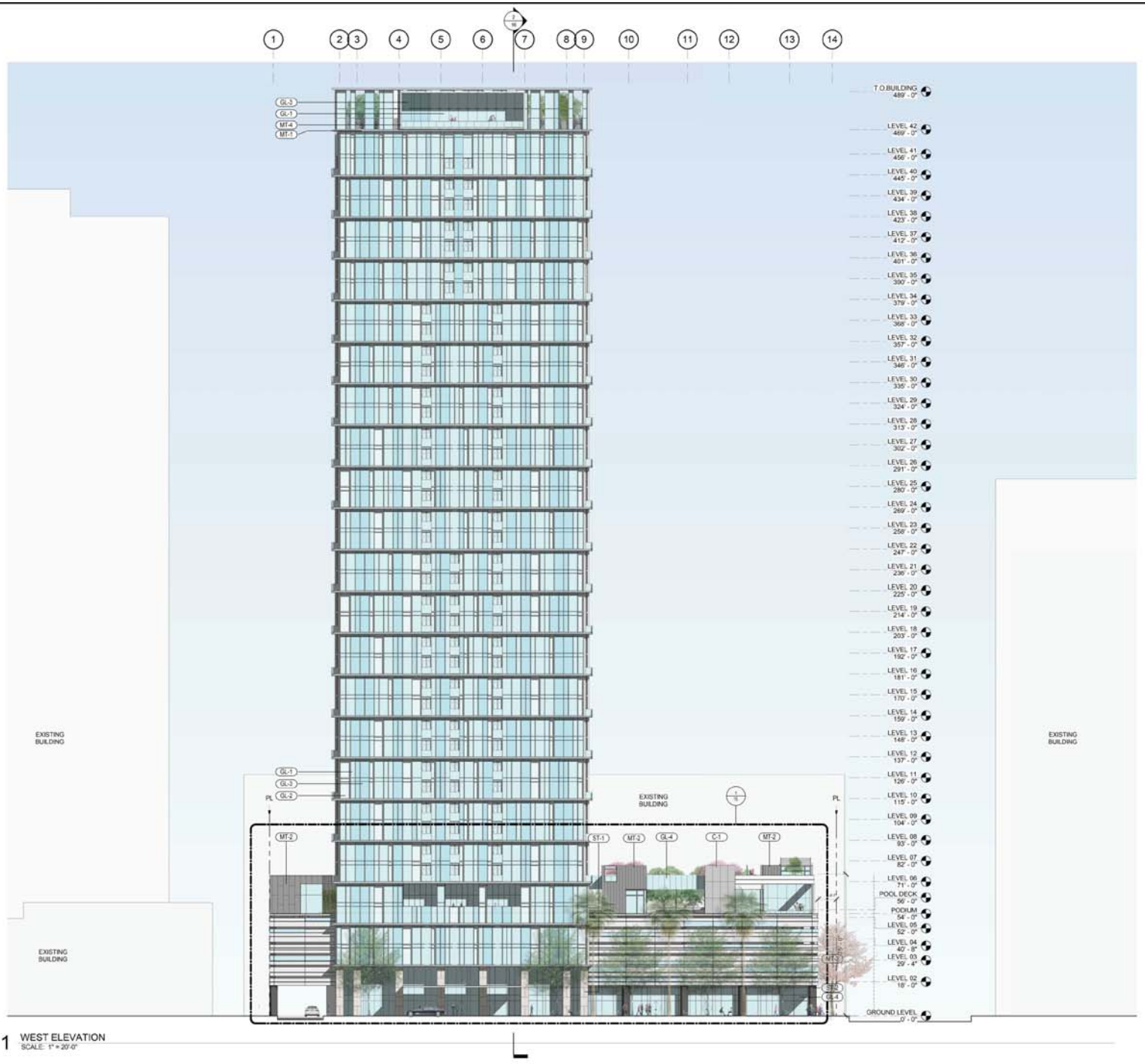

1 WEST ELEVATION
SCALE: 1" = 20'-0"

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1 EAST ELEVATION
SCALE: 1" = 20'-0"

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SCALE: 1/8" = 1'-0"

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1 WEST ELEVATION PODIUM
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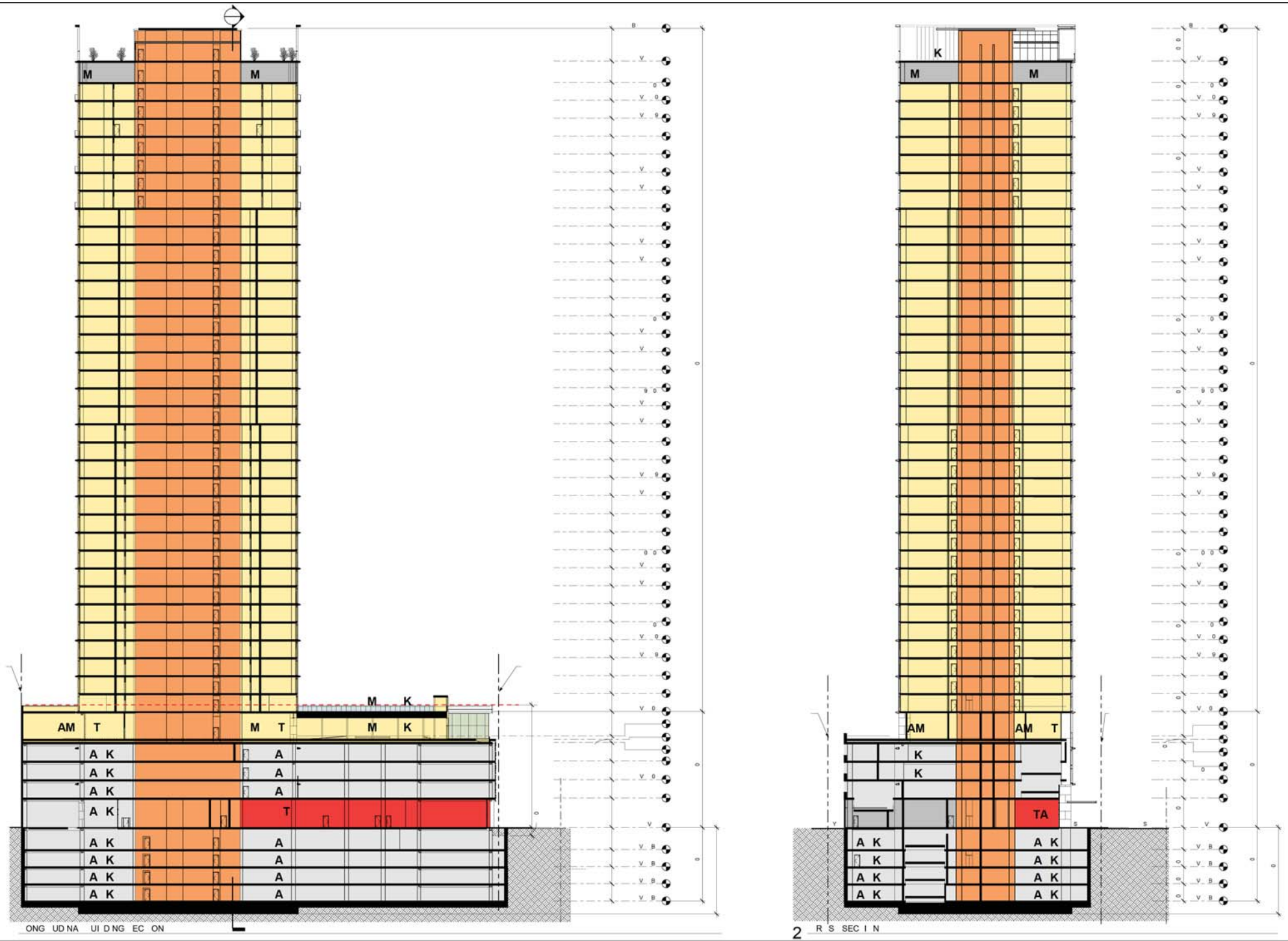

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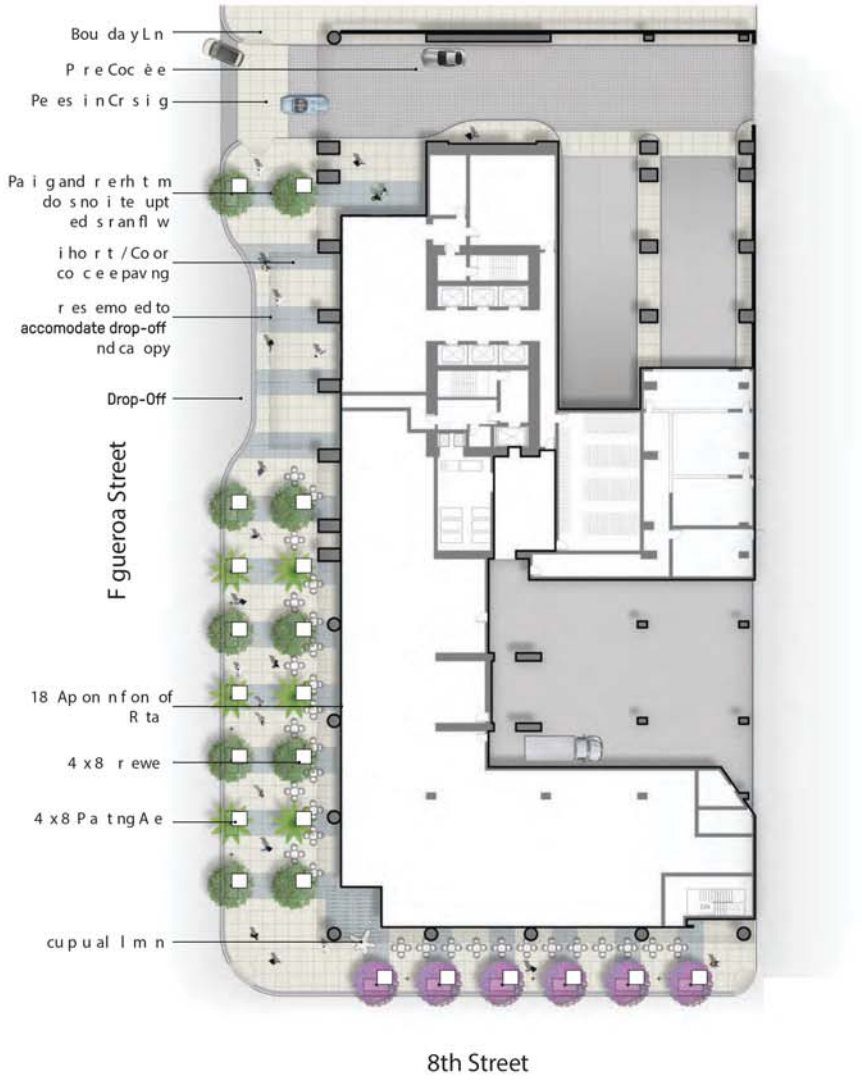

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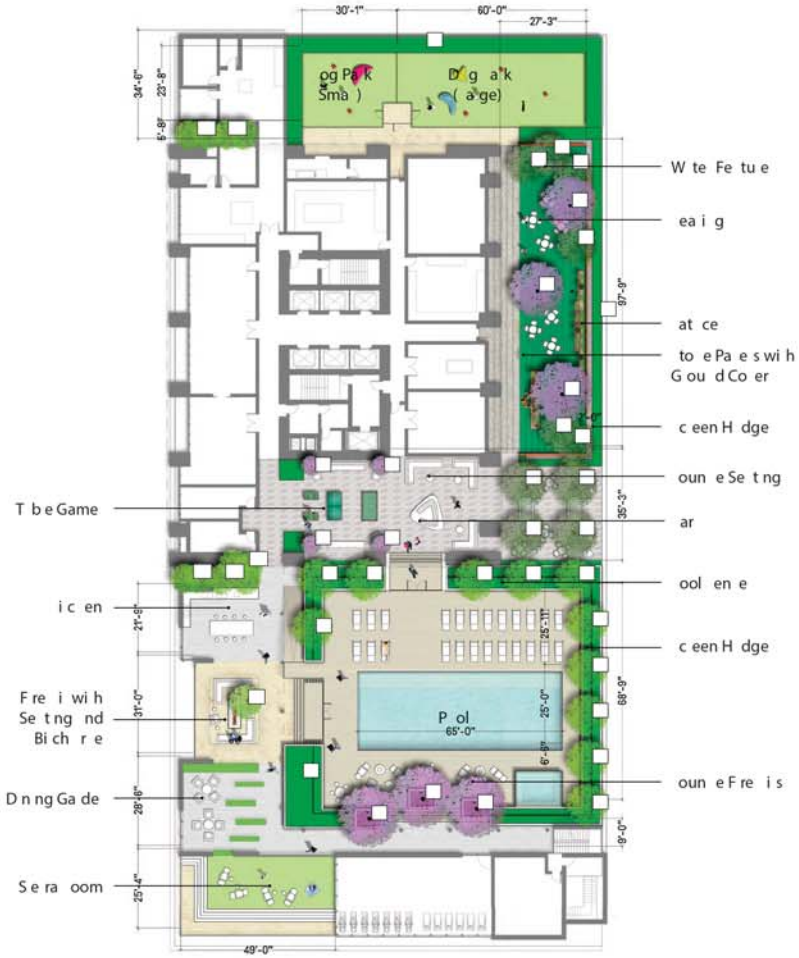

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e el 6 u doo n sc pe R o De k	329 S
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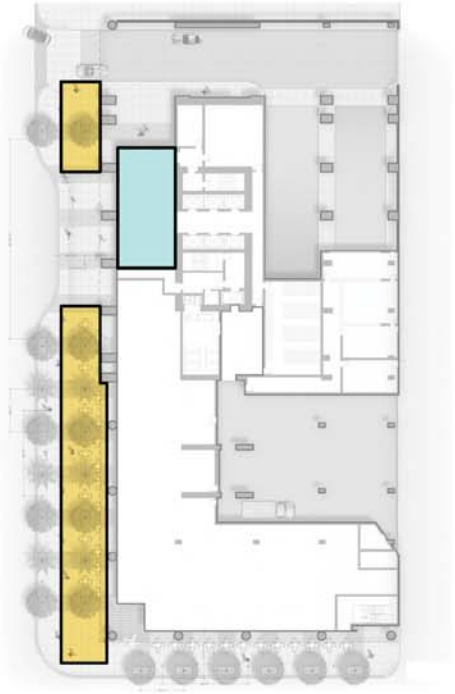
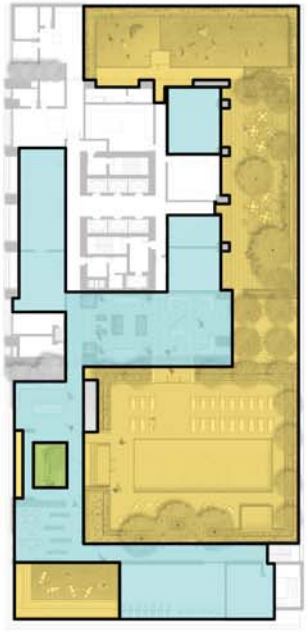


Common Open pace
3984 sqf

In er or Amen ty Space
5 sqf

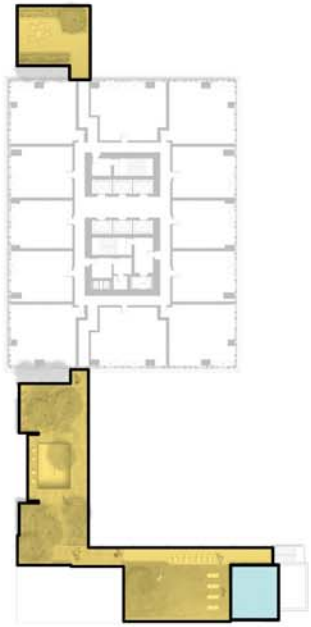
Level 05



Common Open Space
19446 sqf

In er or Amen ty Spa e
10529 sqf

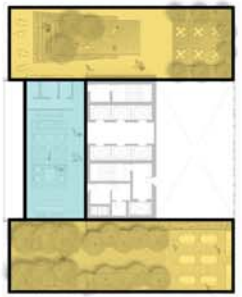
Level 06



Common Open Space
5329 sqf

I te ior Amen ty Spa e
600 sqf

Level 42



Common Open Spa e
7 48sqf

nte or Amen y pace
1 77 qf


KONICA MINOLTA
770
770

Appendix IS-3

SCCIC Records Search Results

South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395
California Historical Resources Information System
Los Angeles, Orange, Ventura and San Bernardino Counties
sccic@fullerton.edu

8/23/2016 SCCIC File #: 16708.2812

Stephanie Eyestone-Jones
Eyestone Environmental
6701 Center Drive West, Suite 900
Los Angeles, CA 90045

Re: Records Search for Fig & 8th Project, City of Los Angeles, CA

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the Hollywood, CA USGS 7.5' quadrangle. The following summary reflects the results of the records search for the project area and a ½-mile radius. The search includes a review of all recorded archaeological and built-environment resources as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (SPHI), the California Historical Landmarks (SHL), the California Register of Historical Resources (CAL REG), the National Register of Historic Places (NRHP), the California State Historic Properties Directory (HPD), and the City of Los Angeles Historic-Cultural Monuments (LAHCM) listings were reviewed for the above referenced project site. Due to the sensitive nature of cultural resources, archaeological site locations are not released.

RECORDS SEARCH RESULTS SUMMARY

Archaeological Resources	Within project area: 0 Within project radius: 1
Built-Environment Resources	Within project area: 0 Within project radius: 107
Reports and Studies	Within project area: 4 Within project radius: 57
OHP Historic Properties Directory (HPD)	Within project area: 0 Within project radius: 119
California Points of Historical Interest (SPHI)	Within project area: 0 Within project radius: 0
California Historical Landmarks (SHL)	Within project area: 0 Within project radius: 1
California Register of Historical Resources (CAL REG)	Within project area: 0 Within project radius: 33
National Register of Historic Places (NRHP)	Within project area: 0 Within project radius: 12

City of Los Angeles Historic-Cultural Monuments (LAHCM)	Within project area: 0 Within project radius: 110

HISTORIC MAP REVIEW – Santa Monica, CA (1902, 1921), 1:62,500: indicated that in 1902, there was already significant urban development. All roads present were paved. The area was fully developed by 1921.

RECOMMENDATIONS

The project site has not been surveyed for cultural resources. It appears that most of the natural ground surface within the project area is obscured by urban development; consequently, archaeological surface finds would not be observable in a surface survey. However, based upon the known archaeological sensitivity in the surrounding area, buried prehistoric or historic cultural resources may be present. Therefore, in order to detect any previously unidentified cultural resources, an archaeological monitor should be retained to observe ground-disturbing activities. In the event that any potential cultural resources are discovered, all work within the vicinity of the find should be diverted until the archaeologist can assess and record the find and make recommendations. Project personnel should not attempt to excavate any potential finds. It is also recommended that any historic buildings, structures or objects (45 years and older and in the project area or vicinity) be identified, recorded, and evaluated for local, state, or national significance (as applies) prior to the approval of project plans. Finally, the Native American Heritage Commission should be consulted to identify if any additional traditional cultural properties or other sacred sites are known to be in the area.

For your convenience, you may find a professional consultant* at www.chrisinfo.org. Any resulting reports by the qualified consultant should be submitted to the South Central Coastal Information Center as soon as possible.

*The SCCIC does not endorse any particular consultant and makes no claims about the qualifications of any person listed. Each consultant on this list self-reports that they meet current professional standards.

If you have any questions regarding the results presented herein, please contact the office at 657.278.5395 Monday through Thursday 9:00 am to 3:30 pm. Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,

Stacy St. James
2016.08.23 17:34:09 -07'00'

Michelle Galaz
Assistant Coordinator

Enclosures:

(X) Invoice #16708.2812

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

Appendix IS-4

Geotechnical Engineering Investigation

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

March 7, 2016
Revised March 8, 2016
File No. 21089

Mitsui Fudosan America
100 First Street, Suite 2350
San Francisco, California 94105

Attention: Robert Davidson

Subject: Geotechnical Engineering Investigation
Proposed Mixed-Use Development
732-756 South Figueroa Street, Los Angeles, California

Dear Mr. Davidson:

This letter transmits the Geotechnical Engineering Investigation for the subject property prepared by Geotechnologies, Inc. This report provides geotechnical recommendations for the development of the site, including earthwork, seismic design, retaining walls, excavations, shoring, and foundation design. Engineering for the proposed project should not begin until approval of the geotechnical investigation is granted by the local building official. Significant changes in the geotechnical recommendations may result due to the building department review process.

The validity of the recommendations presented herein is dependent upon review of the geotechnical aspects of the project during construction by this firm. The subsurface conditions described herein have been projected from limited subsurface exploration and laboratory testing. The exploration and testing presented in this report should in no way be construed to reflect any variations which may occur between the exploration locations or which may result from changes in subsurface conditions.

Should you have any questions please contact this office.
Respectfully submitted,
GEOTECHNOLOGIES, INC.

STANLEY S. TANG
R.C.E. 56178

SST:ae

Distribution: (5) Addressee

Email to: [rdavidson@mfamerica.com]
[alanglois@johnsonfain.com]

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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
732-756 SOUTH FIGUEROA STREET
LOS ANGELES, CALIFORNIA

INTRODUCTION

This report presents the results of the geotechnical engineering investigation performed on the subject property. The purpose of this investigation was to identify the distribution and engineering properties of the earth materials underlying the site, and to provide geotechnical recommendations for the design of the proposed development.

This investigation included excavation of six exploratory borings, collection of representative samples, laboratory testing, engineering analysis, review of published geologic data, review of available geotechnical engineering information and the preparation of this report. The site location is shown on the enclosed Vicinity Map, and the exploration locations are shown on the enclosed Plot Plan. The results of the exploration and the laboratory testing are presented in the Appendix of this report.

PROPOSED DEVELOPMENT

Information concerning the proposed development was furnished by the client. The proposed mixed-use development consists of a 43-story residential tower with 5 podium levels. The entire development will be constructed over four levels of subterranean parking garage, extending on the order of 45 feet below the existing site grade.

It is anticipated that the tower will be supported on a mat foundations, and the podium structure will be supported on conventional spread footings. Based on the preliminary structural loads provided by the project structural engineer, an average bearing pressure for the tower on the order

of 13,500 psf has been assumed. Typical column footing loads for the podium structure will be between 1,500 and 2,000 kips. Grading will consist of excavations on the order of 50 to 55 feet in depth for the proposed subterranean parking levels and foundation elements.

Any changes in the design of the project or location of any structure, as outlined in this report, should be reviewed by this office. The recommendations contained in this report should not be considered valid until reviewed and modified or reaffirmed, in writing, subsequent to such review.

SITE CONDITIONS

The subject site is located at the northeast corner of Figueroa Street and West 8th Street, in the City of Los Angeles, California. At the time of exploration, the site was occupied by an asphaltic paved parking lot. The site is bounded by a parking lot to the north, by an alleyway to the east, by 8th Street to the south, and by Figueroa Street to the west.

The subject site is roughly level with no pronounced topographic highs or lows. Drainage appears to occur by sheetflow along existing contours towards the city streets. The vegetation on the site is non-existent due to the paved nature of the site. The neighboring development consists primarily of residential and commercial structures.

GEOTECHNICAL EXPLORATION

FIELD EXPLORATION

The site was explored between November 11, 2015, and November 16, 2015, by excavating six exploratory borings. The borings were advanced to depths between 80 and 150 feet with the aid of a truck mounted drilling machine, equipped with 8-inch diameter hollow stem augers. Samples were collected in the borings and transported to our office for laboratory testing. The boring

locations are shown on the enclosed Plot Plan. The geologic materials encountered are logged on Plates A-1 through A-6.

Geologic Materials

The explorations encountered existing fill underlain by natural alluvium, and bedrock. Fill materials underlying the site consist predominantly of silty sands. The fill soils are generally dark to yellowish brown in color, moist, medium dense, and fine grained. Fill thickness between three to five feet was encountered during exploration.

The existing fill materials are underlain by natural alluvial deposits. Very dense to very stiff Older Alluvium was generally encountered below a depth of 10 to 15 feet below the existing site grade. The underlying natural alluvium predominantly consists of silty sands, sands, to gravelly sands, sandy silts and sandy clays. The alluvium is generally dark brown to yellowish brown, slightly moist to moist, very dense to very stiff generally below a depth of 15 feet, fine to coarse grained, with varying amount of gravel and cobbles.

Bedrock was encountered at depths of 50, 60, and 90 feet in Boring Number B1, B2, and B6, respectively. Bedrock was not encountered in the remainder of the borings which were excavated to depths between 80 and 90 feet below the existing site grade. Bedrock consists of sandstone and siltstone of the Fernando Formation. Bedrock varies between yellowish and grayish brown to gray in color, slightly moist to moist, moderately hard to very hard. More detailed soil profiles may be obtained from individual boring logs.

Groundwater

Groundwater was not encountered during exploration, which was excavated to a maximum depth of 150 feet below the existing ground surface. The historically highest groundwater level was

established by review of California Geological Survey Seismic Hazard Zone Report of the Hollywood Quadrangle. Review of this report indicates that the historically highest groundwater level is on the order of 70 feet below the existing site grade. Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors not evident at the time of the measurements reported herein. High groundwater levels can result in changed conditions.

Caving

Caving could not be directly observed in the borings excavated with the hollow stem drilling machine because the boreholes were cased during drilling, and caving was not possible. Based on the experience of this firm, large diameter excavations, excavations that encounter granular, cohesionless soils, and excavations below the groundwater table will most likely experience caving.

SEISMIC EVALUATION

REGIONAL GEOLOGIC SETTING

The subject property is located in the northern portion of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges are characterized by northwest-trending blocks of mountain ridges and sediment-floored valleys. The dominant geologic structural features are northwest trending fault zones that either die out to the northwest or terminate at east-trending reverse faults that form the southern margin of the Transverse Ranges.

REGIONAL FAULTING

Based on criteria established by the California Division of Mines and Geology (CDMG) now called California Geologic Survey (CGS), faults may be categorized as active, potentially active, or inactive. Active faults are those which show evidence of surface displacement within the last 11,000 years (Holocene-age). Potentially-active faults are those that show evidence of most recent surface displacement within the last 1.6 million years (Quaternary-age). Faults showing no evidence of surface displacement within the last 1.6 million years are considered inactive for most purposes, with the exception of design of some critical structures.

Buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the southern California area. Due to the buried nature of these thrust faults, their existence is usually not known until they produce an earthquake. The risk for surface rupture potential of these buried thrust faults is inferred to be low (Leighton, 1990). However, the seismic risk of these buried structures in terms of recurrence and maximum potential magnitude is not well established. Therefore, the potential for surface rupture on these surface-verging splays at magnitudes higher than 6.0 cannot be precluded.

SEISMIC HAZARDS AND DESIGN CONSIDERATIONS

Surface Rupture

In 1972, the Alquist-Priolo Special Studies Zones Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. The Act defines "active" and "potentially active" faults utilizing the same aging criteria as that used by California Geological Survey (CGS). However, established state policy has been to zone only those faults which have direct evidence of movement within the last 11,000 years. It is this recency of fault movement that the CGS

considers as a characteristic for faults that have a relatively high potential for ground rupture in the future.

CGS policy is to delineate a boundary from 200 to 500 feet wide on each side of the known fault trace based on the location precision, the complexity, or the regional significance of the fault. If a site lies within an Earthquake Fault Zone, a geologic fault rupture investigation must be performed that demonstrates that the proposed building site is not threatened by surface displacement from the fault before development permits may be issued.

Ground rupture is defined as surface displacement which occurs along the surface trace of the causative fault during an earthquake. Based on research of available literature, no known active faults or potentially active faults underlie the subject site. In addition, the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Based on these considerations, the potential for surface ground rupture at the subject site is considered low.

Liquefaction

Liquefaction is a phenomenon in which saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to the buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

Liquefaction typically occurs in areas where groundwater is less than 50 feet from the surface, and where the soils are composed of poorly consolidated, fine to medium-grained sand. In addition to the necessary soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to initiate liquefaction.

The Seismic Hazards Maps of the State of California (CDMG, 1999), does not classify the site as part of the potentially "Liquefiable" area. This determination is based on groundwater depth records, soil type and distance to a fault capable of producing a substantial earthquake.

Groundwater was not encountered during exploration, which was excavated to a maximum depth of 150 feet. The historically highest groundwater level was established by review of California Geological Survey Seismic Hazard Zone Report of the Hollywood Quadrangle. Review of this report indicates that the historically highest groundwater level is on the order of 70 feet below the existing site grade.

Based on the dense nature of the underlying soils, and the depth to historic highest groundwater level, the potential for liquefaction occurring at the site is considered to be remote.

Dynamic Dry Settlement

Seismically-induced settlement or compaction of dry or moist, cohesionless soils can be an effect related to earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structure.

Some seismically-induced dry settlement of the proposed and existing improvements should be expected as a result of strong ground-shaking. However, due to the uniform nature of the upper earth materials, excessive differential settlements are not expected to occur.

Tsunamis, Seiches and Flooding

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. Review of the County of Los Angeles Flood and

Inundation Hazards Map, Leighton (1990), indicates the site does not lie within the mapped tsunami inundation boundaries.

Seiches are oscillations generated in enclosed bodies of water which can be caused by ground shaking associated with an earthquake. No major water-retaining structures are located immediately up gradient from the project site. Therefore, the risk of flooding from a seismically-induced seiche is considered to be remote.

Review of the County of Los Angeles Flood and Inundation Hazards Map, Leighton (1990), indicates the site does not lie within mapped inundation boundaries due to a seiche or a breached upgradient reservoir.

Landsliding

The probability of seismically-induced landslides affecting the subject development is considered to be remote, due to the lack of significant slopes on the site and surrounding areas.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the exploration, laboratory testing, and research, it is the finding of Geotechnologies, Inc. that construction of the proposed mixed-use development is considered feasible from a geotechnical engineering standpoint provided the advice and recommendations presented herein are followed and implemented during construction.

Between 3 and 5 feet of existing fill materials was encountered during exploration at the site. Due to the variable nature and the varying depths of the existing fill materials, the existing fill materials are considered to be unsuitable for support of the proposed foundations, floor slabs, or additional fill.

The proposed development will be constructed over 4 subterranean parking levels. It is anticipated that excavations on the order of 50 to 55 feet in depth will be required for the proposed subterranean parking levels including the foundation elements. Excavation of the proposed subterranean levels will remove the existing fill materials and expose the underlying dense native soil. The proposed tower may be supported on mat foundations bearing in the underlying dense native soil, and the podium structure may be supported on conventional foundations bearing in the underlying dense native soils.

Due to the location of the proposed structure relative to property lines, public way, and existing structures, the excavation of the proposed subterranean levels will require shoring measures to provide a stable excavation.

The validity of the conclusions and design recommendations presented herein is dependent upon review of the geotechnical aspects of the proposed construction by this firm. The subsurface conditions described herein have been projected from borings on the site as indicated and should in no way be construed to reflect any variations which may occur between these borings or which may result from changes in subsurface conditions. Any changes in the design or location of any structure, as outlined in this report, should be reviewed by this office. The recommendations contained herein should not be considered valid until reviewed and modified or reaffirmed subsequent to such review.

SEISMIC DESIGN CONSIDERATIONS

Seismic Velocity Measurements

A downhole seismic velocity measurement was performed by GeoPentech at the project site. The result of the seismic velocity measurements is presented at the end of this report. According to the seismic downhole results, an average shear wave velocity of 1,300 feet/second was measured

between 0 and 100 feet, and an average shear wave velocity of 1,550 feet/second was measured between 50 and 150 feet.

2013 California Building Code Seismic Parameters

Based on information derived from the subsurface investigation, the subject site is classified as Site Class C, which corresponds to a "Very Dense Soil or Soft Rock" Profile, according to Table 20.3-1 of ASCE 7-10. This information and the site coordinates were input into the USGS U.S. Seismic Design Maps tool (Version 3.1.0) to calculate the ground motions for the site.

2013 CALIFORNIA BUILDING CODE SEISMIC PARAMETERS	
Site Class	C
Mapped Spectral Acceleration at Short Periods (S_S)	2.355g
Site Coefficient (F_a)	1.0
Maximum Considered Earthquake Spectral Response for Short Periods (S_{MS})	2.355g
Five-Percent Damped Design Spectral Response Acceleration at Short Periods (S_{DS})	1.570g
Mapped Spectral Acceleration at One-Second Period (S_1)	0.827g
Site Coefficient (F_v)	1.3
Maximum Considered Earthquake Spectral Response for One-Second Period (S_{M1})	1.075g
Five-Percent Damped Design Spectral Response Acceleration for One-Second Period (S_{D1})	0.717g

FILL SOILS

The maximum depth of fill encountered on the site was 5 feet. This material and any fill generated during demolition should be removed during the excavation of the subterranean levels and wasted from the site.

EXPANSIVE SOILS

The onsite geologic materials are in the very low expansion range. The Expansion Index was found to be between 9 and 17 for bulk samples remolded to 90 percent of the laboratory maximum density. Recommended reinforcing is noted in the "Foundation Design" and "Slabs-On-Grade" sections of this report.

METHANE ZONES

According to the LADBS Parcel Profile Report, the subject property is not located within a Methane Zone or a Methane Buffer Zone as designated by the City of Los Angeles.

GRADING GUIDELINES

The following guidelines may be utilized for any miscellaneous site grading which may be required as part of the proposed development.

Site Preparation

- A thorough search should be made for possible underground utilities and/or structures. Any existing or abandoned utilities or structures located within the footprint of the proposed grading should be removed or relocated as appropriate.
- All vegetation, existing fill, and soft or disturbed geologic materials should be removed from the areas to receive controlled fill. All existing fill materials and any disturbed geologic materials resulting from grading operations shall be completely removed and properly recompacted prior to foundation excavation.
- Any vegetation or associated root system located within the footprint of the proposed structures should be removed during grading.

- Subsequent to the indicated removals, the exposed grade shall be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted in excess of the minimum required comparative density.

- The excavated areas shall be observed by the geotechnical engineer prior to placing compacted fill.

Compaction

The City of Los Angeles Department of Building and Safety requires a minimum 90 percent of the maximum density, except for cohesionless soils having less than 15 percent finer than 0.005 millimeters, which shall be compacted to a minimum 95 percent of the maximum density in accordance with the most recent revision of the Los Angeles Building Code. Based on the laboratory test results performed by this firm, the granular soils encountered at the site would require the 95 percent compaction requirement.

All fill should be mechanically compacted in layers not more than 8 inches thick. All fill shall be compacted to at least 95 percent of the maximum laboratory density for the materials used. The maximum density shall be determined by the laboratory operated by Geotechnologies, Inc. using the test method described in the most recent revision of ASTM D 1557.

Field observation and testing shall be performed by a representative of the geotechnical engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until a minimum of 95 percent compaction is obtained.

Acceptable Materials

The excavated onsite materials are considered satisfactory for reuse in the controlled fills as long as any debris and/or organic matter is removed. Any imported materials shall be observed and tested by the representative of the geotechnical engineer prior to use in fill areas. Imported materials should contain sufficient fines so as to be relatively impermeable and result in a stable subgrade when compacted. Any required import materials should consist of geologic materials with an expansion index of less than 50. The water-soluble sulfate content of the import materials should be less than 0.1% percentage by weight.

Imported materials should be free from chemical or organic substances which could affect the proposed development. A competent professional should be retained in order to test imported materials and address environmental issues and organic substances which might affect the proposed development.

Utility Trench Backfill

Utility trenches should be backfilled with controlled fill. The utility should be bedded with clean sands at least one foot over the crown. The remainder of the backfill may be onsite soil compacted to 95 percent of the laboratory maximum density. Utility trench backfill should be tested by representatives of this firm in accordance with the most recent revision of ASTM D-1557.

Shrinkage

Shrinkage results when a volume of soil removed at one density is compacted to a higher density. A shrinkage factor between 5 and 15 percent should be anticipated when excavating and recompacting the existing fill and underlying native geologic materials on the site to an average comparative compaction of 92 percent.

Weather Related Grading Considerations

When rain is forecast all fill that has been spread and awaits compaction shall be properly compacted prior to stopping work for the day or prior to stopping due to inclement weather. These fills, once compacted, shall have the surface sloped to drain to an area where water can be removed.

Temporary drainage devices should be installed to collect and transfer excess water to the street in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope.

Work may start again, after a period of rainfall, once the site has been reviewed by a representative of this office. Any soils saturated by the rain shall be removed and aerated so that the moisture content will fall within three percent of the optimum moisture content.

Surface materials previously compacted before the rain shall be scarified, brought to the proper moisture content and recompacted prior to placing additional fill, if considered necessary by a representative of this firm.

Geotechnical Observations and Testing During Grading

Geotechnical observations and testing during grading are considered to be a continuation of the geotechnical investigation. It is critical that the geotechnical aspects of the project be reviewed by representatives of Geotechnologies, Inc. during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise this office at least twenty-four hours prior to any required site visit.

FOUNDATION DESIGN

The proposed tower may be supported on a mat foundation bearing in the underlying dense native soils at the level of the planned excavation. The podium structure may be supported on conventional foundations bearing in the underlying dense native soils at the level of the planned excavation.

Mat Foundation

The proposed tower will be constructed over 4 subterranean parking levels extending on the order of 50 to 55 feet below the existing site grade, including the foundation elements. It is anticipated that an average bearing pressure for the tower mat foundation will be on the order of 13,500 psf. Foundation bearing pressure will vary across the mat footings, with the highest concentrated loads located at the central cores of the mat foundations.

Given the size of the proposed mat foundation, these average bearing pressures are well below the allowable bearing pressures, with factor of safety well exceeding 3. For design purposes, an average allowable bearing pressure of 13,500 pounds per square foot may be utilized. The mat foundation may be designed utilizing a modulus of subgrade reaction of 250 pounds per cubic inch. This value is a unit value for use with a one-foot square footing. The modulus should be reduced in accordance with the following equation when used with larger foundations.

$$K = K_1 * [(B + 1) / (2 * B)]^2$$

where K = Reduced Subgrade Modulus
K_1 = Unit Subgrade Modulus
B = Foundation Width (feet)

The bearing values indicated above are for the total of dead and frequently applied live loads, and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Since the recommended bearing value is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

Conventional

Continuous foundations may be designed for a bearing capacity of 4,000 pounds per square foot, and should be a minimum of 12 inches in width, 24 inches in depth below the lowest adjacent grade and 24 inches into the recommended bearing material.

Column foundations may be designed for a bearing capacity of 4,500 pounds per square foot, and should be a minimum of 24 inches in width, 24 inches in depth below the lowest adjacent grade and 24 inches into the recommended bearing material.

The bearing capacity increase for each additional foot of width is 500 pounds per square foot. The bearing capacity increase for each additional foot of depth is 750 pounds per square foot. The maximum recommended bearing capacity is 12,000 pounds per square foot.

A minimum factor of safety of 3 was utilized in determining the allowable bearing capacities. The bearing values indicated above are for the total of dead and frequently applied live loads, and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Since the recommended bearing value is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

All continuous foundations should be reinforced with a minimum of four #4 steel bars. Two should be placed near the top of the foundation, and two should be placed near the bottom.

Miscellaneous Foundations

Foundations for small miscellaneous outlying structures, such as property line fence walls, planters, exterior canopies, and trash enclosures, which will not be tied-in to the proposed structure, may be supported on conventional foundations bearing in properly compacted fill and/or the native soils. Wall footings may be designed for a bearing value of 1,500 pounds per square foot, and should be a minimum of 12 inches in width, 18 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material. No bearing value increases are recommended. The client should be aware that miscellaneous structures constructed in this manner may potentially be damaged and will require replacement should liquefaction occurs during a major seismic event.

Lateral Design

Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.40 may be used with the dead load forces.

Passive geologic pressure for the sides of foundations poured against undisturbed or recompacted soil may be computed as an equivalent fluid having a density of 250 pounds per cubic foot with a maximum earth pressure of 3,000 pounds per square foot. The passive and friction components may be combined for lateral resistance without reduction. A one-third increase in the passive value may be used for short duration loading such as wind or seismic forces.

Foundation Settlement

It is anticipated that total settlement on the order of 3½ inches will occur below the more heavily loaded central core portions of the mat foundation beneath the residential tower. Settlement on the edges of the mat foundation is expected to be on the order of 1½ to 1¾ inch.

The maximum settlement of a typical column footing (approximately 2,000 kips) below the podium structure is expected to be less than ½ to ¾ inch.

Differential settlement between the podium column footings and the edges of the residential tower mat foundation is expected to be on the order of 1 inch. Differential settlement between columns is not expected to exceed ½ inch.

Foundation Observations

It is critical that all foundation excavations are observed by a representative of this firm to verify penetration into the recommended bearing materials. The observation should be performed prior to the placement of reinforcement. Foundations should be deepened to extend into satisfactory geologic materials, if necessary. Foundation excavations should be cleaned of all loose soils prior to placing steel and concrete. Any required foundation backfill should be mechanically compacted, flooding is not permitted.

RETAINING WALL DESIGN

Cantilever retaining walls supporting a level backslope may be designed utilizing a triangular distribution of active earth pressure. Restrained retaining walls may be designed utilizing a triangular distribution of at-rest earth pressure. Retaining walls may be designed utilizing the following table:

Height of Retaining Wall (feet)	Cantilever Retaining Wall Triangular Distribution of Active Earth Pressure (pcf)	Restrained Retaining Wall Triangular Distribution of At-Rest Earth Pressure (pcf)
45 feet	48 pcf	55 pcf
55 feet	50 pcf	55 pcf

The lateral earth pressures recommended above for retaining walls assume that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures.

The upper ten feet of the retaining wall adjacent to streets, driveways or parking areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal street traffic. If the traffic is kept back at least ten feet from the retaining walls, the traffic surcharge may be neglected. Foundations may be designed using the allowable bearing capacities, friction, and passive earth pressure found in the "Foundation Design" section above.

Dynamic (Seismic) Earth Pressure

Retaining walls exceeding 6 feet in height shall be designed to resist the additional earth pressure caused by seismic ground shaking. A triangular pressure distribution should be utilized for the additional seismic loads, with an equivalent fluid pressure of 25 pounds per cubic foot. The seismic earth pressure should be combined with the lateral active earth pressure for analyses of restrained basement walls under seismic loading condition.

Surcharge from Adjacent Structures

As indicated herein, additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures for retaining walls and shoring design.

The following surcharge equation provided in the LADBS Information Bulletin Document No. P/BC 2008-83, may be utilized to determine the surcharge loads on basement walls and shoring system for existing structures located within the 1:1 (h:v) surcharge influence zone of the excavation and basement.

Resultant lateral force: $R = (0.3*P*h^2)/(x^2+h^2)$

Location of lateral resultant: $d = x*[(x^2/h^2+1)*\tan^{-1}(h/x)-(x/h)]$

where:

R	=	resultant lateral force measured in pounds per foot of wall width.
P	=	resultant surcharge loads of continuous or isolated footings measured in pounds per foot of length parallel to the wall.
x	=	distance of resultant load from back face of wall measured in feet.
h	=	depth below point of application of surcharge loading to top of wall footing measured in feet.
d	=	depth of lateral resultant below point of application of surcharge loading measure in feet.
$\tan^{-1}(h/x)$	=	the angle in radians whose tangent is equal to h/x.

The structural engineer and shoring engineer may use this equation to determine the surcharge loads based on the loading of the adjacent structures located within the surcharge influence zone.

Waterproofing

Moisture effecting retaining walls is one of the most common post construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water inside the building.

Efflorescence is a process in which a powdery substance is produced on the surface of the concrete by the evaporation of water. The white powder usually consists of soluble salts such as gypsum, calcite, or common salt. Efflorescence is common to retaining walls and does not affect their strength or integrity.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection to below grade walls.

Retaining Wall Drainage

All retaining walls shall be provided with a subdrain in order to minimize the potential for future hydrostatic pressure buildup behind the proposed retaining walls. Subdrains may consist of four-inch diameter perforated pipes, placed with perforations facing down. The pipe shall be encased in at least one-foot of gravel around the pipe. The gravel may consist of three-quarter inch to one inch crushed rocks.

A compacted fill blanket or other seal shall be provided at the surface. Retaining walls may be backfilled with gravel adjacent to the wall to within 2 feet of the ground surface. The onsite earth materials are acceptable for use as retaining wall backfill as long as they are compacted to a minimum of 95 percent of the maximum density as determined by the latest revision of ASTM D 1557.

Certain types of subdrain pipe are not acceptable to the various municipal agencies, it is recommended that prior to purchasing subdrainage pipe, the type and brand is cleared with the proper municipal agencies. Subdrainage pipes should outlet to an acceptable location.

Where retaining walls are to be constructed adjacent to property lines, there is usually not enough space for placement of a standard perforated pipe and gravel drainage system. Under these circumstances, 2-inch diameter weepholes may be placed at the 8 feet on center along the base of the wall. The wall shall be backfilled with a minimum of 1 foot of gravel above the base of the retaining wall. The gravel may consist of three-quarter inch to one inch crushed rocks.

The lateral earth pressures recommended above for retaining walls assume that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. If a drainage system is not provided, the walls should be designed to resist an external hydrostatic pressure due to water in addition to the lateral earth pressure. In any event, it is recommended that retaining walls be waterproofed.

Retaining Wall Backfill

Any required backfill should be mechanically compacted in layers not more than 8 inches thick, to at least 95 percent of the maximum density obtainable by the latest revision of ASTM D 1557 method of compaction. Flooding should not be permitted. Proper compaction of the backfill will be necessary to reduce settlement of overlying walks and paving. Some settlement of required backfill should be anticipated, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the structure.

Proper compaction of the backfill will be necessary to reduce settlement of overlying walks and paving. Some settlement of required backfill should be anticipated, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the structure.

Sump Pump Design

The purpose of the recommended retaining wall backdrainage system is to relieve hydrostatic pressure. Groundwater was not encountered during exploration to a depth of 150 feet which corresponds to 120 feet below the base of the proposed structure. Therefore the only water which could affect the proposed retaining walls would be irrigation waters and precipitation. Additionally, the proposed site grading is such that all drainage is directed to the street and the structure has been designed with adequate non-erosive drainage devices.

Based on these considerations the retaining wall backdrainage system is not expected to experience an appreciable flow of water, and in particular, no groundwater will affect it. However, for the purposes of design, a flow of 10 gallons per minute may be assumed.

TEMPORARY EXCAVATIONS

It is anticipated that excavations on the order of 50 to 55 feet in vertical height will be required for the proposed subterranean levels and foundation elements. The excavations are expected to expose fill and dense native soils, which are suitable for vertical excavations up to 4 feet where not surcharged by adjacent traffic or structures. Excavations which will be surcharged by adjacent traffic, public way, properties, or structures should be shored.

Where sufficient space is available, temporary unsurcharged embankments could be sloped back without shoring. Excavations over 4 feet in height should may be excavated at a uniform 1:1 (h:v) slope gradient in its entirety to a maximum height of 15 feet. A uniform sloped excavation does not have a vertical component.

Where sloped embankments are utilized, the tops of the slopes should be barricaded to prevent vehicles and storage loads within seven feet of the tops of the slopes. If the temporary construction

embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. The soils exposed in the cut slopes should be inspected during excavation by personnel from this office so that modifications of the slopes can be made if variations in the soil conditions occur.

Excavation Observations

It is critical that the soils exposed in the cut slopes are observed by a representative of Geotechnologies, Inc. during excavation so that modifications of the slopes can be made if variations in the geologic material conditions occur. Many building officials require that temporary excavations should be made during the continuous observations of the geotechnical engineer. All excavations should be stabilized within 30 days of initial excavation.

SHORING DESIGN

The following information on the design and installation of the shoring is as complete as possible at this time. It is suggested that a review of the final shoring plans and specifications be made by this office prior to bidding or negotiating with a shoring contractor be made.

One method of shoring would consist of steel soldier piles, placed in drilled holes and backfilled with concrete. The soldier piles may be designed as cantilevers or laterally braced utilizing drilled tie-back anchors or raker braces.

Soldier Piles

Drilled cast-in-place soldier piles should be placed no closer than 3 diameters on center. The minimum diameter of the piles is 18 inches. Structural concrete should be used for the soldier

piles below the excavation; lean-mix concrete may be employed above that level. As an alternative, lean-mix concrete may be used throughout the pile where the reinforcing consists of a wideflange section. The slurry must be of sufficient strength to impart the lateral bearing pressure developed by the wideflange section to the earth materials. For design purposes, an allowable passive value for the earth materials below the bottom plane of excavation may be assumed to be 600 pounds per square foot per foot. To develop the full lateral value, provisions should be implemented to assure firm contact between the soldier piles and the undisturbed earth materials.

The frictional resistance between the soldier piles and retained earth material may be used to resist the vertical component of the anchor load. The coefficient of friction may be taken as 0.4 based on uniform contact between the steel beam and lean-mix concrete and retained earth. The portion of soldier piles below the plane of excavation may also be employed to resist the downward loads. The downward capacity may be determined using a frictional resistance of 450 pounds per square foot. The minimum depth of embedment for shoring piles is 5 feet below the bottom of the footing excavation, or 7 feet below the bottom of excavated plane, whichever is deeper.

Casing may be required should caving be experienced in the saturated earth materials. If casing is used, extreme care should be employed so that the pile is not pulled apart as the casing is withdrawn. At no time should the distance between the surface of the concrete and the bottom of the casing be less than 5 feet.

Piles placed below the water level will require the use of a tremie to place the concrete into the bottom of the hole. A tremie shall consist of a water-tight tube having a diameter of not less than 10 inches with a hopper at the top. The tube shall be equipped with a device that will close the discharge end and prevent water from entering the tube while it is being charged with concrete. The tremie shall be supported so as to permit free movement of the discharge end over the entire top surface of the work and to permit rapid lowering when necessary to retard or stop the flow of concrete. The discharge end shall be closed at the start of the work to prevent water entering the

tube and shall be entirely sealed at all times, except when the concrete is being placed. The tremie tube shall be kept full of concrete. The flow shall be continuous until the work is completed and the resulting concrete seal shall be monolithic and homogeneous. The tip of the tremie tube shall always be kept about five feet below the surface of the concrete and definite steps and safeguards should be taken to insure that the tip of the tremie tube is never raised above the surface of the concrete.

A special concrete mix should be used for concrete to be placed below water. The design shall provide for concrete with a strength of 1,000 psi over the initial job specification. An admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included. The slump shall be commensurate to any research report for the admixture, provided that it shall also be the minimum for a reasonable consistency for placing when water is present.

Lagging

Soldier piles and anchors should be designed for the full anticipated pressures. Due to the cohesionless nature of the underlying earth materials, lagging will be required throughout the entire depth of the excavation. Due to arching in the geologic materials, the pressure on the lagging will be less. It is recommended that the lagging should be designed for the full design pressure but be limited to a maximum of 400 pounds per square foot. It is recommended that a representative of this firm observe the installation of lagging to insure uniform support of the excavated embankment.

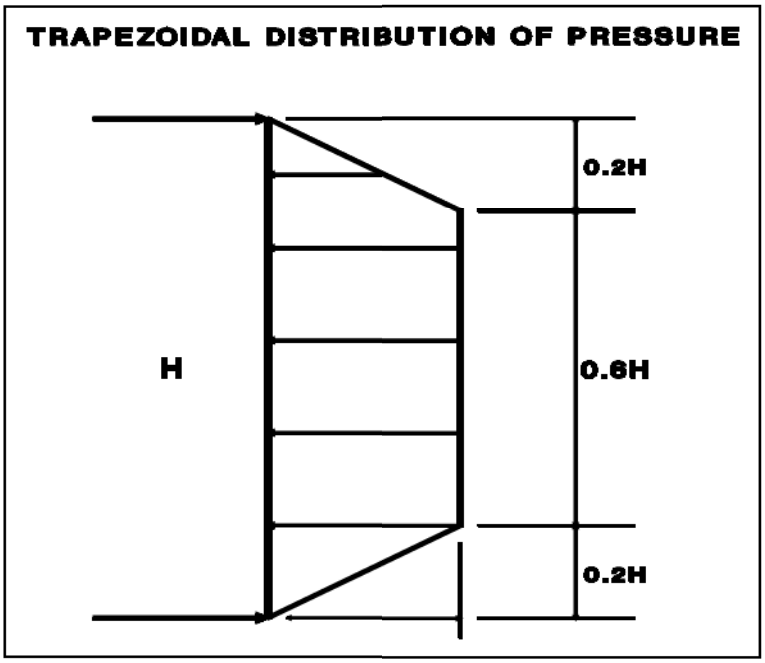
Lateral Pressures

A triangular distribution of lateral earth pressure should be utilized for the design of cantilevered shoring system. A trapezoidal distribution of lateral earth pressure would be appropriate where shoring is to be restrained at the top by bracing or tie backs. The design of trapezoidal distribution

of pressure is shown in the diagram below. Equivalent fluid pressures for the design of cantilevered and restrained shoring are presented in the following table:

Height of Shoring (feet)	Cantilever Shoring System Equivalent Fluid Pressure (pcf) Triangular Distribution of Pressure	Restrained Shoring System Lateral Earth Pressure (psf)* Trapezoidal Distribution of Pressure
50 feet	42 pcf	28H psf
55 feet	45 pcf	30H psf

*Where H is the height of the shoring in feet.



Where a combination of sloped embankment and shoring is utilized, the pressure will be greater and must be determined for each combination. Additional active pressures should be applied where the shoring will be surcharged by adjacent traffic or structures.

The upper ten feet of the retaining wall adjacent to streets, driveways or parking areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal street traffic. If the traffic is kept back at least ten feet from the retaining walls, the traffic surcharge may be neglected. Foundations may be designed using the allowable bearing capacities, friction, and passive earth pressure found in the "Foundation Design" section above.

Tied-Back Anchors

Tied-back anchors may be used to resist lateral loads. Friction anchors are recommended. For design purposes, it may be assumed that the active wedge adjacent to the shoring is defined by a plane drawn 35 degrees with the vertical through the bottom plane of the excavation. Friction anchors should extend a minimum of 20 feet beyond the potentially active wedge.

Drilled friction anchors may be designed for a skin friction of 300 pounds per square foot. Pressure grouted anchor may be designed for a skin friction of 2,000 pounds per square foot. Where belled anchors are utilized, the capacity of belled anchors may be designed by assuming the diameter of the bonded zone is equivalent to the diameter of the bell. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads.

It is recommended that at least 3 of the initial anchors have their capacities tested to 200 percent of their design capacities for a 24-hour period to verify their design capacity. The total deflection during this test should not exceed 12 inches. The anchor deflection should not exceed 0.75 inches during the 24 hour period, measured after the 200 percent load has been applied.

All anchors should be tested to at least 150 percent of design load. The total deflection during this test should not exceed 12 inches. The rate of creep under the 150 percent test load should not

exceed 0.1 inch over a 15 minute period in order for the anchor to be approved for the design loading.

After a satisfactory test, each anchor should be locked-off at the design load. This should be verified by rechecking the load in the anchor. The load should be within 10 percent of the design load. Where satisfactory tests are not attained, the anchor diameter and/or length should be increased or additional anchors installed until satisfactory test results are obtained. The installation and testing of the anchors should be observed by the geotechnical engineer. Minor caving during drilling of the anchors should be anticipated.

Anchor Installation

Tied-back anchors may be installed between 20 and 40 degrees below the horizontal. Caving of the anchor shafts, particularly within sand deposits, should be anticipated and the following provisions should be implemented in order to minimize such caving. The anchor shafts should be filled with concrete by pumping from the tip out, and the concrete should extend from the tip of the anchor to the active wedge. In order to minimize the chances of caving, it is recommended that the portion of the anchor shaft within the active wedge be backfilled with sand before testing the anchor. This portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill should be placed by pumping; the sand may contain a small amount of cement to facilitate pumping.

Deflection

It is difficult to accurately predict the amount of deflection of a shored embankment. It should be realized that some deflection will occur. It is estimated that the deflection could be on the order of one inch at the top of the shored embankment. If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent buildings and utilities in

adjacent street and alleys. If desired to reduce the deflection, a greater active pressure could be used in the shoring design. Where internal bracing is used, the rakers should be tightly wedged to minimize deflection. The proper installation of the raker braces and the wedging will be critical to the performance of the shoring.

The City of Los Angeles Department of Building and Safety requires limiting shoring deflection to ½ inch at the top of the shored embankment where a structure is within a 1:1 (h:v) plane projected up from the base of the excavation. A maximum deflection of 1-inch has been allowed provided there are no structures within a 1:1 (h:v) plane drawn upward from the base of the excavation.

Monitoring

Because of the depth of the excavation, some mean of monitoring the performance of the shoring system is suggested. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all soldier piles and the lateral movement along the entire lengths of selected soldier piles. Also, some means of periodically checking the load on selected anchors will be necessary, where applicable.

Some movement of the shored embankments should be anticipated as a result of the relatively deep excavation. It is recommended that photographs of the existing buildings on the adjacent properties be made during construction to record any movements for use in the event of a dispute.

Shoring Observations

It is critical that the installation of shoring is observed by a representative of Geotechnologies, Inc. Many building officials require that shoring installation should be performed during continuous observation of a representative of the geotechnical engineer. The observations insure that the

recommendations of the geotechnical report are implemented and so that modifications of the recommendations can be made if variations in the geologic material or groundwater conditions warrant. The observations will allow for a report to be prepared on the installation of shoring for the use of the local building official, where necessary.

SLABS ON GRADE

Concrete Slabs-on Grade

Concrete floor slabs should be a minimum of 5 inches in thickness. Slabs-on-grade should be cast over undisturbed natural geologic materials or properly controlled fill materials. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 95 percent of the maximum dry density.

Outdoor concrete flatwork should be a minimum of 4 inches in thickness. Outdoor concrete flatwork should be cast over undisturbed natural geologic materials or properly controlled fill materials. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 95 percent of the maximum dry density.

Design of Slabs That Receive Moisture-Sensitive Floor Coverings

Geotechnologies, Inc. does not practice in the field of moisture vapor transmission evaluation and mitigation. Therefore it is recommended that a qualified consultant be engaged to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. The qualified consultant should provide recommendations for mitigation of potential adverse impacts of moisture vapor transmission on various components of the structure.

Where dampness would be objectionable, it is recommended that the floor slabs should be waterproofed. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection for concrete slabs-on-grade.

All concrete slabs-on-grade should be supported on vapor retarder. The design of the slab and the installation of the vapor retarder should comply with the most recent revisions of ASTM E 1643 and ASTM E 1745. The vapor retarder should comply with ASTM E 1745 Class A requirements.

Where a vapor retarder is used, a low-slump concrete should be used to minimize possible curling of the slabs. The barrier can be covered with a layer of trimable, compactible, granular fill, where it is thought to be beneficial. See ACI 302.2R-32, Chapter 7 for information on the placement of vapor retarders and the use of a fill layer.

Concrete Crack Control

The recommendations presented in this report are intended to reduce the potential for cracking of concrete slabs-on-grade due to settlement. However even where these recommendations have been implemented, foundations, stucco walls and concrete slabs-on-grade may display some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete cracking may be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement and curing, and by placement of crack control joints at reasonable intervals, in particular, where re-entrant slab corners occur.

For standard control of concrete cracking, a maximum crack control joint spacing of 15 feet should not be exceeded. Lesser spacing would provide greater crack control. Joints at curves and angle points are recommended. The crack control joints should be installed as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by a structural engineer.

Complete removal of the existing fill soils beneath outdoor flatwork such as walkways or patio areas, is not required, however, due to the rigid nature of concrete, some cracking, a shorter design life and increased maintenance costs should be anticipated. In order to provide uniform support beneath the flatwork it is recommended that a minimum of 12 inches of the exposed subgrade beneath the flatwork be scarified and recompacted to 95 percent relative compaction.

Slab Reinforcing

Concrete slabs-on-grade should be reinforced with a minimum of #4 steel bars on 16-inch centers each way. Outdoor flatwork should be reinforced with a minimum of #3 steel bars on 18-inch centers each way.

PAVEMENTS

Prior to placing paving, the existing grade should be scarified to a depth of 12 inches, moistened as required to obtain optimum moisture content, and recompacted to 95 percent of the maximum density as determined by the most recent revision of ASTM D 1557. The client should be aware that removal of all existing fill in the area of new paving is not required, however, pavement constructed in this manner will most likely have a shorter design life and increased maintenance costs. The following pavement sections are recommended:

Service	Asphalt Pavement Thickness Inches	Base Course Inches
Passenger Cars	3	4
Moderate Truck	4	6
Heavy Truck	6	9

A subgrade modulus of 100 pounds per cubic inch may be assumed for design of concrete paving. Concrete paving for passenger cars and moderate truck traffic shall be a minimum of 6 inches in

thickness, and shall be underlain by 4 inches of aggregate base. Concrete paving for heavy truck traffic shall be a minimum of 7½ inches in thickness, and shall be underlain by 6 inches of aggregate base. For standard crack control maximum expansion joint spacing of 15 feet should not be exceeded. Lesser spacing would provide greater crack control. Joints at curves and angle points are recommended.

Aggregate base should be compacted to a minimum of 95 percent of the most recent revision of ASTM D 1557 laboratory maximum dry density. Base materials should conform to Sections 200-2.2 or 200-2.4 of the "Standard Specifications for Public Works Construction", (Green Book), latest edition.

SITE DRAINAGE

Proper surface drainage is critical to the future performance of the project. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Proper site drainage should be maintained at all times.

All site drainage should be collected and transferred to the street in non-erosive drainage devices. The proposed structure should be provided with roof drainage. Discharge from downspouts, roof drains and scuppers should not be permitted on unprotected soils within five feet of the building perimeter. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters which are located within a distance equal to the depth of a retaining wall should be sealed to prevent moisture adversely affecting the wall. Planters which are located within five feet of a foundation should be sealed to prevent moisture affecting the earth materials supporting the foundation.

STORMWATER INFILTRATION

The proposed structure will be constructed over four levels of subterranean parking garage. It is anticipated that excavation of the proposed subterranean levels including the foundation elements will extends to depths between 50 and 55 feet below the existing site grade. Very stiff cohesive soils interlayered with occasional granular soils were encountered below the base of the proposed structure. In addition, bedrock is anticipated at depths of 10 to 30 feet below the base of the tower structure. Due to the impermeable nature of the stiff cohesive soils and bedrock, the high loading condition of the tower, and the potential for creating perched water conditions affecting offsite structures, it is the opinion of this firm that the site is not feasible for stormwater infiltration.

SOIL CORROSIVITY STUDY

A soil corrosivity study was performed by HDR, Inc. The results of soil corrosion potential testing indicate that the electrical resistivities of the soils were in the moderately and mildly corrosive categories in the as-received moisture, and in the corrosive categories when saturated. Soil pH values of the samples ranged between 7.0 and 7.7, indicating neutral to mildly alkaline conditions. The chemical content of the samples was low. Sulfate content is negligible.

In summary, the soils are classified as corrosive to ferrous metals. Detailed results, discussion of results and recommended mitigating measures are provided in the HDR report presented at the end of this report. Any questions regarding the results of the soil corrosion report should be addressed to HDR, Inc.

DESIGN REVIEW

Engineering of the proposed project should not begin until approval of the geotechnical report by the Building Official is obtained in writing. Significant changes in the geotechnical recommendations may result during the building department review process.

It is recommended that the geotechnical aspects of the project be reviewed by this firm during the design process. This review provides assistance to the design team by providing specific recommendations for particular cases, as well as review of the proposed construction to evaluate whether the intent of the recommendations presented herein are satisfied.

CONSTRUCTION MONITORING

Geotechnical observations and testing during construction are considered to be a continuation of the geotechnical investigation. It is critical that this firm review the geotechnical aspects of the project during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. All foundations should be observed by a representative of this firm prior to placing concrete or steel. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise Geotechnologies, Inc. at least twenty-four hours prior to any required site visit.

If conditions encountered during construction appear to differ from those disclosed herein, notify Geotechnologies, Inc. immediately so the need for modifications may be considered in a timely manner.

It is the responsibility of the contractor to ensure that all excavations and trenches are properly sloped or shored. All temporary excavations should be cut and maintained in accordance with applicable OSHA rules and regulations.

EXCAVATION CHARACTERISTICS

The exploration performed for this investigation is limited to the geotechnical excavations described. Direct exploration of the entire site would not be economically feasible. The owner, design team and contractor must understand that differing excavation and drilling conditions may be encountered based on boulders, gravel, oversize materials, groundwater and many other conditions. Fill materials, especially when they were placed without benefit of modern grading codes, regularly contain materials which could impede efficient grading and drilling. Southern California sedimentary bedrock is known to contain variable layers which reflect differences in depositional environment. Such layers may include abundant gravel, cobbles and boulders. Similarly bedrock can contain concretions. Concretions are typically lenticular and follow the bedding. They are formed by mineral deposits. Concretions can be very hard. Excavation and drilling in these areas may require full size equipment and coring capability. The contractor should be familiar with the site and the geologic materials in the vicinity.

CLOSURE AND LIMITATIONS

The purpose of this report is to aid in the design and completion of the described project. Implementation of the advice presented in this report is intended to reduce certain risks associated with construction projects. The professional opinions and geotechnical advice contained in this report are sought because of special skill in engineering and geology and were prepared in accordance with generally accepted geotechnical engineering practice. Geotechnologies, Inc. has a duty to exercise the ordinary skill and competence of members of the engineering profession.

Those who hire Geotechnologies, Inc. are not justified in expecting infallibility, but can expect reasonable professional care and competence.

The scope of the geotechnical services provided did not include any environmental site assessment for the presence or absence of organic substances, hazardous/toxic materials in the soil, surface water, groundwater, or atmosphere, or the presence of wetlands.

Proper compaction is necessary to reduce settlement of overlying improvements. Some settlement of compacted fill should be anticipated. Any utilities supported therein should be designed to accept differential settlement. Differential settlement should also be considered at the points of entry to the structure.

GEOTECHNICAL TESTING

Classification and Sampling

The soil is continuously logged by a representative of this firm and classified by visual examination in accordance with the Unified Soil Classification system. The field classification is verified in the laboratory, also in accordance with the Unified Soil Classification System. Laboratory classification may include visual examination, Atterberg Limit Tests and grain size distribution. The final classification is shown on the excavation logs.

Samples of the geologic materials encountered in the exploratory excavations were collected and transported to the laboratory. Undisturbed samples of soil are obtained at frequent intervals. Unless noted on the excavation logs as an SPT sample, samples acquired while utilizing a hollow-stem auger drill rig are obtained by driving a thin-walled, California Modified Sampler with successive 30-inch drops of a 140-pound hammer. The soil is retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The central portion of the samples are stored in close

fitting, waterproof containers for transportation to the laboratory. Samples noted on the excavation logs as SPT samples are obtained in accordance with the most recent revision of ASTM D 1586. Samples are retained for 30 days after the date of the geotechnical report.

Moisture and Density Relationships

The field moisture content and dry unit weight are determined for each of the undisturbed soil samples, and the moisture content is determined for SPT samples by the most recent revision of ASTM D 4959 or ASTM D 4643. This information is useful in providing a gross picture of the soil consistency between exploration locations and any local variations. The dry unit weight is determined in pounds per cubic foot and shown on the "Excavation Logs", A-Plates. The field moisture content is determined as a percentage of the dry unit weight.

Direct Shear Testing

Shear tests are performed by the most recent revision of ASTM D 3080 with a strain controlled, direct shear machine manufactured by Soil Test, Inc. or a Direct Shear Apparatus manufactured by GeoMatic, Inc. The rate of deformation is approximately 0.025 inches per minute. Each sample is sheared under varying confining pressures in order to determine the Mohr-Coulomb shear strength parameters of the cohesion intercept and the angle of internal friction. Samples are generally tested in an artificially saturated condition. Depending upon the sample location and future site conditions, samples may be tested at field moisture content. The results are plotted on the "Shear Test Diagram," B-Plates.

The most recent revision of ASTM 3080 limits the particle size to 10 percent of the diameter of the direct shear test specimen. The sheared sample is inspected by the laboratory technician running the test. The inspection is performed by splitting the sample along the sheared plane and

observing the soils exposed on both sides. Where oversize particles are observed in the shear plane, the results are discarded and the test run again with a fresh sample.

Consolidation Testing

Settlement predictions of the soil's behavior under load are made on the basis of the consolidation tests using the most recent revision of ASTM D 2435. The consolidation apparatus is designed to receive a single one-inch high ring. Loads are applied in several increments in a geometric progression, and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. Samples are generally tested at increased moisture content to determine the effects of water on the bearing soil. The normal pressure at which the water is added is noted on the drawing. Results are plotted on the "Consolidation Test," C-Plates.

Expansion Index Testing

The expansion tests performed on the remolded samples are in accordance with the Expansion Index testing procedures, as described in the most recent revision of ASTM D4829. The soil sample is compacted into a metal ring at a saturation degree of 50 percent. The ring sample is then placed in a consolidometer, under a vertical confining pressure of 1 lbf/square inch and inundated with distilled water. The deformation of the specimen is recorded for a period of 24 hour or until the rate of deformation becomes less than 0.0002 inches/hour, whichever occurs first. The expansion index, EI, is determined by dividing the difference between final and initial height of the ring sample by the initial height, and multiplied by 1,000.

Laboratory Compaction Characteristics

The maximum dry unit weight and optimum moisture content of a soil are determined by use of the most recent revision of ASTM D 1557. A soil at a selected moisture content is placed in five layers into a mold of given dimensions, with each layer compacted by 25 blows of a 10 pound hammer dropped from a distance of 18 inches subjecting the soil to a total compactive effort of about 56,000 pounds per cubic foot. The resulting dry unit weight is determined. The procedure is repeated for a sufficient number of moisture contents to establish a relationship between the dry unit weight and the water content of the soil. The data when plotted represent a curvilinear relationship known as the compaction curve. The values of optimum moisture content and modified maximum dry unit weight are determined from the compaction curve.

Grain Size Distribution

These tests cover the quantitative determination of the distribution of particle sizes in soils. Sieve analysis is used to determine the grain size distribution of the soil larger than the Number 200 sieve. The most recent revision of ASTM D 422 is used to determine particle sizes smaller than the Number 200 sieve. A hydrometer is used to determine the distribution of particle sizes by a sedimentation process. The grain size distributions are plotted on the E-Plates presented in the Appendix of this report.

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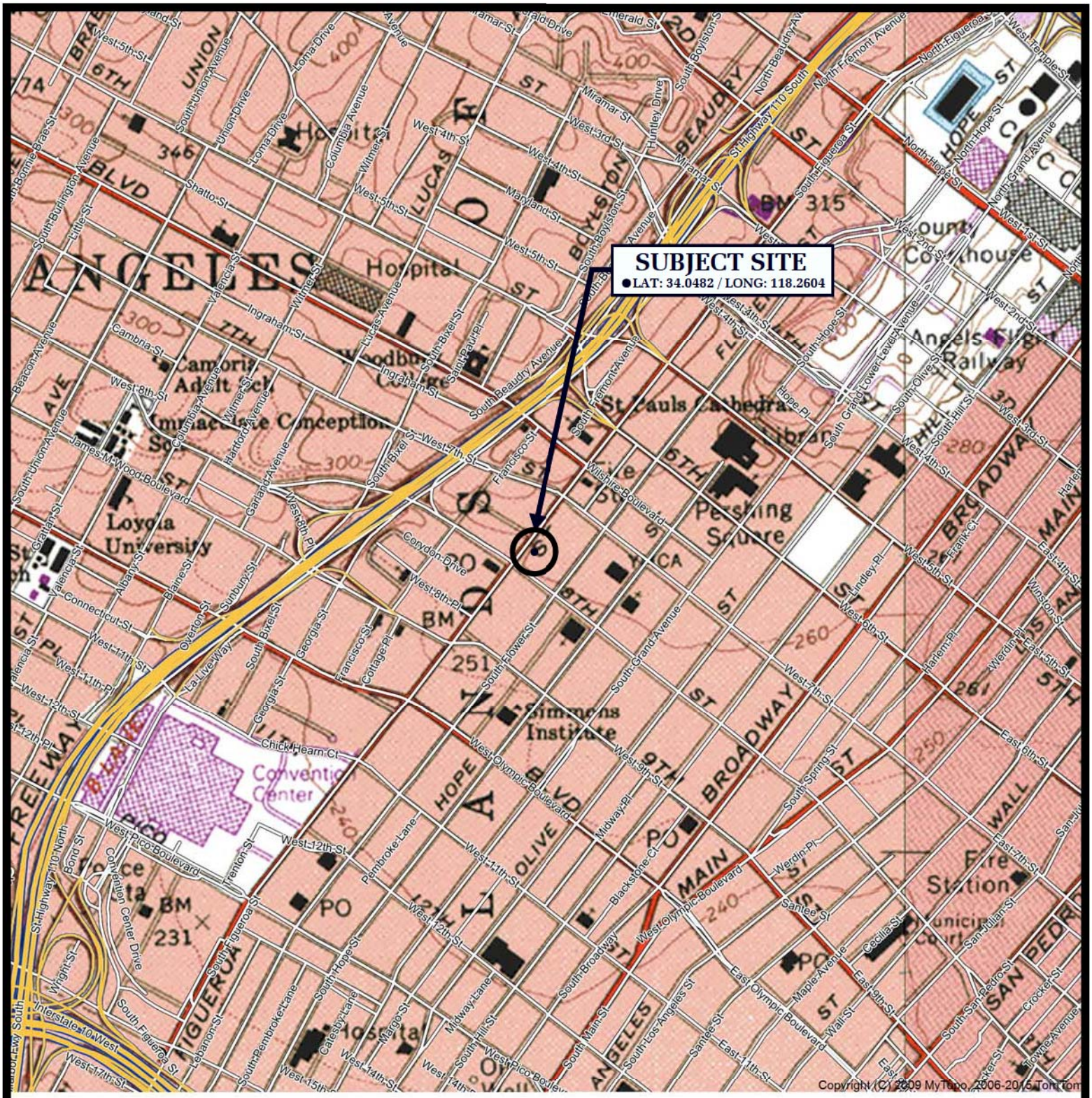

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0 1000 2000 3000
FEET

REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, HOLLYWOOD, CA QUADRANGLE

VICINITY MAP

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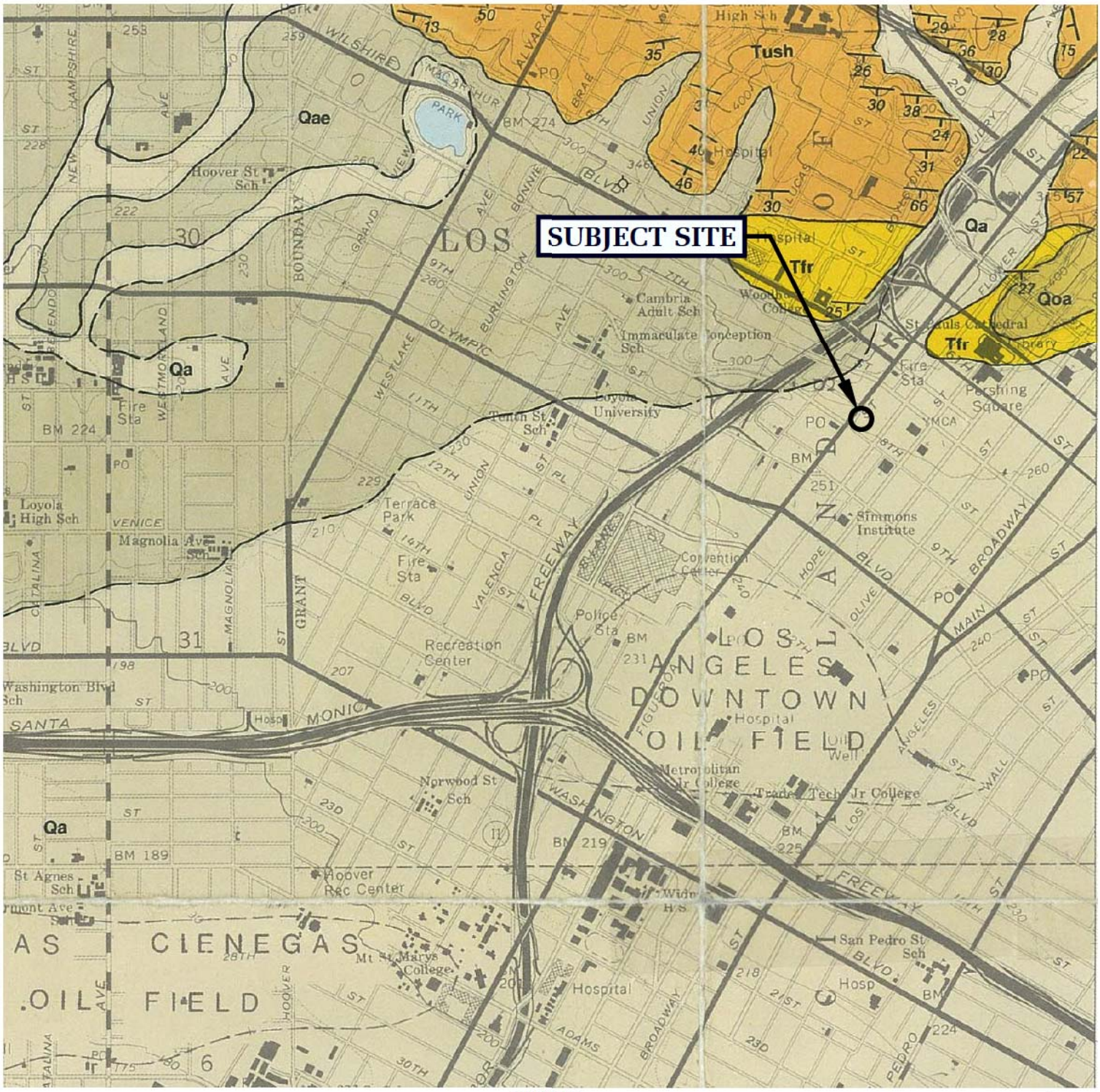
MITSUI FUDOSAN AMERICA

FILE NO. 21089



SCALE IN FEET
0 500 1000 2000

LEGEND

- **Qa:** Surficial Sediments - alluvium; gravel, sand and clay
- **Qae:** Older Surficial Sediments - similar to Qa, but slightly elevated and dissected
- **Qoa:** Older Surficial Sediments - older alluvium, gray to light brown pebble-gravel, sand, silt, and clay, similar to Qae
- **Tush:** Unnamed Shale - gray to light brown, thin-bedded silty clay shale, soft and crumbly
- **Tush:** Fernando Formation - Repetto Member (Lamar 1970): consolidated but crumbly gray to greenish-gray claystone-siltstone
- Folds - arrow on axial trace of fold indicates direction of plunge
- Fault - dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful

N

REFERENCE: DIBBLEE, T.W., (1991) GEOLOGIC MAP OF THE HOLLYWOOD & BURBANK (SOUTH HALF) QUADRANGLES (#DF-30)

LOCAL GEOLOGIC MAP - DIBBLEE

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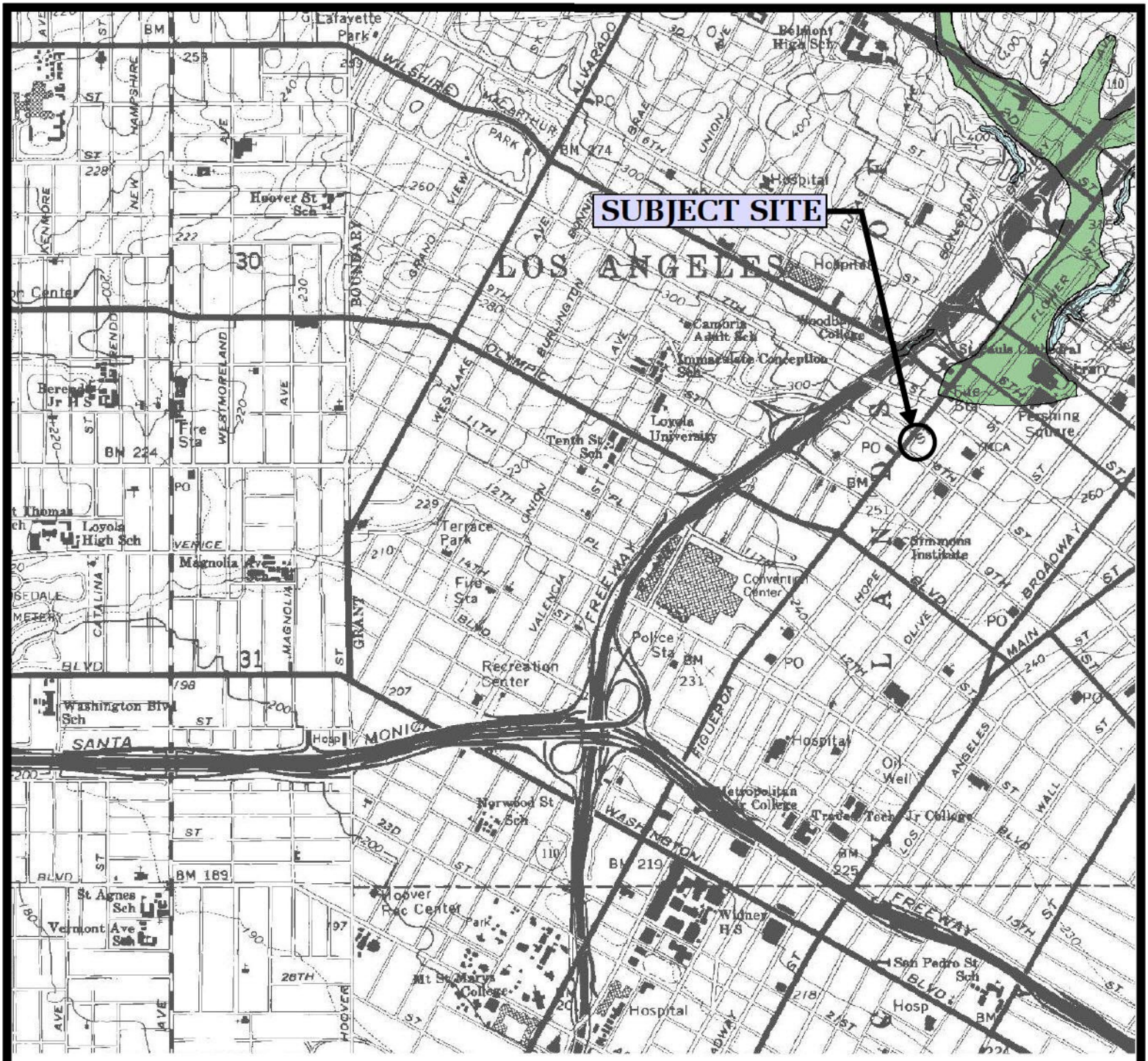

REFERENCE: SEISMIC HAZARD ZONES, HOLLYWOOD QUADRANGLE OFFICIAL MAP (CDMG, 1999)

SEISMIC HAZARD ZONE MAP

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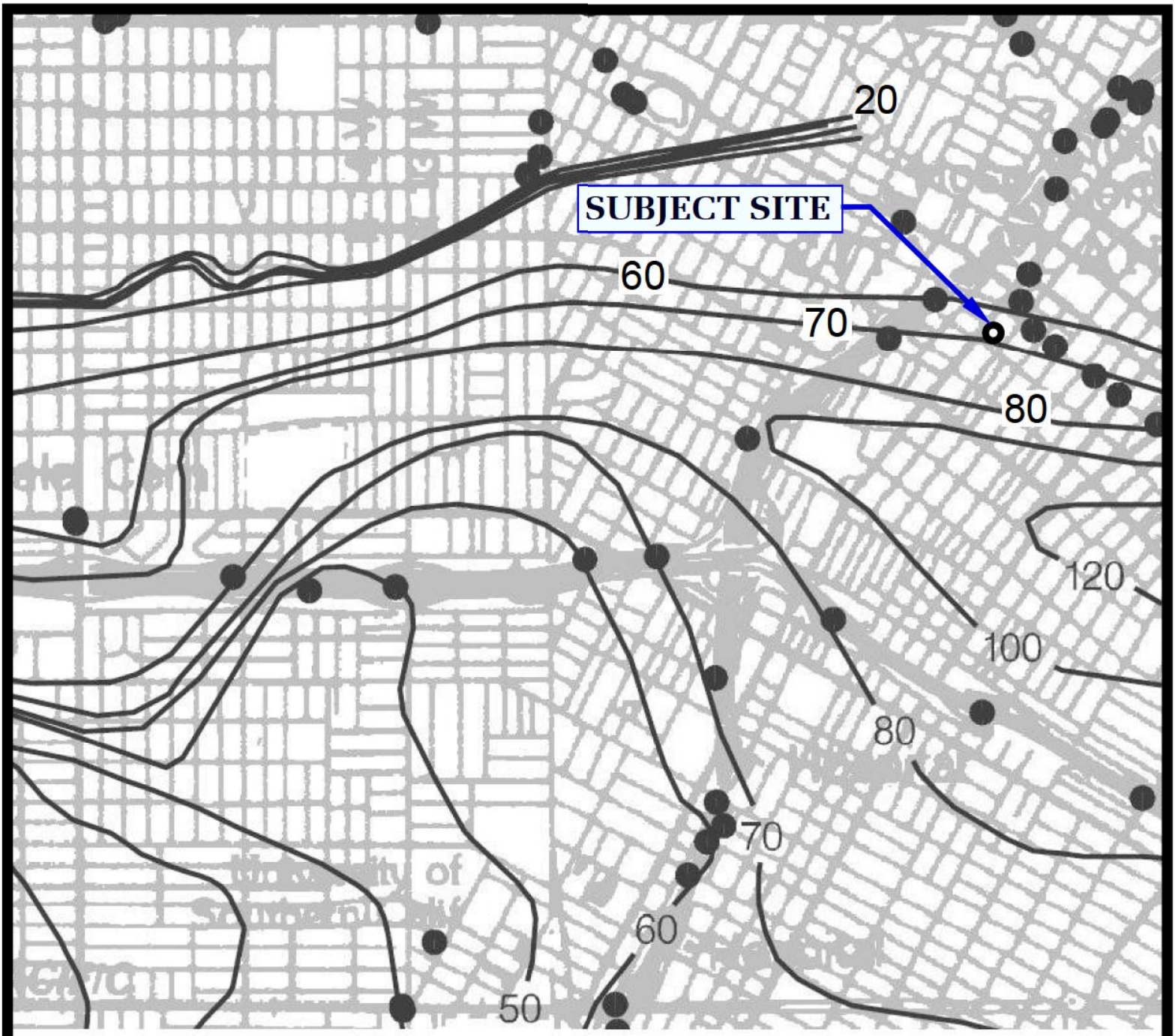

REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 026
HOLLYWOOD 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1998, REVISED 2006)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

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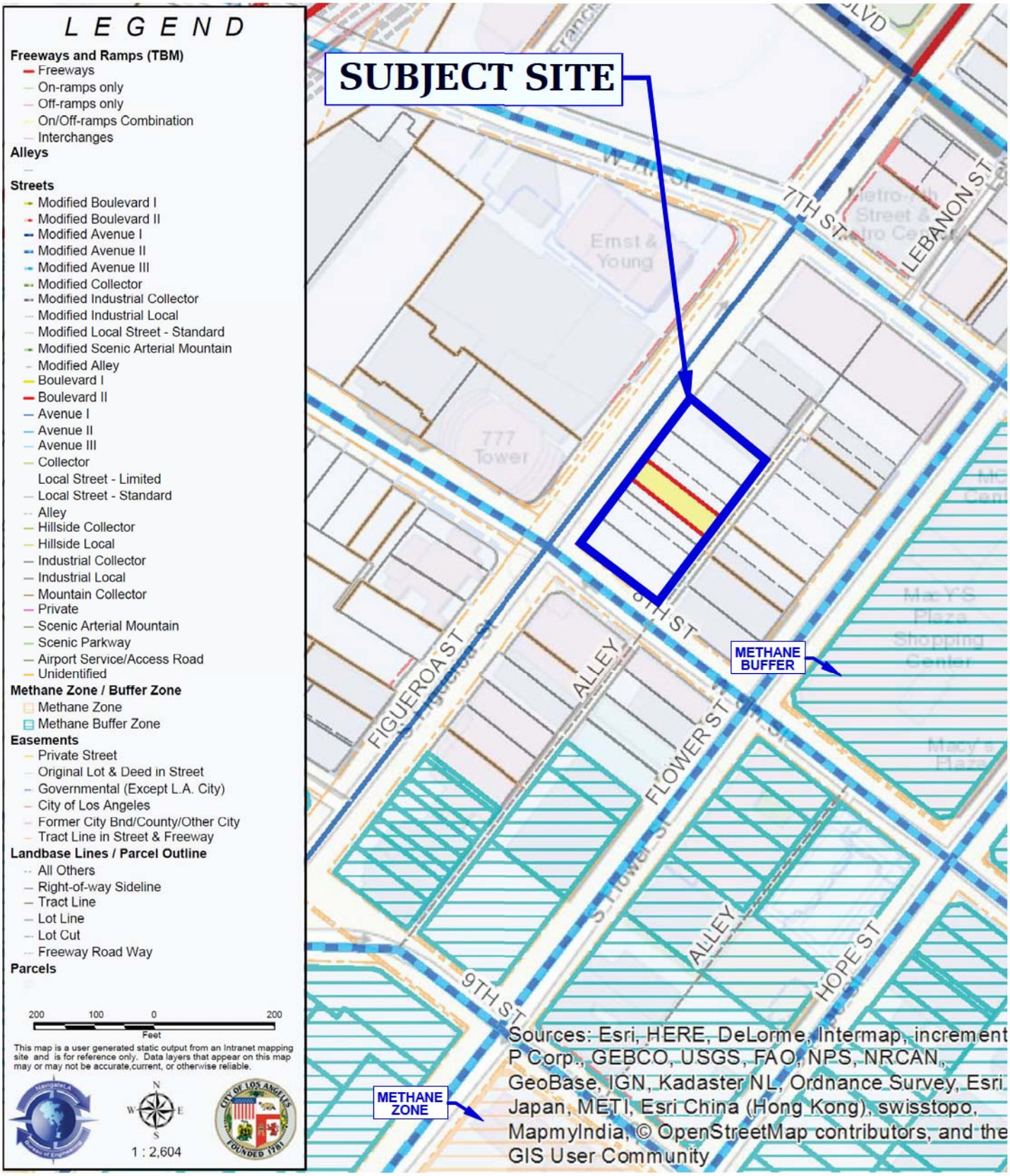

REFERENCE: http://navigatela.lacity.org/NavigateLA/

METHANE ZONE RISK MAP

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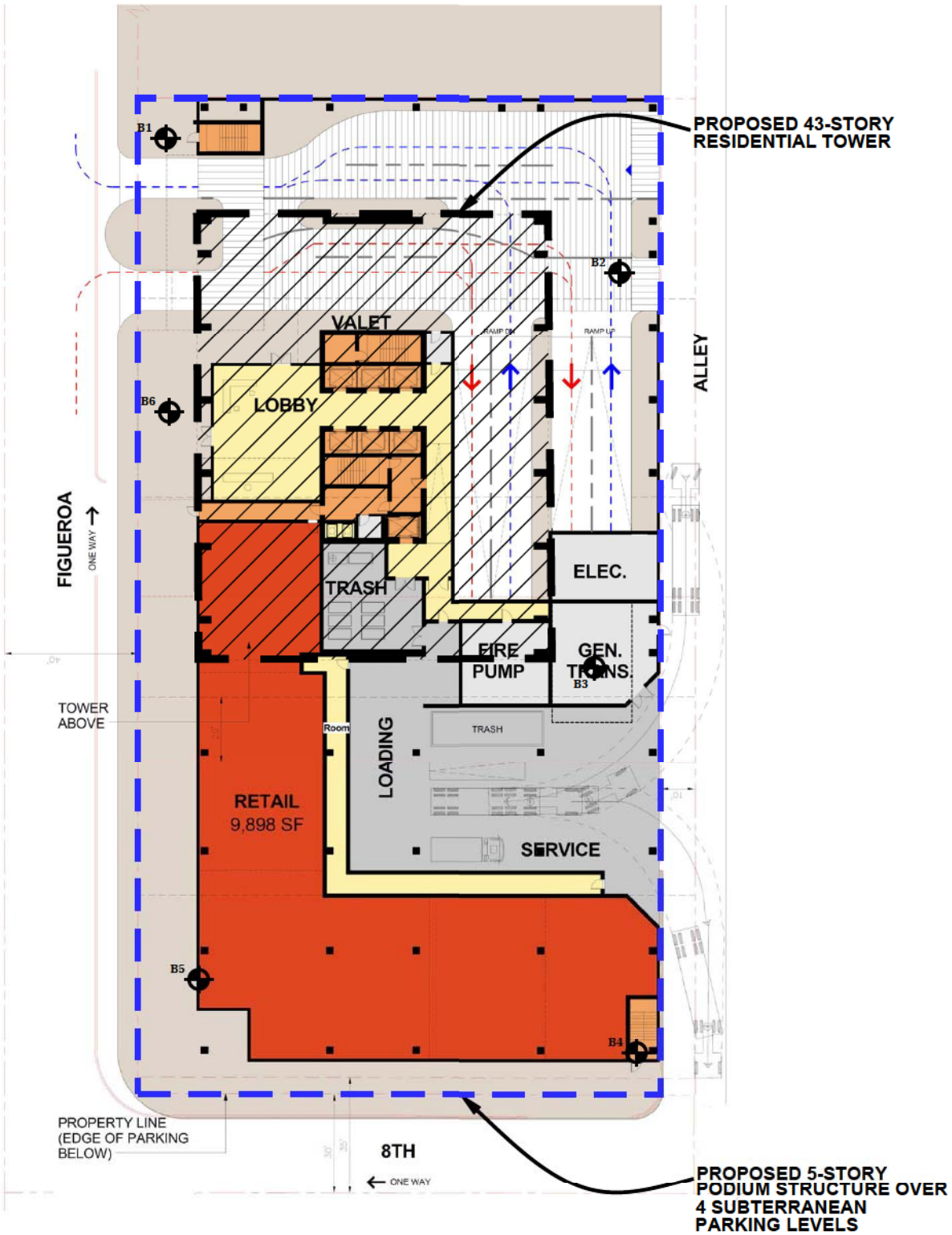


SCALE IN FEET

0 30 60

LEGEND

B6 LOCATION & NUMBER OF BORING

REFERENCE: [illegible]

PLOT PLAN

Geotechnologies, Inc.
Consulting Geotechnical Engineers

MITSUI FUDOSAN AMERICA

FILE No. 21089	DRAWN BY: TC
DATE: January '16	SHEET: 1 of 1

BORING LOG NUMBER 1

Mitsui Fudosan America **Date: 11/11/15**

File No. 21089 **Method: 8-inch Diameter Hollow Stem Auger**

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Parking Lot
				0		4-inches Asphalt, No Base
				1		FILL: Silty Sand, dark yellowish brown, very dense, slightly moist, very fine to medium grained, trace of fine gravel
				2		
				3		
				4		
5	50/6"	8.5	86.5	5	SM	Silty Sand, medium brown, slightly moist, dense to very dense, fine grained
				6		
				7		
7.5	50/6"	10.4	104.1	8		
				9		
10	50/6"	8.9	119.6	10		
				11	SW	Gravelly Sand, light gray, slightly moist, very dense with abundant gravel and cobbles
				12		
				13		
				14		
15	50/3"	2.1	114.7	15		
				16		
				17		
				18		
				19		
20	50/4"	1.5	100.6	20		Gravelly sand, light grayish brown, slightly moist to dry, very dense, fine to coarse grained
				21		
				22		
				23		
				24		
25	50/4"	1.5	117.6	25		

BORING LOG NUMBER 1

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	50/4"	4.0	112.8	30		
				31	SM	Silty Sand, light gray to yellowish brown, slightly moist, very dense, fine grained with gravel
				32		
				33		
				34		
35	50/5"	2.7	110.7	35		
				36	SP	Sand, light gray, slightly moist, very dense, fine grained
				37		
				38		
				39		
40	50/5"	10.4	115.0	40		
				41	SC	Clayey Sand, brown, moist, very dense, fine grained
				42		
				43		
				44		
45	50/6"	16.9	109.1	45		
				46	SP	Sand, light grayish brown, moist, very dense, fine grained
				47		
				48		
				49		
50	50/5"	10.9	107.4	50		
					RX	BEDROCK: Sandstone, gray, moist, moderately hard, fine grained

BORING LOG NUMBER 1

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
				53		
				54		
55	50/6"	21.0	103.4	55		Siltstone, olive brown, moist, moderately hard, fine grained
				56		
				57		
				58		
				59		
60	50/6"	17.5	99.5	60		Light gray
				61		
				62		
				63		
				64		
65	50/5"	19.5	95.0	65		
				66		
				67		
				68		
				69		
70	50/6"	7.7	100.6	70		Sandstone, grayish brown, slightly moist, moderately hard to hard, fine grained
				71		
				72		
				73		
				74		
75	50/6"	16.8	106.3	75		

BORING LOG NUMBER 1

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79		
80	50/6"	12.6	97.0	80		Total Depth 80 feet No Water Fill to 5 feet
				81		
				82		
				83		
				84		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				85		
				86		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 2

Mitsui Fudosan America **Date: 11/16/15**

File No. 21089 **Method: 8-inch diameter Hollow Stem Auger**

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt, No Base
				1		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
2.5	75	31.2	97.4	2		
				3	ML	Sandy Silt, dark brown, very moist, stiff, fine grained
				4		
5	52	10.3	119.8	5	SM/SP	Sand to Silty Sand, dark brown, moist, dense, fine grained
				6		
				7		
				8		
				9		
10	35	11.6	122.4	10	SM	Silty Sand, dark brown, moist, dense, fine grained
				11		
				12		
				13		
				14		
15	71	3.4	116.7	15	SW	Gravelly Sand, dark brown, slightly moist, very dense, fine to coarse grained, with abundant gravel and cobbles
				16		
				17		
				18		
				19		
20	39 50/2"	2.4	121.0	20		
				21		
				22		
				23		
				24		
25	27 50/5"	4.7	97.0	25	SP	Sand, yellowish brown, slightly moist, very dense, fine grained

BORING LOG NUMBER 2

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	37 50/4"	3.2	110.7	30		Sand, yellowish brown, slightly moist, very dense, fine grained
				31		
				32		
				33		
				34		
35	85	3.9	106.2	35		
				36		
				37		
				38		
				39		
40	84	4.4	105.8	40		
				41		
				42		
				43		
				44		
45	40 50/4"	6.4	104.2	45		Sand, dark to yellowish brown, slightly moist, very dense, fine grained, occasional cobbles
				46		
				47		
				48		
				49		
50	89	14.0	103.4	50		
					ML	Sandy Silt, dark grayish brown, moist, very stiff, fine grained

BORING LOG NUMBER 2

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
				53		
				54		
55	54	25.9	100.9	55	CL	Sandy Clay, dark reddish brown, moist, very stiff, fine grained
				56		
				57		
				58		
				59		
60	60	26.6	99.6	60	RX	BEDROCK: Siltstone, gray to dark gray, moist, moderately hard
				61		
				62		
				63		
				64		
65	39 50/4"	18.6	111.5	65		Siltstone, gray to dark gray, moist, moderately hard to hard
				66		
				67		
				68		
				69		
70	89	17.0	112.7	70		
				71		
				72		
				73		
				74		
75	41 50/3"	13.8	111.4	75		Sandstone, gray, moist, hard

BORING LOG NUMBER 2

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79		
80	32 50/4"	10.4	104.5	80		
				81		Total Depth 80 feet No Water Fill to 3 feet
				82		
				83		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				84		
				85		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				86		
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 3

Mitsui Fudosan America **Date: 11/16/15**

File No. 21089 **Method: 8-inch diameter Hollow Stem Auger**

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		3-inch Asphalt over 1-inch Base
				1		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
2.5	44	5.0	116.8	2		
				3	SM	Silty Sand, dark brown, slightly moist, medium dense, fine grained
5	27	6.2	SPT	4		
				5	SM/ML	Silty Sand to Sandy Silt, dark brown, slightly moist, medium dense to stiff, fine grained
7.5	66	13.2	113.8	6		
				7		
10	21	11.2	SPT	8		
				9		
12.5	78	1.3	122.1	10		
				11		
15	78	1.3	SPT	12	SW	Gravelly Sand, dark to medium brown, slightly moist, very dense, fine to coarse grained, with abundant gravel and cobbles
				13		
17.5	100/8"	2.1	116.0	14		
				15		
20	50/6"	1.4	SPT	16		
				17		
22.5	38 50/5"	1.2	120.4	18		
				19		
25	75	2.4	SPT	20		
				21		
				22		
				23	SP	Sand, dark brown, slightly moist, very dense, fine to medium grained, occasional cobbles
				24		
				25		

BORING LOG NUMBER 3

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	100/8"	3.7	112.7	28		
				29		
30	77	3.1	SPT	30		
				31		
				32		
32.5	40 50/3"	3.0	109.9	33		Sand, dark to yellowish brown, slightly moist, very dense, fine grained
				34		
35	42	4.0	SPT	35		
				36		
				37		
37.5	28 50/5"	4.7	105.0	38		
				39		
40	45	3.4	SPT	40		
				41		
				42		
42.5	42 50/3"	8.6	114.6	43		
				44		
45	78	13.2	SPT	45	SM/SP	Silty Sand to Sand, dark to yellowish brown, moist, very dense, fine grained, occasional cobbles
				46		
				47		
47.5	86	18.0	109.6	48	SC	Clayey Sand, dark grayish brown, moist, very dense, fine grained
				49		
50	57	11.0	SPT	50	SP/CL	Sand interbedded with Sandy Clay, grayish brown, moist, dense to very stiff, fine grained

BORING LOG NUMBER 3

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	45 50/4"	15.2	114.1	53		
				54		
55	33	13.6	SPT	55		
				56		
				57		
57.5	48 50/5"	11.3	121.2	58	CL	Sandy Clay, dark grayish brown, moist, very stiff
				59		
60	36	18.2	SPT	60	SM/CL	Silty Sand to Sandy Clay, moist, medium dense to very stiff, fine grained, stiff
				61		
				62		
62.5	39 50/5"	21.2	106.0	63		
				64		
65	30 50/5"	16.6	SPT	65		
				66		
				67		
67.5	26 50/5"	18.5	110.0	68	SM	Silty Sand, dark grayish brown, moist, very dense, fine grained
				69		
70	38	18.2	SPT	70		
				71		
				72		
72.5	83	16.5	111.4	73	ML	Sandy Silt, dark grayish brown, moist, very stiff
				74		
75	28	12.1	SPT	75		

BORING LOG NUMBER 3

Mitsui Fudosan America

File No. 21089

km/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
77.5	79	16.5	110.8	78		
				79		
80	39	15.8	SPT	80	SM/ML	Silty Sand to Sandy Silt, dark grayish brown, moist, dense to stiff, fine grained
				81		
				82		
82.5	66	14.5	117.4	83	SM	Silty Sand, dark grayish brown, moist, dense, fine grained
				84		
85	40	21.2	SPT	85	SM/ML	Silty Sand to Sandy Silt, dark grayish brown, moist, dense to stiff, fine grained
				86		
				87		
87.5	40 50/5"	4.8	121.0	88	SP	Sand, gray, slightly moist, very dense, fine grained
				89		
90	48	5.9	SPT	90		Total Depth 90 feet No Water Fill to 3 feet NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 4

Mitsui Fudosan America **Date: 11/13/15**

File No. 21089 **Method: 8-inch Diameter Hollow Stem Auger**

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Parking Lot
				0		4-inches Asphalt over 1.5-inch Base
				1		FILL: Clayey Sand, brown, moist, dense, very fine to medium grained
2.5	38	13.6	119.3	2		
				3		
				4		
5	37	17.8	111.2	5	CL	Sandy Clay, dark brown, moist, stiff, fine grained
				6		
7.5	28	16.4	109.8	7		
				8		
				9		
10	27	20.6	102.2	10		
				11		
				12	SW	Gravelly Sand, light grayish brown, slight moist, very dense
				13		
				14		
15	50/5"	2.8	118.7	15		
				16		
				17		
				18		
				19		
20	50/6"	2.5	120.9	20		With gravel and cobbles
				21		
				22		
				23		
				24		
25	50/5"	4.0	111.6	25		

BORING LOG NUMBER 4

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	50/5"	4.0	104.8	30		dark to yellowish brown, slightly moist, very dense, fine to coarse grained, with gravel and cobbles
				31		
				32		
				33		
				34		
35	50/6"	2.7	103.3	35		yellowish brown, fine to coarse grained, occasional gravel
				36		
				37		
				38		
				39		
40	50/5"	5.9	105.1	40	SP	Sand, dark to yellowish brown, slightly moist, very dense, fine to medium grained
				41		
				42		
				43		
				44		
45	50/5"	6.5	108.0	45		
				46		
				47		
				48		
				49		
50	50/4"	2.5	104.4	50	SW	Gravelly Sand, yellowish brown, slightly moist, very dense, fine to coarse grained, with gravel and cobbles

BORING LOG NUMBER 4

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51 – 52 – 53 – 54 –		
55	50/4"	15.6	106.1	55 – 56 – 57 – 58 – 59 –	SM	Silty Sand, grayish brown, moist, very dense, fine to very coarse grained
60	73	13.9	120.7	60 – 61 – 62 – 63 – 64 –	SC	Clayey Sand, brown, moist, very dense, fine grained
65	35	5.6	102.3	65 – 66 – 67 – 68 – 69 –	SM	Silty Sand, reddish brown, slightly moist, dense, fine grained, occasional gravel
70	46	25.3	97.2	70 – 71 – 72 – 73 – 74 –	CL	Sandy Clay, brown, moist, very stiff, fine grained, occasional gravel
75	87	15.8	104.6	75 –	SP	Sand, brown, moist, very dense, very fine to medium grained

BORING LOG NUMBER 4

Mitsui Fudosan America

File No. 21089

sa/ae

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79	ML	Sandy Silt, dark brown, moist, very stiff, fine to medium grained
80	50/4"	14.8	114.7	80		Total Depth 80 feet No Water Fill to 5 feet
				81		
				82		
				83		
				84		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				85		
				86		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 5

Mitsui Fudosan America **Date: 11/11/15**

File No. 21089 **Method: 8-inch Diameter Hollow Stem Auger**

sa

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Parking Lot
				0		3-inches Asphalt, No Base
				1		FILL: Silty Sand, dark yellowish brown, slightly moist to moist, very dense, fine to medium grained
				2		
				3		
				4		
5	68	10.5	115.6	5	SM	Silty Sand, dark brown, moist, very dense, fine grained
				6		
				7		
7.5	48	14.2	116.5	8		
				9		
10	65	7.5	109.5	10		
				11		
				12	SW	Gravelly Sand, yellowish brown, slightly moist, very dense, fine to coarse grained, with abundant gravel and cobbles
				13		
				14		
15	50/5"	2.2	120.2	15	SP	Sand, light yellowish brown, slightly moist, very dense, fine to to coarse grained, with gravel
				16		
				17		
				18		
				19		
20	50/3"	4.3	96.6	20		Sand, light yellowish brown, slightly moist, very dense, fine to coarse grained, with gravel
				21		
				22		
				23		
				24		
25	50/5"	2.7	100.5	25		

BORING LOG NUMBER 5

Mitsui Fudosan America

File No. 21089

sa

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	70	19.2	106.4	30	CL	Sandy Clay to Sand, dark yellowish brown, moist, very stiff to very dense, fine grained
				31		
				32		
				33		
				34		
35	50/5"	4.0	106.3	35	SW	Sand, light yellowish brown, slightly moist, very dense, fine to coarse grained, with gravel
				36		
				37		
				38		
				39		
40	50/5"	4.7	105.3	40		
				41		
				42		
				43		
				44		
45	50/6"	3.1	99.0	45		yellowish brown, fine to coarse grained, with gravel
				46		
				47		
				48		
				49		
50	50/6"	18.6	110.4	50	SC	Clayey Sand, dark brown, moist, very dense, very fine to fine grained

BORING LOG NUMBER 5

Mitsui Fudosan America

File No. 21089

sa

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51 – 52 – 53 – 54 –		
55	50/6"	21.2	107.5	55 – 56 – 57 – 58 – 59 –	CL	Sandy Clay, dark gray, moist, very stiff, fine grained
60	50/6"	24.8	95.9	60 – 61 – 62 – 63 – 64 –	ML	Sandy Silt, dark yellowish brown, moist, hard, very fine to medium grained
65	50/5"	16.2	113.9	65 – 66 – 67 – 68 – 69 –	SM/SL	Silty Sand to Sandy Silt, yellowish brown, moist, very dense to very stiff, fine grained
70	50/6"	24.2	101.2	70 – 71 – 72 – 73 – 74 –	CL	Sandy Clay, brown, moist, very stiff, very fine grained
75	50/6"	23.3	103.2	75 –		

BORING LOG NUMBER 5

Mitsui Fudosan America

File No. 21089

sa

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79		
					ML	Sandy Silt, light olive brown, moist, very stiff, very fine grained
80	50/6"	14.7	113.1	80		
				81		Total Depth 80 feet No Water Fill to 5 feet
				82		
				83		
				84		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				85		
				86		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 6

Mitsui Fudosan America **Date: 11/13/15**

File No. 21089 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		4-inch Asphalt over 2-inch Base
				1		FILL: Sandy Silt, dark brown, moist, stiff
2.5	28	13.9	117.9	2		
				3	ML	Sandy Silt, dark brown, moist, stiff
				4		
5	36 50/5"	11.4	119.7	5	SM/ML	Silty Sand to Sandy Silt, dark brown, moist, very dense to very stiff, fine grained
				6		
				7		
				8		
				9		
10	61	10.2	121.1	10		
				11		
				12		
				13		
				14		
15	100/10.5"	1.7	111.7	15	SW	Gravelly Sand, dark brown, slightly moist, very dense, fine to coarse grained, with gravel and cobbles
				16		
				17		
				18		
				19		
20	100/9"	3.0	109.2	20	SP	Sand, dark to medium brown, slightly moist, very dense, fine to medium grained, occasional gravel
				21		
				22		
				23		
				24		
25	100/8"	2.9	107.3	25		
						Sand, yellowish brown, slightly moist, very dense, fine to medium grained

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	79	18.5	110.6	30	ML	Sandy Silt, dark brown, moist, very stiff
				31		
				32		
				33		
				34		
35	100/8"	9.8	124.3	35	SM	Silty Sand, dark brown, moist, very dense, fine grained
				36		
				37		
				38		
				39		
40	50/6"	5.6	105.4	40	SP	Sand, yellowish brown, slightly moist, very dense
				41		
				42		
				43		
				44		
45	27 50/6"	14.4	115.0	45	ML	Sandy Silt, brown, moist, very stiff
				46		
				47		
				48		
				49		
50	37 50/3"	9.4	117.7	50		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51 – 52 – 53 – 54 –		
55	100/9"	6.0	91.9	55 – 56 – 57 – 58 – 59 –	SM	Silty Sand, light olive brown, slightly moist, very dense, fine grained
60	69	25.5	95.6	60 – 61 – 62 – 63 – 64 –	CL	Sandy Clay, olive brown, moist, very dense
65	33 50/5"	22.5	100.8	65 – 66 – 67 – 68 – 69 –	ML	Sandy Silt, olive brown, moist, very stiff, very fine grained
70	48 50/3"	16.6	107.4	70 – 71 – 72 – 73 – 74 –	RX	BEDROCK: Sandstone, gray, moist, hard
75	22 50/2"	5.1	101.6	75 –		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79		
80	34 50/4"	7.3	106.1	80		hard, fine grained
				81		
				82		
				83		
				84		
85	39 50/3"	7.3	104.5	85		
				86		
				87		
				88		
				89		
90	40	28.2	96.6	90		Siltstone, dark gray, moist, moderately hard to hard
				91		
				92		
				93		
				94		
95	50 50/4"	24.5	99.9	95		
				96		
				97		
				98		
				99		
100	58	24.8	96.9	100		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				101		
				102		
				103		
				104		
105	47 50/3"	25.7	97.6	105		
				106		Shale to Claystone, dark gray, moist, hard
				107		
				108		
				109		
110	27 50/6"	26.0	99.3	110		
				111		
				112		
				113		
				114		
115	34 50/4"	26.6	98.3	115		
				116		
				117		
				118		
				119		
120	84	25.1	98.5	120		
				121		
				122		
				123		
				124		
125	38 50/6"	21.8	100.8	125		
						Siltstone, dark gray, moist, hard

BORING LOG NUMBER 6

Mitsui Fudosan America

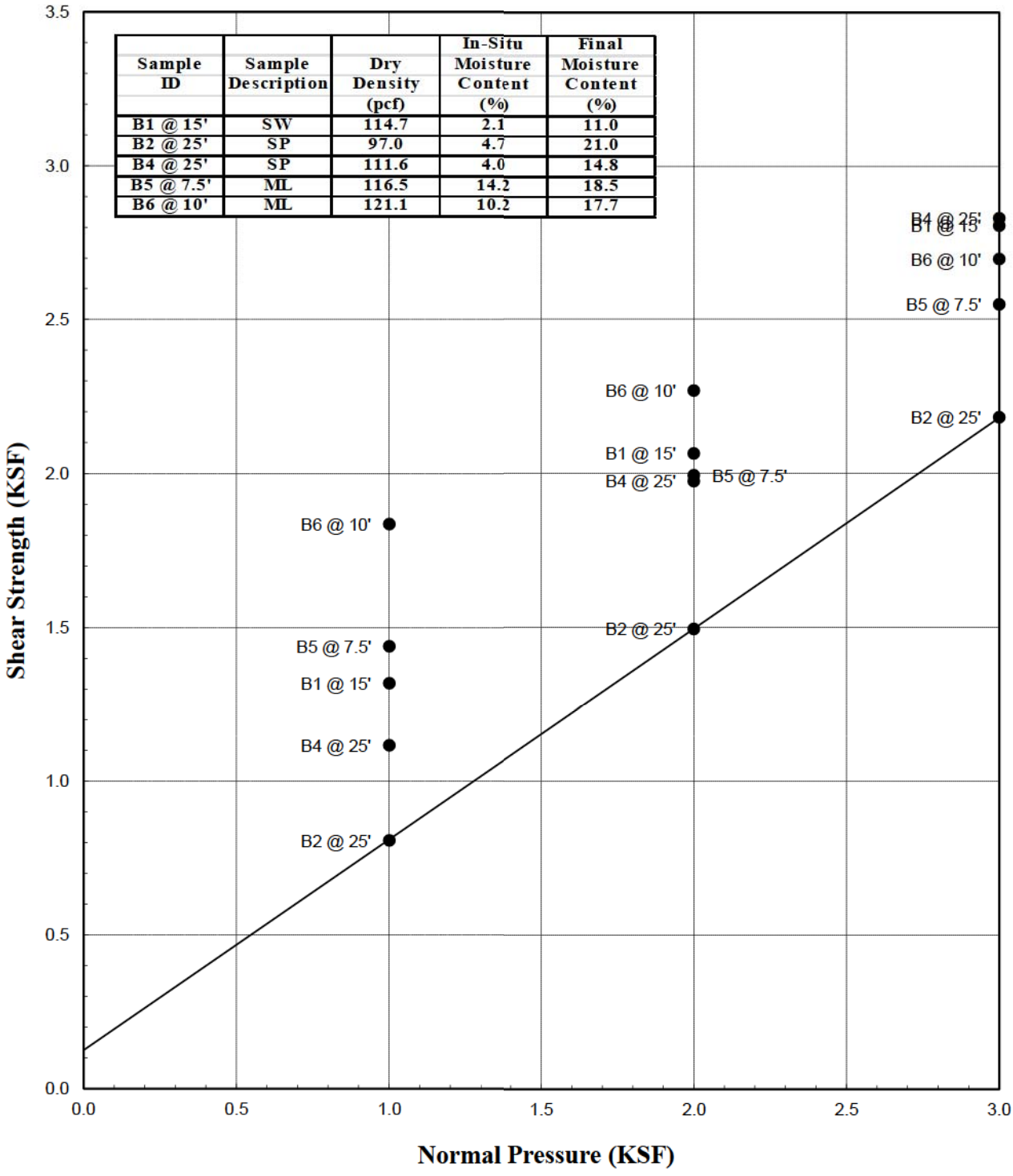
File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				126		
				127		
				128		
				129		
130	29 50/5"	24.0	101.3	130		
				131		
				132		
				133		
				134		
135	30 50/4"	24.9	98.3	135		Siltstone, gray, moist, hard
				136		
				137		
				138		
				139		
140	39 50/5"	25.0	101.6	140		
				141		
				142		
				143		
				144		
145	39 50/5"	24.4	102.3	145		
				146		
				147		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				148		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop
				149		Modified California Sampler used unless otherwise noted
150	26 50/6"	25.2	100.5	150		Total Depth 150 feet No Water Fill to 3 feet

Saturated Shear

Sample ID	Sample Description	Dry Density (pcf)	In-Situ Moisture Content (%)	Final Moisture Content (%)
B1 @ 15'	SW	114.7	2.1	11.0
B2 @ 25'	SP	97.0	4.7	21.0
B4 @ 25'	SP	111.6	4.0	14.8
B5 @ 7.5'	ML	116.5	14.2	18.5
B6 @ 10'	ML	121.1	10.2	17.7



ϕ: 34.5 degrees
c: 120.0 psf

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

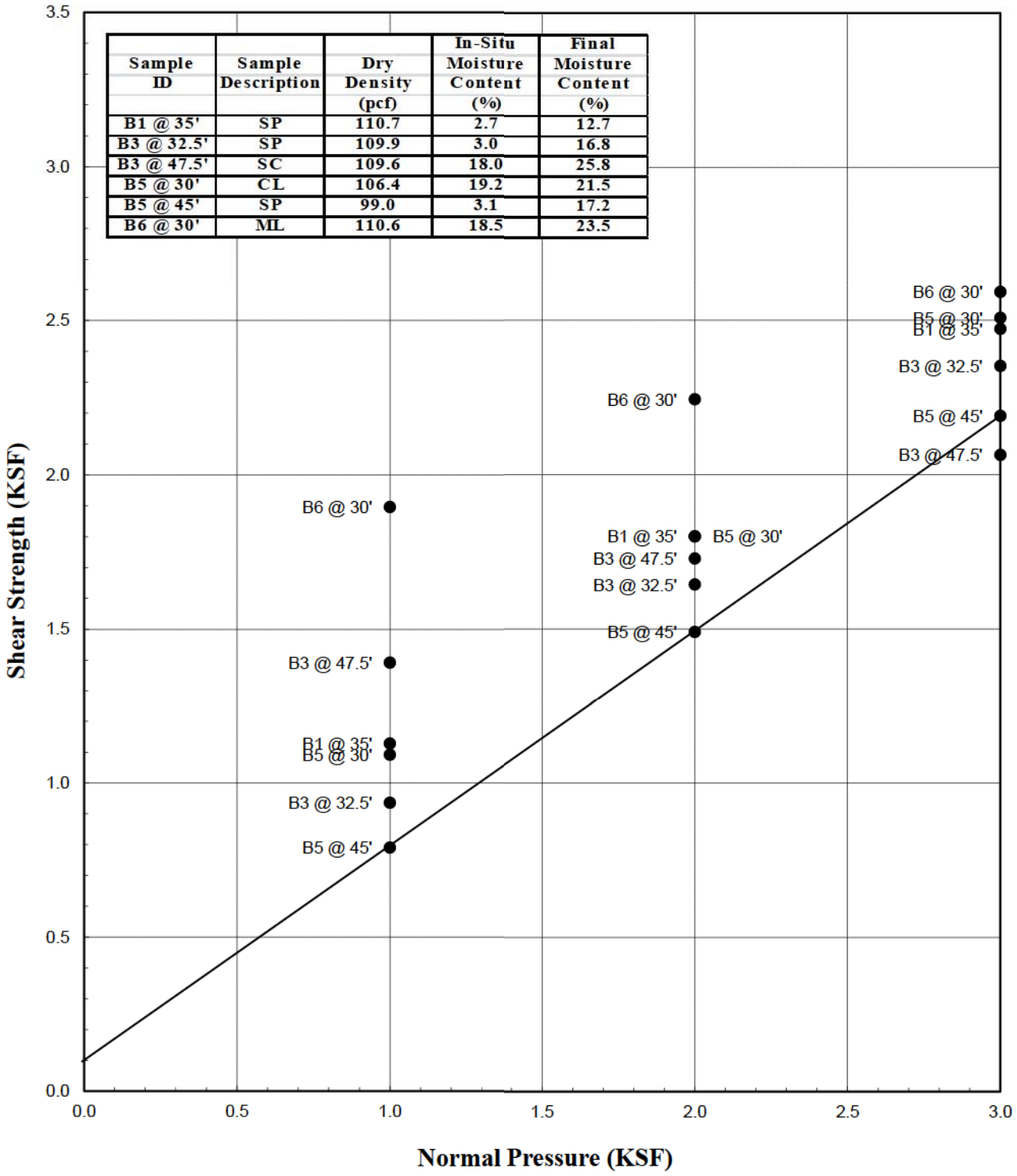
PROJECT: MITSUI FUDOSAN AMERICA

FILE NO.: 21089

PLATE: B-1

Saturated Shear

Sample ID	Sample Description	Dry Density (pcf)	In-Situ Moisture Content (%)	Final Moisture Content (%)
B1 @ 35'	SP	110.7	2.7	12.7
B3 @ 32.5'	SP	109.9	3.0	16.8
B3 @ 47.5'	SC	109.6	18.0	25.8
B5 @ 30'	CL	106.4	19.2	21.5
B5 @ 45'	SP	99.0	3.1	17.2
B6 @ 30'	ML	110.6	18.5	23.5



ϕ: 35.0 degrees
c: 90.0 psf

SHEAR TEST DIAGRAM

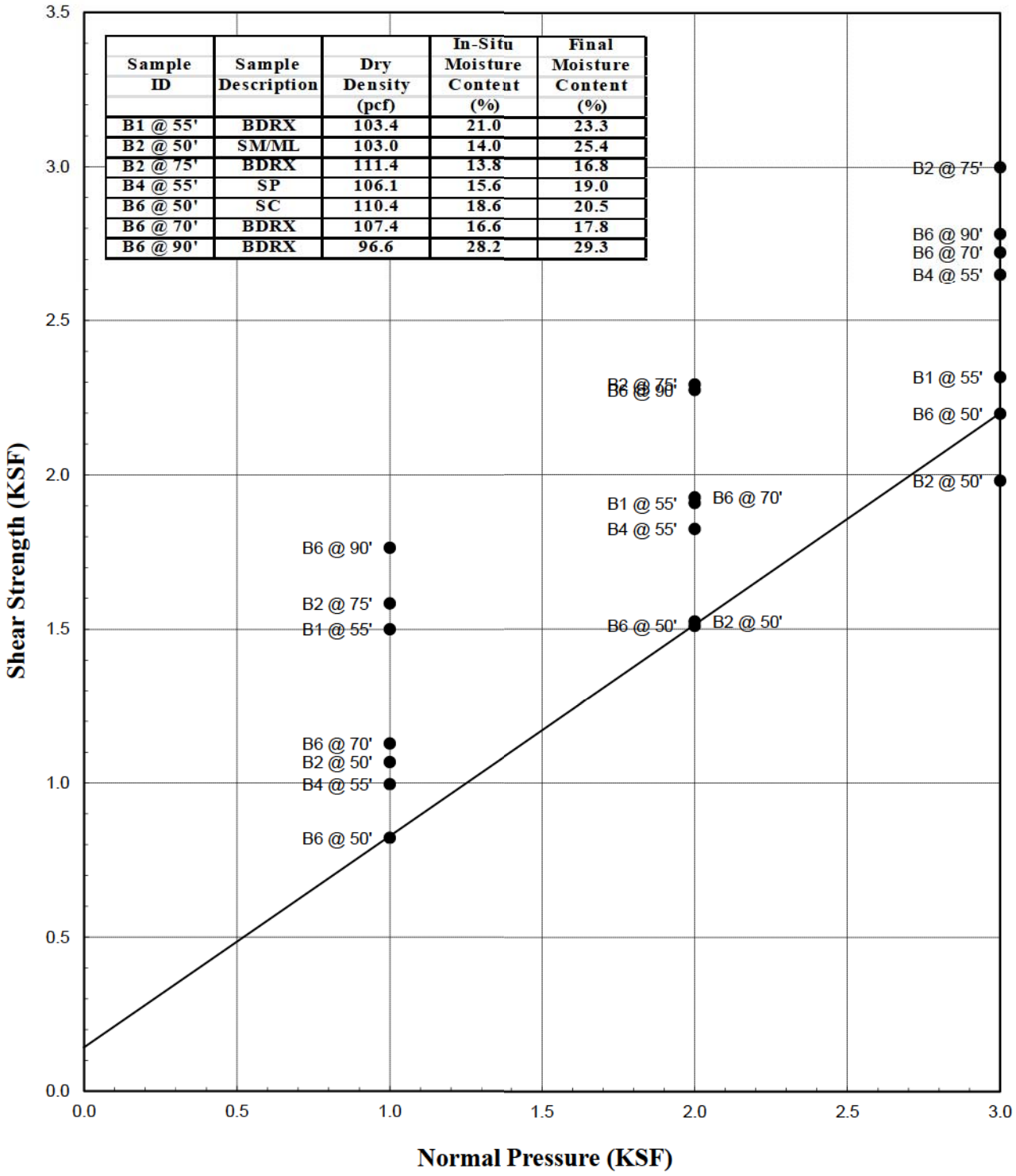
Geotechnologies, Inc.
Consulting Geotechnical Engineers

PROJECT: MITSUI FUDOSAN AMERICA

FILE NO.: 21089 | PLATE: B-2

Saturated Shear

Sample ID	Sample Description	Dry Density (pcf)	In-Situ Moisture Content (%)	Final Moisture Content (%)
B1 @ 55'	BDRX	103.4	21.0	23.3
B2 @ 50'	SM/ML	103.0	14.0	25.4
B2 @ 75'	BDRX	111.4	13.8	16.8
B4 @ 55'	SP	106.1	15.6	19.0
B6 @ 50'	SC	110.4	18.6	20.5
B6 @ 70'	BDRX	107.4	16.6	17.8
B6 @ 90'	BDRX	96.6	28.2	29.3



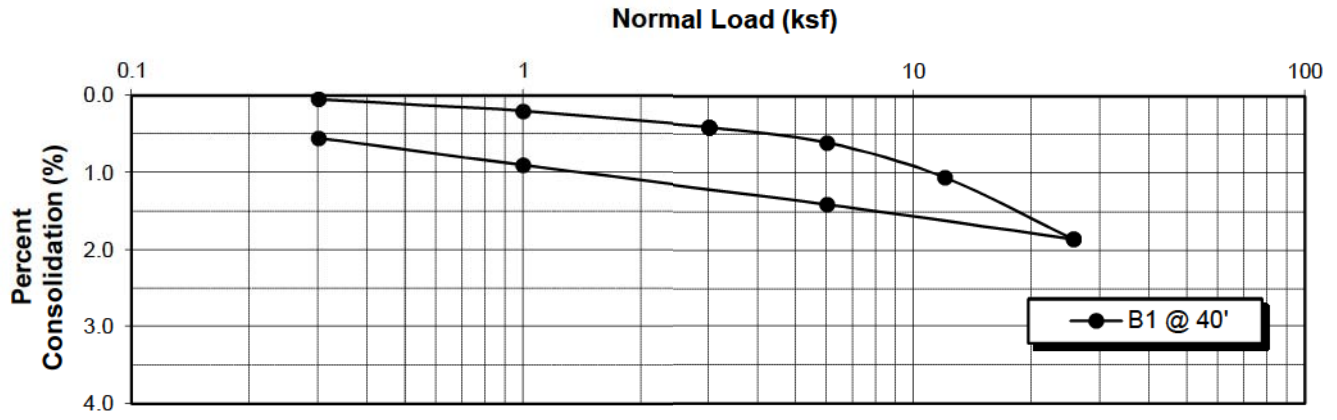
ϕ: 34.5 degrees
c: 135.0 psf

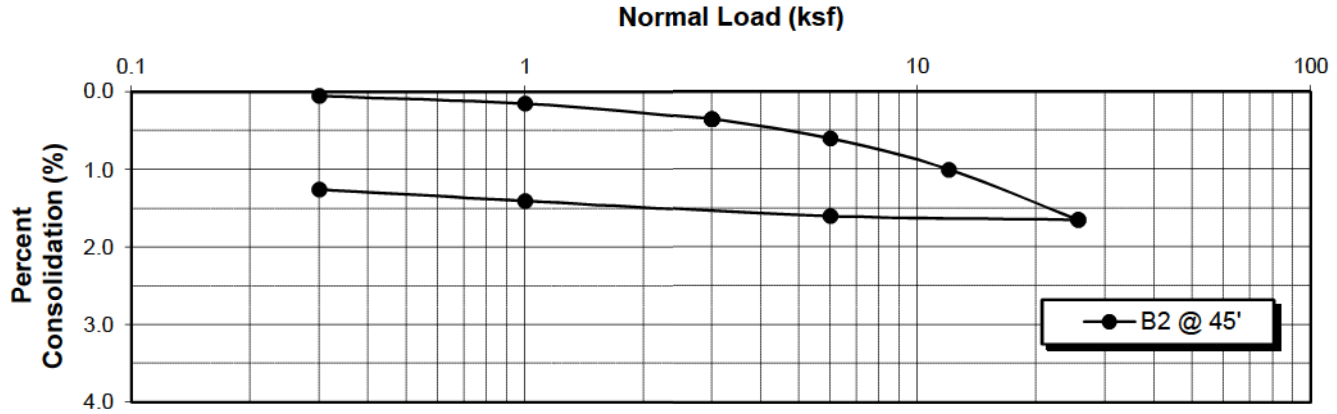
SHEAR TEST DIAGRAM

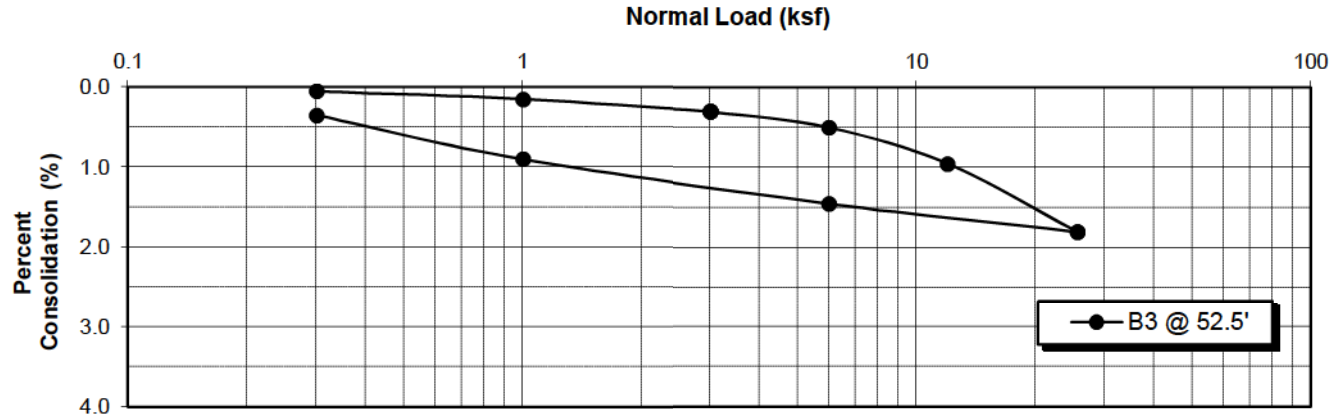
Geotechnologies, Inc.
Consulting Geotechnical Engineers

PROJECT: MITSUI FUDOSAN AMERICA

FILE NO.: 21089 | PLATE: B-3







Water added at 2 KSF

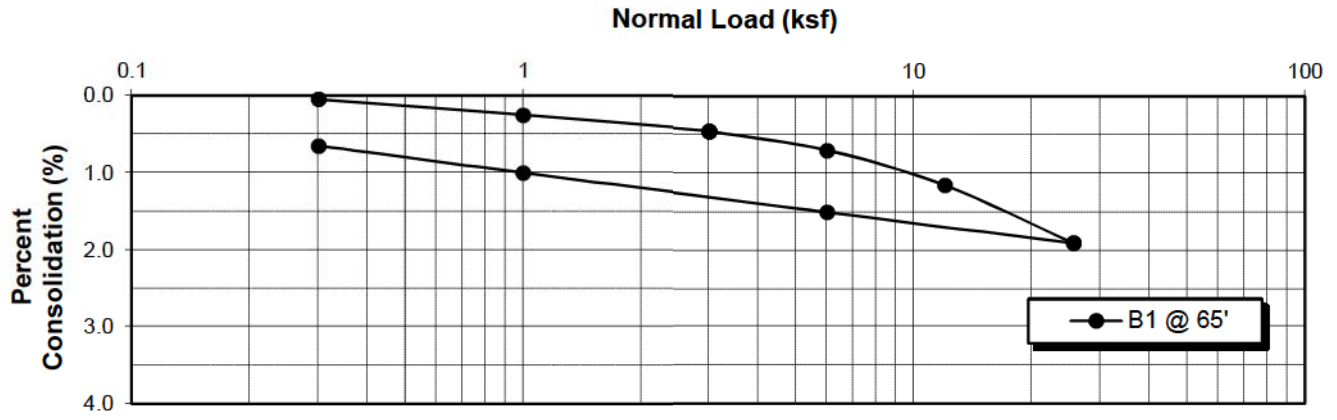
CONSOLIDATION

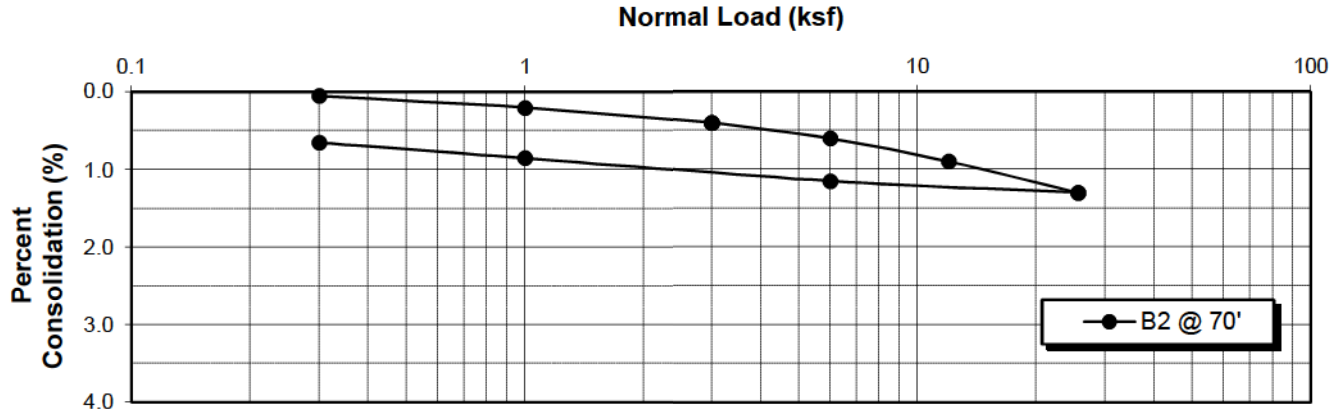
Geotechnologies, Inc.
CONSULTING GEOTECHNICAL ENGINEERS

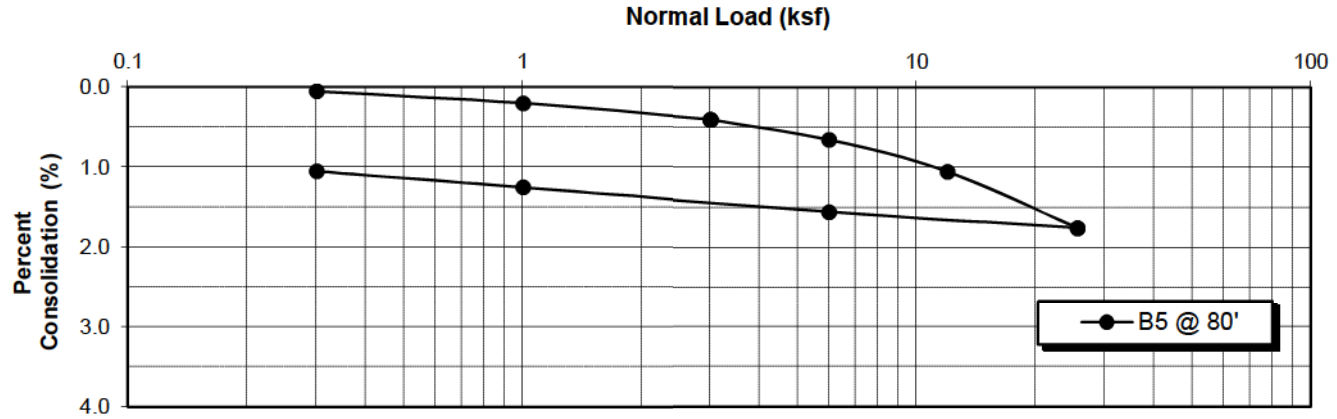
PROJECT: MITSUI FUDOSAN AMERICA

FILE NO. 21089

PLATE: C-1







Water added at 2 KSF

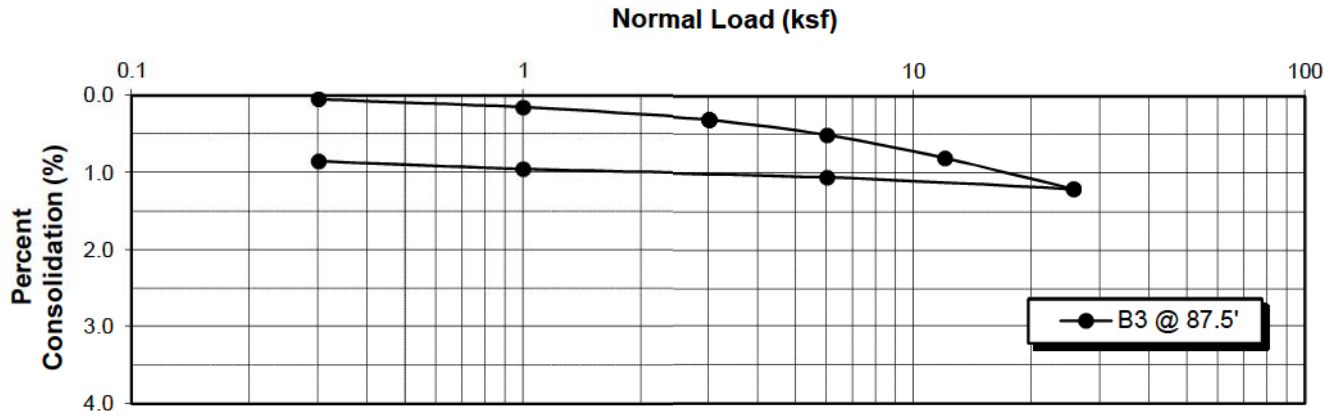
CONSOLIDATION

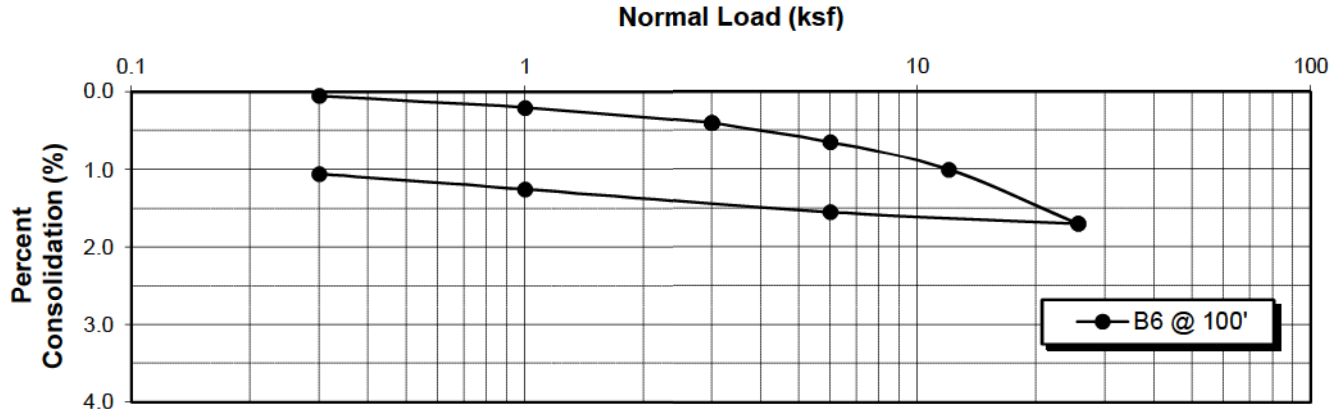
Geotechnologies, Inc.
CONSULTING GEOTECHNICAL ENGINEERS

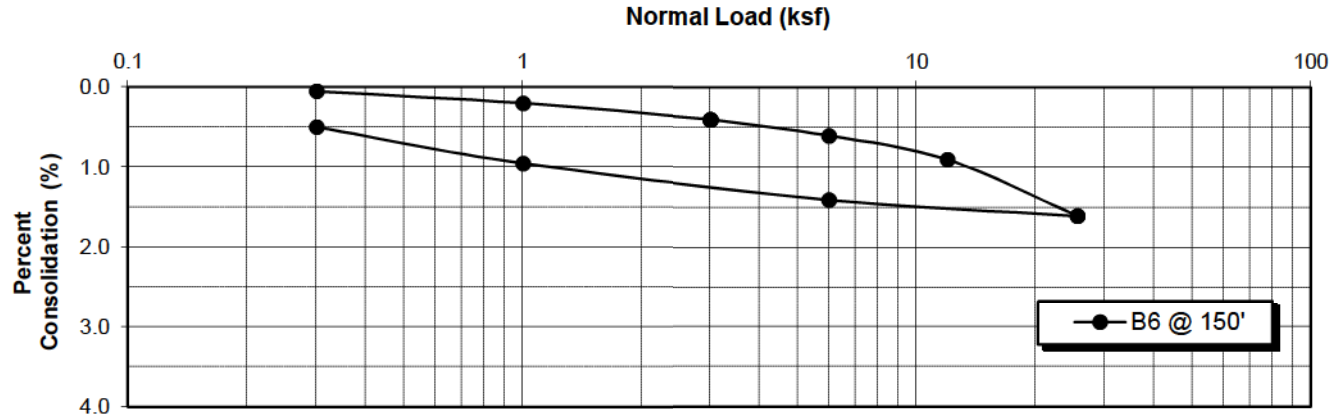
PROJECT: MITSUI FUDOSAN AMERICA

FILE NO. 21089

PLATE: C-2







Water added at 2 KSF

CONSOLIDATION

Geotechnologies, Inc.
CONSULTING GEOTECHNICAL ENGINEERS

PROJECT: MITSUI FUDOSAN AMERICA

FILE NO. 21089

PLATE: C-3

Geotechnologies, Inc.
Consulting Geotechnical Engineers
439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

Mitsui Fudosan America
File No. 21089

COMPACTION/EXPANSION/SULFATE DATA SHEET

ASTM D-1557

Sample	B2 @ 1'-5'	B3 @ 1'-5'	B4 @ 1'-5'
Soil Type	SM	SM	SM
Maximum Density (pcf)	131.5	132.0	131.0
Optimum Moisture Content (percent)	9.5	8.5	9.0
Percent finer than 0.005mm (percent)	<15%	<15%	<15%

EXPANSION INDEX

Sample	B2 @ 1'-5'	B3 @ 1'-5'	B4 @ 1'-5'
Soil Type	SM	SM	SM
Expansion Index – UBC Standard 18-2	9	10	17
Expansion Characteristic	Very Low	Very Low	Very Low

PLATE D

Geotechnologies, Inc.

Project: Mitsui Fudosan America
File No.: 21089

Settlement Calculation - Mat Footing

Description: Tower Mat Footing (134' x 105')

Soil Unit Weight	125.0 pcf	Mat Footing
Bearing Value	13500.0 psf	242406 kips
Depth of Footing	55.0 feet	
Width of Footing	134.0 feet	

* Influence Values are based on Westergaard's Analyses (Ref: Sowers)

Depth Below Ground Surface (feet)	Average Depth Below Ground Surface (feet)	Average Depth Below Foundation (feet)	Ratio of Foundation vs. Depth (a/z)	Influence Value	Foundation Influence Pressure (psf)	Natural Soil Pressure (psf)	Total Pressure (psf)	Consolidation Curve Used	Percent Strain [Total] (%)	Percent Strain [Natural] (%)	Percent Strain [Net] (%)	Thickness of Depth Increment (feet)	Net Settlement (inches)
55.0													
	57.5	2.5	53.6	94%	12642.75	7187.5	19830.25	B3 @ 52.5'	1.50	0.60	0.90	5.0	0.54
60.0													
	65.0	10.0	13.4	90%	12160.463	8125	20285.463	B1 @ 65'	1.70	0.85	0.85	10.0	1.02
70.0													
	75.0	20.0	6.7	81%	10871.888	9375	20246.888	B2 @ 70'	1.20	0.80	0.40	10.0	0.48
80.0													
	90.0	35.0	3.8	68%	9200.25	11250	20450.25	B3 @ 87.5'	1.10	0.75	0.35	20.0	0.84
100.0													
	125.0	70.0	1.9	44%	6002.775	15625	21627.775	B6 @ 100'	1.50	1.25	0.25	50.0	1.50
150.0													
	210.0	155.0	0.9	16%	2106	26250	28356	B6 @ 150'	1.70	1.65	0.05	120.0	0.72
270.0													

Settlement: 5.10
Reduction: 0.67

Total Settlement in inches: ***3.40***

Geotechnologies, Inc.

Project: Mitsui Fudosan America
File No.: 21089

Settlement Calculation - Column Footing

Description: 2,000-kip column footing

Soil Unit Weight	125.0 pcf	Column Footing
Bearing Value	12000.0 psf	2028 kips
Depth of Footing	50.0 feet	
Width of Footing	13.0 feet	

* Influence Values are based on Westergaard's Analyses (Ref: Sowers)

Depth Below Ground Surface (feet)	Average Depth Below Ground Surface (feet)	Average Depth Below Foundation (feet)	Ratio of Foundation vs. Depth (a/z)	Influence Value	Foundation Influence Pressure (psf)	Natural Soil Pressure (psf)	Total Pressure (psf)	Consolidation Curve Used	Percent Strain [Total] (%)	Percent Strain [Natural] (%)	Percent Strain [Net] (%)	Thickness of Depth Increment (feet)	Net Settlement (inches)
50.0													
	55.0	5.0	2.6	56%	6714.6	6875	13589.6	B3 @ 52.5'	1.05	0.60	0.45	10.0	0.54
60.0													
	65.0	15.0	0.9	16%	1872	8125	9997	B1 @ 65'	1.00	0.85	0.15	10.0	0.18
70.0													
	75.0	25.0	0.5	7%	885.6	9375	10260.6	B2 @ 70'	0.80	0.75	0.05	10.0	0.06
80.0													

Settlement: 0.78
Reduction: 0.67

Total Settlement in inches: ***0.52***

February 12, 2016

Project No. 15087A

Mr. Stan Tang
Geotechnologies, Inc.
439 Western Avenue
Glendale, California 91201

SUBJECT: DOWNHOLE SEISMIC TEST RESULTS
BORING NUMBER 6
732-756 SOUTH FIGUEROA STREET
LOS ANGELES, CALIFORNIA

Dear Mr. Tang,

Per your request and in accordance with the provisions of our proposal, dated October 20, 2015, we performed downhole seismic tests within Boring Number 6 located at 732-756 South Figueroa Street in Los Angeles, California. The log of Boring Number 6 provided by Geotechnologies, Inc. is included in Attachment 1 and indicates that the subsurface materials are composed of (1) Fill primarily consisting of sandy silt from the ground surface to approximately 3 feet below ground surface; (2) Alluvium predominantly consisting of silt (ML) and sand (SM, SP, and SW) with occasional clay (CL) from approximately 3 to 70 feet; and (3) Bedrock primarily consisting of shale, claystone, siltstone, and sandstone from approximately 70 to 150 feet (bottom of the borehole). Additionally, groundwater was not observed during borehole drilling on 11/13/2015. Downhole seismic tests were performed within Boring Number 6 to assist Geotechnologies, Inc. with their evaluation of the site. This letter summarizes the results of the downhole seismic tests and the evaluation of V_{s30}.

Seismic Downhole Methods and Procedures

Downhole seismic tests were collected within Boring Number 6 on February 1, 2016. The downhole seismic test method makes direct measurements of in-situ vertically propagating compression (P) and horizontally polarized shear (SH) wave velocities as a function of depth within the geologic material adjacent to a borehole. Measurement procedures followed ASTM D7400-08, "Standard Test Methods for Downhole Seismic Testing".

Boring Number 6 was drilled with an 8-inch diameter bit using hollow stem auger drilling methods and a 2-inch diameter PVC casing was installed under the direction of Geotechnologies, Inc. as part of their geotechnical investigation. The annular space between the 8-inch diameter hole and 2-inch diameter casing was backfilled with bentonite-cement grout, which was assumed to be formulated to approximate the density of the surrounding geologic material and pumped in from the base of the borehole to completely fill the annular space.

A seismic source was used to generate a seismic wave (P or SH) at the ground surface. The seismic source was offset horizontally from the borehole a distance of 5 feet. The P-wave seismic source consisted of a ground plate that was struck vertically with a sledgehammer. The SH-wave seismic source consisted of an 8-foot long by 6-inch wide by 4-inch high wood beam capped on both ends with a steel plate and loaded in place by the front end of a vehicle that was parked on top of the beam. The ends of this beam were positioned equidistant from the borehole. Initially, one end of the beam was struck horizontal with a sledgehammer to produce an SH-wave (forward hit). Next, the opposite end of the beam was struck horizontally with a sledgehammer to produce an opposite polarity SH-wave (reverse hit). The combination of the two opposite polarity SH-waves were used to determine SH travel times.

A downhole receiver positioned at a selected depth within the borehole was used to record the arrival of the seismic wave (P or SH). A three component triaxial borehole geophone (one vertical-channel and two orthogonal horizontal channels), which could be firmly pneumatically fixed against the PVC casing sidewall, was used to collect the downhole seismic measurements. Multiple downhole seismic measurements were performed at successive receiver depths within the borehole. The receiver depth was referenced to ground surface, and measurements were made at receiver intervals of 5 feet from the ground surface to the bottom of the hole (150 ft).

A Geometrics S12 signal enhancing seismograph was used to record the response of the downhole receiver. The seismic source (sledgehammer) contained a trigger that was connected to and initiated the seismograph recording, thus measuring the travel time between seismic source and downhole receiver. Downhole seismic test records were digitally recorded and stored with a 0.062 ms sample interval.

The recorded digital downhole seismic records were analyzed using the OYO Corporation program PickWin Version 4.1.1.7. The digital waveforms were analyzed to identify arrival times. The first prominent departure of the vertical receiver trace was identified as the P-wave first arrival. The SH-wave forward and reverse hits recorded on the two horizontal receiver channels were superimposed. The SH-wave first arrival was identified at the location of the first prominent relatively low-frequency departure of the forward hit and an 180^{o} polarity change is noted to have occurred on the reverse hit. For analysis, an 85 Hz low-cut filter was applied to the P waveforms, and a 209 Hz high-cut filter was applied to the SH waveforms.

After correcting the P and SH-wave travel time for the source offset, the P and SH-wave travel-times were plotted versus depth. P and SH layer and interval velocities were calculated as the slope of lines drawn through the plotted data.

Seismic Downhole Results

The results of the seismic downhole measurements collected within Boring Number 6 are presented on Figure 1. Figure 1 shows (1) a table of the measured P and SH-wave travel-times and depths; (2) a table of the interpreted P and SH-wave layer velocities and depth ranges; (3) a table of the calculated P and SH-wave interval velocities; and (4) a plot of the P and SH-wave travel-times as a function of depth showing the interpreted layer velocities.

Table 1 below summarizes the interpreted P and SH layer velocities and depths shown on Figure 1 for the various geologic units within Boring Number 6, as logged by Geotechnologies, Inc. As shown on Table 1, the measured SH-wave velocity from 0 to 5 feet below ground surface is approximately 820 ft/sec; from 5 to 65 feet is approximately 1,280 ft/sec; from 65 to 95 feet is approximately 1,440 ft/sec; from 95 to 125 feet is approximately 1,630 ft/sec; and from 125 to 150 feet is approximately 1,830 ft/sec.

Also, the measured P-wave velocity within Boring Number 4 from 0 to 5 feet below ground surface is approximately 1,710 ft/sec; from 5 to 65 feet is approximately 2,250 ft/sec; from 65 to 85 feet is approximately 2,940 ft/sec; and from 85 to 150 feet is approximately 5,310 ft/sec. The measured P-wave velocities suggest the material adjacent to the borehole below a depth of 85 feet is saturated.

TABLE 1
SUMMARY OF SH-WAVE AND P-WAVE VELOCITY LAYERS WITHIN BORING NUMBER 6

<table>
<tr><th>PREDOMINANT LITHOLOGY</th><th>Depth Range (ft)</th><th>SH-WAVE Velocity (ft/sec)</th><th>P-WAVE Velocity (ft/sec)</th></tr>
<tr><td>Stiff sandy Silt (ML) [Fill]</td><td>0 to 5</td><td>820</td><td>1,710</td></tr>
<tr><td>Stiff to very stiff sandy Silt (ML) and very dense Sand (SM, SP and SW) with occasional very stiff Clay (CL) [Alluvium]</td><td>5 to 65</td><td>1,280</td><td>2,250</td></tr>
<tr><td rowspan="4">Hard Shale, Claystone, Siltstone and Sandstone [Bedrock]</td><td>65 to 85</td><td rowspan="2">1,440</td><td>2,940</td></tr>
<tr><td>85 to 95</td><td rowspan="3">5,310</td></tr>
<tr><td>95 to 125</td><td>1,630</td></tr>
<tr><td>125 to 150</td><td>1,830</td></tr>
</table>

The V_{s30} was calculated based on the procedures outlined in the 2010 California Building Code, "2010 California Existing Building Code, Title 24, Part 10, Section 1613A.5.5 – Site Classification for Seismic Design." The V_{s30} was calculated from Equation 16A-40 of this reference which states:

$$v_s = \frac{\sum_{i=1}^{n} di}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$

where:

i = distinct different soil and/or rock layer between *1* and n
v_{si} = shear wave velocity in feet per second of layer i
d_i = thickness of any layer within the 100 foot interval
$\sum_{i=1}^{n} d_i$ = 100 feet

Based on this procedure, the V_{s30} for Boring Number 6 was calculated between a depth of 0 to 100 feet and 50 to 150 feet. The results are summarized on Table 2.

TABLE 2
CALCULATED V_{s30} WITHIN BORING NUMBER 6

DEPTH RANGE (ft, below ground surface)	V_{s30} (ft/sec)
0 to 100	1,300
50 to 150	1,550

Limitations

The above information is based on limited observations and geophysical measurements made as described above. GeoPentech does not guarantee the performance of the project, only that the information provided meets the standard of care of the profession at this time under the same scope limitations imposed by the project. In this regard, our scope of work included making the P and SH-wave velocity measurements in one borehole under the direction of Geotechnologies, Inc. personnel. We relied upon the assumption that the annular space between the PVC casing and the borehole wall was properly filled with bentonite-cement grout so that PVC casing and the borehole wall were in continuous contact and that the grout was formulated to approximate the density of the surrounding geologic material.

We trust the contents of this letter will meet your current needs. If you have questions or require additional information, please call.

Very Truly Yours,

GeoPentech

REGISTERED GEOPHYSICIST • STEVE DUKE No. 1013 Exp. 7-31-17 • STATE OF CALIFORNIA

Steven K. Duke
Senior Project Geophysicist
GP 1013

REGISTERED PROFESSIONAL ENGINEER SARKIS V. TATUSIAN GE 2118 EXP. 6-30-17 GEOTECHNICAL STATE OF CALIFORNIA

Sarkis Tatusian
Principal
GE 2118

SEISMIC WAVE TRAVEL TIMES

Depth (ft)	P-time (ms)	P-layer	SH-wave (ms)	SH-layer
0	0	1	0	1
5	4.14	12	8.58	12
10			11.18	2
15	5.51	2	14.75	2
20	7.70	2	18.34	2
25	10.27	2	22.20	2
30	12.49	2	26.06	2
35	14.96	2	30.02	2
40	17.25	2	33.61	2
45	19.56	2	37.61	2
50	21.75	2	41.55	2
55	23.85	2	45.16	2
60	26.14	2	49.27	2
65	28.10	23	52.86	23
70	29.65	3	55.87	3
75	31.16	3	58.63	3
80	33.04	3	61.68	3
85	34.86	34	65.37	3
90	35.87	4	69.41	3
95	36.99	4	73.72	34
100	37.98	4	76.74	4
105	39.10	4	79.87	4
110	40.19	4	82.80	4
115	41.10	4	85.37	4
120	42.04	4	88.86	4
125	42.76	4	92.40	45
130	43.41	4	95.28	5
135	44.32	4	97.75	5
140			100.77	5
145			103.55	5
150	47.08	4	105.90	5

Source Offset (ft)
5

Vs30 (fps)	Depth Range (ft, bgs)
1,300	0 to 100
1,550	50 to 150

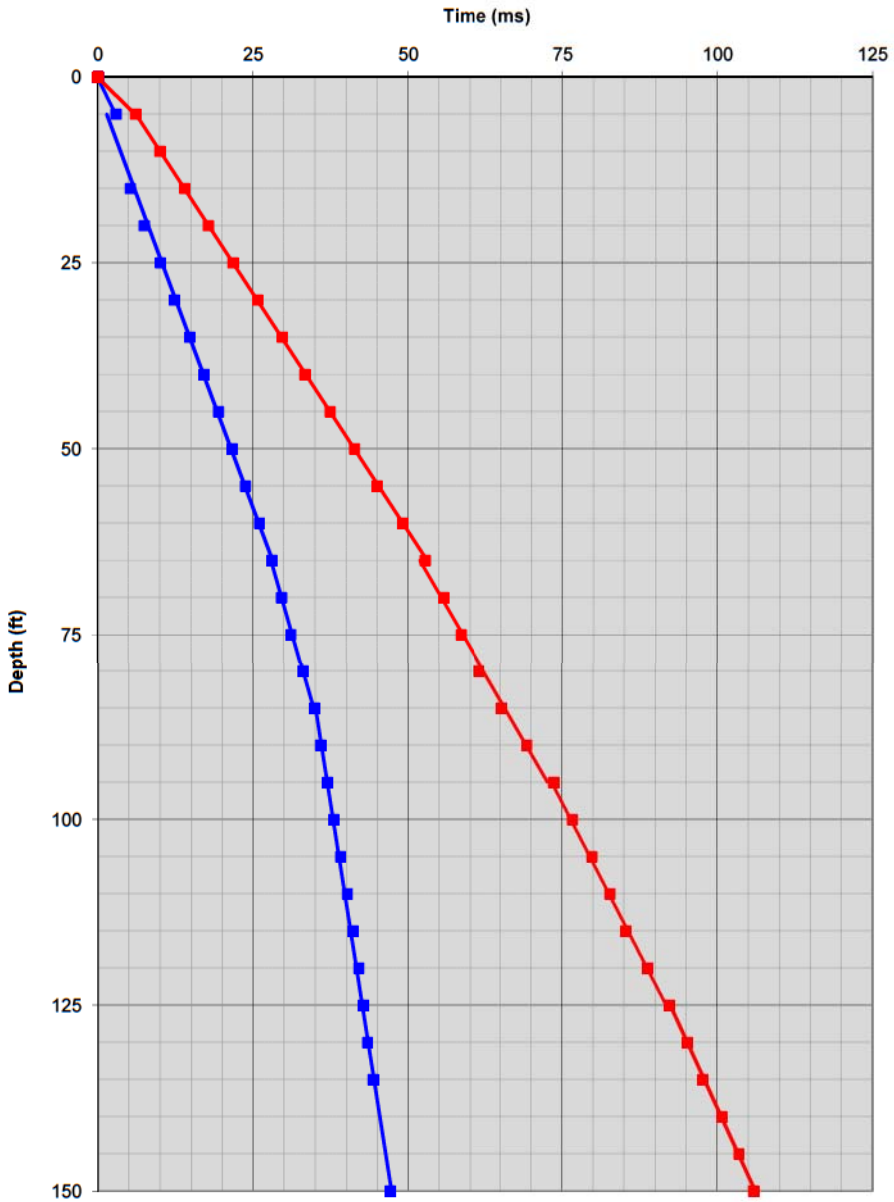
LAYER VELOCITES

Layer	P-Velocity (fps)	P-Depth (ft)	SH-Velocity (fps)	SH-Depth (ft)
1	1,710	0 to 5	820	0 to 5
2	2,250	5 to 65	1,280	5 to 65
3	2,940	65 to 85	1,440	65 to 95
4	5,310	85 to 150	1,630	95 to 125
5			1,830	125 to 150
6				
7				
8				
9				
10				

INTERVAL VELOCITES

Depth Range (ft)	P-Velocity (fps)	SH-Velocity (fps)
0 to 5	1,710	820
5 to 10		1,270
10 to 15		1,250
15 to 20	2,230	1,320
20 to 25	1,920	1,260
25 to 30	2,230	1,270
30 to 35	2,010	1,250
35 to 40	2,170	1,380
40 to 45	2,150	1,240
45 to 50	2,280	1,260
50 to 55	2,360	1,380
55 to 60	2,180	1,210
60 to 65	2,540	1,390
65 to 70	3,210	1,650
70 to 75	3,310	1,810
75 to 80	2,650	1,640
80 to 85	2,740	1,350
85 to 90	4,900	1,230
90 to 95	4,450	1,160
95 to 100	5,040	1,650
100 to 105	4,460	1,590
105 to 110	4,560	1,710
110 to 115	5,480	1,940
115 to 120	5,330	1,430
120 to 125	6,840	1,410
125 to 130	7,660	1,730
130 to 135	5,480	2,020
135 to 140		1,660
140 to 145		1,790
145 to 150		2,130

TRAVEL TIME PLOT



GeoPentech

SEISMIC DOWNHOLE RESULTS
B-6

PROJECT: 732-756 FIGUEROA STREET
PROJECT #: 15087A | DATE: FEB 2016 | FIGURE: 1

ATTACHMENT 1

BORING LOG NUMBER 6
GEOTECHNOLOGIES, INC.

BORING LOG NUMBER 6

Mitsui Fudosan America **Date: 11/13/15**

File No. 21089 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		4-inch Asphalt over 2-inch Base
				1		FILL: Sandy Silt, dark brown, moist, stiff
2.5	28	13.9	117.9	2		
				3	ML	Sandy Silt, dark brown, moist, stiff
				4		
5	36 50/5"	11.4	119.7	5	SM/ML	Silty Sand to Sandy Silt, dark brown, moist, very dense to very stiff, fine grained
				6		
				7		
				8		
				9		
10	61	10.2	121.1	10		
				11		
				12		
				13		
				14		
15	100/10.5"	1.7	111.7	15	SW	Gravelly Sand, dark brown, slightly moist, very dense, fine to coarse grained, with gravel and cobbles
				16		
				17		
				18		
				19		
20	100/9"	3.0	109.2	20	SP	Sand, dark to medium brown, slightly moist, very dense, fine to medium grained, occasional gravel
				21		
				22		
				23		
				24		
25	100/8"	2.9	107.3	25		
						Sand, yellowish brown, slightly moist, very dense, fine to medium grained

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	79	18.5	110.6	30	ML	Sandy Silt, dark brown, moist, very stiff
				31		
				32		
				33		
				34		
35	100/8"	9.8	124.3	35	SM	Silty Sand, dark brown, moist, very dense, fine grained
				36		
				37		
				38		
				39		
40	50/6"	5.6	105.4	40	SP	Sand, yellowish brown, slightly moist, very dense
				41		
				42		
				43		
				44		
45	27 50/6"	14.4	115.0	45	ML	Sandy Silt, brown, moist, very stiff
				46		
				47		
				48		
				49		
50	37 50/3"	9.4	117.7	50		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51 – 52 – 53 – 54 –		
55	100/9"	6.0	91.9	55 – 56 – 57 – 58 – 59 –	SM	Silty Sand, light olive brown, slightly moist, very dense, fine grained
60	69	25.5	95.6	60 – 61 – 62 – 63 – 64 –	CL	Sandy Clay, olive brown, moist, very dense
65	33 50/5"	22.5	100.8	65 – 66 – 67 – 68 – 69 –	ML	Sandy Silt, olive brown, moist, very stiff, very fine grained
70	48 50/3"	16.6	107.4	70 – 71 – 72 – 73 – 74 –	RX	BEDROCK: Sandstone, gray, moist, hard
75	22 50/2"	5.1	101.6	75 –		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
				78		
				79		
80	34 50/4"	7.3	106.1	80		hard, fine grained
				81		
				82		
				83		
				84		
85	39 50/3"	7.3	104.5	85		
				86		
				87		
				88		
				89		
90	40	28.2	96.6	90		Siltstone, dark gray, moist, moderately hard to hard
				91		
				92		
				93		
				94		
95	50 50/4"	24.5	99.9	95		
				96		
				97		
				98		
				99		
100	58	24.8	96.9	100		

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				101		
				102		
				103		
				104		
105	47 50/3"	25.7	97.6	105		
				106		Shale to Claystone, dark gray, moist, hard
				107		
				108		
				109		
110	27 50/6"	26.0	99.3	110		
				111		
				112		
				113		
				114		
115	34 50/4"	26.6	98.3	115		
				116		
				117		
				118		
				119		
120	84	25.1	98.5	120		
				121		
				122		
				123		
				124		
125	38 50/6"	21.8	100.8	125		
						Siltstone, dark gray, moist, hard

BORING LOG NUMBER 6

Mitsui Fudosan America

File No. 21089

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				126		
				127		
				128		
				129		
130	29 50/5"	24.0	101.3	130		
				131		
				132		
				133		
				134		
135	30 50/4"	24.9	98.3	135		Siltstone, gray, moist, hard
				136		
				137		
				138		
				139		
140	39 50/5"	25.0	101.6	140		
				141		
				142		
				143		
				144		
145	39 50/5"	24.4	102.3	145		
				146		
				147		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				148		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop
				149		Modified California Sampler used unless otherwise noted
150	26 50/6"	25.2	100.5	150		Total Depth 150 feet No Water Fill to 3 feet

February 1, 2016 via email: stang@geoteq.com

GEOTECHNOLOGIES, INC.
439 Western Avenue
Glendale, CA 91201

Attention: Mr. Stanley Tang

Re: Soil Corrosivity Study
Mitsui Fudosan America
Los Angeles, CA
HDR #274852, GI #21089

Introduction

Laboratory tests have been completed on four soil samples provided for the Mitsui Fudosan America project. The purpose of these tests was to determine if the soils might have deleterious effects on underground utility piping, hydraulic elevator cylinders, and concrete structures including post tensioning systems. HDR Engineering, Inc. (HDR) assumes that the samples provided are representative of the most corrosive soils at the site.

The proposed structure consists of a multi-story mixed-use development with two subterranean levels. The site is located at 732-756 South Figueroa Street in the City of Los Angeles, California. The water table is reportedly over 100 feet deep. The site was previously used as a parking lot.

The scope of this study is limited to a determination of soil corrosivity and general corrosion control recommendations for materials likely to be used for construction. HDR's recommendations do not constitute, and are not meant as a substitute for, design documents for the purpose of construction. If the architects and/or engineers desire more specific information, designs, specifications, or review of design, HDR will be happy to work with them as a separate phase of this project.

Laboratory Soil Corrosivity Tests

The electrical resistivity of each sample was measured in a soil box per ASTM G187 in its as-received condition and again after saturation with distilled water. Resistivities are at about their lowest value when the soil is saturated. The pH of the saturated samples was measured per CTM 643. A 5:1 water:soil extract from each sample was chemically analyzed for the major soluble salts commonly found in soil per ASTM D4327, ASTM D6919, and Standard Method 2320-B[1]. Laboratory analysis was performed under HDR laboratory number 16-0039SCS and the test results are shown in the attached Table 1.

Soil Corrosivity

A major factor in determining soil corrosivity is electrical resistivity. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. Corrosion of buried metal is an electrochemical process in which the amount of metal loss due to corrosion is directly proportional to the flow of electrical current (DC) from the metal into the soil. Corrosion currents, following Ohm's Law, are inversely proportional to soil resistivity. Lower electrical resistivities result from higher moisture and soluble salt contents and indicate corrosive soil.

A correlation between electrical resistivity and corrosivity toward ferrous metals is:[2]

Soil Resistivity in ohm-centimeters	Corrosivity Category
Greater than 10,000	Mildly Corrosive
2,001 to 10,000	Moderately Corrosive
1,001 to 2,000	Corrosive
0 to 1,000	Severely Corrosive

Other soil characteristics that may influence corrosivity towards metals are pH, soluble salt content, soil types, aeration, anaerobic conditions, and site drainage.

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[1] *American Public Health Association (APHA). 2012. Standard Methods of Water and Wastewater. 22nd ed. American Public Health Association, American Water Works Association, Water Environment Federation publication. APHA, Washington D.C.*

[2] *Romanoff, Melvin. Underground Corrosion, NBS Circular 579. Reprinted by NACE. Houston, TX, 1989, pp. 166–167.*

Electrical resistivities were in the moderately and mildly corrosive categories with as-received moisture. When saturated, the resistivities were in the mildly corrosive to corrosive categories. The resistivities dropped considerably with added moisture because the samples were dry as-received. The wide variations in soil resistivity can create concentration type corrosion cells that increase corrosion rates above what would be expected from the chemical characteristics alone.

Soil pH values varied from 7.0 to 7.7. This range is neutral to mildly alkaline.[3] These values do not particularly increase soil corrosivity.

The soluble salt content of the samples was low. Nitrate was detected in low concentrations. Tests were not made for sulfide and oxidation-reduction (redox) potential because these samples did not exhibit characteristics typically associated with anaerobic conditions.

Variations in soil resistivity of an order of magnitude or more can create differential-aeration corrosion cells that would affect all metals. This soil is classified as corrosive to ferrous metals.

Corrosion Control Recommendations

The life of buried materials depends on thickness, strength, loads, construction details, soil moisture, etc., in addition to soil corrosivity, and is, therefore, difficult to predict. Of more practical value are corrosion control methods that will increase the life of materials that would be subject to significant corrosion.

The following recommendations are based on the soil conditions discussed in the Soil Corrosivity section above. Unless otherwise indicated, these recommendations apply to the entire site or alignment.

Steel Pipe

Implement *all* the following measures:

1. Underground steel pipe with rubber gasketed, mechanical, grooved end, or other nonconductive type joints should be bonded for electrical continuity. Electrical continuity is necessary for corrosion monitoring and cathodic protection.

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[3] *Romanoff, Melvin. Underground Corrosion, NBS Circular 579. Reprinted by NACE. Houston, TX, 1989, p. 8.*

2. Install corrosion monitoring test stations to facilitate corrosion monitoring and the application of cathodic protection:

    a. At each end of the pipeline.

    b. At each end of all casings.

    c. Other locations as necessary so the interval between test stations does not exceed 1,200 feet.

3. To prevent dissimilar metal corrosion cells and to facilitate the application of cathodic protection, electrically isolate each buried steel pipeline per NACE SP0286 from:

    a. Dissimilar metals.

    b. Dissimilarly coated piping (cement-mortar vs. dielectric).

    c. Above ground steel pipe.

    d. All existing piping.

4. Choose one of the following corrosion control options:

    OPTION 1

    a. Apply a suitable dielectric coating intended for underground use such as:

        i. Polyurethane per AWWA C222 *or*

        ii. Extruded polyethylene per AWWA C215 *or*

        iii. A tape coating system per AWWA C214 *or*

        iv. Hot applied coal tar enamel per AWWA C203 *or*

        v. Fusion bonded epoxy per AWWA C213.

    b. Apply cathodic protection to steel piping as per NACE SP0169.

    OPTION 2

a. As an alternative to dielectric coating and cathodic protection, apply a ¾-inch cement mortar coating per AWWA C205 or encase in concrete 3 inches thick, using any type of ASTM C150 cement. Joint bonds, test stations, and insulated joints are still recommended for these alternatives.

NOTE: Some steel piping systems, such as for oil, gas, and high-pressure piping systems, have special corrosion and cathodic protection requirements that must be evaluated for each specific application.

Hydraulic Elevator

Implement *all* the following measures:

1. Electrically insulate each cylinder from building metals by installing dielectric material between the piston platen and car, insulating the bolts, and installing an insulated joint in the oil line.

2. Choose one of the following corrosion control options for the hydraulic steel cylinders.

   OPTION 1

   a. Coat hydraulic elevator cylinders as described above for steel pipe, item #4, option 1.

   b. Apply cathodic protection to hydraulic cylinders as per NACE SP0169.

   OPTION 2

   a. As an alternative to electrical insulation and cathodic protection, place each cylinder in a plastic casing with a plastic watertight seal at the bottom.

3. The elevator oil line should be placed above ground if possible but, if underground, should be protected by one of the following corrosion control options:

   OPTION 1

   a. Provide a bonded dielectric coating.

   b. Electrically isolate the pipeline.

   c. Apply cathodic protection to steel piping as per NACE SP0169.

OPTION 2

a. Place the oil line in a PVC casing pipe with solvent-welded joints to prevent contact with soil and soil moisture.

Iron Pipe

Implement *all* the following measures:

1. To prevent dissimilar metal corrosion cells and to facilitate the application of cathodic protection, electrically insulate underground iron pipe from dissimilar metals and from above ground iron pipe with insulating joints per NACE SP0286.
2. Bond all nonconductive type joints for electrical continuity. Electrical continuity is necessary for corrosion monitoring and cathodic protection.
3. Install corrosion monitoring test stations to facilitate corrosion monitoring and the application of cathodic protection:
    a. At each end of the pipeline.
    b. At each end of any casings.
    c. Other locations as necessary so the interval between test stations does not exceed 1,200 feet.
4. Choose one of the following corrosion control options:

    OPTION 1

    a. Apply a suitable coating intended for underground use such as:
        i. Polyethylene encasement per AWWA C105; *or*
        ii. Epoxy coating; *or*
        iii. Polyurethane; *or*
        iv. Wax tape.

NOTE: The thin factory-applied asphaltic coating applied to ductile iron pipe for transportation and aesthetic purposes does not constitute a corrosion control coating.

b. Apply cathodic protection to cast and ductile iron piping as per NACE SP0169.

OPTION 2

a. As an alternative to coating systems described in Option 1 and cathodic protection, concrete encase all buried portions of metallic piping so that there is a minimum of 3 inches of concrete cover provided over and around surfaces of pipe, fittings, and valves using any type of ASTM C150 cement.

Copper Tubing

Implement *all* the following measures:

1. Electrically insulate underground copper pipe from dissimilar metals and from above ground copper pipe with insulating devices per NACE SP0286.

2. Electrically insulate cold water piping from hot water piping systems.

3. Place cold water copper tubing in an 8-mil polyethylene sleeve or encase in double 4-mil thick polyethylene sleeves and bed and backfill with clean sand at least 2 inches thick surrounding the tubing. Clean sand should have a minimum resistivity of no less than 3,000 ohm-cm, and a pH of 6.0–8.0. Copper tubing for cold water can also be treated the same as for hot water.

4. Hot water tubing may be subject to a higher corrosion rate. Protect hot copper tubing by one of the following measures:

    a. Preventing soil contact. Soil contact may be prevented by placing the tubing above ground or encasing the tubing with PVC pipe with solvent-welded joints. *or*

    b. Applying cathodic protection per NACE SP0169. The amount of cathodic protection current needed can be minimized by coating the tubing.

Plastic and Vitrified Clay Pipe

1. No special precautions are required for plastic and vitrified clay piping placed underground from a corrosion viewpoint.

2. Protect all metallic fittings and valves with wax tape per AWWA C217 or epoxy.

All Pipe

1. On all pipes, appurtenances, and fittings not protected by cathodic protection, coat bare metal such as valves, bolts, flange joints, joint harnesses, and flexible couplings with wax tape per AWWA C217 after assembly.

2. Where metallic pipelines penetrate concrete structures such as building floors, vault walls, and thrust blocks use plastic sleeves, rubber seals, or other dielectric material to prevent pipe contact with the concrete and reinforcing steel.

Concrete

1. From a corrosion standpoint, any type of ASTM C150 cement may be used for concrete structures and pipe because the sulfate concentration is negligible, 0 to 0.10 percent.[4,5,6]

2. Standard concrete cover over reinforcing steel may be used for concrete structures and pipe in contact with these soils due to the low chloride concentration[7] found onsite.

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[4] *2012 International Building Code (IBC) Section 1904.3*

[5] *2012 International Residential Code (IRC) which refers to American Concrete Institute (ACI) 318 Table 19.3.2.1*

[6] *2013 California Building Code (CBC) which refers to American Concrete Institute (ACI) 318 Table 19.3.2.1*

[7] *Design Manual 303: Concrete Cylinder Pipe. Ameron. p.65*

Post Tensioning Slabs: Unbonded Single-Stranded Tendons and Anchors

1. Soil is considered an aggressive environment for post-tensioning strands and anchors. Protect post-tensioning strands and anchors against corrosion by implementing *all* the following measures:[8,9,10]

    a. Prior to grouting the pocket, apply a corrosion protection cap filled with corrosion protection material to the strand end that fully encapsulates the strand end and wedge cavity such as Tiger Industries' PocketCap or equal. Ensure the cap fully seats against the anchor face.

    b. All components exposed to the job site should be protected within one working day after their exposure during installation.

    c. Ensure the minimum concrete cover over the tendon tail is 1 inch, or greater if required by the applicable building code.

    d. Caps and sleeves should be installed within one working day after the cutting of the tendon tails and acceptance of the elongation records by the engineer.

    e. Inspect the following to ensure the encapsulated system is completely watertight:

        i. Sheathing: Verify that all damaged areas, including pin-holes, are repaired.

        ii. Stressing tails: After removal, ensure they are cut to a length for proper installation of P/T coating filled end caps.

        iii. End caps: Ensure proper installation before patching the pocket former recesses.

---

[8] *Post-Tensioning Manual, sixth edition. Post-Tensioning Institute (PTI), Phoenix, AZ, 2006.*

[9] *Specification for Unbonded Single Strand Tendons. Post-Tensioning Institute (PTI), Phoenix, AZ, 2000.*

[10] *ACI 423.6-01: Specification for Unbonded Single Strand Tendons. American Concrete Institute (ACI), 2001*

iv. Patching: Ensure the patch is of an approved material and mix design, and installed void-free.

f. Limit the access of direct runoff onto the anchorage area by designing proper drainage.

g. Provide at least 2 inches of space between finish grade and the anchorage area, or more if required by applicable building codes.

Closure

The analysis and recommendations presented in this report are based upon data obtained from the laboratory samples. This report does not reflect variations that may occur across the site or due to the modifying effects of construction. If variations appear, HDR should be notified immediately so that further evaluation and supplemental recommendations can be provided.

HDR's services have been performed with the usual thoroughness and competence of the engineering profession. No other warranty or representation, either expressed or implied, is included or intended.

Please call if you have any questions.

Respectfully Submitted,
HDR Engineering, Inc.

Lucy Jaramillo

Gregory K. Frost, PE

Enc: Table 1

Table 1 - Laboratory Tests on Soil Samples

Geotechnologies, Inc.
Mitsui Fudosan America
GI #21089, HDR Lab #16-0039SCS
20-Jan-16

Sample ID			B1 @ 5' SM	B2 @ 10' SM	B3 @ 22.5' SP	B4 @ 7.5' SM
Resistivity		**Units**				
as-received		ohm-cm	17,600	11,200	1,040,000	2,760
saturated		ohm-cm	1,560	3,160	24,000	1,040
pH			7.3	7.3	7.7	7.0
Electrical Conductivity		mS/cm	0.14	0.15	0.02	0.14
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	19	46	6.3	20
magnesium	Mg^{2+}	mg/kg	10	14	2.4	7.8
sodium	Na^{1+}	mg/kg	134	132	29	148
potassium	K^{1+}	mg/kg	7.1	8.0	2.6	6.3
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	134	390	73	137
fluoride	F^{1-}	mg/kg	16	4.2	ND	1.7
chloride	Cl^{1-}	mg/kg	15	14	8.5	15
sulfate	SO_4^{2-}	mg/kg	138	30	10.0	158
phosphate	PO_4^{3-}	mg/kg	ND	ND	9.4	19
Other Tests						
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	27	24	0.7	22
sulfide	S^{2-}	qual	na	na	na	na
Redox		mV	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

Appendix IS-5

Hazardous Materials Reports

California

Environmental

ENVIRONMENTAL SITE ASSESSMENT - PHASE I
AND SCREENING SUBSURFACE ASSESSMENT – PHASE II
Commercial Property
APNs 5144-010-010, -011, -012, -013 & -014
734-746 S. Figueroa Street & 817 W. 8th Street
Los Angeles, CA 90017

FOR

MITSUI FUDOSAN AMERICA
100 First Street, Suite 2350
San Francisco, CA 94105
Robert Davidson, Director, Development and Asset Management

CE Job No. EV1015-3429

December 2015
Revised June 2016

30423 Canwood Street, Suite 208, Agoura Hills, CA 91301 (818) 991-1542 (818) 991-1542 (fax) ceworks@calenviro.com

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1.0 EXECUTIVE SUMMARY

An Environmental Site Assessment - Phase I was prepared for the subject property located at 734-746 S. Figueroa Street & 817 W. 8th Street Los Angeles, CA 90017. The scope of work for the Phase I meets ASTM E 1527-13 *Standard Practice for Environmental Site Assessments*. The purpose of the Phase I report is to provide information regarding the potential for hazardous material impacts to the soil and groundwater beneath the subject property. Such threats or material threats are identified in this report as Recognized Environmental Conditions (RECs). The presence of Historical Recognized Environmental Conditions (HRECs) and Controlled Recognized Environmental Conditions (CRECs) was also evaluated. The extent of this evaluation in conjunction with owner/client-supplied data is intended to satisfy the requirements of all appropriate inquiry into the previous ownership and uses of the property. The scope of the work included a site reconnaissance, research of land use records and other sources for preliminary indications of hazardous material use, storage, or disposal at the property and/or on contiguous parcels. A new high-rise structure, including commercial and residential units, with subterranean parking levels is proposed for the property.

The subject property consists of five (5) rectangular shaped parcels of land that encompass approximately 1.06 acres. The property is asphalt paved and currently utilized as a parking lot. Access to the property is via Figueroa Street to the west and 8th Street to the south. The subject property is zoned for C2-4D commercial use and is not listed as a cultural or historic site. Historical site utilization research indicates that the subject property was developed with residential structures from 1888 until the late 1920s. Sanborn Fire Insurance Map research indicates the subject property was developed with residential structures between 1888-1920, and developed with nine stores and the Abbey hotel between 1950-1960. Historical aerial photograph research indicates that the subject property was developed with residences between 1923-1928; was redeveloped with two structures at the south end of the property in 1938 and is developed as a parking lot in 1977. A response from the LAFD indicates no underground tank records are maintained for the subject site.

The subject property is not identified on the standard environmental government sources researched in this report. One hundred ten environmental sites, listed on the LUST, Cortese, LOS ANGELES CO. HMS, SLIC, WIP, SWRCY, RCRA-SQG, FINDS, CLEANERS, HAZNET, EMI, UST, CA FID UST, SWEEPS UST, HIST UST, CA WDS and ERNS databases, are located within a one-quarter mile radius of the subject property. The nearest listed environmental concern site a former cleaners across 8th approximately 100 feet southwest of the subject property at 823 W. 8th Street. The nearest listed contaminated site to the subject property is located approximately 640 feet to the west-southwest of the subject property at 845 S. Figueroa Street. This off-site location is listed as a LUST cleanup site. A gasoline leak was reported on October 19, 1993. This off-site location was issued a case closed status by the RWQCB on March 4, 1996. It is considered unlikely that the subject property was impacted by this off-site release due to distance and flow direction of regional groundwater to the south-southwest.

California Environmental implemented soil-gas sampling to assist in evaluating subsurface contamination from volatile organic compounds (VOCs). Soil-gas sampling was implemented onsite on December 2, 2015. Ten (10) probes were placed at 5 and 15 feet below ground surface. Eleven (11) soil-gas samples were collected from seven (7) locations (CESV1-CESV7) including the purge volume tests and a sample replicate. Laboratory analysis of soil-gas found benzene between 0.11 and 0.29 ug/L in CESV1-5ft, CESV1-15ft, CESV2-5ft, CESV3-5ft, CESV3-15ft, CESV5-5ft, CESV6-5ft, and CESV7-5ft. All detections of benzene are below the CHHSLs for commercial properties (0.28 ug/L) with the exception of CESV3-15ft (0.29 ug/L), which is only slightly above the commercial CHHSL of 0.28 ug/L. The very low concentrations of benzene are attributed to the property's long-term use as a commercial parking lot. Tetrachloroethene (PCE) was detected in one location; samples CESV1-5ft (0.12 ug/L) and CESV1-15ft (0.11 ug/L) at concentrations below residential (0.47 ug/L) and commercial (1.6 ug/L) CHHSLs. The PCE is likely attributed to an off-site release and due to the localization and low detection concentrations is not considered a concern for the subject site.

Current indoor air quality (including biological agents and mold) is not a concern since there are no structures located on the property. The proposed development includes several levels of ventilated subterranean garage that will mitigate the potential for vapor intrusion into future onsite units. All soil to depths of 25-30 ft will be removed, further reducing the potential for an onsite vapor intrusion condition. Therefore it is our opinion that vapor intrusion mitigation measures are not required for the proposed development.

One data failure was encountered during the preparation of this report. The owner questionnaire was not returned to C. Review of recorded Land Title Records including environmental liens was excluded from this report. These records should be obtained and reviewed by the user. However, research conducted for this report has not revealed any evidence of environmental liens or environmental related Activity Use Limitations (AULs) in connection with the property.

California Environmental has prepared an Environmental Site Assessment – Phase I in conformance with the scope and limitations of ASTM 1527-13 for the property located at 734-746 S. Figueroa Street and 817 W. 8th Street, Los Angeles, California, 90017, California. **This assessment has revealed no evidence of recognized environmental conditions (RECs), historical recognized conditions (HRECs), or controlled recognized conditions (C-RECs) in connection with the subject property**.

2.0 INTRODUCTION

The following report presents the findings of the Environmental Site Assessment – Phase I prepared for the subject property located at 734-746 S. Figueroa Street and 817 W. 8th Street, Los Angeles, California, 90017. The scope of the Phase I study meets ASTM E 1527-13 *Standard Practice for Environmental Site Assessments* and included research of available land use records and other sources for preliminary indications of hazardous material use, storage or disposal at the property. The findings of this study are intended to provide information to the client regarding potential hazardous material impacts to the soil and groundwater beneath the site.

The scope of the investigation was conducted in general accordance with ASTM Standard Practice for Environmental Site Assessments – Phase I, Environmental Site Assessment Process ASTM E 1527-13. The steps outlined in this process are intended to permit a user (client) to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide purchaser limitations on CERCLA liability. Specifically, this report along with certain obligations of the client, constitutes All Appropriate Inquiry (AAI) into the previous ownership and uses of the property consistent with the standard of care as practiced in this area by environmental professionals. A main component of the assessment is to identify recognized environmental conditions, controlled recognized environmental conditions, and historical recognized environmental conditions, as they may affect the subject property. As defined by ASTM E 1527-13, a recognized environmental condition (REC) means *"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property."* A controlled recognized environmental condition (C-REC) is defined *as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)."* An historical recognized environmental condition (HREC) is defined as *"a past release of any hazardous substances*

or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)."

An important component of complying with the ASTM E 1527-13 Standard is information to be obtained or in the possession of the client and/or seller of the property. Such information includes obtaining and review of a recent title report, any specialized information regarding the site or surrounding area which may give rise to identification of a recognized environmental condition, and/or reasons given by the seller should the purchase price be significantly lower than what would be reasonably expected for a property of similar size and value. Often a real estate appraiser is commissioned to evaluate the purchase or sale price of a property. Such an appraisal is outside the scope of this Phase I Assessment report.

The independent conclusions represent California Environmental's (CE) professional judgment based on the conditions that existed and the information and data available during the course of study. Factual information regarding operations, conditions, and test data provided by the client, the owner or their representatives have been assumed to be correct and complete. This report includes **GENERAL FINDINGS** and **CONCLUSIONS AND RECOMMENDATIONS**, which together with the remainder of this report are subject to the **NOTICE** at the end of the report. **This report was prepared for the sole use and reliance by the client as identified on the title page of this report. Use of this report by other entities is expressly forbidden unless permission is granted by the client and CE.**

The scope of work included:

- A walkover of the site.
- Review of building and grading permits on file with the City of Los Angeles Department of Building and Safety.
- A records review request for underground storage tank files and industrial waste records maintained by the City of Los Angeles Fire Department Underground Storage Tank and Hazardous Materials Divisions.

- Review of historical USGS topographic maps and historical aerial photographs maintained by EDR Company.

- Research of historical Sanborn Fire Insurance Maps maintained by EDR Company.

- Contact with the California Environmental Protection Agency, Department of Toxic Substances Control to review their files.

- Contact with the California Environmental Protection Agency, Regional Water Quality Control Board to review their files.

- Contact with the Los Angeles County Health Department to review their files.

- Contact with the South Coast Air Quality Management District to review their files.

- Review of the DOMS Online Mapping Program, Oil Field Maps, and oil well records maintained by the State of California Division of Oil, Gas, and Geothermal Resources.

- Review of the City of Los Angeles – City Wide Methane Ordinance Map (A-20960).

- Review of Los Angeles County Landfill Maps.

- Review of the following lists and maps of suspect or known contaminated sites; a complete listing of these sources is contained within **APPENDIX V**.

    - California Regional Water Quality Control Board, (RWQCB) – *Computer Case Listing of Reported Underground Tank Leaks*, covering Los Angeles County.

    - California Department of Health Services – *Hazardous Waste and Substance Sites – Cortese List and Contaminated Wells List, which includes the Bond Expenditure Plan* (BEP) sites.

    - California Environmental Protection Agency, Facility and Manifest Data, HAZNET.

    - Historical California Environmental Protection Agency, Department of Toxic Substances Control – *CalSites List*.

    - California Department of Health Services, *Hazardous Waste Information System* (HWIS) and Tanner Report.

    - California Integrated Waste Management Board, *Solid Waste Information System* – (SWIS) List.

- State Water Resources Control Board, *Toxic Pits Clean-up Act (Toxic Pits)*.

- State Water Resources Control Board, *Hazardous Substance Storage Container Database* (UST, LUST, SLIC, and WDS).

- U.S. Environmental Protection Agency – *National Priorities List* (NPL).

- U.S. Environmental Protection Agency – *Comprehensive Environmental Response, Compensation, and Liability Information System* (CERCLIS).

- U.S. Environmental Protection Agency, *Toxic Release Inventory System* (TRIS).

- U.S. Environmental Protection Agency, *Resource Conservation and Recovery Information, System Treatment, Storage and Disposal Facilities*, (RCRA-TSDF).

- U.S. Environmental Protection Agency, *Resource Conservation and Recovery Information System, Large Quantity Generators*, (RCRA-LQG).

- U.S. Environmental Protection Agency, Resource *Conservation and Recovery Information System, Small Quantity Generators*, (RCRA-SQG).

- U.S. Environmental Protection Agency – *Superfund Amendment and Reauthorization Act, Title III*, (SARA Title III).

- U.S. Environmental Protection Agency, *Emergency Response Notification System* (ERNS).

- U.S. Environmental Protection Agency, *Facility Index System* (FINDS).

- U.S. Environmental Protection Agency, *Civil Enforcement Docket* (DOCKET).

- A review of government records databases of suspect or known contaminated sites and historical city directories research was performed by EDR Company. The results of the search are summarized in this report. The EDR reports are enclosed in **APPENDICES II** and **V**.

- Preparation of this report.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The subject property is located between W. 7th Street and W. 8th Street on the east side of S. Figueroa Street, in the City of Los Angeles, California, see **FIGURE 1 – VICINITY MAP**. The current street addresses for the property is 734-746 S. Figueroa Street and 817 W. 8th Street. According to the Los Angeles County Tax Assessor's office, the Assessor's Parcel Number (APNs) for the subject property are 5144-010, -011, -012, -013 and -014.

3.2 SITE RECONNAISSANCE

The site conditions were observed during a reconnaissance conducted by Mr. Gregory Buensuceso of California Environmental on December 2, 2015. California Environmental completed an Environmental Field Reconnaissance Checklist during the site reconnaissance. The Environmental Field Reconnaissance Checklist is included in **APPENDIX I**. The features described below are shown on the enclosed **FIGURE 2 – PLOT PLAN**. Photographs of the subject property are attached in the **ILLUSTRATIONS** section of this report.

3.2.1 Description of Property/Proposed Project/Cultural Resource

The subject property consists of five (5) rectangular shaped parcels of land that encompass approximately 1.06 acres. The property is asphalt paved and currently utilized as a parking lot. Access to the property is via Figueroa Street to the west and 8th Street to the south. It is proposed to redevelop the site with a high-rise commercial building. The city of Los Angeles Planning Department (ZIMAS website) indicates the subject property is zoned for C2-4D commercial use. ZIMAS indicates the subject site is not an historical or cultural site.

3.2.2 Adjacent Properties

The subject property is bound to the north by a commercial building, to the east by a parking lot and two (2) parking structures, to the south by 8th Street, and to the west by Figueroa Street.

3.2.3 Topography and Drainage

The subject property has a gentle slope towards the south-southwest. The topographic elevation of the subject property is approximately 265 feet amsl. Drainage from the site is by sheetflow towards the adjacent streets and alleyway. No evidence of surface drains, catch basins, sumps or standing water was observed on the subject property at the time of the site reconnaissance.

3.2.4 Past Uses of the Property

No evidence of the past use, treatment, storage, disposal or generation of hazardous substances was observed on the subject property at the time of the site reconnaissance.

3.2.5 Use of Hazardous Substances

No evidence of significant hazardous substance use was observed on the subject property at the time of the site reconnaissance.

3.2.6 Storage Tanks

No evidence of existing aboveground or underground storage tanks, clarifiers, sumps, or grease interceptors was observed on the subject property at the time of the site reconnaissance.

3.2.7 Containers of Hazardous or Unidentified Substances

No evidence of containers of hazardous or unidentified substances was observed on the subject property at the time of the site reconnaissance.

3.2.8 Solid Waste Disposal

No evidence of onsite disposal or landfill of solid waste material was observed on the subject property at the time of the site reconnaissance.

3.2.9 Poly-Chlorinated Biphenyl's (PCBs)

No evidence of PCB containing transformers or equipment was observed on the subject property at the time of the site reconnaissance.

3.2.10 Heating/Cooling Equipment

There are no structures currently located on the subject property.

3.2.11 Asbestos Containing Building Materials (ACM)

There are no structures currently located on the subject property.

3.2.12 Wastewater Disposal Systems

Wastewater treatment or disposal systems were not observed on the subject property at the time of the site reconnaissance.

3.2.13 Radon

Radon hazard assessment was not included in the scope of this study. However, the EDR research report indicates the levels of radon at 15 sites located within the 90017 zip code in Los Angeles County were below four picoCurie per Liter (pCi/L), the Federal Action level.

3.2.14 Lead

There are no structures currently located on the subject property. Therefore lead based paint is not an environmental concern for the property. The potential for lead in drinking water was also evaluated.

The Los Angeles Department of Water and Power (LADWP) supplies drinking water to the subject property. The LADWP 2014 Drinking Water Quality Report indicates the lead concentration in the delivered drinking water is below the permissible maximum contaminant level for lead (15 ug/L).

3.2.15 Wells

No evidence of dry wells, irrigation wells, injection wells, abandoned wells, monitoring wells or other wells was observed on the subject property at the time of the site reconnaissance.

3.2.16 Odor

No evidence of strong, pungent or noxious odors was noted on the subject property at the time of the site reconnaissance.

3.2.17 Stressed Vegetation

No evidence of stressed vegetation was observed on the subject property at the time of the site reconnaissance.

3.2.18 Staining or Residue

No evidence of staining or residue was observed on the subject property at the time of the site reconnaissance.

3.2.19 Pits, Ponds, or Lagoons

No evidence of pits, ponds, and/or lagoons was observed on the subject property at the time of the site reconnaissance.

3.2.20 Potable Water Supply

Water is available to the subject property by the City of Los Angeles Department of Water and Power.

3.2.21 Sewage Disposal System

The subject property can be connected to the public sewage disposal system.

3.2.22 Other Conditions of Concern

No other conditions of environmental concern regarding potential sources for soil and groundwater contamination were observed on the subject property at the time of the site reconnaissance.

3.3 SITE DRIVE-BY

A drive-by near the subject property was conducted to help identify nearby sites that possibly use, store or generate hazardous materials. The area surrounding the subject property consists of commercial properties. No service stations are located on the properties adjacent to the subject property. A list of selected environmental risk sites identified within a one-quarter mile radius of the subject property is included in the **STANDARD ENVIRONMENTAL RECORDS SOURCES** section of this report.

4.0 PREVIOUS WORK

No previous environmental reports were provided for the subject property.

5.0 GEOLOGY AND HYDROGEOLOGY

The subject property is located in the northernmost part of the Peninsular Ranges province near the boundary between the Transverse Ranges and Peninsular Ranges geomorphic provinces. The Transverse Ranges geomorphic province is characterized by east-west trending mountain ranges that include the Santa Monica Mountains. The southern boundary of the province is marked by the Santa Monica, Hollywood, Raymond, Sierra Madre, and Cucamonga faults. The Peninsular Range province is

characterized by northwest/southeast trending alignments of mountains, hills, and intervening basins, reflecting the influence of northwest trending major faults and folds controlling the general geologic structures of the region.

The subject property is located within the Los Angeles Forebay area of the Central Groundwater Basin. The Central Basin occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles Groundwater Basin. The Los Angeles Forebay occupies the westerly portion of the Central Basin Non-Pressure Area. Historically a recharge area for the Los Angeles River, the recharge capability has been substantially reduced since the river channel was lined. The Central Basin is underlain by marine siltstone and sandstone of Miocene age Puente Formation. Alluvial deposits consisting of sand and silt underlie the subject property. Onsite borings excavated by Geotechnologies in 2015 did not encounter groundwater at depths of 80 ft bgs. The regional direction of groundwater flow is towards the south.

6.0 SITE UTILIZATION HISTORY

6.1 HISTORICAL CITY DIRECTORIES

EDR Company was contacted to research historical city directories for the subject property and adjacent sites. The city directories were reviewed at approximately five year intervals spanning from 1920-2013. A summary of city directories reviewed for the subject property is included in **TABLE I**. The EDR City Directory is attached in **APPENDIX II**.

TABLE I
Historical City Directories

Year	Use/User	Source
742 S. Figueroa Street		
1924	Gamble, V. A. Hough, A. O. Keyser, Frank S. – Car Washer Roche, Edgar A. – Real Estate Roche, Joe S. – Decorator Schneider, Karl W.	Los Angeles Directory Co.

TABLE I
Historical City Directories-continued

744 S. Figueroa Street		
1924	Hart, Paul – Accountant Kircheiner, Ove Nelson, Wilbur Wolter, Raoul	Los Angeles Directory Co.
1933	Golden, Harry – Soft Drinks	Los Angeles Directory Co.
1937	Dussen, Henry – Soft Drinks	Los Angeles Directory Co.
1942	Loftus, W.M. Pauline – Auto Pk Simms, Virgil – Shoe Shiner	Los Angeles Directory Co.
746 S. Figueroa Street		
1924	Angelus Lighting Fixture Co. New Mexico Petroleum & Refining(office) Thompson, Howard – Real Estate Waybright & Thompson – Real Estate	Los Angeles Directory Co.
1929	Angelus Lighting Fixture Co.	Los Angeles Directory Co.
1937	Bessac, Clinton H.	Los Angeles Directory Co.
1958-1976	Copeland Brokerage Co.	Pacific Telephone
817 W. 8th Street		
1958-1967	Abbey Café	Pacific Telephone

6.2 BUILDING INFORMATION

There are no structures currently located on the subject property.

6.3 UNDERGROUND STORAGE TANK PERMIT RESEARCH

The City of Los Angeles Fire Department Underground Storage Tank and Hazardous Materials Divisions were contacted by our personnel to research their files for underground storage tank (UST) permits and industrial waste records for the subject property. The City of Los Angeles Fire Prevention Bureau has not yet responded to our records review request. The historical use of the site (residential, retail stores and parking lot) makes it unlikely for USTs to have been used on the subject property. The LAFD response indicates no UST records are maintained for the subject site.

6.4 STATE REGULATORY AGENCY FILE REVIEW

Inquiry letters were sent to the State of California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board – Los Angeles Region (RWQCB). Responses from both the DTSC and RWQCB indicate that no records are maintained for the subject property addresses. The agency inquiries and responses are included in **APPENDIX IV**.

CalEPA DTSC and RWQCB online databases were also reviewed. The DTSC Envirostor lists Federal Superfund, State Response, Voluntary Clean-ups, School Clean-ups and Investigations, Military Evaluations and Geotracker LUFT/SLIC databases. The subject property is not listed on the databases researched for this report.

6.5 LACHD AND SCAQMD FILE REVIEW

An inquiry letter was sent to the Los Angeles County Health Department (LACHD) for any information they may have regarding soil, water or air contamination at the subject property. A response letter from LACHD indicates that no records are maintained for the subject property addresses. The agency inquiry letter and response are included in **APPENDIX IV**.

The SCAQMD online FIND database was researched for any active and/or inactive records related to the subject property. A review of the SCAQMD Facility Information Detail (FIND) database indicates that no records are maintained for the subject property addresses.

6.6 HISTORICAL AERIAL PHOTOGRAPH RESEARCH

Historical aerial photographs were reviewed as part of this study. The photographs are part of the aerial photograph collections maintained by the EDR Company. Sixteen photographs covering the time period 1923-2012 were reviewed for the subject property. The photographs are summarized below in **TABLE II**. The aerial photographs are attached in **APPENDIX II** of this report.

TABLE II
Historical Aerial Photographs

Date	Flight No.	Description
1923	USGS	The subject property is property appears to be developed with residential structures. The surrounding area appears to be developed with residential structures.
1928	USGS	The subject property and surrounding area appear similar to the previous photo.
1938	USGS	The subject property has been redeveloped with two structures at the south end of the property. The northern end of the property has been redeveloped as a paved parking lot. The surrounding area appears to be redeveloped with commercial structures.
1948	USGS	The subject property and surrounding area appear similar to the previous photo.
1952	USGS	The subject property appears similar to the previous photo. The 110-freeway can be seen under construction to the north of the subject property. The remainder of the surrounding area appears similar to the previous photo.
1964	USGS	The subject property appears similar to the previous photo. The 110-freeway can be seen to the north of the subject property. The remainder of the surrounding area appear similar to the previous photo.
1977	EDR	The structure at the south end of the lot has been redeveloped as a parking lot. The remainder of the subject property and surrounding area appears similar to the previous photo.
1979	EDR	The subject property and surrounding area appear similar to the previous photo.
1983	EDR	The structure on the subject property has been demolished and the property has been redeveloped into its current configuration as a parking lot. Construction can be seen to the west and south of the subject property. The adjacent property to the southeast is developed to with its current parking structure.
1989	USGS	The subject property and surrounding area appear similar to the previous photo.
1994	USGS/DOQQ	The subject property and surrounding area appear similar to the previous photo.
2002	USGS	The subject property and surrounding area appear similar to the previous photo.
2005	USDA/NAIP	The subject property and surrounding area appear similar to the previous photo.
2009	USDA/NAIP	The subject property and surrounding area appear similar to the previous photo.
2010	USDA/NAIP	The subject property and surrounding area appear similar to the previous photo.
2012	USDA/NAIP	The subject property and surrounding area appear similar to the previous photo.

6.7 HISTORICAL FIRE INSURANCE MAPS

The EDR Company was contacted to review historical fire insurance maps for the subject property. Maps covering the subject property for fourteen time periods (1888-1970) were found. The map descriptions are summarized below in **TABLE III.** Copies of the fire insurance maps are attached in **APPENDIX II** of this report.

TABLE III
Historical Fire Insurance Maps

Date	Description
1888	The northern end of the subject property is developed with three dwellings. The surrounding are is developed with residential structures. A school is located south of the subject property.
1894	The subject property is developed with five dwellings and a shed. The surrounding area is similar to the previous map.
1906	The subject property is developed with eight dwellings, a dance hall, and a shed. A church has developed to the east of the subject property. Infill of the surrounding area with residential structures can be seen in all directions.
1920	The subject property and surrounding area appear similar to the previous map.
1950	The southern portion of the subject property has been redeveloped with nine stores and the Abbey Hotel. The northern portion of the subject property has been redeveloped as a parking lot. The adjacent property to the east has been redeveloped with a commercial structure occupied by General Petroleum Corporation.
1953	The subject property and surrounding area appear similar to the previous map.
1955	The subject property and surrounding area appear similar to the previous map.
1958	The subject property and surrounding area appear similar to the previous map.
1960	The subject property and surrounding area appear similar to the previous map.
1962	The subject property and surrounding area appear similar to the previous map.
1963	The subject property and surrounding area appear similar to the previous map.
1967	The subject property and surrounding area appear similar to the previous map.
1968	The subject property and surrounding area appear similar to the previous map.
1970	The subject property and surrounding area appear similar to the previous map.

6.8 HISTORICAL TOPOGRAPHIC MAP RESEARCH

Historical USGS topographic maps were provided by EDR Company and from online database sources. Maps covering the subject property for fifteen time periods (1894-2012) were found. The map descriptions are summarized below in **TABLE IV.** The topographic maps are attached in **APPENDIX II** of this report.

TABLE IV
Historical Topographic Maps

Date	Quadrangle	Description
1894	Los Angeles	The subject property and surrounding area is densely developed with commercial and residential structures. To the northwest West Lake can be seen.
1896	Santa Monica, Pasadena	The subject property and surrounding area is densely developed with commercial and residential structures. To the northwest West Lake can be seen.
1898	Santa Monica	The subject property and surrounding area is densely developed with commercial and residential structures. To the northwest West Lake can be seen.
1900	Los Angeles, Pasadena	The subject property and surrounding area is densely developed with commercial and residential structures. To the northwest West Lake can be seen.

TABLE IV
Historical Topographic Maps - Continued

Date	Quadrangle	Description
1902	Santa Monica	The subject property and surrounding area is densely developed with commercial and residential structures. To the northwest West Lake can be seen.
1921	Santa Monica	The subject property and surrounding area are densely developed with commercial structures.
1928	Los Angeles	The subject property and adjacent property contains commercial structures.
1953	Hollywood, Los Angeles	The subject property and surrounding area is mapped as being in an area of urban development. Directly to the west Harbor freeway can be seen
1966	Hollywood, LA	The subject property area is mapped as being in an area of urban development.
1972	Hollywood, LA	The subject property and surrounding area is mapped as being in an area of urban development.
1981	Hollywood, LA	The subject property area is mapped as being in an area of urban development.
1991, 1994	Hollywood, LA	The subject property and surrounding area is mapped as being in an area of urban development.
2012	Hollywood, LA	The subject property and surrounding area is mapped as being in an area of urban development.

7.0 NEARBY CONTAMINATED SITES

7.1 LANDFILLS

The Major Waste System maps for Los Angeles County, the Solid Waste Information Systems (SWIS), and the Waste Management Unit Database (WMUD) were reviewed to identify landfills and transfer stations located near the property. Map no. 114-197 and the EDR database report indicate that there are no landfills or transfer stations located within a 2,000-foot radius of the subject property. No active hazardous waste landfills are located within Los Angeles County.

7.2 OIL FIELD MAPS/METHANE HAZARD ZONES

Oil field maps published by the State of California Division of Oil, Gas and Geothermal Resources (DOGGR) and online mapping systems (DOGGR Well Finder) were researched to determine if oil production occurred on or near the subject property. No oil production occurred on the subject property.

The DOGGR online mapping system indicates the subject property is located approximately 1,650 feet north of the Los Angeles Downtown oil field. The DOGGR online mapping system also indicates that

there is a plugged oil well owned by Chevron U.S.A. Inc. located approximately 1,800 feet southwest of the subject property. The subject property is not located with a recognized Methane Hazard Zone as identified on the City of Los Angeles website (ZIMAS – Zone Information and Map Access System).

7.3 STANDARD ENVIRONMENTAL RECORD SOURCES

In addition to the above records, agency database lists were reviewed for known or suspected contaminated sites and for sites which store, generate or use hazardous materials near the subject property. The subject property is not identified on the standard environmental government sources researched for this report. Therefore, based on our review of the regulatory databases, the subject site is in compliance with current local, state and federal environmental regulations. One hundred ten environmental sites, listed on the LUST, Cortese, LOS ANGELES CO. HMS, SLIC, WIP, SWRCY, RCRA-SQG, FINDS, CLEANERS, HAZNET, EMI, UST, CA FID UST, SWEEPS UST, HIST UST, CA WDS and ERNS databases, are located within a one-quarter mile radius of the subject property. The nearest listed environmental concern site is located approximately 100 feet to southwest of the subject property at 823 W. 8th Street, the former location of a dry cleaning facility owned by Bernard De Grazia. The nearest listed contaminated site to the subject property is located approximately 640 feet to the west-southwest of the subject property at 845 S. Figueroa Street. This off-site location is listed as a LUST cleanup site. A gasoline leak was reported on October 19, 1993. This off-site location as issued a case closed status by the RWQCB on March 4, 1996. It is considered unlikely that the subject property was impacted by this off-site release due to distance and flow direction of regional groundwater to the south-southwest. Selected environmental risk sites found to exist within one-quarter mile radius of the property are listed in **TABLE V**. The EDR Radius Map with GeoCheck is attached in **APPENDIX V**.

TABLE V
Standard Environmental Record Sources

Name	Address	Distance from S.P.	Source(s)
De Grazia, Bernard	823 W 8th St	100 ft SW	EDR US Hist Cleaners
Hochman Isidore	829 W 8th St	100 ft WSW	EDR US Hist Cleaners
777 Tower	777 S Figueroa St	110 ft WNW	UST
S. Figueroa Plaza	777 S Figueroa St	110 ft WNW	SWEEPS UST, CA FID UST, EMI
Rothblatt, Aaron	806 W 8th St	120 ft WSW	EDR US Hist Cleaners
JP Auto Service	811 W 8th St	122 ft S	EDR US Hist Auto Stat
Browns Dye Works	738 S Figueroa St	122 ft N	EDR US Hist Cleaners
Gaines H. H.	818 W 8th St	123 ft WSW	EDR US Hist Cleaners

TABLE V
Standard Environmental Record Sources-continued

Target Store, Sloan's Dry Cleaner	735 S Figueroa St	122 ft N	RCRA-SQG, EDR US Hist Cleaners
Fisher I I	828 W 8th St	122 ft W	EDR US Hist Cleaners
800 Figueroa Building	800 S Figueroa St	148 ft SW	UST, SWEEPS UST, Hist UST, CA FID, UST
CitiCorp Plaza	725 S Figueroa St	206 ft NW	CA FID UST, UST, SWEEPS UST
Century Parking Inc, Quick Pick Dry Cleaners	757 S Flower St	220 ft ESE	SWEEPS UST, CA FID UST, EDR US Hist Cleaners
Scura Salvatore	803 S Flower St	222 ft SSE	EDR US Hist Cleaners
Western Union Telegraph	745 S Flower St	226 ft E	EDR US Hist Cleaners
C.S. Lubricating SE	742 S Flower St	238 ft E	EDR US Hist Auto Stat
Kutsuma, M	726 W 8th St	239 ft SSE	EDR US Hist Cleaners
Gas Company Lofts	810 S Flower St	247 ft S	RCRA-LQG, FINDS
Parking Concepts Inc	725 S Flower St	279 ft E	SWEEPS UST
UNK	801 S Figueroa St	306 ft WSW	SWEEPS UST, CA FID UST
Spot Cash Clothes Cleaners	908 W 8th St	338 ft W	EDR US Hist Cleaners
The Hammerson Property	818 W 7th St	339 ft NE	SWEEPS UST, CA FID UST, AST
Heuschkel, Theo	910 W 8th St	344 ft W	EDR US Hist Auto Stat
Coleman, Edwards	815 W 7th St	348 ft NE	EDR US Hist Auto Stat
So Cal Gas Co, Shoffner, A.M.	844 S Flower St	390 ft S	SWEEPS UST, CA FID UST, EDR US Hist Auto Stat, Hist UST
Broadway Plaza Cleaners	700 S Flower St	390 ft ENE	EDR US Hist Cleaners, RCRA-SQG, FINDS, EMI
Winterbottom, Jos	936 W 8th St	410 ft WNW	EDR US Hist Auto Stat
Husbands, L.R.	852 Flower St	432 ft S	EDR US Hist Auto Stat
Ralph De Fay	946 W 8th St	436 ft WNW	Hist UST
Signal Oil Co Office, Pappadopoolos, Nicholas	811 W 7th St	436 ft NE	EDR US Hist Auto Stat, EDR US Hist Cleaners
Wong Lanny	941 W 7th St	438 ft NNW	EDR US Hist Cleaners
Durant, R.G.	857 S Flower St	449 ft SSW	EDR US Hist Auto Stat
Charloff, Bessie	948 W 7th St	469 ft NNW	EDR US Hist Cleaners
Benum, Jack	862 S Flower St	488 ft SSW	EDR US Hist Cleaners
Century Parking Inc.	727 W 7th St	498 ft ENE	SWEEPS UST, CA FID UST

Note: A search of public information databases may omit some nearby contaminated sites due to missing or inaccurate information in the public record.

7.4 POTENTIAL VAPOR ENCROACHMENT CONDITION (p-VEC)/INDOOR AIR

The State of California has adopted Indoor Air Quality Guidelines (CHHSLs) issued by CALEPA in 2005/2010. Potential sources for vapor intrusion to indoor air include degassing of solvents and other compounds from contaminated soil and contaminated groundwater. No evidence of soil and groundwater contamination that would suggest the potential impact of vapor encroachment into future onsite structure(s) was noted within the scope of this investigation, which included an onsite soil gas evaluation. Current indoor air quality (including biological agents and mold) is not a concern since there are no structures located on the property. The proposed development includes several levels of ventilated subterranean garage that will mitigate the potential for vapor intrusion into future onsite units. Therefore it is our opinion that vapor intrusion mitigation measures will not be required for the proposed development.

8.0 SUBSURFACE SITE ASSESSMENT

California Environmental implemented a geophysical survey and soil-gas sampling to assist in evaluating for subsurface contamination associated with volatile organic compounds (VOCs). An Underground Service Alert notification was made 48 hours prior to the initiation of the subsurface assessment.

8.1 GEOPHYSICAL SURVEY

Southwest Geophysics, Inc. conducted a geophysical survey on the property on December 2, 2015 under the direction of California Environmental. The purpose of the survey was to locate to identify utility and sewer lines beneath the property. Southwest Geophysics utilized total field magnetics, ground penetrating radar, and metal detecting equipment to evaluate for the presence of utilities beneath the areas of the proposed borings. The locations of all the borings are depicted on **FIGURE 3 – ASSESSMENT PLAN.**

8.2 SOIL-GAS SAMPLING

Soil-gas sampling was implemented onsite on December 2, 2015. H&P Mobile Geochemistry conducted soil-gas probe placement and sampling under the direction of California Environmental. A direct-push Strataprobe rig and a hand driven drill were utilized for the placement of the soil vapor probes. Ten (10) probes were placed at 5 and 15 feet below ground surface. Eleven (11) soil-gas samples were collected from seven (7) locations (CESV1-CESV7) including the purge volume tests and a sample replicate. Soil-gas samples were obtained and analyzed for volatile organic compounds (USEPA Method 8260B) in general accordance with the DTSC/RWQCB guidelines (CalEPA/DTSC/RWQCB Soil-gas Advisory, 2012) in an onsite state certified mobile laboratory.

The soil-gas probes consisted of a sampling tip attached to inert nylon tubing. Each segment of tubing was pre-measured to ensure the correct depth. The sample point was set within a one foot sand sensing zone at the desired depth of each soil vapor point. Dry granular bentonite was placed above and/or below the sand-sensing zone and hydrated in order to seal the sand sensing zone. The probe was completed to the surface with the hydrated bentonite and capped with gas-tight 2-way valve preventing degassing of the gas point and interference from the surface. The soil-gas probes were allowed to equilibrate for two (2) hours prior to the collection of the soil-gas sample. A site-specific purge volume test was completed at the first vapor probe location. The optimum purge volume (3 PV) was utilized for vapor sampling. 1,1-difluoroethane was utilized as the leak check compound. Vapor probe locations were sampled using the H&P Mobile Geochemistry SOP which includes protocols for surface seals, purge volume tests, tracer compounds, sample flow rate, duplicate samples, and analytical instrument calibration.

Laboratory analysis of soil-gas found benzene between 0.11 and 0.29 ug/L in CESV1-5ft, CESV1-15ft, CESV2-5ft, CESV3-5ft, CESV3-15ft, CESV5-5ft, CESV6-5ft, and CESV7-5ft. The concentrations of benzene detected exceed the residential CHHSL of 0.085 ug/l. All detections of benzene are below screening concentrations (the CHHSLs) for commercial properties (0.28 ug/L) with the exception of CESV3-15ft (0.29 ug/L) which is just slightly above the commercial CHHSL of 0.28 ug/L. Tetrachloroethene (PCE) was detected in samples CESV1-5ft (0.12 ug/L) and CESV1-15ft (0.11 ug/L) at concentrations below residential (0.47 ug/L) and commercial (1.6 ug/L) CHHSLs. The laboratory

analyses of the soil-gas samples are shown below in **TABLE VI**. The soil-gas laboratory report and chain of custody record are attached in **APPENDIX VI**. The locations of the soil-gas samples are depicted on **FIGURE 3 – ASSESSMENT PLAN.**

TABLE VI

Laboratory Analysis of Soil Gas
Figueroa St. & 8th St.
Los Angeles, CA 90017

Sample ID	Date	EPA Method 8260B - ug/l						
		B	T	E	X	PCE	TCE	VC
CESV1-5ft	12/9/15	**0.13**	<1.0	<0.1	<0.1	**0.12**	<0.1	<0.01
CESV1-15ft	12/10/15	**0.11**	<1.0	<0.1	<0.1	**0.11**	<0.1	<0.01
CESV2-5ft	12/10/15	**0.16**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV2-15ft	12/10/15	<0.1	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV3-5ft	12/10/15	**0.17**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV3-15ft	12/10/15	**0.29**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV4-5ft	12/10/15	<0.1	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV5-5ft	12/10/15	**0.12**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV5-5ft (Rep)	12/10/15	**0.12**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CESV6-5ft	12/10/15	**0.22**	<1.0	<0.1	**0.57**	<0.01	<0.1	<0.01
CESV7-5ft	12/10/15	**0.13**	<1.0	<0.1	<0.1	<0.01	<0.1	<0.01
CHHSL-Res		0.085	320	1.1	740	0.47	1.3	0.028
CHHSL-Com		0.28	890	3.6	2100	1.6	4.4	0.095

B – Benzene; T – Toluene; E – Ethylbenzene; X – Xylene; TCE – Tricholoroethene; PCE – Tetrachloroethene; VC-Vinyl Chloride

CHHSL = California Human Health Screening Level, Residential - res, Commercial - com

9.0 GENERAL FINDINGS

During the research phase of this study, the following information was obtained:

- The elevation of the subject property is approximately 265 feet above mean sea level.

- Topographic contour lines in the vicinity of the subject and adjacent properties indicate a gentle slope towards the south-southwest.

- Sanborn Fire Insurance Map research indicates the subject property was developed with residential structures between 1888 and 1920. The southern portion of the subject property was developed with nine stores and the Abbey Hotel from 1950 to 1960.

- Historical aerial photograph research indicates that the subject property was developed with residential structures between 1923 and 1928. The subject property was developed with two commercial structures and a parking lot from 1938 to 1964. The southernmost structure was demolished by 1977.

- Historical city directories indicate that occupied by residential and commercial tenants from 1924 to 1976.

- No records are maintained at DTSC for the subject property.

- No records are maintained at RWQCB for the subject property.

- No records are maintained at SCAQMD for the subject property.

- No records are maintained at LACHD for the subject property.

- No records are maintained at SCAQMD for the subject property.

- No landfills or transfer stations are located within a 2,000-foot radius of the subject property.

- The DOGGR online mapping system indicates the subject property is located approximately 1,650 feet north of the Los Angeles Downtown oil field. The DOGGR online mapping system also indicates that there is a plugged oil well owned by Chevron U.S.A. Inc. located approximately 1,800 feet southwest of the subject property.

- The subject property is not located with a recognized Methane Hazard Zone as identified on the City of Los Angeles website (ZIMAS – Zone Information and Map Access System).

- The subject property is not identified on the environmental government sources researched in this report.

- The nearest listed contaminated site to the subject property is located approximately 640 feet to the west-southwest of the subject property at 845 S. Figueroa Street. This off-site location is listed as a LUST cleanup site. A gasoline leak was reported on October 19, 1993. This off-site location as issued a case closed status by the RWQCB on March 4, 1996. It is considered unlikely that the subject property was impacted by this off-site release due to distance and flow direction of regional groundwater to the south-southwest.

- The depth to groundwater beneath the subject property is greater than 80 feet bgs.

- The regional direction of groundwater flow is towards the south-southwest.

- A potential vapor encroachment condition (p-VEC) was not found associated with the subject property.

During the site reconnaissance, the following observations were made:

- The subject property consists of five (5) rectangular shaped parcels of land that encompass approximately 1.06 acres.

- The property is asphalt paved and currently utilized as a parking lot.

- The subject property has a gentle slope towards the south-southwest. Drainage from the site is by sheetflow towards the adjacent streets and adjacent alleyway.

- No evidence of surface drains, catch basins, sumps or standing water was observed on the subject property.

- No evidence of the past use, treatment, storage, disposal or generation of hazardous substances was observed on the subject property.

- No evidence of hazardous substance use was observed on the subject property.

- No evidence of existing aboveground or underground storage tanks, clarifiers, sumps, or grease interceptors was observed on the subject property.

- No evidence of containers of hazardous or unidentified substances was observed on the subject property.

- No evidence of onsite disposal or landfill of solid waste material was observed on the subject property.

- No evidence of PCB containing transformers or equipment was observed on the subject property.

- Heating and cooling equipment was not observed at the time of the site reconnaissance.

- No evidence of wastewater treatment or disposal systems was observed on the subject property.

- No evidence of dry wells, irrigation wells, injection wells, abandoned wells, monitoring wells or other wells was observed on the subject property.

- No evidence of strong, pungent or noxious odors was noted on the subject property.

- No evidence of stressed vegetation was observed on the subject property.

- No evidence of staining or residue was observed on the subject property.

- No evidence of pits, ponds, and/or lagoons was observed on the subject property.

- No other conditions of environmental concern regarding potential sources for soil and groundwater contamination were observed on the subject property.

- The area surrounding the subject property consists of commercial properties.

10.0 CONCLUSIONS AND RECOMMENDATIONS

The subject property consists of five (5) rectangular shaped parcels of land that encompass approximately 1.06 acres. The property is asphalt paved and currently utilized as a parking lot. Access to the property is via Figueroa Street to the west and 8th Street to the south. It is proposed to redevelop the site with a high-rise commercial building with subterranean parking. The city of Los Angeles Planning Department (ZIMAS website) indicates the subject property is zoned for C2-4D commercial use.

Historical site utilization research indicates that the subject property was developed with residential structures from 1888 until the late 1920s. Sanborn Fire Insurance Map research indicates the subject property was developed with residential structures between 1888-1920, and developed with nine stores and the Abbey hotel between 1950-1960. Historical aerial photograph research indicates that the subject property was developed with residences between 1923-1928; is redeveloped with two structures at the southern portion of the property in 1938 and is developed as a parking lot in 1977. No UST records are maintained for the subject property.

The subject property is not identified on the standard environmental government sources researched in this report. Therefore, based on our review of the regulatory databases, the subject site appears in compliance with current local, state and federal environmental regulations. One hundred ten environmental sites, listed on the LUST, Cortese, LOS ANGELES CO. HMS, SLIC, WIP, SWRCY, RCRA-SQG, FINDS, CLEANERS, HAZNET, EMI, UST, CA FID UST, SWEEPS UST, HIST UST, CA WDS and ERNS databases, are located within a one-quarter mile radius of the subject property. The nearest listed environmental concern site is located approximately 100 feet to southwest of the subject property at 823 W. 8th Street, the former location of a dry cleaning facility owned by Bernard De Grazia. The nearest listed contaminated site to the subject property is located approximately 640 feet to the west-southwest of the subject property at 845 S. Figueroa Street. This off-site location is listed as a LUST cleanup site. A gasoline leak was reported on October 19, 1993. This off-site location was issued a case closed status by the RWQCB on March 4, 1996. It is considered unlikely that the subject property was impacted by this off-site release due to distance and flow direction of regional groundwater to the south-southwest.

California Environmental implemented soil-gas sampling to assist in evaluating subsurface contamination associated with volatile organic compounds (VOCs). Soil-gas sampling was implemented onsite on December 2, 2015. Ten (10) probes were placed at 5 and 15 feet below ground surface. Eleven (11) soil-gas samples were collected from seven (7) locations (CESV1-CESV7) including the purge volume tests and sample replicate. Laboratory analysis of soil-gas found benzene between 0.11 and 0.29 ug/L in CESV1-5ft, CESV1-15ft, CESV2-5ft, CESV3-5ft, CESV3-15ft, CESV5-5ft, CESV6-5ft, and CESV7-5ft. All benzene soil gas detections are below the CHHSLs for commercial properties (0.28 ug/L) with the exception of CESV3-15ft (0.29 ug/L), which is slightly above the commercial CHHSL of 0.28 ug/L. The benzene detections are attributed to the property's extended use as a commercial parking lot. Tetrachloroethene (PCE) was detected in samples CESV1-5ft (0.12 ug/L) and CESV1-15ft (0.11 ug/L) at concentrations below residential (0.47 ug/L) and commercial (1.6 ug/L) CHHSLs. The PCE is attributed to an off-site release and due to the localization (found only in one location) and low concentrations is not considered an environmental concern.

Current indoor air quality (including biological agents and mold) is not a concern since there are no structures located on the property. The proposed development includes several levels of ventilated subterranean garage that will mitigate the potential for vapor intrusion into future onsite units. Therefore it is our opinion that vapor intrusion mitigation measures will not be required for the proposed residential/commercial development.

A data failure was encountered during the preparation of this report. The owner questionnaire was not returned to CE. Review of recorded Land Title Records including environmental liens was excluded from this report. These records should be obtained and reviewed by the user. However, research of the subject property's historical use has not revealed any evidence of Activity Use Limitations (AULs).

California Environmental has prepared an Environmental Site Assessment - Phase I in conformance with the scope and limitations of ASTM 1527-13 for the property located at 734-746 S. Figueroa Street and 817 W. 8th Street, Los Angeles, California, 90017, California. **This assessment has revealed no evidence of recognized environmental conditions (RECs), historical recognized conditions (HRECs), or controlled recognized conditions (C-RECs) in connection with the subject property**. The proposed development includes several levels of ventilated subterranean garage that will mitigate

the potential for vapor intrusion into future onsite units. All soil to depths of 25-30 ft will be removed, further reducing the potential for an onsite vapor intrusion condition. Therefore it is our opinion that vapor intrusion mitigation measures are not required for the proposed residential/commercial development.

This report is subject to the following **NOTICE**:

11.0 NOTICE

All properties are subject to some element of environmental risk and the risk cannot be eliminated. Industrial and commercial properties developed prior to modern environmental laws are especially risk prone to environmental hazards which include, but are not limited to, wastes which may be toxic, ignitable, corrosive or reactive. The potential for these environmental hazards to impact the use of the property can be reduced by the identification and mitigation of the hazards prior to development or redevelopment of the property. Due to the difficulty in locating underground wastes, in some cases it is not always possible to ascertain that hazardous wastes are present on the property prior to development.

A Phase I environmental site assessment does not utilize subsurface exploration to check for the presence of hazardous wastes on the property. The experience of the assessor, along with the research of available reports, aerial photographs and land use records are used to evaluate the potential for hazardous wastes to occur on the site. Based on the information gained from the historical research, subsurface exploration may be recommended to check for the presence of hazardous wastes. Preexisting environmental problems such as the presence of hazardous wastes in the soil or groundwater, can be concealed by grading activities and site improvements. If such wastes are present these wastes cannot be observed.

The undersigned, Charles I. Buckley declares that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312 and I have the specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in §312.20.

This report was prepared with the skill and competence as commonly used by environmental professionals in this area. No warranty, expressed or implied, of any kind is made or intended in connection with this report, or by the fact you are being furnished this report, or by any other oral or written statement.

Should you have any questions or desire any additional information, please contact the undersigned.

Respectfully Submitted,

Charles I. Buckley
Professional Geologist No. 4035
Certified Engineering Geologist No. 1250
Certified Hydrogeologist No. 55

12.0 REFERENCES AND QUALIFICATIONS

1. ASTM International, Designation: E1527-13, *Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process*, 2013.

2. ASTM International, Designation: E2600-10, *Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions*, 2010.

3. California Environmental Protection Agency (CalEPA), *California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*, 2015.

4. City of Los Angeles Fire Department, *File Review Request*, December 2015.

5. Los Angeles County Department of Public Works Hydrological Records Division, *Well Information*, December 2015.

6. SCAQMD, *File Review*, December 2015.

7. LACHD, *File Review*, December 2015.

8. RWQCB, *File Review*, December 2015.

9. DTSC, *File Review*, December 2015.

10. EDR Aerial Photo Decade Package, *Inquiry No. 4470840.9*, November 2015.

11. EDR Historical Topographic Map Report, *Inquiry No. 4470840.4*, November 2015.

12. EDR-Radius Map with Geocheck, *Inquiry No. 4470840.2s*, November 2015.

13. EDR-City Directory, *Inquiry No. 4470840.5*, November 2015.

14. Certified Sanborn® Map Report, *Inquiry No. 4470840.3*, November 2015.

15. Major Waste Systems Maps, Los Angeles County, *Map No. 114-197*, June 1972.

16. State of California Division of Oil, Gas and Geothermal Resource, *Well Finder Database, 2015.*

17. USGS 7.5-minute Topographic Map, *Hollywood & Los Angeles Quadrangles*, 2012.

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EDUCATION:

- **Masters** Work in Hydrogeology
  California State University, Los Angeles, 1980-1988
- **Bachelor of Science**, Geology (Engineering Geology)
  University of California, Los Angeles, 1978

REGISTRATIONS AND APPOINTMENTS:

- State of California, Dept. of Conservation, Former Member, State Mining and Geology Board (Appointed by Gov. Pete Wilson and State Senate confirmed to 4 year term, 1997-2001)
- State of California, Certified Hydrogeologist, No. 55
- State of California, Registered Geologist No. 4035
- State of California, Certified Engineering Geologist No. 1250

PROFESSIONAL EXPERIENCE:

Jan 88-Present CALIFORNIA ENVIRONMENTAL
CEO - Principal Hydrogeologist

Founded California Environmental in January of 1988. Clients include Fortune 500 Corporations, County Government, Municipal Agencies, Financial Institutions, Land Developers, and Consultants. Principal Investigator for groundwater supply and groundwater contamination investigations. Project leader for groundwater remediation at a State of California Superfund Sites. Principal hydrogeologist for design and implementation of a groundwater monitoring network for an existing Sanitary Landfill. Lead investigator to delineate structure of a California Groundwater Basin; Pioneered use of a cost effective soil/gas vapor technique used to track groundwater plumes. Conducted over 2000 Phase I Environmental Investigations in California. These investigations included the use and interpretation of historic topographic maps, Sanborn Insurance Maps, aerial photography, and other historic data sources. Successfully completed remedial clean-up on 500+ sites in southern California; including impacts associated with fuels, PCBs, metals, asbestos and chlorinated solvents. Expert consultant for environmental impairment of soil and groundwater: Expert for the Port of Los Angeles, L.A. County Counsel, L.A. City Recreation and Parks and private attorneys.

PROFESSIONAL EXPERIENCE (cont.):

Mar 84-Dec 87 KOVACS-BYER AND ASSOCIATES

Manager Environmental Services Group

Spearheaded the development into the groundwater and environmental segments of consulting market. Ascended from project geologist status to manager of Environmental Services Group. Responsible for all aspects of project management including; organization and staffing, developing technical requirements needed to complete projects, client and agency liaison.

Provided technical leadership for groundwater testing including design and analysis of aquifer pump tests. Lead Geotechnical Investigator for remedial repair of complex landslide terrains. Prepared Seismic Analysis for critical facilities. Recommended specialized drainage systems for abatement of groundwater problems. Project Consultant for award winning projects on which severe geotechnical problems were overcome.

Mar 80-Mar 84 GEOTECHNICAL SERVICES GROUP; BUREAU OF ENGINEERING; CITY OF LOS ANGELES
Assistant Engineering Geologist

Performed geologic mapping in hillside areas of the City of Los Angeles. Reviewed Geotechnical Reports submitted to the City of Los Angeles for private development. Directed landslide investigations. Prepared Expert Opinion documents regarding groundwater and geologic issues for the City Engineer and City Attorney. Conducted field monitoring of known landslides within the City of Los Angeles.

Aug 79-Mar 80 UNITED STATES GEOLOGICAL SURVEY
Field Assistant

Assisted in geological mapping for a uranium resource development project sponsored by the Department of Energy and the United States Geological Survey.

CONTINUING EDUCATION:

- "Advanced Data Analysis Techniques for Evaluating and Quantifying Natural Attenuation for Remediation of Contaminated Sites", NGWA Short Course, March 2007.
- "Technical Guidance for Indoor Air Vapor Intrusion", Severn Trent Laboratory, San Pedro, CA, 1/2005.
- "Low Cost Remediation Techniques", AGSE, San Francisco, CA 2002.
- "Remediation of MtBE", AGSE, Anaheim, CA 2002.
- "Assessment and Management of MtBE Impacted Sites", San Francisco, January 1999.
- "Workshop on MtBE Water Issues", Los Angeles, June 1997.
- "Management Action Programs Seminar", Newport Beach, November 1996.
- "ACWA - Groundwater Workshop", Monterey, June 1995.
- "SeSoil Modeling Workshop" GSC, San Francisco, CA, October 1994
- **CONTINUING EDUCATION (cont.):**

- "Groundwater Monitoring and Remediation", Short Course AEG, October 1992
- "Microbial Processes in Biodegradation", AGSE, Albuquerque NM, February, 1991

- "Introduction to Groundwater Geochemistry", National Water Well Association, San Francisco, CA 1988
- "Fate and Transport of Contaminants in the Subsurface", United States Environmental Protection Agency, San Francisco, CA, December, 1987.
- "How to Monitor and Sample the Vadose Zone "National Water Well Association, San Diego, CA, 1988.
- "Treatment Technology for Contaminated Groundwater" UCLA Fall, 1986.
- "Groundwater Contamination Detection, Monitoring and Cleanup", UCLA, April, 1986.
- "Introduction to Groundwater Modeling", National Water Well Association, Fullerton, CA 1985.

- **ORAL PRESENTATIONS AND SEMINARS:**

- "Overview of Environmental Regulations, State and Federal Laws" Guest Lecturer, University of
- Southern California, 1991.
- "Environmental Risks and Underground Tank Leaks, Commercial Property Inspection"
- California Real Estate Inspectors Association, Santa Monica, CA., May, 1988.
- "Modified Technique for Soil/Gas Surveys to Detect Groundwater Contamination".
- Association of Engineering Geologists, Southern California Section meeting. December, 1987.
- "Historic Aerial Photographic Evidence of Landslide Development, Potrero Canyon, CA."
- Association of Engineering Geologists Annual Meeting, San Francisco, CA., October, 1986.
- "Environmental Issues and Careers", Guest Lecturer, USC Department of Geology, Spring 1992.

PROFESSIONAL PAPERS:

- "Geology, Landslides and Slope Stabilization.
- Potrero Canyon Park, Pacific Palisades, CA."
- Association of Engineering Geologists Guidebook,
- June 20, 1987.
- "Red Rose Landslide Stabilization, 3358-3400
- Red Rose Drive, CA.
- with Hollingsworth, R.A.; Association of Engineering Geologists Guidebook.
- June 20, 1987.
- "Residential Development and Landsliding, Castellammare Mesa area, Los Angeles, CA."
- Association of Engineering Geologists Guidebook.
- June 2, 1984.

AFFILIATIONS:

Association of Engineering Geologists.
Association of Groundwater Scientists and Engineers.
California Groundwater Association.
Hazardous Waste Association of California.
Hydrology Section-American Geophysical Union.
National Water Well Association

ILLUSTRATIONS

Site Photographs - Plates 1-2
Figure 1 - Vicinity Map
Figure 2 - Plot Plan
Figure 3 – Assessment Plan

Southwest portion of the subject property; view to the north
Figueroa Street & W 8th Street, Los Angeles, CA 94105

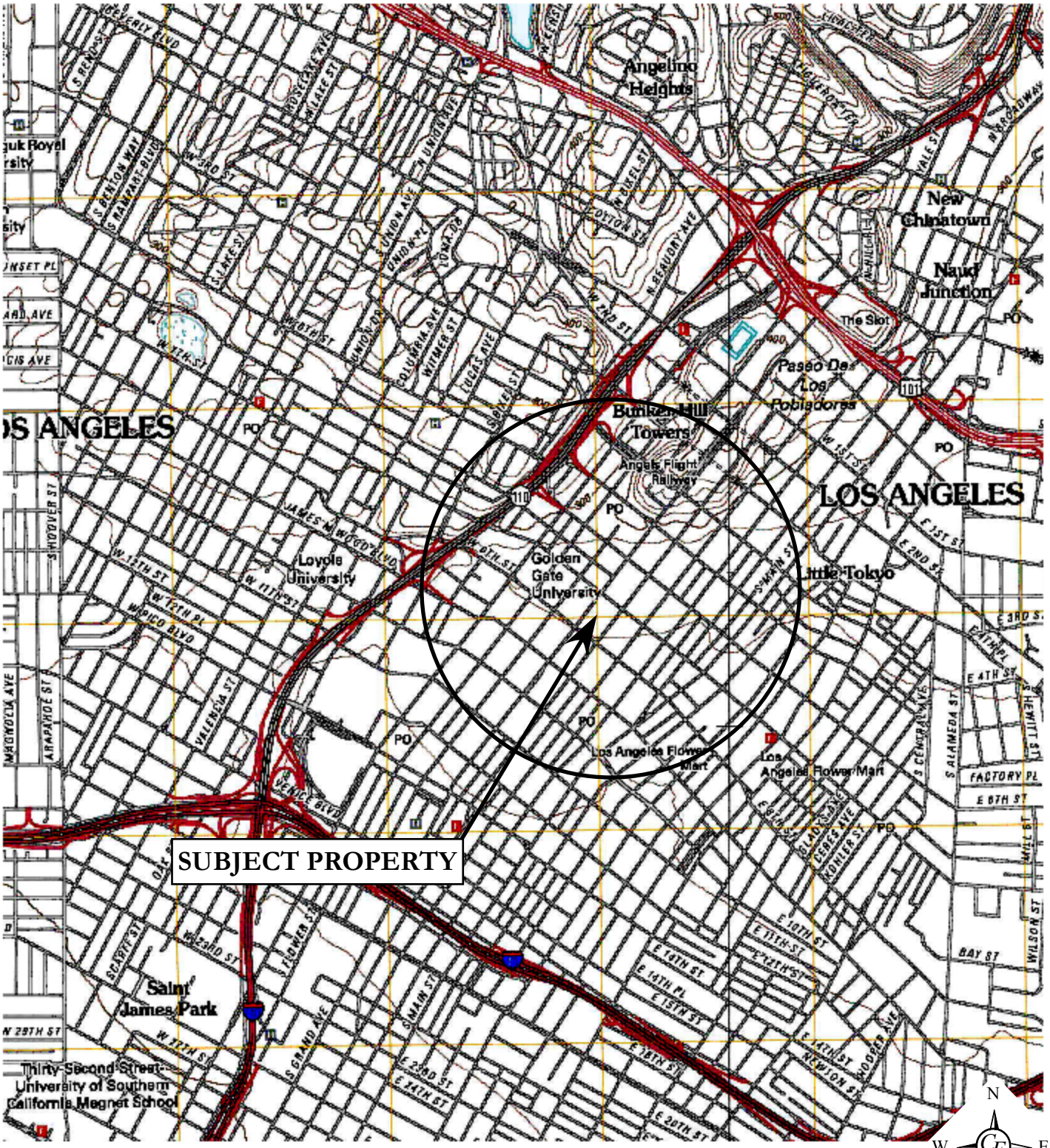
Northeast portion of the subject property; view to the southwest
Figueroa Street & W 8th Street, Los Angeles, CA 94105

PLATE 1

Front loader storage on the southern corner of the property
Figueroa Street & W 8th Street, Los Angeles, CA 94105

Soil cuttings storage on the southern edge of the property
Figueroa Street & W 8th Street, Los Angeles, CA 94105

PLATE 2



References: USGS 7.5' Los Angeles Topographic Quadrangle,
Los Angeles County Assessor's Office Map 4470

FIGURE 1 - VICINITY MAP

Figueroa St. & W 8th St,
Los Angeles, California

Drawn By:	RTB	Job #	EV1115-3429
Checked By:	CIB	Date:	December 2015

California Environmental

References: Google Earth

FIGURE 2 - PLOT PLAN

W 8th Street & S Figueroa Street
Los Angeles, CA

Drawn By:	**RTB**	**Job #**	**EV1115-3429**
Checked By:	**CIB**	**Date:**	**December 2015**

California Environmental

Soil Vapor Point

References: Google Earth

FIGURE 3 - ASSESSMENT PLAN

W 8th Street & S Figueroa Street
Los Angeles, CA

Drawn By:	**RTB**	**Job #**	**EV1115-3429**
Checked By:	**CIB**	**Date:**	**December 2015**

California Environmental

APPENDIX I

Environmental Field Reconnaissance Checklist and Field Interview and User Questionnaires

ENVIRONMENTAL FIELD
RECONNAISSANCE CHECKLIST (PART A)

Completed By: Ryan T, Bzoskie/Greg Buensuceso Title: PM

Property Address: Figueroa & 8th Street Date: 11-25-15

USES OF THE PROPERTY	
1. Name of present occupants of the property (include business names and addresses or unit numbers):	N/A
2. Describe the present use(s) of the property:	Parking Lot
3. Describe the present of adjacent properties:	Office and Commercial
4. Is the property used for an industrial use?	No
5. Is any adjoining property used for an industrial use?	No
6. Is the property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No
7. Is the property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility?	No
8. Is any adjoining property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No
9. Is any adjoining property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility?	No
10. Is the property used for agricultural purposes?	No
PROPERTY CONDITIONS	
11. Are there or have there been any damaged or discarded industrial or automotive batteries on the property?	No
12. Are there currently any solvents, paints, fuels, pesticides, herbicides, or other chemicals, in individual containers larger than 5 gallons or totaling more than 50 gallons, used on or stored at the property?	No
13. Are there currently any industrial drums (typically 55 gallons) or sacks of chemicals located on the property?	Fifteen 55 gallons containing soil cuttings were present on the south portion of the site during the walkover.
14. Is there any visible evidence fill dirt has been brought onto the property from a contaminated site?	No
15. Is there any visible evidence fill dirt has been brought onto the property from an unknown site?	No
16. Are there any waste treatment or waste disposal ponds, pits or lagoons on the property?	No
17. Is there any stained soil, or soil emitting unusual odors, on the property?	No
18. Are there any flooring, drains, or walls in the facility that are stained by substances other than water or have emitted unusual odors?	No

19. Is there heating and cooling equipment onsite?	No
20. What is the fuel source for any onsite heating and cooling equipment?	No
21. Is there any visible evidence of storage tanks (underground or aboveground) at the property?	No
22. Are there currently or have there been any vent pipes, fill pipes, fill ports, or surface covers indicating possible fill ports on the property or adjacent to any building located on the property?	No
23. Is there visible evidence of geotechnical and/or environmental subsurface assessments such as patched borings or groundwater monitoring well covers?	No
24. Are there any oil wells, drilling sumps, mud pits, or oil pipelines on or adjacent to the property?	No
25. Are there any pipelines on, beneath, or adjacent to the property, other than water, sewer, and natural gas utilities serving the property?	No
26. Is the property known to be located in a methane hazard area due to oil fields, natural seepage, or landfill gas?	No
27. Does the property or any facility at the property produce wastewater other than domestic sewage and storm water runoff?	No
28. Are there any waste water treatment systems (clarifiers, oil/water separators, grease traps, filtration systems, etc.) at the property?	No
29. How is waste water from the property disposed of? Sanitary sewer. Septic system. Surface water. Pond, pit, sump, or well. Other (describe).	N/A
30. Does the property or any facility at the property produce solid waste other than domestic trash and greenwaste?	No
31. How is solid waste from the property disposed of? Municipal or private trash service. Recycling. Onsite dumping or burial. Other (describe).	N/A
32. How is solid waste stored at the property?	N/A
33. Does the property or any facility at the property generate hazardous or special waste in the course of normal operation? Examples include spent solvents, photo processing waste, waste oil, used filters, etc. Provide copies of generator notification or waste manifests.	No
34. If hazardous or special wastes are generated at the property, how are they stored?	N/A
35. Are pesticides or herbicides stored, mixed, or disposed of on the property?	No
36. Are there any transformers, capacitors, or hydraulic equipment on the property that are known or suspected of containing PCBs?	No
37. Are there any building materials on the property known or suspected to contain asbestos? Please describe:	No

ENVIRONMENTAL COMPLIANCE	
38. Does the property or any occupant of or facility on the property have any licenses, permits, registrations, or notifications for tanks, pipelines, industrial waste, wastewater treatment, wastewater discharge, stormwater discharge, waste disposal, waste storage or treatment, air emissions, chemical use, or chemical storage?	No
39. Is there visible evidence of any spills, leaks, or other releases or threatened releases of any hazardous substances or petroleum products from the property to soil, groundwater, or surface water?	No
40. Is there visible evidence of any release or threatened release of any hazardous substances or petroleum products from another location to soil, groundwater, or surface water at the property?	No
41. Is there visible evidence of the current or past existence of environmental violations on the property or in any facility located on the property?	No
42. Does the property discharge waste water, other than storm water runoff, into a storm drain or onto adjacent properties or streets?	No
43. Does the property discharge waste water, other than storm water, into a sanitary sewer system?	No
44. Is there visible evidence that hazardous substances, petroleum products, unidentified waste materials, tires, batteries, or any other waste materials have been dumped, buried, or burned on the property?	No

Terra-Petra
ENVIRONMENTAL ENGINEERING
justin@terra-petra.com | terra-petra.com

March 2, 2016

Mitsui Fudosan America
100 First Street, Suite 2350
San Francisco, CA 94105

Attention: **Robert Davidson, Director, Development & Asset Management, tel. 415.840.2501 / email. *rdavidson@mfamerica.com***

Subject: **DRAFT** Summary Report for Methane Soil Gas Investigation, 8th and Figueroa St., Los Angeles, CA.

1.0 INTRODUCTION: The subject property is located on the east side of Figueroa St. between 8th St. and 11th St., and on the west side of an alley in the City of Los Angeles, CA. The site is currently occupied by uncovered, asphalt-paved, on-grade parking lots (See **Exhibit 1, Site Location Map**). It is our understanding that a new high-rise structure having as many as 4-levels of subgrade parking is being proposed for the site. The entire site has an area of approximately 46,381.7 sq. ft.

Terra-Petra under the direction of Mitsui Fudosan America **(Client),** completed a methane soil gas investigation at the subject address in accordance with LADBS Information Bulletin Ref. No. 91.7104.1, P/BC 2002-101 under Terra-Petra's LADBS Methane Testing Lab License #10224. This site is not in a City of Los Angeles designated Methane or Methane Buffer Zone. The investigation that was completed was done so on a voluntary basis at the direction of our client.

2.0 SCOPE OF WORK: The scope of work consisted of contacting the Underground Service Alert (USA Dig-alert) for underground utility clearance, conducting a methane soil gas investigation, installing sampling and testing probes, and the preparation of this summary report.

2.1 Methane Soil Gas Investigation – Shallow Probes: On 2/25/16, Terra-Petra directed a contracted drill crew to excavate a series of five (5) shallow soil gas monitoring probes using hand-auguring equipment to 4 ft. bsg each at locations shown on **Exhibit 2, Probe Locations Map**. Shallow gas monitoring probes were constructed as shown on **Exhibit 3, Shallow Probe Construction Diagram**. Shallow probes were each monitored once on 2/25/16 for detectable combustible gas and soil gas pressure using a calibrated Landtec GEM 5000 portable 4-gas detector, and measurements were recorded in an approved format (See **Exhibit 5, Methane Soil Gas Monitoring Data Spreadsheets**).

Probes were removed after the monitoring events and surface paving was repaired by patching with concrete at each location.

2.2 Methane Soil Gas Investigation – Deep Probe Sets: On 2/25/16 and 2/26/16, Terra-Petra directed a truck-mounted Marl 10/Marl 11 drill rig with an 8-in. diameter hollow-stem, continuous-flight auger to drill three (3) soil borings to a total depth of 60' bsg each (See **Exhibit 2, Probe Locations Map**). Each of the three (3) deep soil borings were converted to deep soil gas monitoring probes with nested probes at 45 ft., 50 ft. and 60 ft. bsg. (See **Exhibit 4, Deep Probe Construction Diagrams**.) Deep probe sets were each monitored twice by Terra-Petra personnel for detectable combustible gas and soil gas pressure using a calibrated Landtec GEM 5000 portable 4-gas detector, and measurements were recorded in an approved format (See **Exhibit 5, Methane Soil Gas Monitoring Spreadsheets)**. Where combustible gas concentrations were detected, an inline activated carbon filter was used at the detector inlet to strip non-methane hydrocarbons from the sample stream thus to allow the measurement of combustible gas as methane.

One (1) soil gas sample was collected from the DP-2 @ 45' gas monitoring probe in an appropriately labeled Tedlar bag using a hand squeeze-bulb sample pump and transported to JEL using strict Chain-of-custody protocol. This sample was tested for detectable methane concentrations using ASTM Method D1946 (See **Exhibit 6, Laboratory Report, Methane Gas Testing**).

3.0 FINDINGS: Findings for the on-site methane soil gas investigation are presented below.

3.1 Methane Soil Gas Investigation: Results for soil gas monitoring of combustible gas at each shallow soil gas monitoring probe showed non-detectable levels for combustible gas as methane, with all pressures less than 2-in. water column.

Results for soil gas monitoring of methane gas at deep probe sets DP-1, DP-2 and DP-3 all showed detectable levels for methane with pressures less than 2-in. water column. The highest record field reading was at DP-2 @ 45'. Results for soil gas monitoring of methane gas at this probe showed methane at 10.7 percent by volume (%,v/v), or 107,000 ppmv.

Results from the 3rd party independent laboratory testing at DP-2 @ 45' showed methane at 9.04 percent by volume (%,v/v), or 90,400 ppmv. This verifies that the field readings are accurate. Methane gas is combustible at a range between 5 to 15 percent by volume (%,v/v), or 50,000-150,000 ppmv.

4.0 CONCLUSIONS:

Elevated methane levels were found in all three deep sets, with combustible levels detected in DP-2 at 45' and 50' BSG. Soil Gas Pressures were non-existent, registering less than 0.0 inches of water column pressure. Per the City of Los Angeles ORDINANCE NO. 175790, DIVISION 71 METHANE SEEPAGE REGULATIONS SEC. 91.7101., the division sets forth the minimum requirements of the City of Los Angeles for control of methane intrusion emanating from geologic formations for those properties that lie within a designated methane or methane buffer zone. The requirements do not regulate flammable vapor that may originate in and propagate from other sources, which include, but are not limited to, ruptured hazardous material transmission lines, underground atmospheric tanks, or similar installations. It does also not regulate properties that fall outside of the designated methane and methane buffer zones. Thus, the requirements do not pertain to methane detected on this property.

"Although methane is not toxic, it is combustible and potentially explosive at concentrations greater than 53,000 parts per million (ppm) in the presence of oxygen. This concentration, referred to as methane's Lower Explosive Level or LEL, is the concentration at which methane is considered hazardous. Because it is lighter than air, methane has a natural tendency to rise to the ground surface, where it typically dissipates into the atmosphere. As methane is generated it migrates in the subsurface, however, the potential exists for it to accumulate beneath slab-on-grade foundations. If the gas accumulates at high concentrations and becomes pressurized, and one or more cracks or other penetrations exist in the floor slab, detectable levels of methane may enter the interior of a structure." Tofani, G., Amini H., Alexander, G., Hudnall, M., Villalobas, B. The MTrans Methane Gas Migration Model., Methane Gas Technical Working Group., (June 25, 2002)

5.0 RECOMMENDATIONS:

Based on the findings and conclusions presented above, there are no requirements obligating any proposed improvements at this site to comply with ORDINANCE NO. 175790, DIVISION 71 METHANE SEEPAGE REGULATIONS SEC. 91.7101. However, given that combustible levels of methane gas were detected at DP-2 we would recommend that consideration be given to installing a methane mitigation system beneath the proposed development to prevent against any potential methane gas intrusion into the building. In our opinion, due to the absence of pressure gradients in the soil during our investigation there appears to be a low risk for methane gas intrusion into any proposed structures at this site. We would still recommend that a Methane Mitigation System in compliance with the City of Los Angeles Department of Building and Safety's **Methane Zone – Level II, < 2-in. water column pressure, no de-watering system** be designed and installed for the proposed improvements at the subject site. The methane mitigation system will serve to protect the structure from any potential methane gas intrusion that could occur at the site now and in the future. A description of the mitigation system is outlined below.

Terra-Petra recommends that a permeable aggregate layer of either sand or ¾" gravel two (2) inches thick be placed directly beneath the slab. Below the gravel layer shall be a Passive Sub-Slab Methane Venting (SSV) system consisting of a 4" dia. Perforated ADS pipe within a 12" X 12" trench lined with an 8 oz. per sy. geotextile and filled with ¾" gravel. The SSV system is designed to function by providing a pathway to allow methane gas/soil gas pressures to migrate to the exterior of the building (roof) rather than entering a building. The SSV systems will be emplaced below the floor slab to allow soil gas to move laterally under natural diffusion or pressure gradients to a collection piping system for discharge to the atmosphere. The SSV system in and of itself is effective in mitigating any potential methane intrusion at this site.

Terra-Petra is also proposing that a methane/waterproofing barrier membrane having a Los Angeles Research Report for such use be installed over the top of the gravel layer, beneath the floor slab and at all subterranean walls. Methane barrier membranes ideally cause methane gas that would otherwise enter the building to migrate laterally to the sub-slab collection piping system and vent to the atmosphere.

Methane Barrier Membranes used in combination with a passive Sub-Slab Venting System improve the performance of the overall Methane Mitigation System. The liner system serves as a secondary containment system to prevent any gasses not collected by the SSV system from entering the building. It is this dual system that offers the best protection from Methane Intrusion.

Methane barrier membranes are not able to completely eliminate methane intrusion due to the potential of punctures, perforations and tears. As such, they must be well protected in order to be effective. Effective protection courses include 10oz per sy. geotextile, 2" sand course, or a 2" non-reinforced slurry or waste slab. The specific protection course that is selected, as well as the proposed means and methods for construction staging, will be based on the geotechnical and structural engineer's recommendations.

6.0 STATEMENT OF LIMITATIONS: The guidelines presented in this summary report are based upon the services described herein and the scope of work for this survey. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geologists and environmental scientists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice in this report. Any change in the existing conditions at the subject site should be brought immediately to the attention of Terra-Petra. If the information related to us or further observations by Mitsui Fudosan America reveal unanticipated or changed conditions, Terra-Petra reserves the right to make alterations or additions to the original recommendations.

The recommendations have been prepared specifically for the subject site and are to be used only by Mitsui Fudosan America and authorized clients, consultants, and subcontractors on this subject site. No information contained herein may be reproduced, imitated, or used in any way other than for the above referenced project.

The opportunity to be of service is appreciated. If there are any questions, please contact Justin Conaway at (213) 458-0494.

Sincerely, Terra-Petra

John R. Conaway
CA RCE #19689

ATTACHMENTS

Exhibit 1 **Site Location Map**
Exhibit 2 **Probe Locations Maps**
Exhibit 3 **Shallow Probe Construction Diagram**
Exhibit 4 **Deep Probe Construction Diagrams**
Exhibit 5 **Methane Soil Gas Monitoring Data Spreadsheets**
Exhibit 6 **Laboratory Reports, Methane Gas Testing**

Exhibit 1

Site Location Map

LOS ANGELES

700 S. Flower St., Ste. 2580
Los Angeles, CA 90017
p 213.458.0494
f 213.788.3564

SAN FRANCISCO

One Sansome St., Ste. 3500
San Francisco, CA 94104
p 415.590.4890
f 415.590.4891

DENVER

3801 E. Florida St., Ste. 400
Denver, CO 80210
p 303.991.5876
f 303.759.8477

NEW YORK

One Penn Plaza, 36th Fl.
New York, NY. 10019
p 212.786.7456
f 212.786.7317

MITSUI FUDOSAN • RELATED

8TH AND FIG.

JOHNSON FAIN

ALTA/ACSM LAND TITLE SURVEY

817 W. 8TH STREET AND 734–744 S. FIGUEROA STREET
LOS ANGELES, CALIFORNIA

LEGEND:

A/C – ASPHALTIC CONCRETE
APN – ASSESSORS PARCEL NUMBER
CATV – CABLE TELEVISION
CEFB – CITY ENGINEERS FIELDBOOK
CLF – CHAIN LINK FENCE
COMM – COMMUNICATIONS
DIST. – DISTANCE
D/W – DRIVEWAY
E. – EAST
EST. – ESTABLISHED
FD. – FOUND
FL – FLOW LINE
FS – FINISH SURFACE
G – GUTTER
LS – LICENSED SURVEYOR
LT&T – LEAD, TACK AND TAG
N – NORTH
PB – PULLBOX
P.O.B. – POINT OF BEGINNING
REC. – RECORD
REF. – REFERENCE
R/W – RIGHT OF WAY
S – SOUTH
SFN. – SEARCHED, FOUND NOTHING
SMH – SEWER MANHOLE
TC – TOP OF CURB
T.R. – TITLE REPORT
(TYP) – TYPICAL
W – WEST
W/ – WITH

20' 0' 20' 40'

SCALE: 1" = 20'

UTILITY NOTE:

THE UTILITIES SHOWN HEREON WERE BASED ON OBSERVED EVIDENCE ONLY. THE SURVEY WOULD NOT SHOW UTILITIES COVERED BY CARS/TRUCKS OR RECENTLY PAVED ASPHALT/CONCRETE. THE SUBJECT PROPERTY APPEARS TO CONTAIN THE NECESSARY UTILITIES TO PERFORM NORMAL OPERATION.

PARKING SPACE TABLE	
TYPE OF SPACE	TOTAL EXISTING
STANDARD	219
HANDICAP	2
TOTAL	221

SITE RESTRICTIONS:

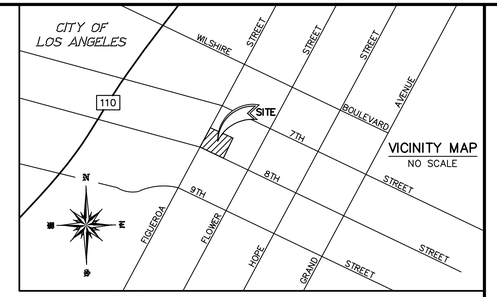
SETBACKS:

FRONT – NONE SIDE – NONE
STREET SIDE – NONE REAR – NONE
HEIGHT – NONE
ZONE – C2–4D

FLOOR AREA RATIO – 13:1
PARKING REQUIREMENT – N/A

ALL SITE RESTRICTIONS WERE OBTAINED PER THE CITY OF LOS ANGELES (PLANNING DEPARTMENT).
NAVIGATELA.LACITY.ORG

*ZONING AND RESTRICTIONS SHOWN HEREON WERE OBTAINED BY A GENERAL REQUEST AT THE PUBLIC COUNTER OF THE ABOVE NAMED DEPARTMENT. NO REPRESENTATION IS MADE FOR THE ACCURACY OR COMPLETENESS OF SAID THIRD PARTY INFORMATION. THIS FIRM IS NOT AN EXPERT IN THE INTERPRETATION OF COMPLEX ZONING ORDINANCES, COMPLIANCE IS BEYOND THE SCOPE OF THIS SURVEY. ANY USER OF SAID INFORMATION MUST CONTACT THE LOCAL AGENCY DIRECTLY. THIS INFORMATION IS NOT PROVIDED FOR DESIGN PURPOSES.



VICINITY MAP
NO SCALE

DATUM STATEMENT:

BENCHMARK ID: LA CITY BM NO. 12–06431

DESCRIPTION: SPIKE LOCATED IN THE WEST CURB OF FIGUEROA STREET; 18 FEET NORTH OF THE BEGINNING CURB RETURN OF NORTH 8TH STREET IN THE NORTH END OF A CATCH BASIN.

ELEVATION: 263.383
DATUM: NAVD88

FLOOD NOTE:

ZONE – "X" PER FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 06037 C 1620 F EFFECTIVE SEPTEMBER 26, 2008.

ZONE "X" DENOTES AREAS SUBJECT TO MINIMAL FLOODING

THE ABOVE STATEMENT IS FOR INFORMATION ONLY AND THIS SURVEYOR ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THE CITED MAP(S). IN ADDITION, THE ABOVE STATEMENT DOES NOT REPRESENT THIS SURVEYOR'S OPINION OF THE PROBABILITY OF FLOODING.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS NORTH 37°51'00" WEST ALONG THE CENTERLINE OF FLOWER STREET, AS SHOWN ON THE MAP OF TRACT NUMBER 1696, FILED IN BOOK 20, PAGE 80 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY, STATE OF CALIFORNIA.

STATEMENT OF POSSIBLE ENCROACHMENTS:

NOTE: THE FOLLOWING IS A LISTING OF OBSERVED IMPROVEMENTS THAT CROSS PROPERTY LINES, STATEMENT OF OWNERSHIP OR POSSESSION IS NEITHER IMPLIED NOR THE INTENT OF THIS LISTING.

(A) – WROUGHT IRON FENCE LIES 0.3' SOUTHWEST OF THE RIGHT OF WAY.

LAND AREA:

(GROSS)
50,335 SQUARE FEET
1.15 ACRES

(NET)
46,546 SQUARE FEET
1.06 ACRES

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF LOS ANGELES, IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1:

LOT 6 AND A PART OF LOT 7 IN BLOCK 30 OF THE HUBER TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 2 PAGE 280 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT THE POINT OF INTERSECTION OF THE NORTHERLY LINE OF EIGHTH STREET WITH THE EASTERLY LINE OF FIGUEROA (FORMERLY PEAL STREET), AS SAID STREETS ARE SHOWN ON SAID MAP; THENCE NORTHERLY ALONG THE EASTERLY LINE OF FIGUEROA STREET 100 FEET; THENCE EASTERLY PARALLEL WITH THE NORTHERLY LINE OF EIGHTH STREET, 165 FEET, MORE OR LESS, TO THE EASTERLY LINE OF SAID LOT 7; THENCE SOUTHERLY PARALLEL WITH THE EASTERLY LINE OF FIGUEROA STREET, 100 FEET TO THE NORTHERLY LINE OF EIGHTH STREET; THENCE WESTERLY ALONG SAID NORTHERLY LINE, 165 FEET, MORE OR LESS, TO THE POINT OF BEGINNING.

PARCEL 2:

THE NORTHEAST 20 FEET OF LOT 7 AND THE SOUTHWEST 30 FEET OF LOT 8 IN BLOCK 30 OF THE HUBERT TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 2 PAGE 280 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL 3:

ALL OF LOTS 9 AND 10 AND THAT PORTION OF LOT 8, ALL IN BLOCK 30 OF THE HUBER TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 2 PAGE 280 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS A WHOLE AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHEASTERLY LINE OF FIGUEROA STREET, DISTANT NORTHEASTERLY THEREON 150 FEET FROM THE NORTHEASTERLY LINE OF EIGHTH STREET, AS SAID STREETS ARE SHOWN ON SAID MAP OF THE HUBER TRACT; THENCE NORTHEASTERLY, ALONG SAID FIGUEROA STREET, TO THE MOST NORTHERLY CORNER OF SAID LOT 10; THENCE SOUTHEASTERLY ALONG THE NORTHEASTERLY LINE OF SAID LOT 10, TO THE MOST EASTERLY CORNER OF SAID LOT 10; THENCE SOUTHWESTERLY, ALONG THE SOUTHEASTERLY LINES OF SAID LOTS 10, 9 AND 8, TO A POINT ON A LINE THAT IS PARALLEL WITH THE NORTHEASTERLY LINE OF SAID EIGHTH STREET AND WHICH PASSES THE POINT OF BEGINNING; THENCE NORTHWESTERLY, ALONG SAID PARALLEL LINE TO THE POINT OF BEGINNING.

APN: 5144–010–010 THROUGH 014

ITEMS CORRESPONDING TO SCHEDULE "B":

BY: CHICAGO TITLE COMPANY
725 SOUTH FIGUEROA STREET
SUITE 200
LOS ANGELES, CA 90017
(213) 488–4300

TITLE NO.: 00046209–994–X49
TITLE OFFICER: DAVE BALASSI
DATED: OCTOBER 22, 2015

THE FOLLOWING ITEMS WERE FOUND IN SAID COMMITMENT AND ARE REFERENCED ON THIS MAP. COVENANTS, CONDITIONS, RESTRICTIONS, TERMS AGREEMENTS AND MATTERS LISTED HEREON CONTAIN NUMEROUS ITEMS THAT AFFECT THE SUBJECT PROPERTY, CONTENTS MUST BE REVIEWED TO DISCERN SPECIFICS.

(1) – WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT DISCLOSED BY THE PUBLIC RECORDS. THE EXTENT TO WHICH THIS ITEM AFFECTS THE SUBJECT PROPERTY CANNOT BE ASCERTAINED FROM EXAMINATION OF THE ABOVE REFERENCED TITLE REPORT AND SUPPORTIVE DOCUMENTS CONTAINED THEREIN.

(2) – AN EASEMENT FOR PUBLIC STREET RECORDED JANUARY 10, 1917 AS RECORDING NO. 153 IN BOOK 6408, PAGE 69 OF DEEDS. THIS ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(3) – AN EASEMENT FOR PUBLIC ALLEY RECORDED JULY 20, 1927 AS RECORDING NO. 1677 IN BOOK 6730, PAGE 178 OF OFFICIAL RECORDS. THIS ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(4) – THE FACT THAT SAID LAND IS LOCATED WITHIN A PROJECT AREA OF THE REDEVELOPMENT AGENCY AS DISCLOSED BY DOCUMENT RECORDED JULY 22, 1975 AS RECORDING NO. 3675 AND JULY 30, 1975 AS RECORDING NO. 3868, BOTH OF OFFICIAL RECORDS. THIS ITEM AFFECTS THE SUBJECT PROPERTY, IS BLANKET IN NATURE AND IS NOT PLOTTED HEREON.

ITEMS #'S SHOWN HEREON ARE STATED AS EXCEPTIONS ON ABOVE REFERENCED COMMITMENT. NO RESPONSIBILITY FOR THE COMPLETENESS, ACCURACY, OR CONTENT OF SAID REPORT IS ASSUMED BY THIS MAP.

SURVEY NOTES:

–THERE WERE NO MONUMENTS FOUND OR SET AT THE PROPERTY LINE CORNERS UNLESS OTHERWISE NOTED.
–THE INFORMATION COURSES AND DISTANCES SHOWN ON THIS SURVEY PRINT ARE TRUE AND CORRECT AND ACCURATELY REPRESENT THE BOUNDARIES AND AREA OF THE PREMISES.
–THERE IS NO VISIBLE EVIDENCE THAT THE SITE WAS USED FOR AS A SUMP, DUMP OR SANITARY LANDFILL.
–THERE IS NO VISIBLE EVIDENCE OF CEMETERIES ON SUBJECT PROPERTY.
–AT THE TIME OF SURVEY NO EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR ADDITIONS WERE OBSERVED.
–NO RECENT CHANGES IN STREET RIGHTS–OF–WAY WERE OBSERVED AT THE TIME OF SURVEY.
–THIS SURVEY HAS BEEN PREPARED FOR TITLE INSURANCE PURPOSES ONLY. THIS SURVEY DOES NOT CONTAIN SUFFICIENT DETAIL FOR DESIGN PURPOSES.
–THE RELATIVE POSITIONAL ACCURACY OF CALLED OUT IMPROVEMENTS SHOWN ON THE SURVEY IS WITHIN +/– 0.1' OF THEIR ACTUAL LOCATIONS.
–UNLESS THIS PLAN HAS THE SEAL AND SIGNATURE OF THE SURVEYOR AND/OR ENGINEER RESPONSIBLE FOR ITS PREPARATION, THIS IS NOT AN AUTHENTIC COPY OF THE ORIGINAL SURVEY AND SHALL NOT BE DEEMED RELIABLE.
–JRN CIVIL ENGINEERS ASSUMES NO LIABILITY FOR THE ACCURACY OR COMPLETENESS OF ANY THIRD PARTY INFORMATION REFERENCED OR REPRESENTED HEREON, ANY OF SAID INFORMATION SHOWN HEREON HAS BEEN PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
–AS OUTLINED IN SECTION 8770.6 OF THE BUSINESS AND PROFESSIONS CODE "THE USE OF THE WORD "CERTIFY" OR "CERTIFICATION" BY A LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER IN THE PRACTICE OF PROFESSIONAL ENGINEERING OR LAND SURVEYING OR THE PREPARATION OF MAPS, PLATS, REPORTS, DESCRIPTIONS, OR OTHER SURVEYING DOCUMENTS ONLY CONSTITUTES AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THOSE FACTS OR FINDINGS WHICH ARE THE SUBJECT OF THE CERTIFICATION, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED."

SURVEYOR'S CERTIFICATE:

TO: MITSUI FUDOSAN AMERICA AND CHICAGO TITLE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 6, 7(a), 7(b)(1), 7(c), 8, 9, 11(a), 13, 14, 16, 17, AND 18 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON NOVEMBER 20, 2015.

DANIEL S. COOK L.S. NO. 4964

LICENSED LAND SURVEYOR
DANIEL S. COOK
L.S. No. 4964
STATE OF CALIFORNIA

REVISIONS

JRN CIVIL ENGINEERS
232 AVENIDA FABRICANTE, SUITE 107
SAN CLEMENTE, CALIFORNIA 92672
(949) 248–4685 FAX (949) 248–4687

ALTA/ACSM LAND TITLE SURVEY
ADDRESS: 817 W. 8TH STREET AND 734–744 S. FIGUEROA STREET LOS ANGELES, CALIFORNIA
CLIENT: MITSUI FUDOSAN AMERICA

SCALE: 1" = 20'
DATE: 11/25/15
DRAWN BY: BK
CHKD. BY: JLM

SHEET 1 OF 1
FILE NO. 15168

Exhibit 2

Probe Locations Map

LOS ANGELES

700 S. Flower St., Ste. 2580
Los Angeles, CA 90017
p 213.458.0494
f 213.788.3564

SAN FRANCISCO

One Sansome St., Ste. 3500
San Francisco, CA 94104
p 415.590.4890
f 415.590.4891

DENVER

3801 E. Florida St., Ste. 400
Denver, CO 80210
p 303.991.5876
f 303.759.8477

NEW YORK

One Penn Plaza, 36th Fl.
New York, NY. 10019
p 212.786.7456
f 212.786.7317

SOIL GAS MONITORING PROBE LOCATIONS

MARCH 1, 2016

PARKING LOT,
8TH & FIGUEROA ST.
LOS ANGELES, CA. 90017

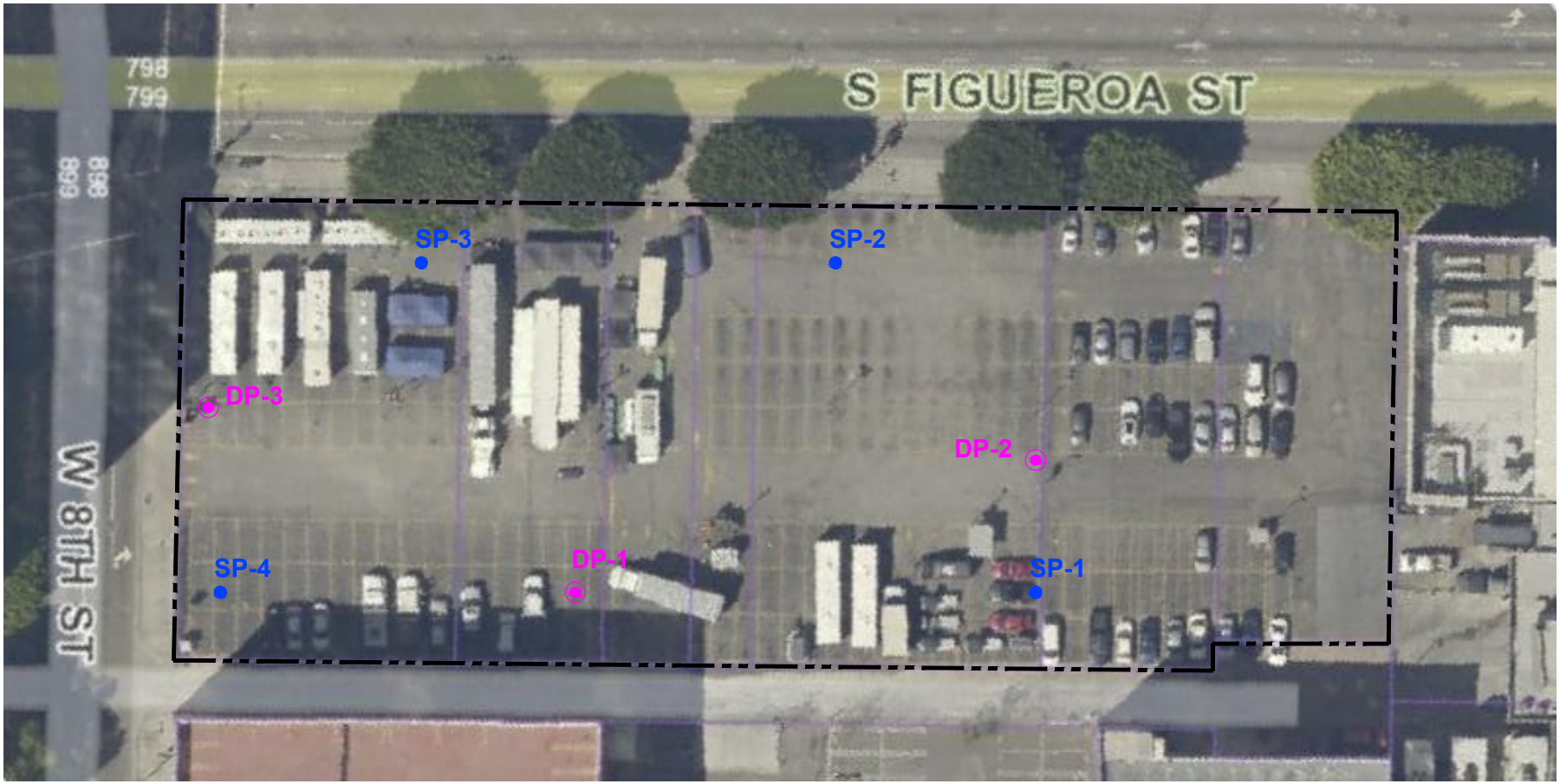


IMAGE SOURCE: PARCEL VIEWER

LEGEND

SP-4 SHALLOW PROBE

DP-4 DEEP PROBE

APPROXIMATE PROPERTY LINE

0' 30' 60'

SCALE: 1" = 60'

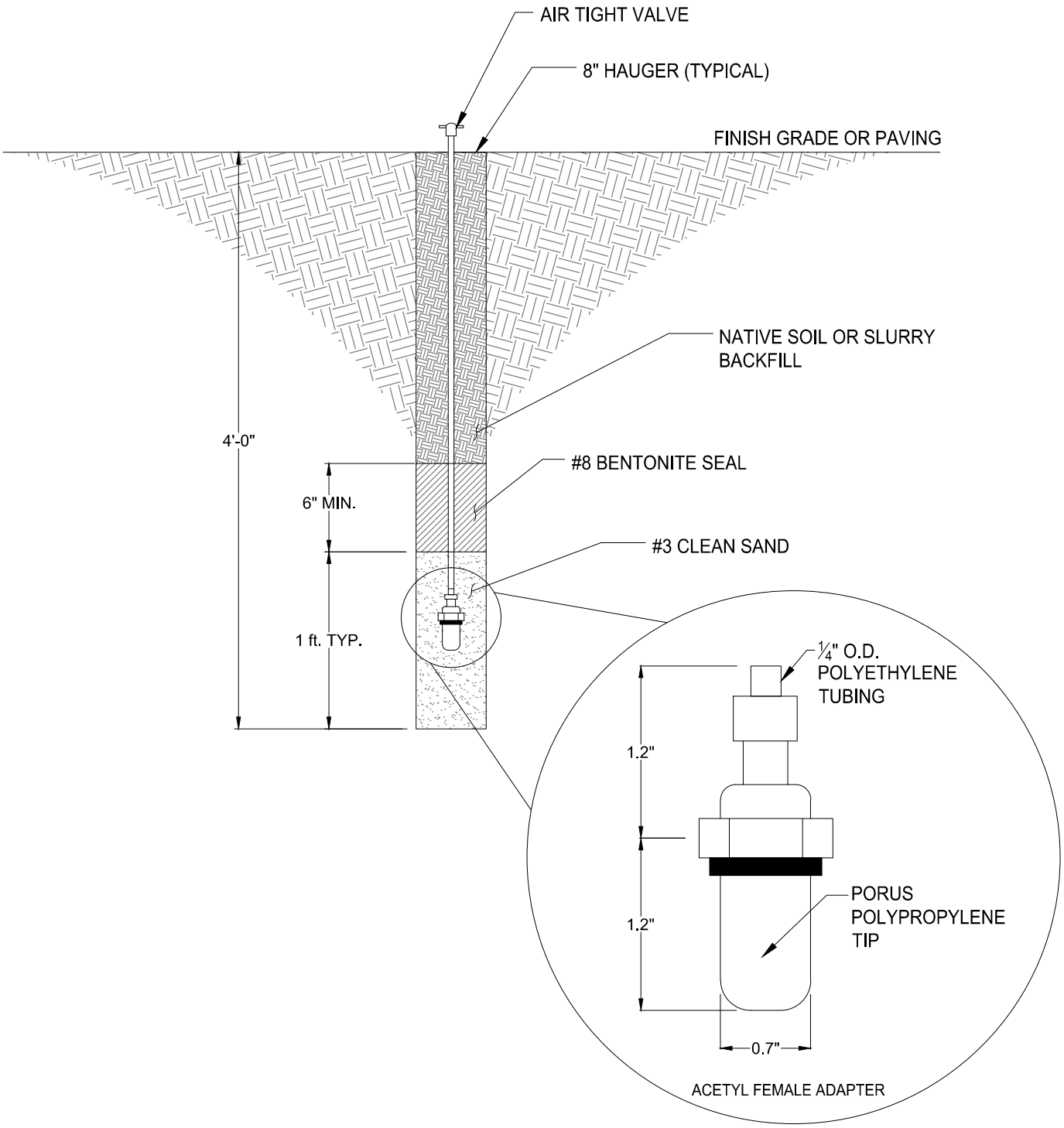
TERRA-PETRA

LOS ANGELES
100 E. CORSON ST. SUITE 2360
LOS ANGELES, CA. 90017
T: (213) 458-0464
F: (213) 788-3964

SAN FRANCISCO
ONE SANSOME ST., SUITE 3500
SAN FRANCISCO, CA. 94104
T: (415) 590-4880
F: (415) 590-4881

Exhibit 3

Shallow Probe Construction Diagram



TERRA-PETRA

LOS ANGELES
700 S. FLOWER ST. SUITE 2580
LOS ANGELES, CA. 90017
T: (213) 458-0494
F: (213) 788-3564

SAN FRANCISCO
ONE SANSOME ST. SUITE 3500
SAN FRANCISCO, CA. 94104
T: (415) 590-4890
F: (415) 590-4891

817 W. 8TH STREET
LOS ANGELES, CA. 90017

CONSTRUCTION DIAGRAM FOR
SWALLOW PROBE AT 4 FT.

MARCH 1, 2016

Exhibit 4

Deep Probe Construction Diagrams

LOS ANGELES

700 S. Flower St., Ste. 2580
Los Angeles, CA 90017
p 213.458.0494
f 213.788.3564

SAN FRANCISCO

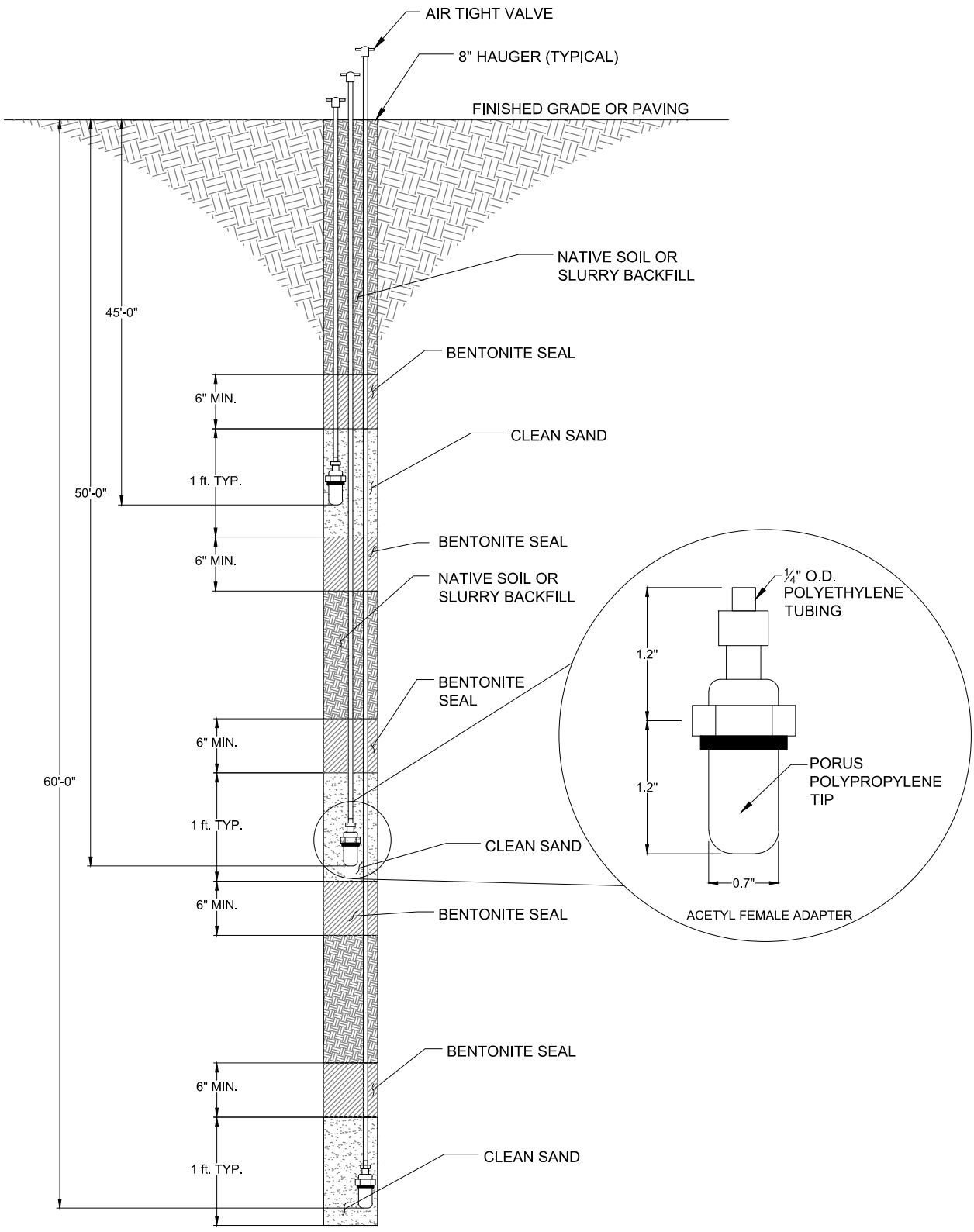
One Sansome St., Ste. 3500
San Francisco, CA 94104
p 415.590.4890
f 415.590.4891

DENVER

3801 E. Florida St., Ste. 400
Denver, CO 80210
p 303.991.5876
f 303.759.8477

NEW YORK

One Penn Plaza, 36th Fl.
New York, NY. 10019
p 212.786.7456
f 212.786.7317



TERRA-PETRA
LOS ANGELES
700 S. FLOWER ST. SUITE 2580
LOS ANGELES, CA. 90017
T: (213) 458-0494
F: (213) 788-3564
SAN FRANCISCO
ONE SANSOME ST. SUITE 3500
SAN FRANCISCO, CA. 94104
T: (415) 590-4890
F: (415) 590-4891

817 W. 8TH STREET
LOS ANGELES, CA. 90017

CONSTRUCTION DIAGRAM FOR
DEEP PROBE AT 60 FT.

MARCH 1, 2016

Exhibit 5

Methane Soil Gas Monitoring Data Spreadsheets

LOS ANGELES
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f 212.786.7317

Soil Gas Investigation Spreadsheet

Site Location:		**Parking Lot, 8th St. and Figueroa St., Los Angeles, CA 90017.**									
Date:		**2/25/16**									
Time:		**0700hr.**									
Weather conditions:		**Clear, warm, still, dry.**									
Instrument:		**Landtec GEM 5000 portable 4-gas detector (I/R for methane).**									
Barometric Pressure:		**30.07-in. Hg**									
Drilling Method:		**Truck-mounted CME-95 hollow-stem continuous-flight auger.**									
		Probe Press.	**Combustible Gas**		**Methane***	**CO_2**	**O_2**	**N_2**			
Probe No.	**Depth**	**(in-H20)**	**(%v/v)**		**(%v/v)**	**(%v/v)**	**(%v/v)**	**(%v/v)**	**Comments:**		
SP-1	**4.0**	**0.0**	**ND**			**0.9**	**20.1**	**Bal.**			
SP-2	**4.0**	**0.0**	**ND**			**0.6**	**20.3**	**Bal.**			
SP-3	**4.0**	**0.0**	**ND**			**0.4**	**20.2**	**Bal.**			
SP-4	**4.0**	**0.0**	**ND**			**0.2**	**20.1**	**Bal.**			
SP-5	**4.0**	**0.0**	**ND**			**0.5**	**20.2**	**Bal.**			
DP-1	**45.0**	**0.0**			**ND**	**0.9**	**20.2**	**Bal.**			
	50.0	**0.0**			**ND**	**0.5**	**20.1**	**Bal.**			
	60.0	**0.0**			**0.2**	**1.0**	**19.0**	**Bal.**			
DP-2	**45.0**	**0.0**			**0.9**	**1.0**	**18.6**	**Bal.**			
	50.0	**0.0**			**1.0**	**1.5**	**18.5**	**Bal.**			
	60.0	**0.0**			**0.7**	**1.1**	**18.1**	**Bal.**			
DP-3											
(Note: ND = Not Detected. *= measurement using in-line carbon filter.)											

DL SCIENCE, INC.
532 W. Maple ave.
El Segundo. CA 90245
tel. (310) 416-1472
dllucero@sbcglobal.net

Soil Gas Investigation Spreadsheet

Site Location:		**Parking Lot, 8th St. and Figueroa St., Los Angeles, CA 90017.**									
Date:		**2/26/16**									
Time:		**0700hr.**									
Weather conditions:		**Fog, warm, still, moderately humid.**									
Instrument:		**Landtec GEM 5000 portable 4-gas detector (I/R for methane).**									
Barometric Pressure:		**30.10-in. Hg**									
Drilling Method:		**Truck-mounted CME-95 hollow-stem continuous-flight auger.**									
		Probe Press.	**Combustible Gas**		**Methane***	**CO_2**	**O_2**	**N_2**			
Probe No.	**Depth**	**(in-H20)**	**(%v/v)**		**(%v/v)**	**(%v/v)**	**(%v/v)**	**(%v/v)**	**Comments:**		
DP-1	**45.0**	**0.0**			**ND**	**1.7**	**18.1**	**Bal.**			
	50.0	**0.0**			**ND**	**2.1**	**17.6**	**Bal.**			
	60.0	**0.0**			**ND**	**1.3**	**17.0**	**Bal.**			
DP-2	**45.0**	**0.0**			**10.7**	**6.0**	**5.6**	**Bal.**	**Sampled.**		
	50.0	**0.0**			**8.7**	**8.5**	**5.6**	**Bal.**			
	60.0	**0.0**			**1.3**	**1.0**	**13.5**	**Bal.**			
DP-3	**45.0**	**0.0**			**0.1**	**0.3**	**20.4**	**Bal.**			
	50.0	**0.0**			**ND**	**0.3**	**20.2**	**Bal.**			
	60.0	**0.0**			**ND**	**0.4**	**19.2**	**Bal.**			
(Note: ND = Not Detected. *= measurement using in-line carbon filter.)											

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dllucero@sbcglobal.net

Soil Gas Investigation Spreadsheet

Site Location:		**Parking Lot, 8th St. and Figueroa St., Los Angeles, CA 90017.**									
Date:		**2/27/16**									
Time:		**0700hr.**									
Weather conditions:		**Fog, warm, still, moderately humid.**									
Instrument:		**Landtec GEM 5000 portable 4-gas detector (I/R for methane).**									
Barometric Pressure:		**30.06-in. Hg**									
Drilling Method:		**Truck-mounted CME-95 hollow-stem continuous-flight auger.**									
		Probe Press.	**Combustible Gas**		**Methane***	**CO_2**	**O_2**	**N_2**			
Probe No.	**Depth**	**(in-H20)**	**(%v/v)**		**(%v/v)**	**(%v/v)**	**(%v/v)**	**(%v/v)**	**Comments:**		
DP-1	**45.0**										
	50.0										
	60.0										
DP-2	**45.0**										
	50.0										
	60.0										
DP-3	**45.0**	**0.0**			**ND**	**0.6**	**19.0**	**Bal.**			
	50.0	**0.0**			**ND**	**1.3**	**18.6**	**Bal.**			
	60.0	**0.0**			**ND**	**1.0**	**18.2**	**Bal.**			
(Note: ND = Not Detected. *= measurement using in-line carbon filter.)											

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Exhibit 6

Laboratory Reports, Methane Gas Testing

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Terra-Petra	**Report date:**	2/26/2016
Client Address:	700 S. Flower Street, Suite 2580 Los Angeles, CA 90017	**JEL Ref. No.:**	ST-9143
Attn:	David L. Lucero	**Date Sampled:**	2/26/2016
		Date Received:	2/26/2016
Project:	8th St. + Figueroa St.	**Date Analyzed:**	2/26/2016
Project Address:	817 W. Figueroa St. Los Angeles, CA 90017	**Physical State:**	Soil Gas

ANALYSES REQUESTED

1. ASTM D1946 – Methane

Sampling – Soil Gas samples were collected in Tedlar bags.

Approval:

Steve Jones, Ph.D.
Laboratory Manager

JONES ENVIRONMENTAL, INC.

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562-646-1611
805-399-0060

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SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Terra-Petra	**Report date:**	2/26/2016
Client Address:	700 S. Flower Street, Suite 2580 Los Angeles, CA 90017	**JEL Ref. No.:**	ST-9143
Attn:	David L. Lucero	**Date Sampled:**	2/26/2016
		Date Received:	2/26/2016
Project:	8th St. + Figueroa St.	**Date Analyzed:**	2/26/2016
Project Address:	817 W. Figueroa St. Los Angeles, CA 90017	**Physical State:**	Soil Gas

ASTM D1946 - Methane

Sample ID:	**DP-2@45'**		
JEL ID:	**ST-9143-01**	**Practical Quantitation Limit**	**Units**
Methane (CH_4)	**9.04**	0.01	%
Dilution Factor	1		
	022616		

ND = Not Detected

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Terra-Petra	**Report date:**	2/26/2016
Client Address:	700 S. Flower Street, Suite 2580 Los Angeles, CA 90017	**JEL Ref. No.:**	ST-9143
Attn:	David L. Lucero	**Date Sampled:**	2/26/2016
		Date Received:	2/26/2016
Project:	8th St. + Figueroa St.	**Date Analyzed:**	2/26/2016
Project Address:	817 W. Figueroa St. Los Angeles, CA 90017	**Physical State:**	Soil Gas

ASTM D1946 - Methane

Sample ID:	**METHOD BLANK**		
JEL ID:	**ST-9143-02**	**Practical Quantitation Limit**	**Units**
Methane (CH_4)	ND	0.01	%
Dilution Factor	1		
	022616		

ND = Not Detected

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562-646-1611
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SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
QUALITY CONTROL INFORMATION

Client:	Terra-Petra	**Report date:**	2/26/2016
Client Address:	700 S. Flower Street, Suite 2580 Los Angeles, CA 90017	**JEL Ref. No.:**	ST-9143
Attn:	David L. Lucero	**Date Sampled:**	2/26/2016
		Date Received:	2/26/2016
Project:	8th St. + Figueroa St.	**Date Analyzed:**	2/26/2016
Project Address:	817 W. Figueroa St. Los Angeles, CA 90017	**Physical State:**	Soil Gas

ASTM D1946 - Methane

GC#: 022616

JEL ID:	**ST-9143-03**	**ST-9143-04**		
Parameter	LCS Recovery (%)	LCSD Recovery (%)	RPD	Acceptability Range (%)
Methane (CH_4)	102%	102%	0.1%	60 - 140

LCS = Lab Control Sample
LCSD = Lab Control Sample Duplicate
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 15%

DATA FILE: 022616

Parameter	LCS Results	LCS (%)	LCSD (%)	RPD	LCSD Results	Expected	Acceptability (%) Range
		Recovery	Recovery				
Methane	4.58	102%	102%	**0.1%**	4.57	**4.5**	60-140

David L. Lucero

JONES ENVIRONMENTAL, INC.
11007 Forest Place
Santa Fe Springs, CA 90670
(714) 449-9937
(562) 646-1611
www.jonesenv.com

Chain-of-Custody Record

Client: TERRA - PETRO
Date: 2/26/16
Project Name: 8TH ST. & FIGUEROA ST.
Client Project #: —
Project Address: 817 W. FIGUEROA ST.
LOS ANGELES, CA 90017
Project Contact: DAVID L. LUCERO

Turn Around Requested:
- ☐ Immediate Attention
- Rush: ☐ 24 ☐ 48 ☐ 72
- ☒ Normal
- ☐ Mobile Lab

SOIL GAS
Purge Number: ☐ 1P ☐ 3P ☐ 7P ☐ 10P
Purge Rate: _____ cc/min
Shut in Test Y / N
Tracer:
- ☐ n-propanol
- ☐ n-pentane
- ☐ 1,1-DFA
- ☐ Helium
- ☐ _____

JEL Project #: ST-9143
Page 1 of 1

Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Sample ID	Purge Number	Purge Volume	Date	Sample Collection Time	Sample Analysis Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)		Analysis Requested: METHANE			Magnehelic Vacuum (In/H_2O)	Number of Containers	Remarks/Special Instructions
DP-2@95'			2/26/16			ST-9143-01	SG		X				1	

❶ Relinquished by (signature)	Date 2/26/16	❷ Received by (signature)	Date 2/26/16	Total Number of Containers
Company TERRA - PETRO	Time 1015 PW	Company Jones Env	Time 1015	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.
Company	Time	Company	Time	☐ EDD ☐ EDF

Appendix IS-6

Hydrology Report

6080 Center Drive, Suite 700 Los Angeles, CA 90045 310.665.2800 kpff.com

DATE: July 18, 2016

TO: Ms. Madonna Marcelo

FROM: Michael Bowden

RE: 8th and Figueroa
Surface Water Hydrology and Water Quality Calculations-Technical Memo

KPFF has conducted a review of existing Surface Water Hydrology and Water Quality conditions for the 8th and Figueroa project site. Following are our findings.

Project Description

The project site is located within the City of Los Angeles at 734-744 Figueroa Street, is fully developed and operating as an asphalt surface parking lot. The project site area is approximately 1.07 acres. It is bound by Figueroa Street to the northwest, a public alley to the southeast, 8th Street to the southwest and an existing privately owned surface parking lot to the northeast.

The proposed project consists of a new forty two-story mixed-use residential apartment building with three levels of parking above grade and parking and retail at the ground floor over an additional four levels of subterranean parking. The building would include 456 units ranging from studios to 3- bedroom apartments, rooftop decks, and a podium level swimming pool.

Existing Hydrology

Surface hydrology is regulated by the City of Los Angeles (City). City requirements include compliance with the State of California General Permit for storm water discharges during construction for projects with over one acre of land disturbance, and post-construction compliance with the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual and the City of Los Angeles Low Impact Development (LID) Ordinance.

The LACDPW Hydrology Manual requires that a storm drain conveyance system be designed for a 25-year storm event and that the combined capacity of a storm drain and street flow system accommodate flow from a 50-year storm event. The existing site has a 50-year storm flow rate of 3.33 cubic feet per second (cfs).

The entire project site is impervious. Storm water runoff from the project site is conveyed by sheet flow in the southerly direction. Half of the flow is directed

towards an existing catch basin located at the northeast corner of the intersection of 8th Street and Figueroa Street. The remainder of the surface runoff flows towards the gutter along 8th Street. The existing parking lot is relatively flat sloping at approximately 1.8% in the southerly direction.

Underground storm drainage facilities exist along 8th Street. LACFD owns and maintains the 27-inch reinforced concrete pipe (RCP) located approximately 3 feet south of the southern property line. This storm drain is connected to the catch basin at the intersection of 8th Street and Figueroa Street and flows in the easterly direction.

The site is located within Federal Emergency Management Agency (FEMA) flood Zone X, which denotes an area where the potential for flooding is minimal. There are no surface water bodies in the project vicinity. Therefore, the project will not impede or redirect flood flows and will not expose people or structures to risk due to flooding.

Proposed Hydrology

Storm water runoff from the project site will be conveyed by new private underground storm drain pipes into existing County drainage facilities along Figueroa Street and 8th Street. The site will maintain a gentle gradient with addition of pervious landscape areas. The extent of proposed impervious surfaces will be less than 100 percent which would be less than the existing condition. Therefore, this project will not increase the quantity of stormwater runoff. Since runoff is being reduced with the introduction of landscaped areas, existing facilities will not be adversely impacted. Construction activities have the potential to temporarily alter existing drainage patterns and flows by exposing the underlying soils and making the project site temporarily more permeable.

Best Management Practices (BMPs) implemented during project construction are described in the Storm Water Pollution Prevention Plan (SWPPP). The project SWPPP will identify potential pollutant sources that may affect the quality of discharge associated with construction activity, identify non-storm water discharges, and recommend how to effectively prevent erosion and prohibit the entry of pollutants into the public storm drain system during construction.

Post construction BMPs will be implemented to control pollutants associated with storm water runoff in compliance with City of Los Angeles Watershed Protection

Division LID Standards. Compliance with City storm water mitigation requirements and the addition of landscaping will reduce the quantity and improve the quality of storm water runoff generated on the project site. The addition of post-construction BMPs, such as stormwater storage tanks, will be strategically placed, thus not imposing a significant impact on the environment and existing infrastructure.

Existing Water Quality Management

Storm water runoff from the project site is conveyed by sheet flow into the concrete gutters along Figueroa Street and 8th Street into L.A. County maintained drainage facilities. The existing site is generally flat and fully developed with an asphalt surface parking lot, therefore the entire site is fully impervious. This site has been used as a parking lot prior to the enforcement of storm water quality BMP design, implementation and maintenance. In compliance with LID requirements, the proposed project will implement new BMPs which are anticipated to improve the quality of post-construction storm water discharge from the site.

Proposed Water Quality Management - Construction

Within the State of California, the National Pollutant Discharge Elimination System (NPDES) requirements mandate that storm water BMPs are implemented during project construction including those identified in the Storm Water Pollution Prevention Plan (SWPPP). The requirements are enforced through the City's plan review and approval process. Plans and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address storm water pollution prevention goals.

The project SWPPP will identify potential pollutant sources that may affect the quality of discharge associated with construction activity, identify non-storm water discharges, and recommend to effectively prohibit the entry of pollutants into the public storm drain system during construction.

Proposed Water Quality Management - Project Operation

The City's Watershed Protection Division has adopted the LID Ordinance as issued by the Los Angeles Regional Water Quality Control Board (LARWQCB) and amended by the City of Los Angeles Department of Public Works.

LID is a storm water management strategy with goals to mitigate the impacts of increased runoff and storm water pollution as close to its source as possible. LID promotes the use of natural infiltration systems, evapo-transpiration, and re-use of storm water. The goal is to remove pollutants such as nutrients, bacteria, and metals from storm water runoff while also reducing the quantity and intensity of storm water flows by minimizing impervious surface area and by the use of various infiltration and treatment strategies. Where infiltration is not feasible, the use of bio-retention/filtration, rain gardens, green roofs, and rain barrels; in order to store, evaporate, detain, and treat runoff may be used.

LID prioritizes the selection of BMPs in the following order:

1. Infiltration Systems
2. Storm water Capture and Use
3. High Efficiency Bio-filtration/Bio-retention Systems
4. Combination of Any of the Above

The intent of the City of Los Angeles LID standards is to:

- Encourage the beneficial use of rainwater and urban runoff;
- Reduce storm water/urban runoff while improving water quality;
- Promote rainwater harvesting;
- Reduce offsite runoff and provide increased groundwater recharge;
- Reduce erosion and hydrologic impacts downstream; and
- Enhance the recreational and aesthetic values in our communities.

Based on a previous Geotechnical Engineering Investigation by Geotechnologies Inc. for the 8th and Figueroa mixed-use development, we understand that the project site is not suitable for the use of infiltration as a stormwater BMP due to unsuitable soils located below the proposed building foundation, the zone for potential infiltration. Therefore, storm water capture and use is planned as a potential post-construction BMP. Based on the landscape schedule, there is enough proposed landscaped area to accommodate a capture and use system. The system will include a pretreatment device to filter out trash and debris before water is used to

irrigate landscaped areas of the site. Although the drainage pattern of the site will be altered, it will not result in substantial erosion or siltation on or off-site.

Existing Groundwater

Based on previous geotechnical explorations at the site, encountered fill materials ranged from 3 to 5 feet. The fill material consisted primarily of silty sands. The underlying natural soils beneath the site consist of silty sands to gravelly sands, sandy silts, and sandy clays. As stated above, groundwater was not encountered on the site with excavations up to 150 feet deep. However, the historic highest groundwater is located 70 feet below ground surface. Because groundwater was not encountered on site, groundwater supplies will not be depleted nor will water quality be degraded. This site is not susceptible to inundation.