# Ldcp

### City of Los Angeles

Department of City Planning • Environmental Analysis Section City Hall • 200 N. Spring Street, Room 750 • Los Angeles, CA 90012



### **INITIAL STUDY**

#### CENTRAL CITY NORTH COMMUNITY PLAN AREA

# **College Station Project**

Case Number: ENV-2012-2055-EIR

**Project Location:** 924 N. Spring Street, Los Angeles, California 90012

**Council District:** 1

Project Description: The Project proposes a mixed-use transit-oriented development. Two development options are proposed. Under Development Program I, Parcel 1 would be developed with 500 market-rate apartments, five live-work lofts, and approximately 19,800 square feet of ground-floor retail/restaurant space in two high-rise towers up to 20 stories in height. Parcel 2 would be developed with 100 affordable senior housing units in four-story buildings, a 20,000-square-foot ground-floor market, and 4,500 square feet of ground-floor retail/restaurant space. Parcel 3 would be developed with 80 live-work lofts in an eight-story building and 2,100 square feet of ground-floor retail/restaurant space. Development Program I would total 685 residential units and approximately 691,746 square feet. Parking totaling 1,054 stalls would be provided in subterranean and podium structures and angled parking on internal streets. Under Development Program II, Parcel 1 would be developed with 339 market-rate apartments, 14 live-work lofts, and 7,500 square feet of ground-floor retail/restaurant space in five-story-plus-loft buildings. Parcels 2 and 3 would be developed as under Development Program I. Development Program II would total 533 residential units and approximately 560,726 square feet. Parking totaling 851 stalls would be provided in subterranean and podium structures and angled parking on internal streets.

**APPLICANT:** EVOQ Properties, Inc.

**PREPARED BY:** PCR Services Corporation

ON BEHALF OF:

The City of Los Angeles
Department of City Planning
Environmental Analysis Section

# **INITIAL STUDY**

# COLLEGE STATION

CITY OF LOS ANGELES, CALIFORNIA

Prepared for:

City of Los Angeles Planning Department 200 N. Spring Street, Room 721 Los Angeles, CA 90012

Prepared by:

PCR Services Corporation 201 Santa Monica Boulevard, Suite 500 Santa Monica, California 90401

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City of Los Angeles College Station Project



#### CITY OF LOS ANGELES

OFFICE OF THE CITY CLERK ROOM 615, CITY HALL LOS ANGELES, CALIFORNIA 90012

#### CALIFORNIA ENVIRONMENTAL QUALITY ACT

# INITIAL STUDY AND CHECKLIST

(Article IV B City CEQA Guidelines)

| LEAD CITY AGENCY                                                                                                                                                                                                                                                                                        | COUNCIL DI  | STRICT                                                   | DATE             |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------|------------------|--|--|
| City Planning Department                                                                                                                                                                                                                                                                                | 1           |                                                          | June 17, 2014    |  |  |
| RESPONSIBLE AGENCIES                                                                                                                                                                                                                                                                                    |             |                                                          |                  |  |  |
| Regional Water Quality Control Board, South Coast Air Quality Management District (SCAQMD), Los Angeles Board of Public Works, Los Angeles Building and Safety Department, Los Angeles Department of Water and Power (Board of Water and Power Commissioners), Los Angeles Department of Transportation |             |                                                          |                  |  |  |
| PROJECT TITLE/NO.                                                                                                                                                                                                                                                                                       |             | CASE NO.                                                 |                  |  |  |
| College Station Project                                                                                                                                                                                                                                                                                 |             | ENV-2012-20SS-EIR                                        |                  |  |  |
| PREVIOUS ACTIONS CASE NO.                                                                                                                                                                                                                                                                               | 🛛 DOES have | significant changes from p                               | revious actions. |  |  |
| CPC-2005-1843-GPA-ZC-HD-ZAA-SPR<br>ENV-2005-881-EIR                                                                                                                                                                                                                                                     | DOES NOT    | OOES NOT have significant changes from previous actions. |                  |  |  |

#### PROJECT DESCRIPTION:

EVOQ Properties, Inc. proposes a mixed-use transit-oriented development on a vacant 5.24-acre parcel (Project Site) at 924 N. Spring Street. The Project would subdivide the Project Site into three parcels separated by two private internal streets. The parcels would consist of a 2.99-acre southern parcel (Parcel 1), a 1.3S-acre central parcel (Parcel 2), and a 0.90-acre northern parcel (Parcel 3).

Two development options ("Development Program I" and "Development Program II") are proposed. Under Development Program I, Parcel 1 would be developed with up to S00 market-rate apartments in two high-rise towers of up to 20 stories each, five double-height live-work lofts, and ground-floor retail/restaurant space. The primary Project frontage would be on N. Spring Street and ground-floor retail/restaurant uses and a pedestrian plaza would front onto N. Spring Street and College Street. Parking would be provided in a single subterranean level and five-level podium structure on Parcel 1 and angled street parking along the private internal street to the north. Parcel 2 would be developed with up to 100 affordable senior housing units in four-story buildings above a ground-floor market and ground-floor retail/restaurant space. Parcel 3 would be developed with up to 80 live-work lofts in an eight-story building and ground-floor retail/restaurant uses. Parking for Parcels 2 and 3 would be provided in two-level subterranean structures beneath each parcel and angled street parking along the Project Site's private internal streets. Development Program I would total 685 dwelling units and approximately 691,746 square feet (FAR of 3.03:1), and would provide 1,0S4 parking stalls.

Under Development Program II, Parcel 1 would be developed with up to 339 market-rate apartment units, 14 live-work lofts, and ground-floor retail/restaurant space in five-story-plus-loft buildings. Residential uses would front on N. Spring Street, College Street, and the private internal street connecting N. Spring Street and Rondout Street, and ground-floor retail/restaurant space would front on N. Spring Street. Parking would be provided in a single subterranean level and two-level podium structure on Parcel 1 and angled street parking along the private internal streets. Parcels 2 and 3 would be developed as under Development Program I. Development Program II would total 533 residential units and approximately 560,726 square feet (FAR of 2.46:1), and would provide 851 parking stalls.

#### **ENVIRONMENTAL SETTING:**

The Project Site is located at the northern end of the Central City North Community Plan Area and in the southwestern portion of the Cornfield Arroyo Seco Specific Plan (CASP) Area, where land uses transition between the light industrial and transit corridor uses to the east and the Chinatown area to the west. The areas north, east, and south of the Project Site are developed with hybrid and light industrial land uses and public facilities (e.g., rail yards and spur lines). The Los Angeles River is located approximately 0.50 miles east of the Project Site. Metro's Gold Line tracks and Chinatown Station, and the Los Angeles Historic State Park, are located across N. Spring Street. The Chinatown Central Business District is located west of the Project Site and is developed with commercial and residential uses.

#### PROJECT LOCATION:

The Project Site is located at 924 N. Spring Street and is bordered on the west by N. Spring Street; on the northeast by Rondout Street; on the east by an alley and wholesale commercial/light industrial uses and surface parking; and on the south by College Street. The Project Site is served by a network of regional transportation facilities. Local access to the Project Site is provided by N. Spring Street, N. Main Street, and College Street. Regional access is provided by the Hollywood Freeway (US 101) and the Harbor Freeway (SR 110), approximately 0.80 miles to the south and west, respectively.

| PLANNING DISTRICT                     |                                                                   | STATUS: |                                            |
|---------------------------------------|-------------------------------------------------------------------|---------|--------------------------------------------|
| Central City North Community Plan     |                                                                   |         | CLIMINARY  DPOSED  DPTED December 15, 2000 |
| EXISTING ZONING                       | MAX. DENSITY ZONING                                               |         |                                            |
| UC-CA (Urban Center, CASP)            | CASP                                                              |         | DOES CONFORM TO PLAN                       |
| PLANNED LAND USE & ZONE               | MAX. DENSITY PLAN                                                 |         |                                            |
| Hybrid Industrial (HI, MR2, P)        | CASP                                                              |         | ☑ DOES NOT CONFORM TO PLAN                 |
| SURROUNDING LAND USES                 | PROJECT DENSITY                                                   |         |                                            |
| See Attachment A, Project Description | 3.03:1 (Development Program I)<br>2.46:1 (Development Program II) |         | ☐ NO DISTRICT PLAN                         |

| DETERMINATION (To be completed by Lead Agency)                                                                                                                                                                                                                           |                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| On the basis of this initial evaluation:                                                                                                                                                                                                                                 |                                                                                                                                      |
| ☐ I find that the proposed project COULD NOT have a significant e prepared.                                                                                                                                                                                              | ffect on the environment, and a NEGATIVE DECLARATION will be                                                                         |
| I find that although the proposed project could have a significar this case because revisions on the project have been made by or ag DECLARATION will be prepared.                                                                                                       | , ·                                                                                                                                  |
| ☑ I find the proposed project MAY have a significant effect on the                                                                                                                                                                                                       | environment, and an ENVIRONMENTAL IMPACT REPORT is required.                                                                         |
|                                                                                                                                                                                                                                                                          | ed in an earlier document pursuant to applicable legal standards, and lysis as described on attached sheets. An ENVIRONMENTAL IMPACT |
| I find that although the proposed project could have a significar effects (a) have been analyzed adequately in an earlier EIR or NEGA been avoided or mitigated pursuant to that earlier EIR or NEGATIVE imposed upon the proposed project, nothing further is required. | TIVE DECLARATION pursuant to applicable standards, and (b) have                                                                      |
| SIGNATURE                                                                                                                                                                                                                                                                | City Planner                                                                                                                         |

#### **EVALUATION OF ENVIRONMENTAL IMPACTS:**

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less that significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
- 4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of a mitigation measure has reduced an effect from "Potentially Significant Impact" to "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analysis," cross referenced).
- 5) Earlier analysis must be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR, or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
  - Earlier Analysis Used. Identify and state where they are available for review.
  - Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated
- 7) Supporting Information Sources: A sources list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whichever format is selected.
- 9) The explanation of each issue should identify:
  - The significance criteria or threshold, if any, used to evaluate each question; and
  - 2) The mitigation measure identified, if any, to reduce the impact to less than significance.

#### **ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

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

| $\boxtimes$ | Aesthetics                         | ☐ Hazards & Hazardous Materials | X I         | Public Services                    |
|-------------|------------------------------------|---------------------------------|-------------|------------------------------------|
|             | Agriculture and Forestry Resources | ☐ Hydrology/Water Quality       | X I         | Recreation                         |
| $\boxtimes$ | Air Quality                        | □ Land Use/Planning             | $\boxtimes$ | Transportation/Traffic             |
|             | Biological Resources               | ☐ Mineral Resources             | ×ا          | Utilities/Service Systems          |
|             | Cultural Resources                 | ☑ Noise                         | $\boxtimes$ | Mandatory Findings of Significance |
|             | Geology/Soils                      | ☑ Population/Housing            |             |                                    |
| $\boxtimes$ | Greenhouse Gas Emissions           |                                 |             |                                    |

| BACKGROUND                                               |                |
|----------------------------------------------------------|----------------|
| PROPONENT NAME                                           | PHONE NUMBER   |
| EVOQ Properties, Inc.                                    | (213) 988-8890 |
| PROPONENT ADDRESS                                        |                |
| 626 Wilshire Boulevard, Suite 850, Los Angeles, CA 90017 |                |
| AGENCY REQUIRING CHECKLIST                               | DATE SUBMITTED |
|                                                          |                |

| <b>~</b> > |     |       |     |      |     |      |   |
|------------|-----|-------|-----|------|-----|------|---|
| $\sim$     | ENV | 'IROI | NME | NTAI | LIM | PACT | S |

(Explanations of all potentially and less than significant impacts are required to be attached on separate sheets)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-------------|
| I. AESTHETICS. Would the project:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                    |                                    |             |
| a. Have a substantial adverse effect on a scenic vista?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | $\boxtimes$                          |                                                                    |                                    |             |
| b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | $\boxtimes$                          |                                                                    |                                    |             |
| c. Substantially degrade the existing visual character or quality of the site and its surroundings?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |                                                                    |                                    |             |
| d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                                    |                                    |             |
| II. AGRICULTURE AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: |                                      |                                                                    |                                    |             |
| a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |                                                                    |                                    |             |
| b. Conflict with existing zoning for agricultural use, or a Williamson Act Contract?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                                                                    |                                    | $\boxtimes$ |
| c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                                                                    |                                    |             |
| d. Result in the loss of forest land or conversion of forest land to non-forest use?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                                                                    |                                    | $\boxtimes$ |
| e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                                                                    |                                    |             |

|                                                                                                                                                                                                                                                                                                             | Potentially<br>Significant<br>Impact | Potentially Significant Unless Mitigation Incorporated | Less Than<br>Significant<br>Impact | No Impact |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|------------------------------------|-----------|
| III. AIR QUALITY. Where available, the significance criteria established by the South Coast Air Quality Management District (SCAQMD) may be relied upon to make the following determinations. Would the project:                                                                                            |                                      |                                                        |                                    |           |
| a. Conflict with or obstruct implementation of the SCAQMD or Congestion Management Plan?                                                                                                                                                                                                                    |                                      |                                                        |                                    |           |
| b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?                                                                                                                                                                                          | $\boxtimes$                          |                                                        |                                    |           |
| c. Result in a cumulatively considerable net increase of any criteria pollutant for which the air basin is non-attainment (ozone, carbon monoxide, & PM 10) under an applicable federal or state ambient air quality standard?                                                                              |                                      |                                                        |                                    |           |
| d. Expose sensitive receptors to substantial pollutant concentrations?                                                                                                                                                                                                                                      | $\boxtimes$                          |                                                        |                                    |           |
| e. Create objectionable odors affecting a substantial number of people?                                                                                                                                                                                                                                     |                                      |                                                        | $\boxtimes$                        |           |
| IV. BIOLOGICAL RESOURCES. Would the project:                                                                                                                                                                                                                                                                |                                      |                                                        |                                    |           |
| a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service? |                                      |                                                        |                                    |           |
| b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?                                                          |                                      |                                                        |                                    |           |
| c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh vernal pool, coastal, etc.) Through direct removal, filling, hydrological interruption, or other means?                                         |                                      |                                                        |                                    |           |
| d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?                                                                          |                                      |                                                        |                                    |           |
| e. Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance (e.g., oak trees or California walnut woodlands)?                                                                                                                          |                                      |                                                        |                                    |           |
| f. Conflict with the provisions of an adopted Habitat<br>Conservation Plan, Natural Community Conservation Plan, or<br>other approved local, regional, or state habitat conservation<br>plan?                                                                                                               |                                      |                                                        |                                    |           |

|                                                                                                                                                                                                                                                                                        | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-------------|
| V. CULTURAL RESOURCES: Would the project:                                                                                                                                                                                                                                              |                                      |                                                                    |                                    |             |
| a. Cause a substantial adverse change in significance of a historical resource as defined in State CEQA §15064.5?                                                                                                                                                                      |                                      |                                                                    |                                    |             |
| b. Cause a substantial adverse change in significance of an archaeological resource pursuant to 5tate CEQA §15064.5?                                                                                                                                                                   |                                      |                                                                    | $\boxtimes$                        |             |
| c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?                                                                                                                                                                                |                                      |                                                                    | $\boxtimes$                        |             |
| d. Disturb any human remains, including those interred outside of formal cemeteries?                                                                                                                                                                                                   |                                      |                                                                    |                                    |             |
| VI. GEOLOGY AND SOILS. Would the project:                                                                                                                                                                                                                                              |                                      |                                                                    |                                    |             |
| a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:                                                                                                                                                        |                                      |                                                                    |                                    |             |
| i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | · 🗌                                  |                                                                    |                                    |             |
| ii. Strong seismic ground shaking?                                                                                                                                                                                                                                                     |                                      |                                                                    | $\boxtimes$                        |             |
| iii. Seismic-related ground failure, including liquefaction?                                                                                                                                                                                                                           |                                      |                                                                    | $\boxtimes$                        |             |
| iv. Landslides?                                                                                                                                                                                                                                                                        |                                      |                                                                    |                                    | $\boxtimes$ |
| b. Result in substantial soil erosion or the loss of topsoil?                                                                                                                                                                                                                          |                                      |                                                                    | $\boxtimes$                        |             |
| c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potential result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?                                                      |                                      |                                                                    |                                    |             |
| d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?                                                                                                                                       |                                      |                                                                    |                                    |             |
| e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?                                                                                                   |                                      |                                                                    |                                    |             |
| VII. GREENHOUSE GAS EMISSIONS. Would the project:                                                                                                                                                                                                                                      |                                      |                                                                    |                                    |             |
| a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?                                                                                                                                                            | $\boxtimes$                          |                                                                    |                                    |             |
| b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?                                                                                                                                                       | $\boxtimes$                          |                                                                    |                                    |             |

|                                                                                                                                                                                                                                                                                                                                                                                      | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-----------|
| VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:                                                                                                                                                                                                                                                                                                                            |                                      |                                                                    |                                    |           |
| a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials                                                                                                                                                                                                                                               |                                      |                                                                    |                                    |           |
| b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?                                                                                                                                                                                      |                                      |                                                                    |                                    |           |
| c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?                                                                                                                                                                                                                      |                                      |                                                                    |                                    |           |
| d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?                                                                                                                                                       |                                      |                                                                    | $\boxtimes$                        |           |
| e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?                                                                                                                     |                                      |                                                                    |                                    |           |
| f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for the people residing or working in the area?                                                                                                                                                                                                                              |                                      |                                                                    |                                    |           |
| g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?                                                                                                                                                                                                                                                            |                                      |                                                                    |                                    |           |
| h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?                                                                                                                                                                 |                                      |                                                                    |                                    |           |
| IX. HYDROLOGY AND WATER QUALITY. Would the project result in:                                                                                                                                                                                                                                                                                                                        |                                      |                                                                    |                                    |           |
| a. Violate any water quality standards or waste discharge requirements?                                                                                                                                                                                                                                                                                                              |                                      |                                                                    |                                    |           |
| b. Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted)? |                                      |                                                                    |                                    |           |
| c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?                                                                                                                                                   |                                      |                                                                    |                                    |           |

|                                                                                                                                                                                                                                                                                                 | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-------------|
| d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in an manner which would result in flooding on- or off site?                      | . 🗆                                  |                                                                    |                                    |             |
| e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?                                                                                                           |                                      |                                                                    |                                    |             |
| f. Otherwise substantially degrade water quality?                                                                                                                                                                                                                                               |                                      |                                                                    | $\boxtimes$                        |             |
| g. Place housing within a 100-year flood plain as mapped on federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?                                                                                                                                    |                                      |                                                                    |                                    |             |
| h. Place within a 100-year flood plain structures which would impede or redirect flood flows?                                                                                                                                                                                                   |                                      |                                                                    |                                    | $\boxtimes$ |
| i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?                                                                                                                              |                                      |                                                                    |                                    |             |
| j. Inundation by seiche, tsunami, or mudflow?                                                                                                                                                                                                                                                   |                                      |                                                                    |                                    | $\boxtimes$ |
| X. LAND USE AND PLANNING. Would the project:                                                                                                                                                                                                                                                    |                                      |                                                                    |                                    |             |
| a. Physically divide an established community?                                                                                                                                                                                                                                                  |                                      |                                                                    | $\boxtimes$                        |             |
| b. Conflict with applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? |                                      |                                                                    |                                    |             |
| c. Conflict with any applicable habitat conservation plan or natural community conservation plan?                                                                                                                                                                                               |                                      |                                                                    |                                    | $\boxtimes$ |
| XI. MINERAL RESOURCES. Would the project:                                                                                                                                                                                                                                                       |                                      |                                                                    |                                    |             |
| a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?                                                                                                                                                          |                                      |                                                                    |                                    |             |
| b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?                                                                                                                          |                                      |                                                                    |                                    |             |
| XII. NOISE. Would the project result in:                                                                                                                                                                                                                                                        |                                      |                                                                    |                                    |             |
| a. Exposure of persons to or generation of noise in level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?                                                                                                           | $\boxtimes$                          |                                                                    |                                    |             |
| b. Exposure of people to or generation of excessive groundborne vibration or groundborne noise levels?                                                                                                                                                                                          | $\boxtimes$                          |                                                                    |                                    |             |

|                                                                                                                                                                                                                                                                                                                                                                                | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-------------|
| c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?                                                                                                                                                                                                                                                 |                                      |                                                                    |                                    |             |
| d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?                                                                                                                                                                                                                                     |                                      |                                                                    |                                    |             |
| e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?                                                                                                            |                                      |                                                                    |                                    |             |
| f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?                                                                                                                                                                                                                 |                                      |                                                                    |                                    | $\boxtimes$ |
| XIII. POPULATION AND HOUSING. Would the project:                                                                                                                                                                                                                                                                                                                               |                                      |                                                                    |                                    |             |
| a. Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?                                                                                                                                                                       |                                      |                                                                    |                                    |             |
| b. Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?                                                                                                                                                                                                                                                           |                                      |                                                                    |                                    |             |
| c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?                                                                                                                                                                                                                                                                     |                                      |                                                                    |                                    |             |
| XIV. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: |                                      |                                                                    |                                    |             |
| a. Fire protection?                                                                                                                                                                                                                                                                                                                                                            | $\boxtimes$                          |                                                                    |                                    |             |
| b. Police protection?                                                                                                                                                                                                                                                                                                                                                          | $\boxtimes$                          |                                                                    |                                    |             |
| c. Schools?                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                    | $\boxtimes$                        |             |
| d. Parks?                                                                                                                                                                                                                                                                                                                                                                      | $\boxtimes$                          |                                                                    |                                    |             |
| e. Other governmental services (including roads)?                                                                                                                                                                                                                                                                                                                              |                                      |                                                                    |                                    |             |
| XV. RECREATION.                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                                    |                                    |             |
| a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?                                                                                                                                                                 | $\boxtimes$                          |                                                                    |                                    |             |

|                                                                                                                                                                                                                                                                                                                                                                                                                               | Potentially<br>Significant<br>Impact | Potentially<br>Significant<br>Unless<br>Mitigation<br>Incorporated | Less Than<br>Significant<br>Impact | No Impact |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|------------------------------------|-----------|
| b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?                                                                                                                                                                                                                                       |                                      |                                                                    |                                    |           |
| XVI. TRANSPORTATION/CIRCULATION. Would the project:                                                                                                                                                                                                                                                                                                                                                                           |                                      |                                                                    |                                    |           |
| a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? |                                      |                                                                    |                                    |           |
| b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?                                                                                                                                                                |                                      |                                                                    |                                    |           |
| c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?                                                                                                                                                                                                                                                               |                                      |                                                                    |                                    |           |
| d. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?                                                                                                                                                                                                                                                                            |                                      |                                                                    |                                    |           |
| e. Result in inadequate emergency access?                                                                                                                                                                                                                                                                                                                                                                                     |                                      |                                                                    |                                    |           |
| f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?                                                                                                                                                                                                                                        |                                      |                                                                    |                                    |           |
| XVII. UTILITIES. Would the project:                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                                                                    |                                    |           |
| <ul> <li>a. Exceed wastewater treatment requirements of the<br/>applicable Regional Water Quality Control Board?</li> </ul>                                                                                                                                                                                                                                                                                                   |                                      |                                                                    | $\boxtimes$                        |           |
| b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? (Water)                                                                                                                                                                                                                |                                      |                                                                    |                                    |           |
| c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?                                                                                                                                                                                                                                  |                                      |                                                                    |                                    |           |
| d. Have sufficient water supplies available to serve the project from existing entitlements and resource, or are new or expanded entitlements needed?                                                                                                                                                                                                                                                                         | $\boxtimes$                          |                                                                    |                                    |           |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Potentially<br>Significant<br>Impact | Potentially Significant Unless Mitigation Incorporated | Less Than<br>Significant<br>Impact | No Impact |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|------------------------------------|-----------|
| e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?                                                                                                                                                                                                                      |                                      |                                                        |                                    |           |
| f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?                                                                                                                                                                                                                                                                                                                                 |                                      |                                                        | $\boxtimes$                        |           |
| g. Comply with federal, state, and local statutes and regulations related to solid waste?                                                                                                                                                                                                                                                                                                                                                              |                                      |                                                        | $\boxtimes$                        |           |
| h. Other utilities and service systems?                                                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                        | $\boxtimes$                        |           |
| XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.                                                                                                                                                                                                                                                                                                                                                                                                             |                                      |                                                        |                                    |           |
| a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? |                                      |                                                        |                                    |           |
| b. Does the project have impacts which are individually limited, but cumulatively considerable?("Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).                                                                                             |                                      |                                                        |                                    |           |
| c. Does the project have environmental effects which cause substantial adverse effects on human beings, either directly or indirectly?                                                                                                                                                                                                                                                                                                                 | $\boxtimes$                          |                                                        |                                    |           |

|                                   | -                   | fitional sheets if necessary) |               |
|-----------------------------------|---------------------|-------------------------------|---------------|
| PREPARED BY                       | TITLE               | TELEPHONE #                   | DATE          |
| Anne R. Doehne                    | Associate Principal | (310) 451-4488                | June 16, 2014 |
| PCR Services Corporation          |                     | i i                           |               |
| 201 Santa Monica Blvd., Suite 500 |                     |                               |               |
| Santa Monica, CA 90401            |                     |                               |               |

# ATTACHMENT A

PROJECT DESCRIPTION

#### ATTACHMENT A: PROJECT DESCRIPTION

#### A. INTRODUCTION

EVOQ Properties ("Project Applicant") proposes to construct a mixed-use transit-oriented development ("TOD") containing up to 685 dwelling units and 55,900 square feet ("sf") of retail/restaurant space on a 5.24-acre parcel ("Project Site" or "Site") at 924 N. Spring Street, in the Central City North community of the City of Los Angeles. The Project Site is located immediately east of the Los Angeles County Metropolitan Transportation Authority ("Metro") Chinatown Gold Line light rail station at N. Spring Street and College Street, and Los Angeles State Historic Park. The Project Site is currently vacant and is periodically used for parking by nearby industrial and commercial businesses. The Project Applicant proposes two different development options, including a lower density mid-rise option and a higher density high-rise option.

#### B. PROJECT LOCATION AND SURROUNDING USES

The Project Site is located near the northern end of the Central City North Community Plan Area, just north of Downtown Los Angeles (the Central City area). Chinatown's Central Business District lies just west of the Project Site and the Gold Line Station and right-of-way.

The Project Site is an irregularly-shaped parcel extending from College Street on the south to Llewellyn Street on the north. To the southeast, it is bordered by two parcels housing wholesale commercial/light industrial uses, storage, and surface parking, from which it is separated by a short alley connecting College Street and (unimproved) Rondout Street. The Project Site is bounded on the east/northeast by Rondout Street and on the west by N. Spring Street. The Project Site's location is shown in **Figure A-1**, *Regional Location Map*.

Much of the surrounding area was developed more than 50 years ago with industrial uses and rail facilities, and current land uses in the Project vicinity reflect the Project Site's location at the western transitional edge of the light industrial and transit corridor between N. Alameda Street/N. Spring Street and the Los Angeles River, and Chinatown to the west, as shown in **Figure A-2**, *Oblique Aerial Photograph of Project Site*. The areas north, east, and south of the Project Site are generally developed with light industrial land uses, hybrid industrial land uses (i.e., a mix of residential, commercial, community, and industrial uses), and public facilities, including rail yards and spur lines. The Blossom Plaza mixed-use development at the corner of N. Broadway and College Street to the west of the Project Site is currently under construction. Los Angeles State Historic Park, established in 2005 on an approximately 32-acre parcel on the former site of the Southern Pacific Railroad Company's River Station railroad yard northeast of the Project Site, is a major open space amenity within the Community Plan Area; currently, the southernmost 13 acres are developed for interim public use pending buildout of the park in accordance with its approved master plan.

The Project Site is served by a network of regional transportation facilities. Local access to the Project Site is provided by N. Spring Street, N. Main Street, and College Street. Other major roadways in the Project vicinity

include N. Vignes Street to the southeast and W. Cesar Chavez Boulevard to the south. Regional access is provided by the Hollywood Freeway (US 101) and the Harbor Freeway (SR 110), located approximately 0.8 miles to the south and west, respectively.

The Project Site is served by a variety of transit options, including two Los Angeles Department of Transportation ("LADOT") DASH bus lines providing local access: the Lincoln Heights-Chinatown line, with stops at N. Main Street/College Street and N. Spring Street/College Street as well as multiple stops along Broadway, and the Downtown Route B line, with a stop adjacent to the Project Site at N. Spring Street/College Street. The Project Site is also served by LADOT's Commuter Express, providing bus service to the greater Los Angeles area. Route 409, with a stop on N. Broadway 0.1 miles west of the Project Site, and Route 419, with a stop along N. Hill Street 0.2 miles west of the Project Site, provide service to the San Fernando Valley. Metro bus line 76 has a stop on N. Main Street and provides service to the San Gabriel Valley.

The Metro Gold Line Chinatown Station is located immediately west of the Project Site, providing linkages to East Los Angeles and Pasadena, as well as other areas within the Metro Rail system. Union Station, located approximately 0.4 miles south of the Project Site, is a major hub for public transportation, including Amtrak, Metrolink, and other bus lines providing national, regional, and local access.

#### C. SITE BACKGROUND AND EXISTING CONDITIONS

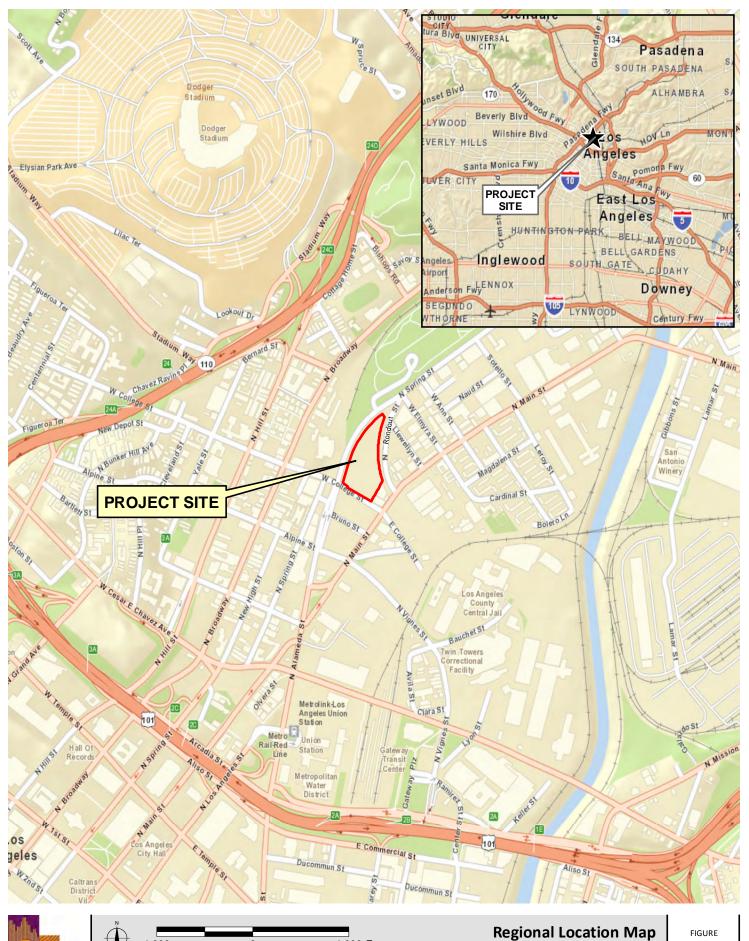
The Project Site encompasses approximately 5.24 acres (228,000 sf) and is currently vacant, as shown in Figure A-2. It is periodically used for surface parking and storage by the nearby commercial and industrial operations. The site is generally flat and supports no landscaping, except for two ornamental specimen trees along the Project Site boundary with the alley to its southeast.

The Project Site was used as a freight rail yard beginning in approximately 1905, during which time it housed freight storage houses, multiple rail lines, wood yard, coal yard, oil storage, small businesses, and dwelling units. The site was vacant by 1970 and was acquired from Union Pacific Railroad by Metro for equipment and materials staging during construction of the Gold Line. All on-site buildings were demolished in the late 1980s. Metro subsequently undertook soil and groundwater remediation under the oversight of regulatory authorities and the California Water Quality Control Board issued a No Further Action notification in 2003.

#### D. EXISTING PLANNING AND ZONING

#### 1. Central City North Community Plan

The Project Site is located within the Central City North Community Plan Area, one of 35 community plan areas. The City's 35 community plans collectively comprise the Land Use Element of the General Plan; they are the official guide to the future development of the City of Los Angeles. The Community Plan designates the Project Site for Hybrid Industrial land uses. This land use designation corresponds with the HI (Hybrid Industrial, Cornfield Arroyo Seco Specific Plan ["CASP"]), CM (Commercial Manufacturing) and P (Parking) zones. Additionally, the Project Site is further limited by footnotes to the Community Plan. Footnote 1 on the Community Plan restricts heights for Industrial land uses to Height District No. 1. Footnote 10 recognizes





1,000 1,000 Feet 0 **College Station** Source: ESRI Street Map, 2009; PCR Services Corporation, 2014.

**A-1** 







the site's adjacency to the Chinatown Transit Station and makes note that a plan should be developed that "recognizes Chinatown as a Local and Tourist Destination Center and will provide for development and uses which encourage TOD and pedestrian activity, including a station area plaza, paseos, mixed residential/commercial uses and local/regional transit ridership opportunities (including intermodal transfers). Footnote 12 is specific to residential and mixed-use projects at the Project Site. It reads:

"For the Area bounded by North Spring Street on the west, Rondout Street on the north, North Main Street in the east and College Street on the south the following restrictions shall apply:

For residential mixed-use projects, the first 1.5:1 FAR of residential use shall be permitted to be market rate units. Residential uses with FARS 1.5:1 to 3:1 shall set aside 20% of their units for affordable housing. Residential projects with FARS in excess of 3:1 shall set aside 100% of the units above the 3:1 threshold as affordable units. Units complying with the affordable requirements of this footnote shall not be used for the purpose of obtaining additional density bonus, under the terms of the State law. The affordable component of these projects may be used for any other incentive listed by State law."

#### 2. Cornfield Arroyo Seco Specific Plan (CASP) and Zoning

The Project Site is further located at the extreme southwest edge of the CASP Area. The CASP is intended to facilitate evolution of the area from vehicle-oriented industrial and public facility uses to a mixed-use community of pedestrian and transit-oriented uses. According to the CASP, the generalized land use designation for the Project Site is Hybrid Industrial, which corresponds for the Project Site to the Urban Center (UC-CA) CASP zoning designation.

However, pursuant to Section 1.2.B.2.e of the CASP, "The provisions of this Specific Plan shall not apply to any Project that has an application that is deemed complete by the Department of City Planning prior to the adoption of this Specific Plan." The Project application was deemed complete and predated the June 2013 adoption and August 2013 implementation of the CASP¹; accordingly, the provisions of the CASP do not apply to this Project.

Prior to CASP adoption, the Project Site was designated Light Industrial, which corresponds with the M2 (Light Industrial) zone, MR2 (Restricted Light Industrial) zone, and P (Automobile Parking) zone in the Los Angeles Municipal Code ("LAMC"). The prior zoning for the Project Site was MR2-1, wherein "1" denotes Height District 1, which permits a 1.5:1 floor area ratio (FAR) and unlimited building height. The MR2 designation is intended to protect light industrial land uses from encroachment by commercial and other non-industrial uses, to accommodate the shift from traditional industries to technology and other light industry, and to upgrade development standards to improve compatibility with nearby residential uses. A variety of uses are permitted under this zoning designation, including wholesale, commercial, and limited manufacturing uses, open storage, and parking.

City of Los Angeles College Station

A-5

Ordinance 182,617, enacted August 14, 2013.

#### E. DESCRIPTION OF THE PROPOSED PROJECT

#### 1. Development Program

The Project would subdivide the site into three blocks or parcels, separated by two private internal streets and a broad pedestrian plaza. The southern Project Site parcel, Parcel 1, has an area of 2.99 acres (130,000 sf) and is located directly opposite the Metro Gold Line Chinatown Station. The central parcel, Parcel 2, has an area of 1.35 acres (59,000 sf). The northern parcel, Parcel 3, has an area of 0.90 acres (39,000 sf) and is the parcel closest to Los Angeles State Historic Park.

Two development options are proposed for the Project Site, both of which would represent a mix of residential and retail/restaurant uses. The primary Project frontage would be on N. Spring Street, with ground-floor retail/restaurant uses and publicly accessible open space programmed along the N. Spring Street and College Street frontages, to link the site to the Metro Gold Line Chinatown Station and existing and planned mixed-use residential/commercial development within Chinatown. The two development options are discussed below and summarized in **Table A-1**, *Development Program Summaries*.

The locations of key Project components are shown in **Figures A-3**, *Development Program I – Conceptual Site Plan*, and **Figure A-8**, *Development Program II – Conceptual Site Plan*. Renderings of Development Program I are shown in **Figures A-4** through **A-7** and renderings of Development Program II are shown in **Figures A-9** through **A-12**.

At present there are few or no amenities that encourage pedestrian linkages between the Project Site and Chinatown or Los Angeles State Historic Park. As part of the Project, the Project Applicant proposes to activate the sidewalk along N. Spring Street with such features as a landscaped parkway, multiple seating areas, street furniture, and crosswalks that would enhance the pedestrian environment and improve connections with Chinatown, the Metro Gold Line Chinatown Station, and Los Angeles State Historic Park.

As part of the Project, the Project Applicant is requesting a General Plan Amendment to redesignate the Project Site from Hybrid Industrial to Regional Commercial, together with a Zone Change and Height District Change from UC(CA) to C2-2. Under the designations prior to the adoption of the CASP, the Project Site would be limited to a 1.5:1 FAR and would have no front, rear, or side yard setbacks. Since the MR-1 and C2-2 zoning designations impose no height restrictions, the requested Height District Change would not modify the permitted height of buildings on the Project Site; however, Height District 2 would allow a 6:1 FAR.

#### **Development Program I**

Development Program I would total 685 residential dwelling units and a maximum developed floor area of approximately 691,746 sf, for an overall averaged FAR of 3.03:1 and 131 du/acre. Subject to final design, the Project proposes to provide 1,054 on-site parking spaces (880 residential spaces and 174 non-residential spaces) under Development Program I. This would accommodate all Project parking demand, including residents, guests, employees, and patrons. The Project would also include bicycle amenities to serve Project residents, employees, and patrons. These would be provided pursuant to the City of Los Angeles Bicycle Ordinance and could include bicycle stalls and lockers for employees.

Table A-1

Development Program Summaries

| Use                                                   | Development Program               | Development Program               |
|-------------------------------------------------------|-----------------------------------|-----------------------------------|
| Parcel 1 (2.99 acres/130,000 sf)                      | <b>'</b>                          |                                   |
| Residential Area (sf)                                 | 444,960                           | 319,440                           |
| Studio Apartments (#)                                 | 94                                | 57                                |
| 1BR Apartments (#)                                    | 274                               | 171                               |
| 2BR Apartments (#)                                    | 132                               | 111                               |
| Total Number of Dwelling Units                        | 500                               | 339                               |
| 2BR Live-Work Lofts (#)                               | 5                                 | 14                                |
| Common Area (sf)                                      | 8,000                             | 4,000                             |
| Retail/Restaurant (sf)                                | 19,800                            | 7,500                             |
| SF Subtotal/FAR/DU per Acre                           | 478,760/3.68:1/167                | 347,740/2.67:1/102                |
| , , <del>,</del>                                      | , , ,                             | . , ,                             |
| Parcel 2 (1.35 acres/59,000 sf) Residential Area (sf) | 76,200                            | 76,200                            |
| 1BR Apartments (#)                                    | 96                                | 76,200<br>96                      |
| 2BR Apartments (#)                                    | 4                                 | 4                                 |
| Total Number of Dwelling Units                        | 100                               | 100                               |
|                                                       | 1,500                             | 1,500                             |
| Common Area (sf)                                      |                                   | 20,000                            |
| Market (sf)                                           | 20,000                            |                                   |
| Retail/Restaurant (sf)  SF Subtotal/FAR/DU per Acre   | 4,500<br><b>102,200/1.73:1/74</b> | 4,500<br><b>102,200/1.73:1/74</b> |
| Sr Subtotal/PAR/Do pel Acre                           | 102,200/1./3.1//4                 | 102,200/1./3.1//4                 |
| Parcel 3 (0.90 acres/39,000 sf)                       |                                   |                                   |
| Live-Work Lofts (sf)                                  | 108,686                           | 108,686                           |
| 1 BR Live-Work Lofts (#)                              | 14                                | 14                                |
| 2 BR Live-Work Lofts (#)                              | 66                                | 66                                |
| <b>Total Number of Dwelling Units</b>                 | 80                                | 80                                |
| Retail/Restaurant (sf)                                | 2,100                             | 2,100                             |
| SF Subtotal/FAR/DU per Acre                           | 110,786/2.84:1/88                 | 110,786/2.84:1/88                 |
| Total Floor Area                                      | 691,746                           | 560,726                           |
| Total Number of Dwelling Units                        | 685                               | 533                               |
| Total Retail/Restaurant Square Footage                | 26,400                            | 14,100                            |
| Total Market Square Footage                           | 20,000                            | 20,000                            |
| Averaged FAR                                          | 3.03:1                            | 2.46:1                            |
| DU/Acre                                               | 131                               | 102                               |
| Parking Spaces                                        | Parcel 1: 758 stalls              | Parcel 1: 555 stalls              |
|                                                       | Parcel 2: 158 stalls              | Parcel 2: 158 stalls              |
|                                                       | Parcel 3: 138 stalls              | Parcel 3: 138 stalls              |
| Total Parking Supply                                  | 1,054 stalls                      | 851 stalls                        |

Source: EVOQ; Van Tilburg, Banvard & Soderbergh, The Mobility Group. June 2014.

#### Parcel 1

Under Development Program I, Parcel 1 would be the most densely developed, with up to 500 market-rate residential apartments and approximately 19,800 sf of ground-floor retail/restaurant space in two high-rise towers up to 20 stories and 220 feet in height above adjacent grade. The towers, including the ground-floor retail/restaurant space, would front on N. Spring Street and College Street. Five live-work lofts would front on the private internal street connecting N. Spring Street and Rondout Street. The two towers and the livework units would surround a parking podium. Developed floor area on Parcel 1 would total approximately 478,760 sf and the FAR for the parcel would be 3.68:1.

Private outdoor open space for the use of Project residents would include rooftop decks and pools atop both towers. Indoor open space and recreational amenities would include community rooms, media rooms, and gym facilities. The southwest corner of Parcel 1, at the intersection of N. Spring Street and College Street, would be developed with a publicly accessible pedestrian plaza facing the Metro Gold Line Chinatown Station, and a new pedestrian crosswalk would be created at the intersection of N. Spring Street and College Street.

Parking for all Parcel 1 uses, totaling 758 stalls, would be accommodated in a single subterranean level and a five-level podium structure on Parcel 1 and angled surface parking along the private internal street north of Parcel 1. A private internal street would separate Parcels 1 and 2 and connect N. Spring Street and Rondout Street; vehicle access to the Parcel 1 parking structure would be provided from a drive aisle between the private street and College Street. A drop-off pocket would be located on College Street in front of the eastern tower. The loading area for Parcel 1 would be at grade near the southeast corner of the parcel, accessed from the off-site alley between College Street and Rondout Street.

#### Parcel 2

Parcel 2 would be developed with a senior housing community of up to 100 affordable units housed within four-story, 62-foot buildings, a ground-floor neighborhood market of approximately 20,000 sf, and ground-floor retail/restaurant space totaling approximately 4,500 sf. The senior housing community would be arrayed around a central podium courtyard atop the ground-floor market. The market and retail/restaurant space would front on N. Spring Street. Developed floor area on Parcel 2 would total approximately 102,200 sf and the FAR for the parcel would be 1.73:1.

Parcel 2 would include an expansive, publicly accessible pedestrian plaza at the corner of N. Spring Street and the private internal street connecting N. Spring Street and Rondout Street. Private open space for the use of residents would include a pool deck in the central podium courtyard and an indoor community or "rec" room.

Parking for all Parcel 2 uses, totaling 158 stalls, would be accommodated in a two-level subterranean structure within Parcel 2 and angled surface parking along the private internal streets north and south of Parcel 2. Vehicle access for the Parcel 2 parking structure would be via a single ingress/egress driveway off the private internal street connecting N. Spring Street and Rondout Street. The loading area for Parcel 2 would be at-grade and accessed from Rondout Street.









FIGURE





**Development Program I: Oblique Aerial View** 

College Statio

Source: Van Tilburg, Banvard & Soderbergh, AIA, 2014.





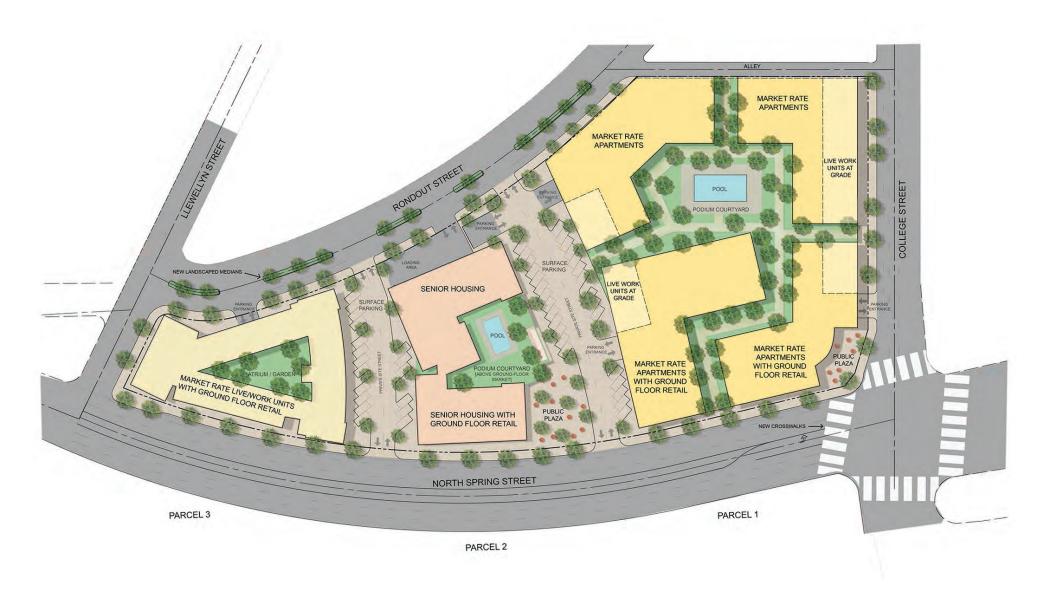




**Development Program I: View from North** 















**Development Program II – Oblique Aerial View** 

FIGURE













#### Parcel 3

Parcel 3 would be developed with up to 80 market-rate, double-height live-work lofts and approximately 2,100 sf of ground-floor retail/restaurant space, in an eight-story, approximately 82-foot building. The livework units would surround a central ground-floor atrium/garden and would front on N. Spring Street, Llewellyn Street, Rondout Street, and the internal private street south of Parcel 3. The retail/restaurant space would front on N. Spring Street and Llewellyn Street. Developed floor area on Parcel 3 would be approximately 110,786 sf and the FAR would be 2.84:1.

Private open space for the use of residents would include the central atrium/garden and may also include community rooms, media rooms, and gym facilities.

Vehicle access for Parcel 3 would be provided by an ingress/egress driveway from Rondout Street. Parking for all Parcel 3 uses, totaling 138 stalls, would be accommodated in a two-level subterranean structure within Parcel 3 and angled surface parking along the private internal street south of Parcel 3.

### **Development Program II**

Development Program II would total 533 residential dwelling units and a maximum developed floor area of approximately 560,726 sf, for an overall averaged FAR of 2.46:1 and 102 du/acre. Subject to final design, the Project proposes to provide 851 on-site parking spaces (695 residential spaces and 156 non-residential spaces) under Development Program II. This would accommodate all Project parking demand, including residents, guests, employees, and patrons. The Project would also provide bicycle amenities to serve Project residents, employees and patrons. These would be provided pursuant to the City of Los Angeles Bicycle Ordinance and could include bicycle stalls and lockers for employees.

#### Parcel 1

Under Development Program II, Parcel 1 would still be the most densely developed of the three parcels. It would be developed with up to 339 residential units, 14 double-height live-work lofts, and approximately 7,500 sf of ground-floor retail/restaurant in five-story-plus-loft buildings, approximately 82 feet in height. The buildings would be arrayed around a central courtyard atop a parking podium. Residential uses would front on N. Spring Street, College Street, Rondout Street, and the private internal street connecting N. Spring Street and Rondout Street; ground-floor retail/restaurant space would front on N. Spring Street. Developed floor area on Parcel 1 under Development Program II would total approximately 347,740 sf and the FAR for the parcel would be 2.67:1.

Private outdoor open space for the use of Project residents would include a pool deck within the central courtyard. Indoor open space and recreational amenities would include community rooms, media rooms, and gym facilities. The southwest corner of Parcel 1, at the intersection of N. Spring Street and College Street, would be developed with a publicly accessible pedestrian plaza facing the Metro Gold Line Chinatown Station, and a new pedestrian crosswalk would be created at the intersection of N. Spring Street and College Street.

Parking for all Parcel 1 uses, totaling 555 stalls, would be accommodated in a single subterranean level and a two-level podium structure on Parcel 1, and angled surface parking along the private internal street north of Parcel 1. A private internal street would separate Parcels 1 and 2 and connect N. Spring Street and Rondout

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Street; vehicle access for the Parcel 1 parking structure would be via two ingress/egress driveways off this street. The loading area for Parcel 1 would be at grade near the southeast corner of the parcel, accessed from the off-site alley between College Street and Rondout Street.

#### Parcels 2 and 3

Under Development Program II, Parcels 2 and 3 would be developed as under Development Program I, with the same land use mix, number of residential units and associated square footage, retail/restaurant uses and associated square footage, and vehicle access, and parking accommodations.

# 2. Anticipated Construction Schedule

Construction of the Project is anticipated to beginning early 2016 pending Project consideration and approval, and would be completed in 2018. Construction is expected to take place in three phases corresponding to the three Project Site parcels, and phases may overlap. Up to 8,400 cubic yards of demolition debris (i.e., asphalt and base material) and 63,100 cubic yards of soil are anticipated to be excavated during Project construction, all of which would require export off-site.

# F. NECESSARY APPROVALS

It is anticipated that approvals required for the proposed Project would include, but may not be limited to, the following:

- Tentative Parcel Map Approval;
- Site Plan Review:
- General Plan Amendment from Hybrid Industrial to Regional Commercial;
- Zone Change from UC(CA)to C2-2;
- Height District Change from Height District 1 to Height District 2, to allow an increase in the maximum FAR from 1.5:1 to 6:1:
- Zoning Administrator Interpretation to specify the front, rear, and side yards of the Project;
- Certification of the Environmental Impact Report;
- Development Agreement;
- Grading, excavation, foundation, and associated building permits; and
- Other permits and approvals as deemed necessary, including possible legislative approvals as required by the City to implement the Project.

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# ATTACHMENT B

EXPLANATION OF CHECKLIST DETERMINATIONS

# ATTACHMENT B: EXPLANATION OF CHECKLIST DETERMINATIONS

The following discussion provides responses to each of the questions set forth in the City of Los Angeles Initial Study Checklist. The responses below indicate those topics that are expected to be addressed in an Environmental Impact Report ("EIR") and demonstrate why other topics are not expected to result in significant environmental impacts and thus do not need to be addressed further in an EIR. The questions with responses that indicate a "Potentially Significant Impact" do not presume that a significant environmental impact would result from the Project. Rather, such responses indicate the topics will be addressed in an EIR with conclusions regarding impact significance reached as part of the EIR analysis.

# I. AESTHETICS

*Would the project:* 

#### a. Have a substantial adverse effect on a scenic vista?

**Potentially Significant Impact.** The Project Site is located within a highly urbanized area northeast of downtown Los Angeles. Visual resources of merit in the Project vicinity include Los Angeles State Historic Park to the west, the Los Angeles River to the east, the downtown Los Angeles skyline to the southwest, and the easternmost foothills and bluffs of the Santa Monica Mountains to the northwest. Because the Project would introduce mid-rise and/or high-rise buildings and increase overall density on the currently undeveloped Project Site, it is recommended that this issue be analyzed further in an EIR.

# b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

**Potentially Significant Impact.** The Project Site is not located along a City- or State-designated scenic highway or associated view corridor. Although not designated a California scenic highway, the Arroyo Seco Parkway ("SR 110"), which begins approximately 2.0 miles northwest of the Project Site, has been designated by the State as a Historic Parkway from the Figueroa Tunnels to Pasadena (post miles 25.7 to 31.9). This section of SR 110 has also been designated as a National Scenic Byway by the Federal Highway Administration ("FHWA"). Although the designated segment of SR 110 is north of the Project Site, the proposed high-rise towers may be visible from the roadway following Project buildout. Therefore, it is recommended that this topic be analyzed further in an EIR to determine any potential impacts on views from the designated segment of SR 110.

# c. Substantially degrade the existing visual character or quality of the site and its surroundings?

**Potentially Significant Impact.** The Project would develop the Project Site with several mid- and high-rise buildings, private streets, a broad pedestrian plaza, ground-level retail/market uses, and streetscape improvements. Because the proposed development would alter the visual character of the undeveloped Project Site and its surroundings by introducing new buildings and increasing development density in the Project area, it is recommended that this topic be analyzed further in an EIR.

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

**Potentially Significant Impact.** The Project Site lies within a highly urbanized area northeast of downtown Los Angeles, which is characterized by medium to high ambient nighttime artificial light levels. At night, the surrounding development typically generates moderate to high levels of interior and exterior lighting for security, parking, signage, architectural lighting, and landscaping/decorative purposes. Street lights and traffic on local streets also contribute to relatively high ambient light levels in the area. The Project would contribute to ambient nighttime illumination as the Project's new architectural lighting, security lighting, and illuminated signage is expected to increase light levels over existing conditions. Some lighting elements may be visible from nearby off-site vantages, including the residential uses east of the Project Site. In addition, the Project would introduce new building surface materials to the Project Site with the potential to generate glare. Therefore, it is recommended that this topic be analyzed further in an EIR.

Shading impacts are influenced by the height and bulk of a structure, the time of year, the duration of shading during the day, and the proximity of shade-sensitive land uses, or receptors. The Project vicinity is characterized by a number of low- and medium-density hybrid and industrial uses, which are not shadesensitive receptors. However, the Los Angeles State Historic Park is located across N. Spring Street from the Project Site. As the Project would increase the height and massing of on-site development in the potential area of shading for this park, it is recommended that this topic be analyzed further in an EIR.

# II. AGRICULTURE AND FOREST RESOURCES

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

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

No Impact. The Project Site consists of a currently undeveloped lot. No agricultural uses or related operations are present within the Project Site or in the surrounding highly urbanized area. As such, the Project Site is not located on designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program.<sup>1</sup> Since the Project would not convert farmland to non-agricultural uses, there would be no impact. No further analysis of this topic in an EIR is recommended and no mitigation measures are required.

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Los Angeles County Important Farmland Map 2010 and Los Angeles County Williamson Act Map 2011-2012.

# b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

**No Impact.** The Project Site is designated as Regional Commercial in the City of Los Angeles General Plan. The Project Site is currently zoned MR2-1 (Restricted Light Industrial) and consists of a flat, undeveloped parcel that is periodically used for parking. No agricultural zoning is present in the Project vicinity, and no nearby lands are enrolled under the Williamson Act. As such, the Project would not conflict with existing zoning for agricultural uses or a Williamson Act contract, and there would be no impact. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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

**No Impact.** As discussed in the response to Checklist Question II(b), the Project Site is currently zoned MR2-1 and consists of an undeveloped lot. Furthermore, consistent with the built, urbanized area surrounding the Project Site, the larger Project vicinity is zoned for light industrial, commercial, residential, and open space uses. No forest land or land zoned for timberland production is present on-site or in the surrounding area. As such, the Project would not conflict with existing zoning for forest land or timberland, and there would be no impact. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

#### d. Result in the loss of forest land or conversion of forest land to non-forest use?

**No Impact.** The Project Site consists of an undeveloped parcel and no forest land exists in the Project vicinity. As such, the Project would not result in the loss of forest land or conversion of forest land to nonforest use, and there would be no impact. No further analysis of this topic is necessary and no mitigation measures are required.

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

**No Impact.** There are no agricultural uses or related operations on or near the Project Site, which is located northeast of downtown Los Angeles, a highly urbanized portion of the City. Therefore, the Project would not involve the conversion of farmland to other uses, either directly or indirectly. No impacts to agricultural land or uses would occur. No further analysis of this topic is necessary and no mitigation measures are required.

# III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

#### a. Conflict with or obstruct implementation of the applicable air quality plan?

**Potentially Significant Impact.** The Project Site is located within the 6,600-square-mile South Coast Air Basin ("Basin"). The South Coast Air Quality Management District ("SCAQMD") together with the Southern

California Association of Governments ("SCAG") is responsible for formulating and implementing air pollution control strategies throughout the Basin. The current Air Quality Management Plan ("AQMP") was adopted February 1, 2013 and outlines the air pollution control measures needed to meet Federal particulate matter ("PM<sub>2.5</sub>") standards in 2014 and ozone ("O<sub>3</sub>") standards by 2023. The AQMP also proposes policies and measures currently contemplated by responsible agencies to achieve Federal standards for healthful air quality in the Basin that are under SCAQMD jurisdiction. In addition, the current AQMP addresses several Federal planning requirements and incorporates updated emissions inventories, ambient measurements, meteorological data, and air quality modeling tools from that included in earlier AQMPs. The Project would support and be consistent with several key policy directives set forth in the AQMP. For example, the Project would provide a range of employment opportunities, locate new development in proximity to existing transit facilities, and would reuse a site in an area already served by existing infrastructure. Notwithstanding these attributes, the Project would increase traffic in the area and, consequently, generate operational air emissions that could affect implementation of the AQMP. Pollutant emissions resulting from Project construction would also have the potential to affect implementation of the AQMP. Therefore, it is recommended that this topic be analyzed further in an EIR.

#### b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

**Potentially Significant Impact.** As indicated in the response to Checklist Question III(a), the Project Site is located within the Basin, which is characterized by relatively poor air quality. State and Federal air quality standards are often exceeded in many parts of the Basin, with Los Angeles County among the highest of the counties that comprise the Basin in terms of non-attainment of the standards. The Basin is currently in nonattainment for O<sub>3</sub>, particulate matter less than 10 microns in diameter ("PM<sub>10</sub>")<sup>2</sup>, and PM<sub>2.5</sub> on Federal and State air quality standards. The Project would result in increased air emissions associated with construction and operational traffic. Therefore, it is recommended that this topic be analyzed further in an EIR.

Result in a cumulatively considerable net increase of any criteria pollutant for which the c. project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

**Potentially Significant Impact.** As discussed in the response to Checklist Question III(b), the Project would result in increased air emissions from construction and operational traffic in the Basin, an air quality management area currently in non-attainment of Federal and State air quality standards for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. Therefore, it is recommended that this topic be analyzed further in an EIR.

#### d. Expose sensitive receptors to substantial pollutant concentrations?

**Potentially Significant Impact.** The Project vicinity is generally developed with non-sensitive air receptors, such as light- to medium-density hybrid and industrial uses, and transportation uses. Sensitive air receptors in the vicinity include the Los Angeles State Historic Park (located across N. Spring Street from the Project Site) and residential uses (located approximately 750 feet east of the Project Site). Project construction and

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As noted in the 2012 AQMP, the Basin has met the PM<sub>10</sub> standards at all stations and a request for re-designation to attainment status is pending with U.S. Environmental Protection Agency.

operation could increase air emissions above current levels, thereby potentially affecting these sensitive receptors. Therefore, it is recommended that this topic be analyzed further in an EIR.

# e. Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. Odors are typically associated with industrial projects involving the use of chemicals, solvents, petroleum products, and other strong-smelling elements used in manufacturing processes. Odors are also associated with such uses as sewage treatment facilities and landfills. The Project involves the construction and operation of a mixed-use development (residential units, live-work lofts and retail) and would not introduce any major odor-producing uses that would have the potential to affect a substantial number of people. Odors associated with Project operation would be limited to those associated with on-site waste generation and disposal (e.g., trash cans, dumpsters). Project operation is not expected to create objectionable odors. Activities and materials associated with construction would be typical of construction projects of similar type and size. On-site trash receptacles would be covered and properly maintained in a manner that promotes odor control. Any odors that may be generated during construction of the Project would be localized and would not be sufficient to affect a substantial number of people or result in a nuisance as defined by SCAQMD Rule 402. Impacts with regard to odors would be less than significant. No further analysis of this topic is necessary and no mitigation measures are required.

# IV. BIOLOGICAL RESOURCES

*Would the project:* 

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

**No Impact.** The Project Site is located in a highly urbanized area and is currently vacant and periodically used for surface parking and storage by nearby commercial and industrial operations. The Site was historically used as freight rail yard beginning in approximately 1905, and housed multiple rail lines and ancillary facilities. No landscaping is present within the Project Site and no native trees or other plant species are present on-site. Because of the urbanized nature of the Project Site and Project vicinity, the Project Site does not support habitat for candidate, sensitive, or special status species. Therefore, no impacts to candidate, sensitive, or special status species would occur. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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

**No Impact.** As discussed in the response to Checklist Question IV(a), the Project Site and surrounding area are located in a highly urbanized setting. The Project Site does not contain any drainage channels to the river, riparian habitat, or other sensitive natural communities as indicated in the City or regional plans or in regulations by the California Department of Fish and Wildlife ("CDFW") or US Fish and Wildlife Service ("USFWS"). Furthermore, the Project Site is not located in or adjacent to a Significant Ecological Area as

defined by the City of Los Angeles.<sup>3</sup> Therefore, the Project would not have an adverse effect on any riparian habitat or other sensitive natural community. No further analysis of this topic is necessary and no mitigation measures are required.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

**No Impact.** As discussed in the response to Checklist Question IV(a), the Project Site is located in a highly urbanized area and is currently a vacant lot periodically used for parking by off-site businesses. The surrounding area has been fully developed with urban uses and associated infrastructure. The Project Site does not contain any wetlands as defined by Section 404 of the Clean Water Act. Therefore, the Project would not have an adverse effect on federally protected wetlands. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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

**No Impact.** As stated in the response to Checklist Question IV(a), the Project Site is currently occupied with an undeveloped lot. Due to the highly urbanized nature of the Project Site and surrounding area, the lack of a major water body, as well as there being no trees on the Project Site, the Project Site does not contain substantial habitat for native resident or migratory species, or native nursery sites. Therefore, the Project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native nursery sites. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

**Less Than Significant Impact.** As stated in the response to Checklist Question IV(a), the Project Site is a vacant lot with very little vegetation, except for some ornamental specimen trees along its eastern perimeter. No locally protected biological resources, such as oak trees or California walnut woodlands, or other tress protected under the City of Los Angeles Protected Tree Ordinance (Chapter IV, Article 6 of the Los Angeles Municipal Code ["LAMC"]), exist on the Project Site. The Project would include ornamental landscaping at building perimeters and entrances.

Numerous young street trees are present adjacent to the Project Site along Spring Street. It is likely that these trees would be removed to accommodate the Project. The trees are not considered significant non-protected trees (i.e., non-protected trees with a trunk diameter of eight inches or greater at a height of 54 inches above the ground) by the City. Nonetheless, it is the City's policy to retain street trees during Project development. Thus, any street trees that would be removed as part of the Project would be replaced in

<sup>&</sup>lt;sup>3</sup> City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, at page 2.18-13;

http://cityplanning.lacity.org/housinginitiatives/housingelement/frameworkeir/FrameworkFEIR.pdf, accessed September 6, 2013.

accordance with the City's Street Tree Ordinance. Landscaping would comply with all LAMC requirements. Therefore, the Project would not conflict with local policies or ordinances protecting biological resources, and a less than significant impact would occur. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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

**No Impact.** As discussed in the response to Checklist Question IV(a), the Project Site is located within a developed, urbanized area and does not provide habitat for any sensitive biological resources. The Project Site is not located within a habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan.<sup>4</sup> Therefore, the Project would not conflict with the provisions of any adopted conservation plan, and no impact would occur. No further analysis of this topic is necessary and no mitigation measures are required.

#### V. CULTURAL RESOURCES

Would the project:

#### Cause a substantial adverse change in the significance of a historical resource as defined in a. §15064.5?

**Less Than Significant Impact.** The Project Site was developed as far back as 1905 and historically used as a rail yard, including storage of wood, coal and petroleum products. Prior to these uses, the Project Site was used for agricultural purposes. The Project Site was vacant as of 1970 and was acquired by the Los Angeles Metropolitan Transit Authority (MTA) for support of the expansion of the MTA Gold Line to Pasadena; it had been previously owned by the Union Pacific Railroad. The Project Site is currently an undeveloped lot. Numerous ground-disturbing activities have been completed at the Project Site since the removal of on-site structures in 1970. These activities include the removal of greater than 12,000 tons of soil from the Project Site to remediate subsurface hazardous materials concerns. As a result, any subsurface historical resources were likely disturbed during the demolition of previous on-site structures and subsequent remediation activities. As the Project would not require the removal of existing structures which are considered historic resources, it is anticipated to result in a less than significant impact. No further analysis of this topic in an EIR is required.

#### b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

**Less Than Significant Impact.** A search conducted for the Los Angeles State Historic Park EIR identified that 23 cultural resource studies had been conducted within the vicinity of the Park but no recorded prehistoric archaeological sites were found within a half-mile radius. The Project Site has been previously disturbed by historical grading, building, and remediation activities, and there is no record that any items of archaeological significance were ever recovered at the Project Site. However, there is the potential for historic archaeological deposits to be preserved below the present ground surface. Given that the Project

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California Department of Fish and Wildlife, Habitat Conservation Planning, Natural Community Conservation Planning, Summary of Natural Community Conservation Plans (NCCPs) January, 2013; http://www.dfg.ca.gov/habcon/nccp/. Accessed January 15, 2014.

would require grading and excavation to a greater depth than previously occurred on the Project Site, the possibility exists that archaeological artifacts not previously encountered may be encountered, which is a potentially significant impact. In the event of the discovery of previously unknown archaeological resources during construction, implementation of the following standard City Regulatory Compliance Measure would reduce impacts to a less than significant level. No further analysis of this topic in an EIR is required.

Regulatory Compliance Measure IS-1: Prior to the issuance of any grading, excavation, or ground disturbance permit, the applicant shall execute a covenant acknowledging and agreeing to comply with all the terms and conditions established herein which shall be recorded in the County Recorder's Office. The agreement (standard master covenant and agreement form CP-6770) shall run with the land and shall be binding on any subsequent owners, heirs or assigns. The agreement with the conditions attached must be submitted to the Development Services Center for approval before being recorded. After recordation, a certified copy bearing the Recorder's number and date shall be provided to the Department of City Planning for retention in the administrative record for Case No. ENV 2013-2055-EIR.

- a. All initial grading and all excavation activities shall be monitored by a project archaeologist. The project archaeologist shall be present full-time during the initial disturbances of matrix with potential to contain cultural deposits and will document activity.
- b. The services of an archaeologist, qualified for historic resource evaluation, as defined in CEQA and Office of Historic Preservation (OHP) Guidelines, shall be secured to implement the archaeological monitoring program. The qualified archaeologist shall be listed, or be eligible for listing, in the Register of Professional Archaeologist (RPA). Recommendations may be obtained by contacting the South Central Coastal Information Center (657-278-5395) located at California State University Fullerton.
- c. In the event of a discovery, or when requested by the project archaeologist, the contractor shall divert, direct, or temporarily halt ground disturbing activities in an area in order to evaluate potentially significant archaeological resources.
  - i. It shall be the responsibility of the project archaeologist to: determine the scope and significance of the find; determine the appropriate documentation, preservation, conservation, and/or relocation of the find; and determine when grading/excavation activities may resume in the area of the find.
  - ii. Determining the significance of the find shall be guided by California Public Resources Code Division 13, Chapter 1, Section 21083.2, subdivision (g) and (h). If the find is determined to be a "unique archaeological resource", then the applicant, in conjunction with the recommendation of the project archaeologist, shall comply with Section 21083.2, subdivisions (b) though (f).
  - iii. If at any time the project site, or a portion of the project site, is determined to be a "historical resource" as defined in California Code of Regulations Chapter 3, Article 1, Section 15064.5, subdivision (a), the project archaeologist shall prepare and issue a mitigation plan in conformance with Section 15126.4, subdivision (b).
  - iv. If the project archaeologist determines that continuation of the project or project-related activities will result in an adverse impact on a discovered historic resource which cannot be mitigated, all further activities resulting in the impact shall immediately cease, and the Lead Agency shall be contacted for further evaluation and direction.

- v. The applicant shall comply with the recommendations of the project archaeologist with respect to the documentation, preservation, conservation, and/or relocation of finds.
- d. Monitoring activities may cease when:
  - vi. Initial grading and all excavation activities have concluded; or
  - vii. By written consent of the project archaeologist agreeing that no further monitoring is necessary. In this case, a signed and dated copy of such agreement shall be submitted to the Dept. of City Planning for retention in the administrative record for Case No. ENV 2012-2055-EIR.
- e. At the conclusion of monitoring activities, and only if archaeological materials were encountered, the project archaeologist shall prepare and submit a report of the findings to the South Central Coastal Information Center.
- f. At the conclusion of monitoring activities, the project archaeologist shall prepare a signed statement indicating the first and last date monitoring activities took place, and submit it to the Dept. of City Planning, for retention in the administrative file for Case No. **ENV 2012-2055-EIR.**

# c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

**Less Than Significant Impact.** The Project Site does not include any known unique geologic features. In addition, no unique geologic features are anticipated to be encountered during project construction. Therefore, the Project would not directly or indirectly destroy a unique geologic feature. Impacts associated with unique geologic features would be less than significant and no mitigation measures would be necessary.

The Project Site has been previously disturbed by historical grading, building, and remediation activities, and there is no record that any significant paleontological resources were ever recovered at the Project Site. However, Project-related grading and excavation for subterranean parking and building foundations could extend into native soils that might potentially contain paleontological resources, which is a potentially significant impact. In the event of the discovery of previously unknown paleontological resources during construction, implementation of the following standard City Regulatory Compliance Measure would reduce impacts to a less than significant level. No further analysis of this topic in an EIR is required.

**Regulatory Compliance Measure IS-2:** If any paleontological materials are encountered during the course of Project development, all further development activity shall halt and the following shall be undertaken:

- g. The services of a paleontologist shall then be secured by contacting the Center for Public Paleontology-USC, UCLA, California State University Los Angeles, California State University Long Beach, or the Los Angeles County Natural History Museum-who shall assess the discovered material(s) and prepare a survey, study or report evaluating the impact.
- h. The paleontologist's survey, study or report shall contain a recommendation(s), if necessary, for the preservation, conservation, or relocation of the resource.
- i. The Applicant shall comply with the recommendations of the evaluating paleontologist, as contained in the survey, study or report.

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- j. Project development activities may resume once copies of the paleontological survey, study or report are submitted to the Los Angeles County Natural History Museum.
- **Regulatory Compliance Measure IS-3:** Prior to the issuance of any building permit, the Applicant shall submit a letter to the case file indicating what, if any, paleontological reports have been submitted, or a statement indicating that no material was discovered.
- **Regulatory Compliance Measure IS-4:** A covenant and agreement binding the Applicant to this condition shall be recorded prior to issuance of a grading permit.

# d. Disturb any human remains, including those interred outside of formal cemeteries?

**Less Than Significant Impact.** There are no known burial sites within the Project boundaries or in the vicinity. Nonetheless, although remote, the potential exists to encounter human remains during excavation activities, which is a potentially significant impact. In the event of the discovery of unrecorded human remains during construction, compliance with the following standard City of Los Angeles Regulatory Compliance Measure would reduce impacts to a less than significant level. No further analysis of this topic in an EIR is required.

Regulatory Compliance Measure IS-5: As required by state law (e.g., Public Resources Code Section 5097.98, State Health and Safety Code Section 7050.5, and California Code of Regulations Section 15064.5(e)), if human remains are discovered at the Project Site during construction, work at the specific construction site at which the remains have been uncovered shall be suspended, and the City of Los Angeles Public Works Department and County coroner shall be immediately notified. If the remains are determined by the County coroner to be Native American, the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.

# VI. GEOLOGY AND SOILS

Portions of the following impact analysis pertaining to the Project Site's underlying geology and soils are based, in part, on information contained in the *Report of Geotechnical Due-Diligence Investigation for a Proposed Mixed-Use Development, Chinatown Area, Los Angeles, California*, ("Geotechnical Investigation") prepared by LGC Valley, Inc. in June 2013. The Geotechnical Investigation is included as Appendix B-1 of this Initial Study.

*Would the project:* 

- a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

**Less Than Significant Impact.** The seismically active region of southern California is crossed by numerous active and potentially active faults and is underlain by several blind thrust faults. Based on criteria established by the California Geological Survey ("CGS"), faults can be classified as active, potentially active, or

inactive. Active faults are those that have shown evidence of movement within the past 11,000 years (i.e., during the Holocene Epoch). Potentially active faults are those that have shown evidence of movement between 11,000 and 1.6 million years ago (i.e., during the Pleistocene Epoch). Inactive faults are those that have exhibited displacement greater than 1.6 million years before the present (i.e., during the Quaternary Epoch). Blind thrust faults are low angle reverse faults with no surface expression. Due to their buried nature, the existence of blind thrust faults is usually not known until they produce an earthquake.

The closest Holocene (active) fault to the Project Site is the Newport-Inglewood Fault, located approximately 8 miles southwest of the site. The closest Pleistocene (potentially active) fault is the Hollywood Fault, located approximately 4 miles north of the site. Several Quaternary faults (non-active faults) are also located greater than 5 miles from the Project Site. The closest blind thrust faults to the Project Site are the Elysian Park Thrust Fault, which generally underlies the southwest portion of the Los Angeles Basin, approximately 3.3 miles southwest of the Project Site.

Fault rupture is the displacement that occurs along the surface of a fault during an earthquake. The CGS has established earthquake fault zones known as Alquist-Priolo Earthquake Fault Zones around the surface traces of active faults to assist cities and counties in planning, zoning, and building regulation functions. These zones identify areas where potential surface rupture along an active fault could prove hazardous and identify where special studies are required to characterize hazards to habitable structures. In addition, the City of Los Angeles General Plan Safety Element has designated fault rupture study areas extending along each side of active and potentially active faults to establish areas of hazard potential due to fault rupture. Although there are numerous active and potentially active faults through the Los Angeles region, none are located close enough to produce surface expression at the Project Site. Thus, the Project Site is not located with an Alquist-Priolo Earthquake Fault Zone, and no known faults exist on the site.<sup>5</sup> Based on this information, the Project would not result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury involving rupture of a known earthquake fault and, therefore, impacts from fault rupture are less than significant and no mitigation measures are required.

# ii. Strong seismic ground shaking?

**Less Than Significant Impact.** The Project Site is located within the seismically active Southern California region and is not exposed to a greater than normal seismic risk than other properties in the City. The level of ground shaking that would be experienced at the Project Site from active or potentially active faults or blind thrust faults in the region would be a function of several factors including earthquake magnitude, type of faulting, rupture propagation path, distance from the epicenter, earthquake depth, duration of shaking, site topography, and site geology. The active faults that could produce shaking at the Project Site are the same faults discussed in Checklist Question VI(a)ii above, plus the Whittier-Elsinore Fault, San Jacinto Fault, San Andreas Fault and numerous other smaller faults and blind thrust faults found throughout the region.

Based on the Project Site's relationship with known faults, the Geotechnical Investigation concluded that the design earthquake (10 percent chance of being exceeded in 50-year period) could produce a weighted magnitude Peak Horizontal Ground Acceleration ("PHGA") of 0.40g at the Project Site. As with any new project development in the State of California, building design and construction are required to conform to the current seismic design provisions of the City's Building Code, which incorporates relevant provision of

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<sup>&</sup>lt;sup>5</sup> City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan, Safety Element, November 26, 1996, Exhibit A. Available at: http://cityplanning.lacity.org/cwd/gnlpln/saftyelt.pdf, accessed January 6, 2014.

the 2013 California Building Code ("CBC"). The 2013 CBC, as amended by the City's Building Code, incorporates the latest seismic design standards for structural loads and materials to provide for the latest in earthquake safety.

While it is likely that future earthquakes produced in southern California would shake the Project Site, modern, well-constructed buildings are designed to resist ground shaking through the use of shear panels and other forms of building reinforcement. As with any new construction in the City and State, design and construction techniques for the Project would be required to conform to the current seismic design provisions of the 2013 CBC (as amended by the City's Building Code). Additionally, construction of the Project would be required to adhere to applicable recommendations provided in the Geotechnical Investigation, to minimize seismic-related hazards. Overall, given compliance with regulatory requirements and site-specific recommendations, impacts associated with seismic ground shaking would be less than significant. No further analysis of this topic in an EIR is recommended.

# iii. Seismic-related ground failure, including liquefaction?

**Less Than Significant Impact.** Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Specifically, liquefaction occurs when the shock waves from an earthquake of sufficient magnitude and duration compact and decrease the volume of the soil; if drainage cannot occur, this reduction in soil volume will increase the pressure exerted on the water contained in the soil, forcing it upward to the ground surface. This process can transform stable soil material into a fluid-like state. This fluid-like state can result in horizontal and vertical movements of soils and building foundations from lateral spreading of liquefied materials and postearthquake settlement of liquefied materials. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density non-cohesive (granular) soils; and 3) high-intensity ground motion. Studies indicate that saturated, loose to medium dense, near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential.

The Project Site is located within a City of Los Angeles-designated Liquefaction Hazard Zone. In general, the Project Site is underlain by undocumented fills to a depth of 7 feet below ground surface ("bgs") that consist of silty sand and some gravel. These undocumented fills were found to be loose to medium dense and dry to slightly moist. Below the undocumented fill material, alluvial soils were encountered. The alluvial soils were stiff to hard silts/clays, medium dense to very dense silty/gravelly sand, and sand. Generally, the soils below the proposed depth of the subterranean garage were found to be dense and very dense silty to gravelly sand. These alluvial soils were dry to slightly moist in the upper most 30 feet and slightly moist to saturated below 30 feet.

The Geotechnical Investigation evaluated whether the fine-grained soils encountered on the Project Site (silts and clays) are susceptible to liquefaction. Groundwater was encountered in the borings at depths ranging from approximately 30 to 35 feet bgs, and the highest historic groundwater level for the site is approximately 20 feet bgs.

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The Geotechnical Investigation noted that the soil layers below the upper 20 feet, which are low plasticity silts/clays, have been found to be liquefiable in a seismic event; the fine grained soils encountered on the Project Site are considered to be low to moderately plastic, and were therefore evaluated as potentially liquefiable soils. On-site soils encountered at depths greater than 20 feet in the borings were gravelly/silty sands to silty/clayey soils, were found to be slightly moist to wet, and based on blow counts and in-situ densities were found to be medium dense to dense or stiff to hard.

Based on the liquefaction analysis considering a design groundwater elevation of 20 feet and a magnitude weighted peak ground acceleration of 0.4g, the results indicated that the sandy soils encountered in the upper soil layers were not potentially liquefiable; however some fine grained layers of silty/clayey soils were found to be potentially liquefiable between 35–45 feet bgs.

Based on the results of the previous liquefaction analysis, the Geotechnical Investigation concluded that the amount of total seismically induced settlement possible for the design conditions, with the remedial recommendations provided therein, is less than one-quarter inch. Based on this small amount of settlement during the design seismic event, the Geotechnical Investigation concluded that the potential for dry sand settlement is considered negligible (i.e., less than a tenth of an inch) due the lack of dry, loose granular soils. Nonetheless, the Geotechnical Investigation contains design recommendations to account for one-quarter inch of post-construction seismic settlement, including design specifications for conventional and mat foundations.

In addition, as with any development project within the City, the Project would comply with the Uniform Building Code Chapter 18, Division 1, Section 1804.5, Liquefaction Potential and Soil Strength Loss, which requires the preparation of a final geotechnical report that outlines site-specific design recommendations related to liquefaction and soil-strength loss. Prior to issuance of the building permit, the Applicant would be required to submit the final geotechnical report to the City's Department of Building and Safety ("LADBS"), which would review the report and issue an Approval Letter. The Project would be required to comply with the conditions contained within LADBS's Approval Letter for the Project, which may be subsequently amended or modified. With adherence to the site-specific design recommendation in the Geotechnical Investigation provided in Appendix B-1 and the final geotechnical report and any subsequent modifications by LADBS, impacts with regard to liquefaction would be less than significant. No further evaluation of this topic in an EIR is recommended. No mitigation measures are required.

#### iv. Landslides?

**No Impact.** The Project Site is not located within a City-designated Hillside Grading Area, is not subject to the City's Hillside Ordinance, and is not located in a City-designated Landslide area. Additionally, the Project Site is relatively flat, sloping very gently to the southeast. Further, the Project Site is not in immediate proximity to any mountains or steep slopes. As such, the Geotechnical Investigation concluded that there are no indications of landslides close to or within the Project Site. Therefore, the Project would not expose people or structures to potential substantial adverse effects involving landslides and no impact would result. No mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

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# b. Result in substantial soil erosion or the loss of topsoil?

**Less Than Significant Impact.** During construction, the 5.24-acre Project Site would be subject to ground-disturbing activities (e.g., excavation, grading, foundation construction, the installation of utilities). These activities would expose soils for a limited time, allowing for possible erosion.

Although Project development has the potential to result in the erosion of soils, this potential would be reduced by implementation of standard erosion controls imposed during site preparation and grading activities. Specifically, all grading activities would require grading permits from the LADBS, which would include requirements and standards designed to limit potential impacts associated with erosion. In addition, on-site grading and site preparation would also comply with all applicable provisions of Chapter IX, Division 70 of the LAMC which addresses grading, excavations, and fills. This municipal code section requires that all grading activities occur in accordance with grading permits issued by LADBS. The permits typically require that excavation and grading activities be scheduled during dry weather periods. Should grading activities occur during the rainy season (October 1st to April 14th), a Wet Weather Erosion Control Plan ("WWECP") would be prepared pursuant to the "Manual and Guideline for Temporary and Emergency Erosion Control," adopted by the Los Angeles Board of Public Works. The WWECP would include measures such as diversion dikes to channel runoff around the site. Division 70 of the LAMC also requires that stockpiles, excavated, and exposed soil be covered with secured tarps, plastic sheeting, erosion control fabrics, or treated with a biodegradable soil stabilizer. A deputy grading inspector is required be on-site during grading operations to ensure adhered to applicable regulations. Lastly, as Project construction would require greater than one acre of ground-disturbing activities, the Applicant would be required to prepare a Stormwater Pollution Prevention Plan ("SWPPP") in accordance with the National Pollutant Discharge Elimination System ("NPDES") permit. The SWPPP incorporates best-management practices ("BMPs") in accordance with the City of Los Angeles's Best Management Practices Handbook, Part A Construction Activities to control erosion and to protect the quality of surface water runoff during the Project's construction period.

Regarding soil erosion during Project operations, the potential is relatively low due to the fact that the Project Site would be developed with buildings and/or landscaped. The use of hardscape and landscape plantings would act as an effective barrier to soil erosion by impeding direct contact between precipitation/irrigation and on-site soils. With compliance with regulatory requirements that include implementation of BMPs, less than significant impacts would occur related to erosion or loss of topsoil.

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

Less Than Significant Impact. Soils on the Project Site consist of undocumented fill material underlain by natural deposits of Holocene-age alluvial deposits likely derived from the Santa Monica Mountains to the west. Potential impacts with respect to liquefaction and landslide potential were determined to be less than significant based on the analysis presented in the response to Checklist Questions VI(a)(iii) and (iv), above. With respect to lateral spreading, or collapse, all Project construction and design would comply with the 2010 CBC, as enforced by the City of Los Angeles, which is designed to assure safe construction and includes building foundation requirements appropriate to the conditions present at the Project Site. Further, the Geotechnical Investigation concluded that no significant permanent slopes currently exist on the Project Site; therefore, slope stability is not considered an issue with respect to Project development. With regard to

subsidence, the Project Site is not located within the vicinity of subsurface oil and mineral extraction, which would result in subsidence at the Project Site.

Project excavation would cause disturbance of existing soils and contribute to potential localized raveling or caving of excavated areas (e.g. the excavated side walls loosing stability). Such potential effects are typical of construction for projects with deep excavations. All required excavations would be sloped and properly shored in accordance with applicable provisions of the CBC as incorporated into the City's Building Code, and the site-specific recommendations contained in the Geotechnical Investigation. Specifically, the Geotechnical Investigation recommends that all excavations should be performed in accordance with Project plans, specifications, and all Occupational Safety and Health Administration (OSHA) requirements. Excavations should be laid back or shored in accordance with OSHA requirements before personnel or equipment are allowed to enter. Further, the Geotechnical Investigation recommends a temporary shoring system be in place during Project excavation and construction. Sample recommendations for the shoring system include bracing strategies, minimum soil pressure recommendations, methods of appropriate tie back, appropriate spacing and design parameters of piles and bracing, etc.) or tie-back shoring is recommended in areas where the shoring will be located close to existing structures in order to limit shoring defections or required due to the proposed depth of excavation, and allowable friction coefficients. With compliance with standard City requirements and the recommendations of the Geotechnical Investigation, impacts associated with lateral spreading, subsidence, or collapse would be less than significant. No mitigation measures are required and no further analysis of this issue in an EIR is recommended.

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

**Less Than Significant Impact.** The soils beneath the Project Site are alluvial soils that do not have a high expansion potential. Based on laboratory testing, the Geotechnical Investigation found that on-site soils have an expansion index of 9 (very low) in the 2013 CBC. As a result, the soils underlying the Project Site would not cause structural concerns related to the expansion of soils. The Project would be constructed and designed in accordance with the 2013 CBC, as enforced by the City of Los Angeles, which includes building foundation requirements appropriate to site-specific. Because underlying soils are not expansive and the Project would be designed and constructed in accordance with applicable regulations, impacts with respect to expansive soils would be less than significant. No mitigation measures or further analysis of this topic in an EIR are necessary.

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

No Impact. The Project Site is located in an urbanized area where municipal wastewater infrastructure already exists. The Project would connect to existing infrastructure and would not use septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur. No further analysis of this topic in an EIR is necessary and no mitigation measures are required.

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#### VII. GREENHOUSE GAS EMISSIONS

*Would the project:* 

#### a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

**Potentially Significant Impact.** Construction and operation of the Project would increase greenhouse gas ("GHG") emissions which have the potential to either individually or cumulatively result in a significant impact on the environment. In addition, the Project would generate vehicle trips that would contribute to the emission of GHGs. The amount of GHG emissions associated with the Project has not been estimated at this time. Therefore, it is recommended that this topic be further evaluated in an EIR and include a quantitative assessment of Project-generated GHG emissions resulting from construction equipment, vehicle trips, electricity and natural gas usage, and water conveyance, as well as relevant Project features that reduce GHG emissions.

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

Potentially Significant Impact. In 2010, the City adopted the 2010 California Green Building Standards Code, also known as CALGreen, with amendments, as Ordinance No. 181,480, thereby codifying provisions of CALGreen as the new Los Angeles Green Code ("LA Green Code"). As of January 2011, the LA Green Code is applicable to the construction of new buildings (residential and nonresidential), building alterations with a permit valuation of over \$200,000, and residential and nonresidential building additions. The LA Green Code contains both mandatory and voluntary green building measures for the reduction of GHG emissions through energy conservation. In addition, the Project is required to implement applicable energy conservation measures to reduce GHG emissions such as those described in the California Global Warming Solutions Act of 2006, also known as AB 32. The Project would incorporate sustainable elements of design, construction and operation consistent with the minimum standards of the United States Green Building Council ("USGBC") Leadership in Energy and Environmental Design ("LEED") Certification at the Silver level. Some of the key features intended to contribute to energy efficiency include the use of glass/windows for ventilation and daylight accessibility, and landscaping of roof decks. Other features would include heating, ventilation, and air conditioning (HVAC) systems that use ozone-friendly refrigerants; materials and finishes that emit minimal quantities of volatile organic compounds ("VOCs"); high-efficiency fixtures and appliances; water conservation measures including low-flow fixtures; recycling of solid waste; and stormwater retention on-site. The Project would be designed to comply with the Los Angeles Green Code, which establishes a higher standard for building sustainability than the 2010 California Green Building Standard Code, or CALGreen, which it incorporates with amendment Nonetheless, the amount of greenhouse gas emissions associated with the Project has not been estimated at this time. Therefore, further evaluation is required to determine if the Project would achieve consistency with applicable plans, policies or regulations adopted for the purpose of reducing GHG emissions.

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#### VIII. HAZARDS AND HAZARDOUS MATERIALS

*Would the project:* 

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

**Less Than Significant Impact.** Project construction activities would result in a temporary increase in the use of typical construction materials at the site, including concrete, hydraulic fluids, paints, cleaning materials, and vehicle fuels. The use of these materials during Project construction would be short-term in nature and would occur in accordance with standard construction practices, as well as with applicable federal, state, and local regulations. Potentially hazardous materials would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable standards and regulations. Because these activities would be short-term and cease with Project completion, construction activities would, therefore, not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials and impacts would be less than significant.

The operation of residential and retail uses associated with the Project would use minimal amounts of hazardous materials for routine cleaning and maintenance. These hazardous materials include small quantities of commercially available cleaning solutions, solvents, and pesticides. Additionally, the Project would utilize limited amounts of hydraulic fluid in the elevator equipment and limited quantities of refrigerant in the Heating, Ventilation and Air Conditioning ("HVAC") system. All potentially hazardous materials would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable standards and regulations. With compliance with existing federal, state, and local regulations, the transport, use, and storage of these materials would not pose a significant hazard to the public or the environment and the Project would result in a less than significant impact. No mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

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

**Less Than Significant Impact.** The following discussion of hazardous materials is based, in part, on the technical report for the Project entitled *Environmental Review of the Chinatown Property Referred to as Parcel PA-018 at 924 North Spring Street* ("Environmental Review") prepared by HMC Hazard Management Consultants in April 2013. The Environmental Review, which is included as Appendix B-2 of this Initial Study, summarizes several hazardous materials investigations prepared for previously proposed uses on the Project Site. The reports summarized include the following:

- *Final Site Report Underground Storage Tank Removal*, prepared by Canonie Environmental in 1989.
- Workplan for Los Angeles County Metropolitan Transportation Authority Phase II Environmental Site, prepared by Weston in 1995.
- Phase One Environmental Assessment for Parcel PA-018, Metro Pasadena Blue Line prepared by Weston in 1996.
- *Workplan for Parcel PA-018 Further Investigation*, prepared by Montgomery Watson in 1999.
- Report of Environmental Soil and Groundwater Assessment, prepared by LAW Gibb Group in 2000.

Remedial Action Plan, prepared by England Geosystems in 2001.

- *Updated Remedial Action Plan*, prepared by England Geosystems in 2001.
- Remedial Action Plan Implementation Summary and Site Closure Request, Parcel PA-018, prepared by England Geosystems in 2002.
- Response to OEHHA Comments, Updated Remedial Action Plan Parcel PA-018, prepared by England Geosystems, 2002
- No Further Action Parcel PA-018, Los Angeles to Pasadena Blue Line, 924 North Spring Street Los Angeles, issued by the Los Angeles Regional Water Quality Control Board ("LARWQCB") in 2003.

The Project Site has been the site of multiple hazardous materials investigations beginning in 1989 with documentation of the removal of underground storage tanks ("USTs"). A 1995 workplan and Phase II investigation was performed by Metro in conjunction with their use of the Site for construction staging for Gold Line and station construction. A related 1996 Phase I investigation was performed by Metro that recommended additional limited Phase II investigation of contaminated soils, groundwater, and the status of monitoring wells reported to have been installed on-site during previous investigations. A 1999 workplan was prepared for further investigation that was conducted on the Site, including soil and groundwater sampling and a determination of the potential for on-site migration of hydrocarbons in groundwater beneath adjacent properties. A new soil and groundwater investigation performed in 2000, apparently preparatory to the Site changing hands, and undertook new soil borings across the site to sample soil and groundwater. Finally, three remedial action plans ("RAPs") were prepared between 2000 and 2002; the RAPS involved additional testing on the Project Site prior to the commencement of remediation, and recommended the excavation and removal of 150 cubic yards of contaminated soil from five locations on the Site. Following remediation, a site closure request was prepared in 2002.

The hazardous materials reports determined that the Project Site was developed as far back as 1905 and was historically used as a rail yard, including storage of wood, coal and petroleum products. Several on-site hazardous materials concerns were previously identified associated with former uses on the Project Site and surrounding vicinity, including the presence of a former leaking underground storage tanks ("UST"), total recoverable petroleum hydrocarbons ("TRPH"), petroleum hydrocarbons (diesel and gasoline), pesticides, polychlorinated biphenyls ("PCBs"), lead, arsenic, and copper. Two of the investigations also noted hydrocarbon (crude oil and diesel fuel) contamination of groundwater in the extreme southwest corner of the Project Site, but concluded that this was localized and caused by natural seeps and/or off-site upgradient sources of contamination, and not indicative of groundwater contamination elsewhere beneath the Site. The Environmental Review concluded, based on review of the previous reports, that the Project Site has been adequately investigated and all known issues of concern have been remediated (soil excavated, removed, and disposed of) to cleanup levels, including former USTs, shallow impacted soil from historic uses, and an area of impacted soil found to contain hydrocarbons and arsenic.

In acknowledgment that all identified contaminants of concern have been removed from the Project Site, in 2003 the LARWQCB issued a No Further Action Letter for the Project Site, subject to the recordation of a deed restriction prohibiting ground-floor residential uses on the Project Site, and the implementation of institutional controls. The deed restriction was developed in conjunction with a site plan then under consideration for the Project Site and a modification of the deed restriction could be sought if necessary; however, the ground-floor residential uses proposed under the Project (i.e., live-work lofts on Parcels 1 and 3) would be constructed atop at least one level of underground parking, for which the Site would be excavated. Because previously identified hazardous materials concerns have been remediated, construction

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activities, including excavation and site preparation, would not create a hazard to the public through the release of hazardous materials, and a less than significant impact would result.

Project construction would involve the temporary use of hazardous substances in the form of paint, adhesives, surface coatings and other finishing materials, and cleaning agents, fuels, and oils. All materials would be used, stored, and disposed of in accordance with applicable laws and regulations and manufacturers' instructions. Furthermore, any emissions from the use of such materials would be minimal and localized to the Project Site. The operation of residential and retail uses associated with the Project would use minimal amounts of hazardous materials for routine cleaning and maintenance. These hazardous materials include small quantities of commercially available cleaning solutions, solvents, and pesticides. Additionally, the Project would utilize limited amounts of hydraulic fluid in the elevator equipment and limited quantities of refrigerant in the Heating, Ventilation and Air Conditioning ("HVAC") system. All potentially hazardous materials would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable standards and regulations. As with construction emissions, any emissions from the use of such materials regarding the operation of the Project would be minimal and localized to the Project Site.

Previous site investigations have revealed contamination in groundwater samples from the southwest corner of the Project Site, which was determined to originate from an off-site source. As discussed in the response to Checklist Question VI(a)(iii) above, groundwater was encountered in borings at depths ranging from approximately 30–35 feet bgs and the highest historic groundwater level for the site is approximately 20 feet bgs. If groundwater is encountered during excavation for the subterranean parking levels or the development of pile shafts, it would be tested, treated, and disposed of in accordance with in accordance with the LARWQCB's Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties (Order No. R4-2013-0095, General NPDES Permit No. CAG994004). With adherence to applicable regulations, adverse impacts to groundwater quality would be avoided through implementation of BMPs recommended for construction activity.

According to the LADBS, the Project Site is located within a Methane Hazard Zone.<sup>8,9</sup> The presence of subsurface methane gas is common within former oil production areas and other locations where organic material is present in the soil. Methane is generated by the biodegradation of organic matter in the absence of oxygen. Methane is not toxic; however, it is combustible and potentially explosive at concentrations above 50,000 parts per million (ppm) in the presence of oxygen.

The Los Angeles Municipal Code ("LAMC"), Chapter IX, Article 1, Division 71, Section 91.7103, also known as the Los Angeles Methane Seepage Regulations, became effective March 29, 2003. Subsequent to the adoption of the Methane Seepage Regulations, the City of Los Angeles Department of Building Safety (LADBS) issued an Information Bulletin on November 30, 2004, requiring that a methane site investigation shall be performed onsite prior to any grading activities in designated methane zones. The Methane Seepage Regulations outline required mitigation systems for buildings and paved areas located in areas classified as being located either in a methane zone or a methane buffer zone. The required methane mitigation systems

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<sup>&</sup>lt;sup>9</sup> City of Los Angeles, Bureau of Engineering. Methane and Methane Buffer Zone Map. March 2004.

are based on the Site Design Level, with more involved mitigation systems required at the higher Site Design Levels. The Seepage Regulations also require that paved areas over 5,000 square feet in area and within 15 feet of an exterior wall of a building also be vented in accordance with the Methane Mitigation Standards.

In accordance with City requirements, a methane site investigation would be performed at the Project Site prior to any grading activities to determine whether elevated concentrations of methane are present. In the event elevated concentrations of methane are present, grading or construction activities on-site could pose a potential to encounter methane that could result in a possible hazard. Prior to construction, the Project would be required by LADBS to prepare a Health and Safety Plan. The Health and Safety Plan shall comply with OSHA Safety and Health Standards (29 Code of Federal Regulations 1910.120) and CalOSHA requirements (described below in Section 4.3.6.2.1) shall address, as appropriate, safety requirements that would serve to avoid significant impacts in the event that elevated levels of these soil gases are encountered during grading and construction. The OSHA and CalOSHA requirements include air monitoring to be conducted during all subsurface work activities. With regard to Project operations, the design and construction of buildings in accordance with LAMC Section 91.7101, including any recommendations or mitigation design systems therein, would ensure that workers and residents are not exposed to harmful or flammable concentrations of methane. With adherence to applicable regulations, impacts with respect to methane would be less than significant.

#### c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

**Less Than Significant Impact.** There are three schools located within one-quarter mile of the Project Site: Ann Street Elementary School (approximately 0.2 miles east of the Project Site), Castelar Elementary School (approximately 0.25 miles west of the Project Site), and Los Angeles Confucius Education and Cultural School (approximately 0.3 miles southwest of the Project Site). Construction of the Project would involve the temporary use of hazardous substances in the form of paint, adhesives, surface coatings and other finishing materials, and cleaning agents, fuels, and oils. All materials would be used, stored, and disposed of in accordance with applicable laws and regulations and manufacturers' instructions. Any emissions from the use of such materials would be minimal and localized to the Project Site. Although Project construction may encounter previously identified on-site subsurface hazardous materials, these materials are required to be handled in accordance with applicable regulations, would be localized to the Project Site, and existing schools are sufficient distance from the Project Site to not be impacted if these materials are encountered during Project construction. Operation of the Project would involve the use and storage of small quantities of potentially hazardous materials in the form of cleaning solvents, painting supplies, and pesticides for The use of these materials would be in small quantities and in accordance with the manufacturers' instructions for use, storage, and disposal of such products. During Project operation, the limited quantities and any prescribed handling procedures of hazardous materials would not pose a risk to schools in the Project vicinity, since there would be minimal emissions and they would be localized to the Project Site. It is therefore concluded that the Project would result in a less than significant impact related to hazardous materials at any existing or proposed schools within a one-quarter mile radius of the Project Site.

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

Less Than Significant Impact. Government Code Section 65962.5, amended in 1992, requires CalEPA to develop and update annually the Cortese List, which is a list of hazardous waste sites and other contaminated sites. While Government Code Section 65962.5 makes reference to the preparation of a list, many changes have occurred related to web-based information access since 1992 and information regarding the Cortese List is now compiled on the websites of the Department of Toxic Substances Control ("DTSC"), the State Water Board, and CalEPA. The DTSC maintains the EnviroStor database, which includes sites on the Cortese List and also identifies potentially hazardous sites where cleanup actions (such as a removal action) or extensive investigations are planned or have occurred. The database provides a listing of Federal Superfund sites ("National Priorities List"); State Response sites; Voluntary Cleanup sites; and School Cleanup sites. Based on a review of the EnviroStor database, the Project Site is not identified on any of the above lists. Additionally, the Project Site is not listed on CalEPA's list of sites with active Cease and Desist Orders or Cleanup and Abatement Orders or list of contaminated solid waste disposal sites.

However, the Project Site is on the State Water Board's Geotracker Database, which provides a list of leaking underground storage tank sites that are included on the Cortese List. Specifically, the Geotracker Database lists as the location of the incident titled Pacific Pipeline 2000 (SLS092516) as being immediately south of the Project Site, a case with an Open Status currently in the Site Assessment phase of remediation. No further information is provided on the Geotracker Database and the incident location could not be verified through the database. However, as mentioned above, the Environmental Review performed for the Project referenced a No Further Action issued by the LARWQCB indicating that past contamination on the Project Site has been fully identified and remediated to targeted cleanup levels. As a result, the trace levels of subsurface contaminants from historical uses on the Project Site and surrounding vicinity have not adversely impacted the Project Site such that it would be included on the lists of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, impacts would be less than significant. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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

**No Impact.** The Project Site is not within an airport land use plan and it is not within two miles of a public airport or public use airport. The nearest airport is the Hawthorne Municipal Airport located approximately 11 miles southwest of the Project Site. Therefore, the Project would not result in an airport-related safety hazard for people residing or working in the Project vicinity. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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Department of Toxic Substances Control, EnviroStor Database at http://www.envirostor.dtsc.ca.gov/public; accessed January 16, 2014.

<sup>&</sup>lt;sup>11</sup> CalEPA's List of Active CDO and CAO sites; online at http://www.calepa.ca.gov/sitecleanup/corteselist/; accessed September 6, 2013.

<sup>12</sup> State Water Resources Control Board, https://geotracker.waterboards.ca.gov; accessed January 16, 2014.

# f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

**No Impact.** There are no private airstrips in the vicinity of the Project Site and the Project Site is not located within a designated airport hazard area. Therefore, the Project would not result in airport-related safety hazards for the people residing or working in the area. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

# g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. The Project Site is located in an established urban area well-served by a roadway network. Alameda Street/Spring Street adjacent to the west side of the Project Site is designated as a Selected Disaster Route. While it is expected that the majority of construction activities for the Project would be confined on-site, short-term construction activities may temporarily affect access on portions of adjacent streets during certain periods of the day. In these instances, the Project would implement traffic control measures (e.g., construction flagmen, signage, etc.) to maintain flow and access. Furthermore, in accordance with City requirements the Project would develop a Construction Management Plan, which includes designation of a haul route, to ensure that adequate emergency access is maintained during construction. Therefore, construction is not expected to result in inadequate emergency access.

Project operation would generate traffic in the Project vicinity and would result in some modifications to access from the streets that surround the site. Specifically, the Project would create three new peripheral streets connecting to Alameda Street/Spring Street. Nonetheless, the Project is required to provide adequate emergency access and to comply with City of Los Angeles Fire Department ("LAFD") access requirements. Subject to review and approval of site access and circulation plans by the LAFD, the Project would not impair implementation or physically interfere with adopted emergency response or emergency evacuation plans. Since the Project would not cause an impediment along the City's designated emergency evacuation route, and the proposed residential and retail uses would not impair implementation of the City's emergency response plan, the Project would have a less than significant impact with respect to these issues. As such, no further evaluation of this topic in an EIR or mitigation measures are necessary.

# h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

**No Impact.** The Project Site is located in the highly urbanized area. No wildlands are present on the Project Site or surrounding area. Furthermore, the Project Site is not within a City-designated wildfire hazard area. Therefore, the Project would not expose people or structures to a significant risk involving wildland fires. No further analysis of this topic in an EIR is recommended, and no mitigation measures are required.

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<sup>13</sup> City of Los Angeles Department of Planning General Plan Safety Element – Critical Facilities and Lifeline Systems, Exhibit H (November 26, 1996).

City of Los Angeles, Department of City Planning, Safety Element of the Los Angeles City General Plan, adopted November 26, 1996, Exhibit D – Selected Wildfire Hazard Areas in the City of Los Angeles; http://cityplanning.lacity.org/cwd/gnlpln/saftyelt.pdf, accessed September 11, 2013.

# IX. HYDROLOGY AND WATER QUALITY

Portions of the following impact analysis pertaining to the surface hydrology and water quality and groundwater quantity and quality are based, in part, on information contained in the *Preliminary Hydrology Report*, ("Hydrology Report") prepared by Hall & Foreman, Inc. in March 2014. The Hydrology Report is included as Appendix B-3 of this Initial Study.

*Would the project:* 

# a. Violate any water quality standards or waste discharge requirements?

**Less Than Significant Impact.** The Project Site is generally level and stormwater runoff from the Project Site currently drains in a southwesterly direction via sheet flow to the gutters lining N. Spring Street and College Street, which convey flows to two storm drains located in N. Spring Street near the southwest corner of the Project Site. These storm drains drain to an 18-inch reinforced concrete pipe ("RCP") in N. Spring Street that in turn discharges to a 33-inch RCP at the intersection of N. Spring Street and College Street.

Construction of the Project would require earthwork activities, including grading and excavation of the Project Site, which would expose soils for a limited time and could allow for possible erosion, particularly during precipitation events. However, all grading activities would require grading permits from LADBS, which would include requirements and standards designed to limit potential impacts associated with erosion to permitted levels. Additionally, grading and site preparation would comply with all applicable provisions of Chapter IX, Division 70 of the LAMC, which includes requirements such as the preparation of an erosion control plan to reduce the effects of sedimentation and erosion.

In addition, the Applicant would be required to meet the provisions of the Project-specific SWPPP in accordance with the NPDES permit. The SWPPP would also be subject to review by the City for compliance with the City of Los Angeles' Best Management Practices Handbook, Part A, Construction Activities. As part of these regulatory requirements, BMPs would be implemented to control erosion and to protect the quality of surface water runoff during the construction by controlling potential contaminants such as petroleum products, paints and solvents, detergents, fertilizers, and pesticides. Should grading activities occur during the rainy season (October 1st to April 14th), a WWECP would be prepared pursuant to the "Manual and Guideline for Temporary and Emergency Erosion Control," adopted by the Los Angeles Board of Public Works. As discussed above, if groundwater is encountered during excavation for the subterranean parking levels or the development of pile shafts, it would be tested, treated, and disposed of in accordance with in accordance with the LARWQCB's Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties (Order No. R4-2013-0095, General NPDES Permit No. CAG994004). With adherence to applicable regulations, adverse impacts to groundwater quality would be avoided through implementation of BMPs recommended for such construction activity.

With regard to Project operation, the Project would be required to incorporate operational BMPs per the City of Los Angeles Standard Urban Stormwater Management Plan ("SUSMP") permit requirements. In this regard, the Project proposes the installation of on-site subterranean cisterns to capture and use post-development runoff, and also to provide primary treatment of stormwater prior to discharging into the existing storm drain system. The treatment system associated with the cisterns would mitigate pollution from the proposed building's roof drainage, area drains, and surface runoff in accordance with the

"Stormwater Treatment and Use" LID mitigation method as set forth in the City's Low Impact Development ("LID") Ordinance. The proposed cisterns would be subject to review by the City for compliance with the City of Los Angeles' Best Management Practices Handbook, Part B: Planning Activities. Additional long-term BMPs would be provided to support the cisterns and may include, but are not limited to, ensuring that discharge from downspouts, roof drains, and scuppers would not be permitted on unprotected soils. Further, all storm drain inlets and catch basins within the Project area would be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. The final selection of any additional BMPs would be completed through coordination with the City of Los Angeles. Through preparation of the SUSMP and implementation of the proposed cisterns and other appropriate BMPs, operational water quality impacts of the Project would be less than significant.

Regarding the quantity of stormwater runoff, the undeveloped Project Site does not currently meet the requirements of the City's current LID Ordinance, which require the Project to treat and infiltrate the runoff from a storm event producing 0.75 inch of rainfall in a 24-hour period. Under existing conditions, stormwater flows directly off the Project Site and into the City's storm drain system. As discussed above, the Project proposes the installation of two subterranean cisterns to capture, use, and treat stormwater runoff, prior to discharging it. Based on calculations performed for the Hydrology Report, the proposed cisterns would be sized to accommodate approximately 12,603 cubic feet of water during the design year storm. With installation of the cisterns and implementation of other appropriate BMPs, the Hydrology Report concludes that development of the Project would decrease the quantity and rate of stormwater leaving the Project Site. Accordingly, the Project would result in a less than significant impact with regard to the quantity of stormwater flows from the Project Site.

Based on the above, impacts related to water quality would be less than significant. No further analysis of this topic in an EIR is recommended.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant Impact. The Los Angeles Department of Water and Power ("LADWP") is the water purveyor for the City. Water is supplied to the City from three primary sources, including local groundwater. In 2009 to 2010, LADWP had an available water supply of roughly 550,000 acre-feet ("AF"), with approximately 14 percent coming from local groundwater.<sup>15</sup> Although urban open space does provide for some infiltration to smaller unconfined aquifers, the majority of groundwater recharge in the region occurs via stormwater runoff from nearby mountain ranges. Groundwater levels in the City are also maintained through an active process via spreading grounds and recharge basins. The Project Site is not an area identified as being important to groundwater recharge. Additionally, no groundwater production wells are located in the vicinity of the Project Site.

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Los Angeles Department of Water and Power, 2010 Urban Water Management Plan, Exhibit ES-R - Service Area Reliability Assessment for Average Weather Year, adopted May 3, 2011; https://www.ladwp.com/ladwp/faces/ladwp/aboutus/awater?\_adf.ctrl-state=gixvgqhub\_4&\_afrLoop=237918338210000, accessed April 2013.

Although the Project Site is undeveloped, it is paved with partially decomposed asphalt and was determined in the Hydrology Report to be approximately 91 percent impervious, and groundwater infiltration is therefore limited. Furthermore, the small size of the Project Site limits its potential to contribute to recharge of groundwater sources. Development of the Project Site would maintain approximately the same percentage of impervious surface area on the Project Site and therefore would not substantially modify groundwater infiltration and recharge on the Project Site.

Groundwater was encountered in borings at depths between 30 and 35 feet bgs. This is deeper than the CGS data for the area, which indicated that the historically highest groundwater on the Project Site is approximately 20-foot bgs. The Geotechnical Investigation determined that groundwater could be encountered by Project excavations. If encountered, a dewatering system and/or special foundation and slab design would be required. Groundwater extraction from such a dewatering system, if required, would be minimal and would not lower groundwater levels in the area.

In summary, the Project would not substantially deplete groundwater supplies or result in a substantial net deficit in the aquifer volume or lowering of the local groundwater table. Impacts would be less than significant. Further analysis of this topic in an EIR is not recommended and no mitigation measures would be required.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

**Less Than Significant Impact.** During Project construction, temporary alteration of existing on-site drainage patterns may occur. However, these changes would not result in substantial erosion or siltation due to stringent controls imposed via City grading and building permit regulations as discussed in the response to Checklist Question VIII(a) above.

The Project Site currently constitutes a single drainage subarea. Sheet runoff currently flows in a southwesterly direction into the gutters lining N. Spring Street and College Street, ultimately flowing into two City storm drains located along the east side of N. Spring Street near the southwest corner of the Project Site. These storm drains convey flows to an 18-inch RCP in N. Spring Street, which discharges to a 33-inch RCP located at the intersection of N. Spring Street and College Street.

Development of the Project's proposed roadways, buildings, and associated infrastructure would divide the Project Site into three, smaller drainage subareas. The Project would install on-site drainage catchments and storm drains to accommodate the change in runoff patterns. These drainage features would all feed to an on-site subterranean cistern system designed to accommodate approximately 12,603 cubic feet of water during the design year storm. A portion of the stormwater captured in the cisterns would be utilized on-site, while the remainder would be treated prior to discharge into the storm drain system in N. Spring Street. As such, the overall drainage pattern would remain the same as under existing conditions, with all stormwater flows from the Project Site draining to the storm drain system in N. Spring Street. There are no known deficiencies in this storm drain, and the Project is not anticipated to increase flows to the system. Nonetheless, final plan check by the Los Angeles Bureau of Sanitation ("BOS") would ensure that adequate capacity is available in the storm drain system surrounding streets prior to Project approval. The Applicant would be responsible for providing the necessary storm drain infrastructure to serve the Project Site, as well as any extensions to

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the existing system in the area. As a result, Project development would not result in substantial erosion or siltation on- or off-site. Therefore, a less than significant impact is anticipated. No mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

d. Substantially alter the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant Impact. While the Project Site is under construction, the rate and amount of surface runoff generated at the Project Site would fluctuate. However, the construction period is short-term and compliance with applicable regulations discussed above would preclude fluctuations that result in flooding. With regard to operations, as discussed above, the Project would replace the undeveloped Project Site with a mixed-use development that includes subterranean cisterns to retain, reuse, and treat stormwater flows prior to discharging them into the existing storm drain system in N. Spring Street. With implementation of the Project's cisterns and compliance with applicable LID requirements, the Project would not increase the quantity of stormwater leaving the Project Site. As there are no known deficiencies in the existing storm drain system, the Project would result in a less than significant impact. Final plan check by BOS would ensure that adequate capacity is available in the storm drain system in surrounding streets prior to Project approval. The Applicant would be responsible for providing the necessary on-site storm drain infrastructure to serve the Project Site, as well as any connections to the existing system in the area.

Additionally, the Project Site is not located adjacent to any stream or river, and Project runoff would continue to drain into existing City storm drain infrastructure. There is no known potential of downstream erosion or flooding since the storm drain system is completely channelized in subterranean pipes. Therefore, the Project would not have the potential to result in flooding due to altered drainage patterns and impacts would be less than significant. No further analysis of this topic in an EIR is recommended and no mitigation measures are required.

e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant Impact. As noted previously, stormwater runoff from the Project Site would continue to flow into the City's storm drain system. There are no known deficiencies in the local stormwater system. As discussed above, the Project would not increase stormwater flows off-site as the result of the proposed on-site cisterns installed in accordance with the City's LID requirements. Final plan check by BOS would ensure that adequate capacity is available in the storm drain system in N. Spring Street prior to Project approval. The Applicant would be responsible for providing the necessary storm drain infrastructure to serve the Project Site, as well as any extensions to the existing storm drain system in the area. Therefore, the Project would have a less than significant impact with respect to exceedance of storm drain system capacity or the generation of polluted runoff. No further analysis of this topic in an EIR is recommended and additional mitigation measures are not required. See the response to Checklist Question VIII(a) for a discussion of Project impacts related to water quality.

# f. Otherwise substantially degrade water quality?

**Less Than Significant Impact.** As discussed above in the response to Checklist Question VIII(a), construction and operational BMPs, including the proposed on-site cisterns, implemented as part of the

Project's SWPPP and SUSMP, and good housekeeping practices during Project construction and operation would preclude sediment and hazardous substances from entering stormwater flows. Therefore, the Project would have a less than significant impact in surface water quality and no mitigation measures are required. Further analysis of this topic in an EIR is not recommended.

- g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

**No Impact (g-h).** The Project Site is not located within a flood zone, including the 100-year flood zone designated by the Federal Emergency Management Agency ("FEMA"). No flood zone impacts would occur and no mitigation measures would be required. No further analysis of this topic in an EIR is recommended.

i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

**Less Than Significant Impact.** As discussed above, the Project Site is not located within a designated floodplain. Further, the Project Site is not located with a potential inundation area, being located west of the inundation area for the Los Angeles River.<sup>18</sup> Additionally, there are no levees or dams in the Project vicinity. Therefore, no impact associated with flooding, including flooding due to the failure of a levee or dam, would occur. No mitigation measures are required and no further analysis of this issue in an EIR is necessary.

# j. Inundation by seiche, tsunami, or mudflow?

**No Impact.** A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, lake, or storage tank. A tsunami is a great sea wave, commonly referred to as a tidal wave, produced by a significant disturbance undersea, such as a tectonic displacement of sea floor associated with large, shallow earthquakes. Mudflows occur as a result of downslope movement of soil and/or rock under the influence of gravity.

The Project Site is not located within a City-designated inundation hazard area.<sup>19</sup> Relative to tsunami hazards, the Project Site is located approximately 14 miles inland (northeast) from the Pacific Ocean, and therefore, would not be subject to a tsunami. Furthermore, the Project Site is not located on a City-designated tsunami hazard area.<sup>20</sup> The Project Site itself is characterized by relatively flat topography, though relatively steep slopes of the easternmost portion of the Santa Monica Mountains are located just northwest of Broadway Street. While there exists a nominal potential for mudflows in the hillsides northwest of the Project Site, the relatively high amount of urbanization, landscaping, and natural vegetation within these hillside areas would generally limit the potential for large volumes of earth materials to become

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<sup>&</sup>lt;sup>16</sup> City of Los Angeles Department of City Planning, Parcel Profile Report: 129 W College St. Generated January 16, 2014.

<sup>&</sup>lt;sup>17</sup> Federal Emergency Management Agency, Flood Insurance Rate Map, Map Number 06037C1628F, Effective Date: September 26, 2008

<sup>&</sup>lt;sup>18</sup> City of Los Angeles General Plan, Safety Element Exhibit G, Inundation & Tsunami Hazard Areas, March 1994.

<sup>&</sup>lt;sup>19</sup> City of Los Angeles General Plan, Safety Element Exhibit G, Inundation & Tsunami Hazard Areas, March 1994.

<sup>&</sup>lt;sup>20</sup> Ibid.

unstable and form a significant mudflow. Further, intervening structures, vegetation, roadways, and other obstacles would generally limit adverse physical effects to on-site development if a mudflow were to occur northwest of the Project Site. Overall, therefore, no impacts would occur due to inundation by seiche or tsunamis, and mudflow impacts would be less than significant. As such, further analysis of this topic in an EIR is not recommended and no mitigation measures are required.

# X. LAND USE AND PLANNING

*Would the project:* 

# a. Physically divide an established community?

Less Than Significant Impact. The Project would represent infill development within an established, heavily urbanized but heterogeneous area. The Project Site, located at the extreme southwestern edge of the CASP area, is bordered by a mix of wholesale commercial/light industrial uses, storage, and surface parking. Much of the surrounding area was developed more than 50 years ago with industrial uses and rail facilities, and current land uses in the Project vicinity reflect the Project Site's location at the western transitional edge of the light industrial and transit corridor between N. Alameda Street/N. Spring Street and the Los Angeles River, and Chinatown to the west. Chinatown's Central Business District and its residential uses are located west of Broadway, on the west side of the Metro Gold Line right-of-way, several blocks from the Project Site. The other closest concentration of residential uses is the William Mead Housing Project, a block east of the Project Site.

Thus, the Project area does not currently represent a cohesive community, a fact reflected in the stated purposes of adopted CASP, one of which is to "Transform an underserved and neglected vehicular-oriented industrial and public facility area into a cluster of mixed-use, pedestrian-oriented and aesthetically pleasing neighborhoods." The CASP is also generally intended to facilitate evolution of the area from vehicle-oriented industrial and public facility uses to a mixed-use community of pedestrian and transit-oriented uses, and designates the Project Site as Hybrid Industrial, which corresponds to the Urban Center zoning designation.

The Project would develop a currently vacant property with a mix of residential, live-work, and retail uses under both proposed development options. Furthermore, the Project's proposed private internal streets would provide mid-block vehicle and pedestrian passage between N. Spring Street and Rondout Street. The Project's improved sidewalks, amenities, and ground-level retail and restaurant uses would enhance the pedestrian experience for patrons of the Metro Gold Line Chinatown Station, activate the area, and provide pedestrian connections from Chinatown and the station to future projects east of the Project Site. Project features such as enhanced sidewalks with landscaped parkways, seating areas for people to congregate, a bicycle lane, bicycle racks, and street furniture would enhance the presently non-existent pedestrian linkage between Chinatown, the Metro Gold Line Chinatown Station, and the neighborhood surrounding the Project Site. As such, under both development options, the Project would be compatible with and complement existing and proposed uses in the surrounding area and would not be of a density, scale, or height to constitute a physical barrier separating an established community.

Given the mix of uses in the Project vicinity and the infill character of the Project, the Project would not introduce land uses that would affect existing land use relationships to the point of constituting a physical division of the community. Therefore, the Project would not physically divide an established community and a less than significant impact would result. No further analysis of this topic in an EIR is required.

b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

**Potentially Significant Impact.** The Project Site is located in the CASP Area, which designates the Project Site as Hybrid Industrial, and has the Urban Center (UC(CA)) zoning designation. However, pursuant to Section 1.2.B.2.e of the CASP, "The provisions of this Specific Plan shall not apply to any Project that has an application that is deemed complete by the Department of City Planning prior to the adoption of this Specific Plan." The Project application was deemed complete and predated the June 2013 adoption and August 2013 implementation of the CASP; accordingly, the CASP land use designation and corresponding zoning designation do not apply to the Project Site and the designations that existed prior to the CASP adoption remain in effect. Prior to CASP adoption, the land use designation for the Project Site was Light Industrial and it was zoned MR2-1(Restricted Light Industrial, Height District 1, which permits a 1.5:1 floor area ratio (FAR) and unlimited building height).

The Applicant is requesting a General Plan Amendment to redesignate the Project Site from the current Hybrid Industrial land use designation to Regional Commercial, together with a Zone Change and Height District Change from UC(CA) to C2-2. Under designations in effect prior to the CASP adoption, the Project Site would be limited to the MR-1 zone with a 1.5:1 FAR and would have no front, rear, or side yard setbacks. Since the MR-1 and C2-2 zoning designations impose no height restrictions, the requested Height District Change would not modify the permitted height of buildings on the Project Site; however, Height District 2 would allow a 6:1 FAR. Evaluation of the effects of the Project's proposed General Plan Amendment and Zone Change, and evaluation of Project compliance with other applicable plans, policies, and regulations, is recommended in an EIR.

#### Conflict with any applicable habitat conservation plan or natural community conservation c. plan?

**No Impact.** As discussed in the response to Checklist Question IV, Biological Resources, the Project Site is located in a highly urbanized area and is occupied by an undeveloped lot. Although the channelized Los Angeles River is located approximately 0.5 miles east of the Project Site, the Project Site is devoid of vegetation and natural habitat, and thus does not support sensitive natural communities. Furthermore, the Project Site is not located in or adjacent to a Significant Ecological Area as defined by the City of Los Angeles.<sup>21</sup> The Project Site is not located within a habitat conservation plan or natural community conservation plan. Therefore, the Project would not conflict with the provisions of any adopted applicable conservation plan. No further analysis of this topic in an EIR is recommended and no mitigation measures are required.

City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, at page 2.18-13;

http://cityplanning.lacity.org/housinginitiatives/housingelement/frameworkeir/FrameworkFEIR.pdf, accessed September 6, 2013.

#### XI. MINERAL RESOURCES

Would the project:

- a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
- b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

**No Impact (a-b).** According to the Conservation Element of the City of Los Angeles General Plan, sites that contain potentially significant sand and gravel deposits which are to be conserved follow the Los Angeles River flood plain, coastal plain, and other water bodies and courses and lie along the floodplain between the San Fernando Valley and downtown Los Angeles. Nonetheless, the Project Site is of sufficient distance from the Los Angeles River that it is not classified by the City of Los Angeles as containing significant mineral deposits. Furthermore, the Project Site is not designated as an existing mineral resource extraction area by the State of California or the U.S. Geological Survey. Additionally, the Project Site is designated for Hybrid Industrial uses within the City of Los Angeles General Plan and is not designated as a mineral extraction land use. Therefore, the chances of uncovering mineral resources during construction and grading would be minimal. Project implementation would not result in the loss of availability of a known mineral resource of value to the region and residents of the State, nor of a locally important mineral resource recovery site. No impacts to mineral resources would occur. Further analysis of Mineral Resources is not necessary and no mitigation measures are required.

### XII. NOISE

Would the project result in:

a. Exposure of persons to or generation of noise level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

**Potentially Significant Impact.** Construction of the Project would require the use of heavy construction equipment (e.g., bulldozers, backhoes, cranes, loaders, etc.) that would generate noise on a short-term basis. Additionally, operation of the Project may increase existing noise levels as a result of Project-related traffic; the operation of HVAC systems; sounds associated with vehicles in the structured parking garage; loading and unloading of trucks; and residents and visitors activities on the Project Site. As such, nearby sensitive uses, such as residential uses east of the Project Site, could potentially be affected. Therefore, it is recommended that the Project's potential to exceed noise standards be analyzed further in an EIR.

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<sup>&</sup>lt;sup>22</sup> City of Los Angeles, Department of City Planning, Los Angeles Citywide General Plan Framework, Draft Environmental Impact Report, January 19, 1995, Figure GS-1 – Areas Containing Significant Mineral Deposits in the City of Los Angeles.

<sup>&</sup>lt;sup>23</sup> California Geological Survey, Aggregate Sustainability in California, California, 2012; http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS\_52\_2012.pdf. Accessed January 17, 2014.

# b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

**Potentially Significant Impact.** Construction of the Project may generate groundborne vibration and noise due to site grading, clearing activities, and haul truck travel. In addition, Project construction may require pile-driving. As such, the Project would have the potential to generate or to expose people to excessive groundborne vibration and noise levels during short-term construction activities. Therefore, it is recommended that this topic be analyzed further in an EIR.

Post-construction on-site activities would be limited to residential and retail uses that would not generate excessive groundborne noise or vibration. As such, Project operation would not have the potential to expose people to excessive groundborne vibration or noise, resulting in a less than significant impact. Therefore, no further analysis of operational groundborne vibration or noise is recommended, and no mitigation measures would be necessary.

# c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

**Potentially Significant Impact.** As discussed in the response to Checklist Question XII(a) above, operation of the Project may increase existing noise levels as a result of Project-related traffic, the operation of HVAC systems, loading and unloading of trucks, the use of aboveground parking structures, and the presence of residents and visitors at the Project Site. Therefore, it is recommended that potential impacts associated with a permanent increase in ambient noise levels be analyzed further in an EIR.

# d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

**Potentially Significant Impact.** As discussed in the response to Checklist Question XII(a) above, Project construction would require the use of heavy construction equipment (e.g., bulldozers, backhoes, cranes, loaders, etc.) that would generate noise on a short-term basis. Therefore, it is recommended that potential impacts associated with a temporary or periodic increase in ambient noise levels be further analyzed in an EIR.

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

**No Impact.** As discussed in the response to Checklist Question VIII(e) above, the Project Site is not located within an airport land use plan or within two miles of an airport. The nearest airport is the Hawthorne Municipal Airport located approximately 11 miles southwest of the Project Site. Therefore, the Project would not expose site population in the Project vicinity to excessive noise levels from airport use. No further analysis of this topic in an EIR is recommended and no mitigation measures are required.

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

**No Impact.** As discussed in the response to Checklist Question XII(e) above, the nearest airport is the Hawthorne Municipal Airport, located approximately 11 miles southwest of the Project Site. Since the

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Project is not within the vicinity of a private airstrip, it would not expose people residing or working in the area to excessive noise levels. As no impacts would occur, further analysis of this topic in an EIR is not required.

### XIII. POPULATION AND HOUSING

*Would the project:* 

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

Potentially Significant Impact. The Project would not have indirect effects on growth through such mechanisms as the extension of roads and infrastructure, since the proposed private roads would provide through-connections to existing streets to the serve the needs of the proposed development. However, the Project would introduce new residential units and employment opportunities to the Project Site. Under Development Program I, the Project would provide up to 685 new dwelling units and approximately 46,400 square feet of new market, retail, and restaurant space that would provide new employment opportunities. Under Development Program II, the Project would develop up to 533 new dwelling units and include up to 34,100 square feet of new market, retail, and restaurant space that would provide new employment opportunities. Further analysis of this topic in an EIR is recommended to assess the consistency of the Project's direct and indirect population growth with available population projections.

- b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
- Displace substantial numbers of people, necessitating the construction of replacement housing c. elsewhere?

**No Impact (b-c).** No dwelling units are currently located on the Project Site. Thus, the Project would not result in the demolition of existing housing units. The Project is an infill development and would replace an existing surface parking lot with a mixed-use building consisting of residential and retail uses. Since no existing housing would be displaced, there would be no necessity for the construction of replacement housing elsewhere. As no impacts would occur, further analysis of this topic in an EIR is not recommended, and no mitigation measures are required.

### XIV. PUBLIC SERVICES

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

#### a. Fire protection?

Potentially Significant Impact. The Project would introduce a new mixed-use building and residents/employees to the Project Site, greater demand on LAFD fire protection and emergency medical services would be generated, and there is potential for impacts on emergency response times. Further, the

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Project Site is located within an area that is designated in the General Plan Safety Element, Exhibit D, *Selected Wildfire Hazard Areas*, as an Industrialized Area, which is correlated with greater risk of public exposure to flammable or explosive materials. Further evaluation is needed to determine the Project's potential to impact LAFD fire protection and emergency medical services and emergency response times in the Project area.

During Project construction, temporary lane closures may be required for the construction of the new through streets, new utility connections, street work, and in special, limited circumstances, for offloading and mobile crane placement. Further evaluation is needed to determine the potential for, and significance of, any impacts temporary lane closures could have on emergency response times. Therefore, it is recommended that potential impacts associated with fire protection and emergency medical services be analyzed further in an EIR.

### b. Police protection?

**Potentially Significant Impact.** During Project construction, temporary lane closures may be required for the construction of the new through streets, new utility connections, street work, and in special, limited circumstances, for offloading and mobile crane placement. With respect to Project operations, since the Project would introduce new residents and employees to the Project Site, greater demand on police protection services would be generated and there is potential for impacts on response times. Further evaluation of this topic in an EIR is needed to determine the Project's potential to have an impact on police protection services or police response times in the Project area.

### c. Schools?

**Less Than Significant Impact.** The Project Site is located within the jurisdiction of the Los Angeles Unified School District ("LAUSD"), and specifically located at the westernmost boundary of LAUSD Local District 5. The Project Site is within the attendance boundaries of Ann Street Elementary School, Nightingale Middle School, and within a LAUSD Zone of Choice with multiple high school options, including Belmont High School and Abraham Lincoln High School.<sup>24</sup> These schools are currently operating on a single-track calendar, whereby instruction generally begins in mid-August and continues through early June.

LAUSD has established student generation rates for a variety of uses including residential development (multi-family) as well as other employment generating uses, e.g. retail, hotel, industrial and office uses. An estimate of the number of students that would be generated by the Project's residential and retail uses is provided in **Table B-1**, *Estimated Number of Students to be Generated by the Project*. As stated in Table B-1, under Development Program I, the Project is estimated to generate 114 elementary school students, 31 middle school students, and 66 high school students, for a total of 211 students. In comparison, under Development Program II, the Project is estimated to generate 89 elementary school students, 24 middle school students, and 50 high school students, for a total of 163 students.

Because of the anticipated demographic characteristics of the future residents of the Project, the Project's projected student generation is likely to be less than estimated in the above analysis, which is based on LAUSD generation factors. The Project's large number of live-work lofts, studio and one-bedroom

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LAUSD Zones of Choice are geographic areas comprising multiple high school options. The small school options in each Zone are open to all resident students and represent the demographics of the local are

Table B-1 Estimated Number of Students to be Generated by the Project

|                              |                  | Develop | ment Program I  |        |        |                         |
|------------------------------|------------------|---------|-----------------|--------|--------|-------------------------|
|                              | <b>Amount of</b> |         | Elementary      | Middle | High   |                         |
| Land Use                     | Development      | Units   | School          | School | School | Total                   |
| Residentiala                 | 685              | units   | 113             | 31     | 65     | 209                     |
| Non-Residential <sup>b</sup> | 46,400           | sq.ft.  | 1               | 0      | 1      | 2                       |
| Total                        |                  |         | 114             | 31     | 66     | <b>211</b> <sup>c</sup> |
|                              |                  | Develop | nent Program II |        |        |                         |
|                              | Amount of        |         | Elementary      | Middle | High   |                         |
| Land Use                     | Development      | Units   | School          | School | School | Total                   |
| Residentiala                 | 533              | units   | 88              | 24     | 50     | 162                     |
| Non-Residential <sup>b</sup> | 34,100           | sq.ft.  | 1               | 0      | 0      | 1                       |
| Total                        |                  |         | 89              | 24     | 50     | <b>163</b> <sup>c</sup> |

Student Generation Rates for Residential Uses are taken from the Draft School Facilities Needs Analysis 2012, LAUSD, September 2012. Based on the rate for Multi-family residential uses: Elementary = 0.1649; Middle School = 0.045; High School = 0.0943.

Source: PCR Services Corporation, 2014.

apartments, and senior housing under both schemes would generate few, if any, students. This estimate is also conservative in that it assumes that none of the future Project residents with families would already have students attending the affected schools. Furthermore, it is likely that a portion of the Project's schoolage children would attend private schools, thus reducing attendance at LAUSD schools.

To the extent that on-site development increases demand at LAUSD schools serving the Project Site, State law, including Government Code Section 65995 and Education Code Section 17620, requires the payment of fees at a specified rate for the funding of improvements and expansion to school facilities. Such fees are paid at the issuance of building permits. In accordance with Senate Bill 50 ("SB 50"), enacted in 1998, the payment of this fee is deemed to provide full and complete mitigation for impacts to school facilities and impacts to schools would therefore be reduced to a less than significant level. With implementation of the Regulatory Compliance Measure below, impacts on schools would be reduced to a less than significant level. No further analysis of this topic in an EIR is required.

**Regulatory Compliance Measure IS-5:** The Applicant shall pay school fees as established by law to the Los Angeles Unified School District to offset the impact of additional student enrollment at schools serving the Project area.

#### d. Parks?

**Potentially Significant Impact.** Because the Project would introduce new residents to the Project Site and new employees that might visit nearby parks, greater demand on existing public recreational and park

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Student Generation rates for retail uses are taken from the 2010 Commercial/Industrial Development School Fee Justification Study, LAUSD, September 27, 2010 -- the most recent data available for retail uses. For each 1,000 sf of non-residential space -- Elementary = 0.0178; Middle School = 0.0089; High School = 0.0111.

Total number of students has been rounded up, in order to provide whole student number counts.

facilities and services would be generated. The Project would provide on-site open space in the form of the plazas on Parcels 1 and 2, as well as recreational facilities for Project residents and visitors. These facilities would reduce the Project's demand for use of existing public recreational and park facilities. Nevertheless, it is recommended that potential residual impacts on park services in the Project area be analyzed further in an EIR.

### e. Other public facilities?

**Potentially Significant Impact.** Because the Project would introduce new residents to the Project Site, greater demand on LAPL library services would be generated. Therefore, it is recommended that potential impacts associated with library services be analyzed further in an EIR.

### XV. RECREATION

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

**Potentially Significant Impact.** As discussed in the response to Checklist Question XIV(d), because the Project would introduce new population to the Project Site, greater demand on existing public recreational and park facilities and services could be generated. Therefore, it is recommended that this issue be analyzed further in an EIR.

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

**Potentially Significant Impact.** The Project would provide both publically accessible and private open space and recreational amenities. However, as indicated in the response to Checklist Question XV(a), the Project would introduce new population to the Project Site, which could generate a greater demand on existing public recreational and park facilities and services. Therefore, it is recommended that this issue be analyzed further in an EIR.

### XVI. TRANSPORTATION AND CIRCULATION

*Would the project:* 

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

**Potentially Significant Impact.** The Project would add traffic to local and regional transportation systems. As such, operation of the Project could adversely affect the existing capacity of the street system or exceed an established standard. Construction of the Project would also result in a temporary increase in traffic due to construction-related truck trips and worker vehicle trips. Therefore, traffic impacts during construction could also adversely affect the street system. As the Project's increase in traffic would have the potential to

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result in a significant traffic impact, it is recommended that this topic, including parking provisions, be analyzed further in an EIR.

b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

**Potentially Significant Impact.** The Project would generate vehicle trips which could potentially add trips to a freeway segment or CMP intersection. As such, it is recommended that this topic be analyzed further in an EIR.

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

**No Impact.** As discussed in the response to Checklist Question VIII(e), the nearest airport or heliport is the Hawthorne Municipal Airport, which is located approximately 11 miles southwest of the Project Site. As such, the Project Site is not within any flight paths; does not propose any construction that requires notification of the Federal Aviation Administration; and would not result in a change in air traffic patterns including, increases in traffic levels or changes in location that would result in substantial safety risks. As no impact would occur, further analysis of this topic in an EIR is not required, and no mitigation measures are required.

d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

**Potentially Significant Impact.** Under both development options, the Project proposes two new laterals roadways connecting N. Spring Street and Rondout Street and new driveway entrances on College Street and Rondout Street. All Project roadways and entrances would be designed in accordance with LADOT standards. The Project would not result in incompatible uses as the site is located within a mixed use, urban area. Nonetheless, because the Project would introduce new connector roadways and driveway entrances, it is recommended that this topic be further evaluated in an EIR to determine the potential for the Project to increase hazards due to a design feature.

### e. Result in inadequate emergency access?

**Potentially Significant Impact.** Immediate vehicular access to the Project Site is provided via N. Spring Street, Rondout Street, and College Street. While it is expected that the majority of construction activities for the Project would be confined on-site, short-term construction activities may temporarily affect access on portions of adjacent streets during certain periods of the day. In addition, under both development options, the Project would introduce two new lateral roadways and driveway entrances. These additional streets and driveways could generate traffic in the Project vicinity that could modify access from the streets that surround the Project Site. As such, it is recommended that this topic be analyzed further in an EIR.

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### f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

**Potentially Significant Impact.** Although the Project Site is well served by public transportation, is anticipated to improve the pedestrian experience through the provision of improved sidewalks and groundlevel uses, and is not expected to interfere with or degrade the performance or safety of public transit, bicycle, or pedestrian facilities, it is recommended that the Project's potential for impacts during construction and its consistency with policies, plans, and programs supporting alternative transportation be analyzed further in an EIR.

### **XVII. UTILITIES AND SERVICE SYSTEMS**

*Would the project:* 

### Exceed wastewater treatment requirements of the applicable Regional Water Quality Control a. **Board?**

Less Than Significant Impact. The City of Los Angeles Department of Public Works ("LADPW") provides wastewater services for the Project Site. Any wastewater that would be generated by the site would be treated at the Hyperion Treatment Plant ("HTP"). The HTP is a part of the Hyperion Treatment System, which also includes the Tillman Water Reclamation Plant ("TWRP") and the Los Angeles-Glendale Water Reclamation Plant ("LAGWRP"). The HTP is designed to treat 450 million gallons per day ("mgd") HTP has an average dry water flow of approximately 362 mgd, leaving approximately 88 mgd of capacity available.<sup>25,26</sup>

Following the secondary treatment of wastewater, the majority of effluent from HTP is discharged into the Santa Monica Bay while the remaining flows are conveyed to the West Basin Water Reclamation Plant for tertiary treatment and reuse as reclaimed water. HTP has two outfalls that presently discharge into the Santa Monica Bay (a one-mile outfall pipeline and five-mile outfall pipeline). Both outfalls are 12 feet in diameter. The one-mile outfall pipeline is 50 feet deep and is only used on an emergency basis. The five-mile outfall pipeline is 187 feet deep and is used to discharge secondary treated effluent on a daily basis. It was last inspected in November 2006. HTP effluent is required to meet the Los Angeles Regional Water Quality Control Board's ("LARWQCB") requirements for a recreational beneficial use, which imposes performance standards on water quality that are more stringent than the standards required under the Clean Water Act permit administered under the system's NPDES permit. Accordingly, HTP effluent to Santa Monica Bay is continually monitored to ensure that it meets or exceeds prescribed standards. The Los Angeles County Department of Health Services also monitors flows into the Santa Monica Bay.

The Project's new residential units and commercial uses, including a market, would generate additional wastewater that would require conveyance and treatment. On-site wastewater generation is anticipated to total 93,890 gallons per day ("gpd"), or 0.0094 mgd, under Development Program I and 79,448 gpd

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The HTP is an end-of-the-line plant, subject to diurnal and seasonal flow variation. It was designed to provide full secondary treatment for a maximum-month flow of 450 mgd, which corresponds to an average daily waste flow of 413 mgd, and peak wastewater flow of 850 mgd. (Information regarding peak flow is included in the IRP, Facilities Plan, Volume 1, Wastewater Management, July 2004; page 7-3.)

City of Los Angeles Bureau of Sanitation, Wastewater: Facts & Figures. Available at: http://www.lacitysan.org/wastewater/ factsfigures.ht. Accessed January 17, 2014.

(0.0079 mgd) under Development Program II, as summarized in **Table B-2**, *Estimated Project Wastewater Generation*. Under both development programs, this increase represents less than 0.01 percent of the remaining treatment capacity at the HTP. Given the amount of wastewater generated by the Project and the existing wastewater treatment capacity at the HTP, adequate wastewater treatment capacity would be available to serve the Project.

Table B-2
Estimated Project Wastewater Generation (Development Program I)

| Land Use                 | <b>Unit</b> <sup>a</sup> | Generation Factor <sup>a</sup> | Wastewater Generation (GPD) |
|--------------------------|--------------------------|--------------------------------|-----------------------------|
| Proposed Use             |                          |                                |                             |
| Studio                   | 94 DU                    | 75 GPD/unit                    | 7,050                       |
| 1 Bdrm                   | 370 DU                   | 110 GPD/unit                   | 40,700                      |
| 2 Bdrm                   | 136 DU                   | 150 GPD/unit                   | 20,400                      |
| L/W – 1 Bdrm             | 14 DU                    | 110 GPD/unit                   | 1,540                       |
| L/W – 2 Bdrm             | 71 DU                    | 150 GPD/unit                   | 10,650                      |
| Retail                   | 18,000 SF                | 25 GPD/1,000 sf                | 450                         |
| Market                   | 20,000 SF                | 25 GPD/1,000 sf                | 500                         |
| Restaurant: Full Service | 420 seats                | 30 GPD/seat                    | 12,600                      |
| Total                    |                          |                                | 93,890                      |

### **Estimated Project Wastewater Generation (Development Program II)**

| Land Use                     | <b>Unit</b> <sup>a</sup> | Generation Factor <sup>a</sup> | Wastewater<br>Generation<br>(GPD) |
|------------------------------|--------------------------|--------------------------------|-----------------------------------|
| Proposed Use                 |                          |                                |                                   |
| Studio                       | 57 DU                    | 75 GPD/unit                    | 4,275                             |
| 1 Bdrm                       | 267 DU                   | 110 GPD/unit                   | 29,370                            |
| 2 Bdrm                       | 115 DU                   | 150 GPD/unit                   | 17,250                            |
| L/W – 1 Bdrm                 | 14 DU                    | 110 GPD/unit                   | 1,540                             |
| L/W – 2 Bdrm                 | 80 DU                    | 150 GPD/unit                   | 12,000                            |
| Retail                       | 4,500 SF                 | 25 GPD/1,000 sf                | 113                               |
| Market                       | 20,000SF                 | 25 GPD/1,000 sf                | 500                               |
| Restaurant: Full Service     | 480 seats                | 30 GPD/seat                    | 14,400                            |
| Total                        |                          |                                | 79,448                            |
| Source: Hall & Foreman, 2014 |                          |                                |                                   |

Construction of the Project would include all necessary on- and off-site sewer pipe improvements and connections to adequately connect to the City's existing sewer system. As discussed above, the Project would not generate sewer flows that would jeopardize the ability of the HTP to operate within its established wastewater treatment requirements. As a result, the Project would not exceed the requirements of the LARWQCB and a less than significant impact would result. No mitigation measures or further evaluation of this topic in an EIR is recommended.

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b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

### Wastewater

Portions of the following impact analysis pertaining to the wastewater disposal are based, in part, on information contained in the Initial Sewer Study ("Sewer Study") prepared by Hall & Foreman, Inc. in June 2014. The Sewer Study is included as Appendix B-4 of this Initial Study.

Less Than Significant Impact. With regard to wastewater treatment, as discussed in the response to Checklist Question XVII(a) above, the Project's net increase in wastewater generation would not exceed the treatment capacity of the HTP and a less than significant impact would result.

With regard to the local wastewater conveyance infrastructure, the Project Site is served through an off-site sewer network maintained by the City of Los Angeles Bureau of Sanitation, comprising 8-inch and 15-inch vitrified clay pipes ("VCP"). The first sewer main that would serve the Project Site is an 8-inch sewer in Rondout Street flows southeast and ultimately discharges through a manhole to a City of Los Angeles 12-inch connected VCP main, which is located in North Main Street, east of the Project Site. The second sewer main that would serve the Project Site is a 15-inch VCP located west of the Project Site in N. Spring Street. It flows southwest and ultimately discharges through a manhole to a 15-inch connected VCP main parallel to Alameda Street.

As discussed above, wastewater generation under the Project would total an estimated 81,542 gpd under Development Program I and 65,336 gpd under Development Program II. During final plan check, the Project's Sewer Capacity Availability Request ("SCAR") would be reviewed by the Bureau of Sanitation ("BOS") to verify available capacity in the local sewer system at that time, and to amend requirements of the Applicant to reflect existing capacity as needed.<sup>27</sup> If sewer capacity is confirmed to be adequate, the Project would be issued a permit to connect to the City's sewer system. The Project would be required to provide on-site infrastructure and connections to the local sewer lines, to the satisfaction of LADBS and BOS. The Project would also be required to pay Sewerage Facilities Charges that would be deposited in the City's Sewer Construction and Maintenance Fund and used for operations, maintenance and improvements of the wastewater collection system, which the City monitors routinely to determine the need for required system upgrades. If the BOS determines that adequate capacity is not available in the local sewer system, the BOS would require the Project applicant to amend the Project or complete any necessary off-site improvements to increase capacity in the system. Therefore, BOS review of the Project would ensure that there would be sufficient capacity to accept the Project's wastewater generation and convey it to the HTP for treatment, and the Project would result in a less than significant impact with respect to wastewater conveyance.

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The SCAR calculated the Project's wastewater generation for both development options using standard City wastewater generation rates. To provide a conservative estimate, the SCAR rounded wastewater generation up to 82,000 gpd under Development Scenario I and up to 66,000 gpd under Development Program II. The SCAR was submitted to the BOS for review and approval in March 2014.

### Water

**Potentially Significant Impact.** The Project consists of new mixed-use development on a currently vacant site, which would result in an increase in water demand that may require upgrades to existing utility facilities. Therefore, it is recommended that water supply and infrastructure be analyzed further in an EIR.

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

Less Than Significant Impact. As discussed in the response to Checklist Question IX(e) above, the Project Site would install subterranean cisterns on-site and implement other BMPs in accordance with the City's LID Ordinance to ensure that stormwater flows from the Project Site do not increase over existing conditions. There are no known current deficiencies in the local stormwater system that serves the Project Site. As the storm drain system in N. Spring Street can adequately handle existing flows, the Project's stormwater flows would not exceed the capacity of the storm drain system in N. Spring Street. Final plan check by the City Bureau of Engineering would ensure that adequate capacity is available in the storm drain system prior to Project approval. The Applicant would be responsible for providing the necessary storm drain infrastructure to serve the Project Site, as well as any extensions to the existing system in the area. Therefore, a less than significant impact would result. No additional mitigation measures are required and no further analysis of this topic in an EIR is recommended.

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

**Potentially Significant Impact.** Sections 10910-10915 of the State Water Code (Senate Bill [SB] 610) requires the preparation of a water supply assessment ("WSA") demonstrating sufficient water supplies for a project that is: 1) a shopping center or business establishment that will employ more than 1,000 persons or have more than 500,000 square feet of floor space; 2) a commercial office building that will employ more than 1,000 persons or have more than 250,000 square feet of space, or 3) any mixed-use project that would demand an amount of water equal to or greater than the amount of water needed to serve a 500-dwelling unit subdivision. As both development options for the Project meet the established threshold, a WSA is required for the Project. Further evaluation of this topic in an EIR is recommended.

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

Less Than Significant Impact. As indicated in the response to Checklist Question XVII(a), the Project would not exceed the treatment capacity of the HTP. Specifically, the Project's projected wastewater generation represents a negligible percentage (less than 0.01 percent) of the remaining available capacity at the HTP. Further, as discussed in the response to Checklist Question XVII(b) above, BOS review of the Project during final plan check would ensure that the local wastewater conveyance infrastructure would adequately serve wastewater generated by the Project. Therefore, the project would have a less than significant impact with respect to wastewater treatment capacity. No mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

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### f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

**Less Than Significant Impact.** Solid waste management in the City of Los Angeles involves both public and private refuse collection services as well as public and private operation of solid waste transfer, resource recovery, and disposal facilities. The BOS is responsible for developing strategies to manage solid waste generation and disposal in the City of Los Angeles. The Bureau of Sanitation collects solid waste generated primarily by single-family dwellings, small multi-family dwellings, and public facilities. Private hauling companies collect solid waste generated primarily from large multi-family residential, commercial, and industrial properties. The City does not own or operate any landfill facilities, and the majority of its solid waste is disposed of at in-County landfills.

The remaining disposal capacity for the County's Class III landfills is estimated at approximately 129.2 million tons as of December 31, 2012.<sup>28</sup> In addition to in-County landfills, out-of-County disposal facilities are also available to the City. Aggressive waste reduction and diversion programs on a Countywide level have helped reduce disposal levels at the County's landfills, and based on the Los Angeles County Integrated Waste Management Plan ("CoIWMP"), the County anticipates that future Class III disposal needs can be adequately met through 2027 through a combination of landfill expansion, waste diversion at the source, out-of-County landfills, and other practices.

### **Construction Impacts**

Project construction would require earthwork (grading and excavation) and the new construction of a mixed-use project on the Project Site. Each of these activities would generate demolition waste including but not limited to soil, asphalt, wood, paper, glass, plastic, and metals. As shown in Table B-3, Project Construction Debris, construction of the proposed mixed-use project would generate an estimated 1,277 tons of debris under Development Program I and 1,047 tons under Development Program II. As discussed in Attachment A, Project Description, of this Initial Study, excavation of the Project Site is estimated to generate 8,400 cubic yards of demolition debris under both development options and approximately 63,100 cubic yards ("cy") of soil export under Development Program I, the more intensive development option, and approximately 48,100 cy of soil under Development Program II.

Construction materials are disposed of at one of the unclassified inert landfills available to the City of Los Angeles, typically the Azusa Land Reclamation Facility, which has an estimated remaining capacity of approximately 64.1 million tons. As a result, Project excavation and construction would account for only a small percentage (less than 0.01 percent under Development Programs I and II) of the Azusa Land Reclamation Facility, and construction waste would not exceed the existing capacity of this facility.

These regulations require the Applicant to contract with a waste disposal company that recycles construction and/or demolition debris, as well as to provide temporary waste separation bins during Project construction. On March 5, 2010, the City Council approved the Construction and Demolition Waste Recycling Ordinance, which requires all mixed construction and demolition waste generated within City limits be taken to City-certified construction and demolition waste processors. This recycling requirement is effective

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County of Los Angeles Department of Public Works, County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report. August 2013.

Table B-3 **Project Construction Debris (Development Program I)** 

| Land Use                               | Size                        | Generation Rate<br>(lbs/sf) | Total Solid Waste<br>Generation (lbs) | Total Solid Waste<br>Generation |
|----------------------------------------|-----------------------------|-----------------------------|---------------------------------------|---------------------------------|
| Residential                            | 539,105 sf                  | 4.39 lbs per sf             | 2,366,671 lbs                         | 1,183 tons                      |
| Non-Residential                        | 43,500 sf                   | 4.34 lbs per sf             | 188,790 lbs                           | 94 tons                         |
| Total Solid Was                        | te Generated During         | Project Construction        | 2,555,461 lbs                         | 1,277 tons                      |
| Total Solid V                          | <b>Waste With Diversion</b> | Efforts (50 percent)        | 1,277,731 lbs                         | 639 tons                        |
| Demolition Debris Export (cubic yards) |                             |                             |                                       | 8,400 cy <sup>a</sup>           |
|                                        | 63,100 cy                   |                             |                                       |                                 |

### **Project Construction Debris (Development Program II)**

| Land Use                  | Size                 | Generation Rate<br>(lbs/sf) | Total Solid Waste<br>Generation (lbs) | Total Solid Waste<br>Generation |
|---------------------------|----------------------|-----------------------------|---------------------------------------|---------------------------------|
| Residential               | 438,305 sf           | 4.39 lbs per sf             | 1,924,159 lbs                         | 962 tons                        |
| Non-Residential           | 39,100 sf            | 4.34 lbs per sf             | 169,694 lbs                           | 85 tons                         |
| Total Solid Wast          | e Generated During   | <b>Project Construction</b> | 2,093,853 lbs                         | 1,047 tons                      |
| Total Solid V             | Vaste With Diversion | n Efforts (50 percent)      | 1,046,927 lbs                         | <b>524 tons</b>                 |
|                           | 8,400 cy             |                             |                                       |                                 |
| Soil Export (cubic yards) |                      |                             |                                       | 48,100 cy                       |

cy = cubic yards

Source: Generation Rates: Environmental Protection Agency, Estimating 2003 Building-Related Construction and Demolition Materials Amounts, March 2009.

January 1, 2011 and data is not yet available on the effectiveness of this ordinance.<sup>29</sup> However, assuming Project construction achieves a minimum 50 percent diversion rate as required by Assembly Bill 939, construction debris would be reduced to a total of approximately 639 tons under Development Program I and approximately 524 tons under Development Program II. Waste resulting from Project construction would be further reduced with compliance with applicable City regulations. Construction waste impacts would be less than significant and further evaluation of this topic in an EIR is not required.

### **Operational Impacts**

Estimated solid waste generation for the Project is shown in Table B-4, Estimated Operational Solid Waste *Generation.* It is estimated that the total waste generation for the Project would be approximately 1,667 tons per year (4.56 tons per day) under Development Program I and approximately 1,317 tons per year (3.62 tons per day) under Development Program II. The annual amount of solid waste generated by the

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of Los Angeles, Department of Public Works, Solid Resources, Recycling Statistics. Available at: http://www.lacitysan.org/solid\_resources/recycling/c&d.htm. Accessed January 13, 2014.

Table B-4
Estimated Operational Solid Waste Generation (Development Program I)

| Land Use          | Unit <sup>a</sup><br>(sq. ft.) | Factor <sup>a</sup>     | Waste<br>Generation<br>(lbs/day) | Waste<br>Generation<br>(tons/year) |
|-------------------|--------------------------------|-------------------------|----------------------------------|------------------------------------|
| Proposed Use      |                                |                         |                                  |                                    |
| Residential       | 685                            | 12.23 lbs/unit          | 8,378                            | 1,529                              |
| Commercial/Retail | 26,400                         | 5 lbs/1,000 sq. ft./day | 132                              | 24                                 |
| Market            | 20,000                         | 31.2 lbs / 1,000 sf/day | 624                              | 114                                |
| Total             |                                |                         | 9,134                            | 1,667                              |

### **Estimated Operational Solid Waste Generation (Development Program II)**

| Land Use          | Unit <sup>a</sup><br>(sq. ft.) | Factor <sup>a</sup>     | Waste<br>Generation<br>(lbs/day) | Waste<br>Generation<br>(tons/year) |
|-------------------|--------------------------------|-------------------------|----------------------------------|------------------------------------|
| Proposed Use      |                                |                         |                                  |                                    |
| Residential       | 533                            | 12.23 lbs/unit          | 6,519                            | 1,190                              |
| Commercial/Retail | 14,100                         | 5 lbs/1,000 sq. ft./day | 71                               | 13                                 |
| Market            | 20,000                         | 31.2 lbs / 1,000 sf/day | 624                              | 114                                |
| Total             |                                |                         | 7,239                            | 1,317                              |

Generation factors provided by the CalRecycle website: Estimated Solid Waste Generation Rates. http://www.calrecycle.ca.gov/WasteChar/WasteGenRates/default.htm. Accessed April 18, 2013.

Source: PCR Services Corporation, 2014

Project Site would represent a negligible amount (0.06 percent under Development Program I and 0.04 percent under Development Program II) of the daily solid waste disposed of by the City (8,175.13 tons), for which there is adequate daily permitted capacity. It is important to note that this estimate is conservative, in that the amount of solid waste that would need to be landfilled would likely be less than this forecast based on successful City implementation of AB 939 and the City's objective to achieve a 70 percent diversion goal by 2020 and eventually to a zero waste scenario by 2025 as envisioned in the Los Angeles Solid Waste Integrated Resources Plan. Recycling efforts in the City of Los Angeles in accordance with AB 939 achieved a solid waste diversion rate of 76.4 percent in 2012, the most recent year data is available.<sup>30</sup> Assuming the Project achieves a similar diversion rate, the amount of Project solid waste that would need to be landfilled would be reduced to an estimated 393.4 tons annually (1.07 tons per day) under Development Program I and 310.8 tons annually (0.85 tons per day) under Development Program II. Therefore, a less than significant impact associated with operational solid waste would occur.

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City of Los Angeles, Department of Public Works, Solid Resources, Zero Waste Progress Report. Available at: http://www.lacitysan.org/solid\_resources/recycling/publications/PDFs/CLA\_%20Zero\_Waste\_Progress\_Report.pdf. Accessed January 13, 2013.

As described in the CoIWMP 2012 Annual Report, future disposal needs for the 15-year planning horizon (2027) would be adequately met through the use of in-County and out-of-County facilities. It should also be noted that with annual reviews of demand and capacity in each subsequent Annual Report, the 15-year planning horizon is extended by one year, thereby providing sufficient lead time for the County to address any future shortfalls in landfill capacity.

Based on the above, Project-generated waste would not exacerbate the estimated landfill capacity requirements addressed for the 15-year planning period ending in 2027, or alter the ability of the County to address landfill needs via existing capacity and other options for increasing capacity. Therefore, impacts on solid waste disposal from Project operations would be less than significant.

In summary, the County's inert and Class III landfills would have adequate capacity to accommodate Projectgenerated construction and demolition waste during Project construction and Class III solid waste generation during Project operations. Thus, construction and operation impacts relative to solid waste would be less than significant. No further analysis of this topic in an EIR is recommended. No mitigation measures are required.

### Comply with federal, state, and local statutes and regulations related to solid waste? g.

**Less Than Significant Impact.** Solid waste management in the State is primarily guided by the California Integrated Waste Management Act of 1989 (AB 939) which emphasizes resource conservation through reduction, recycling, and reuse of solid waste. AB939 establishes an integrated waste management hierarchy consisting of (in order of priority): (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and land disposal. Additionally, the City is currently implementing its "Zero-Waste-to-Landfill" goal to achieve zero waste to landfills by 2025 to enhance the Solid Waste Integrated Resources Planning Process. Recycling efforts in the City of Los Angeles in accordance with AB 939 achieved a solid waste diversion rate of 76.4 percent in 2012, the most recent year data is available.

The Project would be consistent with the applicable regulations associated with solid waste. Specifically, the Project would provide adequate storage areas in accordance with the City of Los Angeles Space Allocation Ordinance (Ordinance No. 171,687), which requires that developments include a recycling area or room of specified size on the Project Site.31 Further, the Project would comply with the City's Construction and Demolition Waste Recycling Ordinance. The Project would also promote compliance with AB 939 and City waste diversion goals by providing clearly marked, source sorted receptacles to facilitate recycling. Since the Project would comply with federal, State, and local statutes and regulations related to solid waste, a less than significant impact would occur and no mitigation measures would be required. No further analysis of this topic in an EIR is recommended.

#### h. Other Utilities and Service Systems?

**Less Than Significant Impact.** Electricity transmission to the Project Site is provided and maintained by LADWP. Future plans regarding the provision of electrical services are presented in regularly updated Integrated Resource Plans ("IRPs"). These plans identify future demand for services and provide a framework for how LADWP plans on continuing to meet future consumer demand. The current IRP is based

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Ordinance No. 171687 adopted by the Los Angeles City Council on August 6, 1997.

on a 20-year planning horizon. The LADWP is required to meet operational, planning reserve and reliability criteria, and the resource adequacy standards of the Western Electricity Coordinating Council and the North American Electric Reliability Corporation.

LADWP's Power System served approximately 4.1 million people in 2013 in the City and areas of the Owens Valley and is the nation's largest municipal electric utility. LADWP has a net dependable generation capacity greater than 7,327 megawatts ("MW") from a diverse mix of energy resources.<sup>32</sup> LADWP is fully resourced to meet peak demand but maintains transmission and wholesale marketing operations to keep production costs low and increase system reliability.

The LADWP December 2013 forecast, as presented in the 2013 IRP, indicates a 2017-2018 fiscal year demand for approximately 22,823 gigawatt hours ("GWh") per year.33 The Project's estimated energy consumption is shown in **Table B-5**, *Estimated Electricity Use*. The estimates are based on generation factors provided in the 2013 SCAQMD California Emissions Estimator Model. As indicated in Table B-7, the annual consumption of electricity would be 3,608.01 megawatt hours ("MWh") under Development Program I and 2,882.55 MWh under Development Program II. When compared to the estimated 2017-2018 LADWP demand of 23,300 GWh per year, the Project's energy consumption would represent approximately 0.02 percent of total demand under Development Program I and 0.01 percent of total demand under Development Program II. This amount is negligible, and is within the anticipated service capabilities of LADWP.

Table B-5 **Estimated Electricity Use (Development Program I)** 

| Land Use          | Unit or sq. ft. | Consumption Factor (MWh/unit/year) <sup>a</sup> | Annual Electricity Consumption (MWh) |
|-------------------|-----------------|-------------------------------------------------|--------------------------------------|
| Residential Uses  | 685 units       | 3.48                                            | 2,384.67                             |
| Retail/Restaurant | 26,400 sf       | 0.02                                            | 421.34                               |
| Market            | 20,000 sf       | 0.04                                            | 802.00                               |
| Total             |                 |                                                 | 3,608.01                             |

### Estimated Electricity Use (Development Program II)

| Land Use          | Unit or sq. ft. | Consumption Factor (MWh/unit/year) <sup>a</sup> | Annual Electricity Consumption (MWh) |
|-------------------|-----------------|-------------------------------------------------|--------------------------------------|
| Residential Uses  | 533 units       | 3.48                                            | 1,855.51                             |
| Retail/Restaurant | 14,100 sf       | 0.02                                            | 225.04                               |
| Market            | 20,000 sf       | 0.04                                            | 802.00                               |
| Total             |                 |                                                 | 2,882.55                             |

Electricity demand generation factors based on SCAQMD California Emissions Estimator Model, Appendix Default Data Tables (October 2013), Table 8.1.

Source: PCR Services Corporation, 2014

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City of Los Angeles Department of Water and Power, 2013 Integrated Resources Plan, December 2013.

Ibid, at Appendix A, Table A-1.

Natural gas is provided to the Project Site by the Southern California Gas Company (SoCal Gas). According to the 2012 California Gas Report, the most recent available, California natural gas demand is expected to decrease at a modest rate of 0.25 percent per year from 2012 to 2030 for residential, commercial, electric generation, and industrial markets. This is due to increased energy efficiency programs, increasing reliance on renewable electric generation (e.g. solar and wind) as well as declining industrial demands as California continues its transition from a manufacturing-based to a service-based economy.<sup>34</sup> Over the past five years. California natural gas utilities including SoCal Gas, interstate pipelines and in-state natural gas storage facilities have increased their delivery and receipt capacity to meet natural gas growth. SoCal Gas is supported in its planning effort by the California Energy Commission, which provides Integrated Energy Policy Reports, with annual updates that evaluate future demand for natural gas and supply considerations.

The 2012 California Gas Report indicates that, with only minor variations from year to year, SoCal Gas is projected to provide approximately 975 billion cubic feet (cf) per year of natural gas over the next 20-year planning horizon. The report also indicates that SoCal Gas has a substantially higher capacity available.<sup>35</sup>

The Project's estimated use of natural gas is shown in **Table B-6**, *Estimated Natural Gas Use*. This estimate is based on generation factors provided in the 2011 SCAQMD California Emissions Estimator Model. As indicated therein, the Project would generate a demand for 5,032.49 thousand cubic feet ("kcf") per year under Development Program I and 4,004.80 kcf per year under Development Program II, which represents less than 0.01 percent of the estimated annual demand of 975 billion cubic feet/year under both development options. This amount is negligible and is within the anticipated service capabilities of SoCal Gas.

Furthermore, utility providers are required to plan for necessary upgrades and expansions to their systems to ensure that adequate service would be provided. As such, the Project would have a less than significant impact on electricity and natural gas utilities and service systems. No further analysis of this topic is necessary and no mitigation measures are required. Notwithstanding, the analysis of GHG emissions will evaluate energy use as it effects air emissions and potential conservation measures that will reduce energy consumption as well as the emission of GHGs.

### XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

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

**Potentially Significant Impact.** As discussed within this Initial Study, the Project could result in environmental impacts that have the potential to degrade the quality of environment as addressed herein. Potentially affected resources include Aesthetics (Aesthetics, Views, Light and Glare, and Shade and Shadow), Air Quality, Cultural Resources (Historical, Archaeological, and Paleontological Resources), Greenhouse

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<sup>2012</sup> California Gas Report, Prepared by the California Gas and Electric Utilities. July 2012.

<sup>2012</sup> California Gas Report, prepared by the California Gas and Electric Utilities. July 2012; page 66 and Appendix Table at pages 102-107.

Table B-6 **Estimated Natural Gas Use (Development Program I)** 

|                   |           |                                                     | Annual Natural Gas                     |
|-------------------|-----------|-----------------------------------------------------|----------------------------------------|
| Land Use          | Units     | Consumption Factor<br>(kBtu/unit/year) <sup>a</sup> | Consumption<br>(kcf/year) <sup>b</sup> |
| Residential Units | 685 units | 6,819.80                                            | 4,533.44                               |
| Retail/Restaurant | 26,400 sf | 1.82                                                | 46.63                                  |
| Market            | 20,000 sf | 23.31                                               | 452.42                                 |
| Total             |           |                                                     | 5,032.49                               |

### Estimated Natural Gas Use (Development Program II)

| Land Use          | Units     | Consumption Factor (kBtu/unit/year) <sup>a</sup> | Annual Natural Gas Consumption (kcf/year) <sup>b</sup> |
|-------------------|-----------|--------------------------------------------------|--------------------------------------------------------|
| Residential Units | 533 units | 6,819.80                                         | 3,527.48                                               |
| Retail/Restaurant | 14,100 sf | 1.82                                             | 24.9                                                   |
| Market            | 20,000 sf | 23.31                                            | 452.42                                                 |
| Total             |           |                                                  | 4,004.80                                               |

Natural gas demand generation factors based on SCAQMD California Emissions Estimator Model, Appendix Default Date Tables (October 2013), Table 8.1. kBtu = thousand British thermal units.

Source: PCR Services Corporation, 2014.

Gases, Hazards and Hazardous Materials, Land Use and Planning, Noise, Public Services (Fire, Police, Parks, Other Government Facilities), Recreation, Transportation/Circulation (Traffic, Access, and Parking), and Utilities/Service Systems (Water Supply). An EIR will be prepared to analyze and document these potentially significant impacts.

As discussed previously in the response to Checklist Question IV, the Project would not substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal.

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

**Potentially Significant Impact.** The potential for cumulative impacts occurs when the independent impacts of a given project are combined with the impacts of related projects in proximity to the Project Site, to create impacts that are greater than those of the project alone. Related projects include past, current, and/or probable future projects whose development could contribute to potentially significant cumulative impacts in conjunction with a given project.

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Natural gas consumption expressed in kBtu (thousand British Thermal Units) is converted to consumption in kcf (thousand cubic feet) via the following conversion factor: 1,000 Btu = 0.00097043405077 thousand cubic feet.

For each of the topics determined to be potentially significant within this Initial Study, as identified in the corresponding sections above, the potential for cumulatively significant impacts will be analyzed in an EIR. Topics for which Initial Study determinations were "No Impact" or "Less Than Significant Impact" are discussed below.

With respect to potential contributions to cumulative impacts for agricultural resources, biological resources, and mineral resources, the Project Site is located in an urbanized area, and like the Project, other development occurring in the area would also constitute urban infill in already densely developed areas. The Project Site does not contain agricultural, sensitive biological, or mineral resources, and therefore Project implementation would not be expected to result in a considerable contribution to cumulatively significant impacts on these resources.

With respect to Geology and Soils, geology impacts are site specific and are assessed on a project-by-project basis. As no projects are located immediately adjacent to the Project Site, cumulative geologic impacts resulting from the Project and other related projects would not occur. All projects in the City of Los Angeles would be subject to Federal, State, and local regulations and standards for seismic safety, including the CBC (as amended by the Los Angeles Building Code). Thus, cumulative impacts related to geology and soils would be less than significant. No additional mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

With respect to hydrology and water quality, all development projects that require ground-disturbing activities have the potential to increase or decrease in surface water runoff and contribute point and non-point source pollutants to nearby water bodies. However, as with the Project, related projects would be subject to NPDES permit requirements for both construction and operation, including development of SWPPs for construction projects greater than one acre, compliance with SUSMP requirements during operation, and compliance with other local requirements pertaining to hydrology and surface water quality. It is anticipated that related projects would be evaluated on an individual basis by City of Los Angeles Department of Public Works to determine appropriate BMPs and treatment measures to avoid significant impacts to hydrology and surface water quality. Thus, cumulative impacts related to hydrology/water quality would be less than significant. No mitigation measures would be required and no further analysis of this topic in an EIR is recommended.

With respect to solid waste disposal, electricity consumption, and natural gas consumption, the provision of these services is regional in nature. As indicated in the corresponding Initial Study Checklist sections above, the service providers have prepared forecasts of regional demand for these utilities and their ability to meet future demand. These are incorporated into the respective service providers' plans and strategies for meeting future needs. Utility provider plans are updated periodically to identify emerging shortfalls in service capacity not previously anticipated and develop strategies to accommodate any shortfalls. The plans address expected growth, which anticipates projected development within the service areas. The information contained in this Initial Study concerning the ability of these service providers to meet the Project's needs supports the determination that future demand for solid waste disposal, electricity consumption and natural gas consumption can be met for new growth and development, including the Project. Therefore, the Project is not expected to result in cumulatively considerable contributions to cumulatively significant impacts as the result of solid waste disposal or electricity and natural gas consumption.

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

**Potentially Significant Impact.** As discussed in this Initial Study, the Project could result in potentially significant environmental impacts associated with Aesthetics (Aesthetics, Views, Light and Glare, and Shade and Shadow), Air Quality,, Greenhouse Gases, Hazards and Hazardous Materials, Land Use and Planning, Noise, Public Services (Fire, Police, Parks), Recreation, Transportation/Circulation (Traffic, Access, and Parking), and Utilities/Service Systems (Water Supply). These impacts could have potentially adverse effects on human beings, and further analysis of these impacts is recommended in an EIR.

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## APPENDIX B-1

REPORT OF GEOTECHNICAL DUE-DILIGENCE INVESTIGATION FOR A PROPOSED MIXED USE DEVELOPMENT

## REPORT OF GEOTECHNICAL DUE-DILIGENCE INVESTIGATION FOR A PROPOSED MIXED USE DEVELOPMENT, CHINATOWN AREA, CITY OF LOS ANGELES, CALIFORNIA

Site Address: 129 W. College Street

**Dated: June 12, 2013** 

Project No. 133006-01

**Prepared For:** 

HALL & FOREMAN 25152 Springfield Court, Suite 350 Santa Clarita, CA 91355

### **Geotechnical Consulting**

June 12, 2013 Project No. 133006-01

Mr. Mark Miner *Hall & Foreman*25152 Springfield Court, Suite 350
Santa Clarita, California 91355

Subject: Report of Geotechnical Due Diligence Investigation for a Proposed Mixed Use Development,

Chinatown Area, City of Los Angeles, California

Site Address: 129 W. College Street

In accord with your authorization, LGC Valley, Inc. (LGC) is pleased to present this report of geotechnical due diligence for a proposed approximate 5.65 acre mixed use development located northeast of the intersection of College Street and North Spring Street, Chinatown Area, in the city of Los Angeles, California. The purpose of our investigation was to evaluate the existing onsite geotechnical conditions, review geotechnical and geologic data and maps pertinent to the site, and prepare a report indicating our findings, conclusions, opinions, and recommendations for site development. This report presents the results of our subsurface investigation, and geotechnical analysis of the collected data, and provides our conclusions, opinions and recommendations with respect to site development.

Based on the results of our geotechnical evaluation and review, it is our opinion that the proposed site development is feasible from a geotechnical standpoint provided the recommendations included in this report are incorporated into the project plans and specifications, and followed during site grading and construction.

LGC has reviewed the laboratory test data, procedures and results performed by EGLAB, Inc. (EGL), with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).

If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LGC VALLEY, INC.

Basil Hattar, GE 2734 Principal Engineer

BIH/MCH/kse

Distribution: (6) Addressee

Matthew Hawley, CEG 2122 President

Motthen Hanley

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### 1.0 <u>INTRODUCTION</u>

### 1.1 Purpose and Scope of Services

The main purpose of this investigation was to identify and evaluate the existing geologic and geotechnical conditions at the site and provide preliminary geotechnical design criteria. Recommendations for grading construction, preliminary foundation design for the proposed structure, retaining walls and other relevant aspects of the proposed development are included herein to address the identified site geotechnical constraints. This report includes the results of site exploration, laboratory testing and engineering evaluation, and provides our conclusions, opinions and recommendations with respect to site development.

These items plus other geotechnical conditions are discussed and addressed within this document.

Our scope of services for preparation of this document included:

- Review of geotechnical reports, geologic maps and other documents relevant to the site (Appendix A).
- Perform a site visit to evaluate the existing condition, and mark the geotechnical boring locations.
- A subsurface investigation including the excavation, sampling, and logging of three small-diameter exploratory borings. The borings are labeled B-LGC-1 through B-LGC-3. Logs of the borings are presented in Appendix B, and their approximate locations are depicted on the Exploration Location Map (Figure 3). All of the excavations were sampled and logged under the supervision of a licensed engineer from our firm. The borings were excavated to evaluate the general characteristics of the subsurface conditions on the site including classification of site soils, determination of depth to groundwater, and to obtain representative soil samples.
- Laboratory testing of representative soil samples obtained during our subsurface investigation (Appendix C).
- Perform geotechnical analyses and evaluation of the data.
- Preparation of this report presenting our findings, conclusions, opinions and recommendations with respect to the evaluated geologic and geotechnical conditions at the site.

### 1.2 Site and Project Description

The subject site is located at 129 W. College Street, Chinatown area, city of Los Angeles, California. The subject site is roughly crescent-shaped and consists of approximately 5.65 acres located northeast of the intersection of West College Street and North Spring Street. The site is bound by West College Street to the south, commercial buildings and paved and unpaved driveways to the east, Llewellyn Street to the north and North Spring Street to the west.

The site is planned for a mixed-use transit-oriented development. At this time, two roughly similarly-laid out Schemes are considered for project build-out. The Schemes are similar in that they divide the site into three similarly shaped Parcels that are separated by through-going access roads that will connect Roundout Street to North Spring Street. Though the general layout and plan uses of the two Schemes are similar, the Parcels differ in relative unit density and overall building types that would accommodate each area. The proposed design relative to each Scheme and Parcel is provided in the table below.

|          | Scheme 1                                                                                                                                                                     | Scheme 2                                                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Parcel 1 | • 500 market-rate units in two high-<br>rise towers up to 19-stories in height<br>and five 2-story live-work lofts and<br>approximately 17,000 sf of ground<br>retail space. | • 339 Residential units, 14 live-work lofts and approximately 12,600 sf of ground floor retail space within five 5-story plus loft buildings. |
|          | • One level of subterranean parking and a three-level podium structure.                                                                                                      | One level of subterranean parking and a five-level podium structure.                                                                          |
| Parcel 2 | • 100 senior housing units in two 4-story buildings above a podium, a market and 4,500 sf of retail commercial space.                                                        | • 100 senior housing units in two 4-story buildings above a podium, a market and 7,000 sf of retail commercial space.                         |
|          | • Two levels of subterranean parking.                                                                                                                                        | Two levels of subterranean parking.                                                                                                           |
| Parcel 3 | • 80 four-level, double-height lofts in four 8-story buildings and approximately 2,000 sf of retail space.                                                                   | • 80 four-level, double-height lofts in four 8-story buildings and approximately 2,000 sf of retail space.                                    |
|          | <ul> <li>Two levels of subterranean parking.</li> </ul>                                                                                                                      | Two levels of subterranean parking.                                                                                                           |

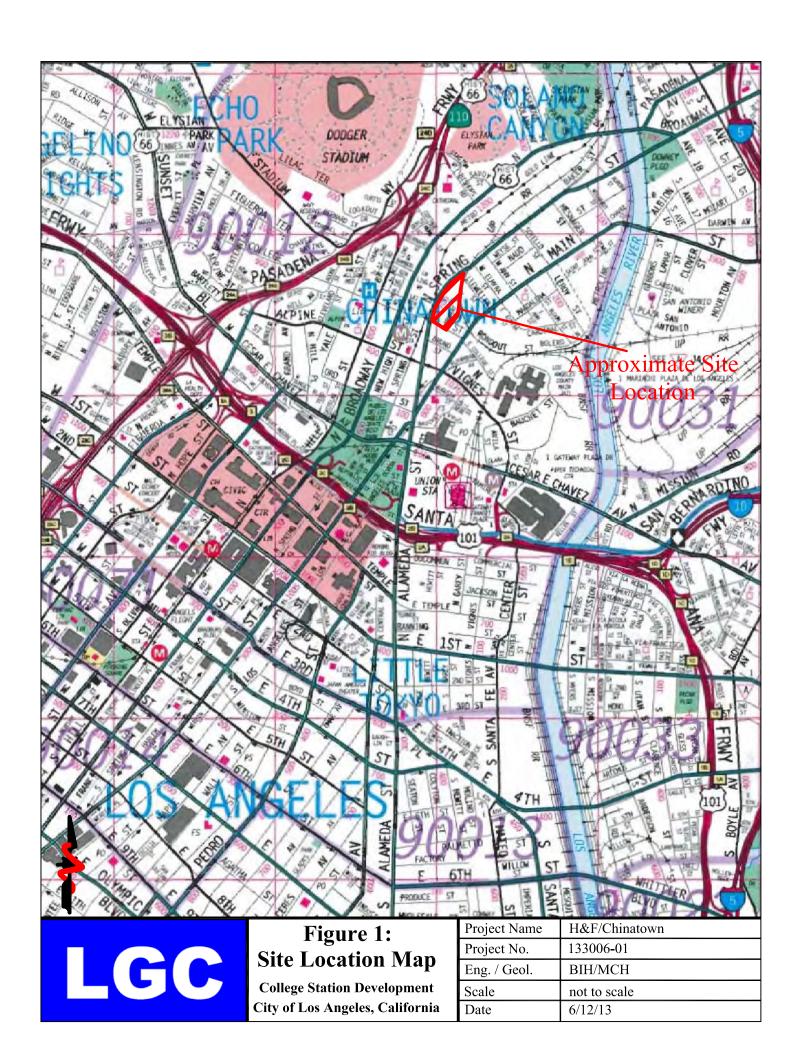
Various amenities including gathering areas, plazas, landscaping, courtyards, atriums and pedestrian walk-ways are also planned around the various Parcels. Practical amenities will include access roads and driveways, loading docks, the installation of various underground utilities and other similar fundamental services.

LGC has preliminarily reviewed the site in a manner that is sufficient for the varying conditions that would be encountered for either Scheme outlined above.

### 1.3 Subsurface Investigation and Laboratory Testing

Our subsurface investigation was performed on May 13, 2013, and consisted of three hollow stem auger borings (B-LGC-1 through B-LGC-3). The borings were extended to a depth of approximately 21.5 to 66.5 feet. The approximate locations of the borings are shown on the Exploration Location Map (Figure 3). Based on a review of seismic hazard zone maps prepared by the California Geological Survey (CGS, 2001), the site is within a potential liquefaction seismic hazard area. Because of this zoning and the depth of proposed construction (one story underground parking), LGC advanced one boring to a depth of approximately 66.5 feet below the ground surface to address the potential for liquefaction. All boring data were used to evaluate the liquefaction potential and to characterize the near-surface geotechnical characteristics of the site. The borings were sampled and logged from the surface under the supervision of a licensed engineer from LGC.

During the subsurface investigation, representative bulk and relatively undisturbed samples were collected for laboratory testing. Laboratory testing was performed by EGLAB, Inc. (EGL), a city of Los Angeles approved testing laboratory. Laboratory testing was performed on representative soil samples and included moisture and density tests, maximum density and optimum moisture content, sieve analysis, Atterberg Limits, expansion, direct shear, consolidation, and corrosion testing. A summary of the test procedures and printouts of the laboratory test results are presented in Appendix C. The moisture and density test results were presented on the boring logs included in Appendix B.



### 2.0 GEOTECHNICAL CONDITIONS

### 2.1 Regional and Local Geology

The subject site is located on the western edge of the Los Angeles USGS 7.5-minute Quadrangle, in the Los Angeles Basin, a structural trough located within southern California. The Los Angeles Basin (Basin) is a northwest-trending alluvial lowland plain about 50 miles long and 20 miles wide. Mountains and hills that generally expose late Cretaceous to late Pleistocene-age sedimentary and igneous rocks bound the Basin along the north, northeast, east and southeast. The Basin is part of the Peninsular Ranges Geomorphic Province of California, which is characterized by sub-parallel blocks sliced longitudinally by young steeply dipping northwest-trending fault zones. The Basin is a site of active sedimentation, and strata are interpreted to be as much as 31,000 feet thick in the center of the trough.

The Los Angeles River is located approximately one half mile to the east of the site and the Santa Monica Mountains are located just north of the site. The site lies at the base of the hills leading into the local mountains which are to the north and west and thus the site soils are likely comprised of generally young alluvial fan deposits over sandy river alluvium deposits.

### 2.2 Site-Specific Geology

Generally the entire site is underlain by artificial fills of up to approximately seven feet in thickness over alluvial material. Site soils are predominantly layers of sands consisting of brown to orange/yellowish brown sand to silty sands down the maximum explored depth of approximately 66.5 feet with some layers of clayey/silty soils encountered between 30 to 45 feet. Ground water was encountered in the borings advanced on site as discussed below.

### 2.2.1 Artificial Fill - Undocumented

It is anticipated that the entire site is covered by undocumented artificial fill soils, which were placed during previous development of the site. Based on the results of our subsurface investigation, the site is underlain by up to approximately 7 feet of undocumented fill composed primarily of silty sand with some gravel. In general, the fill soils encountered on site were found to be loose to medium dense and dry to slightly moist.

### 2.2.2 Quaternary Alluvium (Qal)

Alluvial soils were encountered below the undocumented fill soils across the entire site. As encountered, these soils generally consisted of yellowish/orange-brown and greenish-gray (below approximately 35 feet), dry to slightly moist in the upper 30 feet and slightly moist to saturated below 30 feet, stiff to hard silts/clays and medium dense to very dense silty/gravelly sand and sand to the maximum explored depth of approximately 66.5 feet. Generally, the encountered soils below the proposed subterranean level elevation were found to be dense to very dense silty to gravelly sand or stiff to hard silts/clays. Small amounts of gravel were encountered throughout the soil column.

### 2.3 Geologic Structure

The site is composed of Holocene-age alluvium in the near surface, underlying the undocumented artificial fill. The alluvium is interpreted as generally massive with probable poorly-defined, gradational, lithologic changes between soil types.

### 2.4 Landslides

Based on the relatively flat nature of the site and our review of the geologic literature pertinent to the site, there are no indications of landslides close to or within the limits of the site.

### 2.5 Groundwater

Groundwater was encountered in the geotechnical borings at depths of approximately 30 to 35 feet below the existing ground. This is slightly deeper than the CGS data for the area which indicated that the historically highest groundwater below the existing surface at the site is approximately at the 20 foot contour (CGS, 1998, Revised 2001). In general, groundwater levels in alluvium fluctuate with seasonal variations and local zones of perched groundwater may occur within the near-surface deposits when precipitation is high. For design purposes the historic high groundwater was considered to be at a depth of 20 feet below the existing site grades in accord with standard practice. Based on a conceptual design consisting of one to two levels of subterranean parking, we anticipate that groundwater may be encountered during the deeper portions of subterranean excavation.

### 2.6 Surface Water

Based on our review of local maps, sheet flow is to the south and east towards the Los Angeles River. Surface water runoff relative to project design is the purview of the project civil engineer and should be directed away from planned structures.

### 2.7 Seismicity, Faulting and Related Effects

### 2.7.1 Seismicity

The main parameters to be considered when discussing the potential for earthquake-induced damage to structures are: the distances to the causative faults/earthquakes, the earthquake magnitude, the softness of the site's near-surface soil, and the thickness of the sediments above hard bedrock. These variables must be evaluated in order to achieve a reasonable ground acceleration for site design.

We have performed site-specific analysis based on the known and anticipated geologic conditions, and interpreted seismic parameters at the site. The results of our analysis are discussed in terms of the potential seismic events that could be produced by the maximum probable earthquakes. A maximum probable earthquake is the maximum earthquake likely to occur given the known tectonic framework.

The Elysian Park Thrust Fault, the Santa Monica (Hollywood)-Raymond Hill Fault and the Newport-Inglewood Fault are located approximately 3.3 miles, 3.7 miles, and 7.7 miles respectively, from the site and are considered to have the most significant effect at the site from a probabilistic design standpoint. Attenuation relations prepared by Campbell and Bozorgnia (1997), Sadigh et al (1997) and Abrahamson & Silva (1997) were used to determine the probabilistic horizontal ground motion for the subject site. Based on the average of the attenuation relations used, we conclude the design earthquake (10 percent chance of being exceeded in 50 years) could produce a magnitude weighted Peak Horizontal Ground Acceleration (PHGA) of 0.40g at the site.

### 2.7.2 Seismic Design Criteria

The soil parameters in accordance with the 2011 City of Los Angels Building Code (Based on the 2010 California Building Code and the 2009 International Building Code (Section 1613)) are as follows:

```
Site Class (Table 1613.5.2) = B S_S = 2.218g \text{ (for Site Class B site from Figure 1613.5(3))} \\ S_1 = 0.773g \text{ (for Site Class B site from Figure 1613.5(4))} \\ F_a = 1.0 \text{ (Table 1613.5.3(1))} \\ F_v = 1.5 \text{ (Table 1613.5.3(2))} \\ \text{Site Classification} = D \text{ (Table 1613.5.5)} \\ S_{MS} = 2.218g \\ S_{M1} = 1.159g
```

Design Spectral Response Acceleration Parameters

 $S_{DS} = 1.479g$  $S_{D1} = 0.773g$ 

### 2.7.3 Faulting

The subject site is <u>not</u> located within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1997) and there are no known active or potentially active faults onsite. Therefore the possibility of damage due to ground rupture from earthquake fault rupture is considered nil since active faults are not known to cross the site.

For determining the potential for ground rupture affecting proposed structures, we used the USGS database for Historic (<150 yrs), Holocene to Pleistocene (<15,000 yrs) and Late Quaternary (<130,000 yrs) faults. The closest Historic fault is the Newport-Inglewood fault located approximately 8 miles southwest of the site, the closest Holocene to Pleistocene (active) fault is the Hollywood fault located approximately 4 miles north of the site, and several late Quaternary faults (non-active faults) are located greater than 5 miles to the site.

Secondary effects of seismic shaking resulting from large earthquakes on the major faults in the southern California region, which may affect the site, include soil liquefaction and dynamic settlement. Other secondary seismic effects include shallow ground rupture, and seiches and tsunamis. In general, these secondary effects of seismic shaking are a possibility throughout the Southern California region and are dependant on the distance between the site and causative fault and the onsite geology. The major active faults that could produce these secondary effects are the same faults discussed above plus the Whittier-Elsinore Fault, San Jacinto Fault, San Andreas Fault and numerous other smaller faults and blind thrust faults located closer to the site than these much longer, better-defined faults.

Though no known faults cross the site, secondary effects due to seismic shaking due to the nearby active faults mentioned above are a potential hazard. Of the various potential hazards from strong ground movement to sites, liquefaction is considered to be of greatest risk to the subject site. A discussion of liquefaction and these secondary effects is provided in the following sections.

### 2.7.4 Shallow Ground Rupture

Shallow ground rupture due to active faulting is not likely to occur on site due to the distance from likely seismic events. Therefore, this phenomenon is not considered a significant hazard, although it is a possibility at any site.

### 2.7.5 Liquefaction and Dry Sand Settlement

Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density non-cohesive (granular) soils; and 3) high-intensity ground motion. Liquefaction is typified by a buildup of pore-water pressure in the affected soil layer to a point where a total loss of shear strength occurs, causing the soil to behave as a liquid. Studies indicate that saturated, loose to medium dense, near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential. Cohesive soils may be susceptible to liquefaction if they meet <u>all</u> of the following criteria that is commonly referred to as the "Chinese Criteria" (Seed et al, 1985):

- Clay content (defined as percent finer than 0.005 mm) less than 15 percent
- A liquid limit less than 35 percent
- An in-situ moisture content greater than 0.9 times the liquid limit

Our evaluation utilized the information collected from the excavations and laboratory test results, along with utilizing the Chinese Criteria as a screening tool to determine if the encountered fine grained soils (silts and clays) are susceptible to liquefaction and analyzed as such. Our evaluation using the Chinese Criteria indicated that these fine-grained soil layers (silts and clays) did not meet all of the criteria and were therefore considered as being notsusceptible to liquefaction; however the silt and clay layers encountered were assumed to be potentially liquefiable in the analysis. The use of the Chinese Criteria has been an acceptable tool and is part of the current guidelines; however we are aware of the more recent liquefaction related studies based on the more recent earthquakes including the liquefaction studies based on the earthquakes in Turkey, by Bray et al., which have provided preliminary results and conclusions regarding the liquefaction potentials of fine grained soils. We have reviewed the referenced studies which indicated that the liquefaction potential was more of a function of the percent of clay minerals present in the soil and how the fine grained soil behaves rather than the percentage of "clay-size" particles that are present in the soil. The studies performed in Turkey indicated that the liquefied layers consisted of low plasticity silt layers with Plasticity Index equal to or less than 12 and Liquid Limits generally less than 35.

Groundwater was encountered in our geotechnical borings at a depths ranging from approximately 30 to 35 feet below the existing site grades; and the highest historic groundwater level for the site is approximately 20 feet below the surface from the SHZR 029 (CGS, 1998, Revised 2001), as indicated earlier.

Based on our current evaluation, of the soil layers below the upper 20 feet, based on the laboratory testing and review of recent studies, generally low plasticity silts/clays (even if Clay-size particles are greater than 15 percent) have been found to be liquefiable in a seismic event; the fine grained soils encountered on this site are considered to be low to moderate plastic, and were evaluated as being potentially liquefiable soils.

Site soils encountered below a depth of 20 feet in the geotechnical boring were gravelly/silty sands to silty/clayey soils, that were found to be slightly moist to wet, and based on blow counts and in-situ densities were found to be medium dense to dense or stiff to hard.

Based on our liquefaction analysis considering a design groundwater elevation of 20 feet, a magnitude weighted peak ground acceleration of 0.4, the results indicated that the sandy soils encountered were not potentially liquefiable; however some fine grained layers of silty/clayey soils were found to be potentially liquefiable between 35 and 45 feet below the existing ground surface.

Based on the results of the previous liquefaction analysis, we estimate the amount of total seismically induced settlement possible for the *design* conditions, with the remedial recommendations provided herein, is less than a ¼ of an inch. We estimated these settlements based on the procedures proposed by Tokimatsu and Seed (1987). Based on the above, the estimated differential settlement that should be considered for site development is approximately ¼ of an inch.

During a strong seismic event, seismically induced settlement can occur within loose to moderately dense, dry or saturated granular soil. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Based on blow counts, insitu densities, and our analysis, the potential for dry sand settlement is considered negligible (i.e. less that a tenth of an inch) due to the lack of dry, loose granular soils.

### 2.7.6 Tsunamis and Seiches

Based on the elevation of the proposed development at the site with respect to sea level and its distance from large open bodies of water, the potential of seiche and/or tsunami is considered to be nil.

### 2.8 Slope Stability

No significant permanent slopes currently exist onsite or are planned for the subject site, therefore slope stability is not considered an issue with respect to site development.

### 2.9 <u>Laboratory Testing</u>

Laboratory testing of the onsite soils was performed on representative samples obtained from the borings and included moisture and density tests, maximum density and optimum moisture content, sieve analysis, Atterberg Limits, expansion, direct shear, consolidation, and corrosion testing. Laboratory testing was performed by EGLAB, Inc. (EGL). LGC has reviewed the laboratory test data, procedures and results performed by EGL with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing). A discussion of the tests performed and printout of the laboratory test results are presented in Appendix C. The moisture and density test results are presented on the boring logs in Appendix B.

These results should be confirmed at the completion of site grading.

Expansion potential testing indicated expansion index of 9, "Very Low" (2010 California Building Code, CBC). Sulfate testing indicated soluble sulfate content was 0.182 percent ("Moderate to Severe" ACI 318R-05 Table 4.3.1).

A corrosion suite (pH, resistivity, and chloride content) was performed on a representative sample of the onsite soils. The result for resistivity test was indicated a minimum resistivity value of 470 ohm-centimeters, pH value of 8.19, and chloride content of 280 parts-per-million (ppm). Caltrans defines a corrosive area where any of the following conditions exist: the soil contains more than 500 ppm of chlorides, more than 2,000 ppm (0.2 percent) of sulfates, or a pH of 5.5 or less. Test results are provided in Appendix C.

These results/assumptions should be confirmed at the completion of site grading.

#### 3.0 CONCLUSIONS

Based on the results of our geotechnical evaluation and review, it is our opinion that the proposed site development is feasible from a geotechnical standpoint, provided the following recommendations included in this report are incorporated into the project plans and specifications, and followed during site grading and construction.

Our geotechnical conclusions are as follows:

- The site is <u>not</u> located within an Alquist-Priolo Earthquake Fault Zone (Hart, 1997).
- The site is located within an area deemed to have a potential for liquefaction (CGS, 1998 revised 2001).
- Groundwater was encountered in the geotechnical borings at a depths ranging from approximately 30 to 35 feet and is not anticipated to be a concern for the project.
- Based on the subsurface exploration and our review, the site is underlain by a thin veneer of undocumented artificial fill over alluvium. The undocumented fill and alluvial soils are considered potentially compressible/collapsible in the upper 3 to 7 feet.
- Active or potentially active faults are not known to exist on the site; the closest active fault to the site is the Hollywood fault located approximately 4 miles to the site.
- The magnitude weighted peak horizontal ground acceleration due to a maximum probable earthquake from nearby faults is estimated to be 0.40g.
- Laboratory test results of the onsite soils indicate a Very Low expansion potential.
- Laboratory test results of the onsite soils indicate moderate to severe soluble sulfates and are considered severely corrosive to metals.
- Laboratory test results of the onsite soils indicate a negligible potential of settlement underlying the subterranean levels.
- The onsite soils below recommended remedial grading/excavation depths have a low potential for static settlement (i.e., slightly compressible).
- From a geotechnical perspective, the existing onsite soils are suitable for use as fill, provided they are relatively free from rocks (larger than 6 inches in maximum dimension), construction debris, and organic material.

#### 4.0 RECOMMENDATIONS

## 4.1 Site Earthwork

We anticipate that earthwork at the site will consist of site preparation followed by excavation for subterranean levels followed by construction of slab-on-grade type foundations for the proposed subterranean structure, installation of utilities, subsequently followed by paving/pouring of driveways.

We recommend that earthwork onsite be performed in accordance with the recommendations herein, the City of Los Angeles, and the General Earthwork and Grading Specifications for Rough Grading included in Appendix E. In case of conflict, the recommendations in the following sections shall supersede those included as part of Appendix E.

### 4.1.1 Site Preparation

Prior to grading of areas to receive structural fill or engineered structures, all ground surfaces should be cleared of obstructions, any existing debris and stripped of vegetation. Heavy vegetation and debris should be removed and properly disposed of offsite. All debris from any demolition activities at the site should also be removed and disposed off-site. Holes or depressions resulting from the removal of buried obstructions should be replaced with compacted fill.

Following remedial removals, areas to receive fill should be scarified to a minimum depth of 6 inches, brought to a near-optimum moisture condition, and recompacted to at least 90 percent relative compaction (based on American Standard of Testing and Materials [ASTM] Test Method D1557).

#### 4.1.2 Removal and Recompaction

As discussed in Section 2.2, the upper portion of the site is underlain by potentially compressible unsuitable soils, which may settle under the surcharge of fill and/or foundation loads. Compressible materials not removed by the planned grading should be excavated to competent material (approximately three to seven feet below existing grades) and replaced with compacted fill soils. We anticipate that the design cuts (approximately 10 to 24 feet) for the subterranean level(s) will removal all unsuitable soils; however, localized, deeper removals should be anticipated where deemed necessary by the geotechnical consultant based on observations during grading. Once the excavation is completed to the design bottom, the bottom should be evaluated by the geotechnical consultant, and if deemed suitable, the removal bottom should be scarified and recompacted to a minimum 90 percent relative compaction.

Compressible materials, within areas planned to support pavement or other appurtenant structures outside of the subterranean excavation area, should be excavated to competent material and replaced with compacted fill soils. We anticipate removals on the site to be on the order of approximately three to seven feet below existing grade; however, localized, deeper removals should be anticipated where deemed necessary by the geotechnical consultant based on observations during grading. Removal bottoms should be scarified to a minimum depth of 6 to 12 inches, brought to at least optimum-moisture content, and recompacted.

Based on our site investigation groundwater was encountered at depths ranging from approximately 30 to 35 feet below the original ground surface and is not anticipated to be encountered during most site excavations. However, based on the historic high groundwater level and the conceptual design consisting of up to two levels of subterranean parking, groundwater may be encountered during the deeper portions of subterranean excavations.

Prior to the start of the deeper excavations, exploratory borings should be excavated to help determine the groundwater levels at the time of grading. If at that time the excavation for the foundation for the subterranean parking levels is anticipated to extend below the ground water table, a dewatering system should be obtained from an experienced dewatering consultant, and installed by a qualified dewatering contractor.

If the design foundation level is below the ground water table, the anticipated subgrade soils (i.e. dense sand soils) are likely to be wet to nearly saturated even after dewatering. Construction of a minimum 2-inch thick "mud" (lean concrete) slab may be necessary with the required waterproofing membrane placed above the mud slab prior to foundation construction. At no time should any traffic be allowed by the contractor that causes deflection of the mud slab. The mud slab should be installed to allow for foot and light traffic to allow for construction.

Local conditions such as unsuitable soils or overly-saturated ground may be encountered which will require additional overexcavation beyond the above noted minimum and/or require a rock/gravel blanket with a geotextile to obtain an acceptable subgrade. The actual depths and lateral extents of the excavation should be determined by the geotechnical consultant based on the subsurface conditions encountered during grading. LGC should provide full time geotechnical observation during foundation excavation in order to render clear, quick decisions.

If a dewatering consultant is deemed necessary, they should provide, among other items, recommendations to dewater the site based on the proposed construction methodolgy and construction timeline, and a dewatering system should be installed prior to excavation below the groundwater table.

Dewatering should be limited to the subject site as much as practicable and extend a minimum of 3 feet below the planned bottom excavation and should continue until sufficient building loads have been established to resist hydrostatic uplift forces. The designer of the dewatering system should consider the potential for the excavation bottom to heave as a result of potential onsite artesian pressure. Dewatering of the site should be limited to create as low of a drawdown outside of the limits of the site to reduce the potential of subsidence in the adjacent areas due to increase of effective stress of the soil caused by lowering of the groundwater table.

The dewatering plan should be prepared by a California licensed engineer and reviewed by LGC prior to construction. Agency permits may be required in order to dispose of the collected groundwater. During dewatering, routine monitoring of the excavation bottom (for heave) and off-site improvements (settlement) should be performed. The dewatering consultant should independently evaluate any readily available geotechnical or other relevant data and conduct an additional investigation as considered necessary by them.

From a geotechnical perspective, material that is removed may be placed as fill provided the material is relatively free from rocks (greater than 6 inches in maximum dimension), organic material and construction debris, is moisture-conditioned or dried (as needed) to obtain above-optimum moisture content, and then recompacted prior to additional fill placement or construction.

### 4.1.3 Shrinkage/Bulking

Based on the site soils, bulking is not anticipated at the site. The preliminary estimated shrinkage factors of 10 to 15 percent for the alluvium and undocumented fill may be used for consideration of earthwork calculations. These are preliminary rough estimates which will vary with depth of removal, stripping losses, field conditions at the time of grading, etc. In addition, handling losses are not included in the estimates.

#### 4.1.4 Temporary Excavation Stability

In general, all excavations should be performed in accordance with project plans, specifications, and all Occupational Safety and Health Administration (OSHA) requirements. Excavations should be laid back or shored in accordance with OSHA requirements before personnel or equipment are allowed to enter. Soil conditions should be mapped and frequently checked by a representative of LGC to verify conditions are as anticipated. The contractor shall be responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination with the geotechnical engineer should be maintained to facilitate construction while providing safe excavations. Excavation safety is the responsibility of the contractor.

Temporary excavations for the one to two subterranean levels over five feet should be shored, or cut to a 1H:1V (horizontal, H: vertical, V) slope gradient. Surface water should be diverted away from the exposed cut, and not be allowed to pond on top of the excavations.

#### 4.1.5 Temporary Shoring

The following preliminary geotechnical parameters may be utilized by the shoring consultant for design of the temporary shoring system. Temporary shoring is generally considered to have a service life of two years or less. The geotechnical conditions outside of the perimeter of the proposed structure have not been investigated as part of this report. The recommendations provided herein with regard to shoring of the proposed excavation are based on assumed conditions, extrapolated from the data gathered from this investigation. The shoring designer should independently evaluate the parameters provided, and conduct an additional investigation if they consider necessary.

Prior to construction, the contractor should verify underground clearance of any existing utility lines or structures that must be removed or protected in place during construction, or may conflict with any proposed shoring system. Any tieback anchors and/or soil nails that extend beyond the site property limits will require permission from the adjacent property owner. Special attention will be required to protect existing settlement sensitive improvement in close proximity to the proposed excavation, such as any adjacent structures or streets located along the boundary of the site.

Typical cantilever temporary shoring, where deflection of the shoring will not impact the performance of adjacent structures or streets, may be designed using the active equivalent fluid pressures of 40 pounds per square foot (psf) per foot of depth (or pcf). Braced (i.e. internal bracing -rakers) or tied-back shoring is recommended in areas where the shoring will be located close to existing structures or streets in order to limit shoring defections or required due to the proposed depth of excavation. Braced or tied-back shoring with a level backfill may be designed using an active trapezoidal soil pressure of 24H in pounds per square foot (psf), where H is equal to the depth in feet of the excavation being shored (shape of the trapezoid should be 0.2H, 0.6H, 0.2H). Any building, equipment, or traffic loads located within a 1:1 (horizontal to vertical) projection from the base of the shoring should be added to the applicable lateral earth pressure. A minimum additional uniform lateral pressure of 100 psf for the upper 10 feet should be added to the appropriate lateral earth pressures to account for typical vehicle traffic loading. The proposed shoring should be designed for a maximum shoring deflection of up to 1-inch adjacent to the street (non-surcharged condition) and up to a maximum of 0.5-inches adjacent to existing buildings (surcharged condition).

In addition, the above noted lateral earth pressures for temporary shoring does not include hydrostatic pressures since the current groundwater level was encountered below the anticipated depth of the subterranean structure. Consideration should be given to increasing the provided lateral earth pressures and/or design factors of safety in order to further limit shoring deflections and subsequent potential impacts on adjacent structures and improvements, as necessary.

If temporary gravity grouted tie-backs are used anchors may be designed using a preliminary bond stress of 400 pounds per square foot (psf), and if pressure/post-grouted tieback anchors are used, anchors may be designed using a preliminary bond stress of up to 2,500 pounds per square foot (psf). However, the tieback designer should make an independent evaluation in order to verify the preliminary bond stress is adequate for site conditions. Tieback bond stress should be verified by field testing. Tieback anchors should minimally be designed, constructed, and tested in accordance with the requirements of the Post-Tensioning Institute (PTI). For design purposes, tieback should obtain their load-carrying capacity from the soil behind a plane taken to be 3 horizontal feet from the bottom of the shoring facing and inclined at an angle of 60 degrees measured from the horizontal extending to the top of the excavation. Passive resistance of soldier piles may be assumed to be an equivalent fluid pressure of 350 pcf to a maximum value of 3,500 psf. The passive earth pressure may be increased by 100 percent for isolated piles. Piles with spacing greater than 3 times of pile diameter can be considered as isolated piles. In order to develop the full lateral resistance, firm contact between the soldier pile and undisturbed soils must be assured. For vertical shoring capacity, an allowable skin friction of 500 psf may be used for the portion of pier below the proposed development excavation. End bearing should be neglected. Drilling of shafts for solider piles may require casing or drilling mud to prevent caving.

The components of the shoring system should be designed by a California licensed structural and/or civil engineer specializing in the design of shoring systems. Field pullout testing should

be performed during construction to verify the estimated pullout resistance used in the design and/or post grout tubes should be used to ensure adequate design capacities are obtained. Ultimately, it is the specialty contractor's responsibility to obtain the required pullout capacity, which may require design and/or field modifications.

LGC should review the shoring plans prior to construction to verify that geotechnical recommendations are properly implemented into the project plans

It is highly recommended that a program of documentation and monitoring be devised and put into practice before the onset of any groundwork. The contractor should establish survey points on the shoring, adjacent streets, and neighboring buildings within 100 feet of the excavation perimeter prior to any excavation. These survey points should be used to monitor the movement of the shoring and existing improvements during construction excavation.

The monitoring program should include, but not necessarily be limited to detailed documentation of the existing improvements, buildings and utilities around the excavation, with particular attention to any distress that is already present prior to the start of work.

A licensed surveyor should be retained to establish monuments on the shoring and the surrounding ground prior to excavation. Such monuments should be monitored for horizontal and vertical movement during construction. Results of the monitoring program should be provided immediately to the project structural (shoring) engineer and LGC for review and evaluation.

## 4.1.6 Fill Placement and Compaction

From a geotechnical perspective, the onsite soils are suitable for use as compacted fill, provided they are screened of rocks greater than 6 inches in maximum dimension, organic material, and construction debris. Areas prepared to receive structural fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to at least optimum-moisture content, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557). The optimum lift thickness to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. In general, fill should be placed in uniform lifts generally not exceeding 8 inches in loose thickness. Placement and compaction of fill should be performed in accordance with local grading ordinances under the observation and testing of the geotechnical consultant.

## 4.1.7 <u>Trench Backfill and Compaction</u>

The onsite soils may generally be suitable as trench backfill provided they are screened of rocks and other material over 6 inches in diameter and organic matter. Trench backfill should be compacted in uniform lifts (generally not exceeding 8 inches in compacted thickness) by mechanical means to at least 90 percent relative compaction (per ASTM Test Method D1557).

If trenches are shallow and the use of conventional equipment may result in damage to the utilities; clean sand, having sand equivalent (SE) of 30 or greater, should be used to bed and shade the utilities. Sand backfill should be densified. The densification may be accomplished by jetting or flooding and then tamping to ensure adequate compaction. A

representative from LGC should observe, probe, and test the backfill to verify compliance with the project specifications.

### 4.2 <u>Foundations</u>

#### 4.2.1 General

Preliminary recommendations for foundation design and foundation construction are presented herein. When the structural loads for the proposed structures are known they should be provided to our office to verify the recommendations presented herein.

The following foundation recommendations are provided. The two foundations recommended for the proposed structures are: (1) Conventional foundation; or (2) Mat foundations. For preliminary design purposes a very low to low expansion potential should be considered for design. The as-graded soil conditions should be verified.

The information and recommendations presented in this section are not meant to supersede design by the project structural engineer or civil engineer specializing in the structural design nor impede those recommendations by a corrosion consultant. Should conflict arise, modifications to the foundation design provided herein can be provided.

## 4.2.2 <u>Conventional Foundations</u>

Continuous/Individual footings should have minimum widths of 24 inches for the proposed structure.

Shallow foundations may be designed for a maximum allowable bearing capacity of 2,000 lb/ft<sup>2</sup> (gross), for continuous and spread footings founded in compacted fill or competent native soils. A factor of safety greater than 3 was used in evaluating the above bearing capacity values. This value may be increased by 300 psf for each additional foot of embedment and 100 psf for each additional foot of foundation width to a maximum value of 3,500 psf. An effective plasticity index of 25, for the on-site soils, may be used in the foundation design.

Lateral forces on footings may be resisted by passive earth resistance and friction at the bottom of the footing. Foundations may be designed for a coefficient of friction of 0.35, and a passive earth pressure of 250 lb/ft²/ft. The passive earth pressure incorporates a factor of safety of about 1.5.

All footing excavations should be cut square and level, and should be free of sloughed materials and trash. Subgrade soils should be pre-moistened for the assumed high expansion potential (to be confirmed at the end of grading).

The subgrade should be moisture-conditioned and proof-rolled just prior to construction to provide a firm, relatively unyielding surface, especially if the surface has been loosened by the passage of construction traffic.

Subgrade soils should be pre-saturated to 1.2 times optimum moisture content to a depth of 12 inches for a very low to low expansion potential. The minimum thickness of the floor slabs should be at least 5 inches, and joints should be provided per usual practice.

### 4.2.3 Mat Foundation

A mat foundation can be used for support of the proposed building structure and subterranean parking level(s). An allowable soil bearing pressure of 2,000 psf may be used for the design of the mat slab. The allowable bearing value is for total dead loads and frequently applied live loads and may be increased by one-third for short durations of loading which will include the effect of wind or seismic forces. A coefficient of vertical subgrade reaction, k, of 80 pounds per cubic inch (pci) may be used to evaluate the pressure distribution beneath the mat foundation.

The magnitude of total and differential settlements of the mat foundation will be a function of the structural design and stiffness of the mat. Based on applied structural loads, we estimate that total static settlement will be on the order of an inch at the center of the mat foundation. Post construction differential settlement can be taken as one-half of the maximum estimated settlement

Resistance to lateral loads can be provided by friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 may be used. Frictional resistance along the bottom of the mat foundation should be reduced if a waterproofing membrane is installed. Resistance to lateral loads can be provided by friction acting at the base of foundations and by passive earth pressure. Frictional resistance along the bottom of the mat foundation should be reduced due to the presence of a waterproofing membrane. A coefficient of friction of 0.15 may be used for Paraseal membranes. If a membrane other than Paraseal is desired, LGC should review the material specification in order to provide a coefficient of friction.

### 4.2.4 Foundation Settlement

Based on our current understanding of the project, the results of our site investigation and the recommended remedial grading with shallow foundations embedded into compacted fills or competent native soils, we estimate the post-construction settlement of the site to be less than 1-inch with a differential settlement of approximately of 0.5-inch in 30 feet for shallow foundations. Post-construction settlement should also include the estimated differential seismic settlement up to ½ of an inch.

### 4.3 Lateral Earth Pressures for Subterranean Walls

The following section provides lateral earth pressures for proposed subterranean retaining walls. It is anticipated that site subterranean walls will be constructed directly against temporary shoring or freestanding. If backfill is required, it should meet the project specifications outlined in Section 4.1.6.

Lateral earth pressures are provided as equivalent fluid unit weights, in psf/ft of depth or pcf. These values do not contain an appreciable factor of safety. A soil unit weight of 120 pcf may be assumed for

calculating the actual weight of soil.

If the wall can sufficiently yield to mobilize the full shear strength of the soil, it can be designed for "active" pressure. If the wall cannot yield under the applied load, the shear strength of the soil cannot be mobilized and the earth pressure will be higher. Such walls (basement walls) should be designed for "at-rest" conditions. If a structure moves toward the soils, the resulting resistance developed by the soil is the "passive" resistance. The following lateral pressures for drained and un-drained native soils are presented on Tables 1 and 2. The soil parameters below, assume there is no support provided by the temporary shoring system.

TABLE 1 Lateral Earth Pressures

| Conditions                      | Equivalent Fluid Unit Weight           | (pcf)                             |
|---------------------------------|----------------------------------------|-----------------------------------|
| Conditions                      | Level Backfill (Static)                | Seismic Earth<br>Pressure (pcf) * |
| Active                          | 40                                     | 8                                 |
| At-Rest                         | 60 (Triangular) or 37.5H (Trapezoidal) | 27                                |
| At-Rest                         | 51 (Triangular) or 32H (Trapezoidal)   | 27                                |
| (with Approved Select Backfill) |                                        |                                   |

<sup>\*</sup> This dynamic pressure should be added to the pressures given in Table 1 and considered as an inverted triangular distribution with the resultant acting at 0.6H in relation to the base of the retaining wall footing (where H is the retained height). The aforementioned incremental seismic load was determined in general accordance with the standard of practice in the industry (using the Mononobe-Okabe method for active and Woods method for at-rest) for determining earth pressures as a result of seismic events.

The equivalent fluid pressure values stated above do <u>not</u> include hydrostatic pressures. For designing subterranean walls with a hydrostatic pressure (un-drained) the following lateral earth pressures that include a buoyant and hydrostatic lateral pressure may be used for the portion of the wall in an undrained condition.

Given the location of groundwater encountered during the field investigations (i.e. 30 to 35 feet below existing grade), and the previously documented historic high groundwater depth of 20-feet below the existing grade, and the proposed depth of the bottom parking level(s), a portion of the structure will be located below the historic high groundwater level. Based on the latest design including two subterranean levels and the depth of the historical high groundwater level of 20 feet, the subterranean wall design should including the hydrostatic pressure starting from a depth of 20 feet below the existing grade for evaluating the hydrostatic forces on retaining structures.

TABLE 2
Lateral Earth Pressures (un-drained)

| Conditions | Equivalent Fluid Unit Weight (pcf) |
|------------|------------------------------------|
| Conditions | Level Backfill                     |
| Active     | 90                                 |
| At-Rest    | 100                                |

Surcharge loading effects from any adjacent structures should be evaluated by the structural engineer. Any building or traffic loads located within a 1:1 (horizontal to vertical) projection from the base of the retaining structure should be added to the applicable lateral earth pressure. A minimum additional uniform lateral pressure of 100 psf for the upper 10 feet should be added to the recommended lateral earth pressures to account for typical vehicle traffic loading located within the zone of influence of the proposed retaining structure.

A passive lateral earth pressure of 350 psf per foot to a maximum passive pressure of 3,500 psf may be used. The passive pressure may be increased by one-third due to wind or seismic forces.

## 4.4 Waterproofing

We recommend a waterproofing consultant be retained to determine the most appropriate system, if necessary. The design, installation and observation of the waterproofing system are not the purview of the geotechnical consultant. Adequate waterproofing of subterranean walls should be provided to reduce the potential for ground water seepage below the groundwater table as well as nuisance water issues that may develop above the groundwater table.

## 4.5 <u>Lateral Earth Pressures for Retaining Walls (If Any)</u>

The following lateral earth pressures may be used for the design of any future site retaining walls. Please note that the parameters provided in this section are not applicable to site subterranean walls. Due to the expansive nature of onsite soils, we recommend site retaining walls be backfilled with select soils. Select soils should consist of clean, granular soils (less than 15 percent passing the No. 200 sieve) of very low expansion potential (expansion index 20 or less based on U.B.C. 18-2). The recommended lateral pressures for approved select soils for level or sloping backfill are presented in Table 3.

TABLE 3
Lateral Earth Pressures for Retaining Walls

|            | Equivalent Fluid Weight (pcf) |                              |                                   |  |  |  |  |  |  |  |
|------------|-------------------------------|------------------------------|-----------------------------------|--|--|--|--|--|--|--|
| Conditions | Level Backfill                | 2:1 Backfill Sloping Upwards |                                   |  |  |  |  |  |  |  |
|            |                               |                              | Seismic Earth<br>Pressure (pcf) * |  |  |  |  |  |  |  |
|            | Approved Select Material      | Approved Select Material     |                                   |  |  |  |  |  |  |  |
| Active     | 35                            | 50                           | 8                                 |  |  |  |  |  |  |  |
| At Rest    | 51                            | 80                           | 27                                |  |  |  |  |  |  |  |

<sup>\*</sup> This dynamic pressure should be added to the pressures given in Table 3 and considered as an inverted triangular distribution with the resultant acting at 0.6H in relation to the base of the retaining wall footing (where H is the retained height). The aforementioned incremental seismic load was determined in general accordance with the standard of practice in the industry (using the Mononobe-Okabe method for active and Woods method for at-rest) for determining earth pressures as a result of seismic events.

For design purposes, the recommended equivalent fluid pressure for each case for walls founded above the static ground water and backfilled with approved select soils is provided in Table 3. The equivalent fluid pressure values assume free-draining conditions. If conditions other than those assumed above are anticipated, the equivalent fluid pressure values should be provided on an individual-case basis by the geotechnical engineer. Surcharge loading effects from the adjacent structures should be evaluated by the geotechnical and structural engineers. Retaining wall structures should be provided with appropriate drainage and appropriately waterproofed. The outlet pipe should be sloped to drain to a suitable outlet. Typical wall drainage design is illustrated on Figure 4. It should be noted that the recommended subdrain does not provide protection against seepage through the face of the wall and/or efflorescence. Efflorescence is generally a white crystalline powder (discoloration) that results when water, which contains soluble salts, migrates over a period of time through the face of a retaining wall and evaporates. If such seepage or efflorescence is undesirable, retaining walls should be waterproofed to reduce this potential.

For sliding resistance, a friction coefficient of 0.35 may be used at the concrete and soil interface. Wall footings should be designed in accordance with structural considerations. Refer to Sections 4.3 and 4.6 for passive resistance and allowable soil bearing, respectively.

## 4.6 Soil Bearing

Any at-grade minor improvements, such retaining and free-standing walls, trash enclosures, etc. may be supported on spread footings provided that the earthwork recommendations outlined in this report are properly implemented. An allowable soil bearing pressure of 1,500 psf may be used for the design of footings placed in compacted fill or suitable native soils having a minimum width of 12 inches and minimum embedment of 18 inches below lowest adjacent ground surface. This value may be increased by 300 psf for each additional foot of embedment and 100 psf for each additional foot of foundation width to a maximum value of 3,500 psf. These allowable bearing pressures are applicable for level (ground slope equal to or flatter than 5H:1V) conditions only.

Bearing values indicated above are for total dead loads and frequently applied live loads. The above vertical bearing may be increased by one-third for short durations of loading which will include the effect of wind or seismic forces.

#### 4.7 Preliminary Pavement Recommendations

Based on an R-value of 25, we recommend the following preliminary minimum street sections for Traffic Indices of 5, 6, and 7 (Table 4). These recommendations should be confirmed with R-value testing of representative near-surface soils at the completion of grading. Final street sections should be confirmed by the project civil engineer based upon the projected Traffic Index. In addition, additional sections can be provided based on other traffic indices.

<u>Table 4</u> <u>Preliminary Pavement Design Sections</u>

| <b>Assumed Traffic Index</b> | 5          | 6          | 7           |
|------------------------------|------------|------------|-------------|
| R-Value Subgrade             | 25         | 25         | 25          |
| AC Thickness                 | 3.0 inches | 3.5 inches | 4.0 inches  |
| Base Thickness               | 6.0 inches | 8.0 inches | 10.5 inches |

Portland Cement Concrete Pavement (PCCP) may be designed using a minimum of 6-inches of Portland cement concrete over 8-inches of compacted aggregate base. The modulus of rupture of the concrete should be a minimum of 500 pounds per square inch (psi) at 28 days. Contraction joints should be placed at maximum 15-foot spacing. Where the outer edge of a concrete pavement connects to an asphalt pavement, the concrete slab should be thickened by 50 percent at a taper not to exceed a slope of 1 in 10. This section is only applicable for passenger car driveway areas and should be thickened if heavy truck loading is anticipated. In addition, additional sections can be provided based on other desired anticipated traffic loadings.

Aggregate base should conform to the requirements of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook"). Aggregate base should be compacted to a minimum of 95 percent relative compaction over subgrade compacted to a minimum of 90 percent relative compaction per ASTM- D1557.

## 4.8 Corrosivity to Concrete and Metal

The National Association of Corrosion Engineers (NACE) defines corrosion as "a deterioration of a substance or its properties because of a reaction with its environment." From a geotechnical viewpoint, the "environment" is the prevailing foundation soils and the "substances" are the reinforced concrete foundations or various buried metallic elements such as rebar, piles, pipes, etc., which are in direct contact with or within close vicinity of the foundation soil.

In general, soil environments that are detrimental to concrete have high concentrations of soluble sulfates and/or pH values of less than 5.5. ACI 318R-05 Table 4.3.1, provides specific guidelines for the concrete mix design when the soluble sulfate content of the soils exceeds 0.1 percent by weight or 1,000 ppm. The minimum amount of chloride ions in the soil environment that are corrosive to steel, either in the form of reinforcement protected by concrete cover, or plain steel substructures such as steel pipes or piles, is 500 ppm per California Test 532.

Based on site soil testing, the onsite soils are classified as having a <u>moderate to severe</u> sulfate exposure condition in accordance with ACI 318R-05 Table 4.3.1. As a preliminary recommendation due to results of sulfate content testing, concrete in contact with onsite soils should be designed in accordance with ACI 318R-05 Table 4.3.1 for the negligible category. It is also our opinion that onsite soils should be considered <u>severely corrosive</u> to buried metals. The client and/or other members of the design team should consider this potential as they determine necessary. LGC is not a corrosion consultant and does not provide recommendations related to corrosion.

#### 4.9 Nonstructural Concrete Flatwork

Concrete flatwork (such as walkways, bicycle trails, etc.) have a high potential for cracking due to changes in soil volume related to soil-moisture fluctuations because these slabs are typically much thinner than foundation slabs and are not reinforced with the same dynamic as foundation elements. To reduce the potential for excessive cracking and lifting, concrete should be designed in accordance with the minimum guidelines outlined in Table 5. These guidelines will reduce the potential for irregular cracking and promote cracking along construction joints, but will not eliminate all cracking or lifting. Thickening the concrete and/or adding additional reinforcement will further reduce cosmetic distress.

TABLE 5 Nonstructural Concrete Flatwork

|                 | Homeowner            |                    |                    | City Sidewalk    |
|-----------------|----------------------|--------------------|--------------------|------------------|
|                 | Sidewalks            | Private Drives     | Patios/Entryways   | Curb and Gutters |
| Minimum         |                      |                    |                    | City/Agency      |
| Thickness (in.) | 4 (nominal)          | 4 (full)           | 4 (full)           | Standard         |
|                 | Wet down             | Presoak to 12      | Presoak to 12      | City/Agency      |
| Presaturation   |                      | inches             | inches             | Standard         |
|                 |                      | No. 3 at 24 inches | No. 3 at 24 inches | City/Agency      |
| Reinforcement   | _                    | on centers         | on centers         | Standard         |
|                 |                      |                    |                    | City/Agency      |
| Thickened Edge  | _                    | 8" x 8"            | _                  | Standard         |
|                 | Saw cut or deep tool | Saw cut or deep    | Saw cut or deep    |                  |
|                 | joint to a minimum   | tool joint to a    | tool joint to a    |                  |
| Crack Control   | of 1/3 the concrete  | minimum of 1/3 the | minimum of 1/3 the | City/Agency      |
|                 | thickness            | concrete thickness | concrete thickness | Standard         |
|                 |                      | 10 feet or quarter |                    |                  |
| Maximum Joint   | 5 feet               | cut whichever is   | 6 feet             | City/Agency      |
| Spacing         |                      | closer             |                    | Standard         |
|                 |                      |                    |                    | City/Agency      |
| Aggregate Base  | _                    |                    | _                  | Standard         |

## 4.10 <u>Control of Surface Water and Drainage Control</u>

Positive drainage of surface water away from structures is very important. No water should be allowed to pond adjacent to buildings. Positive drainage may be accomplished by providing drainage away from buildings at a gradient of at least 2 percent for a distance of at least 5 feet, and further maintained by a swale or drainage path at a gradient of at least 1 percent. Where necessary, drainage paths may be shortened by use of area drains and collector pipes.

Planters with open bottoms adjacent to buildings should be avoided. Planters should not be designed adjacent to buildings unless provisions for drainage, such as catch basins, liners, and/or area drains, are made. Overwatering must be avoided.

# 4.11 <u>Construction Observation and Testing</u>

The recommendations provided in this report are based on limited subsurface observations and geotechnical analysis. The interpolated subsurface conditions should be checked in the field during construction by a representative of LGC.

Geotechnical observation and testing should be performed by the geotechnical consultant during subterranean excavation layback or shoring installation (by a city of Los Angeles deputy inspector), subgrade for slab/foundation, subterranean retaining wall construction, backfill of utility trenches, preparation of any subgrade and placement of aggregate base, or when any unusual soil conditions are

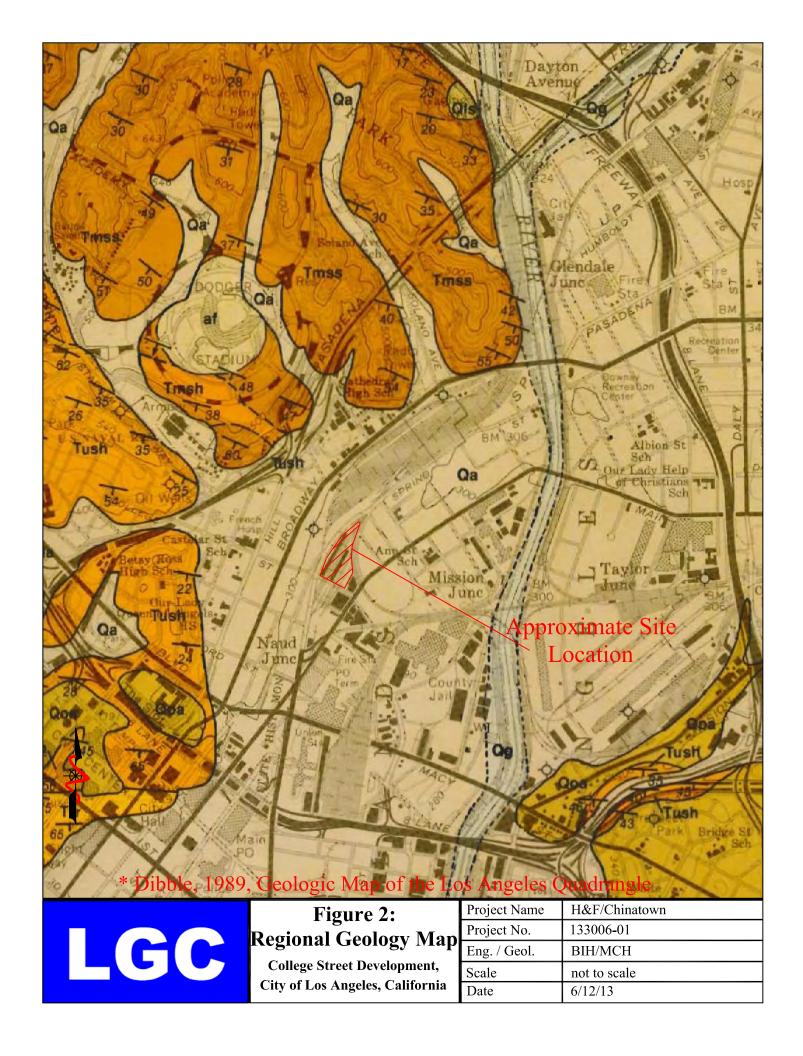
#### 5.0 LIMITATIONS

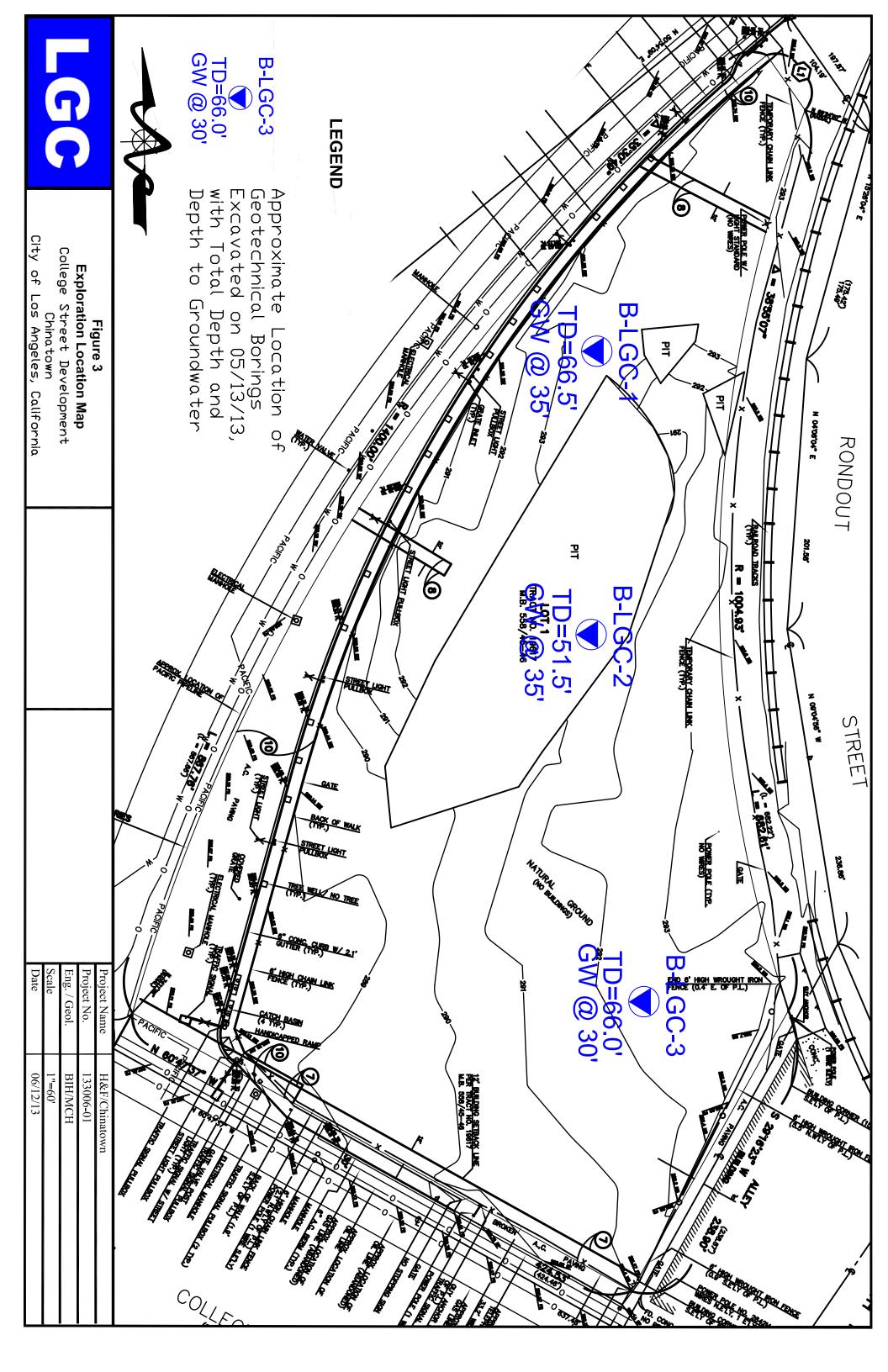
Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report. The samples taken and submitted for laboratory testing, the observations made and the in-situ field testing performed are believed representative of the entire project; however, soil and geologic conditions revealed by excavation may be different than our preliminary findings. If this occurs, the changed conditions must be evaluated by the project soils engineer and geologist and design(s) adjusted as required or alternate design(s) recommended.

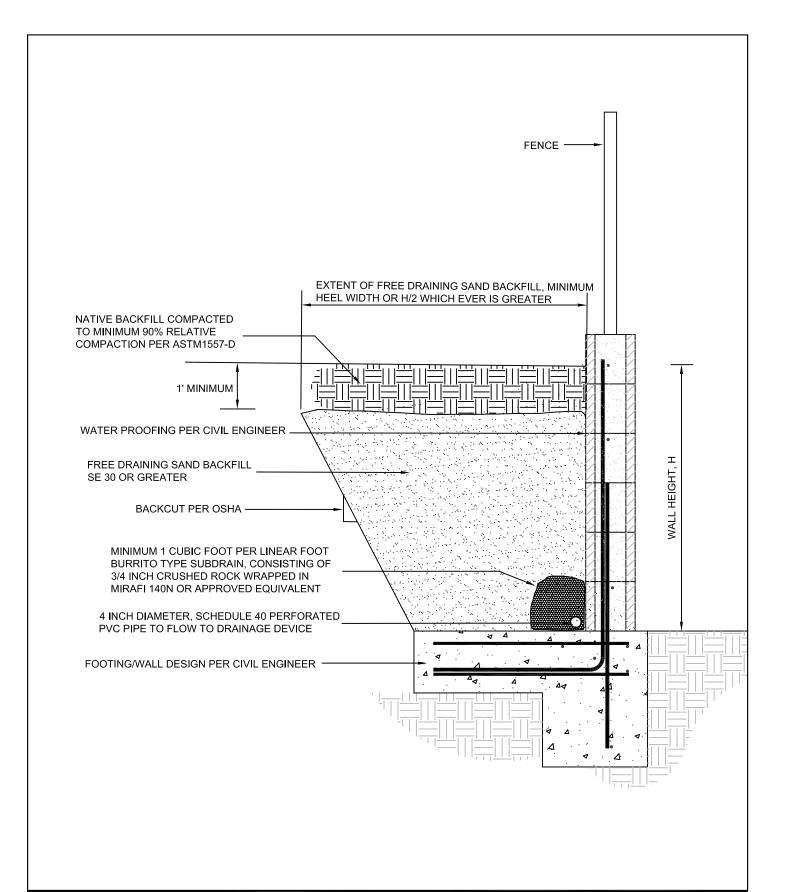
This report is issued with the understanding that it is the responsibility of the owner, or of his/her representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and/or project engineer and incorporated into the plans, and the necessary steps are taken to see that the contractor and/or subcontractor properly implements the recommendations in the field. The contractor and/or subcontractor should notify the owner if they consider any of the recommendations presented herein to be unsafe.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can and do occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties.

In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control.







LGC

Figure 4: Retaining Wall Detail, Sand Backfill

| Project Name | H&F/Chinatown |
|--------------|---------------|
| Project No.  | 133006-01     |
| Eng. / Geol. | BIH/MCH       |
| Scale        | N/A           |
| Date         | 6/12/13       |

#### APPENDIX A

#### **References**

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#### APPENDIX A

### <u>References</u> (cont.)

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# APPENDIX B

# **Boring Logs**

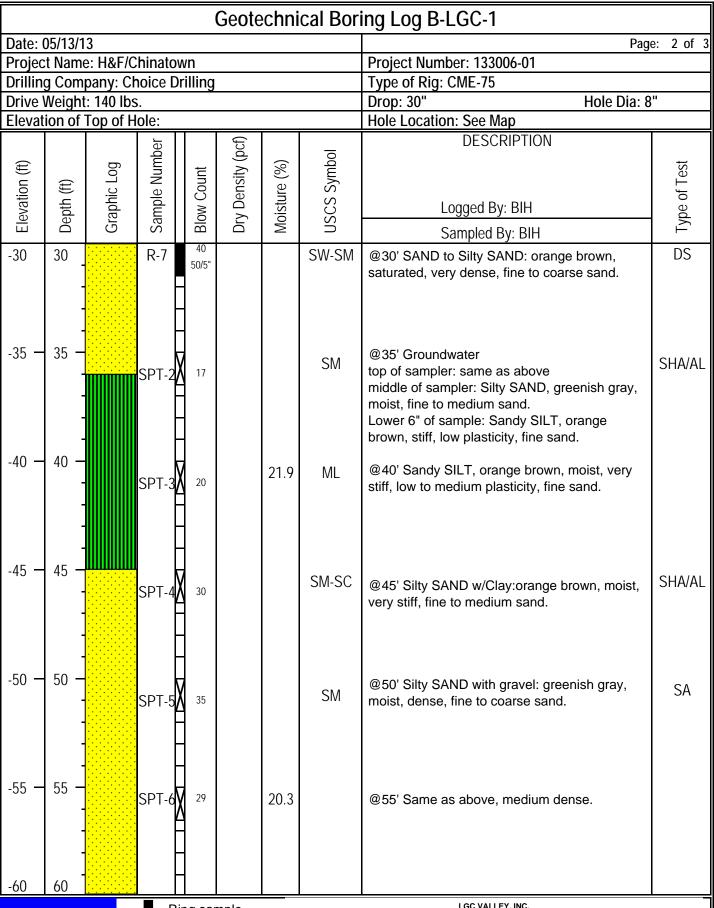
| Geotechnical Boring Log B-LGC-1 |             |               |             |                   |              |                           |                                                                                                                                                  |              |  |  |  |
|---------------------------------|-------------|---------------|-------------|-------------------|--------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|--|--|
| Date: 05/13                     | 3/13        |               |             |                   |              |                           | Page: 1 of 3                                                                                                                                     |              |  |  |  |
| Project Na                      | me: H&F/0   | Chinato       | wn          |                   |              | Project Number: 133006-01 |                                                                                                                                                  |              |  |  |  |
| Drilling Co                     | mpany: C    | hoice [       | rilling     |                   |              | Type of Rig: CME-75       |                                                                                                                                                  |              |  |  |  |
| Drive Weig                      |             |               |             |                   |              |                           | Drop: 30" Hole Dia: 8                                                                                                                            | 11           |  |  |  |
| Elevation of                    | of Top of F | lole:         |             |                   |              |                           | Hole Location: See Map                                                                                                                           |              |  |  |  |
| Elevation (ft) Depth (ft)       | Graphic Log | Sample Number | Blow Count  | Dry Density (pcf) | Moisture (%) | USCS Symbol               | DESCRIPTION  Logged By: BIH                                                                                                                      | Type of Test |  |  |  |
|                                 |             | . 0,          | ×           |                   |              |                           | Sampled By: BIH                                                                                                                                  |              |  |  |  |
| 0 0                             |             | Bag-1         |             |                   |              | SM                        | Artificial Fill (Afu) @0': Gravel Silty SAND with Gravel: brown, dry to slightly moist, fine to medium sand.                                     |              |  |  |  |
| -5 - 5                          |             | R-1           | 29          |                   |              |                           | @ 5' Silty SAND with Gravel: brown, dry to slightly moist, medium dense, fine to medium sand, no visible pores.  @6.5' Quaternary Alluvium (Qal) |              |  |  |  |
| -10 — 10                        |             | R-2           | 50/4"       |                   |              | SW/SM                     | @ 10' SAND to Silty SAND: yellowish brown, dry to slightly moist, very dense; fine to medium sand, no visible pores.                             |              |  |  |  |
|                                 | -           | R-3           | 50/5"       | 121.3             | 1.2          |                           | @ 12.5' Same as above, dry.                                                                                                                      |              |  |  |  |
| -15 — 15                        |             | R-4           | 50/5"       | 124.0             | 1.1          |                           | @ 15' SAND to Silty SAND, with gravel: yellowish orange brown, dry, Very dense, fine to coarse grained sand.                                     |              |  |  |  |
|                                 |             | R-5           | 25<br>50/5" | 130.3             | 3.2          |                           | @ 17.5' Same as above.                                                                                                                           | SA           |  |  |  |
| -20 — 20                        |             | R-6           | 50/5"       | 105.9             | 3.4          |                           | @20' Same as above.                                                                                                                              | CON          |  |  |  |
| -25 — 25                        |             | SPT-1         | 43          |                   |              |                           | @25' Same as above, dense.                                                                                                                       |              |  |  |  |
| -30 30                          |             |               |             |                   |              |                           |                                                                                                                                                  |              |  |  |  |
|                                 |             |               | ing sa      |                   | TH           | HIS SUMMARY A             | <b>LGC VALLEY, INC.</b> PPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DR                                                         | ILLING.      |  |  |  |

LGC

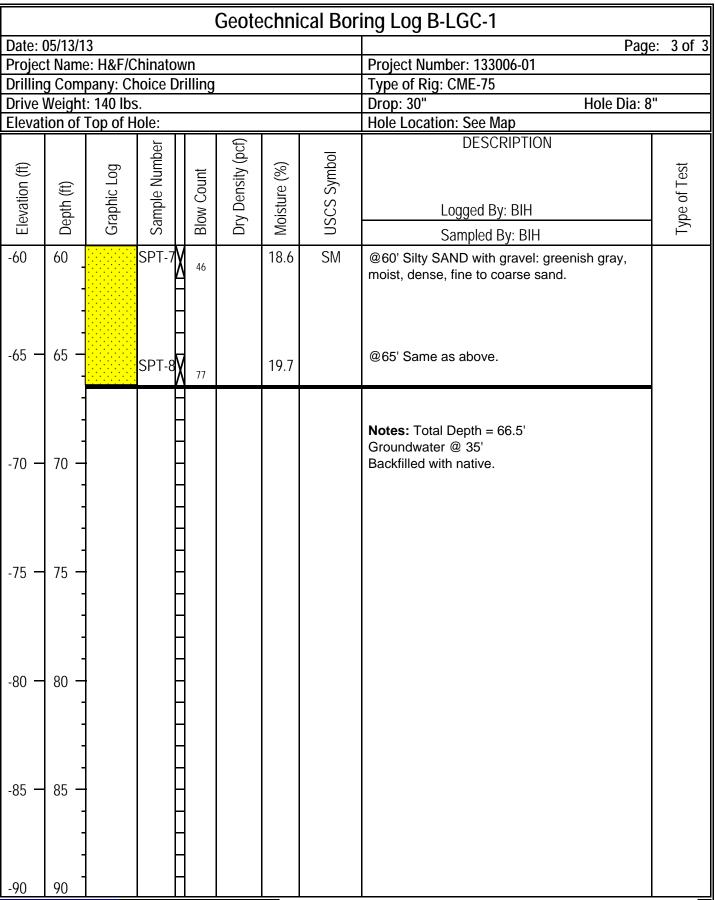
■ = Ring sample

☑ = SPT sample

BULK = Bulk sample



= Ring sample BULK = Bulk sample LGC VALLEY, INC.



|                                   | Geotechnical Boring Log B-LGC-2 |                      |               |                  |                   |              |                           |                                                                                                                                                    |                  |  |  |  |
|-----------------------------------|---------------------------------|----------------------|---------------|------------------|-------------------|--------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--|--|--|
| Date: (                           | 05/13/1                         | 3                    |               |                  |                   |              | Page: 1 of 2              |                                                                                                                                                    |                  |  |  |  |
| Projec                            | t Name                          | e: <b>H&amp;F/</b> C | hinato        | wn               |                   |              | Project Number: 133006-01 |                                                                                                                                                    |                  |  |  |  |
| Drilling Company: Choice Drilling |                                 |                      |               |                  |                   |              |                           | Type of Rig: CME-75                                                                                                                                |                  |  |  |  |
|                                   |                                 | : 140 lbs            |               |                  |                   |              |                           | Drop: 30" Hole Dia: 8                                                                                                                              |                  |  |  |  |
|                                   |                                 | Top of H             |               |                  |                   |              |                           | Hole Location: See Map                                                                                                                             |                  |  |  |  |
|                                   |                                 |                      | er            |                  | cf)               |              |                           | DESCRIPTION                                                                                                                                        |                  |  |  |  |
| Elevation (ft)                    | Depth (ft)                      | Graphic Log          | Sample Number | Blow Count       | Dry Density (pcf) | Moisture (%) | USCS Symbol               | Logged By: BIH                                                                                                                                     | Type of Test     |  |  |  |
| Ele                               | De                              | Grä                  | Sal           | Blc              |                   | Mo           | SN                        | Sampled By: BIH                                                                                                                                    | Ty               |  |  |  |
| 0                                 | 0                               |                      |               |                  |                   |              |                           | ·                                                                                                                                                  |                  |  |  |  |
| O                                 | -<br>-<br>-                     |                      |               |                  |                   |              | SM                        | Artificial Fill (Afu) @0': Gravel Silty SAND with Gravel: brown, dry to slightly moist, fine to medium sand.                                       |                  |  |  |  |
| -5 <b>-</b>                       | 5                               |                      | R-1           | 13               |                   |              |                           | @ 5' Silty SAND with Gravel and rocks: brown, dry to slightly moist, loose, fine to medium sand.  @6.5' Quaternary Alluvium (Qal)                  | DS               |  |  |  |
| -10 —                             | 10 <del>-</del>                 |                      | R-2           | 42               | 104.8             | 2.7          | SW-SM                     | @ 10' SAND to Silty SAND with gravel: yellowish brown, dry, medium dense; fine to medium sand, no visible pores.                                   | COR<br>AL<br>MAX |  |  |  |
|                                   | -                               |                      | Bag-1         | Ø                |                   |              |                           |                                                                                                                                                    | DS               |  |  |  |
| -15 —                             | 15 <del>-</del>                 |                      | R-3           | 31               |                   |              |                           | @ 15' Same as above.                                                                                                                               | El               |  |  |  |
| -20 —                             | 20 <del>-</del><br>-<br>-       |                      | R-4           | 50/5"            | 120.5             | 3.4          | GW-GM                     | @ 20' Gravel to Silty Gravel with Sand: yellowish brown, dry, very dense, fine to medium grained sand, well graded                                 | SA               |  |  |  |
| -25 —                             | 25 <del>-</del><br>-<br>-       |                      | R-5           | 50/6"            | 110.8             | 11.7         |                           | @25' Sandy CLAY layer in upper portion of sampler. orange brown, low plasticity, fine sand. Lower portion Same as at 20'.                          | CON              |  |  |  |
| -30                               | 30                              |                      |               |                  |                   |              |                           |                                                                                                                                                    |                  |  |  |  |
|                                   | C                               |                      |               | ing sa<br>PT sar |                   | TH           | HIS SUMMARY A             | LGC VALLEY, INC.  PPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DR DITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LO | ILLING.          |  |  |  |

■ = Ring sample

■ = SPT sample

BULK = Bulk sample

|                | Geotechnical Boring Log B-LGC-2 |             |               |             |                   |              |                           |                                                                                                                                                                              |              |  |  |  |
|----------------|---------------------------------|-------------|---------------|-------------|-------------------|--------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|--|--|
| Date: 0        | 5/13/1                          | 3           |               |             |                   |              |                           | Page: 2 of 2                                                                                                                                                                 |              |  |  |  |
| Project        | Name                            | e: H&F/C    | hinatov       | vn          |                   |              | Project Number: 133006-01 |                                                                                                                                                                              |              |  |  |  |
|                |                                 | pany: Ch    |               | rilling     |                   |              | Type of Rig: CME-75       |                                                                                                                                                                              |              |  |  |  |
|                |                                 | : 140 lbs   |               |             |                   |              |                           | Drop: 30" Hole Dia: 8                                                                                                                                                        | "            |  |  |  |
| Elevation      | on of                           | Top of H    | ole:          |             | _                 |              |                           | Hole Location: See Map                                                                                                                                                       |              |  |  |  |
| Elevation (ft) | Depth (ft)                      | Graphic Log | Sample Number | Blow Count  | Dry Density (pcf) | Moisture (%) | USCS Symbol               | DESCRIPTION  Logged By: BIH                                                                                                                                                  | Type of Test |  |  |  |
|                |                                 | <u></u>     |               | Ш           |                   |              | _                         | Sampled By: BIH                                                                                                                                                              |              |  |  |  |
|                | 30                              |             | R-6           | 28<br>50/5" | 101.5             | 27.3         | SM                        | @30' top and bottom of sampler Silty SAND: orange brown, saturated, very dense, fine to coarse sand. middle of sampler: Sandy CLAY: orange brown, low plasticity, fine sand. |              |  |  |  |
| -35 —          | 35 <del>-</del>                 |             | SPT-1         | 32          |                   |              |                           | @35' Groundwater Same as above, greenish gray Silty SAND and Sandy CLAY.                                                                                                     | SHA          |  |  |  |
| -40 <b>—</b>   | 40 -                            |             | SPT-2         | 18          |                   | 23.3         | CL                        | @40' Silty CLAY with Sand, greenish gray, moist, medium stiff, low to medium plasticity, fine to coarse sand.                                                                | SHA          |  |  |  |
| -45 <b>—</b>   | 45 <del>-</del>                 |             | SPT-3         | 54          |                   | 17.7         | SW-SM                     | @45' upper 10" of sampler same as above.<br>Lower portion: SAND to Silty SAND: greenish<br>gray, moist, dense, fine to coarse sand.                                          |              |  |  |  |
| -50 —          | 50 <del>-</del>                 |             | SPT-4         | 45          |                   |              |                           | @50' Same as above, medium dense.                                                                                                                                            | SA           |  |  |  |
| -55 —          | 55 —<br>-                       |             |               |             |                   |              |                           | Notes: Total Depth = 51.5' Groundwater @ 35'. Backfilled with native.                                                                                                        |              |  |  |  |
| -60            | 60                              |             | ■= Ri         | ng sai      | mple              |              |                           | LGC VALLEY, INC.                                                                                                                                                             |              |  |  |  |

■ = Ring sample
□ = SPT sample
BULK = Bulk sample

|                                   | Geotechnical Boring Log B-LGC-3     |                      |               |                  |                   |              |                           |                                                                                                                                                                                                 |              |  |  |
|-----------------------------------|-------------------------------------|----------------------|---------------|------------------|-------------------|--------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|--|
| Date:                             | 05/13/1                             | 3                    |               |                  |                   |              | Page: 1 of 3              |                                                                                                                                                                                                 |              |  |  |
| Projec                            | t Name                              | e: <b>H&amp;F/</b> C | hinato        | wn               |                   |              | Project Number: 133006-01 |                                                                                                                                                                                                 |              |  |  |
| Drilling Company: Choice Drilling |                                     |                      |               |                  |                   |              |                           | Type of Rig: CME-75                                                                                                                                                                             |              |  |  |
| Drive '                           | Weight                              | t: 140 lbs           | S             |                  |                   |              |                           | Drop: 30" Hole Dia: 8                                                                                                                                                                           | "            |  |  |
| Elevat                            | ion of                              | Top of H             | lole:         |                  |                   |              |                           | Hole Location: See Map                                                                                                                                                                          |              |  |  |
| Elevation (ft)                    | Depth (ft)                          | Graphic Log          | Sample Number | Blow Count       | Ory Density (pcf) | Moisture (%) | USCS Symbol               | DESCRIPTION  Logged By: BIH                                                                                                                                                                     | Type of Test |  |  |
|                                   |                                     |                      | 0,            | <del>  "</del>   |                   |              |                           | Sampled By: BIH                                                                                                                                                                                 |              |  |  |
| 0                                 | 0 -                                 |                      | Bag-1         |                  |                   |              | SM                        | Artificial Fill (Afu) @0': Gravel over 1 to 2 inches of AC                                                                                                                                      |              |  |  |
| -5 <b>–</b>                       | -<br>  -                            |                      | R-1           | 35               |                   |              |                           | @2.5' Silty SAND with Gravel: brown, dry to slightly moist, medium dense, fine to medium sand.                                                                                                  |              |  |  |
| -5 —                              | 5 <del>-</del><br>-<br>-            |                      | R-2           | 39               | 10/0              |              | SW-SM                     | @ 5' upper sample Same as above.  @5.5' Quaternary Alluvium (Qal)  SAND to Silty SAND with Gravel: yellowish brown, dry, medium dense, fine to medium sand.                                     | DS           |  |  |
| -10 —                             | 10 <del>-</del><br>-                |                      | R-3<br>R-4    | 90               | 106.0             | 2.6          |                           | <ul> <li>@7.5' Same as lower portion of sample above.</li> <li>@ 10' SAND to Silty SAND with gravel: yellowish/orange brown, dry, very dense; fine to medium sand, no visible pores.</li> </ul> | CON          |  |  |
| -15 <b>—</b>                      | -<br>-<br>15 <del>-</del><br>-<br>- |                      | R-5           | 63               |                   |              | SW                        | @ 15' SAND with gravel: yellowish/orange brown, dry, dense; fine to medium sand, no visible pores.                                                                                              | SA           |  |  |
| -20 —                             | 20 <del>-</del>                     |                      | SPT-1         | 30 50/4"         |                   |              |                           |                                                                                                                                                                                                 |              |  |  |
| -25 —                             | -<br>25 <del>-</del><br>-<br>-<br>- |                      | R-6           | 28<br>50/4"      |                   |              | SW                        | <ul><li>@ 20' Same as above, very dense.</li><li>@25' Sandy CLAY layer in upper portion of sampler. reddish/orange brown, low plasticity,</li></ul>                                             | DS           |  |  |
| -30                               | 30                                  |                      | -             | -                |                   |              |                           | fine sand.  Lower portion Same as at 20'. reddish/orange                                                                                                                                        |              |  |  |
| -30                               | JU                                  |                      | <b>I</b> ~:   | <u> </u>         |                   | <u> </u>     | <u> </u>                  | LGC VALLEY, INC.                                                                                                                                                                                | <del></del>  |  |  |
|                                   | 6                                   |                      | ■ = RI        | ng sai<br>PT sar |                   |              |                           | PPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DR<br>DITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LO                                                             |              |  |  |

LGC

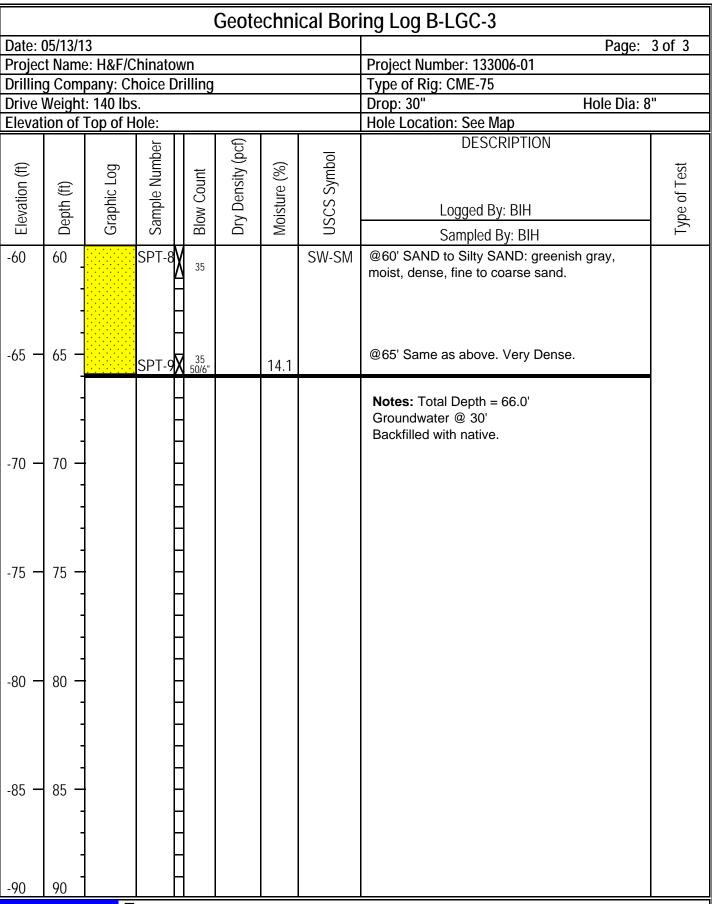
■ = Ring sample

□ = SPT sample

BULK = Bulk sample

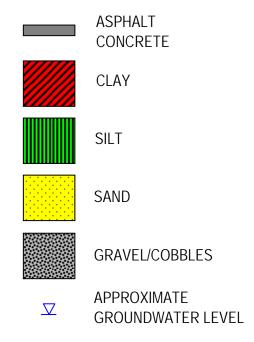
|                             | Geotechnical Boring Log B-LGC-3 |             |               |             |                   |              |              |                                                                                                           |              |  |  |  |
|-----------------------------|---------------------------------|-------------|---------------|-------------|-------------------|--------------|--------------|-----------------------------------------------------------------------------------------------------------|--------------|--|--|--|
| Date: 0                     | 5/13/1                          | 3           |               |             |                   |              | Page: 2 of 3 |                                                                                                           |              |  |  |  |
| Project Name: H&F/Chinatown |                                 |             |               |             |                   |              |              | Project Number: 133006-01                                                                                 |              |  |  |  |
|                             |                                 | pany: Cł    |               | rilling     |                   |              |              | Type of Rig: CME-75                                                                                       |              |  |  |  |
|                             |                                 | : 140 lbs   |               |             |                   |              |              | Drop: 30" Hole Dia: 8                                                                                     | 3"           |  |  |  |
| Elevati                     | on of                           | Top of H    | ole:          | 1 1         |                   | 1            |              | Hole Location: See Map                                                                                    |              |  |  |  |
| Elevation (ft)              | Depth (ft)                      | Graphic Log | Sample Number | Blow Count  | Dry Density (pcf) | Moisture (%) | USCS Symbol  | DESCRIPTION  Logged By: BIH                                                                               | Type of Test |  |  |  |
|                             |                                 | 0           |               | В           |                   | 2            | 1            | Sampled By: BIH                                                                                           | <u> </u>     |  |  |  |
| -30                         | 30                              |             | SPT-2         | 27          |                   |              | SW-SM        | @30' Groundwater<br>SAND to Silty SAND: orange brown,<br>saturated, medium dense, fine to coarse<br>sand. |              |  |  |  |
| -35 —                       | 35 -                            |             | SPT-3         | 17          |                   | 26.8         | ML           | @35' Clayey SILT with Sand, greenish gray, moist, very stiff, medium plasticity, fine sand.               | SHA/AL       |  |  |  |
| -40 —                       | 40 -                            |             | SPT-4         | 20          |                   |              |              | @40' Same as above, more sand, low plasticity.                                                            | SHA/AL       |  |  |  |
| -45 <b>—</b>                | 45                              |             | SPT-5         | 43          |                   | 18.6         | SW-SM        | @45' SAND to Silty SAND: greenish gray, moist to saturated, dense, fine to coarse sand.                   | SA           |  |  |  |
| -50 —                       | 50 -                            |             | SPT-6         | 27<br>50/5" |                   |              |              | @50' Same as above, very desne.                                                                           |              |  |  |  |
| -55 —                       | 55 -                            |             | SPT-7         | 28<br>50/6" |                   | 13.7         |              | @55' Same as above, very dense.                                                                           |              |  |  |  |
| -60                         | 60                              |             | ■ = Ri        | ng sar      | mple              |              |              | LGC VALLEY, INC.                                                                                          |              |  |  |  |

■ = Ring sample
□ = SPT sample
BULK = Bulk sample





# **Key to Boring Logs**



# **Laboratory Test Symbols**

| Symbol | Laboratory Test                                      |  |  |  |  |  |
|--------|------------------------------------------------------|--|--|--|--|--|
| SA     | Sieve Analysis                                       |  |  |  |  |  |
| Н      | Hydrometer Analysis                                  |  |  |  |  |  |
| SHA    | Sieve & Hydrometer Analysis                          |  |  |  |  |  |
| -200   | Percent Passing #200 Sieve                           |  |  |  |  |  |
| AL     | Atterberg Limits                                     |  |  |  |  |  |
| MAX    | Maximum Density                                      |  |  |  |  |  |
| DS     | Undisturbed Direct Shear                             |  |  |  |  |  |
| RDS    | Remolded Direct Shear                                |  |  |  |  |  |
| TRI    | Triaxial Shear                                       |  |  |  |  |  |
| El     | Expansion Index                                      |  |  |  |  |  |
| Р      | Permeability                                         |  |  |  |  |  |
| CN     | Consolidation                                        |  |  |  |  |  |
| COL    | Collapse                                             |  |  |  |  |  |
| UC     | Unconfined Compression                               |  |  |  |  |  |
| S      | Sulfate Content                                      |  |  |  |  |  |
| pHR    | pH & Resistivity                                     |  |  |  |  |  |
| COR    | Corrosion Suite (pH, Resistivity, Chloride, Sulfate) |  |  |  |  |  |
| RV     | R-Value                                              |  |  |  |  |  |

#### APPENDIX C

#### Laboratory Testing Results by EGLAB, Inc.

Laboratory testing was performed by Environmental Geotechnology Laboratory, Inc. The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and the results are presented on the following pages.

LGC has reviewed the laboratory test data, procedures and results performed by Environmental Geotechnology Laboratory, Inc. (EGL) with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve. The portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D422 (CTM 202).

<u>Atterberg Limits</u>: The liquid and plastic limits ("Atterberg Limits") were determined in accordance with ASTM Test Method D4318 for engineering classification of fine-grained material.

<u>Soil Classification:</u> Soils were classified according the Unified Soil Classification System (USCS) in accordance with ASTM Test Methods D2487 and D2488. This system uses relies on the Atterberg Limits and grain size distribution of a soil. The soil classifications (or group symbol) are shown on the laboratory test data, and boring logs.

Expansion Index: The expansion potential of selected samples were evaluated by the Expansion Index Test, U.B.C. Standard No. 18-2 and/or ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557.

<u>Direct Shear</u>: Direct shear tests were performed, in accordance with ASTM D3080, on selected remolded and/or undisturbed samples, which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately 1 hour prior to application of shearing force. The samples were tested under various normal loads, a motor-driven, strain-controlled, direct-shear testing apparatus at a strain rate of less than 0.001 to 0.5 inch per minute (depending upon the soil type).

<u>Consolidation</u>: Consolidation tests were performed on selected, relatively undisturbed ring samples (Modified ASTM Test Method D2435). Samples (2.42 inches in diameter and 1 inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under "double drainage" and total deformation for each loading step was recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height.

Corrosion Testing: Chloride content was tested in accordance with Caltrans Test Method (CTM) 422. The soluble sulfate contents of selected samples were determined by standard geotechnical methods (CTM 417). The soluble sulfate content is used to determine the appropriate cement type and maximum watercement ratios. The test results are presented in the table below: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. As a results of soil's resistivity decreases corrosivity increases.

## EGLAB, INC.,

11819 Goldring Road, Unit D, Arcadia, CA 91006 Ph: 626-263-3588; Fax: 626-263-3599; Email: ryan@eglab.com

June 10, 2013

LGC Valley, Inc. 28532 Constellation Rd. Valencia, CA 91355

Attn: Mr. Basil Hattar

RE: LABORATORY TEST RESULTS/REPORT

Project Name: H & F / Chinatown

Project No.: 133006-01 EGL Job No. 13-059-006

Dear Mr. Hattar:

We have completed the testing program conducted on samples from the above project. The tests were performed in accordance with testing procedures as follows:

| TEST                   | METHOD           |
|------------------------|------------------|
| Moisture Content       | ASTM D2116       |
| Moisture & Dry Density | ASTM D2937       |
| Grain Size Analysis    | ASTM D422        |
| Sieve & Hydrometer     | ASTM D422        |
| Atterberg Limits       | ASTM D4318       |
| Expansion Index        | ASTM D4829       |
| Direct Shear           | ASTM D3080       |
| Consolidation          | ASTM D2435       |
| Modified Proctor       | ASTM D1557       |
| Corrosion              | CT-417, 422, 643 |

Enclosed is the Summary of Test Results.

We appreciate the opportunity to provide testing services to LGC. Should you have any questions, please call the undersigned.

Sincerely yours, **EGLAB, Inc.** 

Ryan Jones, GE

## SUMMARY OF LABORATORY TEST RESULTS

PROJECT NAME: H & F / Chinatown

EGLAB JOB NO.: 13-059-006

PROJECT NO.: 133006-01

CLIENT:

LGC Valley, Inc.

DATE: 5/29/2013

SUMMARIZED BY: JT

|         |        | 7     |            |         |             |
|---------|--------|-------|------------|---------|-------------|
|         | }      | Ì     |            | DRY     | ATTERBERG   |
|         |        |       | MOISTURE   | DENSITY | LIMITS      |
| BORING  | SAMPLE | DEPTH | CONTENT    | ASTM    | ASTM        |
| NO.     | NO.    | (ft)  | ASTM D2216 | D2937   | D4318       |
|         |        |       | (%)        | (PCF)   | *(LL,PL,PI) |
|         |        |       |            |         |             |
| B-LGC-1 | R-3    | 12.5  | 1.2        | 121.3   |             |
| B-LGC-1 | R-4    | 15    | 1.1        | 124.0   |             |
| B-LGC-1 | R-5    | 17.5  | 3.2        | 130.3   |             |
| B-LGC-1 | SPT-2  | 35    |            |         | Non Plastic |
| B-LGC-1 | SPT-3  | 40    | 21.9       |         |             |
| B-LGC-1 | SPT-4  | 45    |            |         | 23,17,6     |
| B-LGC-1 | SPT-6  | 55    | 20.3       |         |             |
| B-LGC-1 | SPT-7  | 60    | 18.6       |         |             |
| B-LGC-1 | SPT-8  | 65    | 19.7       |         |             |
| B-LGC-2 | Bag-1  | 10-15 |            |         | 27,15,12    |
| B-LGC-2 | R-2    | 10    | 2.7        | 104.8   |             |
| B-LGC-2 | R-4    | 20    | 3.4        | 120.5   | ·           |
| B-LGC-2 | . R-6  | 30    | 27.3       | 101.5   |             |
| B-LGC-2 | SPT-2  | 40    | 23.3       |         |             |
| B-LGC-2 | SPT-4  | 50    | 17.7       |         |             |
| B-LGC-3 | R-3    | 7.5   | 2.6        | 106.0   |             |
| B-LGC-3 | SPT-3  | 35    | 26.8       |         | 36,24,12    |
| B-LGC-3 | SPT-4  | 40    |            | i       | 28,24,4     |
| B-LGC-3 | SPT-5  | 45    | 18.6       |         |             |
| B-LGC-3 | SPT-7  | 55    | 13.7       |         |             |
| B-LGC-3 | SPT-9  | 65    | 14.1       |         |             |

<sup>\*</sup>LL,PL,PI = LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX

# **SUMMARY OF TEST RESULTS**

PROJECT NAME:

H & F / Chinatown

EGLAB JOB No.:

13-059-006

PROJECT No.:

133006-01

CLIENT:

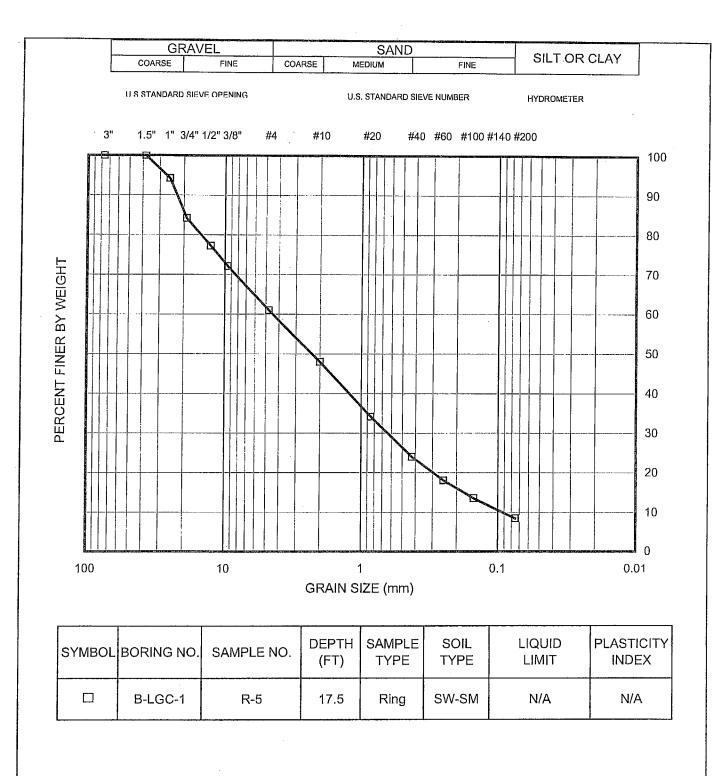
LGC Valley, Inc.

DATE:

5/29/2013

SUMMARIZED BY: JT

| Boring<br>No. | Sample<br>No. | Depth<br>(ft) | pH<br>CalTrans<br>643 | Chloride<br>Content<br>CalTrans<br>422<br>(ppm) | Sulfate<br>Content<br>CalTrans<br>417<br>(% by weight) | Minimum<br>Resistivity<br>CalTrans<br>643<br>(ohm-cm) | Expansion<br>Index<br>ASTM<br>D 4829 |
|---------------|---------------|---------------|-----------------------|-------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|--------------------------------------|
| B-LGC-2       | Bag-1         | 10-15         | 8.19                  | 280                                             | 0.182                                                  | 470                                                   | 9                                    |



Project Name: H & F / Chinatown

Client Job No.:

133006-01

Client Name:

LGC Valley, Inc.

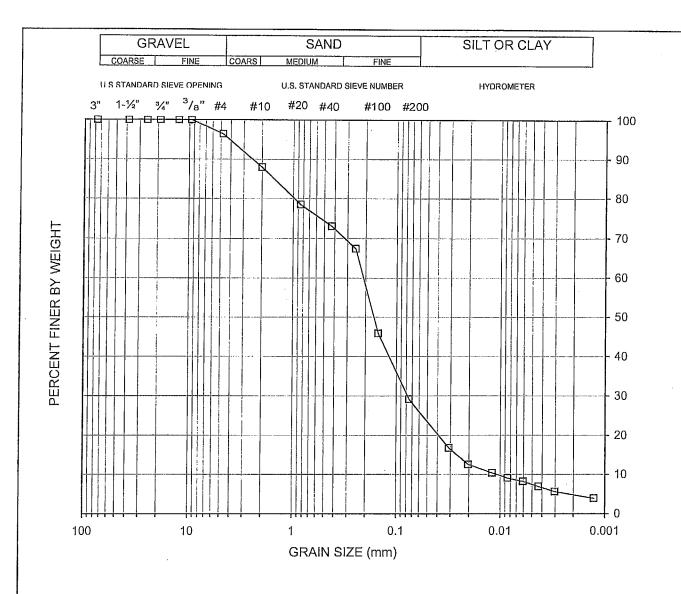
EGLAB Project No.:

13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-1            | SPT-2      | 35            | Bag            | SM           | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

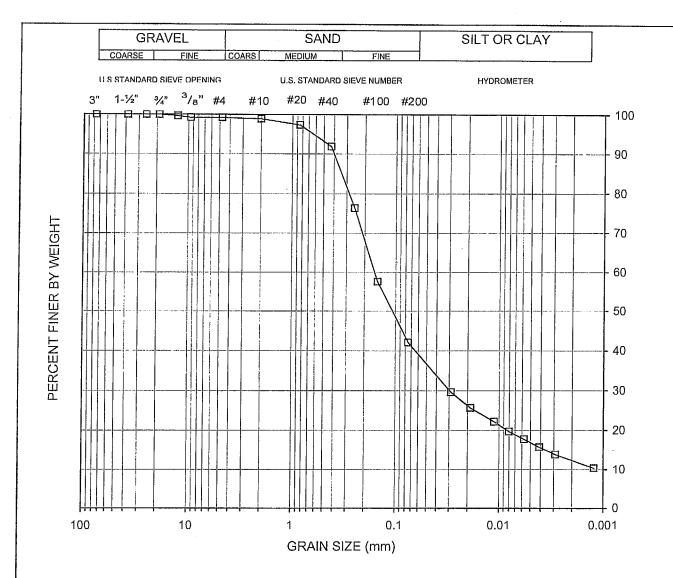
133006-01 EGLAB Project No.: 13-059-006

**GRAINSIZE** 

**DISTRIBUTION CURVE** 

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-1            | SPT-4      | 45            | Bag            | SC-SM        | 23              | 6                   |

Project Name:

H & F / Chinatown

Client: Job No.: LGC Valley, Inc.

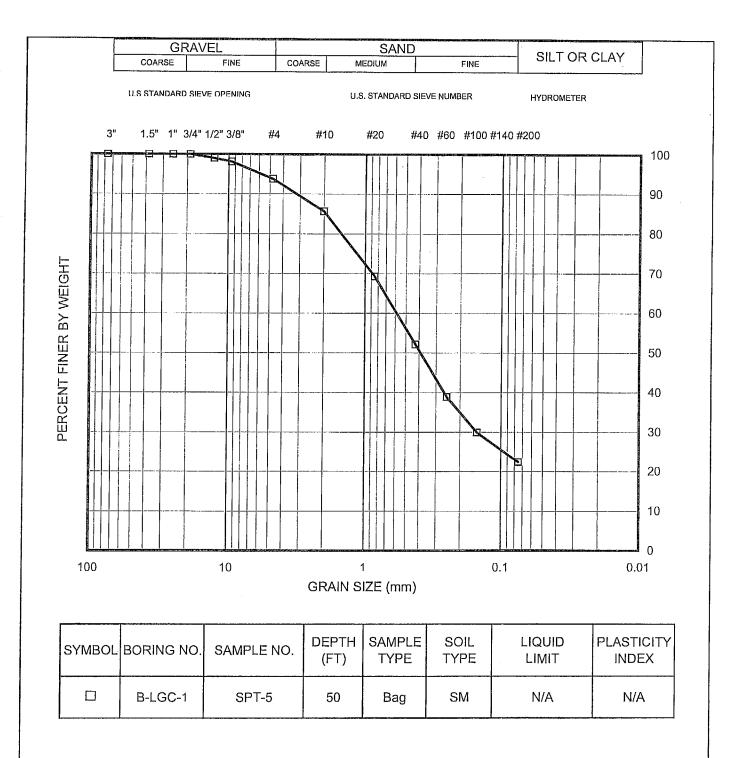
133006-01

EGLAB Project No.: 13-059-006

**GRAINSIZE DISTRIBUTION CURVE** 

05/29/13

(ASTM D422)



Project Name:

H & F / Chinatown

Client Job No.:

133006-01

Client Name:

LGC Valley, Inc.

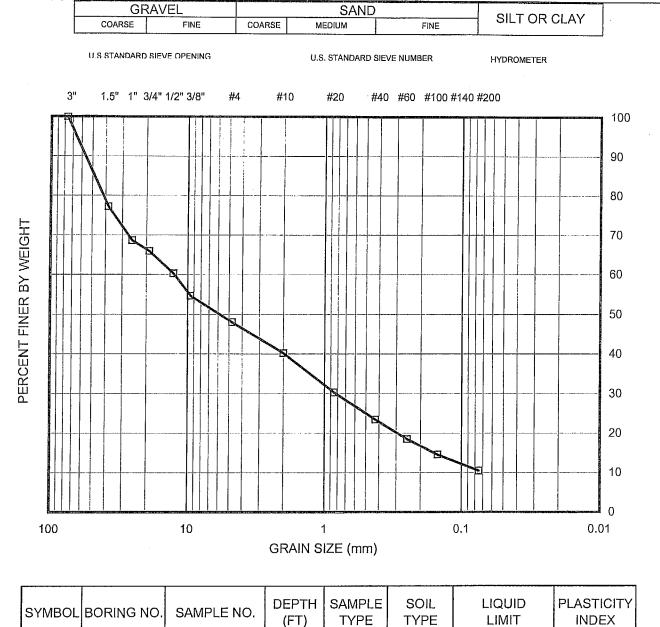
EGLAB Project No.:

13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | BORING NO. | SAMPLE NO. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-2    | R-4        | 20            | Ring           | GW-GM        | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client Job No.:

133006-01

Client Name:

LGC Valley, Inc.

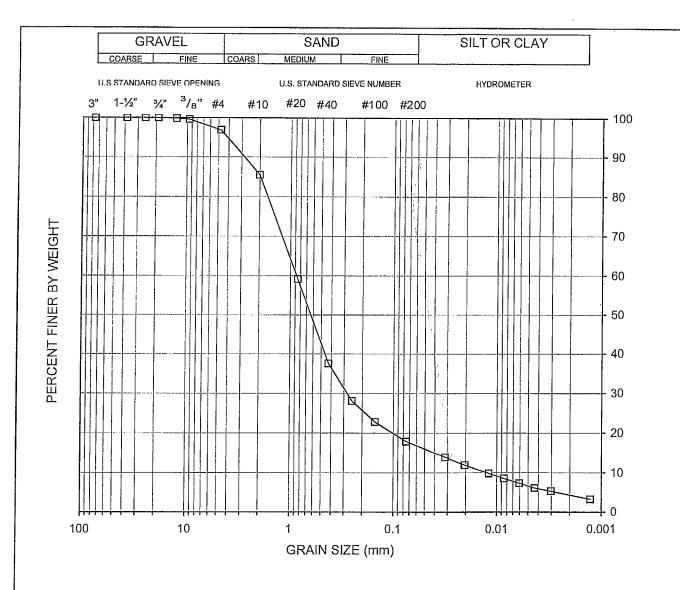
EGLAB Project No.:

13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-2            | SPT-1      | 35            | Bag            | SM           | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

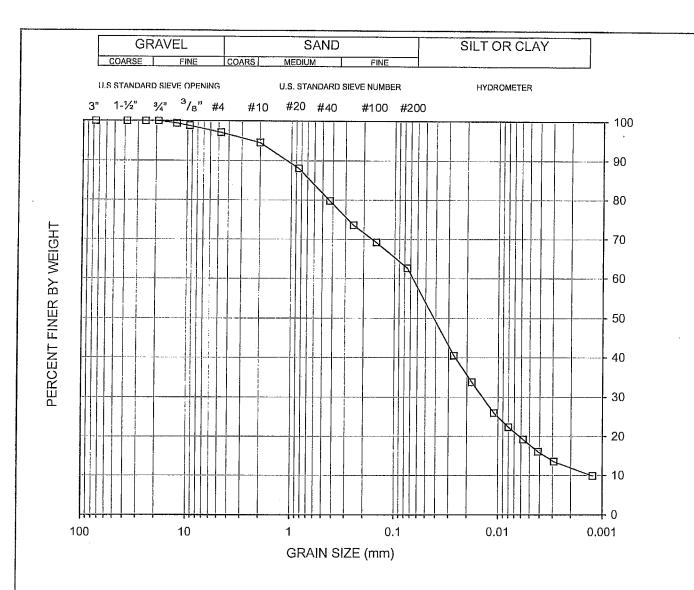
133006-01

EGLAB Project No.: 13-059-006

**GRAINSIZE DISTRIBUTION CURVE** 

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-2            | SPT-2      | 40            | Bag            | CL           | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

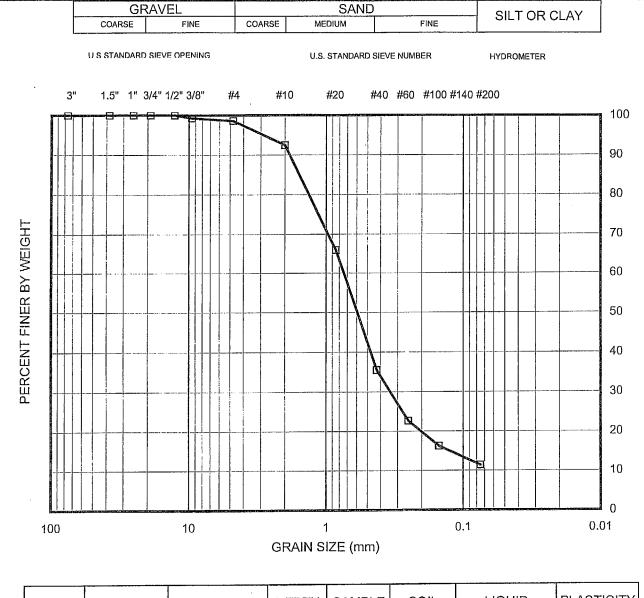
133006-01

EGLAB Project No.: 13-059-006

**GRAINSIZE DISTRIBUTION CURVE** 

05/29/13

(ASTM D422)



| SYMBOL | BORING NO. | SAMPLE NO. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-2    | SPT-4      | 50            | Bag            | SW-SM        | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client Job No.:

133006-01

Client Name:

LGC Valley, Inc.

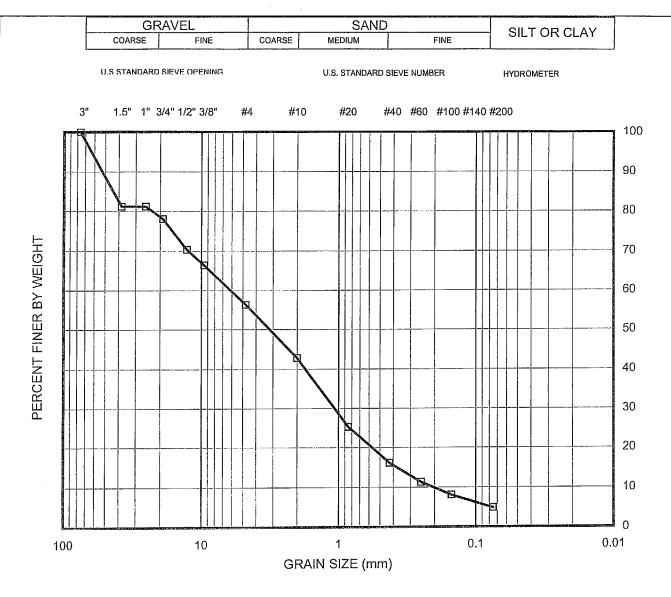
EGLAB Project No.:

13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | BORING NO. | SAMPLE NO. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-3    | R-5        | 15            | Ring           | sw           | N/A             | N/A                 |

Project Name:

H & F / Chinatown

Client Job No.:

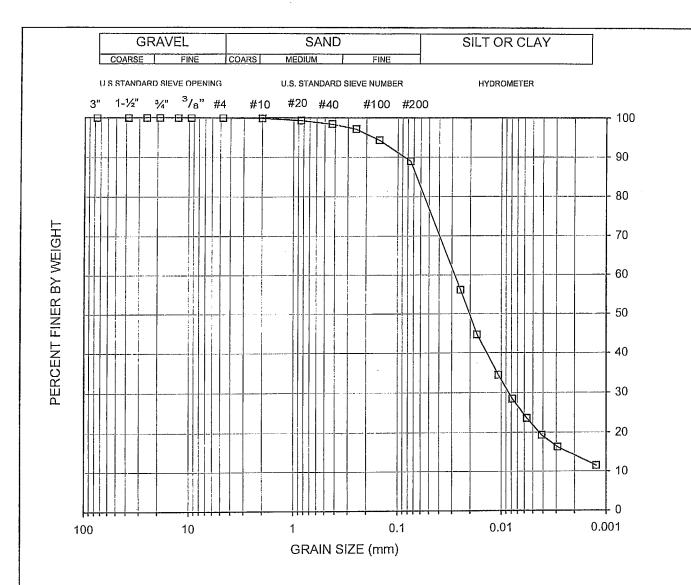
133006-01

Client Name: EGLAB Project No.: LGC Valley, Inc. 13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-3            | SPT-3      | 35            | Bag            | CL           | 36              | 12                  |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

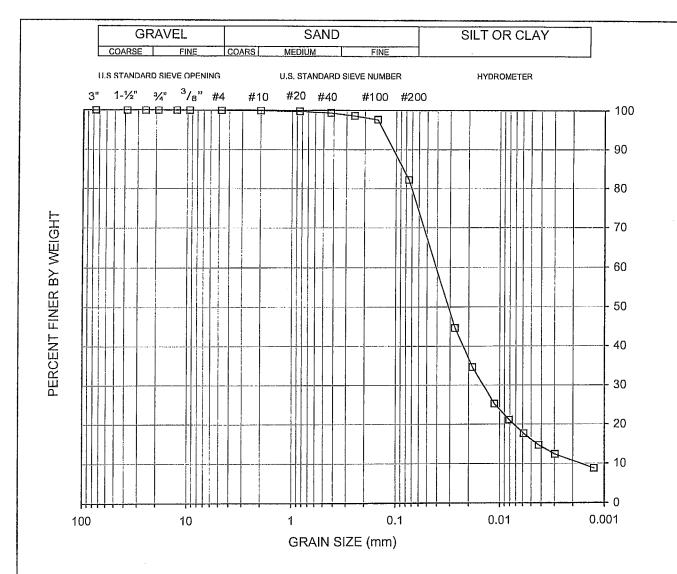
133006-01

EGLAB Project No.: 13-059-006

GRAINSIZE
DISTRIBUTION CURVE

05/29/13

(ASTM D422)



| SYMBOL | SAMPLE<br>LOCATION | SAMPLE No. | DEPTH<br>(FT) | SAMPLE<br>TYPE | SOIL<br>TYPE | LIQUID<br>LIMIT | PLASTICITY<br>INDEX |
|--------|--------------------|------------|---------------|----------------|--------------|-----------------|---------------------|
|        | B-LGC-3            | SPT-4      | 40            | Bag            | ML.          | 28              | 4                   |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

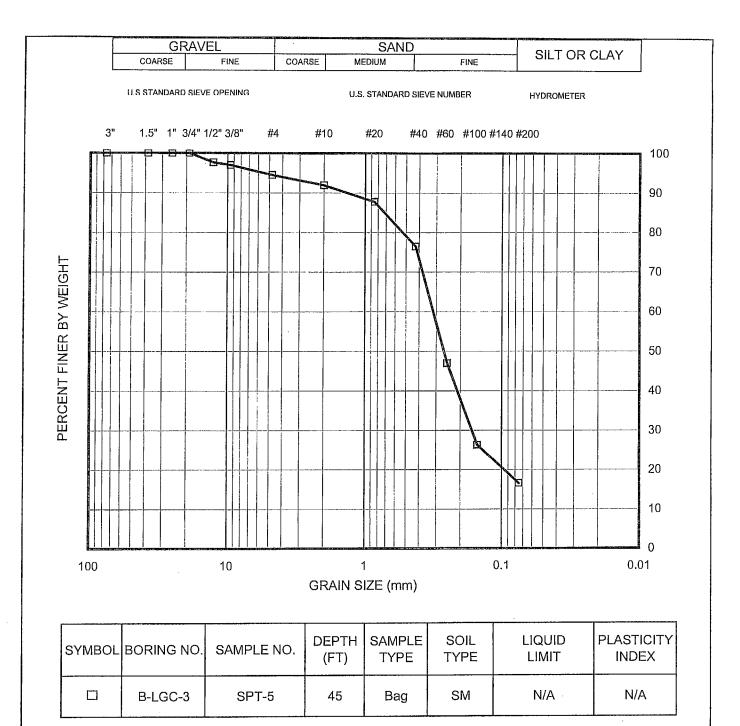
133006-01

EGLAB Project No.: 13-059-006

**GRAINSIZE DISTRIBUTION CURVE** 

05/29/13

(ASTM D422)



Project Name: H & F / Chinatown

Client Job No.:

133006-01

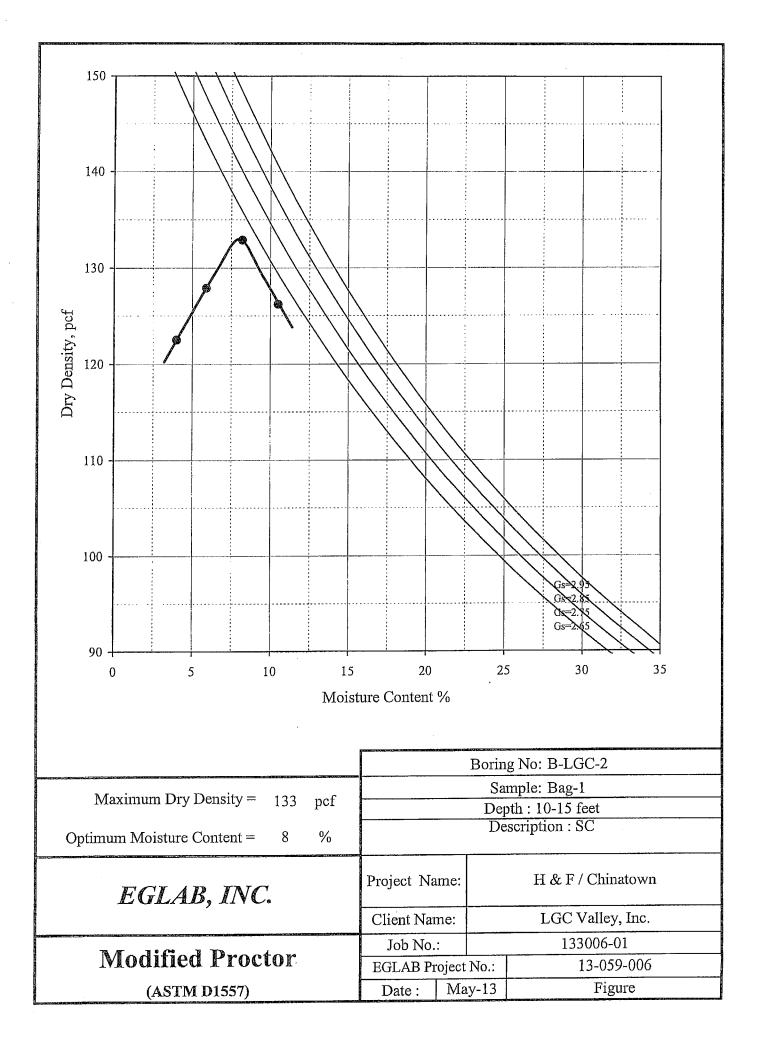
Client Name:

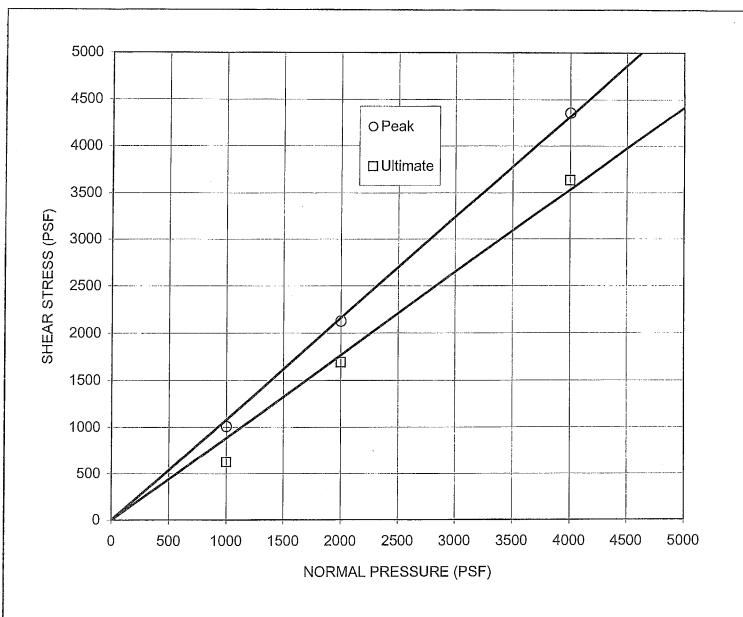
LGC Valley, Inc.

EGLAB Project No.: 13-059-006

GRAIN SIZE
DISTRIBUTION CURVE

05/29/13 (ASTM D422)





| Boring No. | Sample<br>No. | Depth (ft) | Sample<br>Type | Soil Type | Symbol | Cohesion<br>(PSF) | Friction<br>Angle |
|------------|---------------|------------|----------------|-----------|--------|-------------------|-------------------|
| D I C C 1  | DZ            | 20         | Dina           | SP-SM     | 0      | 0                 | 38                |
| B-LGC-1    | R-7           | 30         | Ring           | 3F-3IVI   |        | 0                 | 38                |

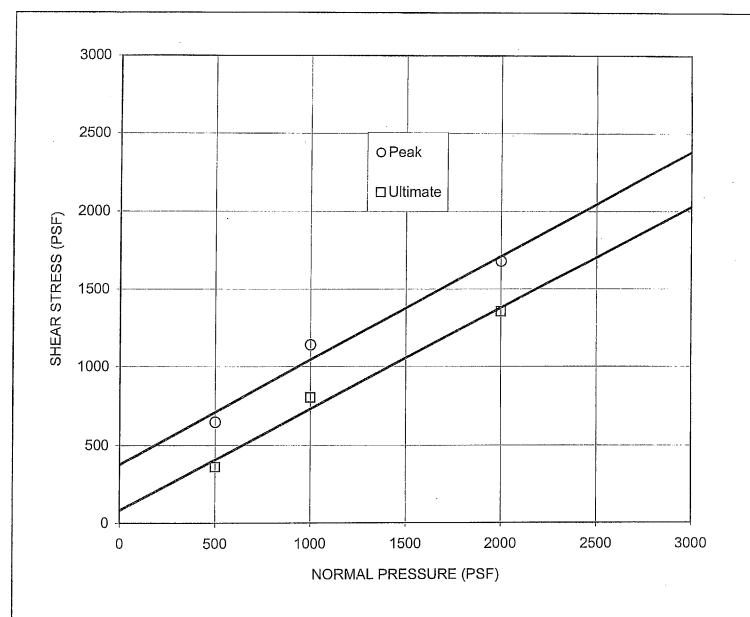
| Normal<br>Stress<br>(psf) | Initial<br>Moisture<br>(%) | Final<br>Moisture<br>(%) |
|---------------------------|----------------------------|--------------------------|
| 1000                      | 9.8                        | 17.8                     |
| 2000                      | 9.8                        | 17.3                     |
| 4000                      | 9.8                        | 14.9                     |

|             | Project Name:                 |                  |  |  |  |
|-------------|-------------------------------|------------------|--|--|--|
|             | H & F / Chinatown             |                  |  |  |  |
| EGLAB, INC. | Client:                       | LGC Valley, Inc. |  |  |  |
| ,           | Project No.:                  | 133006-01        |  |  |  |
|             | EGLAB Project No.: 13-059-006 |                  |  |  |  |

### **DIRECT SHEAR**

Figure

05/13 (ASTM D3080)



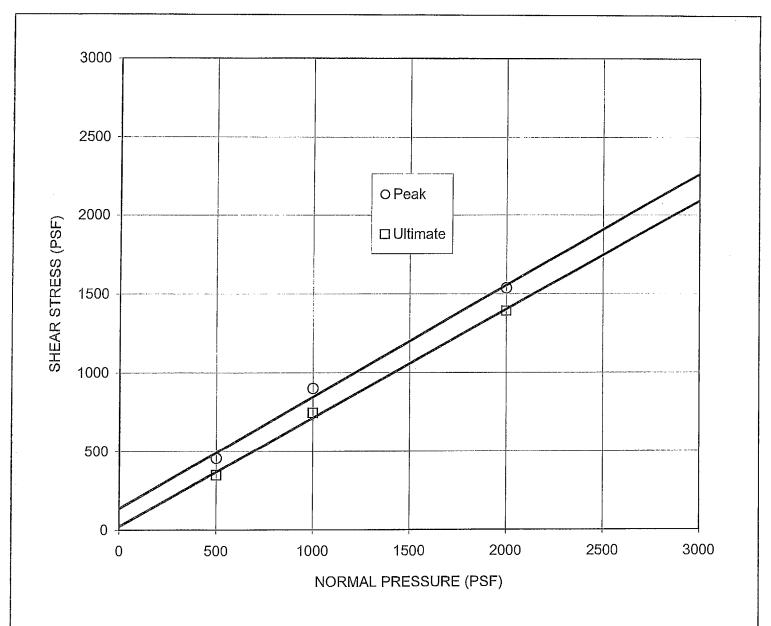
| Boring No. | Sample<br>No. | Depth (ft) | Sample<br>Type | Soil Type | Symbol | Cohesion<br>(PSF) | Friction<br>Angle |
|------------|---------------|------------|----------------|-----------|--------|-------------------|-------------------|
| D 1 00 0   | R-1           | <i>-</i>   | Dina           |           | 0      | 378               | 34                |
| B-LGC-2    | K-1           | ð          | Ring           | CL        |        | 84                | 33                |

| Normal<br>Stress<br>(psf) | Initial<br>Moisture<br>(%) | Final<br>Moisture<br>(%) |
|---------------------------|----------------------------|--------------------------|
| 500                       | 17.0                       | 27.7                     |
| 1000                      | 17.0                       | 27.4                     |
| 2000                      | 17.0                       | 25.2                     |

|             | Project Name:<br>H & F / Chinatown |                  |  |  |
|-------------|------------------------------------|------------------|--|--|
| EGLAB, INC. | Cilent:                            | LGC Valley, Inc. |  |  |
| . <b>*</b>  | Project No.:                       | 133006-01        |  |  |
|             | EGLAB Project No.; 13-059-006      |                  |  |  |
|             |                                    |                  |  |  |

## **DIRECT SHEAR**

05/13 (ASTM D3080) Figure



| Boring No. | Sample<br>No. | Depth (ft) | Sample<br>Type | Soil Type | Symbol | Cohesion<br>(PSF) | Friction<br>Angle |
|------------|---------------|------------|----------------|-----------|--------|-------------------|-------------------|
| D 1 00 0   | D 1           | 40.45      | Dulk           | 22        | 0      | 138               | 35                |
| B-LGC-2    | Bag-1         | 10-15      | Bulk           | SC        |        | 24                | 35                |

05/13

Note: Sample was remolded to 90% maximum relative density and optimum moisture

Maximum Dry Density: 133 pcf Optimum Moisture: 8.0 %

| Normal<br>Stress<br>(psf) | Initial<br>Moisture<br>(%) | Final<br>Moisture<br>(%) |
|---------------------------|----------------------------|--------------------------|
| 500                       | 8.0                        | 15.4                     |
| 1000                      | 8.0                        | 15.2                     |
| 2000                      | 8.0                        | 14.7                     |

| EGLAB, | INC. |
|--------|------|
|        |      |

Project Address: H & F / Chinatown

Client:

LGC Valley, inc.

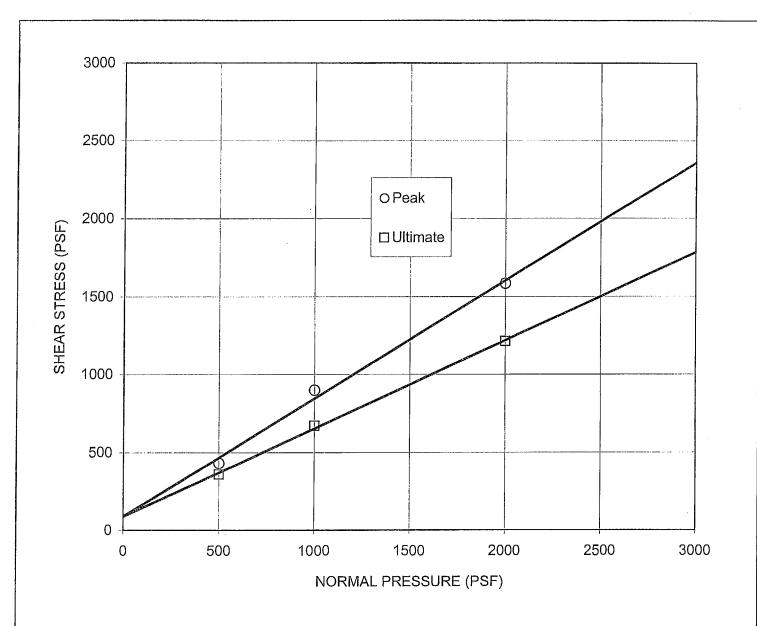
Project No.:

133006-01

EGLAB Project No.: 13-059-006

**DIRECT SHEAR** 

(ASTM D3080)



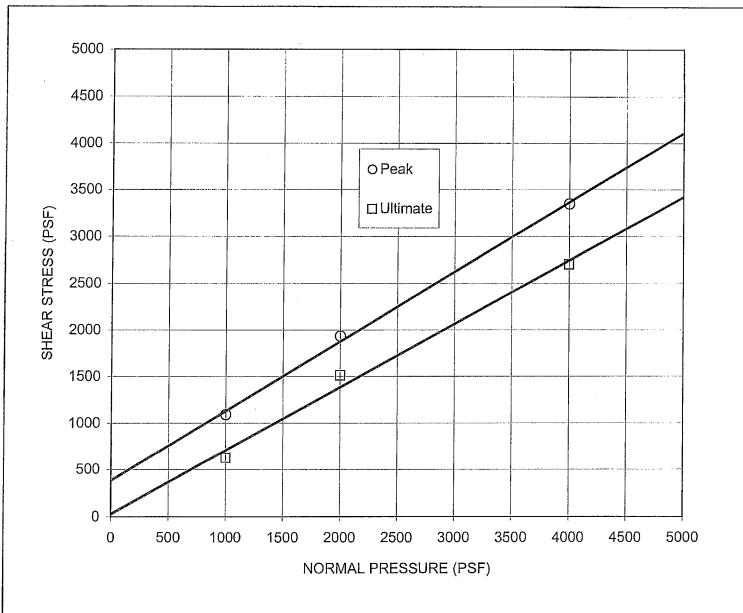
| Boring No. | Sample<br>No. | Depth (ft) | Sample<br>Type | Soil Type | Symbol | Cohesion<br>(PSF) | Friction<br>Angle |
|------------|---------------|------------|----------------|-----------|--------|-------------------|-------------------|
| DICC 2     | DΩ            | _          | Ding           | SM        | 0      | 90                | 37                |
| B-LGC-3    | R-2           | ວ          | Ring           | 3171      |        | 90                | 29                |

| Normal | Initial  | Final    |
|--------|----------|----------|
| Stress | Moisture | Moisture |
| (psf)  | (%)      | (%)      |
| 500    | 5.3      | 18.2     |
| 1000   | 5.3      | 17.7     |
| 2000   | 5.3      | 17.1     |
| 2000   | 5.5      | 17.1     |

| EGLAB, INC. | Project Name:     |                  |  |  |  |
|-------------|-------------------|------------------|--|--|--|
|             | H & F / Chinatown |                  |  |  |  |
|             | Client:           | LGC Valley, Inc. |  |  |  |
| •           | Project No.:      | 133006-01        |  |  |  |
|             | EGLAB Project I   | No.: 13-059-006  |  |  |  |
|             |                   |                  |  |  |  |

DIRECT SHEAR

05/13 (ASTM D3080) Figure

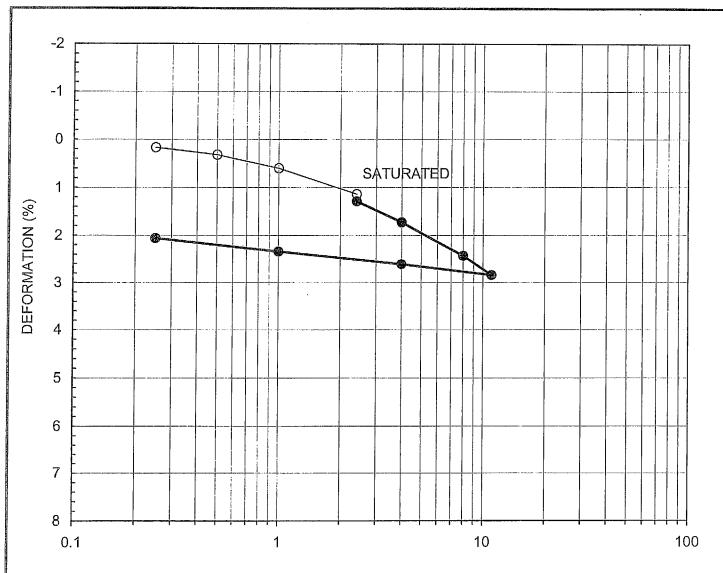


| Boring No. | Sample<br>No. | Depth (ft) | Sample<br>Type | Soil Type | Symbol | Cohesion<br>(PSF) | Friction<br>Angle |
|------------|---------------|------------|----------------|-----------|--------|-------------------|-------------------|
| B-LGC-3    | R-6           | 25         | Dina           | SM        | 0      | 384               | 37                |
| D-LGC-3    | ט-או          | 25         | Ring           | SIVI      |        | 30                | 34                |

| Normal<br>Stress<br>(psf) | Initial<br>Moisture<br>(%) | Final<br>Moisture<br>(%) |
|---------------------------|----------------------------|--------------------------|
| 1000<br>2000              | 6.2<br>6.2<br>6.2          | 20.3<br>18.8<br>18.4     |
| 4000                      | 0.2                        | 10.4                     |

|              | Project Name:     |                  |  |  |
|--------------|-------------------|------------------|--|--|
|              | H & F / Chinatown |                  |  |  |
| EGLAB. INC.  | Client:           | LGC Valley, Inc. |  |  |
| •            | Project No.:      | 133006-01        |  |  |
|              | EGLAB Project     | No.: 13-059-006  |  |  |
| DIRECT SHEAR |                   |                  |  |  |

05/13 (ASTM D3080) Figure



| COMPRESSIVE | STRESS | (KSE) |
|-------------|--------|-------|
| COMPRESSIVE | SIKESS | (NOF) |

| Symbol | Boring Sample No. No. |     | Depth<br>(Ft.) | Soil<br>Type |     | Init. Dry Density<br>(PCF) | Init. Void<br>Ratio |
|--------|-----------------------|-----|----------------|--------------|-----|----------------------------|---------------------|
| 0      | B-LGC-1               | R-6 | 20.0           | SP           | 3.4 | 105.9                      | 0.591               |

Project Name:

H & F / Chinatown

Client: Job No.: LGC Valley, Inc.

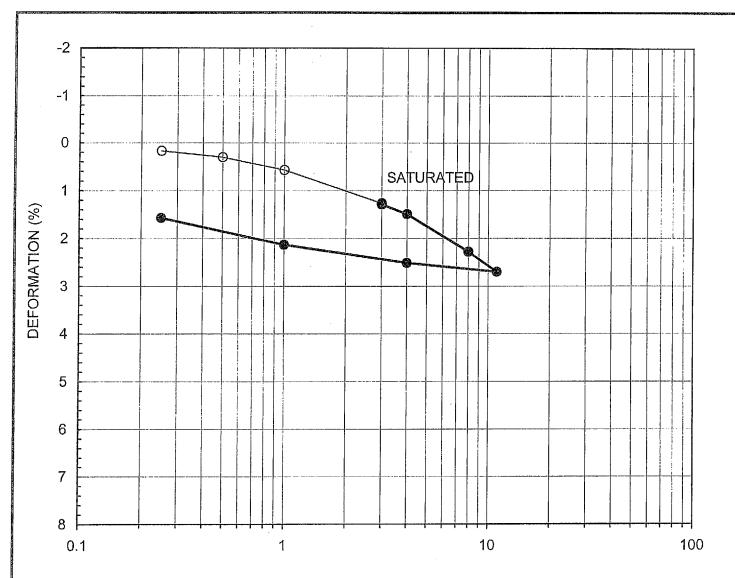
133006-01

EGLAB Project No.: 13-059-006

**CONSOLIDATION** 

05/13

(ASTM D2435)



| COMERCIONE STRESS (NOF, | COMPRESSIVE | STRESS ( | (KSF) |
|-------------------------|-------------|----------|-------|
|-------------------------|-------------|----------|-------|

| Symbol | Boring Sample No. No. |     | Depth Soil (Ft.) Type |    | Init. Moisture<br>Content (%) | Init. Dry Density<br>(PCF) | Init. Void<br>Ratio |
|--------|-----------------------|-----|-----------------------|----|-------------------------------|----------------------------|---------------------|
| 0      | B-LGC-2               | R-5 | 25.0                  | SM | 11.7                          | 110.8                      | 0.521               |

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

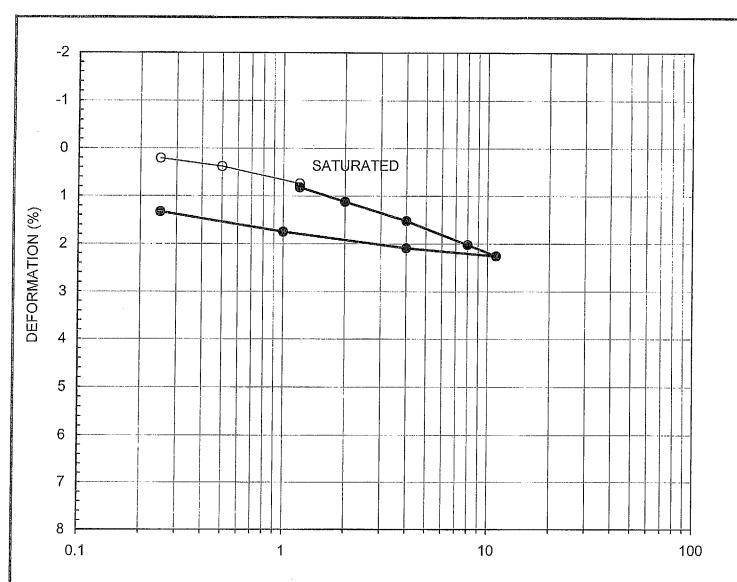
133006-01

EGLAB Project No.: 13-059-006

CONSOLIDATION

05/13

(ASTM D2435)



COMPRESSIVE STRESS (KSF)

| Symbol | Boring<br>No. |     |      | Soil<br>Type | Init. Moisture<br>Content (%) | Init. Dry Density<br>(PCF) | Init. Void<br>Ratio |  |
|--------|---------------|-----|------|--------------|-------------------------------|----------------------------|---------------------|--|
| 0      | B-LGC-3       | R-4 | 10.0 | SP-SM        | 2.1                           | 115.0                      | 0.465               |  |

EGLAB, INC.

Project Name:

H & F / Chinatown

Client:

LGC Valley, Inc.

Job No.:

133006-01

EGLAB Project No.: 13-059-006

**CONSOLIDATION** 

05/13

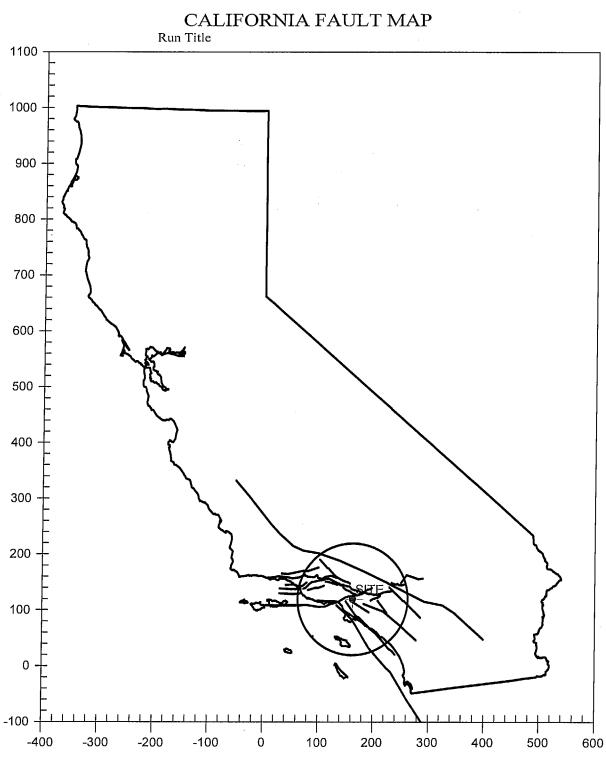
(ASTM D2435)

#### APPENDIX D

#### Probabilistic Seismic Hazard Analysis, and Liquefaction Analysis

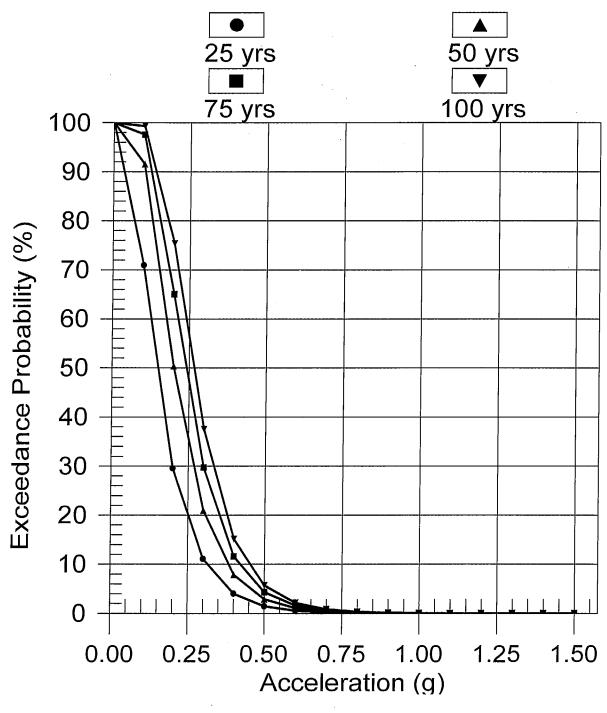
The probabilistic seismic hazard analysis for the site was completed for the three different attenuation relationships (Campbell & Bozorgnia, 1997, Sadigh et al., 1997, and Abrahamson & Silva, 1997). The peak ground acceleration value reported is the mean of the three values obtained.

Probability curves were calculated using the computer program FRISKSP Version 4.0 (Blake, 2000).

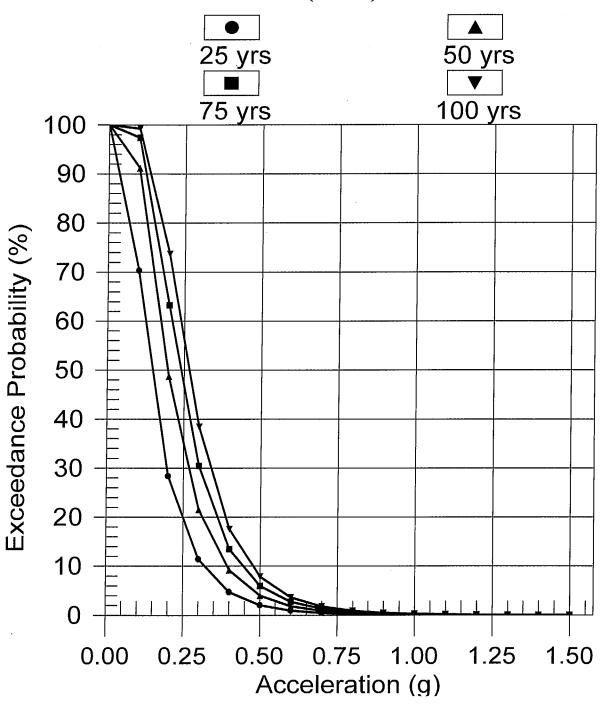


## PROBABILITY OF EXCEEDANCE

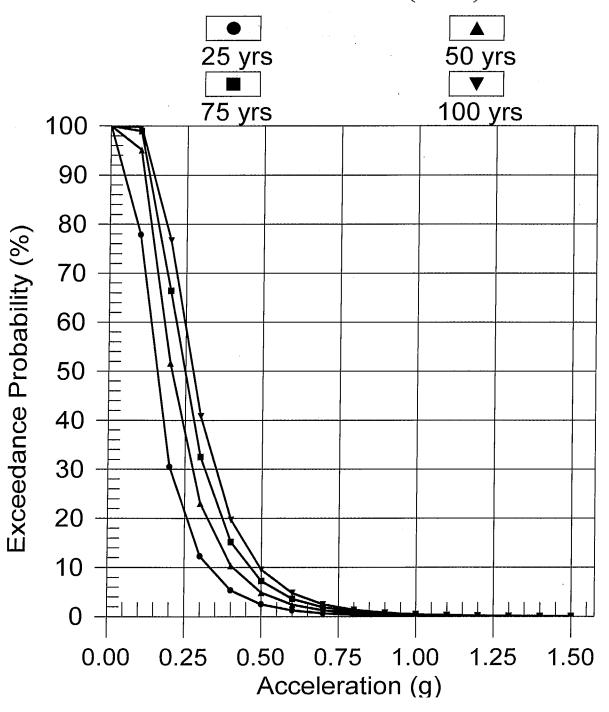
CAMP. & BOZ. (1997 Rev.) AL 2



# PROBABILITY OF EXCEEDANCE SADIGH ET AL. (1997) DEEP SOIL 2



# PROBABILITY OF EXCEEDANCE ABRAHAMSON & SILVA (1997) SOIL 2



## EMPIRICAL PREDICTION OF EARTHQUAKE-INDUCED LIQUEFACTION POTENTIAL

JOB NUMBER: 133006-01 DATE: 06-13-2013

JOB NAME: B-LGC-1

SOIL-PROFILE NAME: hfb1.LDW

BORING GROUNDWATER DEPTH: 35.00 ft

CALCULATION GROUNDWATER DEPTH: 20.00 ft

DESIGN EARTHQUAKE MAGNITUDE: 7.50 Mw

SITE PEAK GROUND ACCELERATION: 0.400 g

BOREHOLE DIAMETER CORRECTION FACTOR: 1.00

SAMPLER SIZE CORRECTION FACTOR: 1.20

N60 HAMMER CORRECTION FACTOR: 1.30

MAGNITUDE SCALING FACTOR METHOD: Idriss (1997, in press)

Magnitude Scaling Factor: 1.000

rd-CORRECTION METHOD: Seed (1985)

FIELD SPT N-VALUES ARE CORRECTED FOR THE LENGTH OF THE DRIVE RODS.

Rod Stick-Up Above Ground: 3.0 ft

CN NORMALIZATION FACTOR: 1.044 tsf

MINIMUM CN VALUE: 0.6

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: hfb1.OUT

NCEER [1997] Method LIQUEFACTION ANALYSIS SUMMARY PAGE 2

File Name: hfb1.OUT

| CALC. | TOTAL | EFF. | FIELD | FC | CORR. | LIQUE. | INDUC. | LIQUE. |
SOIL | DEPTH | STRESS | STRESS | N | DELTA | C | (N1) 60 | RESIST | r | STRESS | SAFETY Page 2

NCEER [1997] Method LIQUEFACTION ANALYSIS SUMMARY PAGE 2

File Name: hfb1.OUT

| CALC. | TOTAL | EFF. | FIELD | FC | CORR. | LIQUE. | INDUC. | LIQUE. |
SOIL | DEPTH | STRESS | STRESS | N | DELTA | C | (N1) 60 | RESIST | r | STRESS | SAFETY Page 2

| NO.                                             | (ft)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (tsf)                                                                                                                                                                                                                                                                                                                                                       | (B/ft)                                                                                                                                                                                       | N1_60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | N<br>N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (B/ft)                                                       | RATIO                                                                                                                                                                                                                                                                                                             | d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | RATIO                                                                                                                                                                                     | FACTOR                                                                                                                                                                                                                                                                                                                                                                                            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21.75<br>22.25<br>22.75<br>22.75<br>23.25<br>23.75<br>24.75<br>25.25<br>26.75<br>26.75<br>26.75<br>27.75<br>28.75<br>28.75<br>29.75<br>30.75<br>31.75<br>32.25<br>33.75<br>33.75<br>33.75<br>34.75<br>35.75<br>36.75<br>37.75<br>38.75<br>37.75<br>38.75<br>37.75<br>38.75<br>37.75<br>38.75<br>37.75<br>38.75<br>37.75<br>38.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75<br>39.75 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| 1.250<br>1.265<br>1.279<br>1.294<br>1.308<br>1.322<br>1.337<br>1.351<br>1.366<br>1.380<br>1.423<br>1.452<br>1.466<br>1.481<br>1.452<br>1.510<br>1.524<br>1.538<br>1.553<br>1.567<br>1.582<br>1.582<br>1.610<br>1.625<br>1.625<br>1.639<br>1.625<br>1.639<br>1.726<br>1.740<br>1.754<br>1.726<br>1.740<br>1.754<br>1.769<br>1.783<br>1.798<br>1.855<br>1.870 | 67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>43<br>43<br>43<br>43<br>43<br>43<br>43<br>43<br>43<br>43<br>47<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60<br>60 | 2.08<br>  2.08<br>  2.08<br>  2.08<br>  2.08<br>  2.08<br>  1.48<br>  1.48<br>  1.48<br>  1.48<br>  1.74<br>  1.74<br> | 0.905<br>  0.905<br>  0.905<br>  0.905<br>  0.905<br>  0.905<br>  0.905<br>  0.814<br>  0.814<br>  0.814<br>  0.814<br>  0.814<br>  0.814<br>  0.746<br>  0.776<br>  0.777<br>  0.77 | 91.7<br>91.7<br>91.7<br>91.7<br>91.7<br>91.7<br>91.7<br>91.7 | Infin | 0.952   0.951   0.949   0.948   0.946   0.945   0.941   0.939   0.938   0.934   0.931   0.922   0.927   0.925   0.922   0.920   0.917   0.914   0.912   0.909   0.899   0.886   0.8874   0.871   0.866   0.874   0.871   0.866   0.874   0.871   0.866   0.874   0.871   0.866   0.874   0.871   0.866   0.858   0.874   0.871   0.866   0.858   0.874   0.871   0.866   0.858   0.874   0.871   0.866   0.858   0.874   0.871   0.866   0.874   0.871   0.868   0.874   0.871   0.868   0.874   0.871   0.866   0.874   0.871   0.866   0.874   0.874   0.875   0.874   0.875   0.874   0.875   0.874   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.875   0.8 | 0.258 0.261 0.263 0.266 0.268 0.270 0.274 0.276 0.288 0.282 0.288 0.289 0.291 0.292 0.293 0.294 0.295 0.296 0.297 0.297 0.298 0.299 0.299 0.299 0.299 0.299 0.299 0.299 0.299 0.299 0.299 | NonLiq<br>  NonLiq | X0.002 X 12 17 = 0.12 11 |

HFB1

NCEER [1997] Method LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: hfb1.OUT

|      |       |        |        |        |       | - <b>-</b> |        |        |         |        |        |
|------|-------|--------|--------|--------|-------|------------|--------|--------|---------|--------|--------|
|      | CALC. | TOTAL  | EFF.   | FIELD  | FC    |            | CORR.  | LIQUE. |         | INDUC. |        |
| SOIL | DEPTH | STRESS | STRESS | N      | DELTA | C          | (N1)60 | RESIST | r       | STRESS | SAFETY |
| NO.  | (ft)  | (tsf)  | (tsf)  | (B/ft) | N1_60 | N          | (B/ft) | RATIO  | d       | RATIO  | FACTOR |
|      |       |        |        |        |       |            |        |        |         |        |        |
| 9    | 43.75 | 2.625  | 1.884  | 20     | 9.14  | 0.677      | 30.3   | Infin  | [0.817] | 0.296  | NonLiq |
|      |       |        |        |        |       | Page 3     | 3      |        |         |        |        |

HFB1 9.14|0.677 30.3 20 44.25 | 2.655 | 1.898 | |Infin |0.812| 0.295|NonLiq Infin Infin Infin 44.75 2.685 9.14 0.677 30.3 1.913 20 0.807 0.294 NonLiq 44.75 45.25 46.25 46.75 47.25 47.75 48.25 49.25 49.75 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.656 | 11.03 | 0.658 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.17 | 0.638 | 7.1 10 2.715 1.927 30 11.03 0.656 41.7 0.802 0.294 NonLiq 0.293 NonLiq
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LIQUEFACTION ANALYSIS SUMMARY

PAGE 4

File Name: hfb1.OUT

| NO.  | DEPTH<br>(ft) | TOTAL<br>STRESS<br>(tsf) | STRESS<br>(tsf) | N<br>(B/ft) | DELTA <br> N1_60 | C<br>N | (N1)60<br>(B/ft) | LIQUE.<br> RESIST<br>  RATIO | r<br>d | RATIO | SAFETY<br>FACTOR |
|------|---------------|--------------------------|-----------------|-------------|------------------|--------|------------------|------------------------------|--------|-------|------------------|
| 14 İ | 65.75         | 3.945                    | 2.518           | 77          | 10.64            | 0.600  | 82.7             | +<br> Infin<br> Infin        | 0.618  | 0.252 | NonLiq           |

## EMPIRICAL PREDICTION OF EARTHQUAKE-INDUCED LIQUEFACTION POTENTIAL

JOB NUMBER: 133006-01

DATE: 06-13-2013

JOB NAME: B-LGC-2

SOIL-PROFILE NAME: hfb2.LDW

BORING GROUNDWATER DEPTH: 35.00 ft

CALCULATION GROUNDWATER DEPTH: 20.00 ft

DESIGN EARTHQUAKE MAGNITUDE: 7.50 MW

SITE PEAK GROUND ACCELERATION: 0.400 g

BOREHOLE DIAMETER CORRECTION FACTOR: 1.00

SAMPLER SIZE CORRECTION FACTOR: 1.20

N60 HAMMER CORRECTION FACTOR: 1.30

MAGNITUDE SCALING FACTOR METHOD: Idriss (1997, in press)

Magnitude Scaling Factor: 1.000

rd-CORRECTION METHOD: Seed (1985)

FIELD SPT N-VALUES ARE CORRECTED FOR THE LENGTH OF THE DRIVE RODS.

Rod Stick-Up Above Ground: 3.0 ft

CN NORMALIZATION FACTOR: 1.044 tsf

MINIMUM CN VALUE: 0.6

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: hfb2.OUT

| SOIL<br>NO.                             | CALC.<br>  DEPTH<br>  (ft)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TOTAL<br>STRESS<br>(tsf)                                                                                                                                                                                                                                                                                                                                    | EFF.<br> STRESS<br>  (tsf)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FIELD<br>  N<br> (B/ft)                                                         | FC<br>DELTA                                                  | C<br>N | CORR.<br> (N1)60<br> (B/ft) | LIQUE.<br> RESIST<br>  RATIO | STRESS | LIQUE.<br> SAFETY<br> FACTOR |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: hfb2.OUT

| CALC. | TOTAL | EFF. | FIELD | FC | CORR. | LIQUE. | INDUC. | LIQUE. |
SOIL | DEPTH | STRESS | STRESS | N | DELTA | C | (N1) 60 | RESIST | r | STRESS | SAFETY |
Page 2

| NO.                                         | (ft)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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                                                                                                                                                                                                                                                         | (B/ft)                                                                                                                                                         | N1_60                                                                                                                                                               | HFB2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (B/ft)                                                       | RATIO                                                                                                                                                 | d                                                                                                                                                                                                                              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| 5555555666666666777777777788888888999999999 | 21.75<br>  22.25<br>  22.75<br>  23.25<br>  23.75<br>  24.75<br>  25.25<br>  26.75<br>  26.75<br>  26.75<br>  27.75<br>  28.75<br>  29.75<br>  29.75<br>  30.75<br>  31.75<br>  32.25<br>  33.75<br>  34.75<br>  35.25<br>  36.75<br>  37.75<br>  36.25<br>  37.75<br>  37.75<br>  37.75<br>  38.75<br>  37.75<br>  38.75<br>  37.75<br>  38.75<br>  37.75<br>  37.75<br>  38.75<br>  37.75<br>  37.75<br>  38.75<br>  38.75 | 1.305  <br>1.335  <br>1.335  <br>1.365  <br>1.425  <br>1.425  <br>1.455  <br>1.545  <br>1.545  <br>1.545  <br>1.545  <br>1.665  <br>1.725  <br>1.755  <br>1.845  <br>1.755  <br>1.845  <br>1.905  <br>1.995  <br>2.025  <br>2.025  <br>2.145  <br>2.175  <br>2.265  <br>2.265  <br>2.265  <br>2.325  <br>2.325  <br>2.445  <br>2.475 | 1.250<br>1.265<br>1.279<br>1.294<br>1.308<br>1.322<br>1.337<br>1.351<br>1.366<br>1.380<br>1.423<br>1.423<br>1.452<br>1.466<br>1.481<br>1.495<br>1.510<br>1.524<br>1.538<br>1.553<br>1.567<br>1.582<br>1.668<br>1.682<br>1.682<br>1.740<br>1.726<br>1.740<br>1.726<br>1.740<br>1.754<br>1.754<br>1.769<br>1.7783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783<br>1.783 | 67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>67<br>52<br>52<br>52<br>52<br>52<br>52<br>52<br>52<br>52<br>32<br>32<br>32<br>32<br>32 | 3.58<br>3.58<br>3.58<br>3.58<br>3.58<br>3.58<br>3.45<br>3.45<br>3.45<br>3.45<br>3.45<br>3.45<br>3.45<br>7.25<br>7.25<br>7.25<br>7.25<br>7.25<br>7.25<br>7.25<br>7.2 | 0.905<br>0.905<br>0.905<br>0.905<br>0.905<br>0.905<br>0.905<br>0.814<br>0.814<br>0.814<br>0.814<br>0.814<br>0.814<br>0.814<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.746<br>0.769<br>0.769<br>0.769<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7699<br>0.7 | 93.2<br>93.2<br>93.2<br>93.2<br>93.2<br>93.2<br>93.2<br>93.2 | Infin | 0.952<br> 0.951<br> 0.949<br> 0.948<br> 0.946<br> 0.945<br> 0.941<br> 0.939<br> 0.938<br> 0.936<br> 0.934<br> 0.931<br> 0.929<br> 0.927<br> 0.927<br> 0.927<br> 0.925<br> 0.927<br> 0.927<br> 0.927<br> 0.927<br> 0.927<br> 0.927<br> 0.927<br> 0.927<br> 0.928<br> 0.938<br> 0.838<br> | 0.258<br>0.261<br>0.263<br>0.266<br>0.268<br>0.270<br>0.274<br>0.276<br>0.280<br>0.285<br>0.285<br>0.285<br>0.285<br>0.295<br>0.291<br>0.291<br>0.292<br>0.293<br>0.293<br>0.295<br>0.297<br>0.297<br>0.298<br>0.298<br>0.299<br>0.299<br>0.299<br>0.299<br>0.299<br>0.299<br>0.299<br>0.300<br>0.300 | NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq<br>NonLiq |  |

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: hfb2.OUT

| 1    | CALC. | TOTAL  | FFF.   | i FTELD | l FC  | · ·    | CORR.  | LIOUE. |       | INDUC. | LIOUE. |
|------|-------|--------|--------|---------|-------|--------|--------|--------|-------|--------|--------|
| SOTI | DEPTH | STRESS | STRESS | N N     | DFLTA | C      | (N1)60 | RESTST |       |        |        |
| NO   | (f+)  | (tsf)  | (tsf)  | (R/ft)  | N1 60 | l N    | (B/ft) | RATTO  | . Y   | RATTO  | FACTOR |
|      |       |        |        |         |       |        | +      |        |       |        |        |
|      |       |        |        |         |       |        | 27.7   |        |       |        |        |
| 9    | 43.73 | 2.023  | 1.004  | 1 10    | 0.72  | D200 : |        | 0.511  | 0.017 | 0.230  | 1.05   |

Page 3

|    |       |       |       |    | HFB2       |      |       |         |              |
|----|-------|-------|-------|----|------------|------|-------|---------|--------------|
| 9  | 44.25 | 2.655 | 1.898 | 18 | 8.72 0.677 | 27.7 |       | . 0.812 | 0.295  1.05  |
| 9  | 44.75 | 2.685 |       | 18 | 8.72 0.677 | 27.7 |       | . 0.807 | 0.294  1.06  |
| 10 | 45.25 | 2.715 | 1.927 | 54 | 2.67 0.656 | 58.0 | Infin | 0.802   | 0.294 NonLiq |
| 10 | 45.75 | 2.745 | 1.942 | 54 | 2.67 0.656 | 58.0 | Infin | 0.797   | 0.293 NonLiq |
| 10 | 46.25 | 2.775 | 1.956 | 54 | 2.67 0.656 | 58.0 | Infin | 0.792   | 0.292 NonLiq |
| 10 | 46.75 | 2.805 | 1.970 | 54 | 2.67 0.656 | 58.0 | Infin | 0.787   | 0.291 NonLiq |
| 10 | 47.25 | 2.835 | 1.985 | 54 | 2.67 0.656 | 58.0 | Infin | 0.782   | 0.290 NonLiq |
| 10 | 47.75 | 2.865 | 1.999 | 54 | 2.67 0.656 | 58.0 | Infin | 0.776   | 0.289 NonLiq |
| 10 | 48.25 | 2.895 | 2.014 | 54 | 2.67 0.656 | 58.0 | Infin | 0.771   | 0.288 NonLiq |
| 10 | 48.75 | 2.925 | 2.028 | 54 | 2.67 0.656 | 58.0 | Infin | 0.766   | 0.287 NonLiq |
| 10 | 49.25 | 2.955 | 2.042 | 54 | 2.67 0.656 | 58.0 | Infin | 0.761   | 0.286 NonLiq |
| 10 | 49.75 | 2.985 | 2.057 | 54 | 2.67 0.656 | 58.0 | Infin | 0.756   | 0.285 NonLiq |
| 11 | 50.25 | 3.015 | 2.071 | 45 | 2.40 0.639 | 47.3 | Infin | 0.751   | 0.284 NonLiq |
| 11 | 50.75 | 3.045 | 2.086 | 45 | 2.40 0.639 | 47.3 | Infin | 0.746   | 0.283 NonLiq |
| 11 | 51.25 | 3.075 | 2.100 | 45 | 2.40 0.639 | 47.3 | Infin | 0.741   | 0.282 NonLiq |

## EMPIRICAL PREDICTION OF EARTHQUAKE-INDUCED LIQUEFACTION POTENTIAL

JOB NUMBER: 133006-01

JOB NAME: B-LGC-3

SOIL-PROFILE NAME: hfb3.LDW

BORING GROUNDWATER DEPTH: 30.00 ft

CALCULATION GROUNDWATER DEPTH: 20.00 ft

DESIGN EARTHQUAKE MAGNITUDE: 7.50 MW

SITE PEAK GROUND ACCELERATION: 0.400 g

BOREHOLE DIAMETER CORRECTION FACTOR: 1.00

SAMPLER SIZE CORRECTION FACTOR: 1.20

N60 HAMMER CORRECTION FACTOR: 1.30

MAGNITUDE SCALING FACTOR METHOD: Idriss (1997, in press)

Magnitude Scaling Factor: 1.000

rd-CORRECTION METHOD: Seed (1985)

FIELD SPT N-VALUES ARE CORRECTED FOR THE LENGTH OF THE DRIVE RODS.

Rod Stick-Up Above Ground: 3.0 ft

CN NORMALIZATION FACTOR: 1.044 tsf

MINIMUM CN VALUE: 0.6

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

DATE: 06-13-2013

File Name: hfb3.OUT

|            | CALC.   | TOTAL     | EFF.   | FIELD      | FC    | ſ      | CORR.       | LIQUE.  | 1          | INDUC.   | LETOUE. |
|------------|---------|-----------|--------|------------|-------|--------|-------------|---------|------------|----------|---------|
| COTI       | DEPTH   |           | STRESS | l N        | DELTA | С      |             | RESIST  | r          |          | SAFETY  |
| SOIL       |         |           | DIKESS |            |       |        |             |         |            |          |         |
| NO.        | (ft)    | (tsf)     | (TST)  | (B/ft)     | N1_60 | N      | (B/ft)      | RATIO   | d          | I KAITO  | FACTOR  |
|            | <b></b> |           | +      |            | +     |        | <del></del> | +       | +          | +        | <b></b> |
| 1          | 0.25    | 0.015     | 0.015  | 23         | 6.81  | *      | *           | *       | *          | *        | **      |
| 1          | 0.75    | 0.045     | 0.045  | 23         | 6.81  | *      | *           | *       | *          | *        | **      |
| 1          | 1.25    | 0.075     | 0.075  | 23         | 6.81  | *      | j *         | *       | *          | *        | **      |
| $ar{1}$    | 1.75    | 0.105     | 0.105  | 23         | 6.81  | *      | **          | *       | *          | *        | **      |
| $\bar{1}$  | 2.25    | 0.135     | 0.135  | 23         | 6.81  | *      | *           | *       | <b>i</b> * | *        | **      |
| īi         | 2.75    | 0.165     | 0.165  | 23         | 6.81  | *      | *           | *       | *          | *        | **      |
| $\dot{1}$  | 3.25    | 0.195     | 0.195  | 23         | 6.81  | *      | *           | *       | *          | <b> </b> | **      |
| 1 1        | 3.75    | 0.225     | 0.225  | 23         | 6.81  | *      | *           | *       | *          | *        | **      |
|            |         | 0.223     |        | 23         |       | *      | *           | *       | *          | ! *      | **      |
| 1          | 4.25    | 0.255     | 0.255  | 23         | 6.81  | *      | ,           | · ·     | *          | *<br>  * | **      |
| 1          | 4.75    | 0.285     | 0.285  | 23         | 6.81  |        |             | l       | i          | 1        |         |
| 2          | 5.25    | 0.315     | 0.315  | 26         | 6.60  | *      | *           | *       | *          | *        | 1       |
| 2  <br>2   | 5.75    | 0.345     | 0.345  | 26         | 6.60  | *      | *           | *       | *          | *        | **      |
| 2          | 6.25    | 0.375     | 0.375  | 26         | 6.60  | *      | *           | *       | *          | *        | **      |
| 2          | 6.75    | 0.405     | 0.405  | 26         | 6.60  | *      | *           | *       | *          | **       | ** **   |
| 2  <br>2   | 7.25    | 0.435     | 0.435  | 26         | 6.60  | *      | **          | *       | *          | *        | **      |
| 2 İ        | 7.75    | 0.465     | 0.465  | 26         | 6.60  | *      | ric .       | *       | *          | *        | **      |
| 2          | 8.25    | 0.495     | 0.495  | 26         | 6.60  | *      | *           | *       | *          | *        | * *     |
| 2          | 8.75    | 0.525     | 0.525  | 26         | 6.60  | *      | *           | *       | *          | *        | **      |
| 5          | 9.25    | 0.555     | 0.555  | 26         | 6.60  | *      | *           | *       | *          | *        | **      |
| 2          | 9.75    | 0.585     | 0.585  | 26         | 6.60  | *      | *           | <br>  * | *          | *        | **      |
| 2          |         |           |        |            |       | *      | *           | *       | *          | *        | **      |
| 3          | 10.25   | 0.615     | 0.615  | 60         | 9.33  | *      | *           | *       | "          | *        | **      |
| 3          | 10.75   | 0.645     | 0.645  | 60         | 9.33  |        | *           | *       | *          | *        | **      |
| 3          | 11.25   | 0.675     | 0.675  | 60         | 9.33  | *      |             |         |            |          |         |
| 3          | 11.75   | 0.705     | 0.705  | 60         | 9.33  | *      | *           | *       | *          | *        | * *     |
| 3          | 12.25   | 0.735     | 0.735  | 60         | 9.33  | *      | *           | *       | *          | *        | * *     |
| 3          | 12.75   | 0.765     | 0.765  | 60         | 9.33  | * ]    | *           | *       | *          | *        | **      |
| 3          | 13.25   | 0.795     | 0.795  | 60         | 9.33  | *      | *           | *       | *          | *        | **      |
| 3          | 13.75   | 0.825     | 0.825  | 60 l       | 9.33  | *      | *           | *       | j * j      | *        | **      |
| 3          | 14.25   | 0.855     | 0.855  | 60 i       | 9.33  | *      | *           | *       | j * j      | *        | * *     |
| 3 i        | 14.75   | 0.885     | 0.885  | 60 i       | 9.33  | *      | . *         | *       | *          | *        | **      |
| 4          | 15.25   | 0.915     | 0.915  | 42         | 0.07  | *      | *           | *       | *          | *        | **      |
| 4          | 15.75   | 0.945     | 0.945  | 42         | 0.07  | *      | *           | *       | *          | *        | **      |
| 4          | 16.25   | 0.975     | 0.975  | 42         | 0.07  | *      | *           | *       |            | *        | **      |
| - 1        |         |           |        |            |       | *      | *           | *       | <u> </u>   | ń        | **      |
| 4          | 16.75   | 1.005     | 1.005  | 42         | 0.07  | *      | *           | *       | *          | *        | **      |
| 4          | 17.25   | 1.035     | 1.035  | 42         | 0.07  | I      | , '  <br>*  | *       |            | *        | **      |
| 4          | 17.75   | 1.065     | 1.065  | 42         | 0.07  | *      | I           |         |            | I        |         |
| 4          | 18.25   | 1.095     | 1.095  | 42         | 0.07  | *      | *           | *       | *          | *        | * *     |
| 4          | 18.75   | 1.125     | 1.125  | 42         | 0.07  | *      | *           | **      | *          | *        | * *     |
| 4          | 19.25   | 1.155     | 1.155  | 42         | 0.07  | **     | *           | *       | *          | *        | * *     |
| 4          | 19.75   | 1.185     | 1.185  | 42         | 0.07  | *      | *           | *       | *          | *        | * *     |
| 5          | 20.25   | 1.215     | 1.207  | 54         |       | 0.905  | 72.3 İ      | Infin   | 0.956      | 0.250    | NonLiq  |
| 5          | 20.75   | 1.245     | 1.2221 | 54         | 0.09  |        |             | Infin   | 0.955      |          | NonLia  |
| 5          | 21.25   | 1.275     | 1.236  | 54         |       | 0.905  |             | Infin   | 0.954      |          | NonLiq  |
| <i>J</i> 1 |         | ± • = 1 J | T 50   | <i>-</i> 1 | 0.05  | 3.3031 | ,           |         | 0.00 / 1   | 0.2301   |         |

| NCEER [1997] Method                                 | LIQUEFACTION ANALYSIS SUMMARY                                                         | PAGE 2                     |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------|
| File Name: hfb3.OUT                                 | •                                                                                     |                            |
| CALC.   TOTAL   EFF. SOIL   DEPTH   STRESS   STRESS | FIELD   FC     CORR. LIQUE.    INI<br>5  N  DELTA  C  (N1)60 RESIST  r  STI<br>Page 2 | DUC. LIQUE.<br>RESS SAFETY |

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: hfb3.OUT

|      | CALC. | LATOT  | EFF.   | FIELD  | l FC  |        | CORR   | LIQUE. | 1     | INDUC. | LIOUE.   |
|------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|----------|
| SOTL | DEPTH | STRESS | STRESS | l N    | DELTA | l C    | (N1)60 | RESIST | r     |        | SAFETY   |
| NO.  | (ft)  | (tsf)  | (tsf)  | (B/ft) | N1_60 | N      | (B/ft) | RATIO  | d     | RATIO  | FACTOR   |
|      |       | , -    |        |        |       |        |        |        |       |        | <u>+</u> |
| 9 i  | 43.75 | 2.625  | 1.884  | 20     | 9.29  | 0.701  | 31.2   | Infin  | 0.817 | 0.296  | NonLiq   |
| - '  |       |        |        |        |       | Page 3 |        | ,      | •     | •      |          |

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                                                                                                                         89.1
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LIQUEFACTION ANALYSIS SUMMARY

PAGE 4

File Name: hfb3.OUT

| NO. | DEPTH | TOTAL<br>STRESS<br>(tsf) | STRESS<br>(tsf) | N<br>(B/ft) | DELTA <br> N1_60 | C<br>N | (N1)60<br>(B/ft) | RATIO | r<br>d | INDUC.<br>STRESS<br>RATIO | SAFETY<br>FACTOR |
|-----|-------|--------------------------|-----------------|-------------|------------------|--------|------------------|-------|--------|---------------------------|------------------|
| 14  | 65.75 |                          | 2.518           | 85          | 8.58             | 0.607  | 89.1             | Infin | 0.618  | 0.252<br>  0.251          | NonLiq           |

### APPENDIX E

### LGC VALLEY, INC.

# General Earthwork and Grading Specifications For Rough Grading

### 1.0 General

- 1.1 <u>Intent:</u> These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).
- 1.2 <u>The Geotechnical Consultant of Record</u>: Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and The Contractor shall prepare and submit to the owner and the specifications. Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. . The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor's sole responsibility to provide proper fill compaction.

# 2.0 Preparation of Areas to be Filled

**2.1** <u>Clearing and Grubbing:</u> Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 10 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

- **Processing:** Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free from oversize material and the working surface is reasonably uniform, flat, and free from uneven features that would inhibit uniform compaction.
- **Overexcavation:** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.
- 2.4 <u>Benching</u>: Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.
- 2.5 <u>Evaluation/Acceptance of Fill Areas:</u> All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

### 3.0 Fill Material

3.1 <u>General</u>: Material to be used as fill shall be essentially free from organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

- 3.2 <u>Oversize</u>: Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.
- 3.3 <u>Import:</u> If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

# 4.0 Fill Placement and Compaction

- 4.1 <u>Fill Layers:</u> Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.
- 4.2 <u>Fill Moisture Conditioning</u>: Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).
- 4.3 <u>Compaction of Fill:</u> After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.
- 4.4 <u>Compaction of Fill Slopes</u>: In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

- 4.5 <u>Compaction Testing:</u> Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).
- 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.
- 4.7 <u>Compaction Test Locations</u>: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

### 5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

# 6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

# 7.0 <u>Trench Backfills</u>

- 7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.
- All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.
- 7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.
- 7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.
- 7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

# APPENDIX B-2

Environmental Review of the Chinatown Property Referred to as Parcel PA-018 at 924 North Spring Street, Los Angeles, California



April 15 2013

Pamela L. Andes, Esq.
Partner
Allen Matkins Leck Gamble Mallory & Natsis LLP
1900 Main Street, Suite 500
Irvine, California 92614

Subject: Environmental Review of the Chinatown Property Referred to as Parcel PA-

018 at 924 North Spring Street Los Angeles California

Dear Ms. Andes,

This letter has been prepared to present our review of the environmental condition of a parcel of property owned by your client located at 924 Spring Street in the Chinatown area of Los Angeles, California (Site). It is our understanding that they are considering selling the Site and have requested this summary to provide an environmental overview to prospective purchasers and/or investors. The Site is located in a commercial area adjacent to the recently constructed MTA Gold Line and Station, the Los Angeles State Historic Park aka "Cornfields" and general industrial and distribution uses. The Site is located at the northeast corner of North Spring Street and College Street in the City of Los Angeles, California (Figure 1). The San Bernardino-Pasadena Freeway interchange is located approximately 0.75 mile to the west and the Los Angeles River is approximately 2,000 feet to the east.

# **Site History**

The Site was developed as far back as 1905 when the property was part of a rail freight yard. The Site included two freight houses and multiple rail lines. The Site included a wood yard, a coal yard, oil warehouses, small businesses and dwelling units. The Site was vacant as of 1970 and was acquired by the Los Angeles Metropolitan Transit Authority (MTA) for support of the expansion of the MTA Gold Line to Pasadena; it had been previously owned by the

Union Pacific Railroad (UP). It is our understanding that Meruelo Maddox Properties, Inc. became the owners in 2001 and, as a result of bankruptcy reorganization, a new management team is in place that has limited historic knowledge of the Site.

### **Investigation History**

The Site has been the subject of several rounds of investigation including the removal of an Underground Storage Tank (UST), as well as in response to plans for UP to sell the Site. This included the preparation of a Phase One Environmental Site Assessment (ESA) by Weston in 1996. Four USTs were removed in 1989 along with an estimated 30 yards of impacted soil. Multiple rounds of subsurface investigations followed the ESA to investigate the issues of concern reported in the ESA as well as to follow up on results obtained during the investigation. Ultimately, England Geosystems was retained by the MTA to prepare a remedial action plan (RAP) that was submitted and ultimately approved after revisions requested by the Los Angeles Regional Water Quality Control Board (RWQCB). The RAP was implemented, which included soil removal and led to the RWQCB issuing an NFA to the Site subject to the recordation of a deed restriction and the implementation of institutional controls. The deed restriction prohibits first floor residential use of the Site. As noted below, it appears that the deed restriction was developed in relation to a specific site plan being considered at that time and a modification of the deed restriction could be proposed if future use contemplates first floor residential occupancy. The following presents a summary of the various investigations.

Canonie Environmental, 1989, Final Site Report Underground Storage Tank Removal.

This report documents the removal of four USTs from the Site in April of 1986. The USTs included one 8,500 gallon gasoline UST, one 900 gallon Diesel UST, one 6,500 gallon oil UST and a 700 gallon gasoline UST. The work was conducted for the Southern Pacific Transportation Company who owned the Site at the time. Soil samples collected at the time

of removal indicated some releases had occurred. Approximately 28 cubic yards of impacted soil was removed. No further action was required from any regulatory agency.

Weston, 1995 Workplan for Los Angeles County Metropolitan Transportation Authority Phase and II Environmental Site Assessments.

A workplan was prepared by Roy F. Weston outlining the procedures that were used to conduct the ESA at the Site and adjacent parcel as well as a limited Phase II sampling effort. The workplan described information obtained from adjacent parcels, which suggested that there were regional groundwater impacts in the Site vicinity.

Weston, 1996 Phase One Environmental Assessment for Parcel PA-018, Metro Pasadena Blue Line.

The ESA was prepared by Weston for the MTA as outlined in the workplan above. The ESA was prepared in general accordance with then existing ASTM guidelines and reviewed the historic, current and neighboring uses of the Site. As described above, the Site was used as a rail freight yard including storage of wood, coal and other materials. Groundwater was reported to flow to the south and east. The report referenced previous reports by Remedial Action Corporation (1994) and ERM-West (1989), which we were not provided for review. The report referenced a UST that was historically located along the northern portion of the Site, which was removed. Subsequent sampling of soil in this area of the Site did not report impacts from the location believed to be the location of the former UST.

Multiple locations were found in the Site vicinity where releases of hazardous substances had occurred. Most of these were either too far away or in the wrong direction with respect to groundwater flow to be considered a concern to the Site. There were two historic fuel storage locations adjacent to the Site that were considered suspect sources to the Site. Groundwater sampling conducted as part of these off Site locations including wells

located either on or very near the Site suggested that impacted groundwater could be found beneath the Site. The maps showing the sampling locations could not be found in the prior remedial efforts and was requested by Weston.

Shallow soil and groundwater at the adjacent parcels to the south of Parcel PA-018 showed localized impacts. Total Recoverable Petroleum Hydrocarbons (TRPH) was found in soil ranging from non-detect to 497 mg/kg. Pesticides were found in soil ranging from non-detect to 450 ug/kg of 4,4-DDE. PCBs were found in soil ranging from non detect to 1,780 ug/kg of Aroclor 1260. Lead was found in one soil sample at a total concentration of 568 mg/kg, with 45 mg/l of soluble lead. A floating hydrocarbon product layer described as degraded gasoline was observed in two of four borings extended to groundwater at the two parcels. Three samples of groundwater were found to contain TPH as diesel and TRPH in concentrations ranging from 0.5 mg/l to 4,730 mg /l. Benzene was detected in two of the groundwater samples, in concentrations of 535 ug/l and 820 ug/l.

Based on the above findings at the off-Site parcel, WESTON recommended additional limited Phase II investigation at the Site as follows:

- Locate the ERM-West (1989) report previously provided to Remedial Action
  Corporation by MTA. Review the report for more specific information pertaining to
  removal of a former UST that appears to have been conducted at the parcel in 1987,
  and for possible correlation to the UST at the parcel described in the EDR
  environmental database orphan list.
- Conduct a limited Phase II investigation including a geophysical survey, and
  installation of shallow soil borings and temporary wells. Information from
  investigations at nearby sites indicates that a potential exists for impacts to shallow
  soil and groundwater at the Site from off-Site sources. Areas which merit specifically
  targeted investigation include the northwestern edge of the parcel, in the former

> location of the "oil" feature identified in the 1906 and 1950 Sanborn maps, and in the vicinity of the apparent former UST, if its location can be determined.

 Confirm the existence and location of monitoring wells reported to have been installed on the parcel as was presented in reports by ERM-West and Geofon.
 Sample the wells if they are found to be in satisfactory condition. Abandon the wells if they have been compromised.

Montgomery Watson, 1999 Workplan for Parcel PA-018 Further Investigation.

Montgomery Watson reviewed the ESA prepared by Weston and other documents and prepared a workplan to conduct further investigations at the Site. In their workplan, Montgomery Watson described the previously described UST removal and sampling as well as limited groundwater sampling conducted both on and off Site as part of the off Site fuel storage facilities. The report states that the results of this sampling found relatively low levels of hydrocarbons in groundwater from these storage activities and remnant crude oil naturally found in the area.

The objectives of the workplan were:

- 1. Characterize the nature and extent of possible constituents of concern (COCs) in the shallow soil across the Site. COCs have been selected based on the potential usage and occurrence documented from previous assessment and investigations.
- 2. Confirm the general condition of the shallow groundwater beneath the Site and evaluate the potential for on-Site migration of hydrocarbons in groundwater from nearby properties.
- 3. Determine the status and (possible) location of the reported UST (former UST) and groundwater monitoring wells reportedly located on-Site, if possible and
- 4. Conduct soil sampling in the UST location to evaluate soil conditions.

The scope of work included the advancement of 12 borings to variable depths and 5 grab groundwater samples. The borings were targeted to investigate the historic rail yard operations, the former UST locations and to obtain a general understanding of groundwater conditions.

LAW Gibb Group, 2000, Report of Environmental Soil and Groundwater Assessment.

LAW Gibb Group was retained to conduct a subsurface investigation including advancing 47 borings throughout the Site. This included sampling in the areas of the former rail yard operations as well as the former UST(s) and the collection of groundwater samples.

The investigation indicated shallow localized soil contamination with lead, copper and petroleum hydrocarbons in the heavy oil range. No volatile organics and only trace to minor (compared to EPA Residential PRGs) concentrations of pesticides and PCBs were detected. Groundwater samples collected at the Site did not indicate groundwater contamination resulting from previous activities at the Site including the former UST area. Analytical results of groundwater samples collected from the extreme southwest corner of the Site indicated groundwater contamination with what appeared to be crude oil and diesel. Based on regional southwesterly flow of ground water and the location of documented upgradient leaking USTs in the area, the source of the petroleum hydrocarbons detected in ground water is most likely from natural seeps and /or off-site upgradient sources.

England Geosystem, 2001, Remedial Action Plan, PA-018.

After the Site characterization was conducted as described above, England Geosystem was retained by the MTA to prepare the RAP for the Site. The RAP summarized the prior work that was conducted at the Site along with a summary of the Site history.

A follow-up soil investigation was performed (Law/Crandall, 2000) to further assess the high concentrations of copper, lead, and TRPH in borings SB-02, SB-03, SB-05, SB-06, and SB-09. Three 10-foot borings (SB-02A, B-02B, and SB-02C) were drilled at a distance of approximately 5 feet from boring SB-02 and samples were collected at 1, 5, and 10 feet bgs. Original soil borings SB-03, SB-05, SB-06, and SB-09 were additionally investigated with three 5-foot borings (labeled A, B, and C) at a radial distance of 5 feet and three 1-foot borings (labeled Aa, Bb, and Cc) at a radial distance of 15 feet. Soil borings SB-11 and SB-12 were drilled to a depth of 5 feet bgs. An additional 49 soil samples were collected during the follow-up investigation and analyzed for one or more of the following: TRPH, lead, and copper.

The results of the follow-up investigation showed copper (above TTLC and STLC) present in areas away from borings SB-09. Soluble copper concentrations above 25 mg/L (STLC) were present in three of the six samples collected at 1-foot bgs (Table 3). Further assessment of lead in borings SB-03, SB-05, and SB-06 revealed that although total lead concentrations did not exceed the TTLC of 1,000 mg/kg, soluble lead at concentrations above the 5 .0 mg/L STLC were present in 5 of the 27 samples analyzed. During the follow-up investigation, TRPH was detected only in the 1-foot samples. TRPH analytical results ranged from not detected at 10 mg/kg to 7,360 mg/kg. No volatile organic compounds were detected in any of the Site soil samples.

The RAP called for the excavation and off site disposal of soil from five areas that were reported to contain COCs over the approved cleanup level. The COCs included

hydrocarbons and select metals including arsenic, lead and copper. The initial excavation was of a total of 150 cubic yards, which would be approximately 200 Tons.

England Geosystem, 2001b, Updated Remedial Action Plan.

After the RAP was submitted to the RWQCB, meetings were held which led to the RWQCB requesting that additional investigations be conducted. England collected additional samples to define the lateral extent of arsenic, copper and lead. The results of England's supplemental investigation were:

- Lead was detected at widely variable concentrations ranging from 0.33 to 897 mg/kg. The majority of the high lead concentrations were detected at the 1-foot sample depth. At the 5-foot sample depth, the average lead concentration was approximately 9 mg/kg, with a maximum of 128 mg/kg (Figures 2 and 3).
- Detectable concentrations of arsenic were present across the Site ranging from 0.8 to 58 .1 mg/kg. Only two locations at the Site were found to contain arsenic at concentrations greater than 10 mg/kg, sample locations SB-04 and SB-09. Additional investigation of these areas revealed that elevated arsenic concentrations were not widely distributed across the Site. At the 5-foot sampling depth, only one arsenic concentration greater than 2 .07 mg/kg was detected (Figures 6 and 7).
- Copper concentrations in soil at the Site ranged from 2 .47 to 7,220 mg/kg. Their concentrations appear evenly distributed across the Site except in the area of boring group SB-09. At the 1-foot sampling depth, copper was detected at concentrations ranging from 14 .3 (SB-09Bb@1') to 7,220 mg/kg (SB-09-E-1). Copper concentrations in the SB-09 group were less than 200 mg/kg.

- Antimony and mercury were also detected. Maximum detected concentrations of antimony and mercury were 14 .5 mg/kg (SB-04@5') and 13 .7 mg/kg (SB-03@1') respectively.
- Pesticides (4,4-DDD, 4,4-DDT, and 4,4-DDE) were detected in only 4 of the 20 samples tested and at a maximum concentration of only 0 .04 mg/kg.
- PCB (Aroclor-1260) was detected at 0.562 mg/kg.
- Gasoline and diesel range organics were not detected at the Site.
   Hydrocarbon analysis indicates that the carbon range present in the samples is above C22 (TRPH). The maximum TRPH concentration was 7,360 mg/kg.
- No VOCs were detected in any of the soil samples collected at the Site.
- Petroleum hydrocarbons and VOCs were detected in only one of the four grab background water samples collected. The source(s) of these compounds is believed to be from off-Site.

The data was used to prepare a health risk assessment (HRA). The HRA was prepared for a mixed-use project where residential uses would not occupy the ground floor. Proposed Site cleanup levels were calculated to be protective of on-Site workers as well as future occupants. The HRA concluded that there was no threat from exposure to the contaminants found on Site except for Arsenic.

The RAP estimated that 82.5 cubic yards of lead impacted soil and 30 cubic yards of arsenic containing soil would need to be removed.

England Geosystem, 2002, Remedial Action Plan Implementation Summary and Site Closure Request, Parcel PA-018.

The RAP was implemented by England in 2002 and included the removal of the known impacted soil. During the excavation, a vein of discolored soil was encountered which was found to contain hydrocarbons and arsenic at elevated concentrations. This vein of

impacted soil was shallow and extended an estimated 680' by 126' and 8 inches in depth. A total of 12,200 Tons of impacted material was removed with 238 Tons being disposed of as Hazardous Waste.

At the completion of the excavation, all of the confirmation samples were reported to be below the project cleanup objectives though some residual impacts did remain. Excerpts of the project data and confirmation samples are included in the Attachment to this letter.

England Geosystem, 2002, Response to OEHHA Comments, Updated Remedial Action Plan Parcel PA-018.

A HRA was conducted to evaluate the potential risk posed to future occupants of the proposed project, which was reviewed by the State Office of Environmental Health Hazard Assessment (OEHHA). England Geosystem addressed these comments in this document. The HRA identified two potentially exposed populations: current outdoor workers and future construction workers. After discussions and revisions, the HRA was approved.

RWQCB, 2003, No Further Action-Parcel PA-018, Los Angeles to Pasadena Blue Line, 924 North Spring Street Los Angeles.

The RWQCB was the lead agency overseeing the remedial efforts. The RWQCB approved the remedial work and granted a No Further Action (NFA) letter, which required a deed restriction to be placed upon the Site. One of the restrictions was to limit residential uses on the ground floor. This restriction appears to be in place as that was the layout of the original project contemplated in the HRA. The contaminants of concern include Arsenic, Lead and Hydrocarbons. The exposure route of concern would be direct contact and inhalation of dust containing such materials. Given that the Site will be substantially paved and exposures prevented by such cover, the need to restrict residential uses on the ground floor appears to be an artifact of the development that was contemplated when the HRA

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was prepared and not on any underlying risk based scenario. It is possible that this

restriction could be amended with additional or updated information.

Conclusions

The Site was historically used as a rail yard including storage of wood, coal and petroleum

products. The Site has been investigated and all known issues of concern have been

remediated including former USTS, shallow impacted soil from historic uses and an area of

impacted soil found to contain hydrocarbons and arsenic. The impacted soil was removed

from the Site to the project cleanup levels. Groundwater sampling conducted at the Site

has documented the presence of heavier end hydrocarbons in the southwest corner of the

Site from an off site source(s). The RWQCB has provided a No Further Action Letter for The

Site which required the preparation of a deed restriction. The deed restriction prohibits first

floor residential use of the Site. As noted below, it appears that the deed restriction was

developed in relation to a specific site plan being considered at that time and a modification

of the deed restriction could be proposed if future use contemplates first floor residential

occupancy.

We thank you for the opportunity to be of service. If there are any questions, please feel

free to contact me at your convenience.

Very truly yours,

Hazard Management Consulting Inc.

Mark S. Cousineau, REA II

Principal

### **REFERENCES**

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- ----, 2002, Response to OEHHA Comments, Updated Remedial Action Plan Parcel PA-018 924 North Spring Street Los Angeles, California, February, 2002.

LAW Gibb Group, 2000 Report of Environmental Soil and Groundwater Assessment Los Angeles to Pasadena Metro Blue Line Parcel PA-018, October 23, 2000.

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RWQCB, 2003, No Further Action-Parcel PA-018, Los Angeles to Pasadena Blue Line, 924 North Spring Street Los Angeles, Letter to Richard Thorpe of the MTA.

- ----, December, 2001, Parcel PA-018 and Avenue 26<sup>th</sup> Street Station Site, Los Angeles to Pasadena Blue Line, (SLIC No, 904a)
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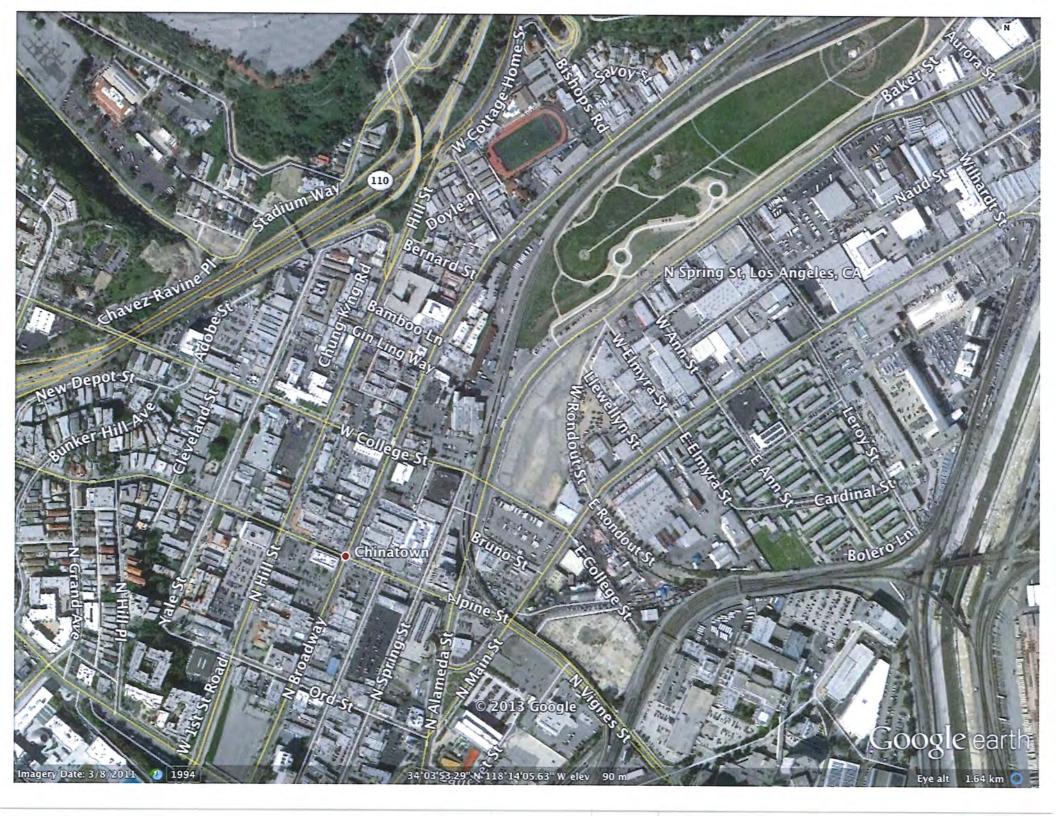
----, 2002a, Remedial Action Plan Approval Clarification Parcel PA-018 Los Angeles to Pasadena Blue Line, 924 North Spring Street Los Angeles, California (SLIC 904B, PAC No. 204-BK), Letter to Richard Thorpe MTA, December 19, 2002.

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Weston, 1996, Phase One Environmental Assessment for Parcel PA-018, Metro Pasadena Blue Line, Prepared for Los Angeles County Metropolitan Transportation Authority, September 1996. (Both Draft and Final Reports).

# **ATTACHMENT**







Reference No.: 503753-23

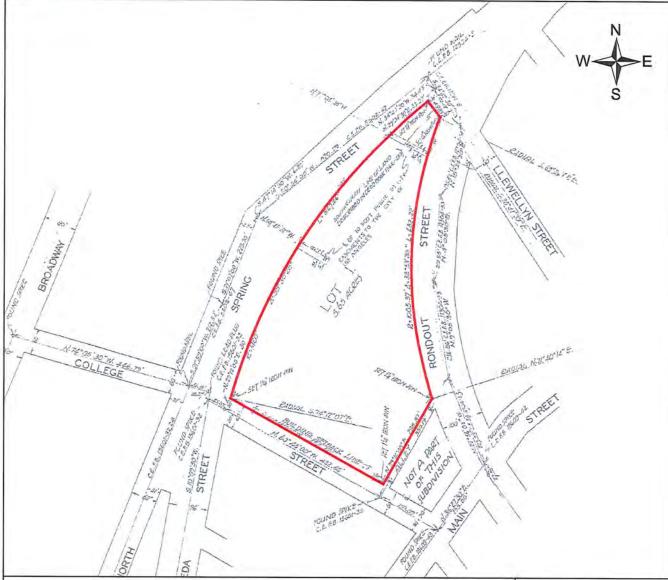
County: Los Angeles

# **Location Map**

# Legend



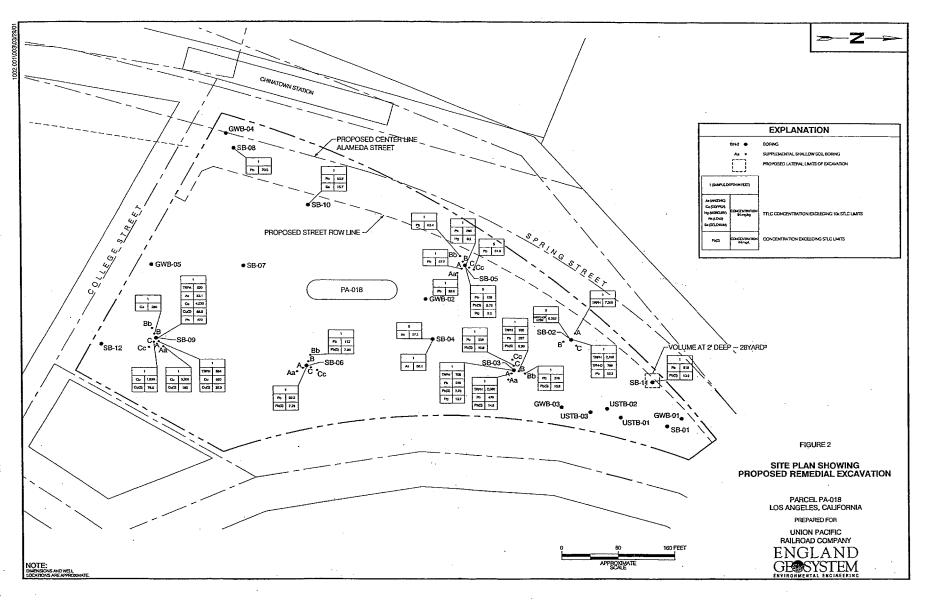
Meruelo Chinatown, LLC, a California limited liability company



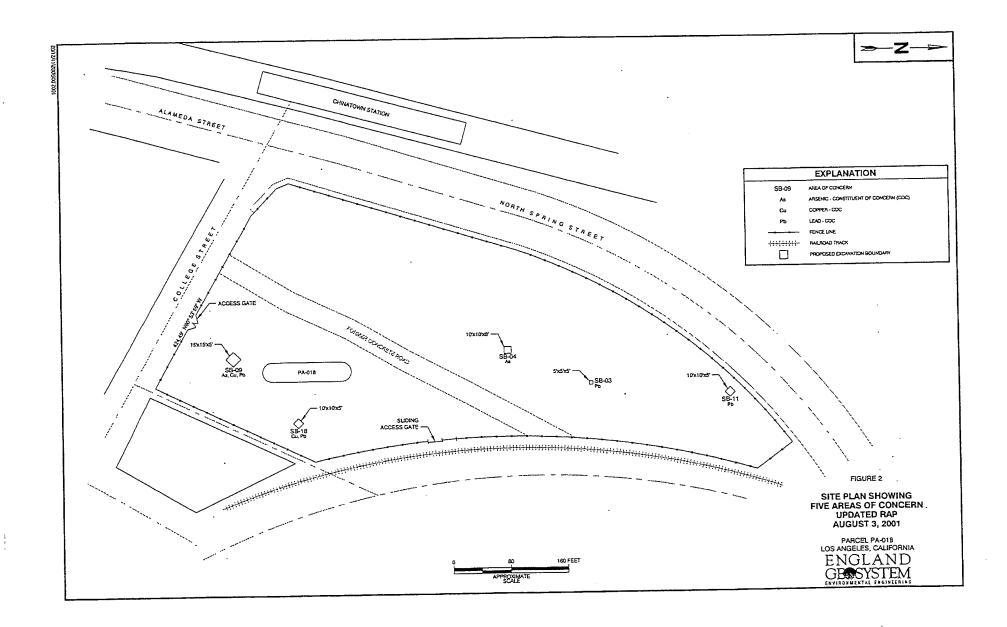
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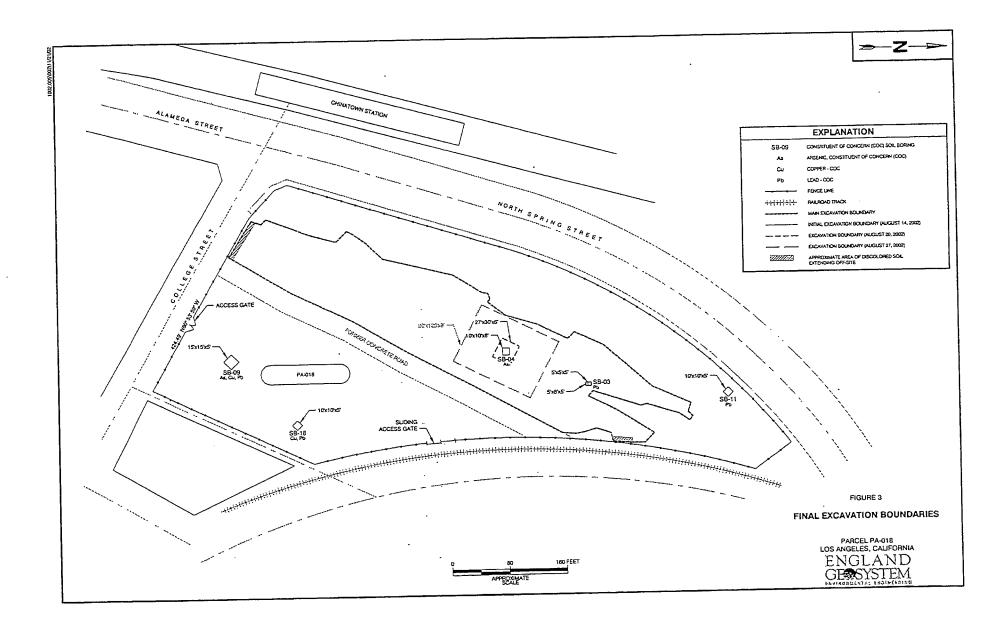
Short Legal: Lot 1 Tract Map # 19617 Bk558 Pg45

Map Not To Scale This map may or may not be a survey of the land depicted hereon. You should not rely upon it for any purpose other than orientation to the general location of the parcel or parcels depicted. First American Title expressly disclaims any liability for alleged loss or damage which may result from reliance upon this map.



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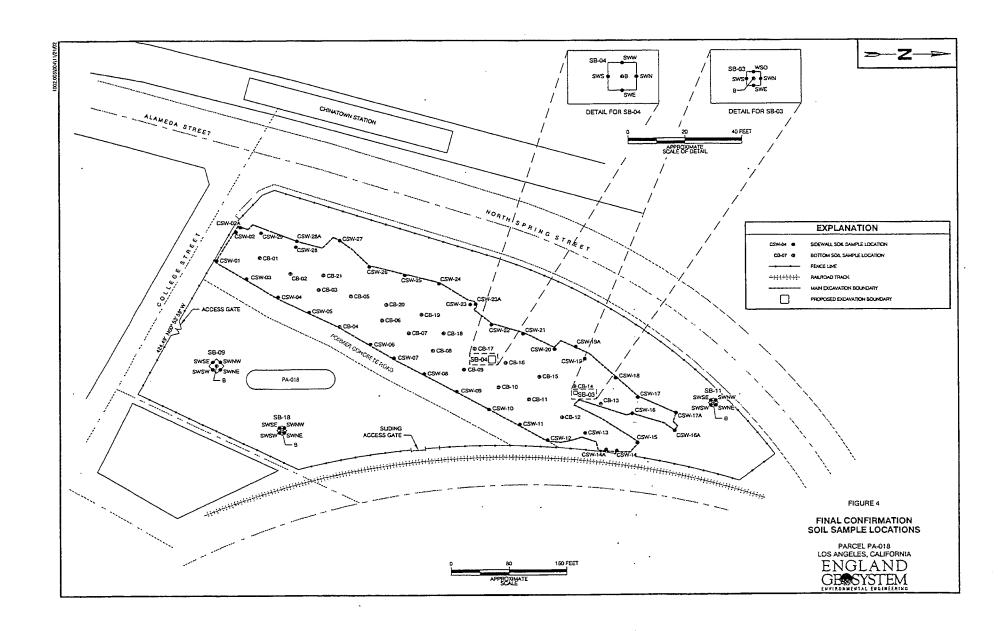


Table 1: Shallow Borings - Petroleum Hydrocarbons in Soil (mg/kg)

| Sample ID and a | TRPH<br>(EPA Method<br>418.1) | TPH-G<br>(EPA Method<br>8015M) | TPH-D<br>(EPA Method<br>8015M)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TPH-O<br>(EPA Method<br>8015M) |
|-----------------|-------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| SB-01@1'        | 36                            | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50 <sub>.</sub>               |
| SB-01@5'        | 200                           | · <1.0                         | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 50                             |
| SB-02@1'        | 53                            | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-02@5'        | 2,160 ·                       | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 799                            |
| SB-03@1'        | 708                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 274                            |
| SB-03@5'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-04@1'        | 86                            | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 82                             |
| SB-04@5'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-05@1'        | 468                           | <1.0                           | <sub>.</sub> <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 100                            |
| SB-05@5'        | 167                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 84                             |
| SB-06@1'        | 188                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 62                             |
| SB-06@5'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 、. <50                         |
| SB-07@1'        | 79                            | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-07@5'        | <10                           | <1.0                           | <10 ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <50                            |
| SB-08@1'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-08@5'        | <10                           | <b>&lt;</b> 1.0                | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-09@1'        | 520                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 150                            |
| SB-09@5'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-10@1'        | <sup>°</sup> 31               | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-10@5'        | <10                           | <1.0                           | <10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <50                            |
| SB-11@1'        | 92                            | _                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | _                              |
| SB-11@5'        | <10                           |                                | _                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | _                              |
| SB-12@1'        | 228                           | _                              | _                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                |
| SB-12@5'        | <10                           | <u> </u>                       | Name of the latest and the latest an | d by/Date: ME/08-02-00         |

Notes:

mg/kg = milligrams per kilogram (parts per million) --= sample not analyzed

Table 1: Shallow Borings - Petroleum Hydrocarbons in Soil (mg/kg)

| Sample ID and<br>Depth | TRPH<br>(EPA Method<br>418.4) |
|------------------------|-------------------------------|
| SB-02A@1'              | 7,360                         |
| SB-02A@5'              | <10                           |
| SB-02A@10'             | <10                           |
| SB-02B@1'              | 52                            |
| SB-02B@5'              | <10                           |
| SB-02B@10'             | <10                           |
| SB-02C@1'              | <10                           |
| SB-02C@5'              | <10 <sub>.</sub>              |
| SB-02C@10'             | <10                           |
| SB-03A@1'              | 2,060                         |
| SB-03A@5'              | <10                           |
| SB-03Aa@1'             | 35                            |
| SB-03B@1'              | 780                           |
| SB-03B@5'              | <10                           |
| SB-03Bb@1'             | 248                           |
| SB-03C@1'              | 430                           |
| SB-03C@5'              | <10                           |
| SB-03Cc@1'             | <10                           |
| SB-09A@1'              | 564                           |
| SB-09A@5'              | <10 .                         |
| SB-09Aa@1'             | 416                           |
| SB-09B@1'              | 18                            |
| SB-09B@5'              | <10                           |
| SB-09Bb@1'             | <10 ·                         |
| SB-09C@1'              | 260                           |
| SB-09C@5'              | <10                           |
| SB-09Cc@1'             | <10                           |
| SB-11@1'               | 92                            |
| SB-11@5'               | <10                           |
| SB-12@1'               | 228                           |
| SB-12@5'               | <10                           |

Notes:

mg/kg = milligrams per kilogram (parts per million)

Table 2. Former UST Borings - Petroleum Hydrocarbons in Soil (mg/kg)

| Sample ID and<br>Depth | TRPH<br>(EPA Method<br>418.1) | TPH-G<br>(EPA Method<br>8015M) | TPH-D<br>(EPA Method<br>8015M) | TPH-O<br>(EPA Method<br>8015M) |
|------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| USTB-01@5'             | <10                           | <1.0                           | <10                            | <50                            |
| USTB-01@10'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-01@15'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-01@22'            | 49                            | <1.0                           | <10                            | <50                            |
| USTB-01@25'            | <10                           | <1.0                           | <10                            | <50 <sub>.</sub>               |
| USTB-01@30'            | <10                           | <1.0                           | <10                            | · <50                          |
| USTB-02@5'             | <10                           | <1.0                           | <10                            | <50                            |
| USTB-02@10'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-02@15'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-02@20'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-02@25'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-02@30'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-03@5'             | <10                           | <1.0                           | <10                            | <50                            |
| USTB-03@10'            | · <10                         | <1.0                           | <10                            | <50                            |
| USTB-03@15'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-03@20'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-03@25'            | <10                           | <1.0                           | <10                            | <50                            |
| USTB-03@30'            | <10                           | <sub>.</sub> <1.0              | <10                            | <50                            |

Notes:

mg/kg = milligrams per kilogram (parts per million)

Table 3: Shallow Soil Borings - Aromatic Hydrocarbons (BTEX) and MTBE in Soil (µg/kg)

| Sample ID and<br>Depth | BTEX<br>(EPA Method<br>8015M/8020) | MTBE<br>(EPA Method<br>8015M/8020) |
|------------------------|------------------------------------|------------------------------------|
| SB-01@1'               | ND                                 | <20                                |
| SB-01@5'               | ND                                 | <20                                |
| SB-02@1'               | ND ·                               | <20                                |
| SB-02@5'               | ND                                 | · <20                              |
| SB-03@1'               | ND                                 | <20                                |
| SB-03@5'               | ND                                 | <20                                |
| SB-04@1'               | ND                                 | <20                                |
| SB-04@5'               | ND                                 | <20                                |
| SB-05@1'               | ND                                 | <20                                |
| SB-05@5'               | ND                                 | <20                                |
| SB-06@1'               | ND                                 | <20                                |
| SB-06@5'               | ND                                 | <20                                |
| SB-07@1'               | ND                                 | <20                                |
| SB-07@5'               | ND                                 | <20                                |
| SB-08@1'               | ND                                 | <20                                |
| SB-08@5'               | ND                                 | <20                                |
| SB-09@1'               | ND                                 | <20                                |
| SB-09@5'               | ND                                 | <20                                |
| SB-10@1'               | ND                                 | <20                                |
| SB-10@5'               | ND                                 | <20                                |

#### Notes:

 $\mu$ g/kg = micrograms per kilogram (parts per billion)

ND = not present above laboratory practical quantitation limits

Table 4: Former UST Borings – Aromatic Hydrocarbons (BTEX) and MTBE in Soil ( $\mu g/kg$ )

| Sample ID and 22 | BTEX<br>(EPA Method<br>8260B) | MTBE<br>(EPA Method<br>5260B) |
|------------------|-------------------------------|-------------------------------|
| USTB-01@5'       | ND                            | <20                           |
| USTB-01@10'      | · ND                          | <20                           |
| USTB-01@15'      | ND                            | <20                           |
| USTB-01@22'      | ND                            | <20 ·                         |
| USTB-01@25'      | ND                            | <20                           |
| USTB-01@30'      | ND                            | . <20                         |
| USTB-02@5'       | . ND                          | <20                           |
| USTB-02@10'      | ND                            | <20                           |
| USTB-02@15'      | ND                            | <20                           |
| USTB-02@20'      | ND                            | <20                           |
| USTB-02@25'      | ND                            | <20                           |
| USTB-02@30'      | ND                            | <20                           |
| USTB-03@5'       | ND                            | <20                           |
| USTB-03@10'      | ND                            | <20                           |
| USTB-03@15'      | ND                            | <20                           |
| USTB-03@20'      | · ND                          | ·<20                          |
| USTB-03@25'      | ND                            | <20                           |
| USTB-03@30'      | ND                            | <20                           |

### Notes:

 $\mu g/kg = micrograms$  per kilogram (parts per billion)

ND = not present above laboratory practical quantitation limits

Table 5: Shallow Soil Borings - Title 22 Metals in Soil (mg/kg)

| Sample ID and<br>Depth | Antimony | Arsenic | Barlum       | Beryllium |
|------------------------|----------|---------|--------------|-----------|
| SB-01@1'               | <0.5     | <0.5    | 153          | <0.5      |
| SB-01@5'               | <0.5     | <0.5    | 82.8         | <0.5      |
| SB-02@1'               | 0.91     | 2.18    | 149          | <0.5      |
| SB-02@5'               | 0.59     | <0.5    | 41.0         | <0.5      |
| SB-03@1'               | 10.3     | 6.51    | 122          | <0.5      |
| SB-03@5'               | <0.5     | <0.5    | 19.8         | <0.5      |
| SB-04@1'               | 14.2     | 58.1    | 126          | <0.5      |
| SB-04@5'               | 14.5     | 57.1    | 90.8         | <0.5      |
| SB-05@1'               | 2.52     | 0.80    | 133          | <0.5      |
| SB-05@5'               | 0.88     | <0.5    | 247          | <0.5      |
| SB-06@1'               | 1.12     | 5.42    | 110          | <0.5      |
| SB-06@5'               | <0.5     | <0.5    | 21.5         | <0.5      |
| SB-07@1'               | 0.54     | 1.28    | 213          | <0.5      |
| SB-07@5'               | <0.5     | 2.07    | 183          | <0.5      |
| SB-08@1'               | 0.54     | <0.5    | 181          | <0.5      |
| SB-08@5'               | <0.5     | <0.5    | 33.8         | <0.5      |
| SB-09@1'               | 7.19     | 53.1    | 97.0         | <0.5      |
| SB-09@5'               | <0.5     | <0.5    | 101          | <0.5      |
| SB-10@1'               | <0.5     | <0.5    | 143          | <0.5      |
| SB-10@5'               | <0.5     | 1.58    | 115          | 0.8       |
| TTLC (mg/kg)           | 500      | 500     | 10,000       | 75        |
| STLC (mg/L)            | 15.0     | 5.0 建建筑 | 7 * 100.0 to | 0.75      |

#### Notes:

mg/kg = milligrams per kilogram (parts per million) mg/L = milligrams per liter (parts per million)

Results in Bold = detected concentration exceeds 10 times the Title 22 STLC values

Table 5: Title 22 Metals in Soil (mg/kg) - (Continued)

| Sample ID and<br>Depth | Cadmlum      | Chromium | Cobalt | Copper |
|------------------------|--------------|----------|--------|--------|
| SB-01@1'               | <0.5         | 17.4     | 10.1   | , 28.9 |
| SB-01@5'               | <0.5         | 8.77     | 4.77   | 16.9   |
| SB-02@1'               | <0.5         | 15.5     | 8.10   | 27.4   |
| SB-02@5'               | <0.5         | 7.30     | 3.67   | 7.56   |
| SB-03@1'               | 1.49         | 10.2     | 5.99   | 194    |
| SB-03@5'               | <0.5         | 4.17     | 1.62   | 3.05   |
| SB-04@1'               | 1.09         | 9.55     | 4.80   | 72.2   |
| SB-04@5'               | 0.94         | 5.70     | 3.69   | 14.6   |
| SB-05@1'               | 0.88         | 13.5     | 5.65   | 50.6   |
| SB-05@5'               | 1.24         | 34.5     | 10.1   | 38.8   |
| SB-06@1'               | <0.5         | 10.5     | 7.32   | 57.0   |
| SB-06@5'               | <0.5         | 2.98     | 1.71   | 2.79   |
| SB-07@1'               | <0.5         | 16.6     | 7.96   | 15.9   |
| SB-07@5'               | <0.5         | 18.4     | 12.8   | 23.4   |
| SB-08@1'               | <0.5         | 13.0     | 7.33   | 24.8   |
| SB-08@5'               | <0.5         | 3.64     | 1.92   | 3.25   |
| SB-09@1'               | 2.15         | 9.66     | 5.13   | 4,230  |
| SB-09@5'               | <0.5         | 14.5     | 7.75   | 24.9   |
| SB-10@1'               | 0.55         | 16.8     | 8.10   | 23.7   |
| SB-10@5'               | <0.5         | 23.0     | 11.6   | 27.9   |
| SB-12@1'               |              | -        | _      | 2.58   |
| SB-12@5'               | . —          |          |        | 2.84   |
|                        | 100          |          |        | 2,500  |
| STLC (mg/L)            | 等点层"自1.0 会主意 | 5.0      | 80.0   | 25.0   |

#### Notes:

mg/kg = milligrams per kilogram (parts per million)

mg/L = milligrams per liter (parts per million)
Results in Bold = detected concentration exceeds 10 times the Title 22 STLC values

Table 5: Title 22 Metals in Soil (mg/kg) - (Continued)

| Sample ID and |                        |              |                | T.       |
|---------------|------------------------|--------------|----------------|----------|
| Depth         | Lead                   | Molybdenum   | Nickel         | Selenium |
| SB-01@1'      | 40.5                   | <0.5         | 16.9           | 0.62     |
| SB-01@5'      | 21.4                   | 0.53         | 6.87           | ∙0.53    |
| SB-02@1'      | 52.3                   | 0.56         | 14.8           | 0.59     |
| SB-02@5'      | 4.53                   | <0.5         | 4.65           | <0.5     |
| SB-03@1'      | 240.0                  | <0.5         | 11.2           | . 0.71   |
| SB-03@5'      | 0.33                   | 4.03         | 2.48           | <0.5     |
| SB-04@1'      | 16.4                   | . 1.25       | 7.34           | 0.60     |
| SB-04@5'      | 4.23                   | <0.5         | 3.63           | <0.5     |
| SB-05@1'      | 286.0                  | 0.69         | 10.4           | 0.62     |
| SB-05@5'      | 128.0                  | 0.70         | 26.9           | 0.61     |
| SB-06@1'      | 92.2                   | <0.5         | 10.1           | 0.68     |
| SB-06@5'      | <0.5                   | <0.5         | 2.00           | <0.5     |
| SB-07@1'      | 20.7                   | 0.70         | 16.0           | 0.52     |
| SB-07@5'      | 2.95                   | 1.15         | 30.2           | 0.84     |
| SB-08@1'      | 70.6                   | 0.61         | 11.2           | 0.66     |
| SB-08@5'      | 0.47                   | 1.23         | 2.41           | <0.5     |
| SB-09@1'      | 470.0                  | 0.77         | 12.1           | 0.73     |
| SB-09@5'      | 8.33                   | <0.5         | 10.1           | . 0.61   |
| SB-10@1'      | 53.2                   | 0.64         | 12.7           | 15.7     |
| SB-10@5'      | 2.18                   | 1.09         | 21.2           | 0.79     |
| SB-11@1'      | 818.0                  |              | <del>-</del>   |          |
| SB-11@5'      | 1.52                   | <del>-</del> |                |          |
| SB-12@1'      | 2.57                   | _            |                |          |
| SB-12@5'      | 2.84                   | _            | ļ. <del></del> | _        |
| TTLC (mg/kg)  |                        | 3,500        |                | 100      |
| STLC (mg/L)   | 3.400 元。 <b>5.0</b> 震音 | 350.0        | 建。 20.0        | 1.0      |

#### Notes:

mg/kg = milligrams per kilogram (parts per million)
mg/l = milligrams per liter (parts per million)

mg/L = milligrams per liter (parts per million)

Results in Bold = detected concentration exceeds 10 times the Title 22 STLC values

- = sample not analyzed

Table 5: Title 22 Metals in Soil (mg/kg) - (Continued)

| Sample ID and | Silver | Thallium              | Vanadium | Zinc  | Mercury |
|---------------|--------|-----------------------|----------|-------|---------|
| Depth         | <0.5   | <0.5                  | 31.9     | 84.6  | 0.61    |
| SB-01@1'      | 11     | <0.5                  | 17.8     | 60.7  | 0.48    |
| SB-01@5'      | <0.5   |                       |          |       |         |
| SB-02@1'      | <0.5   | <0.5                  | 30.8     | 104   | 0.36    |
| SB-02@5'      | <0.5   | <0.5                  | 13.8     | 21.4  | 0.33    |
| SB-03@1'      | 1.01   | <0.5                  | 20.1     | 337   | 13.7    |
| SB-03@5'      | <0.5   | <0.5                  | 6.77     | 8.50  | 0.71    |
| SB-04@1'      | <0.5   | <0.5                  | 31.8     | 77.2  | 0.42    |
| \$B-04@5'     | <0.5   | <0.5                  | 31.0     | 64.6  | 0.36    |
| SB-05@1'      | <0.5   | <0.5                  | 20.8     | 263   | 6.20    |
| \$B-05@5'     | <0.5   | <0.5                  | 41.4     | 194   | 2.20    |
| SB-06@1'      | <0.5   | <0.5                  | 24.2     | 231   | 0.33    |
| SB-06@5'      | <0.5   | <0.5                  | 5.94     | 8.93  | <0.2    |
| SB-07@1'      | <0.5   | <0.5                  | 32.1     | 51.3  | <0.2    |
| SB-07@5'      | · <0.5 | <0.5                  | 29.9     | 69.3  | 0.24    |
| SB-08@1'      | 0.65   | <0.5                  | 27.8     | 101   | 1.29    |
| SB-08@5'      | <0.5   | <0.5                  | 9.42     | 11.3  | 0.3     |
| SB-09@1'      | 2.10   | <0.5                  | 20.0     | 1,820 | 0.7     |
| SB-09@5       | <0.5   | <0.5                  | 27.4     | 72.5  | 0.4     |
| SB-10@1'      | 0.54   | <0.5                  | 31.5     | 103 - | 0.49    |
| SB-10@5'      | <0.5   | <0.5                  | 28.7     | 58.2  | 0.29    |
| TTLC (mg/kg)  | 500    |                       | aa 2,400 | 5,000 | 20      |
| STLC (mg/L)   |        | - 17. <b>7.0</b> ,480 | 24.0     | 250.0 | 0.2     |

Notes:

mg/kg = milligrams per kilogram (parts per million) mg/L = milligrams per liter (parts per million) Results in Bold = detected concentration exceeds 10 times the Title 22 STLC values

Table 5: Title 22 Metals in Soil (mg/kg) - (Continued)

| Sample ID and<br>Depth | Lead<br>(TTLC)      | Lead<br>(STLC) |
|------------------------|---------------------|----------------|
| SB-03A@1'              | 476.0               | 14.5           |
| SB-03A@5'              | 2.02                | <0.50          |
| SB-03Aa@1'             | 5.42                | 0.68           |
| SB-03B@1'              | 287.0               | 8.99           |
| SB-03B@5'              | 1.58                | <0.50          |
| SB-03Bb@1'             | 218.0               | 10.8           |
| SB-03C@1'              | 259.0               | 10.8           |
| SB-03C@5'              | 1.40                | <0.50          |
| SB-03Cc@1'             | 7.50                | <0.50          |
| SB-05A@1'              | 67.2                | 2.23           |
| SB-05A@5'              | 7.95                | <0.50          |
| SB-05Aa@1'             | 59.6                | 1.87           |
| SB-05B@1'              | 4.51                | <0.50          |
| SB-05B@5'              | <0.25               | <0.50          |
| SB-05Bb@1'             | 63.4                | 1.64           |
| SB-05C@1'              | 48.6                | 0.68           |
| SB-05C@5'              | 51.0                | <0.50          |
| SB-05Cc@1'             | 1.98                | <0.50          |
| SB-06A@1'              | 2.99                | <0.50          |
| SB-06A@5'              | 1.56                | <0.50          |
| SB-06Aa@1'             | <sup>-</sup> 26.7   | <0.50          |
| SB-06B@1'              | 1.59                | <0.50          |
| SB-06B@5'              | · 0.74              | <0.50          |
| SB-06Bb@1'             | 112.0               | 7.96           |
| SB-06C@1'              | 2.95                | <0.50          |
| SB-06C@5'              | <0.5                | <0.50          |
| SB-06Cc@1'             | 1.51                | <0.50          |
| TTLC (mg/kg)           | 74. <b>1,000</b> 55 |                |
| STLC (mg/L)            | 国家总型数学是             | <b>5.0</b> 年   |

#### Notes:

mg/kg = milligrams per kilogram (parts per million) mg/L = milligrams per liter (parts per million)

Results in Bold = TTLC detected concentration exceeds 10 times the Title 22 STLC limits or STLC values exceed Title 22 STLC limits.

Table 5: Title 22 Metals in Soil (mg/kg) - (Continued)

| Sample ID and<br>Depth | Copper<br>(TTLC) | Copper<br>(STLC) |
|------------------------|------------------|------------------|
| SB-09A@1'              | 565              | 35.9             |
| SB-09A@5'              | 17.7             | 0.30             |
| SB-09Aa@1'             | 3,300            | 180              |
| SB-09B@1'              | 280              | 8.95             |
| SB-09B@5'              | 4.58             | <0.25            |
| SB-09Bb@1'             | 14.3             | 0.31             |
| SB-09C@1'              | 1,930            | 79.0             |
| SB-09C@5'              | 2.92             | 0.33             |
| SB-09Cc@1'             | . 2.47           | 0.27             |
| TTLC (mg/kg)           | 2,500            | 超级中华分            |
| STLC (mg/L)            | ar erralitie     | 25.0             |

#### Notes:

mg/kg = milligrams per kilogram (parts per million)
mg/L = milligrams per liter (parts per million)
Results in Bold = TTLC detected concentration exceeds 10 times the Title 22
STLC limits or STLC values exceed Title 22 STLC limits.

Table 6: Shallow Soil Borings - Soluble Title 22 Metals in Soil (mg/L)

| Sample ID and Depth | Lead     | Arsenic      | Mercury | Copper               | Selenium |
|---------------------|----------|--------------|---------|----------------------|----------|
| SB-02@1'            | 2.40     | _            |         |                      | _        |
| SB-03@1'            | 7.79     | _            | <0.02   | -                    |          |
| SB-04@1'            |          | 0.90         |         |                      |          |
| SB-04@5'            | <u> </u> | 1.48         | _       |                      |          |
| SB-05@1'            | <0.50    | _            | <0.02   |                      | _        |
| SB-05@5'            | 5.72     | _            | <0.02   |                      |          |
| SB-06@1'            | 7.78     | -            |         | _                    | _        |
| SB-08@1'            | 2.12     |              | _       |                      | _        |
| SB-09@1'            | 3.83     | 0.92         | _       | 86.9                 |          |
| SB-10@1'            | 1.97     |              | _       | -                    | <0.25    |
| SB-11@1'            | 13.9     | <del>-</del> | -       | _                    |          |
| SB-11@5'            | <0.50    | _            |         | _                    | ·        |
| SB-12@1'            | 0.35     | _            | _       | <u> </u>             |          |
| SB-12@5'            | <0.25    |              |         | _                    |          |
| STLC (mg/L)         | 5.0      | 5.0          | 0.2     | 3€ pa. + <b>25.0</b> | 1.0      |

Notes:

mg/L = milligrams per liter (parts per million) — = sample not analyzed

Results in Bold = detected concentration exceeds Title 22 STLC values

#### Table 7: Former UST Borings - VOCs in Soil by EPA Method 8260B (µg/kg)

VOCs were not present above the laboratory practical quantitation limits in the samples from the UST borings that were analyzed.

Table 8: Shallow Soil Borings - PCBs and Pesticides in Soil by EPA Method 8080 (mg/kg)

| Sample ID and<br>Depth            | 4,4'-DDD<br>(DDD) | 4,4'-DDE<br>(DDE) | 4,4'-<br>DDT<br>(DDT) | Araclor-<br>1260<br>(PCB-1260) |
|-----------------------------------|-------------------|-------------------|-----------------------|--------------------------------|
| SB-02@5'                          | <del>-</del>      | . —               |                       | 0.562                          |
| SB-03@1'                          | 0.0043            | _                 | 0.040                 | _                              |
| SB-04@1'                          | _                 | 0.014             | 0.045                 | <del></del>                    |
| SB-05@1'                          | -                 |                   | 0.012                 |                                |
| SB-05@5'                          | _                 |                   | 0.010                 |                                |
| ÉPA Residential<br>PRG<br>(mg/kg) | 2.4               | 1.7               | 1.7                   | 0.22                           |
| EPA Industrial<br>PRG<br>(mg/kg)  | 17                | - 12              | 12                    | 1.0                            |

Notes:

— = not present above laboratory practical quantitation limits PRG = Region 9 Federal EPA Preliminary Remediation Goals

Table 9: Ground-water Borings - Petroleum Hydrocarbons in Ground Water

| Sample ID and<br>Depth | TRPH<br>(EPA Method<br>418.1) | TPH-G<br>(EPA Method<br>8015M) | TPH-D<br>(EPA Method<br>8015M) | TPH-O<br>(EPA Method<br>8015M) |
|------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| GWB-01                 | <0.5                          | <50                            | <0.5                           | <0.5                           |
| GWB-02                 | NA                            | NA                             | NA                             | NA                             |
| GWB-03 .               | <0.5                          | <50                            | <0.5                           | <0.5                           |
| GWB-04 .               | 3,760                         | <500                           | 1,500                          | <10                            |
| GWB-05                 | <0.5                          | <50                            | <0.5                           | <0.5                           |
| Units                  | mg/L                          | μg/L                           | mg/L                           | mg/L                           |

Prepared by/Date: MF/08-02-00

Checked by/Date: RHG/08-03-00

#### Notes:

mg/L = milligrams per liter (parts per million)  $\mu g/L = micrograms$  per liter (parts per billion)

NA = sample not analyzed

Table~10:~Ground-water~Borings- Aromatic Hydrocarbons (BTEX) and MTBE in Ground Water (µg/L)

| Sample ID and<br>Depth | BTEX<br>(EPA Method<br>8015M/8020) | MTBE<br>(EPA Method<br>8015M/8020) |
|------------------------|------------------------------------|------------------------------------|
| GWB-01                 | ND                                 | <2                                 |
| GWB-02                 | NA                                 | NA                                 |
| GWB-03                 | ND                                 | <2                                 |
| GWB-04                 | ND ·                               | <20                                |
| GWB-05                 | ND                                 | <2                                 |

Notes:

 $\mu$ g/L = micrograms per liter (parts per billion)

Table 11: Ground-water Borings - Volatile Organic Compounds in Ground Water (µg/L)

| Sample ID and Depth           | n-Butylbenzene | Napthalene      |
|-------------------------------|----------------|-----------------|
| GWB-01                        | <1.0           | <1.0            |
| GWB-02                        | NA NA          | NA .            |
| GWB-03                        | <1.0           | <1.0            |
| GWB-04                        | 31             | 20              |
| GWB-05                        | <1.0           | <1.0            |
| EPA PRG (Tap Water)<br>(μg/L) | 61             | Not available ` |

#### Notes:

μg/L = micrograms per liter (parts per billion)

NA = not analyzed

The remaining VOC's were not present above the laboratory practical quantitation limits in the four ground-water samples that were analyzed.



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320 W. 4th Street, Suite 200, Los Angeles, California 90013 Phone (213) 576-6600 FAX (213) 576-6640 Internet Address: http://www.swreb.cu.gov/rwggha PBL CONST. AUTHORITY

February 20, 2003

Monard Thorpe Crief Executive Officer Metro Blue Line Construction Authority 625 Fair Oaks Avenue, Suite 200 South Pasadena, CA 91030

| Post-it" Fax Note 7671 | Calo 2/2//63   poges 4 |
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| Fax # 626 - 799-8595   | 130 576-6325           |
| 626-799-8595           | Pax 4                  |

NO FURTHER ACTION-PARCEL PA-018, LOS ANGELES TO PASADENA BLUE LINE, 924 NORTH SPRING STREET, LOS ANGELES, CALIFORNINA (SLIC NO. 904B, BILLING ID 204BK00)

Dear Mr. Thorpe:

The Los Angeles Regional Water Quality Control Board (Regional Board) has received and reviewed the Remedial Action Plan Implementation Summary and Site Closure Request (Closure Report) dated November 21, 2002. A Post-Remediation Human Health Risk Assessment (Post-Remediation HRA) included with the Closure Report, was given to the Office of Environmental Health Hazard Assessment (OEHHA) for review. The purpose of this letter is to provide notice that no further action is required for cleanup or investigation of soil beneath Parcel PA-018 (Site). Upon review of the Closure Report and other information in our files, minor residual contaminants in soil at Parcel 18 do not pose a threat to groundwater quality. Furthermore, based on comments from OEHHA with respect to the Post-Remediation HRA. proposed development on the property, including residential use of the second floors and above, does not pose a significant threat to human health.

Background

Parcel PA-018 is located at the intersection of North Spring Street and College Street in the City of Los Angeles, and across the street from the Metro Chinatown Station. The Site was previously owned by Union Paoific Railroad Company and at present is owned by the Los Angeles to Pasadena Metro Blue Line Construction Authority (Authority). The Site is about 6 acres and is surrounded by industrial and commercial use land.

Historically the Site has been used for a wood and coal yard, an oil warehouse, dwellings, and for small businesses. Since 1905 it was used as a rail freight yard, but it has been vacant since about 1970. Buildings at the Site were demolished in the late 1980s. A gasoline tank was removed in April 1987 with no evidence of leakage. Reports from 1989 indicate that the Site was used for the storage of tanks and shipping containers.

Several water-bearing zones underlie the Site, but there are no production wells within one mile of the property. The shallow semi-perched zone is about 30 ft below ground surface, and the groundwater flow direction is in a south-southwest direction.

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California Environmental Protection Agency

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February 20, 2003

Groundwater in the southwestern portion of the Site has been impacted by heavy-end hydrocarbons (diesel-range and total recoverable petroleum hydrocarbons). Based on regional groundwater flow and documented historic service station operations at neighboring off-site properties, the groundwater explanation appears to be from off-site sources.

The Site is planned for development of a four-story building, with commercial, retail business on the lower level, and housing on the other three floors. There are no planned underground structures, green areas, or unexved areas at the Site.

#### Remedial Action for Contaminants of Concern

In a letter dated August 27, 2002, the Regional Board approved the Response to OEHHA Comments-Updated Remedial Action Plan Parcel PA-018 (Updated RAP) dated February 2002. A Supplemental Human Health Risk Assessment, included in the Updated RAP, was reviewed and approved by OEHHA, in a Memorandum to the Regional Board dated, July 23, 2002. The Updated RAP identified five areas at the first required remedial action, because the Contaminants of Concern (COCs) exceeded target cleanup goals for lead (greater than and/or equal to [≥] 350 milligrams per kilogram [nig/kg]) and arsenic (≥10.8 mg/kg). In two areas, copper was clevated but below target cleanup goals and associated with lead in others.

During excavation, a distinct layer of green clayey soil with a fibrous white material was observed between the top layer of dark brown soil containing various debris, and the deeper layer of light yellowish brown to light brown well graded sand with some well-rounded gravel and cobbles. The green soil layer varied from a few inches to approximately four feet thick, and was observed at depths ranging from 2 to 8 feet below grade. The green soil was analyzed for metals, volatile organic compounds (VOCs), and total perfoleum hydrocarbons (TPH), and revealed arsenic ranging up to 134 mg/kg and lead up to 978 mg/kg. However, works, TPH, or asbestos were not detected in these samples. Soil that was not green in color contained up

Case the green soil was identified, excavation was continued outward radially and the excavated soil was pieced in different stockpiles. The stockpile soil was sampled and analyzed for metals, VOCs, polychlorinated biphenyls (PCBs), pesticides, and TPH. Furthermore, this soil was also analyzed for Soluble Threshold Limit Concentration (STLC) and Toxicity Characteristic Leaching Procedure (TCLP), for the purpose of classifying the soil as hazardous waste or not. Soluble lead (Pb) was up to 11.2 milligrams per liter (mg/L) (STLC Pb = 5 mg/L), and souble arsenic (As) as up to 2.17 mg/L (STLC As = 5mg/L); measured TCLPs for arsenic and lead were found below the respective target values (TCLP arsenic = 5.0 mg/L; TCLP lead = 5 mg/L).

were excevated until all visible green-colored soil was removed, which extended for about 126 feet by 680 feet and represented over 17,000 tons of material excavated and transported off-site (238 tons of frazardous waste were transported to the La Paz County Landfill, Parker City, Arizona; 12,200 tons of waste soil were transported to the Bradley Landfill, Sun Valley California and to Filter Recycling Services, Inc., Etialto, California; 3,100 tons of overburden soil, and 1,500 tons of concrete were transported to the NuWay facility, Irwindale, California). Excavation and soil removal continued up to two points in which the green soil appears to extend beyond the property boundary.

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Mr. Richard Thorpe
Ellis Line Construction Authority

-3-

February 20, 2003

Following a sampling plan, the excavation floor and the sides were analyzed for arsenic and lead, and results indicated that these analyzes were at concentrations below clean up target levels. Confirmation soil samples were analyzed for Title 22 metals (USEPA Method 6010B/7471), mercury (USEPA 7471A), TPH as gasoline (USEPA Method 8015M), TPH carbon range (USEPA Method 8015-CCI), VOCs (USEPA Method 8260B), SVOCs (USEPA Method 8270C), and organochloride pesticides and PCBs (USEPA Method 8081A/8082). Analytical results for the above COCs indicated no concentrations above clean up levels established in the Updated RAP.

#### CEMEA Review of Closure Report and Post-Remediation Health Risk Assessment

In comments to the Regional Board from OEHHA received February 10, 2003, analytical data and health risk analyses presented in the Closure Report and Post-Remediation HRA, indicate that residual levels of hazardous contaminants at Parcel 18 are below levels of concern. Therefore, it was concluded by OEHHA that the Site will not pose any significant health threat to humans following the development of the property.

OTHERA also noted that as long as the nature, extent, and severity of the contamination does not significantly depart from those identified at this Site, and the use of the land does not depart from the proposed use, the health risks associated with residual contamination left in soils at the Site will not exceed and most likely will be less than - those estimated for the protection of human health.

#### No Tarmer Action Required

Based on the information submitted in the Closure Report and on comments received from OEHHA in their Memorandum received February 10, 2003, and with the provision that information provided to this Regional Board is accurate and representative of conditions at the subject site, we have no further requirements for the property with respect to the Spills, Leaks, Investigation, and Cleanup Program at this time. Although monor residual levels of contaminants remain in soil beneath the subject site, additional cleanup is not movined due to the low concentrations detected, which pose minimal threat to human health or groundwater the low concentration must be provided to the Regional Board within 72 hours should additional contamination be encountered during any future activities at the Site and also a written notification must be submitted to this Regional Board should a change of current land use be proposed. In addition, the resolution requirements of other agencies, such as the United States Environmental Protection Agency, are not affected by this Regional Board's "No Further Action" determination. Such agencies may choose to make their own determination concerning this site.

We would like to take this opportunity to thank you for your full cooperation with this Regional Board during the course of the site assessment and soil remediation. If you have any questions, please call Mr. A.T. Liu at (213) 576-6667 or Mr. David Young at (213) 576-6744.

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Mr. Richard Thorpe Blue Line Construction Authority .4.

February 20, 2003

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Dennis A. Dickerson Executive Officer

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Mr. Habib Balian, Metro Blue Line Construction Authority

Mr. John Harris, Richards, Watson & Gershon

Mr. Mark Bierei, Montgomery Watson

Mr. Frank Tam, Montgomery Watson

Ms. Chris Kinne, California Environmental Protection Agency

California Environmental Protection Agency

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## Appendix B-3

Preliminary Hydrology Report

# Preliminary Hydrology Report



#### TUSTIN

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#### **APPENDIX**

- "A" TcCalculator (Tc.Calc\_Depth.xls) 50-Year Event Pre-Development Data and Results
- "B" TcCalculator (Tc\_Calc\_Depth.xls) 50-Year Event Post Development Data and Results
- "C" LID Calculations
- "D" Cistern System Data Sheets and Drawings

#### **ATTACHMENTS**

- LACDPW-Los Angeles 50-Year, 24-Hour Isohyet, 1-H1.19 (1 sheet)
- Los Angeles County Hydrology Manual Appendix D Proportion
   Impervious Data (4 sheets)
- City of Los Angeles Drainage Map No. 494-4-16 (1 sheet)
- LID Manual Table 4.1-Infiltration Feasibility Screening
- LID Manual Table 4.2-Capture and Use

#### **EXECUTIVE SUMMARY**

The purpose of this study is to analyze the proposed College Station development project with respect to hydrology and drainage alternatives. In addition, the issues of water quality and design flows of stormwater are addressed.

This project is a proposed mixed-use transit-oriented development consisting of 5.24 acres at 924 N. Spring Street in the Central City North community of the City of Los Angeles. The Project Site is located immediately east of the Los Angeles County Metropolitan Transportation Authority ("Metro") Chinatown Gold Line light rail station at N. Spring Street and College Street, and the northern end of the site is adjacent to a Los Angeles Historic State Park ("Park", also known as The Cornfields). Project Site is currently vacant and is periodically used for parking by nearby industrial and commercial businesses. The project development will also consist of three new parcels with 685 residential units, and 43,500 square feet of retail space.

Hydrology calculations were performed using the Los Angeles County of Public Works Hydrology Manual, dated 2006, and calculated for both 50-year and 10-year storm events.

With regard to surface water quality and the treatment of both non-storm and "first flush" stormwater runoff in accordance with the City of Los Angeles Stormwater Pollution Control Plan criteria, on-site water treatment is proposed through the use of two Cistern treatment systems. These systems are known as a capture and use BMP's. Both will be constructed within the project limits, please see section 7.0 for a detailed explanation.

#### 1.0 <u>INTRODUCTION</u>

The purpose of this report is to analyze the proposed development with respect to hydrology and surface water quality. See Figure I, Vicinity Map, in the Figures section of this report.

#### 2.0 PROJECT DESCRIPTION

This project is a proposed mixed-use transit-oriented development consisting of 5.24 acres at 924 N. Spring Street in the Central City North community of the City of Los Angeles. Project Site is currently vacant and is periodically used for parking by nearby industrial and commercial businesses. The project development will also consist of three new parcels with 685 residential units, and 43,500 square feet of retail space. To remain conservative the percent imperviousness used in all post-development calculations for the Initial Study is 91%.

#### 3.0 EXISTING SITE SUMMARY

The 5.24 acre proposed project is located at 924 N. Spring Street in the Central City North community of the City of Los Angeles. The site is located immediately east of the Los Angeles County Metropolitan Transportation Authority Chinatown Gold Line light rail station at N. Spring Street and College Street, and the northern end of the site is located across N. Spring Street from the Los Angeles Historic State Park (also known as The Cornfields). The existing site imperviousness was defined using Appendix D from the 2006 LACFCD Hydrology Manual, this percent impervious is found to be 91%. Reference Figure I, Vicinity Map in the Figures section and Appendix D of the 2006 LACFCD Hydrology manual enclosed in the Attachments of this report.

#### 4.0 EXISTING STORM DRAIN FACILITIES

There are two existing storm drain catch basins within close proximity to the project. North Spring Street has two side-opening catch basins connected to an existing storm drain main under Spring Street. The catch basins, laterals and main line are under the ownership of City of Los Angeles. The two existing side-opening catch basins are located on the southwest corner of the project, at the intersection of N. Spring Street and College Street, both are connected in series and ultimately connect via an 18" RCP to a 33" RCP lateral that connects to a 66" main line at the intersection of College and N. Spring Street. The catch basins, the 18" lateral, the 33" lateral and the 66" main are owned and maintained by the City of Los Angeles.

#### 5.0 EXISTING HYDROLOGY

As described in the section above, and by visual inspection of the site, the majority of the site drains in a southeasterly direction. Research efforts to obtain copies of hydrology and hydraulic calculations and data for the existing capacity and allowable discharge to the City of Los Angeles public storm drains in the adjacent streets is still in progress and will be reflected in an updated report upon receipt. Reference Figure II, "Pre-Development Hydrology Map".

#### 6.0 HYDROLOGY CALCULATIONS

Hydrology calculations were performed utilizing the Los Angeles County Department of Public Works' MODRAT method, revised in 2006. This method includes new Isohyetal Maps and a new Tc Calculator "Tc\_Calc\_depth.xls" program. Calculations were performed using the "Tc\_Calc\_depth.xls" program, See "Summary of Hydrological Sub-Areas" (Tables No. 1 and No. 2) on pages 9 and 10.

Drainage sub-areas were created and graphically illustrated on the "Pre-Development Hydrology Map" (Figure II) and the "Post-Development Hydrology Map" (Figure III) found in the Figures section of this report.

The site is situated adjacent to the 50-year Isohyet equal to 6.1 inches of rainfall and the soil classification for the project is 06. See the attached LACDPW "Los Angeles," 50-year, 24-Hour Isohyet Map 1-H1.19" found in the Attachments section of this report.

The proportion impervious values are obtained using Appendix D from the LACFCD Hydrology Manual, the "Proportion Impervious Data" table found in the Attachments section of this report. The proportion impervious value used for the pre-development condition was 91%. With regard to both the pre-development and post-development calculations in the Initial Study, the percent impervious used was 91%. The existing site is a parking lot with decomposing asphalt and the recommended percent impervious is 91% per the Hydrology Manual. The proposed recommended value for High-Rise Apartments and Condominiums is 90% per the Hydrology Manual so to remain conservative with the calculations we used 91%.

#### 6.1 Pre-Development Hydrology Calculations

The existing site is a vacant parking lot that is composed of decomposed asphalt. The existing drainage area is comprised of one (1) drainage sub-area, there is a very small portion of the site that drains to Rondout Street, this sub-area was so small that it was insignificant to the overall behavior of the pre-development condition. The vast majority of the site drains by sheet flow to N. Spring Street and College Street. The street gutter then collects runoff and it is ultimately collected by the existing catch basins located on N. Spring Street as it enters the storm drain system. The sub-area boundary was established utilizing the site topography survey and the existing storm drain network system to obtain the Pre-Development  $Q_{50}$ -year event runoff. See Figure II, "Pre-Development Hydrology Map" and Table No.1, "Summary of Hydrological Sub-Areas" on page 9. See the " $Q_{50}$  Pre-Development" and Reference Figure II, "Pre-Development Hydrology Map"

#### **6.2 Post-Development Hydrology Calculations**

The post-development flow rates were calculated by prorating the pre-development values which were based on an imperviousness of 91%. This post-development runoff was calculated using the existing slope and length of slope to conservatively estimate the proposed runoff. The post-development condition will be a newly constructed building which the Hydrology Manual suggests 90%. However, we used 91% to provide

a conservative post-development flow rate that would adequately simulate the proposed development condition. The Tc calculator is used to model the response of a watershed to a given rain event, it is defined as the time needed for water to flow from the most remote point of the watershed to the watershed outlet. This calculation is typically used to estimate the runoff produced from sheet flow and doesn't adequately calculate the implementation of a buildings plumbing network. With the use of the average cfs per acre proration we are able to calculate the post-development runoff, the average cfs per acre was calculated as follows: 15.75cfs/5.24acres=3.01cfs/acre and applied over the three (3) sub-areas. Please reference Figure III, "Post-Development Hydrology Map" and Table No. 2, "Summary of Hydrological Sub-Areas Post-Development" on page 10 of this report. Please also see "Q<sub>50</sub> Post-Development" output files in the Appendix section of this report.

The drainage area is comprised of three (3) drainage sub-areas that will connect the roof drains, area drains and proposed onsite catch basins to the proposed Cistern systems. The overflow drain will connect directly to catch basins and ultimately discharge to the existing network of storm drain pipes. The overflow will bypass the cisterns and CDS units. Sub-area boundaries were established utilizing the proposed building layout, existing and surrounding topography as well as the existing storm drain network. After the sub areas were defined we prorated each area with 3.01cfs/acre to obtain the Post-Development  $Q_{50}$ -year event runoff. With the use of a Cistern system the post-development runoff is reduced by the peak mitigated flow rate (see Appendix C for  $Q_{pm}$  calculations) so we see that the total peak flow from the post-development condition will be 15.77cfs-0.92cfs= 14.85cfs. This post-development flow rate is less than the pre-development condition of 15.75cfs.

#### 7.0 STORMWATER TREATMENT QUALITY CONTROL

The Standard Urban Stormwater Mitigation Plan (SUSMP) was developed in the City of Los Angeles in 2002 as part of the municipal stormwater program to address stormwater pollution from new development and redevelopment projects. A recent stormwater management approach aimed at achieving this goal is the use of Low Impact Development (LID). LID is the widely recognized and preferred approach to stormwater management for the purpose of water quality compliance. LID is a stormwater management strategy that seeks to mitigate the impact of increases in runoff and stormwater pollutants as close to its source as possible. LID comprises a set of site design approaches and Best Management Practices (BMPs) that promote the use of natural infiltration, evapotranspiration, and reuse of stormwater. With respect to urban development and redevelopment projects, it can be applied on-site to mimic the site's predevelopment drainage characteristics.

#### 7.1 City of Los Angeles Low Impact Development Requirements

In November 2011, the City of Los Angeles adopted the Stormwater LID Ordinance (Ordinance# 181899) with the stated purpose of:

- 1. Requiring use of LID standards and practices in future development and redevelopment to encourage the beneficial use of rainwater and urban runoff;
- 2. Reducing stormwater runoff while improving water quality;
- 3. Promoting rainwater harvesting;
- 4. Reducing offsite runoff and providing increased groundwater recharge;
- 5. Reducing erosion and hydrologic impacts downstream; and
- 6. Enhancing the recreational and aesthetic values in our communities.

These mitigation requirements have been sourced and are incorporated herein by reference to the following stormwater quality literature:

 Development Best Management Practices Handbook, Low Impact Development Manual, part B Planning Activities, Fourth Edition, City of Los Angeles, Board of Public Works, June, 2011

Following is a description of the existing conditions in which potentially significant impacts associated with proposed projects are identified in addition to mitigation measures to reduce project impacts. The primary objectives of mitigation measures are to:

- 1. Effectively reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.
- 2. Reduce the quantity of stormwater discharge into public stormwater conveyance systems through on-site infiltration methods.

#### 7.2 Site Conditions BMP Method of Selection

The proposed project will require treatment of on-site storm flows and the treatment system will be located within the project limits. The proposed stormwater conveyance system will discharge to a proposed Cistern to capture and use the post-development runoff and provide treatment before discharging. See Figure III, "Post-Development Hydrology Map" and Appendix "C".

The required treatment flow to these systems is determined using the method described in the Low Impact Development (LID) plan, published by the City of Los Angeles. The City of Los Angeles LID manual prescribes a hierarchy when determining

the feasibility of using LID mitigation methods for a project. There are 3 widely accepted methods and they should be evaluated and screened in the following order:

- 1. Infiltration Systems
- 2. Stormwater Capture and Use (rain harvesting)
- 3. High Efficiency Biofiltration/Bioretention Systems (Flow Through Planters)
- 4. Combination of Any of the Above
- 1. Infiltration Systems: Due to the prevalence and most importantly the elevation of the on-site underlying water table historically exists 20 feet below the surface, infiltration is not a feasible option as shown in Table 4.1 in the attachments section of this report.
- 2. Stormwater Capture and Use: For the Capture and Use feasibility screening we needed to assume a landscape area of 10% (please see the hand calculations in Appendix C of this report), this assumption allows an Estimate Total Water Usage (ETWU) to be calculated. As shown in Table 4.2 located in the attachments section of this report. When we compare the V<sub>m</sub> to the ETWU we see the relation V<sub>m</sub><ETWU and thus fall under method 2, as shown in Table 4.2 in the attachments. Capture and Use will be the LID mitigation method used.
- **3. High Efficiency Bioinfiltration/Bioretention Systems**: These will be evaluated on an as needed basis. At this time there is no need to implement these types of BMP's
- **4. A Combination**: A combination of BMP's is not necessary at this time.

#### 7.3 Schematic Overview

As the stormwater runoff is collected by the site area drains, roof drains and on-site catch basins it will be directed to the cistern systems which will be located subsurface underneath the drive aisles. This plumbing network will be connected to two Cistern systems and feed them through gravity. The Cistern system is comprised of a pretreatment CDS unit, a large waterproof holding tank and a pump. The water that the site experiences will pass through one of the two proposed systems, first the CDS unit will clean the runoff as it enters the unit. Second, the water will flow from the CDS unit to the large waterproof holding tank as it is collected. Third, the water will then be used to irrigate the sites landscaping through use of a mechanical system consisting of pumps and a control valve. In the event that the storm produces runoff above the mitigation requirements the overflow will discharge via SD pipes directly to an existing and proposed catch basin located on Spring Street. Sub area A1 and A2 will overflow to the proposed catch basin on N. Spring Street and A3 will connect to the existing catch basin on N. Spring Street, please Figure IV-LID BMP Locations Exhibit.

#### 7.4 BMP Sizing Calculations

To determine the volume required to be mitigated  $(V_m)$  and peak mitigated flow rate  $(Q_{pm})$  for the Stormwater Treatment Quality Control Calculations, the Los Angeles County Department of Public Works programs " $V_m$  Calc" and "LID RATE Calculator.xls" were utilized. Each subarea was analyzed to determine the

treatment measure required for that sub-area. Sub areas A1 and A2 will be combined into one Cistern system and sub area A3 will contain the other, please see Figure III of this report for reference. The results of these calculations are found in Appendix "C", but to summarize: the volume that is required to be mitigated for the combined A1 and A2 sub areas is  $V_m$ = 4,670 cubic feet and for A3 the  $V_m$ =7,933 cubic feet. The mitigated peak flow is  $Q_{pm}$ = 0.34cfs and 0.58cfs respectively. This sums to a total  $Q_{pm}$ =0.92 cfs. An initial calculation was performed based on an assumed planter area and it was determined that the use of the Cistern is feasible (please see Appendix "C" for calculation reference). The appropriate size of the Cisterns was estimated by using the  $V_m$  and the formula of a cylindrical tube to model the SRPE, please see the Cistern Sizing printout in Appendix D and the of this report. The Cistern for sub area A1 and A2 will be 2 parallel connected Steel Reinforced Polyethylene (SRPE) pipes, each pipe will be 7 feet in diameter with a length of 62'. The Cistern for sub area A3 will be 2 parallel connected Steel Reinforced Polyethylene (SRPE) pipes, each pipe will be 8 feet in diameter with a length of 80'.

#### 7.5 Post Construction BMP's

#### A. CDS Hydrodynamic Separation Unit:

Each of the two Cistern systems utilize a Contech CDS hydrodynamic separation unit that serves as a method of pretreatment for the collected site runoff. This unit uses a method of continuous deflective separation to effectively screen, separate and trap debris. Sediment and oil from stormwater runoff is also screened and the CDS unit will also capture and retain 100% of floatable debris. For detailed information please see the Appendix D of this report. This CDS unit is connected to the Cistern tank inlet and is fed by way of gravity. The cleaned water is stored and pumped out for irrigation purposes.

#### B. Steel Reinforced Polyethylene (SRPE) Cistern:

The Cistern itself will be constructed out of Steel Reinforced Polyethylene (SRPE) material, please see Appendix D – SRPE for detailed information regarding the material specifications, construction/installation, inspection/maintenance and technical information. It is important to note that due to the findings in the Geotechnical report for this project that due to a shallow water table depth of 30-35 feet below the surface, excessive groundwater may necessitate dewatering and installation shall conform to the table shown in Appendix D - SRPE. Dewatering techniques shall meet all OSHA and local requirements and codes (Please see the SRPE documents in Appendix D). Two options typically exist for pumps, either inside the cistern itself or in a separate vault, the final engineering phase will determine the most appropriate solution. For a sample of the complete system please see the Example Complete RWH system in Appendix D. For locations of the proposed Cisterns please see Figure IV- LID BMP Locations Exhibit.

#### 8.0 **SUMMARY and CONCLUSIONS**

The capacity of the existing storm drain system will not be negatively affected with the proposed development. The existing hydrologic condition is adequate to serve the needs of the proposed project. The post-development runoff will be lower than the predevelopment runoff.

A stormwater treatment system will be installed within the area of the site, this system will consist of 2 CDS units, 2 Cisterns and 2 irrigation control pumps. This treatment system will mitigate pollution from the building's roof drainage, area drains, and surface runoff in while reducing volume discharge to the public SD system.

In conclusion, in accordance with the Los Angeles City Stormwater Quality Management Program, with the installation of the stormwater treatment system on the on-site storm drain network, satisfactory treatment of stormwater and non-stormwater runoff will be provided. The post-development condition will not exceed the pre-development condition.

## TABLE 1 SUMMARY OF HYDROLOGICAL SUB-AREAS

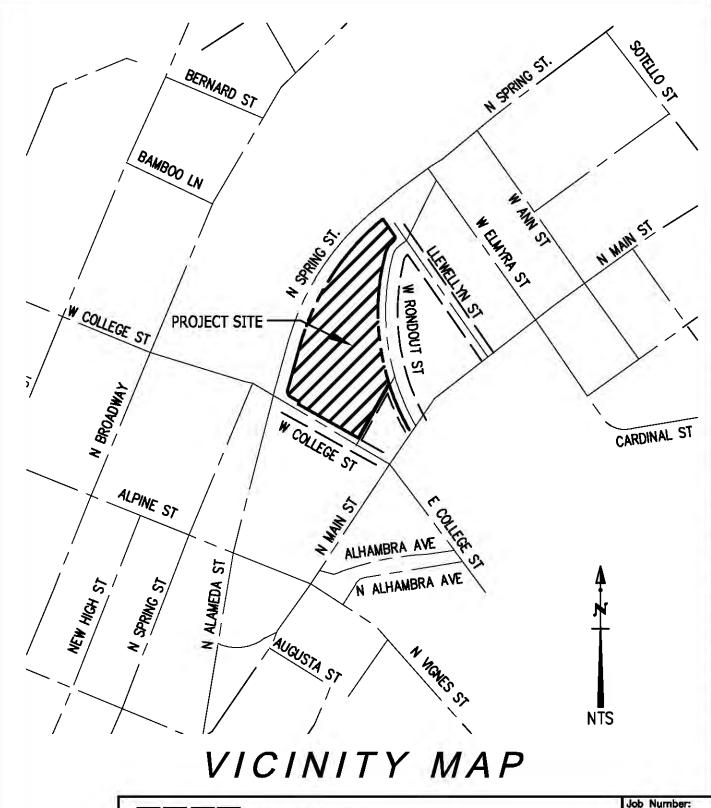
| Sub-Area | Acres | TC  | Q <sub>50</sub> (cfs) | Destination                                |  |
|----------|-------|-----|-----------------------|--------------------------------------------|--|
| A1       | 5.24  | 6.0 | 15.75                 | Existing catch basins in N. Spring Street. |  |
| Total    | 5.24  | _   | 15.75                 | Outlet to LA SD system.                    |  |

TABLE 2 SUMMARY OF HYDROLOGICAL SUB-AREAS

| Sub-<br>Area | Acres | Тс | Q <sub>50</sub> (cfs) | Destination                                        |
|--------------|-------|----|-----------------------|----------------------------------------------------|
| A1           | 0.90  | 6  | 2.71                  | To existing catch basin on N. Spring Street.       |
| A2           | 1.04  | 6  | 3.13                  | To existing catch basin on N. Spring Street.       |
| A3           | 3.30  | 6  | 9.93                  | To existing catch basin on N. Spring Street.       |
| Total        | 5.24  |    | 15.77*                | To proposed water quality unit and to LA SD system |

<sup>\*</sup>This  $Q_{50}$  does not account for the reduction of  $Q_{pm}$  which would be 15.77-0.92=14.85cfs.

# **FIGURES**





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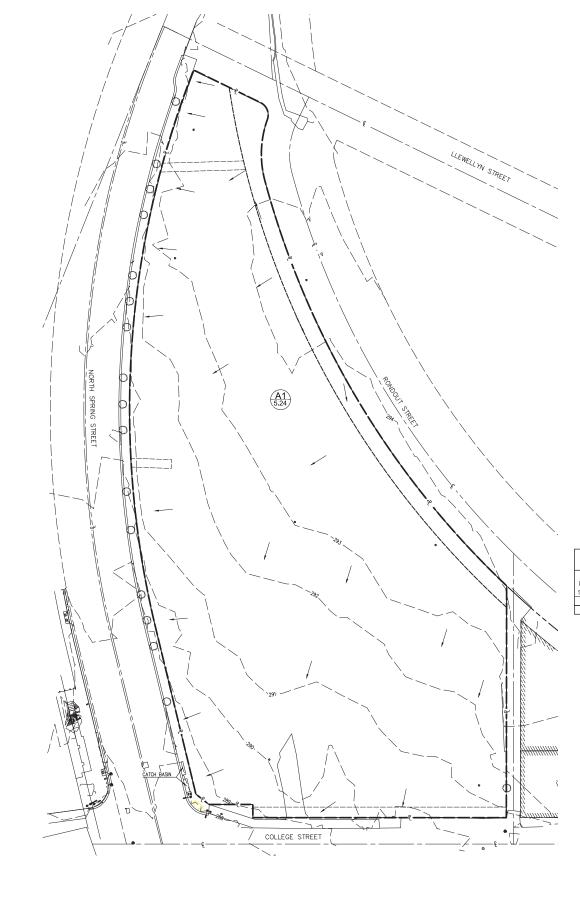
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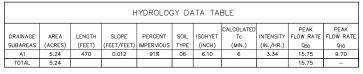
03-17-2014

Scale: NTS

Sheet 1 of 1 Sheets

Opened: Drawing









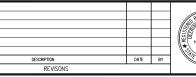
LEGEND:

SUBAREA

ACREAGE

FLOW RATE FOR 50-YR STORM

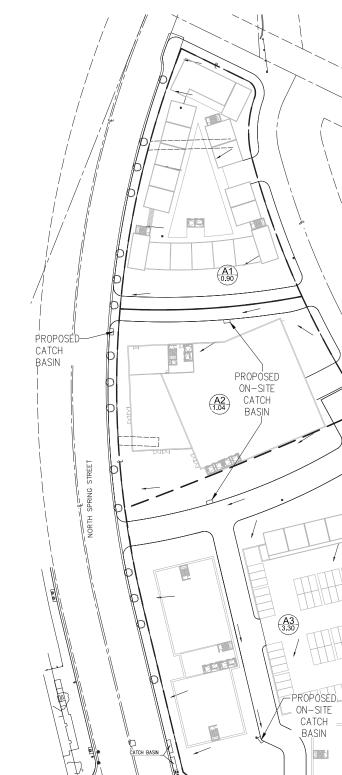
CUBIC FEET PER SECOND





| Hall & Foreman, Inc.                                                      |           |
|---------------------------------------------------------------------------|-----------|
|                                                                           |           |
| Engineering • Planning • Surveying                                        | DRAWN BY  |
| 811 WILSHIRE BOULEVARD, SUITE 1450 . LOS ANGELES, CA 90017 . 213-785-7887 | DESIGNED  |
| PREPARED UNDER THE SUPERVISION OF:                                        |           |
|                                                                           | CHECKED B |

|                    | EVOQ PROPERTIES    |                     |
|--------------------|--------------------|---------------------|
|                    | COLLEGE STATION    |                     |
| DRAWN BY:<br>D.A   | PRE-DEVELOPMENT    | SCALE:<br>1"=40'    |
| DESIGNED BY:<br>BT | HYDROLOGY MAP      | DATE:<br>03-20-2014 |
| CHECKED BY:<br>DV  | APPROVED BY:       | SHT NO.:<br>1 OF 1  |
|                    | CITY ENGINEER DATE | I Or I              |



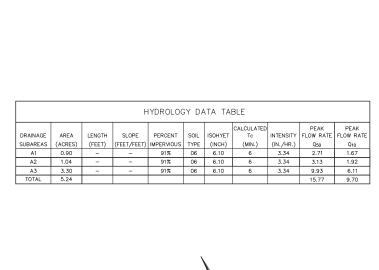
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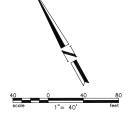
SUBAREA

- ACREAGE

FLOW RATE FOR 50-YR STORM

CUBIC FEET PER SECOND
FLOW DIRECTION
SUBAREA DIVISION







COLLEGE STREET



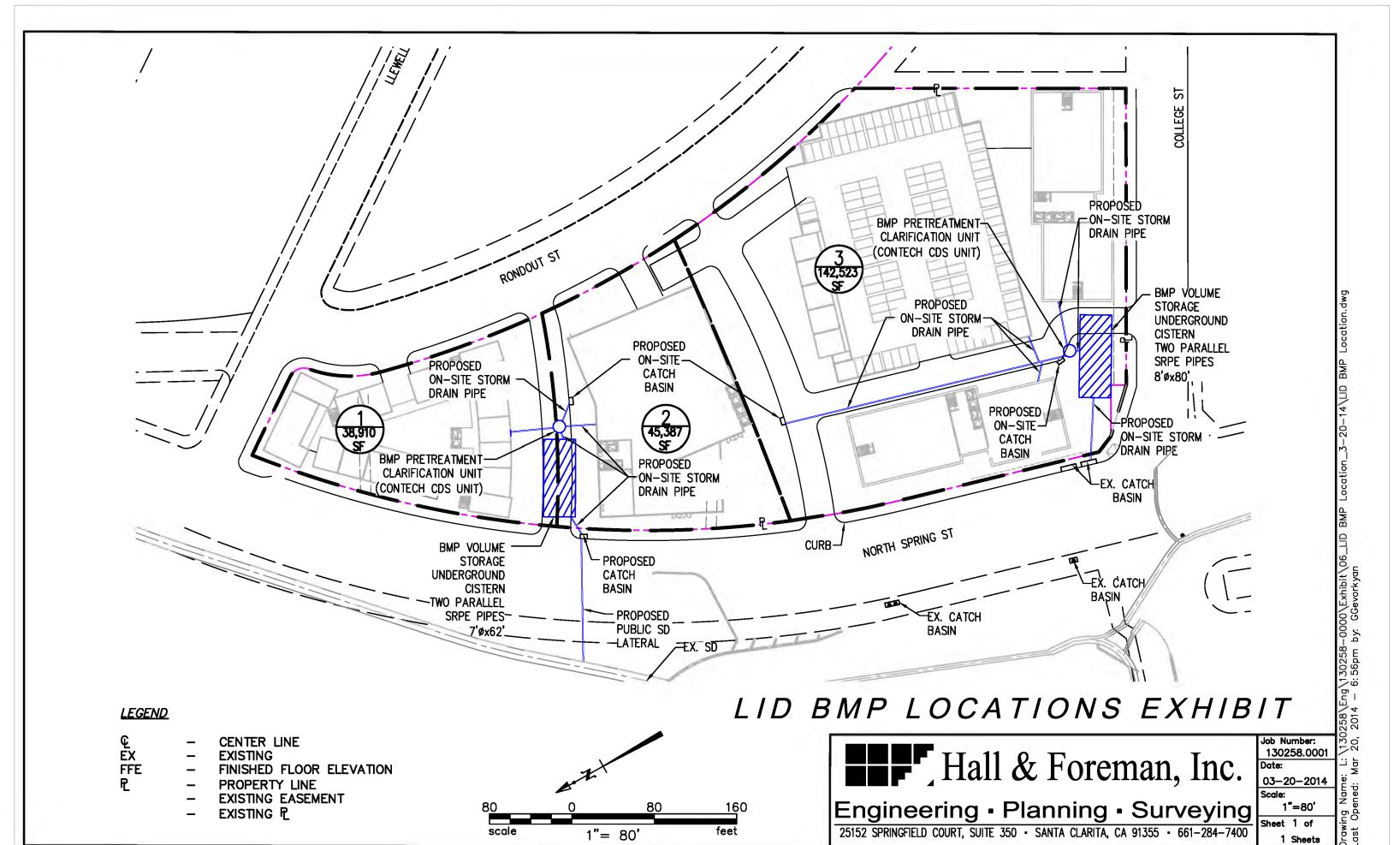
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| Hall & Foreman, Inc.                                                      |                 |  |  |  |
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EVOQ PROPERTIES

COLLEGE STATION

POST-DEVELOPMENT
HYDROLOGY MAP



## **APPENDIX A**

| Tc Calculator                                                                                                                                                                                                                            |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Subarea Parameters Manual Input Subarea Rire Factor A1                                                                                                                                                                                   |  |
| Input File  Check Here If Subarea Parameters Are Defined In An Input File  Import "tcdata.xls" File  Calculate Single Tc From Subarea Parameters Provided In Input File  Calculate Tc's For Multiple Subareas And Create Tc Results File |  |
| Calculation Results  Undeveloped Developed Runoff Runoff Coefficient Coefficient (Cd)  A1 3.34 0.85 0.9  Tc Equation  Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135                                                                  |  |
| Peak Flow Rate Burned Peak Flow 24-Hour Runoff Tc Value (min.) (cfs) Rate (cfs) Volume (acre-ft)  [6] 15.75 n/a 2.21                                                                                                                     |  |

| Tc Calculator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subarea Parameters Manual Input Subarea Rire Factor Number  A1  Area (Acres)  Proportion Impervious  5.24  Rainfall Isohyet (in.)  Flow Path Length (ft.)  Subarea Parameters Selected Subarea Number  1a  ▼  Area (Acres)  Proportion Impervious  5.24  Rainfall Isohyet (in.)  Flow Path Length (ft.)  Slope  470  Subarea Parameters Selected Subarea Number  Fire Factor  Number  1a  ▼  Area (Acres)  Proportion Impervious  5.24  Rainfall Isohyet (in.)  Flow Path Length (ft.)  Slope  470  0.012 |
| Input File  Check Here If Subarea Parameters Are Defined In An Input File  Import "tcdata.xls" File  Calculate Single Tc From Subarea Parameters Provided In Input File  Calculate Tc's For Multiple Subareas And Create Tc Results File                                                                                                                                                                                                                                                                  |
| Calculation Results  Undeveloped Developed Runoff Runoff Coefficient Coefficient (Cd)  A1  Tc Equation  Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135  Undeveloped Runoff Runoff Coefficient Coefficient (Cd)  Calculate Runoff Volume  Calculate Tc  Cancel                                                                                                                                                                                                                                          |
| Tc Value (min.) Peak Flow Rate (cfs) Rate (cfs) Volume (acre-ft) 12.78  Peak Flow Rate (cfs) N/a  1.97                                                                                                                                                                                                                                                                                                                                                                                                    |

# **APPENDIX B**

| Tc Calculator                                                                                                                                                                                                                            |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Subarea Parameters Manual Input Subarea Rire Factor A1                                                                                                                                                                                   |  |
| Input File  Check Here If Subarea Parameters Are Defined In An Input File  Import "tcdata.xls" File  Calculate Single Tc From Subarea Parameters Provided In Input File  Calculate Tc's For Multiple Subareas And Create Tc Results File |  |
| Calculation Results  Undeveloped Developed Runoff Runoff Coefficient Coefficient (Cd)  A1 3.34 0.85 0.9  Tc Equation  Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135                                                                  |  |
| Peak Flow Rate Burned Peak Flow 24-Hour Runoff Tc Value (min.) (cfs) Rate (cfs) Volume (acre-ft)  [6] 15.75 n/a 2.21                                                                                                                     |  |

| Tc Calculator                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subarea Parameters Manual Input Subarea Fire Factor Number  A1                                                                                                                                                                                        |
| Input File  Check Here If Subarea Parameters Are Defined In An Input File  Import "tcdata.xls" File  Calculate Single Tc From Subarea Parameters Provided In Input File  Calculate Tc's For Multiple Subareas And Create Tc Results File              |
| Calculation Results  Undeveloped Developed Runoff Subarea Number  Intensity  A1  2.08  Tc Equation  Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135  Undeveloped Runoff Coefficient Coefficient (Cd)  Calculate Runoff Volume  Calculate Tc  Cancel |
| Peak Flow Rate Burned Peak Flow 24-Hour Runoff Tc Value (min.) (cfs) Rate (cfs) Volume (acre-ft)  8 9.7 1.59                                                                                                                                          |

# **APPENDIX C**

## **College Station**

# **Cistern Sizing**

### Sub-Area 3

59,343 Gallons needed

Area (AC) = 3.3

| Cistern | Length (ft) |
|---------|-------------|

| Cisterri      | Length (ft) |
|---------------|-------------|
| Diameter (ft) | Length (It) |
| 10            | 101.0       |
| 9             | 124.6       |
| 8             | 157.8       |
| 7             | 206.1       |
| 6             | 280.5       |

Vm = 7,933 cf

Volume $V=\pi^*R^2*L$ 

### Sub-Areas 1 & 2

34,904 Gallons needed

| area (AC) | = | 1.94 |
|-----------|---|------|
|           |   |      |

| Cistern       | Length (ft) |
|---------------|-------------|
| Diameter (ft) | Length (it) |
| 10            | 59.4        |
| 9             | 73.3        |
| 8             | 92.8        |
| 7             | 121.2       |
| 6             | 165.0       |

Vm = 4,666 cf

Volume $V=\pi^*R^2L$ 



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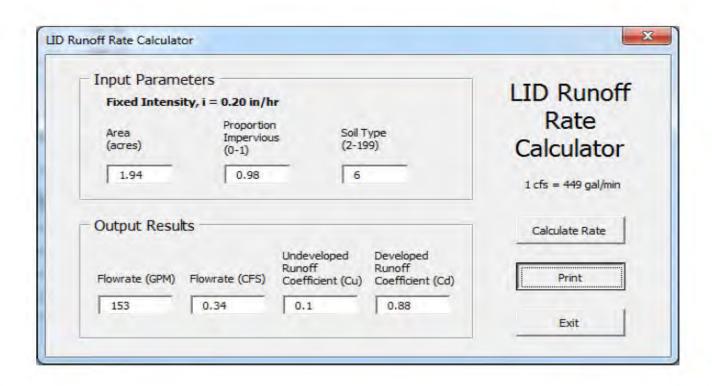


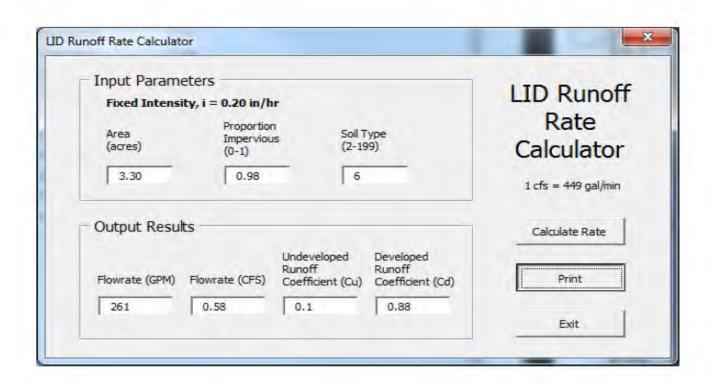
# Engineering • Planning • Surveying

| Engineering • Planning • Surveying           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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Irvine Office: 714.665.4500 Tel / 714.665-4501 Fax Inland Empire Office: 760.524.9100 Tel / 460.524.9101 Fax

LA/Ventura Office: 661.284.7400 Tel / 661.284.7401 Fax Temecula Office: 909.294.9300 Tel / 909.294.9301 Fax





# **SUSMP Volume Mitigation Calculation**

| Subarea | Percent Impervious | Undeveloped<br>Coefficient<br>(Cu) | Impervious<br>Area (AI) | Undeveloped<br>Area<br>(AU) | Pervious Area<br>(Ap) | Total Area<br>(ACRE) | V <sub>m</sub><br>(cf) |
|---------|--------------------|------------------------------------|-------------------------|-----------------------------|-----------------------|----------------------|------------------------|
| Site    | 98%                | 0.1                                | 1.90                    | 0.00                        | 0.04                  | 1.94                 | 4666                   |

## **Rainfall Volume Mitigation Equation:**

 $V_m = (2722.5 \text{ ft}^3/\text{acre})^*[(A_I)(0.9) + (A_p + A_u)(C_u)]$ 

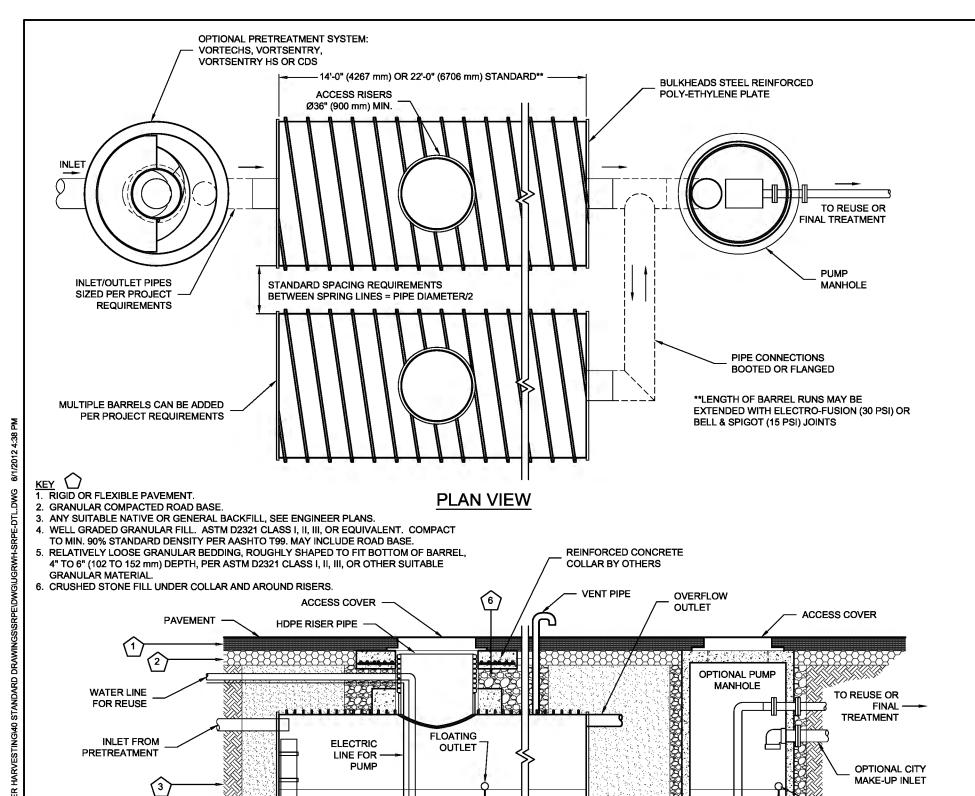
# **SUSMP Volume Mitigation Calculation**

| Subarea | Percent Impervious | Undeveloped<br>Coefficient<br>(Cu) | Impervious<br>Area (AI) | Undeveloped<br>Area<br>(AU) | Pervious Area<br>(Ap) | Total Area<br>(ACRE) | V <sub>m</sub><br>(cf) |
|---------|--------------------|------------------------------------|-------------------------|-----------------------------|-----------------------|----------------------|------------------------|
| Site    | 98%                | 0.1                                | 3.23                    | 0.00                        | 0.07                  | 3.30                 | 7933                   |

## **Rainfall Volume Mitigation Equation:**

 $V_m = (2722.5 \text{ ft}^3/\text{acre})^*[(A_I)(0.9) + (A_p + A_u)(C_u)]$ 

# **APPENDIX D**



OUTLET TO PUMP OR

**ELEVATION VIEW** 

**URBANGREEN** 

FINAL TREATMENT

CALMING

OPTIONAL INTERNAL

SUBMERSIBLE PUMP

W/ FLOAT CONTROL

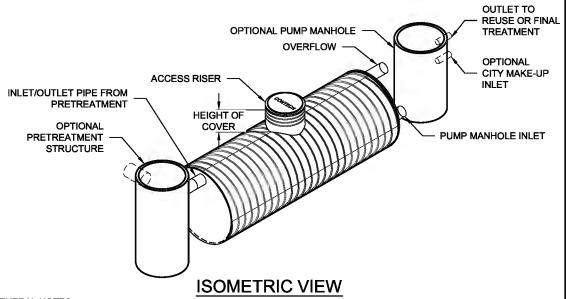
SUITABILITY OF

**NATIVE BACKFILL** 

TO BE VERIFIED BY

**ENGINEER OF RECORD** 

STORAGE AVAILABILITY PER **DIAMETER** AVAILABLE **AVAILABLE** DIAMETER STORAGE PER L.F. STORAGE PER L.F. (IN / mm) (C.F. / m3) (GAL. / L) 12.57 / 0.35 94.00 / 356 48 / 1200 54 / 1350 15.90 / 0.45 118.97 / 450 60 / 1500 19.63 / 0.55 146.88 / 556 72 / 1800 28.27 / 0.80 211.51 / 800 84 / 2100 38.48 / 1.09 287.88 / 1090 96 / 2400 50.27 / 1.42 376.01 / 1423



#### **GENERAL NOTES**

- 1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- 2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE, CAPACITY AND BACKFILL DETAILS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS INC REPRESENTATIVE. www.contech-cpi.com
- 3. ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD
- 4. PRIOR TO INSTALLATION OF THE SYSTEM A PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED. THOSE REQUIRED TO ATTEND ARE THE SUPPLIER OF THE SYSTEM, THE GENERAL CONTRACTOR, SUB-CONTRACTORS AND THE
- 5. THE CISTERN IS MANUFACTURED FROM STEEL REINFORCED POLYETHYLENE PLASTIC.
  6. SYSTEM TO MEET AASHTO HS20/HS25 LIVE LOADING, PER AASHTO LRFD SECTION 12.
- 7. ACCESS COVERS TO MEET AASHTO M306 LOAD RATING.
- 8. MINIMUM COVER IS EQUAL TO PIPE DIAMETER/5 AND NO LESS THAN 12-INCHES (305 mm) FROM TOP OF PIPE TO BOTTOM OF PAVEMENT. Ø72" (1800 mm) AND Ø84" (2100 mm) PIPE MINIMUM COVER IS 18-INCHES (457 mm), Ø96" (2400 mm) PIPE MINIMUM COVER IS 24-INCHES (610 mm).
- 9. FOR INFORMATION ON PRE-TREATMENT SYSTEMS, REFERENCE CONTECH PRE-TREATMENT SYSTEM STANDARD DETAILS OR CONTACT YOUR LOCAL CONTECH REPRESENTATIVE.

#### **INSTALLATION NOTES**

- A. INSTALLATION GUIDE TO BE REVIEWED BY CONTRACTOR PRIOR TO INSTALLATION.
- B. CONTRACTOR TO PROVIDE, INSTALL AND GROUT ALL INLET AND OUTLET PIPES.
- C. CONTRACTOR TO PROVIDE AND INSTALL ALL BEDDING AND BACKFILL MATERIAL.
- D. PRIOR TO PLACING BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, A TENSAR BX GEOGRID SHALL BE UTILIZED OR UNSUITABLE MATERIAL SHALL BE REMOVED AND BROUGHT BACK TO GRADE WITH FILL MATERIAL AS APPROVED BY THE ENGINEER OF RECORD. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE BEDDING MATERIAL CAN BE PLACED.
- E. STONE EMBEDMENT MATERIAL SHALL BE INSTALLED TO 95% STANDARD PROCTOR DENSITY AND PLACED IN 6-INCH (152 mm) TO 8-INCH (203 mm) LIFTS SUCH THAT THERE IS NO MORE THAN A TWO LIFT DIFFERENTIAL BETWEEN ANY OF THE BARRELS AT ANY TIME. GRANULAR BACKFILL MATERIAL SHALL BE COMPACTED TO 90% SPD. BACKFILLING SHALL BE ADVANCED ALONG THE LENGTH OF THE BARRELS AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING AND DISPLACEMENT OF THE BARRELS. THE MINIMUM PIPE SPACING MUST BE MAINTAINED.
- F. REFER TO INSTALLATION GUIDE FOR TEMPORARY CONSTRUCTION LOADING GUIDELINES
- G. IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.
- H. GENERAL INSTALLATION METHODS AND MATERIALS TO BE IN ACCORDANCE WITH ASTM D2321.



800-338-1122 513-645-7000 513-645-7993 FAX

**FLOATING** OUTLET

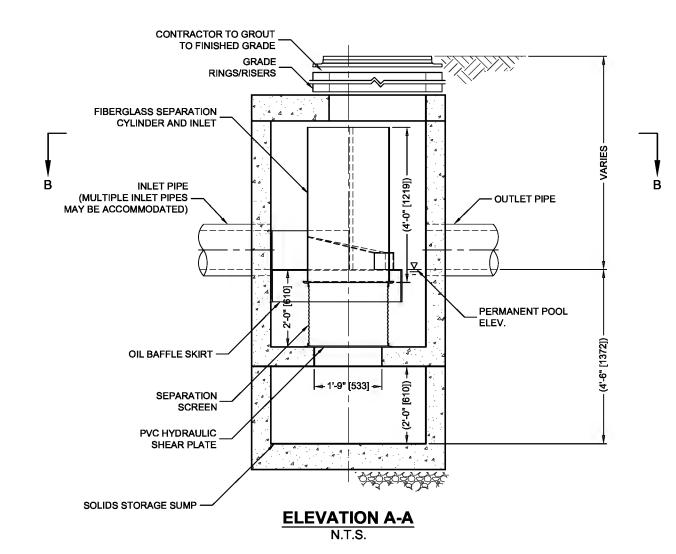
OPTIONAL

PUMP W/

SUBMERSIBLE

FLOAT CONTROL

**URBANGREEN SRPE CISTERN** STANDARD DETAIL





#### CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [283 L/s]. IF THE SITE CONDITIONS EXCEED 10.0 [283 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

#### **CONFIGURATION DESCRIPTION**

GRATED INLET ONLY (NO INLET PIPE)

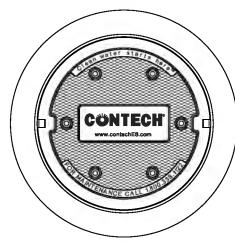
GRATED INLET WITH INLET PIPE OR PIPES

CURB INLET ONLY (NO INLET PIPE)

CURB INLET WITH INLET PIPE OR PIPES

SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)

SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



# FRAME AND COVER (DIAMETER VARIES) N.T.S.

| SITE SPECIFIC DATA REQUIREMENTS |             |      |            |          |   |  |
|---------------------------------|-------------|------|------------|----------|---|--|
| STRUCTURE ID                    |             |      |            |          | 1 |  |
| WATER QUALITY                   | FLOW RAT    | E (C | FS OR L/s) |          | * |  |
| PEAK FLOW RAT                   | E (CFS OR I | L/s) |            |          | * |  |
| RETURN PERIOD                   | OF PEAK F   | LOV  | V (YRS)    |          | * |  |
| SCREEN APERTU                   | JRE (2400 C | R 47 | 700)       |          | * |  |
| D.D. D. L. L.                   |             |      |            | _        |   |  |
| PIPE DATA:                      | I.E.        | М    | ATERIAL    | DIAMETER |   |  |
| INLET PIPE 1                    | *           |      | *          | *        |   |  |
| INLET PIPE 2                    | *           |      | *          |          | * |  |
| OUTLET PIPE                     | *           |      | *          | *        |   |  |
| RIM ELEVATION                   |             |      |            |          | * |  |
| ANTI-FLOTATION BALLAST WIDTH    |             |      | HEIGHT     |          |   |  |
| * *                             |             |      |            |          |   |  |
| NOTES/SPECIAL REQUIREMENTS:     |             |      |            |          |   |  |
| * PER ENGINEER OF RECORD        |             |      |            |          |   |  |

#### GENERAL NOTES

- 1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- 2. DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- 3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- 4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- 5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- 6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

#### INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C INLINE CDS STANDARD DETAIL



# **DuroMaxx® Steel Reinforced PE Technology Installation Guide**







### **Preface**

This installation guide is for your crews. Distribute it to help them unload, handle and install Contech DuroMaxx pipe safely. DuroMaxx is a flexible pipe that can be installed per the requirements of ASTM D2321, "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe."

Don't assume that experienced workers know all the answers. Review these instructions with your supervisors and crews. It can mean a safer and better job for you and your customer.

We suggest that, if performance testing of the joints is required, testing the first few manhole runs should be done in the early stages to ensure that jointing procedures are correct. It will give you an early check that installation procedures are correct.

If you have any questions about these instructions, call your Contech Dealer or your Contech Sales Engineer, or carefully review the installation guide and ASTM D2321.

| Contents                                     | Page |
|----------------------------------------------|------|
| Safety instructions for unloading & handling | 3    |
| Handling weights                             | 4    |
| Flotation prevention                         | 5    |
| Assembly and installation references         | 6    |
| Standard backfill detail                     | 9    |
| Heavy construction loads                     | 10   |
| Cutting instructions                         | 11   |

This safety alert symbol indicates important safety messages. When you see this symbol, it will alert you to hazards or unsafe practices that CAN result in severe personal injury (including death) or property damage. Be sure you understand the message that follows.

## **Safety Instructions**



Failure to follow these instructions can result in serious injury or death and/or damage to pipe.

- 1. Only trained and authorized equipment operators are to be permitted to unload the trailer.
- 2. Wear approved safety hat, shoes, gloves and eye protection.
- 3. Park the truck and trailer on level ground before you start unloading.
- 4. Keep all unauthorized persons clear of the area when the driver releases the binders from the trailer and during unloading.
- 5. Do not release strapping around the wood frame until the pallets or bundles have been placed on level ground and will not be moved again as a unit.
- Know the capabilities and rated load capacities of your lifting equipment. Never exceed them.
- 7. Do not stand or ride on the load of pipe while it is being unloaded.
- If unloading at multiple points, secure pallets between drop off points. Always unload the top pallets first. (See diagram at right).



- 9. Never attach chains or cable to the pipe. They could damage the pipe.
- 10. Do not push pallets off the trailer or permit pipe to drop to the ground.
- 11. Do not stack DuroMaxx pipe more than two pallets high. Stacks of three or more pallets can damage bottom pipes and can become unstable.
- 12. Only use authorized unloading poles to lift pipe. Unauthorized unloading pole can lead to unsafe practices and damaged pipe.

# **AWARNING**

13. Falling or rolling pipe can cause severe personal injury or death. Notwithstanding the instructions contained in this booklet, it is the responsibility of the consignee or consignee's agent to devise safe unloading and handling procedures.



# **AWARNING**

- 14. Do not lift from the steel strapping.
- 15. Do not stand beneath or near the pipe while it is being unloaded.
- 16. Always follow all project, local, state and OSHA rules and safety requirements including but not limited to confined space, trenching, shoring and excavation procedures.

# **Handling Weights**

Approximate weight (pounds/lineal foot). These are estimated average weights and are not for specification use.

| DuroMaxx Dimensions & Handling Weights |                      |                     |                           |                         |  |  |
|----------------------------------------|----------------------|---------------------|---------------------------|-------------------------|--|--|
| Pipe Dia.<br>(in)                      | Outside<br>Dia. (in) | Inside<br>Dia. (in) | Bell Outside<br>Dia. (in) | Approx. Weight (lbs/ft) |  |  |
| 24                                     | 24.9                 | 23.6                | 26.2                      | 11.3                    |  |  |
| 30                                     | 30.9                 | 29.5                | 34.0                      | 18.8                    |  |  |
| 36                                     | 37.1                 | 35.4                | 39.9                      | 23.6                    |  |  |
| 42                                     | 43.2                 | 41.3                | 45.8                      | 27.0                    |  |  |
| 48                                     | 49.5                 | 47.2                | 52.3                      | 30.8                    |  |  |
| 54                                     | 55.5                 | 53.2                | 58.2                      | 36.1                    |  |  |
| 60                                     | 61.4                 | 59.1                | 64.1                      | 42.9                    |  |  |
| 66                                     | 67.8                 | 65.0                | NA                        | 56.9                    |  |  |
| 72                                     | 74.1                 | 70.9                | 77.6                      | 65.6                    |  |  |
| 84                                     | 85.9                 | 82.7                | NA                        | 76.3                    |  |  |
| 96                                     | 97.8                 | 94.5                | NA                        | 87.0                    |  |  |
| 120                                    | 121.9                | 118.1               | NA                        | 109.0                   |  |  |

# **Unloading and Handling**

Read and follow all safety instructions before unloading pipe.

- 1. **Do not** overtighten strapping as it may cause dimpling. If dimpling occurs, unstrap pipe to allow for rebound to occur at the dimpling of the pipe.
- Use a forklift with full-length forks or fork extensions (typically 8 feet), front-end loader or backhoe with fork adapters at full length to engage entire pallet width. Make sure back of forklift is free of protrusions or spikes that could damage the pipe.



3. Use Nylon lifting slings of sufficient strength and length and specifically intended to safely handle the entire pallet or individual pipe, whichever is being lifted.



- 4. For 24" and 30" diameter pipe, one sling point located at mid-length is generally sufficient.
- 5. Use two (2) sling points for lifting sizes greater than 30" diameter. Sling spacing equal to one-third of the pipe length is generally sufficient.
- 6. An approved unloading pole can be used inside the pipe to unload and handle individual pipe sections.



Using forks or unapproved poles inside the pipe will result in damage.

- 7. **Do not** use steel cables, chains and/or hooks to unload or handle pipe.
- **8. Do not** stand or ride on the pipe load during unloading or handling.
- 9. Do not scoop the pipe or strike with forks.
- 10. Do not drag or drop the pipe.
- 11. Proper on-site bell and spigot pipe storage practices and blocking should be used to avoid deformation of the pipe bells

### **Trench Dimensions**

Trenching practices shall be in accordance with OSHA.

- 1. The trench needs to be wide enough for a person to work safely.
- 2. Where trench walls are unstable, the contractor may elect to use tight sheeting, bracing or a trench box for stabilization during pipe laying. If the conditions are severe, sheeting may be left in place.
- 3. Refer to ASTM D2321, Paragraph 6.4.2, for proper placement and movement of trench boxes. Improper use of trench boxes can affect pipe performance.





### Groundwater

- Excessive groundwater may necessitate dewatering. Dewatering techniques must meet all OSHA and local requirements and codes.
- In areas of saturated trench conditions or in dewatered trenches, refer to "Foundation and Bedding," and ASTM D2321 for proper selection of bedding and backfill materials.
- Flotation of the pipe and erosion or wash-out of previously placed soil support must be prevented to ensure that the structure maintains its load carrying capacity.
- 4. Contact the Engineer of Record, hereinafter referred to as "Engineer," for proper cover to prevent flotation.

| Minimum Cover Needed to<br>Prevent Flotation |                |  |  |  |
|----------------------------------------------|----------------|--|--|--|
| DuroMaxx<br>Pipe Dia. (in)                   | Cover Required |  |  |  |
| 24                                           | 1'-1"          |  |  |  |
| 30                                           | 1'-4"          |  |  |  |
| 36                                           | 1'-7"          |  |  |  |
| 42                                           | 1'-10"         |  |  |  |
| 48                                           | 2'-2"          |  |  |  |
| 54                                           | 2'-5"          |  |  |  |
| 60                                           | 2'-8"          |  |  |  |
| 72                                           | 3'-2"          |  |  |  |
| 84                                           | 3'-9"          |  |  |  |
| 96                                           | 4'-3"          |  |  |  |
| 120                                          | 5′-5″          |  |  |  |

# Foundation and Bedding

- An unstable trench bottom must be stabilized at the engineer's direction. In such cases, install special foundation and bedding materials in 6-inch layers and compact.
- 2. Excavation below the final loosely placed bedding material shall be compacted using standard bedding practices or compacted at a minimum of 90% Standard Proctor Density.

3. The final bedding material provides uniform support to hold the pipe on line and grade. A relatively loose 4"to 6" thick bedding layer usually is adequate. Before installing the pipe, bring bedding material to grade along the entire length of the pipe. Bedding materials can be Class I, II or III per ASTM D2321.

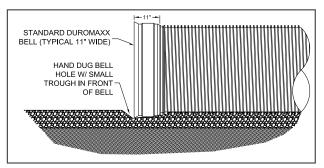


- 4. When excavating in Class IV materials of silts, silty clays and clays, provide a uniform, undisturbed foundation.
- 5. If used for bedding, Class IA materials must be used as haunching material to the spring line in a dry trench. To minimize the potential for migration, Class IA materials should be used to the top of the pipe in wet trenches or in trenches that will fall below the water table.

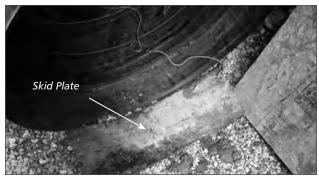
# **Assembly of Pipe (Joining)**

- Pipe is typically joined by inserting the spigot into the bell. When jobsite conditions require putting the bell on to the spigot, care should be taken not to scoop up backfill material into the joint during jointing.
- 2. Remove the protective film from the gasket prior to applying the lubricant or joining the pipe.
- 3. The double sealing gasket is fitted into the spigot valleys as shown in the drawing below. A white line on the front of the gasket will be visible if not properly seated.
- 4. Make sure the bell and spigot joint is thoroughly clean and free of soil of any type.

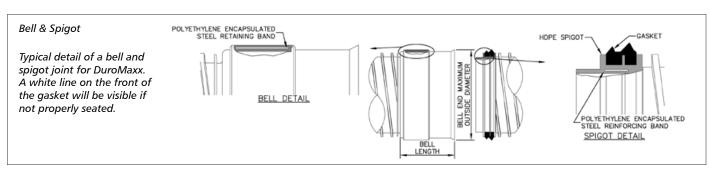
- 5. Be sure to apply a generous amount of gasket lube to the gasket and to swab the inside of the bell. The most common application method is with a rubber glove although johnny mops can be used for smaller diameter pipe.
- 6. Dig out a "bell hole" beneath the entire bell and extend approximately 8" beyond the leading edge of the bell end's edge with a shovel or boot heel in order to keep the spigot free of bedding material and to prevent materials from being pulled in to the bell by the spigot. Materials pulled in to the bell can impair gasket sealing and cause leaks.



7. After creating a bell hole and prior to joint connection, laying a piece of reusable matting or plastic liner in front of the joint will eliminate stone and/or backfill from being scooped or dragged into the joint. Remove the matting after the joint is home.



- Align the spigot end of the pipe into the bell's leading edge during joining process. Straight alignment of the joint ends will minimize the possibility of rolling the gasket.
- 9. Do not push on the bell end of the pipe! Do not use a cable or chain wrapped around the pipe to join the pipe. Use of a nylon strap to pull the pipe is strongly advised.



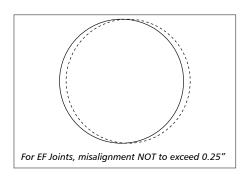
10. The spigot end of the pipe features a "homing mark" that will align with the end of bell when the spigot has been fully inserted into the bell.



- 11. Once the pipe has been fully placed in the trench and prior to backfilling, it is recommended that the Engineer or a qualified representative of the Engineer approve the trench, bedding and placement of the pipe.
- 12. After the joint is homed, hand shovel and shovel slice the bedding (i.e. fill and compact) to fill the bell hole for uniform support.
- 13. Cold Weather Note: Rubber gaskets become harder as the ambient temperature decreases. Gaskets tend to compress less, and when combined with bells, jointing becomes less forgiving. Proper bell-spigot alignment, adequate bell and spigot lubrication and recommended joining procedures all become more essential as temperatures decreases.
- 14. After proper assembly, take precautions to prevent the pipe from movement prior to haunching and backfilling.

# **ElectroFusion (EF) Joint Considerations**

- 1. It is critical that the pipe be kept dry.
- 2. For proper EF coupling, misalignment should not exceed 0.25 in.
- 3. It is critical that the gap between pipe ends should not exceed 1 in. for proper coupling.
- 4. Please conform to OSHA confined space requirements.



# Haunching

- Proper haunching provides a major portion of the pipe's load-carrying capability. Poor workmanship will lead to excessive pipe deflection and grade and alignment problems. Haunching materials can be Class I, II, or III per ASTM D2321.
- 2. Work enough material under the haunch of the pipe by hand to provide proper compaction and side support. Material shall meet the minimum compaction requirements of ASTM D2321.
- When trench walls are unstable, sloughing must be prevented so that haunching material can be placed and compacted adequately. The proper use of a trench box or over-excavation can assist in these cases.
- 4. Don't let the pipe move when placing material under the haunch of the pipe.
- 5. Take care not to damage the pipe with shovels, or other construction/tamping equipment.
- 6. Haunch material extends from the bedding/ foundation material to the springline elevation.

# **Backfill and Compaction**

- Initial backfill materials extend from the springline to above the pipe (see page 9 -Standard Backfill Detail) to provide the remainder of the pipe support and protect the pipe from stones or cobbles in the final backfill. Backfill materials that generally follow the requirements of ASTM D2321, such as Class I, II, or III (or approved equal) may be used.
- Native materials meeting the acceptable materials on page 8 can be used as backfill, but should be approved by the Engineer.
- 3. Materials must be free from large stones, frozen lumps or other debris.
- 4. Typical trench/backfill details can be found on page 9; and acceptable backfill materials and compaction requirements on page 8 in this document.

- 5. Select fill should be placed and compacted to the minimum thickness referenced in the applicable installation detail before transitioning to native or non-select fill material over the pipe or to pavement.
- 6. Fill above the select fill should be fully compacted.
- 7. As backfill is placed around the pipe, care should be taken to avoid damage to the pipe.
- 8. Backfill height differential from one side of pipe to the other shall not exceed 12". Only "hand compaction" equipment is allowed over and around the pipe until minimum construction heights are achieved.

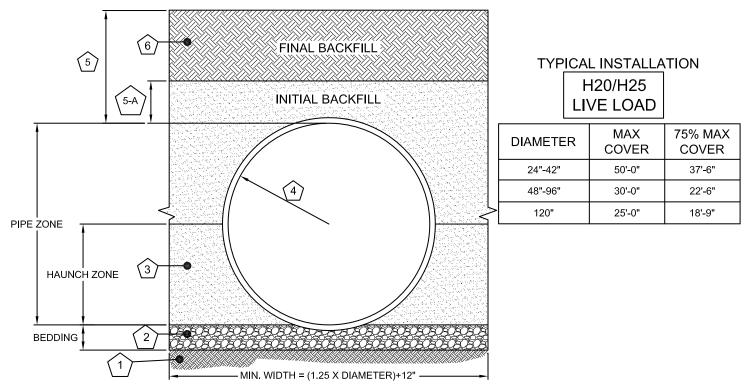




| Description                                                                                                                                      | Acceptable Ba | Minimum              |                                 |                |                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|---------------------------------|----------------|----------------------------------|
|                                                                                                                                                  | ASTM<br>D2321 | ASTM<br>D2487        | AASHTO M43                      | AASHTO<br>M145 | Standard<br>Proctor<br>Density % |
| Graded or crushed,<br>crushed stone, gravel                                                                                                      | Class I       | -                    | 5<br>56                         | A-1-a          | 85%                              |
| Well-graded sand,<br>gravels and gravel/<br>sand mixtures;poorly<br>graded sand, gravels<br>and gravel/sand<br>mixtures; little or no<br>fines   | Class II      | GW<br>GP<br>SW<br>SP | 57<br>6                         | A-1-b<br>A-3   | 85%                              |
| Silty or clayey<br>gravels,gravel/sand/<br>silt or gravel and<br>clay mixtures; silty or<br>clayey sands, sand/<br>clay or sand/silt<br>mixtures | Class III     | GM<br>GC<br>SM<br>SC | Gravel and sand<br>(<10% fines) | A-2-4<br>A-2-5 | 90%                              |

Use of cementitious or flowable backfills is compatible with DuroMaxx. Proper precautions should be taken to preclude flotation of the pipe. Contact your Contech representative for further guidance.

# Standard Backfill Detail - Specification & Standard Drawing



- 1.) FOUNDATION TO BE WELL CONSOLIDATED & STABLE.
- 2.) BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE COMPACTED BEDDING MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 4" TO 6" IN DEPTH.
- 3.) INITIAL BACKFILL & HAUNCHING ZONE MATERIAL TO MEET ASTM D2321 CLASS I, II, III OR APPROVED EQUAL, COMPACTED TO 90% STANDARD DENSITY (A NATIVE MATERIAL CAN BE UTILIZED THAT MEETS ASTM D2321 OR APPROVED EQUAL SPECIFICATION).
- FOR COVER HEIGHTS THAT ARE AT 75% OF MAXIMUM OR EXCEED COVER LIMITS INITIAL BACKFILL MATERIAL TO BE CLASS I OR II AS PER ASTM 2321.
- 120" TO USE CLASS 1 ONLY
- ALL LIFTS TO BE DONE IN CONTROLLED MANNER, TO PREVENT UNEVEN LOADING LIFTS SHOULD NOT EXCEED 6" TO 8" LIFT HEIGHTS.
- 4.) DUROMAXX STEEL REINFORCED (SRPE) PIPE.
- 5.) MINIMUM HEIGHT OF COVERS PER DIAMETER (DISTANCE AS MEASURED FROM TOP-OF-PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT):
  - 12" MINIMUM FOR PIPE DIAMETERS 24" 66"
  - 18" MINIMUM FOR PIPE DIAMETER 72"
  - 24" MINIMUM FOR PIPE DIAMETERS 84" 96"
  - 36" MINIMUM FOR PIPE DIAMETERS 102" 120"
- 5-A) FOR INSTALLATION COVERS THAT EXCEED MINIMUM HEIGHTS OF COVER:
  - 6" MINIMUM FOR PIPE DIAMETERS 24" 60"
  - 12" MINIMUM FOR PIPE DIAMETERS 66" 96"
  - 18" MINIMUM FOR PIPE DIAMETERS 102" 120"
- 6.) FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS PER THE PROJECT PLANS, SPECIFICATIONS, AND ENGINEER-OF-RECORD. MAY INCLUDE APPROVED NATIVE.

#### NOTE:

- 1.) OTHER STRUCTURAL BACKFILL INCLUDING NATIVE MATERIALS MAY BE USED AS DIRECTED BY THE PROJECT ENGINEER. BACKFILL MATERIALS ARE DEFINED UNDER ASTM D2321. GEOTEXTILE SHOULD BE USED AS REQUIRED TO PREVENT SOIL MIGRATION.
- 2.) STANDARD SPACING BETWEEN PARALLEL PIPE RUNS TO BE = PIPE DIA./2. SPACING BELOW THE AFOREMENTIONED FORMULA FOR PIPE DIAMETERS IS ALLOWED BASED ON PROJECT REQUIREMENTS AND APPROVAL/DESIGN BY CONTECH CONSTRUCTION PRODUCTS INC.

#### Flowable Fill

These materials are suitable for use with DuroMaxx at the direction of the Engineer. The contractor must take precautions to preclude the dislocation or flotation of the pipe during placement of the flowable fill. Should these materials be utilized by the contractor, Contech will assist with recommendations for restraint to ensure line and grade can be maintained.

### **Embankment Conditions**

- DuroMaxx is a superior product that is normally installed in a trench condition. Embankment installations are an acceptable installation application.
- 2. In general, the backfill type and placement of the backfill immediately around the pipe can be the same as that shown on page 8.
- 3. The width of the select fill zone around the pipe and the type of material placed outside the zone – adjacent to the select fill zone – are critical and dependent upon the pipe diameter and ultimate amount of fill and loads to be placed over the pipe.
- 4. In the event of an embankment installation, a backfill design should be prepared for the specific site conditions by the Engineer.
- Larger diameters may not be allowed or may require additional care in backfilling. Only small walk-behind compaction equipment should be used directly around the pipe.

#### **Cover Limits**

Once the backfilling process is completed, the contractor should take care to maintain the minimum allowable cover height over the pipe and should notify all other contractors and subcontractors to avoid removal of fill cover or rutting.

| Height of Cover Limits H20-25/HS20-25 |                 |    |  |  |  |
|---------------------------------------|-----------------|----|--|--|--|
| Pipe Dia. (in)                        | Max. Cover (ft) |    |  |  |  |
| 24-42                                 | 1               | 50 |  |  |  |
| 48-60                                 | 1               | 30 |  |  |  |
| 66-72                                 | 1.5             | 30 |  |  |  |
| 84-96                                 | 2               | 30 |  |  |  |
| 120                                   | 3               | 25 |  |  |  |

Table 1

- Allowable minimum cover is measured from the top of the pipe to the bottom of a flexible pavement or the top of the pipe to the top of a rigid pavement. Minimum cover in unpaved areas will be greater than for paved areas shown in Table 2 and must be maintained. Contact your local Contech Sales Engineer for more information.
- All heights of cover are based on trench conditions.
   If embankment conditions exist, additional care
   in the placement of fill outside the pipe backfill
   zone is required. Your Contech representative
   can provide further guidance for a project in
   embankment conditions.

#### **Construction Loads**

| Heavy Construction Loads                                    |              |                  |        |         |  |  |
|-------------------------------------------------------------|--------------|------------------|--------|---------|--|--|
| Minimum Height of Cover Requirements for Construction Loads |              |                  |        |         |  |  |
| Diameter/Span                                               | Axle Load (I | Axle Load (Kips) |        |         |  |  |
| (in)                                                        | >32≤50       | 50≤75            | 75≤100 | 110≤150 |  |  |
| 24-42                                                       | 2.0 ft       | 2.5 ft           | 3.0 ft | 3.0 ft  |  |  |
| 48-72                                                       | 3.0 ft       | 3.0 ft           | 3.5 ft | 4.0 ft  |  |  |
| 78-108                                                      | 3.0 ft       | 3.5 ft           | 4.0 ft | 4.5 ft  |  |  |
| 114-120                                                     | 3.5 ft       | 4.0 ft           | 4.5 ft | 5.0 ft  |  |  |

Table 2

- For temporary heavy construction vehicle loads, an extra amount of minimum compacted cover may be required over the top of the pipe.
- 2. The height-of-cover shall meet the minimum requirements shown in the Table 1. The contractor must provide the additional cover required to avoid damaging the pipe.
- 3. Minimum cover, shown in Table 1, is measured from the top of the pipe to the top of the maintained roadway surface.
- 4. The contractor should notify all other contractors and subcontractors to avoid any off-highway or unusual live loads (construction loads) over the pipe. The loads would include, but are not limited to off-highway trucks, earth movers or scrapers, certain paving and other construction equipment.



# **Joint Testing**

Be sure to apply lube to the spigot gasket and the inside of the bell of every joint made to ensure a proper connection. Do not pull debris into the bell along with the lubricated spigot. A bell hole may be needed in order to achieve this. All pipe must be free of damage of any kind.

# **Temperature Effects**

- 1. DuroMaxx is a superior product and the pipe's stiffness is not affected by solar absorption or elevated ambient temperatures.
- 2. If large swings in temperature occur from the location the pipe is stored and the bottom of the trench, then the pipe may require conditioning to avoid contraction of the pipe's length.
- 3. Operating temperatures are not recommended beyond 120° F (49° C).

### **Manhole or Structure Connections**

DuroMaxx can be connected to manholes or other types of structures using typical methods used by other flexible pipe products. Please consult the Engineer and your local Contech Sales Engineer to discuss what method is most appropriate for the application.

For fixed manhole or structure connections, stackup of pipe tolerance, line and grade variations and thermal effects should be considered when ordering total pipe lengths.

# **Cutting Instructions**

1. The recommended cutting tool for DuroMaxx pipe is a chop saw and abrasive saw blade. Refer to the Operating Instructions from the saw manufacturer for additional information.



2. Blade thickness should be no less than 1/8" thick and is recommended to be made of 2-ply material that is used to cut ductile iron pipe.

- 3. Use the leading edge of the blade to cut into the ribs of the pipe.
- 4. Bury the blade as much as possible into the pipe as you proceed.
- The alternative cutting tool for DuroMaxx is a handheld reciprocating saw. This process will take approximately two minutes to cut the steel ribs. There are 9 ribs for 24" around the pipe circumference.
- For large diameters, square cuts can be achieved from the inside.





Always use safety glasses when cutting DuroMaxx pipe and use protective gloves in case sharp edges are exposed.

## **Repairs**

- Should damage to the pipe occur at any point during installation, the Engineer should be contacted immediately.
- 2. For larger damaged sections, cut out damaged areas and cut a length of replacement pipe to fit.
- Similar to other flexible pipe products, DuroMaxx can be coupled using various industry standard methods and materials (e.g. concrete collars, FERNCO, MARMAC).
- 4. For smaller abrasions or exposed steel, an approved rubberized undercoating spray can be used to cover the steel.

## Taps

- DuroMaxx pipe can be supplied with standard prefabricated taps fittings or components per job plans once pre-fabrication drawings are reviewed by Contech Engineering and approved by the Engineer.
- 2. DuroMaxx can be field tapped using Inserta-Tees® for drainage projects. Please contact your Contech Representative for more information.



# Support

| My Primary Contech Contact:                 | <br> |
|---------------------------------------------|------|
| Phone:                                      | <br> |
| My Customer Solutions Coordinator (CSC) is: |      |
| Phone:                                      |      |
| Project Site Address:                       |      |
| •                                           |      |
|                                             |      |
| NOTES:                                      |      |
|                                             |      |
|                                             |      |
|                                             |      |
|                                             |      |
|                                             |      |

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treatment products. For information on other Contech division offerings, visit www.ContechES.com or call 800-338-1122.

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For more information on installing DuroMaxx, refer to ASTM D2321.







# Rainwater Harvesting Maintenance: Steel Reinforced Polyethylene Cistern

#### Overview

UrbanGreen Steel Reinforced Polyethylene Cisterns should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size or configuration of the system. Cisterns for rainwater harvesting should have pretreatment to remove most pollutants before they reach the cistern and infrequent maintenance of the cistern is typical.

#### **Setup and Safety**

If applicable, set up safety and warning equipment around the access to the cistern to notify pedestrian and vehicle traffic of potential hazards. All OSHA and confined space requirements should be followed as appropriate. If a pump is present in the system the power supply should be disconnected before maintenance activity commences.

#### Inspection

Inspection is the key to effective maintenance. Quarterly inspections are recommended during the first year of operation to establish seasonal trends for a specific location. After one year, annual inspections will ensure that systems are cleaned out at the appropriate time. It is very useful to keep a record of each inspection. A sample inspection log is included for your use.

#### Calming Inlet

Visually ensure the calming inlet is free from obstructions and debris.

#### Cistern Sump Area

Measure or estimate the sediment depth in the cistern with a sludge sampler if visual inspection is not possible. Depths above 4" indicate maintenance is needed.

#### Pump Sump

If a sump is provided to house a submersible pump, measure the depth of sediment in this area. Depths above 4" indicate maintenance is needed.

#### Floating Extractor Outlet

If present, inspect the floating outlet and ensure it is free from debris and unblocked.

#### **Pumps**

Refer to the pump manual for inspection instructions.

#### Cleaning

Ideally, cleaning will be done during the dry season when there is little or no water in the cistern. The cistern should be empty and all inlets should be blocked before entry in the cistern

#### Calming Inlet

Remove all debris from the calming inlet.

#### Cistern Sump Area

Vacuum all sediment from the sump area of the empty cistern. Accumulated sediment can typically be evacuated through the manhole access riser. A standard power washer and vacuum truck can be used.

#### Pump Sump

Remove pumps and vacuum all sediment from the sump area. A standard power washer and vactor truck are typical.

#### Floating Extractor Outlet

Wash the extractor screen to remove all debris.

#### **Pumps**

Refer to the pump manual for maintenance instructions.

#### Repairs

UrbanGreen SRPE is manufactured from Hydrostatic Design Basis rated HDPE. Should a need arise for a repair; the system should be drained in order for a qualified HDPE welder to repair the affected area. Extrusion welding or electrofusion patches of matching HDPE material are acceptable methods.

#### **Factory Contact**

For additional service needs, please contact CONTECH 800 338 1122.

| " Diameter System |                      | Location: Anywhere, USA |                            |                               |                   |
|-------------------|----------------------|-------------------------|----------------------------|-------------------------------|-------------------|
| Date              | Depth of<br>Sediment | Accumulated<br>Trash    | Maintenance<br>Performed   | Maintenance<br>Personnel      | Comments          |
| 12/01/99          | 2"                   | None                    | Removed Sediment           | B. Johnson                    | Installed         |
| 03/01/00          | 1"                   | Some                    | Removed Sediment and Trash | B. Johnson                    | Swept parking lot |
| 06/01/00          | 0"                   | None                    | None                       |                               |                   |
| 09/01/00          | 0"                   | Heavy                   | Removed Trash              | S. Riley                      |                   |
| 12/01/00          | 1"                   | None                    | Removed Sediment           | S. Riley                      |                   |
| 4/01/01           | 0"                   | None                    | None                       | S. Riley                      |                   |
| 04/15/01          | 2"                   | Some                    | Removed Sediment and Trash | ACE Environmental<br>Services |                   |
|                   |                      |                         |                            |                               |                   |
|                   |                      | SAN                     | <b>JIPLE</b>               | <u> </u>                      |                   |
|                   |                      |                         |                            |                               |                   |
|                   |                      |                         |                            |                               |                   |
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|                   |                      |                         |                            |                               |                   |











# Hydrodynamic Separation





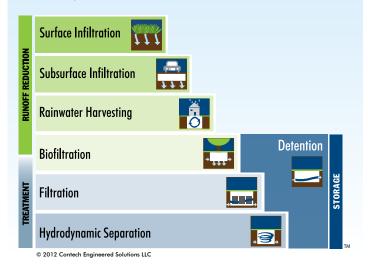
# Hydrodynamic Separation



# Selecting the right stormwater solution just got easier...

It's simple to choose the right low impact development (LID) solution to achieve your runoff reduction goals with the Contech UrbanGreen

Staircase. First, select the runoff reduction practices that are most appropriate for your site, paying particular attention to pretreatment needs. If the entire design storm cannot be retained, select a treatment best management practice (BMP) for the balance. Finally, select a detention system to address any outstanding downstream erosion.



# Removing Pollutants with Hydrodynamic Separation

Hydrodynamic separators are some of the first technologies to be developed for treating stormwater. Our hydrodynamic separation (HDS) products have been providing reliable stormwater treatment solutions for more than 20 years. With performance proven in the lab and in the field at sites across the country, these systems are widely accepted for effective solids removal. They are an optimal choice for pretreatment systems, especially efficient on gross solids, trash and debris, while also removing total suspended solids (TSS).

#### **Fundamentals of HDS**

- Create a low velocity vortex action to:
  - Increase efficiency by increasing length of flow path and eliminating short circuiting
  - Concentrate solids in stable, low velocity flow field
- Incorporate flow controls to:
  - Minimize turbulence and velocity
  - Prevent flow surges and resuspension
  - Retain floating pollutants. Provide easy access to captured pollutants to make maintenance easy

Learn more about hydrodynamic separation at www.ContechES/stormwater

# DYOHDS™ Tool Design Your Own Hydrodynamic Separator

#### **Features**

- Choose from three HDS technologies CDS®, Vortechs® & VortSentry® HS
- Site specific questions ensure the selected unit will comply with site constraints
- Unit size based on selected mean particle size and targeted removal percentage
- Localized rainfall data allows for region specific designs
- PDF report includes detailed performance calculations, specification and standard drawing for the unit that was sized



T Design Your Own (DYO) Hydrodynamic Separator online at www.ContechES.com/dyohds

# **Applications**

HDS products work well as standalone or end-of-pipe treatment systems and can easily be implemented in a retrofit scenario. They are particularly effective at removal of solids, trash and debris – and can help you meet TMDL requirements for these pollutants. HDS systems are also optimal pretreatment systems – and an important building block in a low impact development (LID) design. By removing solids, trash and debris prior to detention, infiltration or re-use systems, you can significantly increase their service life.

### **Water Quality**

HDS products provide high-performance stormwater pollutant removal. These systems are effective in removing solids to meet water quality goals and can be designed to achieve site treatment goals for TSS or oil.

# Pretreatment for Low Impact Development (LID) Designs

Hydrodynamic separation systems installed as pretreatment reduce downstream loading to reduce maintenance

#### Inlet and Outlet Pollution Control

Our HDS products are especially effective for solids and trash and debris. They can be installed at either the inlet or outlet of a drainage system to prevent pollutants from being discharged into lakes, streams or the ocean.



vortSentry HS is an effective option where space is limited



A vortechs protects detention system from sediment build-up and reduces maintenance





CDS unit installed to remove trash before entering Lake Meritt in Oakland, CA

# CDS®

The CDS is a swirl concentrator hybrid technology that provides continuous deflective separation – a combination of swirl concentration and patented indirect screening – into a uniquely capable product. It effectively screens, separates and traps debris, sediment and oil from stormwater runoff and is an ideal system to meet trash Total Maximum Daily Load (TMDL) requirements.

## **Features & Benefits**

### One-of-a-Kind Screening Technology

- Captures and retains 100% of floatables and neutrally buoyant debris 2.4mm or larger
- Effectively removes solids down to  $100\mu m$
- Self-cleaning screen the only non-blocking screening technology available
- Water velocities within the swirl chamber continually shear debris off the screen to keep it clean
- Various screening apertures available

#### **Proven Performance**

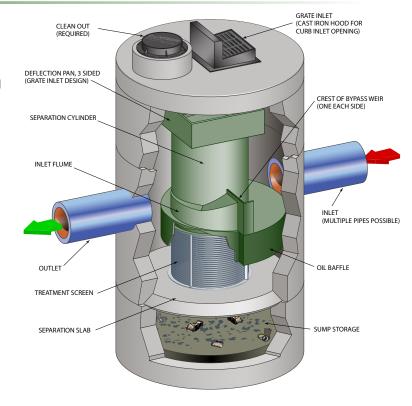
Performance verified by NJ CAT and WA Ecology

#### **Excellent Pollutant Retention**

- Isolated Storage Sump eliminates scour potential
- Oil Baffle improves hydrocarbon removal

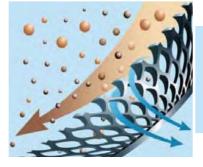
#### Multiple Options to Meet Site-Specific Needs

- Inline, offline, grate inlet and drop inlet configuration
- Accepts multiple pipe inlets and 90-180° angles eliminate the need for junction manholes
- Internal and external peak bypass options available





CDS removes fine sediments and trash debris



Continuous deflective separation — water velocities within the swirl chamber continually shear debris off the screen to keep it clean

# Vortechs®

The Vortechs system's swirl concentrator and flow controls work together to create a low energy environment, ideal for capturing and storing fine particles and other pollutants of concern. With comprehensive lab and field testing, the system delivers proven results and site-specific solutions.

# **Features & Benefits**

#### **Shallow Profile**

- Easy and cost-effective installation, especially on sites with high groundwater or bedrock
- Typical invert only 3 feet below pipe

#### **Effective Fine Solids Removal**

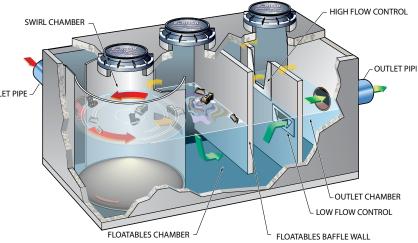
- Large swirl chamber Enhances very fine particle removal (down to 50 microns)
- Flow controls reduce inflow velocity and increase residence time
- Largest treatment zone surface area of any swirl concentrator system available

#### **Easy Maintenance**

- Unobstructed access to stored pollutants
- Sealed swirl chamber decreases clean-out volume

#### **Proven Performance**

• Performance verified by NJ CAT and WA Ecology





Lage diameter swirl chamber for enhancement of sediment removal in a low profile unit

Our systems are widely accepted for effective solids removal \* \*

# VortSentry® HS

The VortSentry HS hydrodynamic separator has a small footprint making it an effective pretreatment or treatment option for projects where space is at a premium.

### **Helical Flow Pattern**

- Enhances trapping and containment of pollutants
- Provides effective removal of settleable solids and floating contaminants

### **Unique Internal Bypass**

- Accepts a wide range of pipe sizes to treat and convey a wide range of flows
- Higher flows can be diverted without the use of external bypass structures
- Secondary inlet enhances floatable debris capture

### Flexible, Compact Design

- Small manhole footprint
- Inlet and grated inlet configuration available

# HEAD EQUALIZING BAFFLE OUTLET PIPE OUTLET FLOW CONTROL TREATMENT CHAMBER FRAME FRAME FROW PARTITION FLOW PARTITION FLOW PARTITION SECONDARY INLET SECONDARY INLET SEDIMENT STORAGE SUMP

GRATE

### **VortSentry**®

Similar to the VortSentry HS, the VortSentry is a compact manhole hydrodynamic separator; however it does not have the same treatment flow routing components/controls as the VortSentry HS does. This limits the flow rate and pipe sizes the system can accept. The VortSentry has received approval and is accepted by many municipalities, and is currently available in only those areas. Please see www.ContechES.com/vortsentry for more information.



vsHS unique internal bypass design treats high flows and bypasses peak flow, eliminating washout

## Maintenance

All stormwater treatment systems – whether natural or manufactured –should be maintained regularly. Despite the widespread implementation of BMPs, water quality goals will not be met if the treatment structures are not properly cleaned and maintained.

Systems vary in their maintenance needs, and the selection of a cost-effective and easy-to-access treatment system can mean a huge difference in maintenance expenses for years to come.

We design our products to minimize maintenance and make it as easy and inexpensive as possible to keep our systems working properly.

### Inspection

Inspection is the key to effective maintenance. Pollutant deposition and transport may vary from year to year and site to site. Semi-annual inspections will help ensure that the system is cleaned out at the appropriate time. Inspections should be performed more frequently where site conditions may cause rapid accumulation of pollutants.

### Vortechs, VortSentry and VortSentry HS

These systems should be cleaned out when sediment has accumulated to a specific depth (refer to the respective maintenance guidelines for details). Maintaining these systems is easiest when there is no flow entering the system. A vacuum truck is generally the most effective and convenient method of excavating pollutants from the systems.

### CDS

The recommended cleanout of solids within the CDS unit's sump should occur at 75% of the sump capacity. Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection and cleanout of the separation chamber and sump, and another allows inspection and cleanout of sediment captured and retained behind the screen. A vacuum truck is recommended for cleanout of the CDS unit and can be easily accomplished in less than 30 minutes for most installations.



A vacuum truck excavates pollutants from the systems



A CDS unit can be easily cleaned out in less than 30 minutes

Find maintenance information for all our products at www.ContechES.com/maintenance \* \* \*



### Learn more

See our HDS systems in action. Flash animations available

at www.ContechES.com/videos

### Connect with us

We're always available to make your job easier. Contact your local project consultant for design assistance. Search online at **www.ContechES.com**. While you're there, be sure to check out our upcoming seminar schedule or request an in-house technical presentation.

### Start a Project

If you are ready to begin a project, visit us at www.ContechES.com/designtoolbox

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, retaining walls, sanitary sewer, stormwater, erosion control and soil stabilization products.

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The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266 related foreign patents or other patents pending.

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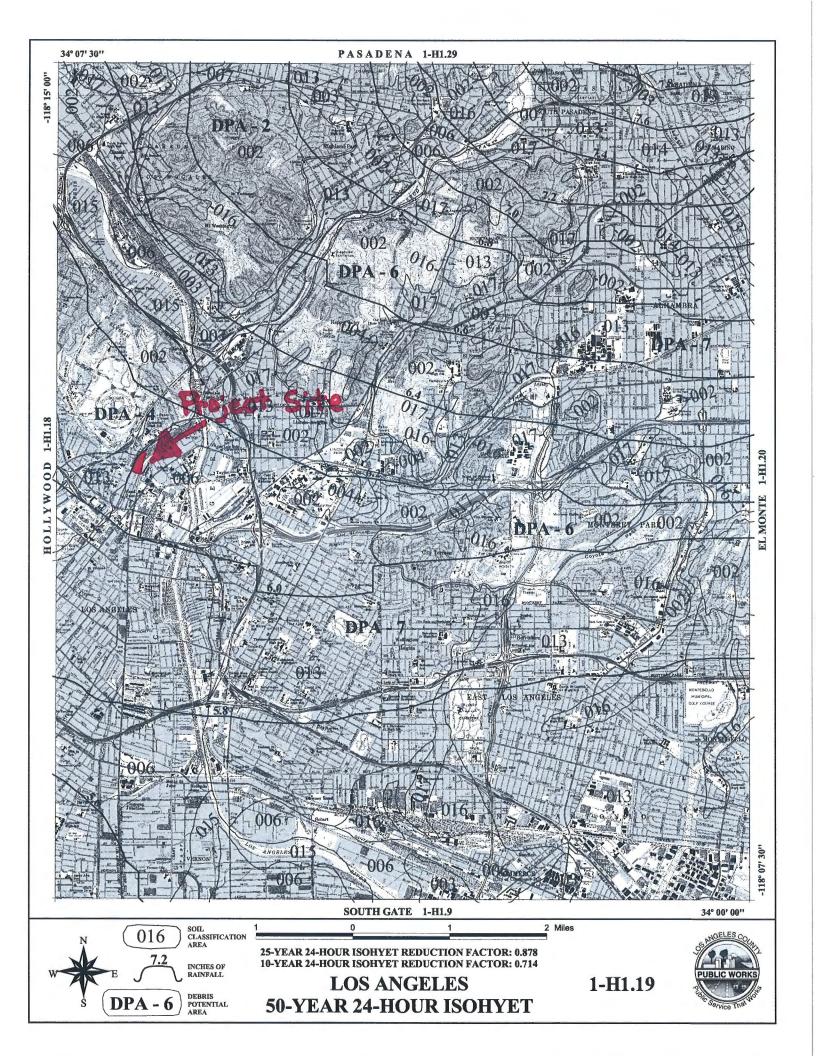




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**FSC** 

# **ATTACHMENTS**



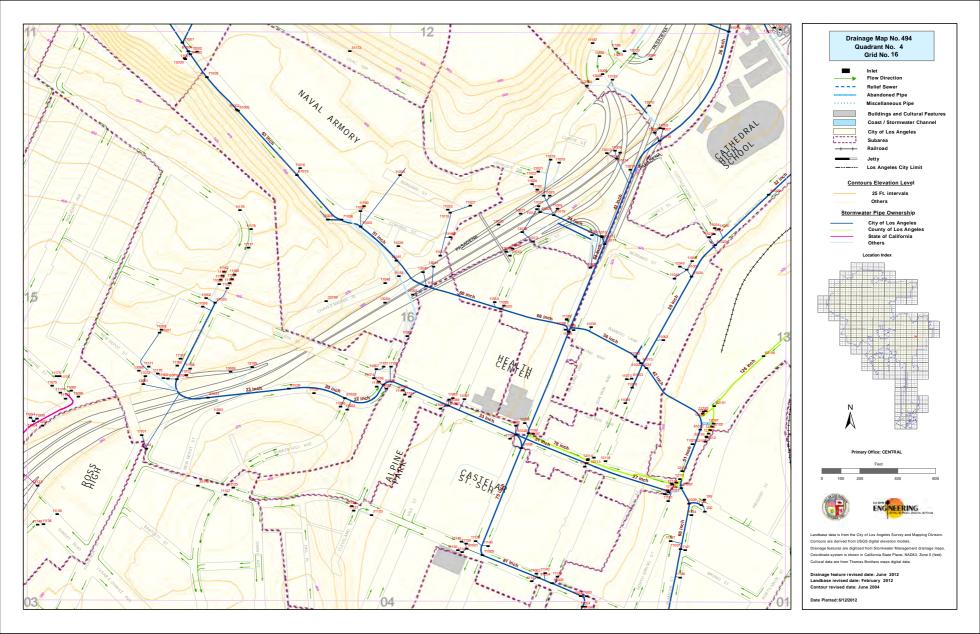
# Proportion Impervious Data

| Code    | Land Use Description                                                | % Impervious |
|---------|---------------------------------------------------------------------|--------------|
| 1111    | High-Density Single Family Residential                              | 42           |
| 1112    | Low-Density Single Family Residential                               | 21           |
| 1121    | Mixed Multi-Family Residential                                      | 74           |
| 1122    | Duplexes, Triplexes and 2-or 3-Unit Condominiums and Townhouses     | 55           |
| 1123    | Low-Rise Apartments, Condominiums, and Townhouses                   | 86           |
| 1124    | Medium-Rise Apartments and Condominiums                             | 86           |
| 1125    | High-Rise Apartments and Condominiums                               | 90           |
| 1131    | Trailer Parks and Mobile Home Courts, High-Density                  | 91           |
| 1132    | Mobile Home Courts and Subdivisions, Low-Density                    | 42           |
| 1140    | Mixed Residential                                                   | 59           |
| 1151    | Rural Residential, High-Density                                     | 15           |
| 1152    | Rural Residential, Low-Density                                      | 10           |
| 1211    | Low- and Medium-Rise Major Office Use                               | 91           |
| 1212    | High-Rise Major Office Use                                          | 91           |
| 1213    | Skyscrapers                                                         | 91           |
| 1221    | Regional Shopping Center                                            | 95           |
| 1222    | Retail Centers (Non-Strip With Contiguous Interconnected Off-Street | 96           |
| 1223    | Modern Strip Development                                            | 96           |
| 1224    | Older Strip Development                                             | 97           |
| 1231    | Commercial Storage                                                  | 90           |
| 1232    | Commercial Recreation                                               | 90           |
| 1233    | Hotels and Motels                                                   | 96           |
| 1234    | Attended Pay Public Parking Facilities                              | 91           |
| 1241    | Government Offices                                                  | 91           |
| 1242    | Police and Sheriff Stations                                         | 91           |
| 1243    | Fire Stations                                                       | 91           |
| 1244    | Major Medical Health Care Facilities                                | 74           |
| 1245    | Religious Facilities                                                | 82           |
| 1246    | Other Public Facilities                                             | 91           |
| 1247    | Non-Attended Public Parking Facilities                              | 91           |
| 1251    | Correctional Facilities                                             | 91           |
| 1252    | Special Care Facilities                                             | 74           |
| 1253    | Other Special Use Facilities                                        | 86           |
| 1261    | Pre-Schools/Day Care Centers                                        | 68           |
| 1262    | Elementary Schools                                                  | 82           |
| 1263    | Junior or Intermediate High Schools                                 | 82           |
| 1264    | Senior High Schools                                                 | 82           |
| 1265    | Colleges and Universities                                           | 47           |
| 1266    | Trade Schools and Professional Training Facilities                  | 91           |
| 1271    | Base (Built-up Area)                                                | 65           |
| 1271.01 | Base High-Density Single Family Residential                         | 42           |
| 1271.02 | Base Duplexes, Triplexes and 2-or 3-Unit Condominiums and T         | 55           |

| Code    | Land Use Description                                       | % Impervious |
|---------|------------------------------------------------------------|--------------|
| 1271.03 | Base Government Offices                                    | 91           |
| 1271.04 | Base Fire Stations                                         | 91           |
| 1271.05 | Base Non-Attended Public Parking Facilities                | 91           |
| 1271.06 | Base Air Field                                             | 45           |
| 1271.07 | Base Petroleum Refining and Processing                     | 91           |
| 1271.08 | Base Mineral Extraction - Oil and Gas                      | 10           |
| 1271.09 | Base Harbor Facilities                                     | 91           |
| 1271.10 | Base Navigation Aids                                       | 47           |
| 1271.11 | Base Developed Local Parks and Recreation                  | 10           |
| 1271.12 | Base Vacant Undifferentiated                               | 1            |
| 1272    | Vacant Area                                                | 2            |
| 1273    | Air Field                                                  | 45           |
| 1274    | Former Base (Built-up Area)                                | 65           |
| 1275    | Former Base Vacant Area                                    | 2            |
| 1276    | Former Base Air Field                                      | 91           |
| 1311    | Manufacturing, Assembly, and Industrial Services           | 91           |
| 1312    | Motion Picture and Television Studio Lots                  | 82           |
| 1313    | Packing Houses and Grain Elevators                         | 96           |
| 1314    | Research and Development                                   | 91           |
| 1321    | Manufacturing                                              | 91           |
| 1322    | Petroleum Refining and Processing                          | 91           |
| 1323    | Open Storage                                               | 66           |
| 1324    | Major Metal Processing                                     | 91           |
| 1325    | Chemical Processing                                        | 91           |
| 1331    | Mineral Extraction - Other Than Oil and Gas                | 10           |
| 1332    | Mineral Extraction - Oil and Gas                           | 10           |
| 1340    | Wholesaling and Warehousing                                | 91           |
| 1411    | Airports                                                   | 91           |
| 1411.01 | Airstrip                                                   | 10           |
| 1412    | Railroads                                                  | 15           |
| 1412.01 | Railroads-Attended Pay Public Parking Facilities           | 91           |
| 1412.02 | Railroads-Non-Attended Public Parking Facilities           | 91           |
| 1412.03 | Railroads-Manufacturing, Assembly, and Industrial Services | 91           |
| 1412.04 | Railroads-Petroleum Refining and Processing                | 91           |
| 1412.05 | Railroads-Open Storage                                     | 66           |
| 1412.06 | Railroads-Truck Terminals                                  | 91           |
| 1413    | Freeways and Major Roads                                   | 91           |
| 1414    | Park-and-Ride Lots                                         | 91           |
| 1415    | Bus Terminals and Yards                                    | 91           |
| 1416    | Truck Terminals                                            | 91           |
| 1417    | Harbor Facilities                                          | 91           |
| 1418    | Navigation Aids                                            | 47           |
|         | Communication Facilities                                   | 82           |
| 1420.01 | Communication Facilities-Antenna                           | 2            |

| Code    | Land Use Description                                                   | % Impervious |
|---------|------------------------------------------------------------------------|--------------|
|         | Electrical Power Facilities                                            | 47           |
| 1431.01 | Electrical Power Facilities-Powerlines (Urban)                         | 2            |
|         | Electrical Power Facilities-Powerlines (Rural)                         | 1            |
| 1432    | Solid Waste Disposal Facilities                                        | 15           |
|         | Liquid Waste Disposal Facilities                                       | 96           |
|         | Water Storage Facilities                                               | 91           |
| 1435    | Natural Gas and Petroleum Facilities                                   | 91           |
| 1435.01 | Natural Gas and Petroleum Facilities-Manufacturing, Assembly, and In   | 91           |
| 1435.02 | Natural Gas and Petroleum Facilities-Petroleum Refining and Processing | 91           |
| 1435.03 | Natural Gas and Petroleum Facilities-Mineral Extraction – Oil and Gas  | 10           |
| 1435.04 | Natural Gas and Petroleum Facilities-Vacant Undifferentiated           | 1            |
| 1436    | Water Transfer Facilities                                              | 96           |
| 1437    | Improved Flood Waterways and Structures                                | 100          |
| 1440    | Maintenance Yards                                                      | 91           |
| 1450    | Mixed Transportation                                                   | 90           |
| 1460    | Mixed Transportation and Utility                                       | 91           |
|         | Mixed Utility and Transportation-Improved Flood Waterways and          |              |
| -       | Structures                                                             | 100          |
|         | Mixed Utility and Transportation-Railroads                             | 15           |
|         | Mixed Utility and Transportation-Freeways and Major Roads              | 91           |
|         | Mixed Commercial and Industrial                                        | 91           |
|         | Mixed Urban                                                            | 89           |
|         | Under Construction (Use appropriate value)                             | 91           |
|         | Golf Courses                                                           | 3            |
|         | Developed Local Parks and Recreation                                   | 10           |
|         | Undeveloped Local Parks and Recreation                                 | 2            |
|         | Developed Regional Parks and Recreation                                | 2            |
|         | Undeveloped Regional Parks and Recreation                              | 1            |
|         | Cemeteries                                                             | 10           |
|         | Wildlife Preserves and Sanctuaries                                     | 2            |
|         | Wildlife-Commercial Recreation                                         | 90           |
|         | Wildlife-Other Special Use Facilities                                  | 86           |
|         | Wildlife-Developed Local Parks and Recreation                          | 10           |
|         | Specimen Gardens and Arboreta                                          | 15           |
|         | Beach Parks                                                            | 10           |
|         | Other Open Space and Recreation                                        | 10           |
|         | Irrigated Cropland and Improved Pasture Land                           | 2            |
| 2120    | Non-Irrigated Cropland and Improved Pasture Land                       | 2            |
| 2200    | Orchards and Vineyards                                                 | 2            |
|         | Nurseries                                                              | 15           |
| 2400    | Dairy, Intensive Livestock, and Associated Facilities                  | 42           |
|         | Poultry Operations                                                     | 62           |
|         | Other Agriculture                                                      | 42           |
| 2700    | Horse Ranches                                                          | 42           |

| Code | Land Use Description                                     | % Impervious |
|------|----------------------------------------------------------|--------------|
| 3100 | Vacant Undifferentiated                                  | 1            |
| 3200 | Abandoned Orchards and Vineyards                         | 2            |
| 3300 | Vacant With Limited Improvements (Use appropriate value) | 42           |
| 3400 | Beaches (Vacant)                                         | 1            |
| 4100 | Water, Undifferentiated                                  | 100          |
| 4200 | Harbor Water Facilities                                  | 100          |
| 4300 | Marina Water Facilities                                  | 100          |
| 4400 | Water Within a Military Installation                     | 100          |



|              | Category 1 Screening<br>(Feasible)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Category 2 Screening (Potentially Feasible)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Category 3 Screening<br>(Infeasible)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | <ol> <li>Underlying Groundwater         □ Depth of bottom of infiltration facility to seasonal high groundwater is &gt; 10 ft</li> <li>Site Soils         □ Infiltration rate (K<sub>sat</sub>) is &gt; 0.5 in/hr         □ Geotechnical hazards are not a potential near the site</li> <li>Site Surroundings         □ Buildings or structures are at least 25 ft away from the potential infiltration BMP         □ Site is not located within the designated hillside grading area.         □ No continuous presence of dry weather flows</li> </ol> | <ol> <li>Underlying Groundwater         □ Depth from bottom of infiltration facility to seasonal high groundwater is ≤ 10 ft         □ Unconfined aquifer is present with beneficial uses that may be impaired by infiltration. Full treatment required if this is the case         □ Groundwater is known to be polluted. Infiltration must be determined to be beneficial</li> <li>Site Soils         □ Infiltration rate is ≤ 0.5 in/hr but potential connectivity to higher K<sub>sat</sub> soils is feasible         □ Geotechnical hazards such as liquefaction are a potential near the site</li> <li>Site Surroundings         □ Buildings or structures are within 10 to 25 ft of the potential infiltration BMP         □ High-risk areas such as service/gas stations, truck stops, and heavy industrial sites. Full treatment is required if this is the case, or high-risk areas must be separate from stormwater runoff mingling</li> </ol> | <ol> <li>Underlying Groundwater         □ Depth from bottom of infiltration facility to seasonal high groundwater is ≤ 5 ft         □ Sites with soil and/or groundwater contamination**     </li> <li>Site Soils         □ Infiltration rate is ≤ 0.3 in/hr and connectivity to higher K<sub>sat</sub> soils is infeasible         □ Building sites designated "Landslide" or "Hillside Grading" areas as specified by the Department of City Planning's Zone Information and Map Access System (ZIMAS)         □ Geotechnical hazards such as liquefaction, collapsible soils, or expansive soils exist</li> <li>Site Surroundings         □ Site is located on a fill site         □ Site is located on or within 50 feet upgradient of a steep slope (20% or greater) and has not been approved by a professional geotechnical engineer or geologist</li> </ol> |
| Instructions | If all of the above boxes are checked, they shall be confirmed by a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional geotechnical engineer or geologist, verifying that infiltration BMPs are feasible at the site*. Otherwise, proceed to Category 2 screening.                                                                                                                                                                                     | If all of the above boxes are checked, or if corresponding boxes in Category 1 are checked in combination with the above boxes, a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional geotechnical engineer or geologist shall be carried out to approve infiltration measures*. Otherwise, proceed to Category 3 screening.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | If any of the above boxes are checked, a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional geotechnical engineer or geologist shall be submitted to prove infiltration practices are not feasible. *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 4.1: Infiltration Feasibility Screening

- \* Geotechnical Reports shall be approved by LADBS Grading Division. See Geotechnical Report Requirements herein.
- \*\* The presence of soil and/or groundwater contamination and/or the presence of existing or removed underground storage tanks shall be documented by CEQA or NEPA environmental reports, approved geotechnical reports, permits on file with the City, or a review of the State of California's Geotracker website.

|              | Category 1 Screening (Feasible)                                                                                                                                                                                                                                                                                                                                                                              | Category 2 Screening<br>(Potentially Feasible)                                                                                                                                                                                                                                                                                                                                                                                                                         | Category 3 Screening<br>(Infeasible)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | 1. Landscaped Area  □ Landscaped area categorization of 1 exists in accordance with Table 4.3  □ Captured volume equal to or less than the Estimated Total Water Usage (ETWU) from October 1 - April 30.  2. Site Soils □ Geotechnical hazards are not a potential near the site  3. Vector Control □ Approved vector control measures will be implemented                                                   | Landscaped Area     □ Landscaped area categorization of 2     exists in accordance with Table 4.3     □ Captured volume greater than the     Estimated Total Water Usage (ETWU)     from October 1 - April 30.      Site Soils     □ Geotechnical hazards such as     liquefaction are a potential near the site     □ Soil hydraulic conductivities are     sufficient for the designed water     application rate; if not, soil     amendments will be implemented   | <ol> <li>Landscaped Area         □ Landscaped area categorization of 3 exists in accordance with Table 4.3</li> <li>Site Soils         □ Geotechnical hazards such as landsliding, collapsible soils, or expansive soils exist</li> <li>Site Surroundings         □ Site is located on or within 50 feet of a steep slope (20% or greater) as determined by the Department of Building and Safety; irrigation within 3 days of a rain event could cause geotechnical instability</li> </ol> |
| Instructions | If all of the above boxes are checked, they shall be confirmed by a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional civil engineer, geotechnical engineer, geologist, or landscape architect, verifying that capture and use BMPs are feasible at the site.* Otherwise, proceed to Category 2 screening. | If all of the above boxes are checked, or if corresponding boxes in Category 1 are checked in combination with the above boxes, a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional civil engineer, geotechnical engineer, geologist, or landscape architect, shall be carried out to approve capture and use measures.* Otherwise, proceed to Category 3 screening. | If any of the above boxes are checked, a site-specific geotechnical investigation report and/or hydrologic analysis conducted and certified by a State of California registered professional geotechnical engineer, geologist, or landscape architect shall be submitted to prove capture & use practices are not feasible. *                                                                                                                                                               |

Table 4.2: Capture and Use Feasibility Screening

<sup>\*</sup> Geotechnical Reports shall be approved by LADBS Grading Division. See Geotechnical Report Requirements contained in the Infiltration Feasibility section.

# APPENDIX B-4

Initial Sewer Study

# Initial Sewer Study



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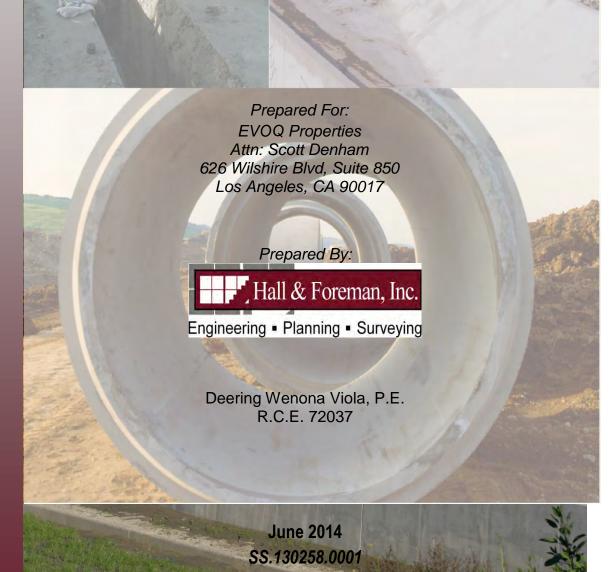
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### SEWER INFRASTRUCTURE SUMMARY

### **INTRODUCTION**

This project is a proposed mixed-use transit-oriented development consisting of 5.24 acres at 924 N. Spring Street in the Central City North community of the City of Los Angeles. The Project Site is located immediately east of the Los Angeles County Metropolitan Transportation Authority Chinatown Gold Line light rail station at N. Spring Street and College Street, and the northern end of the site faces the Los Angeles Historic State Park. Project Site is currently vacant and is periodically used for parking by nearby industrial and commercial businesses. The project will construct 685 residential units, retail spaces, and common areas. Reference attached project Vicinity Map.

### **EXISTING INFRASTRUCTURE:**

### **SEWER**

The existing property and building facilities are serviced through an off-site sewer network. The sewer network is comprised of 8-inch and 15-inch lines that are constructed out of vitrified clay pipes (VCP). The 8-inch off-site sewer in Rondout Street flows south east to Manhole #49513106, a City of Los Angeles owned and maintained structure. This manhole discharges to a City of Los Angeles 12-inch connected VCP main, which is located in North Main Street, east of the project property.

The second sewer main is a 15-inch off-site VCP located west of the project property in North Spring Street. It flows southwest to Manhole #49416163, a City of Los Angeles owned and maintained structure. The manhole discharges to a 15-inch connected VCP main parallel to Alameda Street.

Reference the attachment "Existing Sewer Mains Exhibit"; for visual presentation of the existing off-site sewer network and City of Los Angeles mains.

### **SEWER CAPACITY AVAILABILITY REQUEST (SCAR):**

The Sewer Capacity Availability Request (SCAR) is a clearance process required by the City of Los Angeles for Sewer Connection Permits. The process is used to evaluate the existing sewer system to determine if there is adequate capacity to safely convey sewage from proposed development projects, construction projects, groundwater dewatering projects and any increases in sewage from existing facilities. The sewer capacity availability request (SCAR) for the 15-inch sewer main west of the project site in North Spring Street and 8-inch main east of

the project in Rondout Street was submitted to the Bureau of Sanitation for verification of the existing capacity at the referenced mains.

### **CITY SEWAGE GENERATION FACTORS:**

Submitted with the SCAR were the City's Sewage Generation Factors (SGF) we calculated the estimated sewage discharge amounts based on the proposed housing type (i.e. 1 bedroom apartment, Studio, etc., please see the attached Sewage Generation Factors for housing factor description). For this project we will be evaluating two Schemes, with regard to the SCAR, the main difference between the two Schemes was the total number of residential units and the total Retail/ Restaurant square footages. The information for Scheme One provided higher Gallon Per Day (GPD) values when compared to Scheme Two, this is due to the fact that Scheme One provides a higher residential unit count as a result of a proposed high rise tower and more commercial/retail area. A higher density correlates with a higher SGF and sewage output, please see the sections below for details. These higher density values represent the information that was submitted on the SCAR in order to remain conservative.

### **SCHEME ONE:**

This Scheme is the higher-density option that uses a high rise option with up to 685 residential units and 46,400 square feet of market, retail, and restaurant use. For reference to the calculations below please see the attached "Calculation Breakdown Exhibit" of the calculations.

### A. Residential Unit Count:

With Scheme One we have a total unit count of 685 units. This total is a result of 94 - Studio Apartments, 370 - One Bedroom Apartments, 136 - Two Bedroom Apartments and 85 – Live Work Units. Each type of apartment was added to establish a sub-total and then multiplied by the respective Sewage Generation Factor (please see the attached Sewage Generation Factors Exhibit for reference). For a Studio Apartment we used 75 GPD per Dwelling Unit (DU), for a 1-BR we used 110 GPD/DU, and for a 2-BR we used 150 GPD/DU. There were a few Live-Work residential units that had no designated number of rooms and had an area greater than 1,000 square feet, these were added to the 2-BR sub-total.

### B. Retail Considerations:

For Retail Considerations we added the market, retail and restaurant total square footage of 46,400 sf and multiplied it by (25/1000) Gr SF, and (30 GPD/Seat) per the City's Sewage Generation Factors for Retail/Market and Restaurant (Full Service Indoor Seating) uses, respectively. Our total estimated Sewer Generation Factor was 13,550 GPD.

### C. Total

The total estimated flow was then added together and rounded up to the nearest thousand. The final sum was: 80,340 GPD + 13,550 GPD = 93,890 GPD which was rounded to 94,000 GPD.

### **SCHEME TWO:**

Scheme two is lower in density that has 533 residential units and 34,100 square feet of market, retail, and restaurant use. For reference to the calculations below please see the attached "Calculation Breakdown Exhibit" of the calculations.

### A. Residential Unit Count:

With Scheme Two we have a total unit count of 533 units. This total is a result of 57 - Studio Apartments, 267 - One Bedroom Apartments, 115 - Two Bedroom Apartments and 94 – Live Work Units. Each type of apartment was added to establish a sub-total and then multiplied by the respective Sewage Generation Factor (please see the attached Sewage Generation Factors Exhibit for reference). For a Studio Apartment we used 75 GPD per Dwelling Unit (DU), for a 1-BR we used 110 GPD/DU, and for a 2-BR we used 150 GPD/DU. There were a few Live-Work residential units that had no designated number of rooms and had an area greater than 1,000 square feet, these were added to the 2-BR sub-total.

### B. Retail Considerations:

For Retail Considerations we added the market, retail, and restaurant total square footages of 34,100 sf and multiplied it by (25/1000) Gr SF, and (30 GPD/Seat) per the City's Sewage Generation Factors for Retail/Market and Restaurant (Full Service Indoor Seating) uses, respectively. Our total estimated Sewer Generation Factor was 15,012.50 GPD.

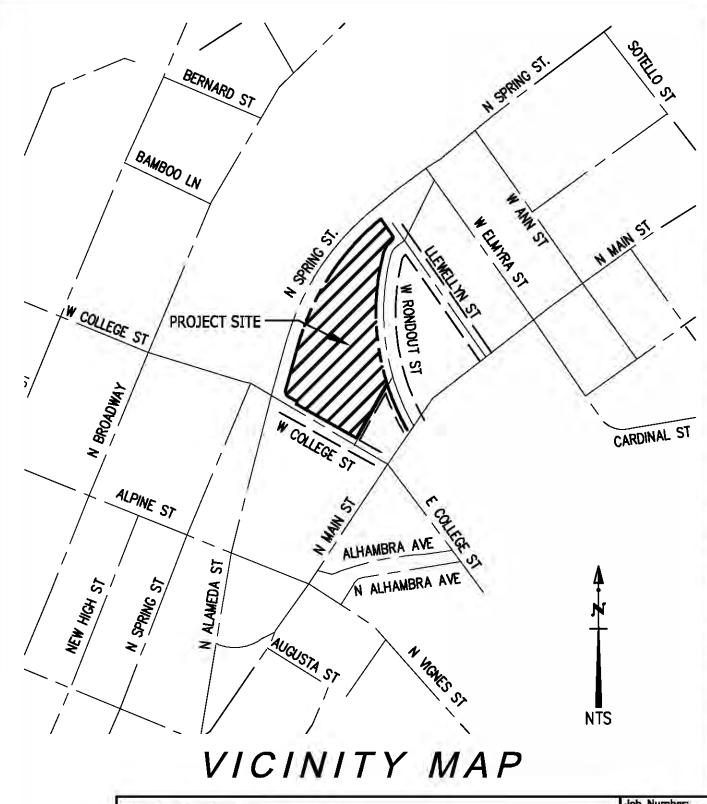
### C. Total

The total estimated flow was then added together and rounded up to the nearest thousand. The final sum was: 64,435 GPD + 15,012.50 GPD = 79,447.50 GPD which rounds up to 80,000 GPD.

### **CONCLUSION:**

In conclusion, the proposed development for Scheme One will produce a total Sewage Generation flow of 94,000 GPD and Scheme Two will produce 80,000 GPD. Per City of Los Angeles standards, sewer capacity availability request for the 15-inch sewer main west of the project site in North Spring Street and 8-inch main east of the project in Rondout Street was submitted to the Bureau of Sanitation for verification of the capacity existing at the

above referenced mains. It is assumed that there will be available capacity in the existing sewer lines; this will be confirmed with the City's response to the Sewer Capacity Availability Request that is currently under review.





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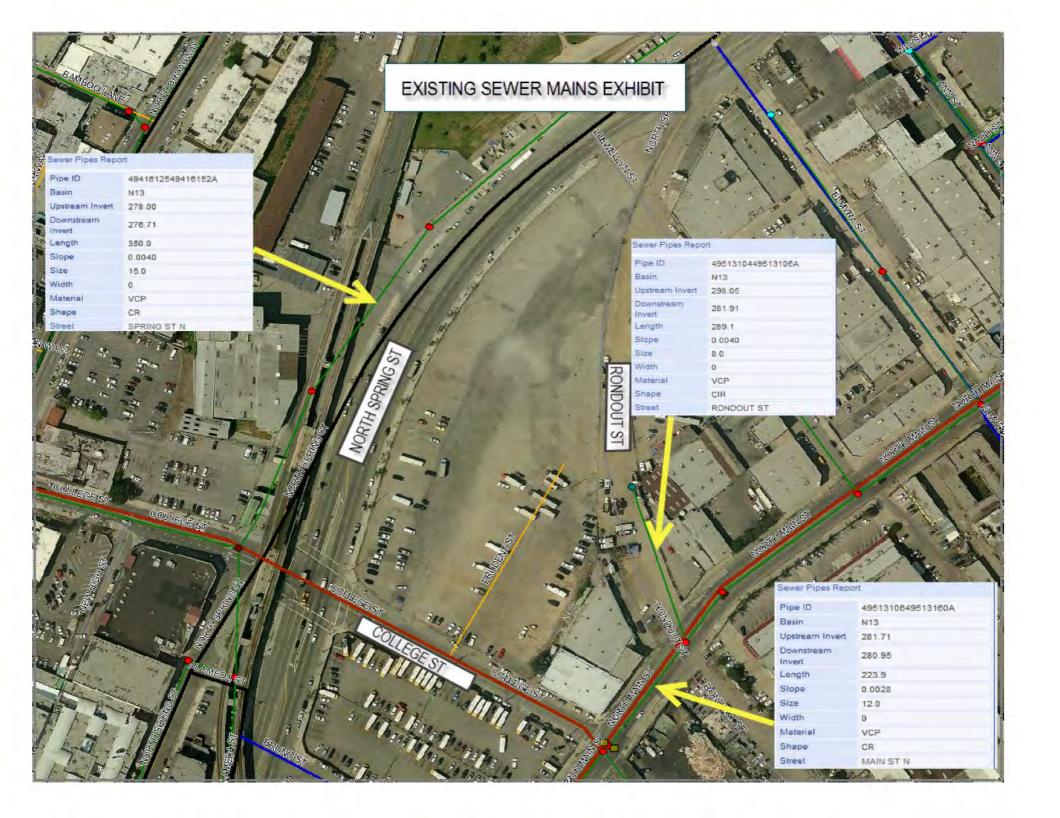
Job Number: 130258.0000

03-17-2014

Scale: NTS

Sheet 1 of 1 Sheets

Opened: Drawing



| Line<br>No. | FACILITY DESCRIPTION                            | PROPOSED SGF IN GPD | BOD<br>(mg/l) | SS<br>(mg/l) |
|-------------|-------------------------------------------------|---------------------|---------------|--------------|
| 1           | Acupuncture Office/Clinic                       | 120/1,000 Gr SF     | 265           | 275          |
|             | Arcade - Video Games                            | 50/1,000 Gr SF      | 265           | 275          |
|             | Auditorium (a)                                  | 3/Seat              | 265           | 275          |
| 4           | Auto Parking (a)                                | 20/1,000 Gr SF      | 265           | 275          |
|             | Auto Mfg., Service Maintenance (b)              | Actual              | 1,260         | 1,165        |
|             | Bakery                                          | 280/1,000 Gr SF     | 3,020         | 2,540        |
|             | Bank: Headquarters                              | 120/1,000 Gr SF     | 265           | 275          |
|             | Bank: Branch                                    | 50/1,000 Gr SF      | 265           | 275          |
| 9           | Ballroom                                        | 350/1,000 Gr SF     | 265           | 275          |
| 10          | Banquet Room                                    | 350/1,000 Gr SF     | 265           | 275          |
|             | Bar: Cocktail, Fixed Set (a) (c)                | 15/Seat             | 265           | 275          |
|             | Bar: Juice, No Baking Facilities (d)            | 720/1,000 Gr SF     | 265           | 275          |
|             | Bar: Juice, with Baking Facilities (d)          | 720/1,000 Gr SF     | 265           | 275          |
|             | Bar: Cocktail, Public Table Area (c)            | 720/1,000 Gr SF     | 265           | 275          |
|             | Barber Shop                                     | 120/1,000 Gr SF     | 265           | 275          |
|             | Barber Shop (s)                                 | 15/Stall            | 265           | 275          |
|             | Beauty Parlor                                   | 425/1,000 Gr SF     | 265           | 275          |
|             | Beauty Parlor (s)                               | 50/Stall            | 265           | 275          |
| 19          | Bldg. Const/Field Office (e)                    | 120/Office          | 265           | 275          |
|             | Bowling Alley: Alley, Lanes & Lobby Area        | 50/1,000 Gr SF      | 265           | 275          |
|             | Bowling Facility: Arcade/Bar/Restaurant/Dancing | Total               | Average       | Average      |
|             | Cafeteria: Fixed Seat                           | 30/Seat             | 1,000         | 600          |
| 23          | Car Wash: Automatic (b)                         | Actual              | 265           | 285          |
|             | Car Wash: Coin Operated Bays (b)                | Actual              | 265           | 285          |
| 25          | Car Wash: Hand Wash (b)                         | Actual              | 265           | 285          |
| 26          | Car Wash: Counter & Sales Area                  | 50/1,000 Gr SF      | 265           | 275          |
| 27          | Chapel: Fixed Seat                              | 3/Seat              | 265           | 275          |
| 28          | Chiropractic Office                             | 120/1,000 Gr SF     | 265           | 275          |
|             |                                                 | 3/Seat              | 265           | 275          |
| 30          | Church School: Day Care/Elem                    | 9/Occupant          | 265           | 275          |
| 31          | Church School: One Day Use (s)                  | 9/Occupant          | 265           | 275          |
| 32          | Cocktail Lounge: Fixed Seat (f)                 | 15/Seat             | 265           | 275          |
|             | Coffee House: No Food Preparation (d)           | 720/1,000 Gr SF     | 265           | 275          |
| 34          | Coffee House: Pastry Baking Only (d)            | 720/1,000 Gr SF     | 265           | 275          |
| 35          | Coffee House: Serves Prepared Food (d)          | 25/Seat             | 1,000         | 600          |
|             | Cold Storage: No Sales (g)                      | 30/1,000 Gr SF      | 265           | 275          |
| 37          | Cold Storage: Retail Sales (g)                  | 50/1,000 Gr SF      | 265           | 275          |
| 38          | Comfort Station: Public                         | 80/Fixture          | 265           | 275          |
| 39          | Commercial Use (a)                              | 50/1,000 Gr SF      | 265           | 275          |

| Line<br>No. | FACILITY DESCRIPTION                              | PROPOSED SGF IN GPD | BOD<br>(mg/l) | SS<br>(mg/l) |
|-------------|---------------------------------------------------|---------------------|---------------|--------------|
|             | Community Center                                  | 3/Occupant          | 265           | 275          |
|             | Conference Room of Office Bldg.                   | 120/1,000 Gr SF     | 265           | 275          |
|             | Counseling Center (h)                             | 120/1,000 Gr SF     | 265           | 275          |
|             | Credit Union                                      | 120/1,000 Gr SF     | 265           | 275          |
|             | Dairy                                             | Average Flow        | 1,510         | 325          |
|             | Dairy: Barn                                       | Average Flow        | 1,510         | 325          |
|             | Dairy: Retail Area                                | 50/1,000 Gr SF      | 265           | 275          |
|             | Dancing Area (of Bars or Nightclub) (c)           | 350/1,000 Gr SF     | 265           | 275          |
|             | Dance Studio (i)                                  | 50/1,000 Gr SF      | 265           | 275          |
|             | Dental Office/Clinic                              | 250/1,000 Gr SF     | 265           | 275          |
| 50          | Doughnut Shop                                     | 280/1,000 Gr SF     | 1,000         | 600          |
| 51          | Drug Rehabilitation Center (h)                    | 120/1,000 Gr SF     | 265           | 275          |
|             | Equipment Booth                                   | 30/1,000 Gr SF      | 265           | 275          |
|             | Film Processing (Retail)                          | 50/1,000 Gr SF      | 265           | 275          |
| 54          | Film Processing (Industrial)                      | Actual              | 265           | 275          |
| 55          | Food Processing Plant (b)                         | Actual              | 2,210         | 1,450        |
| 56          | Gas Station: Self Service                         | 100/W.C.            | 265           | 275          |
| 57          | Gas Station: Four Bays Max                        | 430/Station         | 1,950         | 1,175        |
| 58          | Golf Course Facility: Lobby/Office/Restaurant/Bar | Total               | 700           | 450          |
| 59          | Gymnasium: Basketball, Volleyball (k)             | 200/1,000 Gr SF     | 265           | 275          |
| 60          | Hanger (Aircraft)                                 | 50/1,000 Gr SF      | 265           | 275          |
|             | Health Club/Spa (k)                               | 650/1,000 Gr SF     | 265           | 275          |
| 62          | Homeless Shelter                                  | 70/Bed              | 265           | 275          |
| 63          | Hospital                                          | 70/Bed              | 820           | 1,230        |
| 64          | Hospital: Convalescent (a)                        | 70/Bed              | 265           | 275          |
| 65          | Hospital: Animal                                  | 300/1,000 Gr SF     | 820           | 1,230        |
| 66          | Hospital: Psychiatric                             | 70/Bed              | 265           | 275          |
| 67          | Hospital: Surgical (a)                            | 360/Bed             | 265           | 275          |
|             | Hotel: Use Guest Rooms Only (a)                   | 120/Room            | 265           | 275          |
| 69          | Jail                                              | 85/Inmate           | 265           | 275          |
|             | Kennel: Dog Kennel/Open                           | 100/1,000 Gr SF     | 265           | 275          |
|             | Laboratory: Commercial                            | 250/1,000 Gr SF     | 265           | 275          |
|             | Laboratory: Industrial                            | Actual              | 265           | 275          |
|             | Laundromat                                        | 185/Machine //      | 550           | 370          |
|             | Library: Public Area                              | 50/1,000 Gr SF      | 265           | 275          |
|             | Library: Stacks, Storage                          | 30/1,000 Gr SF      | 265           | 275          |
|             | Lobby of Retail Area (l)                          | 50/1,000 Gr SF      | 265           | 275          |
|             | Lodge Hall                                        | 3/Seat              | 265           | 275          |
| 78          | Lounge (1)                                        | 50/1,000 Gr SF      | 265           | 275          |

| Line<br>No. | FACILITY DESCRIPTION                                   | PROPOSED SGF IN GPD | BOD<br>(mg/l) | SS<br>(mg/l) |
|-------------|--------------------------------------------------------|---------------------|---------------|--------------|
|             | Machine Shop (No Industrial Waste Permit Required) (b) | 50/1,000 Gr SF      | 265           | 275          |
|             | Machine Shop (Industrial)                              | Actual              | 265           | 275          |
|             | Mfg or Industrial Facility (No IW Permit Required) (b) | 50/1,000 Gr SF      | 265           | 275          |
|             | Mfg or Industrial Facility (Industrial)                | Actual              | 265           | 275          |
|             | Massage Parlor                                         | 250/1,000 Gr SF     | 265           | 275          |
|             | Medical Building (a)                                   | 225/1,000 Gr SF     | 265           | 275          |
|             | Medical: Lab in Hospital                               | 250/1,000 Gr SF     | 340           | 275          |
|             | Medical Office/Clinic                                  | 250/1,000 Gr SF     | 265           | 275          |
|             | Mini-Mall (No Food)                                    | 50/1,000 Gr SF      | 265           | 275          |
|             | Mortuary: Chapel                                       | 3/Seat              | 265           | 275          |
|             | Mortuary: Embalming                                    | 300/1,000 Gr SF     | 800           | 800          |
|             | Mortuary: Living Area                                  | 50/1,000 Gr SF      | 265           | 275          |
|             | Motel: Use Guest Room Only (a)                         | 120/Room            | 265           | 275          |
|             | Museum: All Area                                       | 30/1,000 Gr SF      | 265           | 275          |
|             | Museum: Office Over 15%                                | 120/1,000 Gr SF     | 265           | 275          |
|             | Museum: Sales Area                                     | 50/1,000 Gr SF      | 265           | 275          |
|             | Office Building (a)                                    | 120/1,000 Gr SF     | 265           | 275          |
|             | Office Bldg w/Cooling Tower                            | 170/1,000 Gr SF     | 265           | 275          |
|             | Plating Plant (No IW Permit Required) (b)              | 50/1,000 Gr SF      | 265           | 275          |
|             | Plating Plant (Industrial) (b)                         | Actual              | 265           | 275          |
|             | Pool Hall (No Alcohol)                                 | 50/1,000 Gr SF      | 265           | 275          |
|             | Post Office: Full Service (m)                          | 120/1,000 Gr SF     | 265           | 275          |
| 101         | Post Office: Private Mail Box Rental                   | 50/1,000 Gr SF      | 265           | 275          |
|             | Prisons                                                | 175/Inmate          | 265           | 275          |
| 103         | Residential Dorm: College or Residential (n)           | 70/Student          | 265           | 275          |
|             | Residential: Boarding House                            | 70/Bed              | 265           | 275          |
|             | Residential: Apt - Bachelor (a)                        | 75/DU               | 265           | 275          |
|             | Residential: Apt - 1 BDR (a) (o)                       | 4110/DU             | 265           | 275          |
|             | Residential: Apt - 2 BDR (a) (o)                       | 150/DU              | 265           | 275          |
|             | Residential: Apt - 3 BDR (a) (o)                       | 190/DU //           | 265           | 275          |
|             | Residential: Apt - >3 BDR (o)                          | 40/BDR              | 265           | 275          |
|             | Residential: Condo - 1 BDR (o)                         | 110/DU              | 265           | 275          |
|             | Residential: Condo - 2 BDR (o)                         | 150/DU              | 265           | 275          |
| 112         | Residential: Condo - 3 BDR (o)                         | 190/DU              | 265           | 275          |
| 113         | Residential: Condo - >3 BDR (o)                        | 40/BDR              | 265           | 275          |
|             | Residential: Duplex/Townhouse - 1 BR (o)               | 110/DU              | 265           | 275          |
| 115         | Residential: Duplex/Townhouse - 2 BR (o)               | 150/DU              | 265           | 275          |
|             | Residential: Duplex/Townhouse - 3 BR (o)               | 190/DU              | 265           | 275          |
| 117         | Residential: Duplex/Townhouse - >3 BR (o)              | 40/BDR              | 265           | 275          |

| Line | FACILITY DESCRIPTION                            | PROPOSED SGF IN GPD | BOD     | SS      |
|------|-------------------------------------------------|---------------------|---------|---------|
| No.  |                                                 |                     | (mg/l)  | (mg/l)  |
|      | Residential: SFD - 1 BR (o)                     | 140/DU              | 265     | 275     |
| 119  | Residential: SFD - 2 BR (o)                     | 185/DU /            | 265     | 275     |
| 120  | Residential: SFD - 3 BR (o)                     | 230/DU /            | 265     | 275     |
| 121  | Residential: SFD - >3 BR (o)                    | 45/BDR              | 265     | 275     |
| 122  | Residential Room Addition: Bedroom (o)          | 45/BDR              | 265     | 275     |
| 123  | Residential Room Conversion: Into a Bedroom (o) | 45/BDR              | 265     | 275     |
| 124  | Residential: Mobile Home                        | Same as Apt         | 265     | 275     |
| 125  | Residential: Artist (2/3 Area)                  | 75/DU               | 265     | 275     |
| 126  | Residential: Artist Residence                   | 75/DU               | 265     | 275     |
| 127  | Residential: Guest Home w/ Kitchen              | Same as Apt         | 265     | 275     |
| 128  | Residential: Guest Home w/o Kitchen             | 45/BDR              | 265     | 275     |
| 129  | Rest Home                                       | 70/Bed              | 555     | 490     |
| 130  | Restaurant: Drive-In                            | 50/Stall            | 1000    | 600     |
| 131  | Restaurant: Drive-In Seating Area               | 25/Seat             | 1000    | 600     |
| 132  | Restaurant: Fast Food Indoor Seat               | 25/Seat             | 1000    | 600     |
| 133  | Restaurant: Fast Food Outdoor Seat              | 25/Seat             | 1000    | 600     |
| 134  | Restaurant: Full Service Indoor Seat (a)        | J 30/Seat           | 1000    | 600     |
| 135  | Restaurant: Full Service Outdoor Seat           | 30/Seat             | 1000    | 600     |
| 136  | Restaurant: Take Out                            | 300/1,000 Gr SF     | 1000    | 600     |
| 137  | Retail Area (greater than 100,000 SF)           | ✓ 50/1,000 Gr SF    | 265     | 275     |
| 138  | Retail Area (less than 100,000 SF)              | 25/1,000 Gr SF      | 265     | 275     |
|      | Rifle Range: Shooting Stalls/Lanes, Lobby       | 50/1,000 Gr SF      | 265     | 275     |
|      | Rifle Range Facility: Bar/Restaurant            | Total               | Average | Average |
|      | School: Arts/Dancing/Music (i)                  | 11/Student          | 265     |         |
|      | School: Elementary/Jr. High (a) (p)             | 9/Student           | 265     | 275     |
|      | School: High School (a) (p)                     | 11/Student          | 265     | 275     |
|      | School: Kindergarten (s)                        | 9/Student           | 265     | 275     |
|      | School: Martial Arts (i)                        | 9/Student           | 265     | 275     |
| 146  | School: Nursery-Day Care (p)                    | 9/Child             | 265     | 275     |
| 147  | School: Special Class (p)                       | 9/Student           | 265     | 275     |
|      | School: Trade or Vocational (p)                 | 11/Student          | 265     | 275     |
| 149  | School: Training (p)                            | 11/Student          | 265     | 275     |
| 150  | School: University/College (a) (p)              | 16/Student          | 265     |         |
|      | School: Dormitory (a) (n)                       | 70/Student          | 265     | 275     |
|      | School: Stadium, Pavilion                       | 3/Seat              | 265     | 275     |
| -    | Spa/Jacuzzi (Commercial with backwash filters)  | Total               | 265     | 275     |
|      | Storage: Building/Warehouse                     | 30/1,000 Gr SF      | 265     | 275     |
|      | Storage: Self-Storage Bldg                      | 30/1,000 Gr SF      | 265     | 275     |
| 156  | Store: Ice Cream/Yogurt                         | 25/1,000 Gr SF      | 1000    |         |

| Line<br>No. | FACILITY DESCRIPTION                                     | PROPOSED SGF IN GPD | BOD<br>(mg/l) | SS<br>(mg/l) |
|-------------|----------------------------------------------------------|---------------------|---------------|--------------|
| 157         | Store: Retail (1)                                        | 50/1,000 Gr SF      | 265           | 275          |
| 158         | Studio: Film/TV - Audience Viewing Room (q)              | 3/Seat              | 265           | 275          |
| 159         | Studio: Film/TV - Regular Use Indoor Filming Area (q)    | 50/1,000 Gr SF      | 265           | 275          |
| 160         | Studio: Film/TV - Ind. Use Film Process/Machine Shop (q) | 50/1,000 Gr SF      | 265           | 275          |
| 161         | Studio: Film/TV - Ind. Use Film Process/Machine Shop     | Total               | 265           | 275          |
| 162         | Studio: Recording                                        | 50/1,000 Gr SF      | 265           | 275          |
| 163         | Swimming Pool (Commercial with backwash filters)         | Total               | 265           | 275          |
| 164         | Tanning Salon: Independent, No Shower (r)                | 50/1,000 Gr SF      | 265           | 275          |
| 165         | Tanning Salon: Within a Health Spa/Club                  | 640/1,000 Gr SF     | 265           | 275          |
| 166         | Theater: Drive-In                                        | 6/Vehicle           | 265           | 275          |
| 167         | Theater: Live/Music/Opera                                | 3/Seat              | 265           | 275          |
| 168         | Theater: Cinema                                          | 3/Seat              | 265           | 275          |
| 169         | Tract: Commercial/Residential                            | 1/Acre              | 265           | 275          |
| 170         | Trailer: Const/Field Office (e)                          | 120/Office          | 265           | 275          |
| 171         | Veterinary Clinic/Office                                 | 250/1,000 Gr SF     | 265           | 275          |
| 172         | Warehouse                                                | 30/1,000 Gr SF      | 265           | 275          |
| 173         | Warehouse w/ Office                                      | Total               | 265           | 275          |
| 174         | Waste Dump: Recreational                                 | 400/Station         | 2650          | 2750         |
| 175         | Wine Tasting Room: Kitchen                               | 200/1,000 Gr SF     | 265           | 275          |
| 176         | Wine Tasting Room: All Area                              | 50/1,000 Gr SF      | 265           | 275          |

### **College Station**

### **SCAR Calculations**

### **Scheme One**

### Residential

|           |     | Sewage     |        |
|-----------|-----|------------|--------|
| Unit Type | No. | Generation | Total  |
|           |     | Factor     |        |
| Studio    | 94  | 75/DU      | 7,050  |
| 1-BR      | 370 | 110/DU     | 40,700 |
| 2-BR      | 136 | 150/DU     | 20,400 |
| LW-1BR    | 14  | 110/DU     | 1,540  |
| LW-2BR    | 71  | 150/DU     | 10,650 |

Total 685 80,340

### **Retail/ Market/ Restaurant**

| Unit Type                              | Square<br>Footage | Seats | Sewage<br>Generation<br>Factor | Total     |
|----------------------------------------|-------------------|-------|--------------------------------|-----------|
| Retail                                 | 18,000            | N/A   | 25/1,000 Gr SF                 | 450.00    |
| Market                                 | 20,000            | N/A   | 25/1,000 Gr SF                 | 500.00    |
| Restaurant-Full Service Indoor Seating | 8,400             | 420   | 30 GPD/Seat                    | 12,600.00 |

Total 46,400 420 13,550.00

Scheme One Total: 685 Units and 46,400 Retail/ Restaurant/ Market Square Footage produces 93,890 GPD of sewage.

### **Scheme Two**

### Residential

|           |     | Sewage     |        |  |
|-----------|-----|------------|--------|--|
| Unit Type | No. | Generation | Total  |  |
|           |     | Factor     |        |  |
| Studio    | 57  | 75/DU      | 4,275  |  |
| 1-BR      | 267 | 110/DU     | 29,370 |  |
| 2-BR      | 115 | 150/DU     | 17,250 |  |
| LW-1BR    | 14  | 110/DU     | 1,540  |  |
| LW-2BR    | 80  | 150/DU     | 12,000 |  |

Total 533 64,435

### **Retail/ Market/ Restaurant**

| Unit Type                              | Square<br>Footage | Seats | Sewage<br>Generation<br>Factor | Total     |
|----------------------------------------|-------------------|-------|--------------------------------|-----------|
| Retail                                 | 4,500             | N/A   | 25/1,000 Gr SF                 | 112.50    |
| Market                                 | 20,000            | N/A   | 25/1,000 Gr SF                 | 500.00    |
| Restaurant-Full Service Indoor Seating | 9,600             | 480   | 30 GPD/Seat                    | 14,400.00 |

Total 34,100 480 15,012.50

Scheme Two Total: 533 Units and 34,100 Retail/ Market/ Restaurant Square Footage produces 79,447.50 GPD of sewage.

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