

Appendix E

Geotechnical Feasibility Assessment



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1641 Border Avenue • Torrance, CA 90501 T 310.618.2190 888.618.2190 F 310.618.2191 W hamilton-associates.net

July 15, 2021
Project No. 20-2730

Kornerstone Park, LLC
2500 East Ball Road, Suite 260
Anaheim, California 92806

Attention: Mr. Abdul Saquib

Subject: Geotechnical Feasibility Assessment, Proposed Palmyra Cemetery, 2205
E. Palmyra Avenue and 290 South Yorba Street, Orange, California.

Dear Mr. Saquib:

Per your request, presented herewith is Hamilton & Associates, Inc. (H&A) Geotechnical Feasibility Assessment Report for the subject project. H&A's work was conducted in accordance with our change order dated May 11, 2021 and your subsequent authorization. The accompanying geotechnical feasibility assessment presents a review of available geotechnical data and reports with conclusions and preliminary recommendations regarding cemetery development of the site. Our findings indicate that the study area is suitable for the proposed redevelopment of the site provided the preliminary recommendations and guidelines provided in this report are implemented during project planning. Additional design-level geotechnical exploration services will be required for building department level grading plan preparation, construction, and foundation design. We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Respectfully submitted,
HAMILTON & ASSOCIATES, INC.


Andrew Sover
Staff Engineer


David T. Hamilton, PE, GE
President/Geotechnical Engineer



Hamilton & Associates, Inc.

Geotechnical Engineering Construction Testing & Inspection Materials Laboratory

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INTRODUCTION

This report presents the results of H&A's geotechnical feasibility assessment for the Project (described below in Project Concept) to be conducted at 2205 E. Palmyra Avenue, and 290 South Yorba Street, Orange, California, approximately 33.7839°N, 117.8300°W (Site). Figure 1, "Site Location Map" presents the Site's location.

Preliminary geotechnical recommendations for design and construction of the Project were developed based on the review of select published and unpublished literature, including previous field investigation and laboratory analysis by others. This report summarizes the data collected and presents geotechnical findings, conclusions, and recommendations. The information presented in this report may be used for general land planning and entitlement purposes.

PROJECT DESCRIPTION

The Project concept was provided during conversations and in emails with Mr. Abdul Saquib, Owner's Representative and Mr. Rick Fox, Project Architect. Plans of the proposed project were provided to H&A for this report.

Project Concept

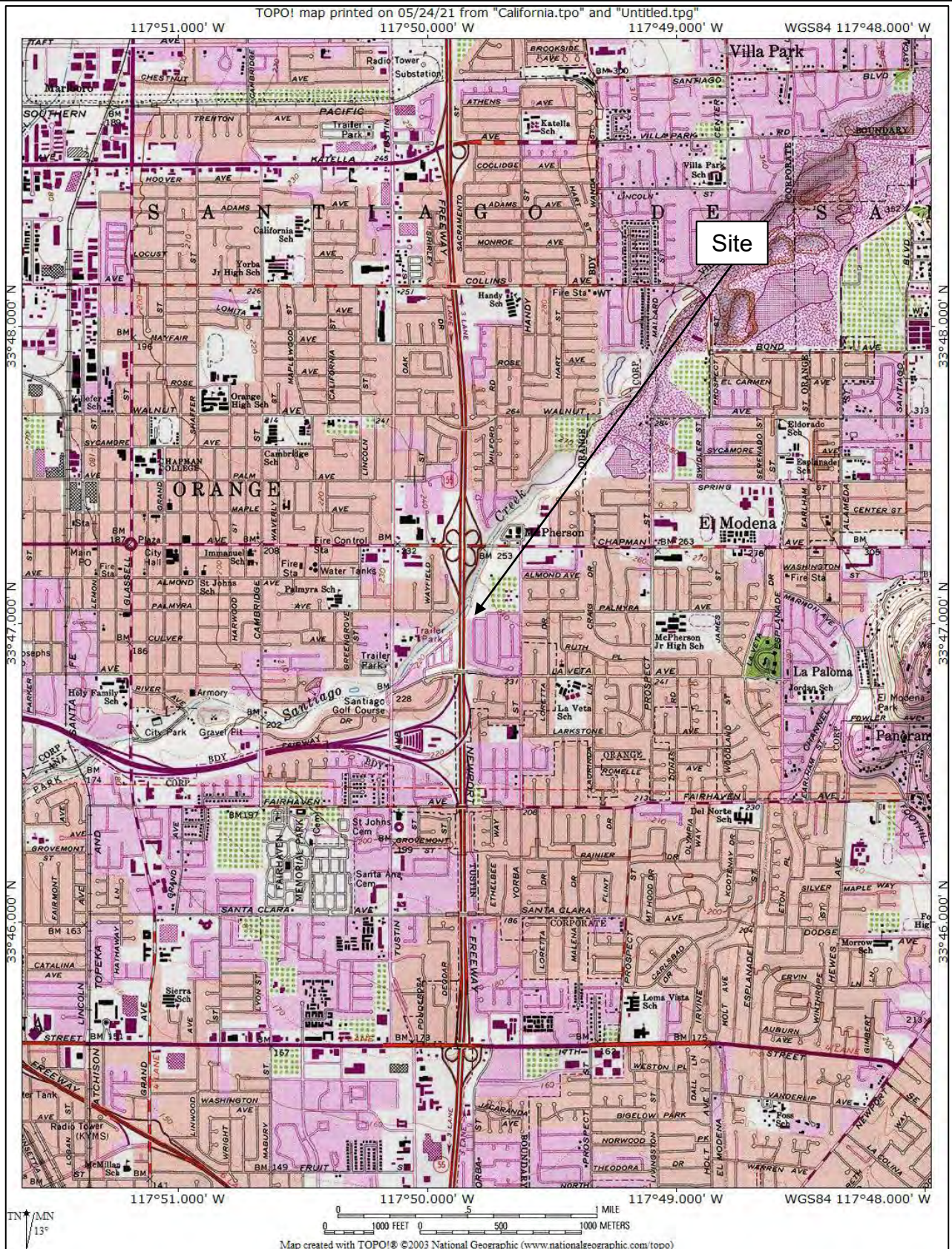
It is H&A's understanding that the Project will consist of a new cemetery development as presented on Plate A-1a, "Architectural Site Plan" and Plate A-1b "Grading Plan".

The usable portion of the site will be developed to accommodate approximately 3,500 gravesites, an outdoor gathering area north of the building, vehicle parking, a loading zone, and pedestrian paths of travel.

The basic site planning module for grave sites is 4' x 8' which allows space for individual liners and a narrow space between them. Each gravesite will be excavated to approximately 5 feet below ground surface (bgs), and a 2-foot buffer is proposed between the underlying landfill and gravesite. A concrete bottomless frame will be placed at the bottom of each gravesite. The bodies will be placed within the concrete frame, filled with soil, and closed with a concrete lid. The remaining portion of each gravesite will then be backfilled and compacted with soil.

A small storage shed is proposed (20' x 40') for the storage of excavation equipment, and miscellaneous cemetery supplies such as pre-cast grave liners, pebbles, and headstones.

SITE LOCATION MAP



PROJECT: Kornerstone (Palmyra Cemetery)

PROJECT NO: 20-2730

DATE: July 2021

ADDRESS: 2205 E. Palmyra Avenue, Orange, California

FIGURE: 1



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The existing building will be re-purposed to provide support for several activities central to funeral and burial practice, as well as administrative offices needed to operate the cemetery. A small portion of the first floor (124 +/- SF) will be demolished and removed, thereby reducing the total existing building area to 5,138 SF. A significant portion of the first-floor interior (approx. 1,540 SF) will be devoted to the Prayer Hall and Women's Prayer Room. The remainder of the first floor will consist of the Bathing Room, Viewing Room, and other miscellaneous support spaces. The second floor will be used exclusively for business and administrative offices accessed only by staff.

Existing Site Conditions and Background

The 5.95 acre irregularly shaped site is generally bounded by the Orange Dog Park to the north, the Orange Unified School District Child Development Center to the east, Palmyra Avenue and residential lots to the south, and the California State Route 55 freeway and Santiago Creek Bank and Bike Path to the west (Figure 1).

Portions of the Site consist of an old landfill operated by County of Orange for waste disposal activities from approximately 1953-1956, while other offsite landfill operations took place from 1946-1956 and included green waste, construction debris, municipal solid waste, and burnt debris.

The site consists of an abandoned YMCA property that was built in approximately 1972 and includes: an abandoned YMCA building; a parking lot to the southeast; a BMX bicycle track to the north; a soccer field to the south-southeast; and outdoor fields to the south.

With the exception of the BMX track, which consists of a variety of 5- to 10-ft constructed soil mounds, the ground surface of the Site is generally flat (gently undulating, minor slopes).

Structural Loading

In the absence of actual structural loading information, we will assume that the proposed shed and retaining walls will be supported by shallow conventional foundations with maximum continuous and spread footing loads on the order of 2 kips per linear foot and 10 kips, respectively.

REVIEW OF AVAILABLE REPORTS

H&A reviewed select available reports, documents and maps pertinent to the Project. The purpose of records review was to obtain any potential geotechnical information regarding the Site and incorporate it into this report. A list of reviewed documents obtained or provided to H&A by other design team members are provided in the "References" section

of this report. A summary of pertinent documents and information is provided below. Excerpts of pertinent data from reports is provided in Appendix B.

July 1972 YMCA/Woodward-McNeill & Associates Geotechnical Investigation & Addendums

In June of 1972, Woodward-McNeill excavated 3 borings on the Site ranging in depth from 52 to 89 feet. The borings were excavated using a 6-in continuous flight auger. Disturbed samples of rubbish were obtained from the cuttings and drive tube samples of native soils were obtained. Boring logs were not included in the report however findings of the field investigation were summarized as such

- Newspapers and magazines were 13 to 15 years old and still readable
- Temperatures were reported to be 91.5°F.
- Rubbish did not appear to contain highly bio-degradable material and mainly contained construction debris and paper
- Water content of rubbish was relatively low.

In the vicinity of the of the proposed structure, existing YMCA building, indicate depth of refuse was approximately 25 feet. Drilling was difficult due to heavy large construction debris. Soils beneath the rubbish consisted of about 7 feet of medium dense silty sands under which lie dense to very dense clayey gravels to maximum depth explored of 89 feet.

The report recommended that the proposed structure be supported on driven piles and utilities should be flexible to account for future possible settlement of the refuse. The proposed structure floor should be sealed to prevent possible methane gas and venting it out from under the building. At a minimum, four feet of fill should exist between the foundation and refuse.

Woodward-McNeill provided a map with the location of the 3 mentioned borings, 7 test pits, and an approximation of the location of rubbish fill. A typical drawing of pile supported floor with a barrier and ventilation system was also obtained. It is unknown if this was provided with the original report or as an addendum. No other figures referenced in the report or following addendums were obtained by H&A.

An addendum to the report prepared in July 1972 recommend that the floor be a raised structural floor either wood deck or concrete slab due to possible settlement under the proposed structure. Recommendations were for the proposed fill under the structure to extend out from the structure a distance of 2 times the maximum depth.

A second addendum to the geotechnical report was prepared in January 1973 detailing a conversation on pile specifications and barrier under the floor and ventilation system specifications.

Based on a letter dated March 5, 1973, driven piles were in the process of installation on the Site beginning sometime around February or March 1973.

What may be a portion of a set of foundation plans was obtained by H&A. While very faded information obtained from the plans suggest that piles were capped with gradebeams that had 2-inch diameter plastic pipes running through crushed rock with 10ml visqueen barriers beneath the slabs. A pile schedule on the plan suggests that piles are on the order of 40 feet to 44 feet in length, depending on the pile type chosen.

1972 LA. Biven Grading Plans

A set of grading and drainage plans, dated December 12, 1972 for the proposed YMCA development were reviewed by H&A. A note for the teen center called for removal and recompaction of 6.6 feet of soil below finish floor elevation and recompact with clean fill to 90%. Also noted was that waste, inflammable waste, vegetation, and refuse shall be removed prior to grading. No compaction reports or as-built plans were obtained by this firm.

1973 Woodward-McNeill & Associates YMCA Pile Driving Operations

Based on a letter obtained by this firm it appears that driven piles were installed on the Site sometime around February 1973, however Woodward-McNeill was not retained to perform observation of pile driving operations. No compaction reports or as-built plans were available.

1991 Earth Technology

Earth Tech (ET) investigated the La Veta Landfill, Site, in an effort to determine if the landfill material would affect groundwater quality in the area. Four groundwater monitoring wells were drilled from October 10 to November 20, 1990, to depths of 247 to 253 feet below the ground surface. Soil samples were collected at 5 feet intervals from 5 feet to 100 feet and 20 foot intervals until termination. Copies of the pertinent boring logs are presented in Appendix B. Water levels at the Site, measured by onsite monitoring wells, indicate that water resides in a confined aquifer 220 feet below the surface, and it flows from north to south. Approximately 50 feet of clay overlie the aquifer. Based on testing and monitoring of the Site it was determined that the landfill is not affecting groundwater quality below the Site. It was noted in ET report that based on their interpretation of aerial photos and research that the northwest portion of the La Veta landfill, subject Site, likely had construction debris placed in the excavation along the creek bed side to aid in

reducing erosion from the Santiago Creek. Refuse was noted as not being placed in the creek bed.

April 2007 California Integrated Waste Management Board Work Plan

The California Integrated Waste Management Board (CIWMB) prepared a report in April 2007 to assess the YMCA site and attempt to determine the footprint of the waste and potential for methane gas to impact the onsite structures or if it was mitigating to nearby areas. Gas monitoring wells were installed. A thorough review of prior documents was performed by the CIWMB in preparation of their report. Review of the 1997 report by Orange County Water District/TRG noted that approximately four feet of soil covered fill material and landfill debris was present up to 22 feet. Under landfill red sandy clay was encountered. The top 10 feet of landfill material contained auto parts, yard clippings, construction debris, wood scraps, newspapers, tin cans and glass bottles. Lower 10 feet contained construction debris, wood chips, soil matrix and newspaper. Review of the 2005 report prepared by US EPA/Weston Solutions noted the subsidence in the parking lot. Additional environmental reports were reviewed by CIWMB but are not listed here as no other geotechnical pertinent data was mentioned. Exhibits and data provided in the work plan are provided in Appendix B.

Geosyntec Reports

Geosyntec performed multiple studies on the Site primarily concerned with the potential of harmful gases. Some studies included soil sampling and summaries are provided here.

2009 Santiago Creek Bed Borings On December 3rd and 4th 2009, Geosyntec advanced 7 borings to depths of 15 to 20 feet along the Santiago Creek bed. Attempts were made to hand auger the first 5 feet but were unsuccessful. A direct push drill rig was used to core each borehole. Of these borings two were located to the west of the Site along the creek bed. Material encountered in the borings near the Site consisted of fill silty sands, likely from CA-55 construction, to depths of 17.5 feet and 15 respectively. SS-2 had a small layer, 0.25 feet, of burned material at a depth of 13 feet below ground surface. Data from this report is provided in Appendix B.

2010 Revised Site Assessment Report Geosyntec drilled a total of 37 soil borings mainly via the use Geoprobe® 6600 and 6610 DT direct-push drill rigs. Soil cores were continuously recovered using a 4 ft sampler lined with acetate sleeves and were advanced to a depth of at least 15 ft bgs. If waste was observed, the boring was advanced to a depth of approximately 5 ft below the observable base of waste. Samples and observations were made of the material which included native soils, fill soils, burned material, and municipal solid waste (MSW). Boring logs from this report are presented in Appendix B. Waste materials, consisting of either fill soil with burnt debris, fill soil with

MSW, or fill soil with a combination of burnt debris and MSW, were observed in 15 of the 37 borings drilled at the Site. Remaining borings were observed to contain native and/or fill soils. Where observed at the YMCA site waste material was generally covered by 5 feet of soil.

February 19, 2020 Ardent Environmental Group, Inc., Draft Report

On November 19, 2019, a preliminary geophysical survey was completed by Subsurface Surveys & Associates (SSS) to attempt to identify the distance of the surface to the landfill debris in the northern portion of the site. The results of the survey were also compared to the former soil borings drilled by Geosyntec. Based on the results of the preliminary geophysical survey data, SSS indicated that clear evidence of the landfill debris/soil interface was not identified. SSS also compared the geophysical survey data to the Geosyntec soil boring logs; however, SSS could not identify a strong correlation, likely as a result of the margin of error in Geosyntec's boring location map and surface elevation changes over the last 10 years. Based on these results, the site-wide geophysical survey was not completed, and Ardent recommended the excavation of test pits in select areas of the site to further assess the depth to the top of the landfill debris.

In January 2020, a total of 54 test pits were excavated in select areas of the proposed cemetery. The test pits were approximately 9 to 57 feet in length and excavated to depths of up to 10 feet bgs

Test pits TP1 through TP22 were excavated in the northern portion of the site in the area of the former BMX track. The depth to the landfill debris ranged from approximately 5 to 9 feet bgs. Shallow zones of construction debris were also noted from approximately 3 to 9 feet bgs in select areas. The zone of construction debris was not consistent and was mostly soil with an intermittent mix of small to large concrete waste, brick, and rebar. The landfill debris consisted of municipal waste and was generally observed as a more consistent layer.

Test pits TP23 through TP51 were excavated in the southern portion of the site in the area of the soccer field. The landfill debris was generally encountered at approximately 6 to 9 feet bgs, with a few shallower zones observed. Shallow construction debris from approximately 1 to 6 feet bgs was also observed in sporadic locations throughout the southern portion of the site. The landfill debris consisted of materials similar to those noted in the northern portion of the site.

The report recommended that importing two to three feet of clean soil to obtain an approximate 7 to 8 foot zone of soil over the Site above potential landfill debris.

HISTORIC TOPOGRAPHIC MAPS AND AERIAL PHOTOGRAPHS

H&A reviewed historical United States Geological Survey (USGS) topographic maps, Anaheim Sheet 1896 and Orange Quadrangle 1935, 1949, and 1964. Portions of these maps are presented as Plates H-1 through H-4 “Historical Topographic Map” and are located in Appendix A.

The Site resides to the east of Santiago Creek, a major watercourse in Orange County that drains the Santa Ana Mountains before becoming a tributary of the Santa Ana River. The Santiago Creek lies approximately 15 to 20 feet below the Site.

Based on the topographic maps the Site and general area gently descend to the south-southwest. The Site appears to be relatively unchanged from the 1896 to 1949 topographic maps based on the contour expression.

The 1949 topographic map depicts a gravel pit to the northeast of the Site that is a present-day dog park.

It is noted that based on historical documents landfills in the vicinity were active from 1946-1956, with the subject Site active from 1953-1956. This is consistent with the 1949 topographic map, where no expression of site-specific landfill operation is present.

Historical aerial photographs spanning from 1931 to 1990 were reviewed and are presented on Plates H-5 through H-18 “Historical Aerial Photography” and are located in Appendix A.

The 1931, 1938 and 1939 aerial image shows the Site is in use for agricultural purposes. Land around the Site to the east and south is in also in use as agricultural land.

In 1947 the Site has been cleared of vegetation and to the north the gravel pit appears to be in use with a haul road graded to the creek bed below. No landfill operations are evident at the Site at this time. Land around the Site remains in use as agricultural land.

The 1952 aerial image shows the Site has been excavated and haul roads appear to connect the Site to the gravel pit to the north. The 1953 and 1955 images suggest continued use of the Site. The 1957 image presents the Site as possibly having been filled in and no longer in active use.

The 1960 image depicts the Site cleared of vegetation and graded. The gravel pit to the north has also been graded.

The 1965 aerial image shows that the area is being developed with housing seen to the east and west of the Site.

The 1970 aerial depicts the lot to the east has begun development of what is the present day OUSD Child Development Center.

The 1973 aerial depicts a structure on the south portion of the Site however a majority of the Site remains undeveloped. At the time of this image, January 19, 1973, it does not appear that construction of the YMCA building has begun. A majority of the agricultural land has been developed into residential lots except for the plot directly to the south.

The 1974 aerial, dated December 9, 1974, depicts the present-day vacant YMCA building on the Site. The north portions of the Site appear to have been graded in a manner similar to what would become the BMX dirt track. The existing parking lot does not appear to have been completed at the time of this image. The residential lots to the south are in a state of development at this time.

The 1980 and 1990 aerial images show the Site similar to present day conditions.

Based on an aerial imagery hosted by Google Earth, the southern structure was removed sometime in 2015 or early 2016.

FIELD EXPLORATION AND LABORATORY TESTING

This report utilizes pertinent geotechnical data from previous reports including field exploration, logging, sampling, and geotechnical testing of Site earth materials as presented on Plate A-1c, "Geotechnical Map". Subsurface explorations as well as the surficial distribution of earth materials were presented based on drafting techniques and are approximate. This report is geotechnical only and did not include any evaluation or assessment of hazardous or toxic materials, which may or may not exist on or beneath the site.

FIELD EXPLORATION

No field exploration was conducted by H&A in preparation of this report. Prior field work performed by Woodward-McNeill, 1972, Earth Technology, 1991, CIWMB 2007, Geosyntec, 2010, and Ardent, 2020 was reviewed in preparation of this report.

LABORATORY TESTING

Laboratory testing of samples by prior firms consisted of environmental constituent testing in the soil or air at the Site. Limited geotechnical laboratory test data was obtained from reviewed records.

SITE AND SUBSURFACE CONDITIONS

GEOLOGIC SETTING

The Site is located within eastern limits of the City of Orange. Figure 2, “Regional Geology Map”, depicts the Site and vicinity as underlain by young alluvial fan deposits (Qyf_{sa})

The Site is located within a seismically active region of Southern California within the zone of influence of several active and potentially active faults. Review of selected maps published by the California Geologic Survey (CGS) and the United States Geologic Survey (USGS) include Figure 3 “Regional Fault Map” and Figure 4 “Seismic Hazards Map”. Review of the USGS Interactive Quaternary Faults database and the USGS Unified Hazard Tool, indicate that the faults of most influence to the Site are the:

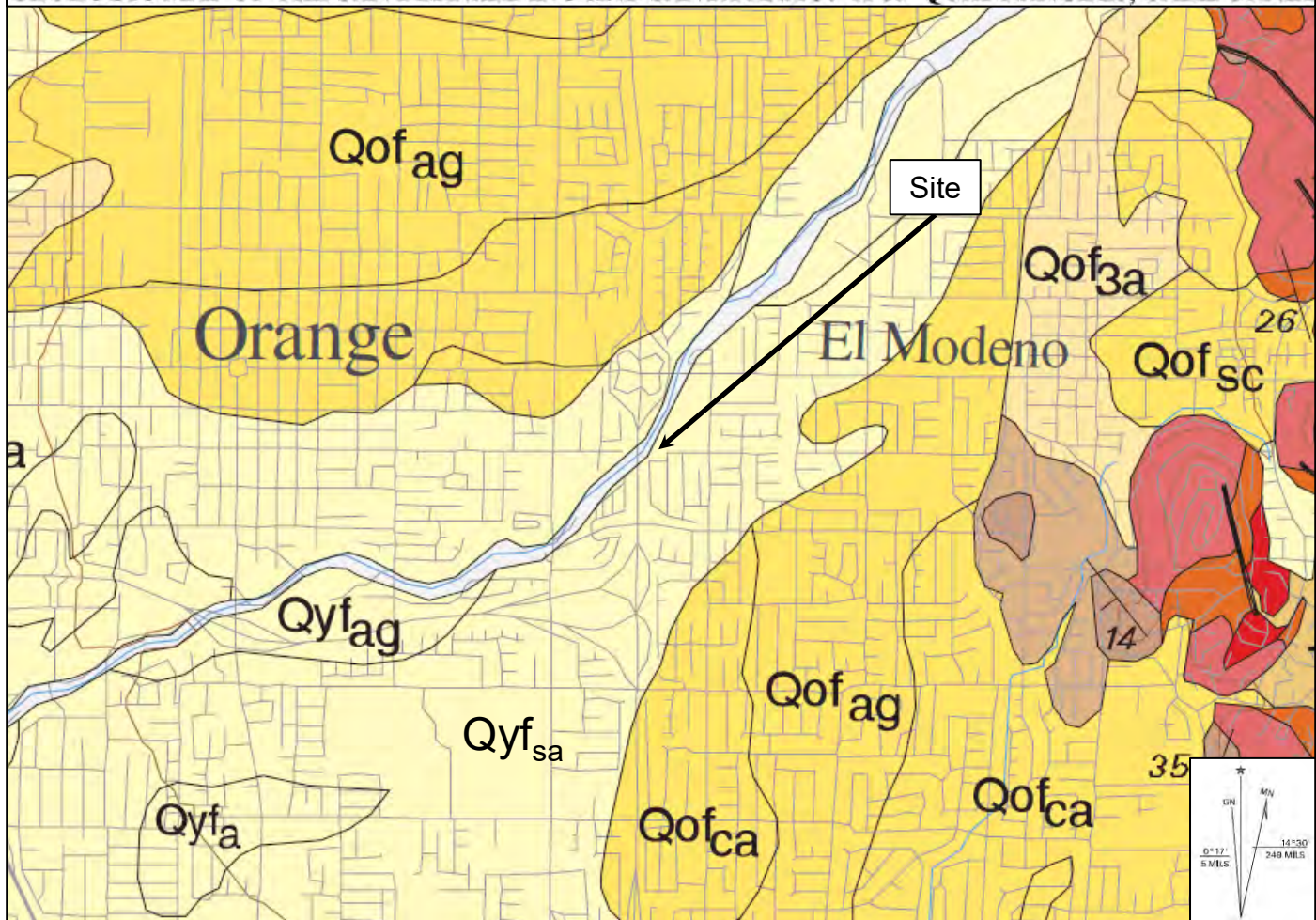
- Elsinore Fault, located approximately 14 miles east of the Site and capable of a M6.5 earthquake,
- Whittier Fault, located approximately 8.8 miles northeast of the Site and capable of producing an M7.4 earthquake,
- Chino Hills Fault, located about 10 miles north of the Site and capable of producing a M6.6 earthquake,
- Peralta Hills Fault located approximately 3.8 miles north of the Site and capable of producing a M6.8 earthquake.

At this time, the Elsinore, and Chino Hills are delineated as active by the CGS according to the Alquist-Priolo Earthquake Fault Zones Act and are currently zoned.

On January 17, 1994 the M6.7 Northridge earthquake occurred approximately 37 miles northwest of the subject site, at a focal depth of 17.5 km (10.9 miles), on a south-dipping blind thrust fault with no direct surface rupture. The M5.9 Whittier Narrows earthquake occurred October 1, 1987 approximately 27 miles northeast of the Site on a previously unknown, north-dipping blind thrust fault in the eastern Los Angeles region, with no recorded surface rupture (Woods, 1995). On February 9, 1971 the M6.5 San Fernando Earthquake occurred along previously mapped faults about 47 miles north of the Site, producing 12 miles of ground rupture. And, on March 10, 1933, the historic Long Beach M6.2 earthquake occurred approximately 18 miles southeast of the subject site (Ziony,

REGIONAL GEOLOGY MAP

GEOLOGIC MAP OF THE SAN BERNARDINO AND SANTA ANA 30' X 60' QUADRANGLES, CALIFORNIA



Qyf

Young alluvial-fan deposits (Holocene and late Pleistocene)—Unconsolidated to moderately consolidated silt, sand, pebbly cobbly sand, and bouldery alluvial-fan deposits having slightly to moderately dissected surfaces.

Qof

Old alluvial fan deposits (late to middle Pleistocene)—Reddish brown, gravel and sand alluvial fan deposits; indurated, commonly slightly dissected. In places includes thin alluvial fan deposits of Holocene age.

VERSION 1.0
compiled by

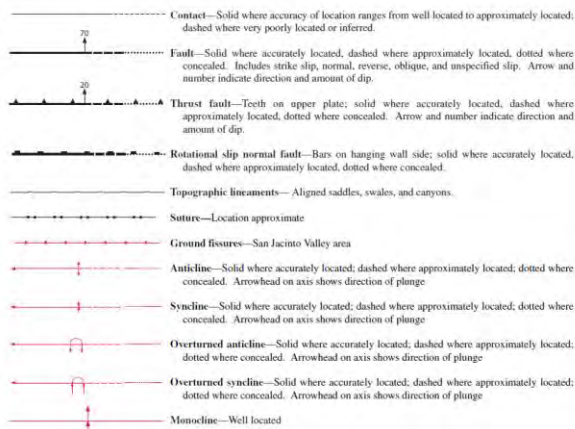
Douglas M. Morton¹ and Fred K. Miller²
2006

Digital Preparation by Pamela M. Cossette² and Kelly R. Boward²

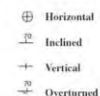
¹ U.S. Geological Survey
Department of Earth Science
University of California, Riverside
Riverside, CA 92521

² U.S. Geological Survey
800 W. Riverside Avenue, Room 502
Springfield, IL 62761

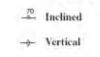
EXPLANATION



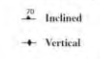
Strike and dip of bedding



Strike and dip of foliation, primary igneous



Strike and dip of foliation, metamorphic



Bearing and plunge of linear features



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DATE: July 2021

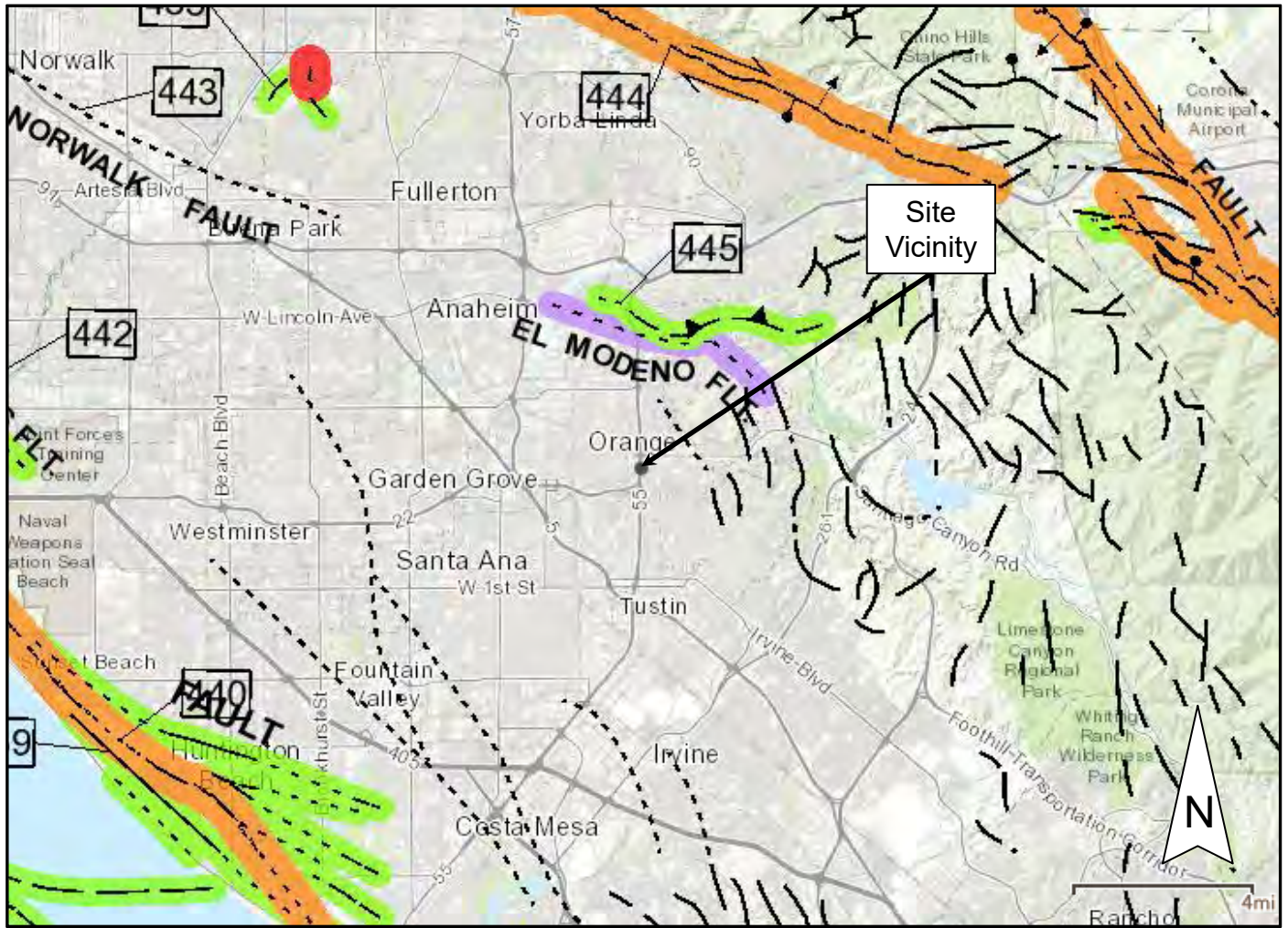
ADDRESS: 2205 E. Palmyra Avenue, Orange, California

FIGURE: 2



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REGIONAL FAULT MAP



Geologic Time Scale	Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
				ON LAND	OFFSHORE
Quaternary	Holocene			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
	Late Quaternary			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
	Late Quaternary			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary	1,600,000			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
	4.5 billion				

From: "Fault Activity Map of California," compiled by Charles W. Jennings and William A. Bryant, California Geological Survey, Map No. 6, California Geologic Data Map Series, 2010

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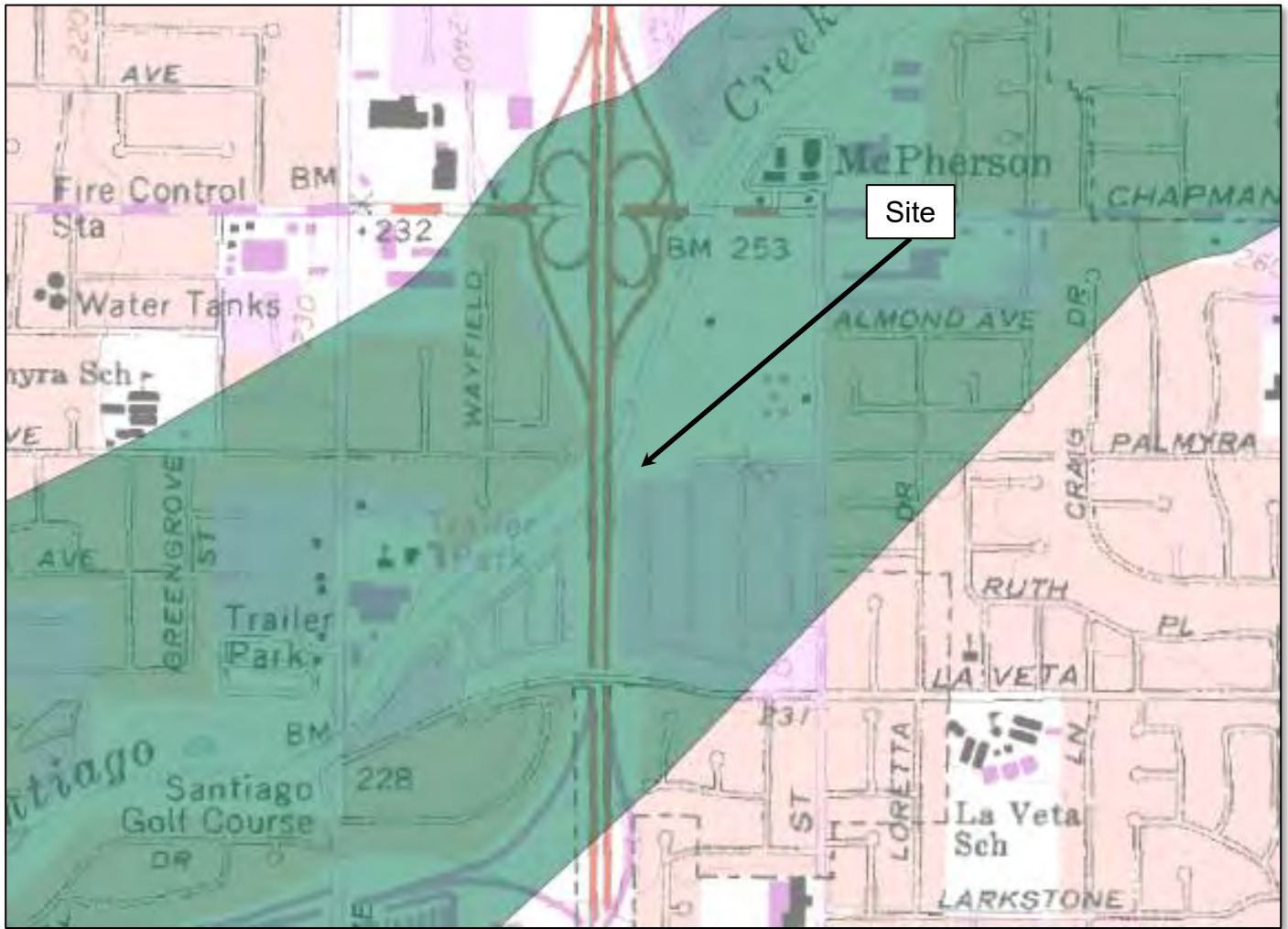
ADDRESS: 2205 E. Palmyra Avenue, Orange, California

FIGURE: 3



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SEISMIC HAZARD ZONES MAP



Contour Interval 20 Feet



MAP EXPLANATION

EARTHQUAKE FAULT ZONES



Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.



Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.



SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

ORANGE QUADRANGLE

SEISMIC HAZARD ZONES

Delineated in compliance with Chapter 7.8 Division 2 of the California Public Resources Code (Seismic Hazard Mapping Act)

OFFICIAL MAP

Released: April 15, 1998

James L. Davis
STATE GEOLOGIST

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

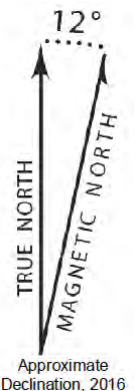


Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.



Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Note: Mitigation methods differ for each zone—AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.



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FIGURE: 4



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1985). All of these earthquakes caused considerable damage near their epicenters and in surrounding cities.

Review of select geologic maps of the area published by the CGS and the United States Geologic Survey (USGS) depict no landslide on or near the Site as shown on Figure 2 and Figure 5, "Landslide Inventory Map".

GEOLOGIC MATERIALS

Onsite earth materials underlying the Site were found to consist of artificial fill, landfill debris, and natural soils. The relationships of the various earth materials in the subsurface are illustrated in the "A" Plates in Appendix A at the end of this report. More detailed descriptions of the soils encountered, and conditions observed during the subsurface exploration are shown in the Boring Logs prepared by Earth Tech, CIWMB, GeoSyntec, 2010 and Test Pit Sections prepared by Ardent are included in Appendix B. Earth materials and geologic conditions described by the consultants above were reviewed and are described below.

Fill (Af)

Artificial (man-made) fill was encountered immediately beneath the surface in all borings and test pits, and generally consisted of Silty Sand to Silty Sand with Gravel and some cobbles. The fill was dry to moist and generally loose in consistency at the time of subsurface exploration.

Landfill (Municipal Solid Waste, Burnt Debris, Construction Debris, Soil)

Landfill debris was encountered below the fill and consisted of municipal solid waste, burnt debris or a combination, mixed with various amounts of sand, silt and gravel. The landfill included wood, glass, newspaper, cardboard, organic wood fragments, at times odorous. Landfill was generally loose in consistency at the time of subsurface exploration.

Young Alluvial Fan Deposits (Qy_{f_{sa}} and Qy_{f_{ag}})

Natural Young Alluvial Fan Deposits underlie the landfill. The Alluvial Fan Deposits generally consisted of silty sand, sandy silt, sand with gravel, gravel with sand, Native soils near the surface include some silt and clay. The natural soil was brown, yellowish brown and grayish brown, dry to moist, and loose to dense in consistency.

FIELD OBSERVATIONS

At the time of this report the site consisted of an abandoned YMCA property that was built in approximately 1972 and included an abandoned YMCA building; a parking lot to the southeast; remnants of a BMX bicycle track to the north a soccer field to the south-southeast; and outdoor fields to the south.

LANDSLIDE INVENTORY MAP



Landslide Types

Landslide Activity

Deposits:

- Debris Flow
- Debris Slide, Soil Slide, or Soil Topple
- Earth Flow
- Rock Fall, Rock Topple, or Soil Fall
- Rock Slide
- Rock Spread
- Debris Fan
- Uncertain
- Type Undifferentiated

Sources:

- Scarp or Main Scarp
- Internal Scarp
- Debris Flow or Slide Scarp
- Debris Flow Track
- Gully or Rock Fall Chute
- Track or Rock Fall Source
- Inner Gorge
- Small Debris Flow Scarp or Track
- Small Slide Source, Type Undifferentiated
- Source Scarp

- Active/Historic
- Dormant Young
- Dormant Mature
- Dormant Old/Relict
- Dormant Age Not Specified

Produced from Landslide Inventory

Retrieved from- <https://maps.conservation.ca.gov/cgs/lsi/app/>

Date retrieved: May 24, 2021

Information provided by: County of Los Angeles, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | California Geological Survey, USGS, Cooper-Clark Associates | California Geological Survey

PROJECT: Kornerstone (Palmyra Cemetery)

PROJECT NO: 20-2730

DATE: July 2021

ADDRESS: 2205 E. Palmyra Avenue, Orange, California

FIGURE: 5

H&A was able to observe the interior and exterior of the YMCA building on numerous occasions and on the day of manometer floor level survey described below. The interior building walls and slabs were in relatively good condition and showed very little distress for a building of its age. Slabs exhibited only typical hairline cracks. Observations of the exterior showed that sidewalks were tilted and leaning away from the building. Small masonry retaining walls at the site were intact and in good condition.

MANOMETER FLOOR LEVEL SURVEY

On June 14, 2021, an interior floor level survey was performed inside the vacant YMCA building on site by using water level manometer equipment. A copy of the floor level survey is included on Plates M-1 and M-2 “Manometer Floor Level Survey” located in Appendix A.

The results of the survey indicated the structure is relatively level. The eastern restroom was identified as the lowest point of the structure. A total of maximum differential of 1.5 inches was recorded across the structure’s first floor, some of which is attributed to flooring and as-built conditions, such as sloping floors to drains in the restrooms. Another possibility for perimeter undulation could be small perimeter additions that may or may not have been pile supported.

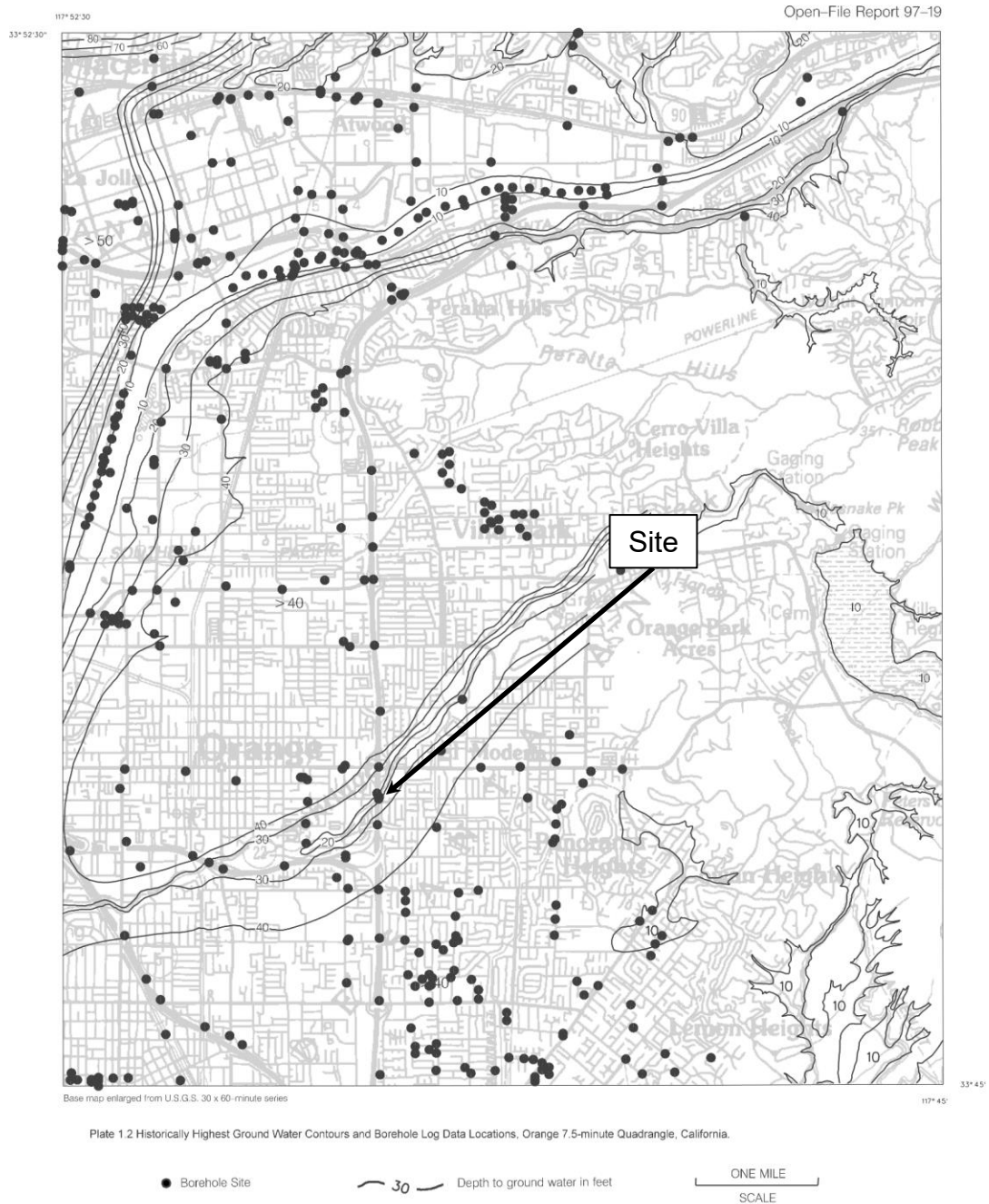
Manometer readings were taken in the second-floor rooms of the structure. Readings indicate that there is approximately 1.5 inches of differential across each room, primarily attributed to framing and an exterior footprint that is extended or cantilevered outside the first floor.

GROUNDWATER AND CAVING

Groundwater was not encountered during the Geosyntec, 2010 and Ardent, 2020 field exploration to the total depth explored of 40 feet bgs. According to the State of California Seismic Hazard Zone Report No. 011 Figure 6, “Historic High Groundwater” indicates site historic high groundwater could be on the order of 20 to 30 feet bgs. Seasonal and long-term fluctuations in the groundwater conditions may occur as a result of variations in irrigation, rainfall, surface run-off and other factors. Earth Tech, 1991 drilled four (4) groundwater monitoring wells from October 10 to November 20, 1990, to depths of 247 to 253 feet below the ground surface. Water levels at the Site, measured by onsite monitoring wells, indicate that water resides in a confined aquifer 220 feet below the surface, and it flows from north to south. Approximately 50 feet of clay overlie the aquifer.

The potential for caving in excavations is likely due to the granular cohesionless nature of on-Site earth material and relatively loose conditions described in explorations.

HISTORIC HIGH GROUNDWATER (SHZR #011)



From: "Seismic Hazard Zone Report for the Orange 7.5 Minute Quadrangle, Los Angeles County, California"
1997

PROJECT: Kornerstone (Palmyra Cemetery)

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ADDRESS: 2205 E. Palmyra Avenue, Orange, California

FIGURE: 6

SEISMOLOGICAL AND GEOLOGIC HAZARDS

Ground Shaking Analysis

The Site was located within a seismically active region of Southern California, within the zone of influence of several active and potentially active fault systems. Neither the location nor magnitude of earthquakes could accurately be predicted at the time of this report. In the past, the Site has been periodically subject to moderate to intense earthquake-induced ground shaking from nearby faults. Considerable damage could occur at the Site and structural improvements during a strong seismic event. There are a number of faults in the area that were, at the time of this report, considered 'active' and that could produce moderate to strong ground shaking at the Site. The possibility of ground acceleration or shaking at the Site could be considered as approximately similar to the Southern California region as a whole. Based on the USGS Deaggregation Application (2014 V4.2.0), the peak ground acceleration for earth materials at the Site was reported to be 0.40g, with a 10% probability of being exceeded in 50 years, and 0.67g for a 2% probabilistic of exceedance in 50 years.

Surface Fault Rupture

The Site does not lie within a designated Alquist-Priolo Earthquake Fault Zone Figure 4. Therefore, the potential for surface fault rupture at the Site during the design life of onsite structures is considered low.

Seismic Settlements (Liquefaction)

The term "liquefaction" describes a phenomenon in which a saturated cohesionless soil loses strength and acquires a degree of mobility as a result of strong ground shaking during an earthquake. The factors known to influence liquefaction potential include soil type and depth, grain size, relative density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking. Hazard data published by the State of California is presented on Figure 4 and indicates that the subject site is within an area identified as having a potential for soil liquefaction. Boring MW-3 (Earthtech, 1991) located in the gravel parking lot southeast of the YMCA building indicates that the upper 50+ feet of the subsurface consists of dense sands, gravels, clayey sands, and a stiff sandy clay layer. Material type and sample blow counts indicate low potential for liquefaction at the Site.

Seismically Induced Landslides

According to Figure 4 published by the State of California, the subject site is not indicated to lie within an area of potential for seismically induced landsliding. Based on site topographic conditions and published literature, the potential for earthquake-induced landslides in the future is considered low.

Expansive Soils

Expansive soils are soils that have a potential to swell or shrink based on the introduction or removal of water from the soil. Expansion occurs due to clay particles in the soil with some particular clays such as montmorillonite and bentonite having significant shrink and swelling capacity. Over time wet and dry season can cause clays to expand and shrink which can cause damage to structure, foundations, and hardscapes if proper construction and preventative measures are not taken.

Based on the reviewed reports and existing borings logs, fill and native soil on Site are generally classified as silty sand or sand with gravel. Silty sand and sand are considered to generally have “Low” soil expansion potential ($EI < 50$) as defined in the latest edition of ASTM D4829. It is H&A’s opinion that a ‘Low’ soil expansion may be used in project planning. The degree of soil expansion should be confirmed by additional tests during or after rough grading operations.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This geotechnical feasibility assessment presents a review of available geotechnical data and reports with conclusions and preliminary recommendations regarding cemetery development of the site. Findings indicate that the study area is suitable for the proposed redevelopment. Additional “design-level” geotechnical exploration services will be required to update this report for building department level grading plan preparation, construction, and foundation design.

Geotechnical considerations for design and construction of the planned cemetery development include 1) the presence of loose undocumented artificial fill, 2) potential for decomposition and/or compression of landfill debris, including municipal solid waste, burnt debris and construction debris, 3) total and differential settlement, including short-term, long-term and seismic-induced, 4) preservation of landfill soil cover and surface drainage 5) expected long-term maintenance, repair, or replacement of various components of the proposed development.

The following discussion and preliminary geotechnical recommendations are provided:

- **End Use Landfill Site Development** The proposed cemetery is an excellent end-use development for the landfill Site. Gravesites are particularly compatible with potential total and differential landfill settlement. The gravesite section will ensure 2-feet of soil cap over landfill debris, and an additional 5 feet of cover. The ground surface of the gravesite development can be maintained to provide for surface drainage.

- **Existing Building** Records indicate the 1972 building foundation likely consists of piles that penetrate landfill and extend into underlying natural soil. The building foundation, slabs and walls are in relatively good condition. It is proposed that the existing YMCA building undergo remodel for cemetery use, without purview of a geotechnical report.
- **Landfill Limits** Portions of the perimeter site are outside the limits of buried landfill debris, which further facilitates development of a proposed new shed, storm water detention pipe, and westerly retaining walls using traditional grading and foundation systems.
- **Utilities** Records indicate that existing subsurface utilities within the structure footprint may be secured by a vault. During “design-level” assessment, existing utilities should be located and examined for their condition. Utility lines servicing the structure should be protected from bending stresses and increase in length due to potential differential settlements. Utility pipes should be designed as flexible as possible. Proposed utilities should avoid the existing parking lot area, which appears to have experienced past settlement, and new fill loading to raise grades will induce further settlement.
- **Settlements** Short- and long-term ground settlement can be attributed to several sources including presence of buried refuse, applied loads from new fills, new structure surcharge, settlement due to decomposition, loose fill and landfill matrix breakdown, hydro-settlement from concentrated water intrusion, or seismic.
- **Foundation / Ground Performance** In concept, pile supported structures through refuse and fill into natural soil typically exhibit less than ½ inch of settlement. Foundations located outside of refuse limits in firm natural soil or approved compacted fill typically experience less than 1 inch of settlement. Settlements in landfill portions of the site could be as large as 1- to 3-feet, depending on conditions. Therefore, planning should include long-term future maintenance, repair, or replacement of improvements, infrastructure, grade, pavement, landscaping, etc... Ideally, pavement, paths, drainage swales and gravesites should be soil (or flexible engineered) surfaces that can be easily maintained and leveled to preserve grade and drainage conditions.
- **New Fill Placement** It will be advantageous to place new fills as early as possible in the construction sequence to allow for settlement. Fill settlement shall be monitored by the geotechnical consultant during and following fill placement. The fill should be left in place until settlement monitoring shows desired results, possibly 2-months or more.
- **Stormwater** No stormwater infiltration systems are permitted at the landfill site.
- **Landfill Gas** As a reminder, in order to protect structures from gas accumulation, gas proofing and ventilation schemes should be incorporated in design. Gas and environmental aspects should be provided by other specialists.

The proposed shed is anticipated to be located outside the landfill footprint and may be supported by conventional foundations embedded into approved compacted fill, underlain by natural soil. The proposed easterly property line retaining wall and 72-inch diameter storm water storage pipe are anticipated to be located outside the landfill footprint and may be supported by approved compacted fill underlain by natural soil. Site retaining walls less than 3-feet that are located within or outside the landfill footprint, may be considered garden walls not under purview of the geotechnical report. Site retaining walls greater than 3 feet that are located within the refuse footprint, are recommended to be graded slopes or flexible reinforced earth walls. The following preliminary geotechnical recommendations are provided.

SITE PREPARATION AND GRADING

Existing Construction Debris, Disturbed Soils

Prior to grading operations, it will be necessary to remove designated existing construction, including any remaining buried obstructions, which may be in the areas of proposed construction. Concrete flatwork should also be removed from areas of proposed construction. Concrete fragments from Site demolition operations should be disposed of off-Site. Any disturbed soils in areas of proposed foundations and slab on grade construction should be reworked.

Remedial Grading

To provide support for the shed and easterly retaining wall/storm water storage pipe it is recommended that subgrade soil be over-excavated uniformly to a minimum depth of not less than 3 feet below footings/pipe and replaced with properly compacted fill. Prior to placement of fills, parking, paths, or landscaping, the upper 2 feet of site soils shall be excavated and replaced with properly compacted fill. Soils should be recompacted to a minimum of 90 percent relative compaction near optimum moisture content for granular soils and above optimum moisture content for clayey soils. A six-inch scarification and recompaction of in-place soils to 90 percent relative compaction above optimum moisture contents may be taken equivalent to six-inches of approved compacted fill, when computing total excavation requirements.

The depth of over excavation should be reviewed by the Geotechnical Consultant during construction. Any subsurface obstruction, buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended. Exposed excavation bottoms should be observed by the Geotechnical consultant or his representative.

New Fills

The upper two (2) feet of Site soils should be excavated and recompact to a minimum of 90 percent relative compaction near optimum moisture content prior to placement of any new fills, where required, to achieve finish grade elevations. Exposed excavation bottoms should be scarified a minimum 6-inches and recompact to at least 90 percent relative compaction at near optimum moisture content. Excavation bottoms should be firm and unyielding prior to backfilling.

Backfilling and Compaction Requirements

On-Site and import materials approved for use should be placed in horizontal lifts not exceeding 8-inches in loose thickness, moisture conditioned to near optimum moisture content for granular soil and above optimum moisture content for clayey soils and compacted to a minimum of 90 percent of the maximum dry density as determined by the latest edition of ASTM Test Method D1557. Existing Site soils, unless indicated otherwise, are considered suitable for re-use during Site grading and backfilling, provided they are free of debris, particles greater than 4 inches in maximum dimension, organic matter or other deleterious materials, and are to a suitable moisture condition to permit achieving the required compaction.

Imported Soils

Any imported soil required to complete grading operations should consist of predominantly granular material which exhibits an Expansion Index ("EI") of less than 20 when tested in accordance ASTM Expansion Test Procedures and should be free of debris and particles greater than 4 inches in maximum dimension, organic matter or other deleterious materials, and should be approved by the Geotechnical Consultant or his representative. Potential import material should be identified, sampled and provided to the Geotechnical Consultant at least 72 hours prior to importation to the Site. Final acceptance of any imported soil will be based upon review and testing of the soil actually delivered to the Site.

Observation and Testing During Construction

All piles, grading, compaction, and backfill operations should be performed under the observation of and testing by the Geotechnical Consultant's designated representative. The consultant should be notified at least two days in advance of the start of construction. A joint meeting between the contractor and geotechnical consultant is required prior to the start of construction to discuss specific procedures and scheduling.

Grading Observation and Testing

Prior to placing any fill the exposed excavation bottoms should be observed by the Project Geotechnical Consultant or their representative. If it is determined during grading that site

soils require overexcavation to greater depths for obtaining proper support for the proposed structure, this additional work should be performed in accordance with the recommendations of the Geotechnical Consultant. Any subsurface obstruction, buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended. Field moisture and density tests should be taken during grading in accordance with this report and local ordinances. All foundation excavations should be observed by the Geotechnical Consultant's representative to verify minimum embedment depths and competency of bearing soils. Such observations should be made prior to placement of any reinforcing steel or concrete.

Settlement Monuments

Monitoring monuments should be installed at the base of the fill to be reworked or placed. Monitoring monuments shall be protected from damage at all times during fill placement by survey stakes, barricades, flags, ribbon, etc. to protect and preserve the monuments throughout the time of fill placement. A typical monitoring monument can be assembled from 2-, 3-, or 5-foot threaded sections of pipe or conduit as the fill progresses in height. Monitoring the monuments during fill placement should be coordinated and directed by the Project Geotechnical Engineer and performed under direction of a California-Licensed Land Surveyor. The success of settlement monitoring depends on the geotechnical engineering firm's ability to correctly monitor the performance of soils under the fill, and therefore proper installation and protection of instrumentation and accurate and timely readings is crucial to success.

FOUNDATION DESIGN

The proposed shed is anticipated to be located outside the landfill footprint and may be supported by conventional foundations embedded into approved compacted fill, underlain by natural soil. The proposed easterly property line retaining wall and 72-inch diameter storm water storage pipe are anticipated to be located outside the landfill footprint and may be supported by approved compacted fill underlain by natural soil. Site retaining walls less than 3-feet, located within or outside the landfill footprint, may be considered garden walls not under purview of the geotechnical report. Site retaining walls greater than 3 feet, located within the refuse footprint, are recommended to be graded slopes or flexible reinforced earth walls. Foundation design details such as concrete strength, reinforcements, etc. should be established by the Project Structural Engineer.

Foundation Capacity

A dead plus live load allowable bearing pressure of 1,500 pounds per square foot may be used in the design of both continuous and spread footings, when supported in approved compacted fill or firm natural soil. Recommended minimum footing embedment is 18

inches below lowest adjacent soil grade. The above bearing pressures may be increased by one-third when considering short term loading from wind or seismic forces.

Lateral Resistance

Resistance to lateral loads can be assumed to be provided by pressure acting on structural components in contact with approved compacted fill or natural soil. Lateral resistance on the sides of footings may be computed using a passive pressure of 200 pounds per square foot per foot embedment into approved compacted fill or natural soil, subject to a maximum of 2,000 pounds per square foot. Friction between the base of the footings and the underlying material may be assumed as 0.30. Friction and lateral pressure may be combined, provided either is limited to two-thirds of the allowable.

Foundation Settlements/Displacements

Total settlements for conventional foundations located outside the landfill footprint into approved compacted fill or natural soil and designed and constructed in accordance with the above criteria and supporting maximum assumed column and wall loads of 30 kips and 2 kips per linear foot, respectively, are not anticipated to exceed 1 inch. A differential settlement on the order of 3/4 inch is anticipated between similarly loaded pad footings and for continuous wall footings over a distance of approximately 30 feet.

SEISMIC DESIGN PARAMETERS

The Site-specific seismic design parameters were determined as a part of this study in accordance with the 2019 California Building Code, which is based on the 2018 International Building Code (IBC). Additionally, seismic design parameters were determined using the Applied Technology Council (ATC) website which uses the USGS Seismic Design Web Services for the hazard loads. The 2019 CBC seismic design parameters that apply to the Site are as follows:

2019 CBC Seismic Parameters

CBC Seismic Parameter	Value or Classification
Site Classification (per Table ASCE/SEI 7-10 Table 20.3-1)	D
Mapped Spectral Response at 0.2 Sec Acceleration, S_s	1.632
Mapped Spectral Response at 1.0 Sec Acceleration, S_1	0.591
Maximum Considered Earthquake Spectral Acceleration, S_{MS}	1.632
Maximum Considered Earthquake Spectral Acceleration, S_{M1}	*null
5-Percent Damped Design Spectral Acceleration, S_{DS}	1.088
5-Percent Damped Design Spectral Acceleration, S_{D1}	*null

*See ASCE 7-16 Section 11.4.8

The Structural Consultant should review the above parameters and the 2019 CBC to evaluate the seismic design. Final selection of design coefficients should be made by the structural consultant based on the local laws and ordinances, expected structure response, and the desired level of conservatism.

RETAINING WALLS

Retaining walls planned should be adequately designed to resist the lateral soil pressures and the anticipated construction loadings and service conditions. The earth pressure acting on retaining walls depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressure. The following equivalent fluid pressures are recommended for vertical walls with no hydrostatic pressure and no surcharge loading:

Soil Type	Backfill Slope Behind Walls	EARTH PRESSURE	
		Equivalent Fluid Pressure (pcf)	
		Active(Cantilever)	At-Rest (Rigid)
Granular Non-Expansive	Level	40	60

These values are applicable for granular non-expansive fill soils placed between the wall sides and an imaginary plane rising at 45 degrees from below the edges (heel) of wall bottoms. The surcharge effect of anticipated loads on the wall backfill (e.g., traffic, construction equipment, footings) should be included in the wall design. Depending on whether the wall is free to deflect or restrained, 33 or 50 percent, respectively, of a maximum surcharge load located within a distance equal to the retained height of the wall should be used in design.

If it is determined that retaining walls require an additional seismic design pressure in accordance with the CBC, the following is provided for lateral earth pressures of site retaining walls. A resultant lateral force acting on proposed retaining walls as a result of seismic forces may be computed as 19 pcf-equivalent fluid pressure. This seismic resultant force may be applied to the retaining wall at a point located at $(2/3)*H$, measured from the bottom of the wall.

Positive drainage measures should be incorporated in design. Retaining wall subdrains should be located below the basement slab elevation and consist of a minimum four-inch diameter perforated ABS-SDR-35 or PVC SCH-40, or equivalent, connected to similar non-perforated outlet pipe. The perforated portion of the pipe should be embedded in at least three cubic feet per lineal foot of 3/4 inch crushed rock or equivalent material which has been wrapped in fabric, consisting of Mirafi 140N or equivalent, and approved by the

Geotechnical Consultant. The filter fabric should overlap at least 12 inches at the ends of the fabric. Other subdrainage alternatives may be considered but should first be reviewed and approved by the Geotechnical Consultant prior to implementation.

PAVEMENT, PATHS, SLAB-ON-GRADE

Soil surface, such as decomposed granite, would be ideal for parking, walkways and paths.

Concrete slabs within the landfill footprint are subject to differential settlement. If flatwork is planned, at a minimum should be supported on properly compacted soils in accordance with the site preparation and grading section of this report. Slab subgrade soils should not be allowed to dry out and should be maintained at the placement moisture condition until concreting. From a geotechnical standpoint, as a minimum, slabs should be 6-inches thick and reinforced with #4 reinforcing bars spaced at 12-inches on center each way.

Slabs should be properly designed and reinforced for the construction and service loading conditions. The structural details, such as slab thickness, concrete strength, amount and type of reinforcements, joint spacing, etc., should be established by the Project Structural Engineer.

ASPHALT PAVEMENT

The finish grade at the subject site is anticipated to be underlain by compacted fill consisting of site “granular” soils, (and landfill at some locations). For preliminary pavement design purposes, an R-Value of 25 has been utilized considering the site soils as subgrade soils. Four (4) traffic indices (TI) of 4.5, 5.5, 7, and 9 together with the assumed minimum R-Value, have been assumed and utilized for the development of preliminary recommendations for the pavement sections. Analyses performed in accordance with the current edition of the Caltrans Highway Design Manual, and assuming compliance with site preparation recommendations, it is recommended that the following AC pavement structural sections be used.

Asphalt Pavement Design Summary

Traffic Index (TI)	Pavement Section Alternatives		Remark
	AC ⁽¹⁾ (inches)	AB ⁽²⁾ (inches)	
4.5	4.0	4.0	For auto parking stalls
5.5	4.0	6.0	For auto circulation aisles/entry and exits
7.0	5.0	9.0	Drive Aisles w/ Medium Truck Loading
9.0	5.0	15.0	Drive Aisle w/ Heavy Truck Loading, Fire Truck

(1) Asphalt Concrete (AC);

(2) Aggregate Base (CAB or CMB), Green book section 200-2.2 and 200-2.4, respectively, compacted to at least 95% relative compaction.

(3) Subgrade: The upper 24-inches of subgrade soils in pavement areas should be compacted to at least 90% relative compaction of the Modified Proctor (ASTM D1557), including deeper removal and recompaction of any encountered undocumented fill, as necessary.

Please be aware that the above preliminary pavement section recommendations have been established based purely on procedures stipulated in the Caltrans Manual. Local government authority should be consulted for minimum pavement section requirements and, if more stringent than that recommended by the Hamilton and Associates, be complied with.

It is recommended that R-Value testing be performed on representative soil samples after rough grading operations on the upper 2 feet to confirm/modify applicability of the above pavement sections.

The asphalt concrete pavement should be compacted to 95% of the unit weight as tested in accordance with the Hveem procedure. The asphalt concrete material shall conform to Type III, Class C2 or C3, of the Greenbook. All subgrade and aggregate base materials should be proof-rolled by heavy rubber tire equipment to verify that the subgrade and base grade are in a non-yielding condition.

If the paved areas are to be used during construction, or if the type and frequency of traffic is greater than assumed in the design, the pavement section should be re-evaluated for the anticipated traffic.

SITE DRAINAGE

For potential for total and differential settlement, larger than building code minimums should be considered for sloping ground. Building code minimums call for the ground immediately adjacent to buildings should be sloped away from the building at a slope of 5% for the first 10 feet. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, the 5% slope should be provided to an alternate method of diverting water from the foundation system, such as swales (sloped at 2%). Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2% away from the building.

UTILITY TRENCHES

All trenches should be backfilled with approved fill material, compacted to relative compaction of not less than 90 percent of maximum density. Care should be taken during backfilling to prevent utility line damage. The on-Site soils may be used for backfilling utility trenches from one foot above the top of pipe to the surface, provided the material is free of organic matter and deleterious substances. Any soft and/or loose materials or fill encountered at a pipe invert should be removed and replaced with properly compacted fill or adequate bedding material. Imported soils for pipe bedding should consist of non-expansive granular soils. The walls of temporary construction trenches may not be stable when excavated nearly vertical due to the potential for caving. Shoring of excavation walls or flattening of slopes will be required for temporary excavations deeper than 4 feet. All work associated with trenches, excavations and shoring must conform to the State of California Safety Code.

PLAN REVIEW, OBSERVATIONS AND TESTING

As foundation and earthwork plans are completed, Hamilton & Associates should be retained to provide plan review for intent of our recommendations. The review will enable us to modify our recommendations should the final design conditions not be as we understand them. During construction, we should provide field observation and testing to check that Site preparation, grading, and foundation installation conform to the intent of our recommendations and to the project plans and specifications. As needed, during construction, we should be retained to consult on geotechnical questions, construction problems, and unanticipated conditions. This would allow us to develop supplemental recommendations as appropriate for the actual subsurface conditions encountered and the specific construction techniques. Furthermore, we would prepare a construction observation and testing report for the building department.

CLOSURE

This report has been prepared for the exclusive use of Kornerstone Park, LLC and their design team for the proposed project at the subject site. The report has not been prepared

for use by other parties and may not contain sufficient information for purposes of other parties.

The Owner or their representatives are responsible for ensuring the information and recommendations contained in this report are brought to the attention of the project engineers and architects, incorporated into the project plans, and implemented by project contractors. This report should be named on project grading plans as a part of the project specifications.

We request and recommend notification should any of the following occur:

1. Final plans for site development indicate utilization of areas not originally proposed for construction.
2. Structural loading conditions vary from those utilized for evaluation and preparation of this report.
3. The site is not developed within 12 months following the date of this report.
4. Change of ownership of property occurs.

If changes or delays do occur, this office should be notified and provided with finalized plans of site development for our review to enable us to provide the necessary recommendations for additional work and/or updating of the report. Any charges for such review and necessary recommendations would be at the prevailing rate at the time of performing review work.

The findings contained in this report are based upon our evaluation and interpretation of the information obtained from existing subsurface exploration. It had been assumed that the geotechnical conditions which exist across the area of study are indicative to those encountered in the subsurface exploration. However, no warranty is expressed or implied as to the conditions at locations or depths other than those excavated. Should any conditions encountered during construction differ from those described herein, this office should be contacted immediately for recommendations prior to continuation of work.

Our findings and recommendations were obtained in accordance with generally accepted current professional principles and local practice in geotechnical engineering and reflect our best professional judgment. We make no other warranty, either express or implied.

These recommendations are, however, dependent on the above assumption of proper quality control of construction. Geotechnical observations and testing should be provided on a continuous basis during temporary and foundation construction at the site to confirm design assumptions and to verify conformance with the intent of our recommendations. If

parties other than Hamilton & Associates, Inc., are engaged to provide geotechnical services during construction they must be informed that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the recommendations in this report or providing alternative recommendations.

This concludes our scope of services as described during our proposal dated May 11, 2021, however, this report is subject to review by the controlling authorities for the project. Any further geotechnical services that may be required of our office to respond to questions/comments of the controlling authorities after their review of the report will be performed on a time and expense basis as per our current fee schedule. We would not proceed with any response to report review comments/questions without authorization from your office.

We appreciate your business and hope that we can assist you during construction related services.

REFERENCES

L.A. Bivens and Associates, Grading Plan, dated December 12, 1972

Woodward-McNeill & Associates, Geotechnical Investigation YMCA-Conrock Site, Orange, California, Project No. B134IB, dated July 11, 1972.

Woodward-McNeill & Associates, Addendum No. 1 to Geotechnical Investigation YMCA-Conrock Site, Orange, California, Project No. B134IB, dated July 31, 1972.

Woodward-McNeill & Associates, Addendum No. 2 to Geotechnical Investigation YMCA-Conrock Site, Orange, California, Project No. B134F, dated January 31, 1973.

Woodward-McNeill & Associates, YMCA Pile Driving Operations YMCA-Conrock Site, Orange, California, Project No. B134F, dated March 5, 1973.

Earth Technology Corporation, Solid Waste Assessment Test, La Veta Disposal Station and Chapman and Yorba Disposal Station, Orange, California, Project No 89-823, dated March 5, 1991.

TRC, Environmental Assessment Report, Former La Veta Refuse Disposal Station, Project No 00-175, dated July 2000.

California Integrated Waste Management Board, Work Plan (Site Investigation) La Veta Refuse Disposal Station (YMCA Property) aka "La Veta Station #2" Parcels 392-071-05, 392-071-06, & 392-052-24, Orange CA 92869-4636, SWIS # 30-CR-0094, dated April 2007.

California Integrated Waste Management Board, Interim Report of Field Activities, Landfill Gas Investigation, La Veta Refuse Disposal Station (YMCA Property), Parcels 392-071-05, 392-071-06, & 392-052-24, Orange CA 92869-4636, SWIS # 30-CR-0094, dated September 2007.

Ninyo and Moore, Supplemental Site Assessment, Portion of the Former La Veta Refuse Disposal Station, 334. S. Jennifer Lane, Orange, California SWIS # 30-CR-0094, Project No. 104690030, dated February 11, 2008.

Geosyntec Consultants, Memorandum, Soil Boring Investigation Results, Santiago Creek Bank, Orange, California, dated February 5, 2009.

Geosyntec Consultants, Revised Site Assessment Report, La Veta Former Refuse Disposal Station, City of Orange, California, Project No. HG1075-F07, dated January 12, 2010.

Ardent Environmental Group, Inc., Landfill Cover Investigation, Former La Veta Refuse Disposal Station, 2205 East Palmyra Avenue and 290 Yorba Street, Orange California, Project No. 100081004, dated May 22, 2020.

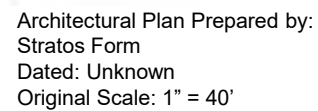
Ardent Environmental Group, Inc., Soil Management Plan, Former La Veta Refuse Disposal Station, 2205 East Palmyra Avenue and 290 Yorba Street, Orange California, Project No. 100081005, dated October 9, 2020.

Ardent Environmental Group, Inc., Post Closure Land Use Plan, Former La Veta Refuse Disposal Station, 2205 East Palmyra Avenue and 290 Yorba Street, Orange California, Project No. 100081005, dated October 9, 2020.

APPENDIX A

Plate A-1a	Architectural Site Plan
Plate A-1b	Grading Plan
Plate A-1c	Geotechnical Plan
Plates A-2 through A-4	Geological Cross Sections
Plates H-1 through H-4	Historical Topographic Maps
Plates H-5 through H-19	Historical Aerial Photography
Plates M-1 and M-2	Manometer

COSTA MESA 55 FREEWAY

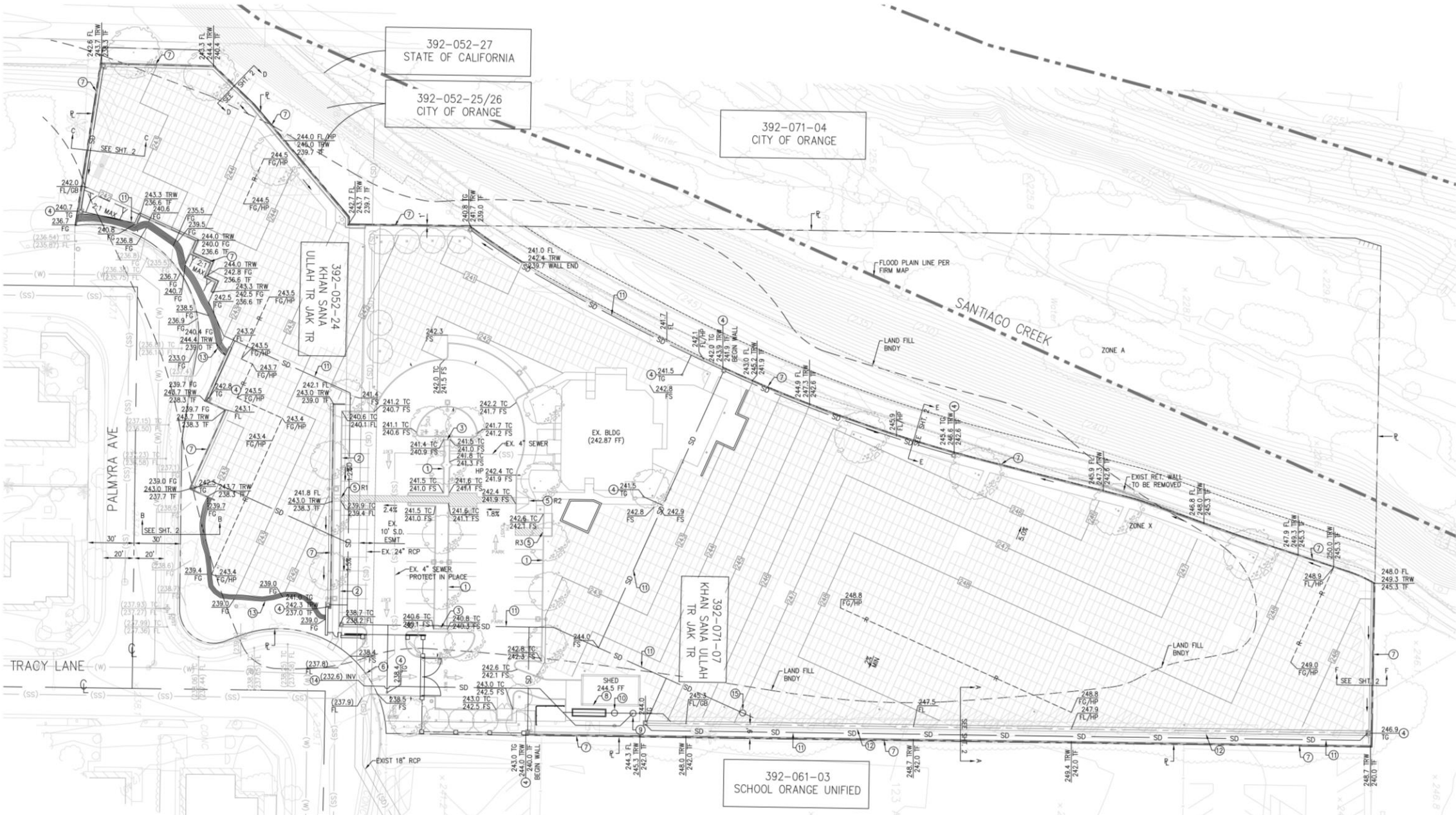


Project No:	20-2730
-------------	---------

Date: July 2021

 Hamilton & Associates

GRADING PLAN



CONSTRUCTION NOTE

- 1. CONSTRUCT CURB
 - 2. CONSTRUCT CURB & GUTTER
 - 3. CONSTRUCT DOUBLE CURB CHANNEL
 - 4. INSTALL GRATE INLET W/ INLET INSERT
 - 5. CONSTRUCT ADA RAMP
 - 6. CONSTRUCT COMMERCIAL DRIVEWAY
 - 7. CONSTRUCT RETAINING WALL WITH WALL GUTTER *
 - 8. INSTALL MODULAR WETLAND SYSTEM UNIT
 - 9. CONSTRUCT DIVERSION MANHOLE
 - 10. INSTALL PUMP
 - 11. CONSTRUCT STORM DRAIN LINE
 - 12. 72" UNDERGROUND STORAGE PIPE
 - 13. CONSTRUCT MSE WALL
 - 14. CONNECT TO EXISTING STORM DRAIN
 - 15. INSTALL CONTECH CDS PRE-TREATMENT UNIT
- *EXCEPT ELY WALL

PRELIMINARY EARTHWORK QUANTITY ESTIMATE

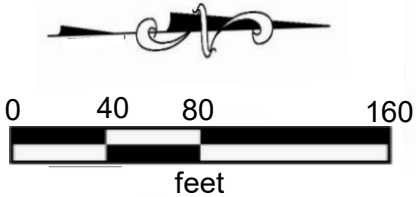
	OUT (CY)	FILL (CY)
RAW	110	11720
NET =	11610 CY IMPORT	

THE ABOVE QUANTITIES DO NOT REFLECT OR ANY SPECIAL CONDITIONS THAT MAY BE SPECIFIED IN THE PRELIMINARY SOILS REPORT AND ARE FOR REFERENCE AND FEE PURPOSES ONLY. SINCE THE ENGINEER CANNOT CONTROL THE EXACT METHOD OR MEANS USED BY THE CONTRACTOR DURING GRADING OPERATION, NOR CAN THE ENGINEER GUARANTEE THE EXACT SOIL CONDITION OVER THE ENTIRE SITE. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR FINAL EARTHWORK QUANTITIES FOR BIDDING, CONTRACT, AND CONSTRUCTION PURPOSES. IF IT APPEARS THERE WILL BE AN EXCESS OR SHORTAGE OF MATERIAL, THE CONTRACTOR MAY NOTIFY THE ENGINEER TO DETERMINE IF POSSIBLE GRADE ADJUSTMENTS CAN BE MADE TO ALLEVIATE SAID MATERIAL EXCESS OR SHORTAGE.

NOTES

- 1. THE GROUND WITHIN 5'-FT OF THE EXISTING BUILDING SHALL HAVE MINIMUM SLOPE 2% FOR IMPERVIOUS SURFACES AND 5% FOR PERVIOUS SURFACES.
- 2. ALL UNUSED USED WATER SERVICES SHALL BE ABANDONED PER CITY WATER DIVISION STANDARDS. IF EXISTING WATER SERVICES WILL BE REUSED, A LEAD FREE CITY OF ORANGE WATER DIVISION BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED BEHIND THE METER WITHIN THE NEAREST SOFT-SCAPE.
- 3. THE EXISTING ON-SITE SEWER LINE LOCATION WILL BE FIELD VERIFIED PRIOR TO THE START OF DESIGN DRAWINGS.

Conceptual Grading Plan Prepared by:
DRC Engineering
Project No.: 19-124
Dated: 5/17/2021
Original Scale: 1" = 30'



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

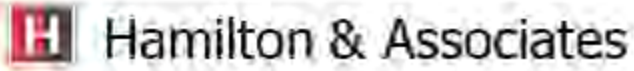


Plate No: A-1b

Date: July 2021

GEOTECHNICAL PLAN

Explanation

Data By Others

Woodward McNeill 1972

- WM-3 Boreings
WM TP-7 Test Pits – Dashed Line approx. limit of refuse

Earth Tech 1991

- MW-3 Boring
MP-2 California Integrated Waste Management Board 2007 Boreings

Boreings (Geosyntec 2009)

- SS-16 Fill and Native Material
SS-2 Fill with Burnt Debris
SS-14 Fill with MSW
SS-15 Fill with Burn Debris and MSW

Ardent 2020

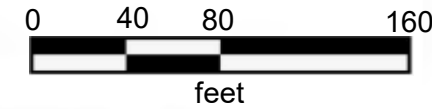
- TP-22 Test Pits
Estimated Line of Refuse

- Estimated Line of Waste Based on Geosyntec 2009; Ninyo & Moore 2008; Earth Tech 1991



Geological Cross Section

Proposed Retaining Wall/Earth Wall



Site Topography by:
DRC Engineering, Inc.
Project No.: 19-124
Dated: 04/25/2019
Original Scale: 1" = 40'

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

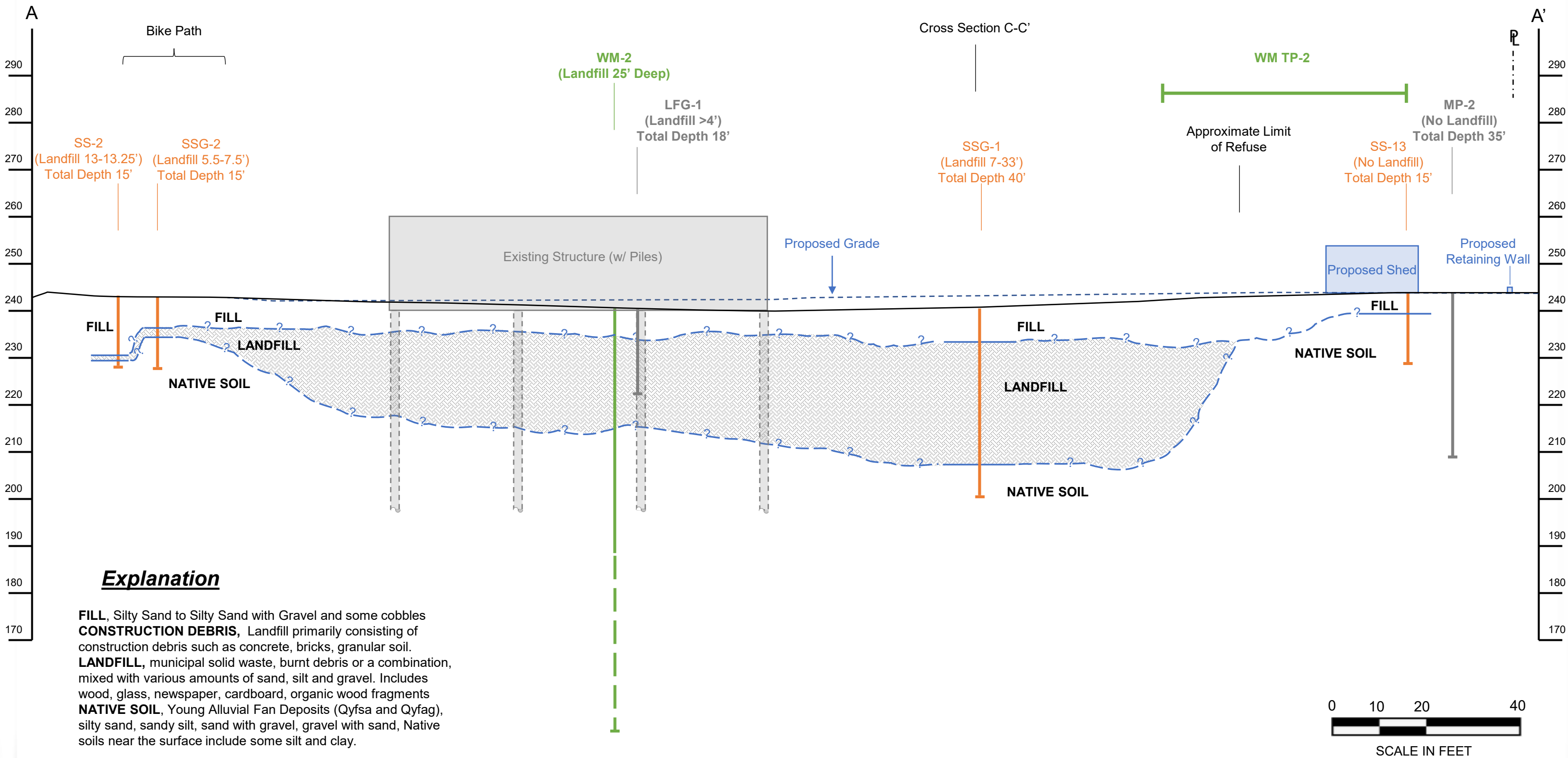
Project No: 20-2730

Plate No:
A-1c

Date:
July 2021

 Hamilton & Associates

GEOLOGIC CROSS SECTION A-A'



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

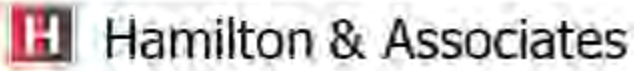
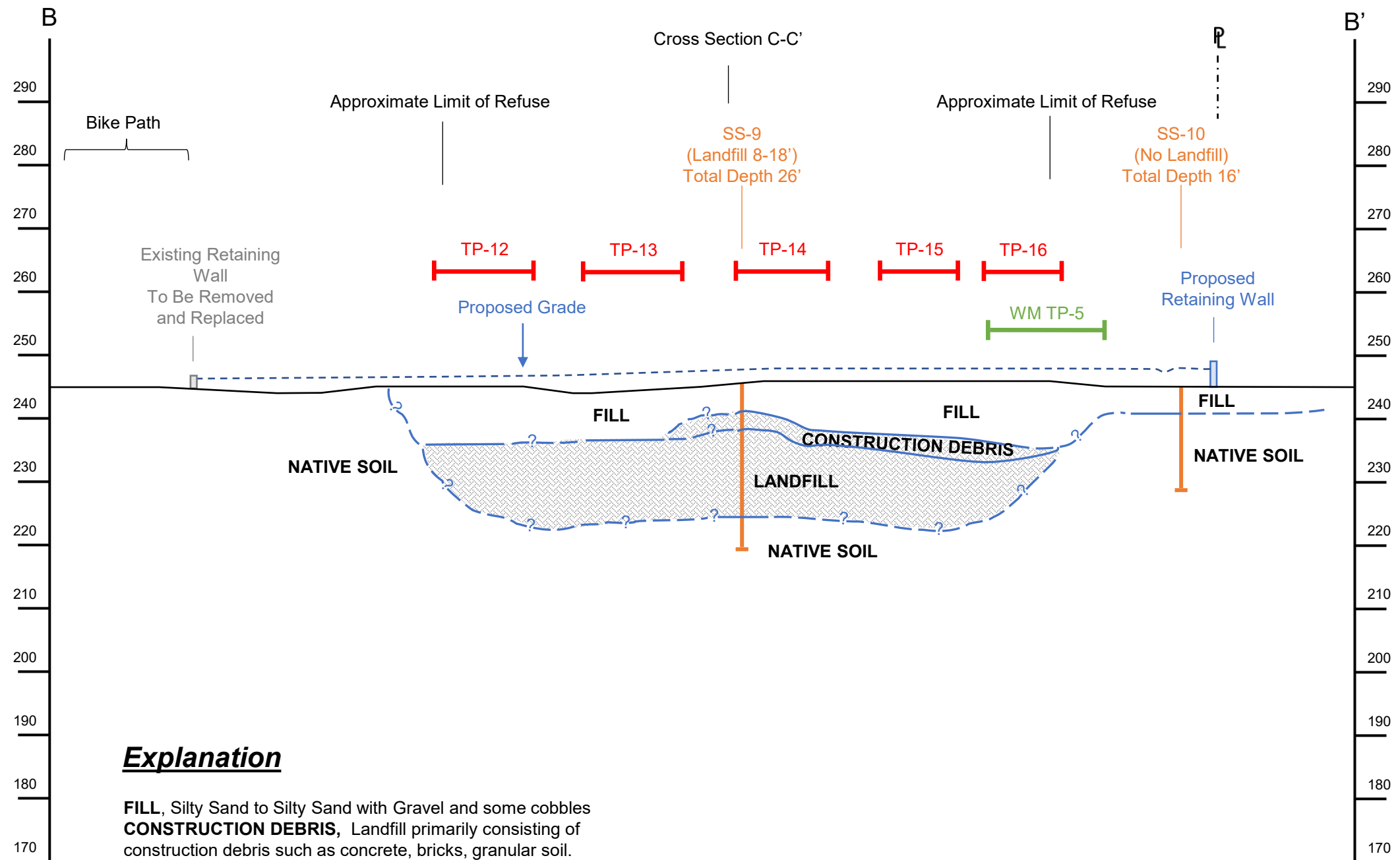


Plate No: A-2

Date: July 2021

GEOLOGIC CROSS SECTION B-B'



Explanation

FILL, Silty Sand to Silty Sand with Gravel and some cobbles
CONSTRUCTION DEBRIS, Landfill primarily consisting of construction debris such as concrete, bricks, granular soil.
LANDFILL, municipal solid waste, burnt debris or a combination, mixed with various amounts of sand, silt and gravel. Includes wood, glass, newspaper, cardboard, organic wood fragments
NATIVE SOIL, Young Alluvial Fan Deposits (Qyfsa and Qyfag), silty sand, sandy silt, sand with gravel, gravel with sand, Native soils near the surface include some silt and clay.



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

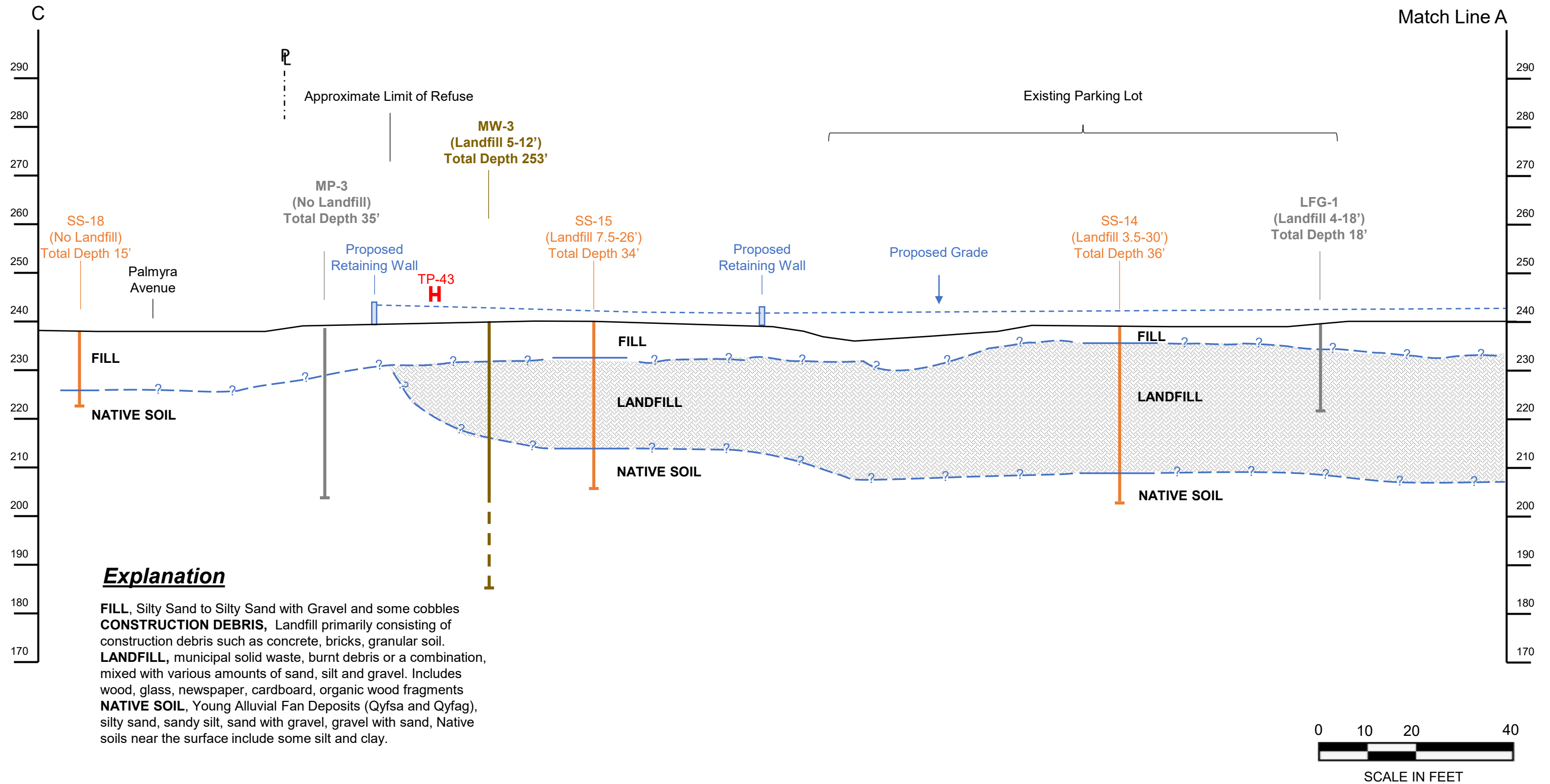
Project No: 20-2730

 **Hamilton & Associates**

Plate No:
A-3

Date:
July 2021

GEOLOGIC CROSS SECTION C-C'



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

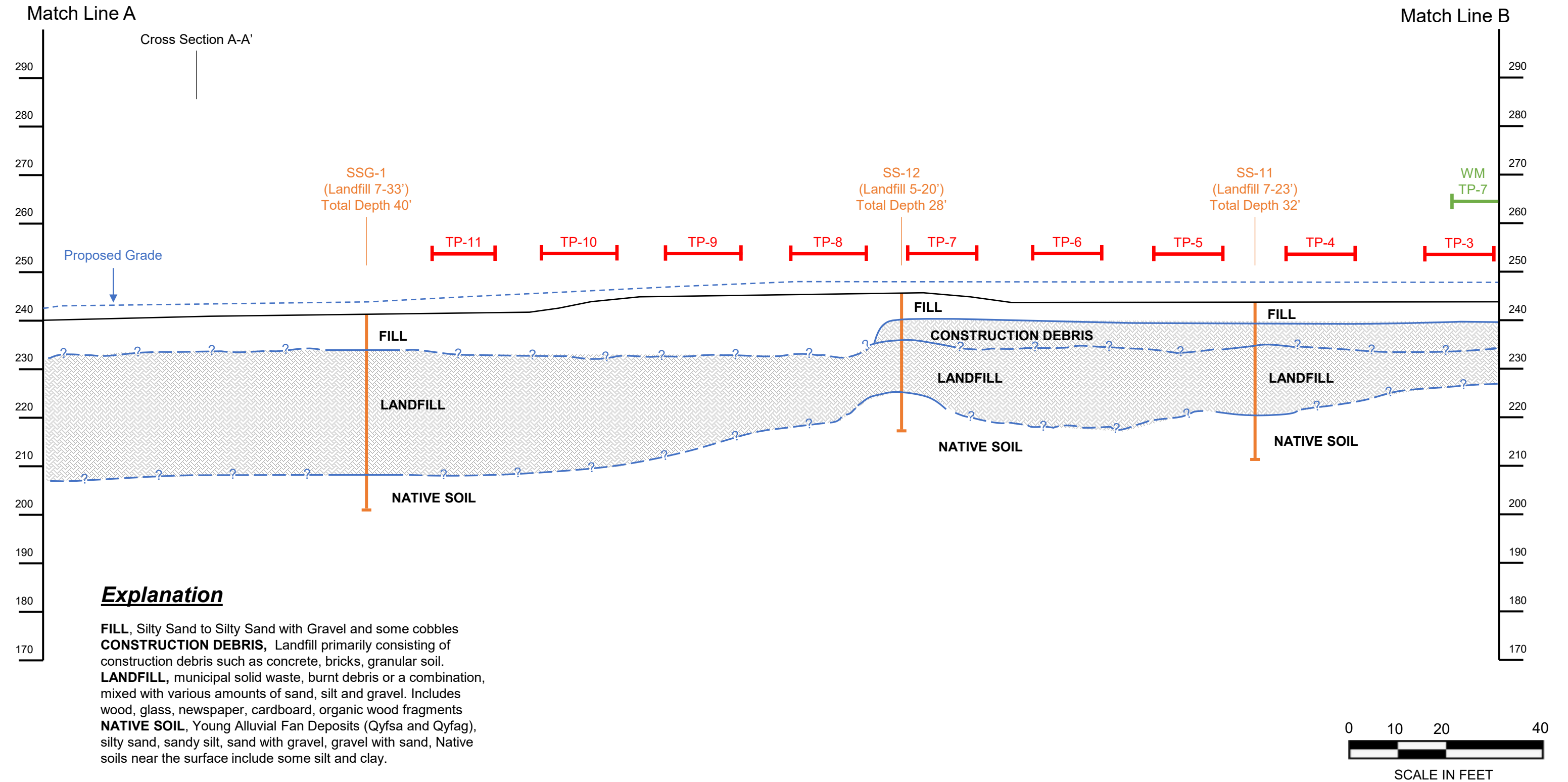
Project No: 20-2730

Hamilton & Associates

Plate No:
A-4a

Date:
July 2021

GEOLOGIC CROSS SECTION C-C'



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

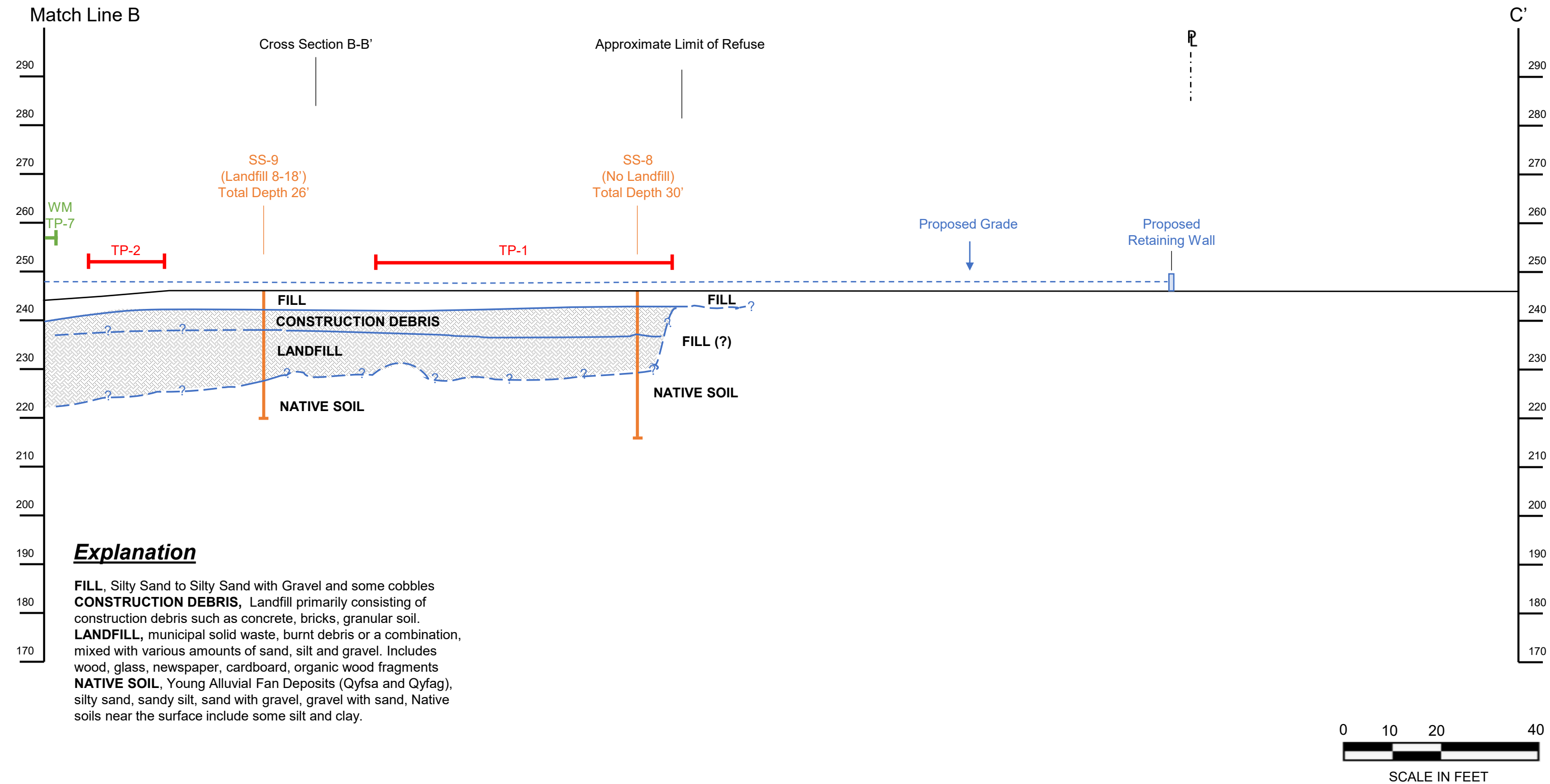


Hamilton & Associates

Plate No:
A-4b

Date:
July 2021

GEOLOGIC CROSS SECTION C-C'



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California		Project No: 20-2730	
 Hamilton & Associates		Plate No:	Date:
		A-4c	July 2021

HISTORICAL TOPOGRAPHIC MAP: 1896



CALIFORNIA
ANAHEIM SHEET

U. S. GEOLOGICAL SURVEY.

Edition of Oct. 1896.

Contour Interval 25 feet
Datum is mean Sea level

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-1

Date:
July 2021

HISTORICAL TOPOGRAPHIC MAP: 1935



CALIFORNIA
(ORANGE COUNTY)
ORANGE QUADRANGLE

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

ORANGE, CALIF
Edition of 1935



Contour interval 5 feet
Datum is mean sea level

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

 Hamilton & Associates

Plate No:
H-2

Date:
July 2021

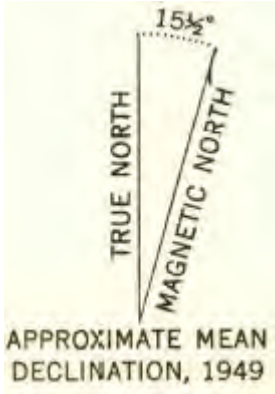
HISTORICAL TOPOGRAPHIC MAP: 1949



ORANGE QUADRANGLE
CALIFORNIA-ORANGE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ORANGE, CALIF.
SE/4 ANAHEIM 15' QUADRANGLE
N3345-W11745/7.5
1949



CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 5 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

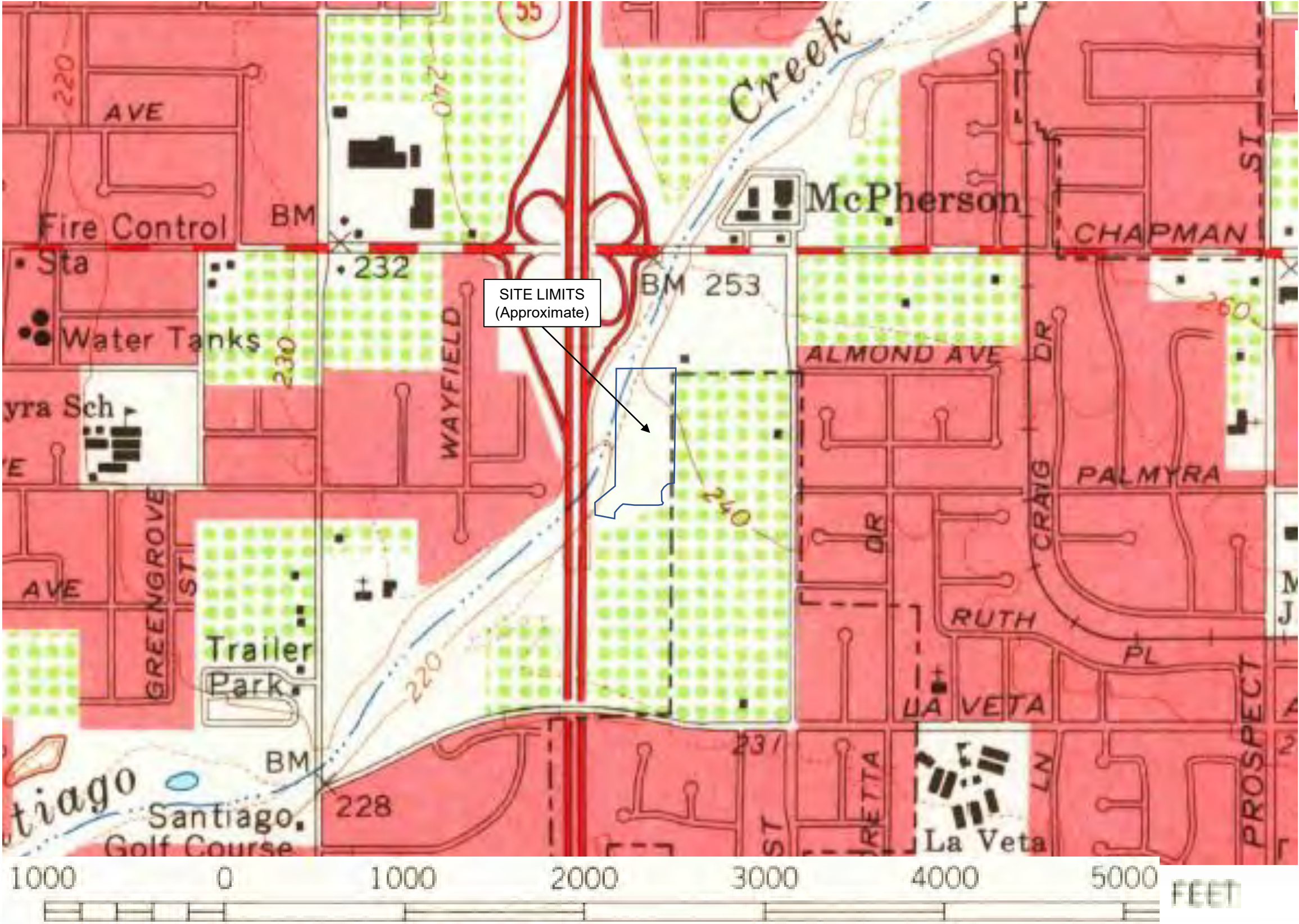
Project No: 20-2730

 Hamilton & Associates

Plate No:
H-3

Date:
July 2021

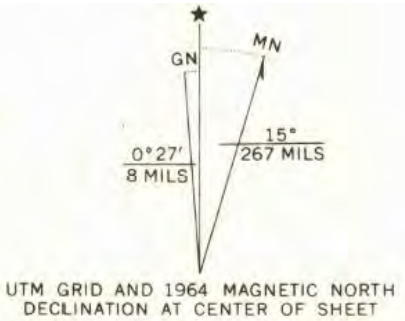
HISTORICAL TOPOGRAPHIC MAP: 1964



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ORANGE QUADRANGLE
CALIFORNIA—ORANGE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

ORANGE, CALIF.
SE/4 ANAHEIM 15' QUADRANGLE
N3345—W11745/7.5
1964



CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

 Hamilton & Associates

Plate No:
H-4

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1931



Imagery Report: Flight C-1780

[Digital](#)
[View Index](#)

Country:	United States	Begin date:	1931-01-01	Note: Orange to Santa Ana. Includes imagery from flight C-1790. Exact flight date is unknown. Imagery acquired January 2013. Nitrate negatives scanned, March 2015.
State(s):	California	End date:	1931-12-31	
Counties:	California: Orange	Scale:	1:15,600	
Filed by (catalog):	C-1780	Overlap:	60	
Filed by (collection):	C-1780	Sidelap:	40	
Imagery Location:	Room 8513 Off-site storage-- UCLA	Directional orientation:	North-South	Physical Details: black and white; paper prints; negative transparencies; cut frame, vertical view,
Index type:	mosaic, SmartIndex	Film type:	Nitrate	Copyright: Reproduction rights held by the Regents of the University of California.
Index scale:	1:55,000	Generation held:	1st and 2nd generation	Flown by: Fairchild Aerial Surveys
Size:	frames 9 X 7 inches			Contractor/requestor: Orange County Road Department
Height:	7			Acquired from: Whittier College
Width:	9			Est. frame count: 27

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

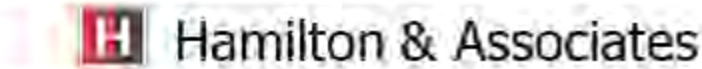


Plate No:
H-5

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1938



Retrieved from: <https://www.ocgis.com/ocpw/historicalimagery/>

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

 **Hamilton & Associates**

Plate No:
H-6

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1939



Imagery Report: Flight C-5925

Partially Digital
[View Index](#)

Country:	United States	Begin date:	1939-10-01	Note: Orange County: area east of Santa Ana River. Frame 134 also held as 18 X 18-inch 4-part print that is stored at Annex 3. Positive transparencies acquired from Teledyne, Inc., 1986. Prints and nitrate negatives acquired from Whittier College, January 2013.
State(s):	California	End date:	1939-10-31	
Counties:	California: Orange	Scale:	1:24,000	
Filed by (catalog):	C-5925	Overlap:	60%	
Filed by (collection):	C-5925	Sidelap:	20%	
Imagery Location:	Map Room--Utility Shelves Room 2552 Off-site storage--UCLA	Directional orientation:	North-South	
		Altitude:	13,750	
		Lens focal length:	8.25 inches	
		Camera:	Aerotar	
Index type:	mosaic	Film type:	Nitrate, Copy	
Index scale:	1:125,000	Spectral range:	500-710 nm	
Size:	frames 9 X 9 inches	Generation held:	1st and 2nd generation	
Height:	9			
Width:	9			

Physical Details:	black and white; paper prints; positive transparencies; negative transparencies; cut frame; vertical view;
Copyright:	Copyright © UC Regents. All Rights Reserved.
Flown by:	Fairchild Aerial Surveys
Contractor/requestor:	Richfield Oil Company
Acquired from:	Teledyne, Inc.; Whittier College
Est. frame count:	232

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-7

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1947



Imagery Report: Flight C-11351

Digital
[View Index](#)



Country:	United States	Begin date:	1947-05-01	Note: Los Angeles County, south of Santa Monica Mountains, Orange County, west of Highway 55. Imagery acquired 1986 and January 2013. MIL has additional frames not shown on index.
State(s):	California	End date:	1947-07-01	
Counties:	California: Los Angeles, Orange	Scale:	1:24,000	Physical Details: black and white, paper prints, negative transparencies, film roll, cut frame, vertical view.
		Overlap:	60%	
Filed by (catalog):	C-11351	Sidelap:	10%	Copyright: Copyright © UC Regents. All Rights Reserved.
Filed by (collection):	C-11351	Directional orientation:	East-West	
Imagery Location:	Map Room—Utility Shelves Room 2552	Altitude:	16,500	Flown by: Fairchild Aerial Surveys
		Lens focal length:	8.25 inches (209.55mm)	
Index type:	mosaic, SmartIndex	Camera:	Fairchild	Contractor/requestor: State of California, Department of Public Works, Division of Water Resources
Index scale:	1:100,000	Film type:	Copy	
Size:	frames 9 x 9 inches	Spectral range:	400-700nm	Acquired from: Teledyne, Inc.; Whittier College
Height:	9	Generation held:	1st and 2nd generation	
Width:	9			Est. frame count: 602

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

 **Hamilton & Associates**

Plate No:
H-8

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1952



Imagery Report: Flight AXK-1953

[Digital](#)
[View Index](#)

Country:	United States	Begin date:	1952-11-18	Note: MIL has additional frames not shown on index.	
State(s):	California	End date:	1953-06-30		
Counties:	California: Orange	Scale:	1:20,000	Physical Details:	black and white; paper prints; vertical view;
Filed by (catalog):	AXK-1953	Overlap:	60%		
Filed by (collection):	AXK-1953	Directional orientation:	North-South	Copyright:	Reproduction rights held by the Regents of the University of California.
Imagery Location:	Map Room—Utility Shelves	Platform id:	Aircraft		
Index type:	mosaic	Lens focal length:	8.25 inches (209.55mm)	Flown by:	Pacific Air Industries
Index scale:	1:63,360	Film type:	Panchromatic		
Size:	frames 9 X 9 inches				

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

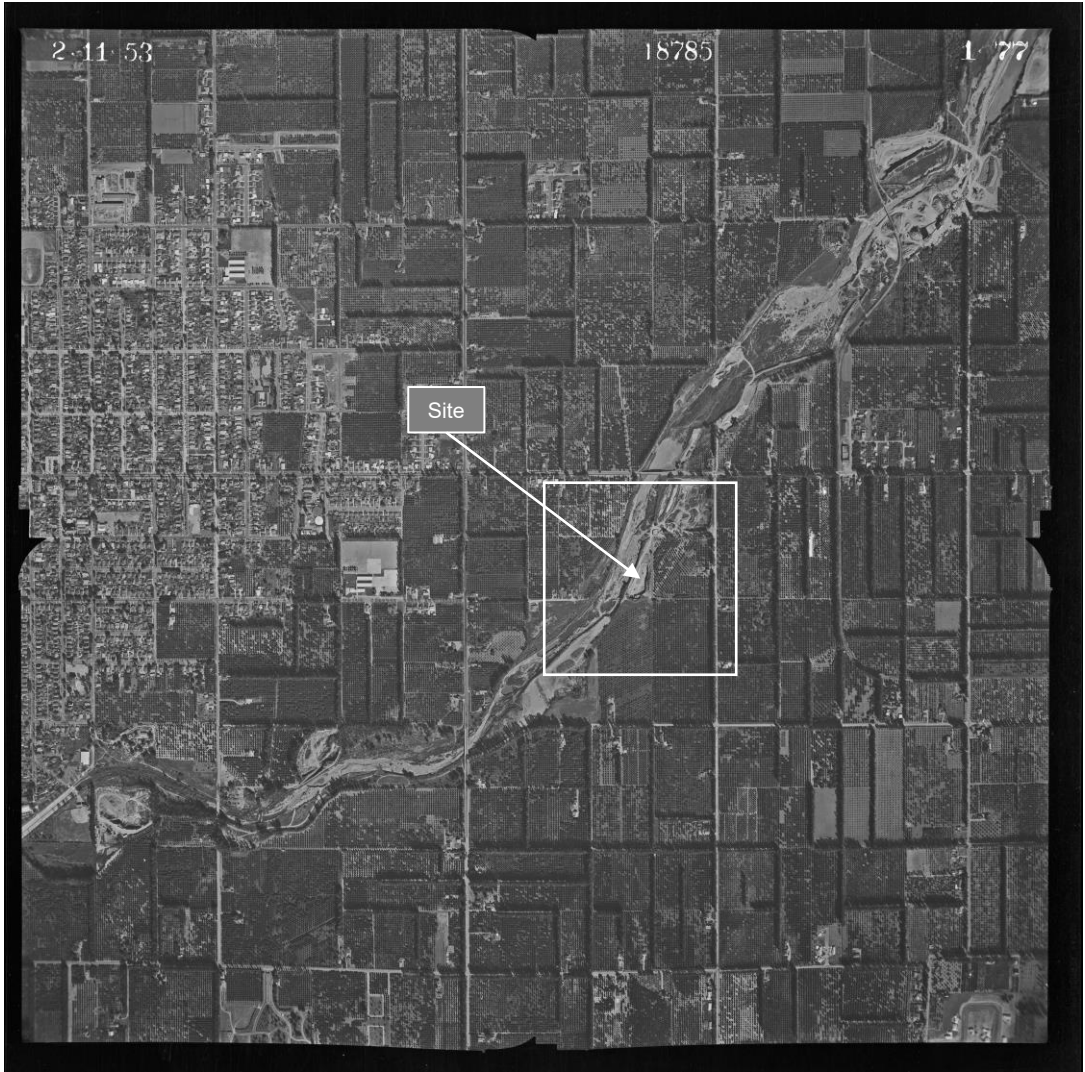
Project No: 20-2730



Plate No:
H-9

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1953



Imagery Report: Flight C-18785

Partially Digital
[View Index](#)

Country:	United States	Begin date:	1953-02-01	Note: Laguna Hills to La Habra. Imagery acquired from Whittier College, January 2013. Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view; Copyright: Copyright © UC Regents. All Rights Reserved. Flown by: Fairchild Aerial Surveys Contractor/requestor: Cities of Anaheim, Brea, Fullerton, La Habra and Santa Ana; Anaheim Union Water Co.; Santa Ana Valle Acquired from: Teledyne, Inc.; Whittier College Est. frame count: 321
State(s):	California	End date:	1953-02-28	
Counties:	California: Los Angeles, Orange	Scale:	1:14,400	
Filed by (catalog):	C-18785	Overlap:	60%	
Filed by (collection):	C-18785	Sidelap:	20%	
Imagery Location:	Map Room--Utility Shelves Room 2552	Altitude:	14,400	
Index type:	mosaic, smartindex	Lens focal length:	12 inches (304.8mm)	
Index scale:	1:55,000	Film type:	Copy	
Size:	frames 9 x 9 inches	Spectral range:	400-700nm	
Height:	9	Generation held:	1st and 2nd generation	
Width:	9			

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

HISTORICAL AERIAL PHOTOGRAPHY: 1955



Imagery Report: Flight C-21960

Partially Digital
[View Index](#)

Country:	United States	Begin date:	1955-05-01	Note: West half of Orange County, Los Angeles County and San Bernardino County area adjacent to Orange County border (Diamond Bar to Seal Beach). Imagery acquired from Whittier College, January 2013.
State(s):	California	End date:	1955-09-30	
Counties:	California: Los Angeles, Orange, San Bernardino	Scale:	1:14,400	
		Overlap:	60%	
		Sidelap:	20%	
Filed by (catalog):	C-21960	Directional orientation:	North-South	Physical Details: black and white, paper prints; negative transparencies; film roll, cut frame; vertical view;
Filed by (collection):	C-21960	Altitude:	14,400	
Imagery Location:	Map Room--Utility Shelves Room 2552	Lens focal length:	12 inches (304.8mm)	Copyright: Copyright © UC Regents. All Rights Reserved.
Index type:	mosaic, smartindex	Film type:	Copy	
Index scale:	1:65,000	Spectral range:	400-700nm	Flown by: Fairchild Aerial Surveys
Size:	frames 9 x 9 inches	Generation held:	1st and 2nd generation	
Height:	9	Contractor/requestor: Orange County Participants		Acquired from: Teledyne, Inc.; Whittier College
Width:	9			

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-11

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1957



Imagery Report: Flight PAI-84V

Partially Digital

[View Index](#)

Country:	United States	Begin date:	1957-04-03	Note: Not all frames held as paper prints.
State(s):	California	End date:	1957-05-04	
Counties:	California: Los Angeles, Orange	Scale:	1:14,400	Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view;
Filed by (catalog):	PAI-84V	Overlap:	60%	
Filed by (collection):	PAI-84V	Sidelap:	20%	Copyright: Copyright © UC Regents. All Rights Reserved.
Imagery Location:	Map Room--Utility Shelves Refrigerators	Directional orientation:	East-West	
Index type:	mosaic	Generation held:	1st and 2nd generations	Flown by: Pacific Air Industries
Index scale:	1:90,000			Acquired from: Teledyne, Inc.
Index filed under:	PAI-84V			
Size:	frames 9 x 9 inches			
Height:	9			
Width:	9			

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-12

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1960



Imagery Report: Flight C-23870

[Digital](#)
[View Index](#)

Country:	United States	Begin date:	1960-05-01	Note: Paper prints stored at Annex2. Roll C-23870-16, 17 has "vinegar syndrome". Imagery acquired from Whittier College, January 2013.
State(s):	California	End date:	1960-07-31	
Counties:	California: Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura	Scale:	1:14,400	
		Overlap:	60%	
		Sidelap:	20%	
Filed by (catalog):	C-23870	Directional orientation:	East-West	Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view;
Filed by (collection):	C-23870	Altitude:	7,200	
Imagery Location:	Map Room--Utility Shelves Room 2552 Refrigerators	Lens focal length:	6 inches (152.4mm)	Copyright: Copyright © UC Regents. All Rights Reserved.
		Film type:	Camera, Copy	
Index type:	mosaic	Spectral range:	400-700nm	Flown by: Fairchild Aerial Surveys
Index scale:	1:72,000	Generation held:	1st and 2nd generation	
Size:	frames 9 x 9 inches	Acquired from: Teledyne, Inc; Whittier College		Est. frame count: 2790
Height:	9			
Width:	9			



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-13

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1965



Imagery Report: Flight PAI-OC-65

[Partially Digital](#)
[View Index](#)

Country:	United States	Begin date:	1965-02-10	Note: Imagery filed by PAI-roll numbers: PAI-250V, PAI-251V, PAI-252V, PAI-253V. Frames 250V-14 through 250V-177, 251V-1 through 251V-124, 252V-1 through 252V-93, and 253V-60 through 253V-82.
State(s):	California	End date:	1965-03-29	
Counties:	California: Los Angeles, Orange	Scale:	1:24,000	
		Overlap:	60%	
Filed by (catalog):	PAI-OC-65	Sidelap:	20%	
Filed by (collection):	PAI-250V, PAI-251V, PAI-252V, PAI-253V	Directional orientation:	East-West	Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view;
Imagery Location:	Map Room--Utility Shelves Room 2552	Altitude:	12,000	
Index type:	mosaic	Lens focal length:	6 inches (152.81mm)	Copyright: Copyright © UC Regents. All Rights Reserved.
Index scale:	1:150,000	Spectral range:	400-700 nm	
Size:	frames 9 x 9 inches	Generation held:	1st and 2nd generation	Flown by: Pacific Air Industries
Height:	9			Acquired from: Teledyne, Inc.
Width:	9			Est. frame count: 403

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730



Hamilton & Associates

Plate No:
H-14

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1970



Retrieved from: <https://www.ocgis.com/ocpw/historicalimagery/>

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

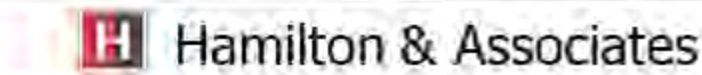
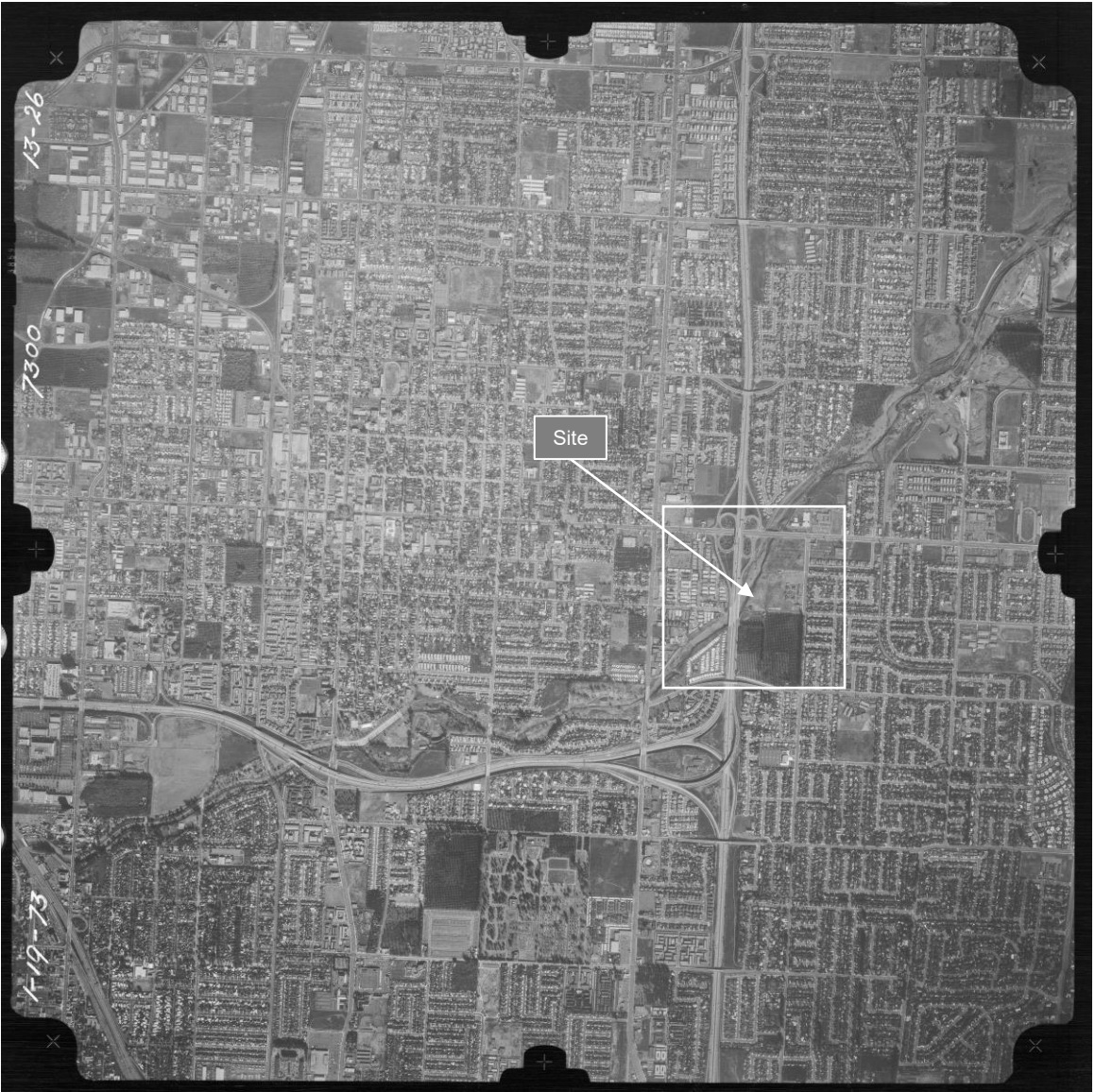


Plate No:
H-15

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1973



Imagery Report: Flight TG-7300

Partially Digital
[View Index](#)

Country:	United States	Begin date:	1973-01-01	Note: Los Angeles County (south half) and Orange County, San Bernardino County and Riverside County (coverage limited to area along western county line).
State(s):	California	End date:	1973-02-28	
Counties:	California: Los Angeles, Orange, Riverside, San Bernardino	Scale:	1:24,000	
		Overlap:	60%	
Filed by (catalog):	TG-7300	Sidelap:	10%	Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view;
Filed by (collection):	TG-7300	Directional orientation:	East-West	
Imagery Location:	Map Room--Utility Shelves Room 2552	Altitude:	12,000	Copyright: Copyright © UC Regents. All Rights Reserved.
		Lens focal length:	6 inches (152.4mm)	
		Spectral range:	400-700 nm	Flown by: Teledyne Geotronics Acquired from: Teledyne Geotronics
Index type:	mosaic	Generation held:	1st and 2nd generation	
Size:	frames 9 x 9 inches			
Height:	9			
Width:	9			

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

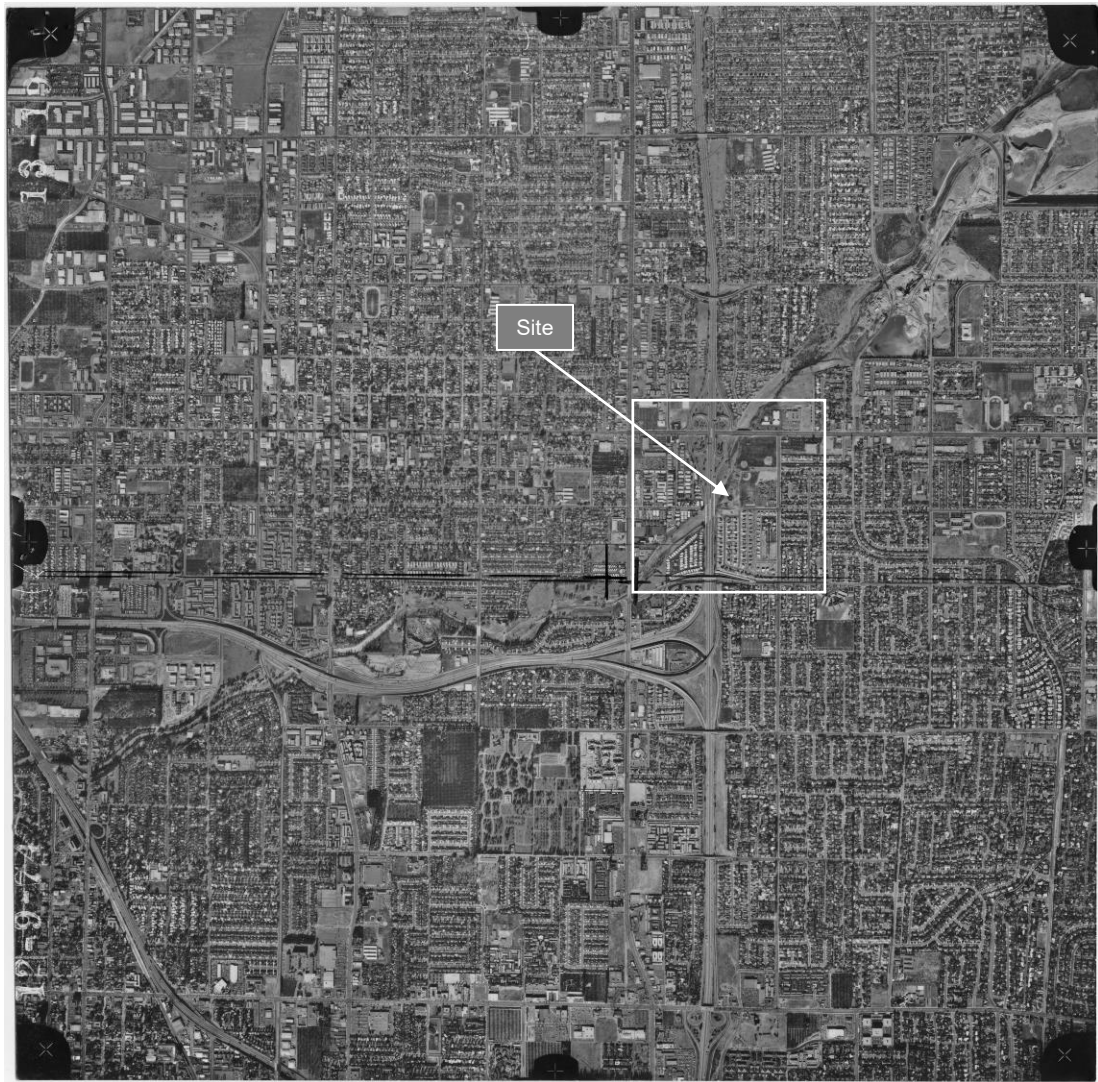


Hamilton & Associates

Plate No:
H-16

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1974



Imagery Report: Flight TG-7400

Partially Digital
[View Index](#)

Country:	United States	Begin date:	1974-12-01	Note: Covers all of Orange County, and areas along border of surrounding counties.
State(s):	California	End date:	1974-12-31	
Counties:	California: Los Angeles, Orange, Riverside, San Bernardino, San Diego	Scale:	1:24,000	
		Overlap:	60%	
		Sidelap:	20%	
Filed by (catalog):	TG-7400	Directional orientation:	East-West	Physical Details: black and white; paper prints; negative transparencies; film roll; cut frame; vertical view;
Filed by (collection):	TG-7400	Altitude:	12,000	
Imagery Location:	Map Room--Utility Shelves Room 2552	Lens focal length:	6 in. (152.4mm)	
		Generation held:	1st and 2nd generations	
Index type:	mosaic			Copyright: Copyright © UC Regents. All Rights Reserved.
Index scale:	1:72,000			Flown by: Teledyne Geotronics
Size:	frames 9 x 9 inches			Acquired from: Teledyne, Inc.
Height:	9			
Width:	9			



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

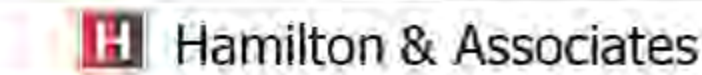


Plate No:
H-17

Date:
July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1980



Retrieved from: <https://www.ocgis.com/ocpw/historicalimagery/>

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California		Project No: 20-2730	
 Hamilton & Associates		Plate No:	Date:
		H-18	July 2021

HISTORICAL AERIAL PHOTOGRAPHY: 1990



Retrieved from: <https://www.ocgis.com/ocpw/historicalimagery/>

Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

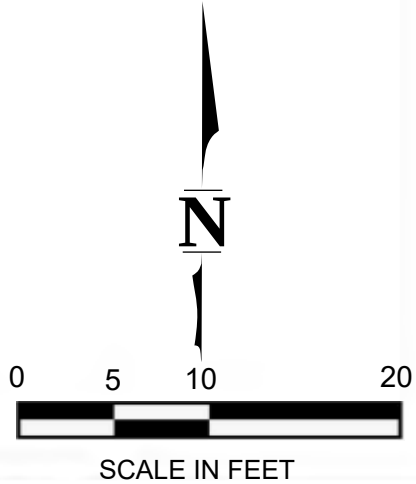
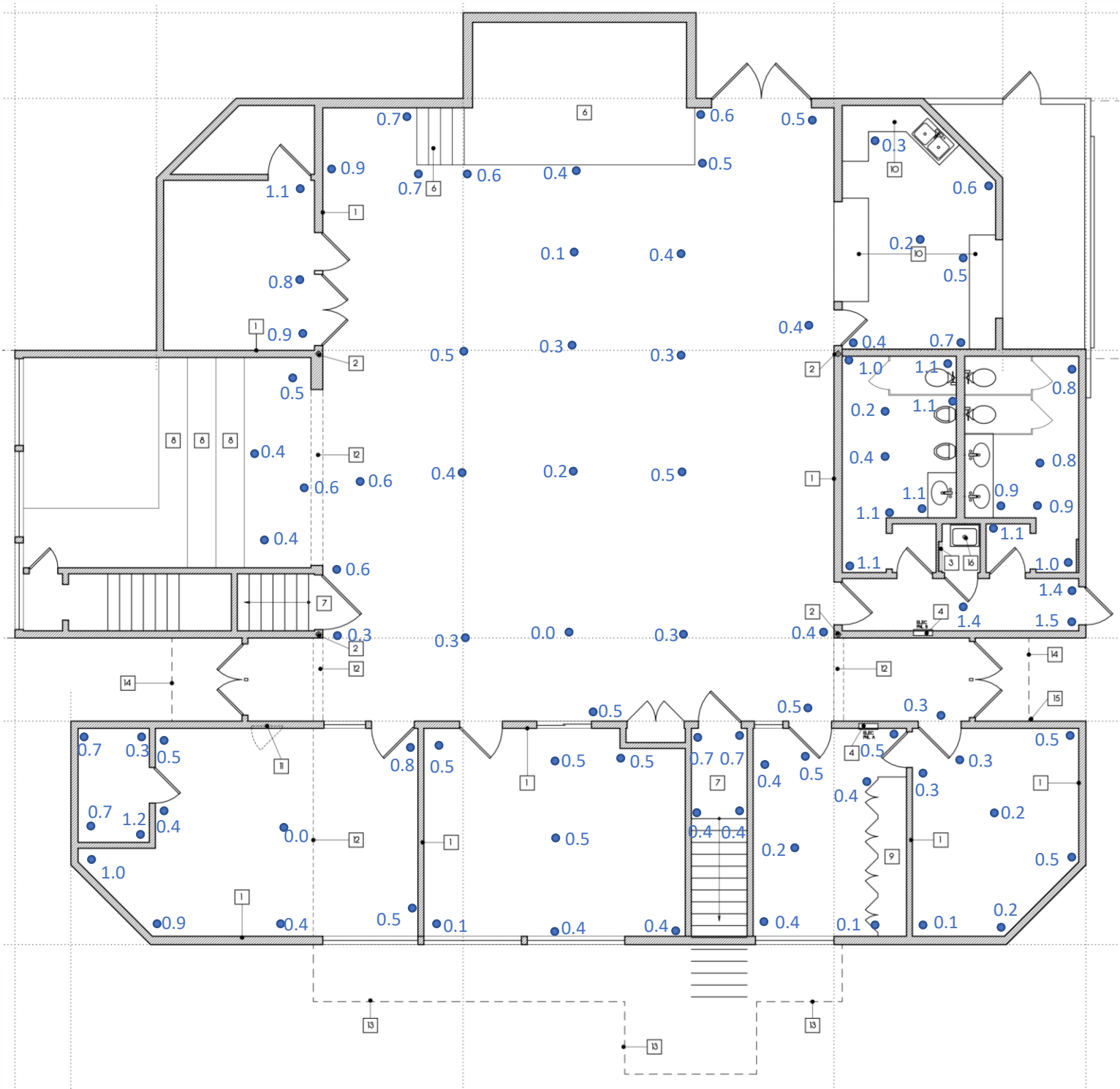
Project No: 20-2730

 **Hamilton & Associates**

Plate No:
H-19

Date:
July 2021

MANOMETER 1st FLOOR



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

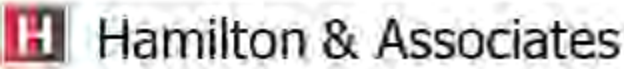
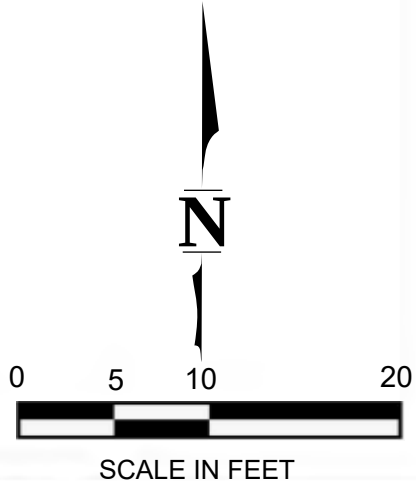
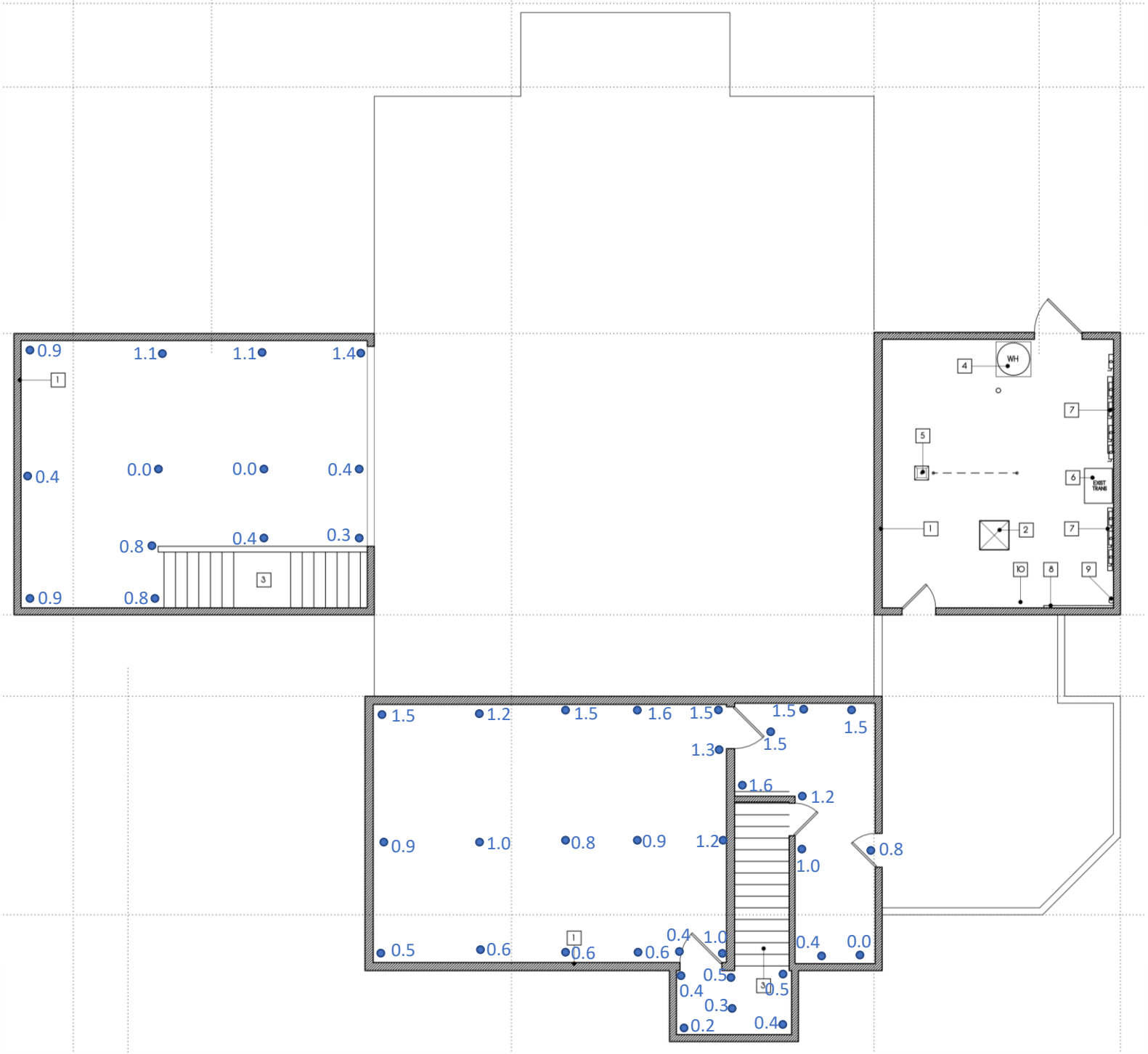


Plate No:
M-1

Date:
July 2021

MANOMETER 2nd FLOOR



Project: Kornerstone (Palmyra Cemetery) – 2205 E. Palmyra Avenue, Orange, California

Project No: 20-2730

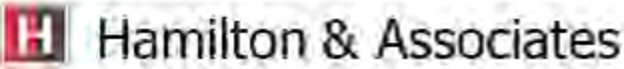


Plate No:
M-2

Date:
July 2021

APPENDIX B

BORING AND TEST PIT BY OTHERS

1. Woodward – McNeill & Associates Geotechnical Report and Addendums
2. Earth Tech Location of Borings and Boring Logs MW-3 and VZ-3
3. California Integrated Waste Management Board Site Plans and Borings
4. Geosyntec Site Plans and Borings Logs
5. Ardent Site Plans and Test Pit Sections

WOODWARD-McNEILL & ASSOCIATES

CONSULTING ENGINEERS AND GEOLOGISTS

AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

2140 W. Olympic Blvd.
Los Angeles, Ca. 90006
(213) 380-1966

758 N. Batavia
Orange, Ca. 92668
(714) 633-6316

Please Reply to:

Orange
13 December 1971

Young Mens Christian Association
P.O. Box 5828
Orange, California 92667

Attention: Mr. Donald E. Kent
Executive Director

SUBJECT: PROPOSAL FOR GEOTECHNICAL INVESTIGATION
YMCA-CONRECK SITE
ORANGE, CALIFORNIA

Gentlemen:

Woodward-McNeill & Associates is pleased to submit this proposal as requested by Mr. Kent, 9 December 1971. It is based on a site plan prepared by Leason F. Pomeroy & Associates, 6 December 1971. We understand that a group of single-story and possibly two-story activities buildings and a swimming pool are planned for this area over the next few years. Building layout is awaiting definition of subsurface conditions.

The site is located between the southeast bank of Santiago Creek and Parkside Elementary School. Soil Conservation Service photographs AXK-2K-38 and 39 (December 1952) revealed that the site was once a gravel quarry. Uncontrolled fill has been dumped into the quarry pit to an unknown depth. No records exist as to dates of fill-start or completion, nor is anything known of the character of the fill. No previous geotechnical investigations have been made. The approximate top-of-slope of the pit (as shown on the 1952 photos) has been drawn on the above-referred drawing.

We propose to carry out an investigation to (a) confirm the approximate location of the easterly top-of-slope line of the pit; and (2) to determine the approximate depth and character of the

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Mr. Donald E. Kent

-2-

13 December 1971

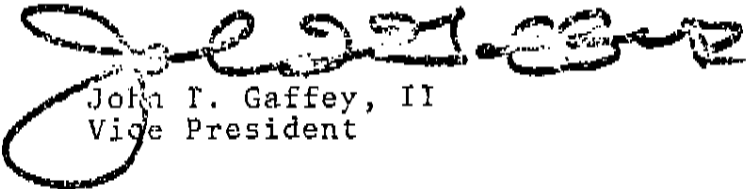
uncontrolled fill along its north-south axis. We will obtain soil samples from the material east of the easterly pit rim; from the fill and from the floor of the original pit below the fill. This will allow preliminary design of shallow foundations for structures on the unfilled area and possible deep foundations for structures built over the fill. A letter report will be prepared in five copies. The investigation will not include design recommendations for structures; sample testing will be withheld until a specific building layout is developed. At that time, samples will have to be tested and a supplementary report prepared giving design recommendations for all structures.

We propose to carry out the investigation for an estimated cost of \$650-\$850, excluding the supplementary (design) report or conferences related thereto. This will cover all field, office engineering and administrative costs necessary to prepare the written report. The fee will be based on the attached schedule.

We have scheduled field work for the near future, based on your verbal approval of the above scope of work. In this connection, we will assume responsibility for safeguarding only those utilities whose location has been furnished by you. Also, we assume no responsibility for injury to YMCA-related persons lingering near our field equipment. Please return one signed copy of this proposal at your convenience. We expect to deliver the report to you not later than 24 December 1971.

Very truly yours,

WOODWARD-McNEILL & ASSOCIATES



John R. Gaffey, II
Vice President

JTG/mh

Accepted by Young Mens Christian Association

Date _____

WOODWARD-McNEILL & ASSOCIATES

CONSULTING ENGINEERS AND GEOLOGISTS

AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

2140 W. Olympic Blvd.
Los Angeles, Ca. 90006
(213) 380-1966

758 N. Batavia
Orange, Ca. 92668
(714) 633-6316

Please Reply to:

Orange
11 July 1972
Project No. B1341B

Young Mens Christian Association
P.O. Box 5828
Orange, California 92667

Attention: Mr. Donald E. Kent
Executive Director

SUBJECT: GEOTECHNICAL INVESTIGATION
YMCA-CONROCK SITE
ORANGE, CALIFORNIA

Gentlemen:

In accordance with the provisions of our proposal dated 7 June 1972 and your subsequent authorization, we have completed a subsurface investigation of the subject site. This report provides recommendations for foundation design of the proposed recreation structure. You have requested that we consider only driven pile foundations to minimize the maintenance to the structure. The report includes consideration of the following items:

- Depth and character of refuse
- Bearing capacity of driven pile foundation vs. length
- Lateral load resistance of grade beams
- Site grading
- Provisions for venting methane gas from beneath the structure
- Protection of utilities

The results of this investigation are presented in the paragraphs which follow.

BACKGROUND

The site is located between the southeast bank of Santiago Creek and Parkside Elementary School. Our *Preliminary Geotechnical Investigation* which was submitted to you on 20 December 1971 presented areal information on the entire site. It is our understanding that the proposed structure is to be located so that its southeast corner is about 135 ft north of the south property line and 160 ft west of the east property line. Further, the proposed structure will be a 2-story, wood-frame structure of irregular plane shape having exterior plan dimension of about 30 by 75 ft. Based on discussions with Mr. L. A. Bivens, the Project Structural Engineer, maximum column loads of 95 kips are anticipated.

FIELD INVESTIGATION

Under the supervision of engineering personnel from this office, 3 borings varying from 52 to 89 ft in depth were completed on 20 June 1972. The locations

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of the borings are indicated on the Site Plan, Fig. 1. Borings were excavated utilizing a 6-in. continuous flight auger. Disturbed samples of rubbish fill were obtained from auger cuttings in the borings. Drive-tube samples of the native soils were also obtained in borings. Temperature and gas measurements were made in borings at the time of drilling in order to better evaluate the present state of decomposition.

The soils and refuse at the site are not stratified, and interpretation of data on Logs of Borings by an untutored individual may lead to erroneous conclusions. For these reasons, and in the interest of brevity, the Logs of Borings have been omitted from this report. The original boring logs will be retained in our files, available for your future reference. The significant findings of our field investigation are tabulated on Table 1.

DISCUSSIONS

Subsurface Conditions

Observations made during our preliminary investigation indicate that the refuse fill has undergone very little decomposition and that decomposition is presently occurring at a very slow rate. Observations made in our preliminary report are listed as follows:

- (1) *Newspapers and magazines 13 to 15 years old were readable.*
- (2) *Temperatures were less than 91.5°F. For high rate of decomposition, the temperature should be in excess of 110 to 120°F.*
- (3) *Rubbish did not appear to contain highly bio-degradable material such as vegetable matter, but did appear to contain mainly construction debris and paper.*
- (4) *The water content of the rubbish appeared to be relatively low. In order for anaerobic decomposition to occur water must be present in significant quantities.*

The data obtained from the borings completed during the present investigation, as presented in Table 1, indicate that the decomposition of refuse has not progressed significantly. In fact the rate of decomposition is likely lower as reflected by lower temperatures recorded during the present investigation than those recorded during the previous investigation. All borings in the vicinity of the proposed structure indicate the depth of refuse is on the order of 25 ft. Some difficulty in penetrating refuse was encountered during drilling, presumably due to the pressure of scattered heavy construction debris. The soils beneath the refuse were found to consist of about 7 ft of medium dense silty sands overlying dense to very dense clayey gravels extending to the maximum depth explored, 89 ft.

Settlement and Methane Gas Generation

The refuse is composed predominately of construction debris and paper with a relatively low moisture content. The temperature and moisture content indicate the rate as well as degree of decomposition of refuse is relatively low at present.

Anticipated settlement can be attributed to several sources. The sources are physical compressions of the refuse due to applied structural load (including fill), settlement due to decomposition and local settlement due to the raveling of soil into underlying voids. The refuse could become wetter in the future. The presence of water will cause an increase in decomposition but, due to the high paper content (therefore relatively low organic content), will probably not increase the rate of decomposition significantly. Water could also provide the mechanism for raveling.

Settlements can be minimized if the structure is supported on pile foundations. The piles should be designed considering structural loads and downdrag loads due to friction of near surface settling fill against the perimeter of piles, and deep perimeter grade beams should be used to provide lateral stability as tilting of vertical piling is a common problem in sanitary landfill construction. Adequate pile embedment also provides some lateral stability if the piling is adequately tied together at the ground surface.

Utilities should be protected and provided with flexible connections to maintain continuous service.

The anaerobic decomposition produces methane gas. The presence of this gas should be considered and included in design and construction planning. During construction the hazard of igniting combustible gas is considered remote as long as it is not confined and is allowed to vent if refuse is exposed. Fire fighting equipment should be made easily accessible as a safety precaution.

The structure should be protected from the migrating gas entering or collecting around it. This protection can be implemented by sealing the structure below flooring, similar to water proofing, and venting gas from beneath the structure. In addition, it is prudent design to provide a buffer layer of compacted fill between the structural foundation and the refuse. As a minimum, 4 ft of fill has been found to provide an adequate cover between foundation and refuse.

RECOMMENDATIONS

Pile Foundation

It is recommended that driven piles be used to support the foundation and floor of the structure. Possible pile types analyzed include, but are not limited to, steel H-section, precast and prestressed concrete, cast-in-place concrete with mandrel-driven shells and cast-in-place pipe piles. The theoretical capacities for individual piles presented on Fig. 2 are recommended for preliminary design. It is recommended that prior to final design that actual pile capacities and lengths be verified in the field by driving of a few piles near boring locations. The purpose of driving piles near boring locations is to evaluate the driving characteristics of a pile with a suitable dynamic pile-driving formula and to evaluate the necessity of jetting piling through dense gravel materials to attain a minimum pile penetration. Depending on driving resistance, subsequent driving at the site may be controlled by a simple blow-count criterion. In order to ensure penetration of the piles through the refuse fill the locations should be predrilled to native material. It is further recommended that all piling be tied together structurally by grade beams or other structural elements and that the floor slab be designed as a diaphragm to provide shear distribution between the various grade beams and ties.

It is recommended that the soil engineer inspect all pile driving. The piles and pile-driving operation should adhere to the requirements set forth in Appendix A.

Site Grading

A minimum of a 4-ft fill cover should be placed over refuse between finished grade or the base of grade beam and the surface of the refuse. The area to receive fill should be proof-rolled and fill should be placed in 8 in. lifts (loose measurement). The top 3 ft of fill should be compacted to a minimum of 90% of the maximum density determined with ASTM Test Method 1557. It will be advantageous to place the fill as early as possible in the construction sequence to encourage areal settlement. The settlement of the fill should be monitored during and after construction. The fill should be left in place for about

2 months (depending on settlement readings) prior to the commencement of pile driving. After construction the exterior grade should be maintained to a predetermined elevation, so that the lateral stability of the foundation is not compromised by the loss of passive pressure resistance due to settlement of soil adjacent to deep perimeter grade beams. In this regard a passive pressure against perimeter grade beams equivalent to that exerted by a fluid weighing 300 pcf may be used for design.

All site preparation and grading should be done under the observation of a soil engineer in accordance with the provisions set forth in Appendix B to this report.

Utilities

Utility lines servicing the structure should be protected from bending stresses and increases in length due to differential settlements. To accomplish this, utility pipes should be designed as flexible as possible. A typical detail of a flexible connection is included as Fig. 3a. Outside of structure, where located over refuse fill, utilities should be placed in a protective vault. A typical schematic diagram of such a vault is shown in Fig. 3b.

Gas Protection of Structure

In order to protect the structure from gas accumulation, gas proofing and ventilating schemes should be incorporated in the foundation design. A typical detail for venting and sealing the structure is included as Fig. 4.

Settlement

If the recommendations for pile foundations are followed we anticipate less than 1/2 in. settlement, total and differential, for the pile supported structure. Settlements in the areas surrounding the structure may be as large as 1 1/2 to 3 ft, depending on grading. Therefore, long term future maintenance of the grade, pavements and landscaping should be planned.

Future Gas Problem

If the foregoing recommendation for venting and sealing the structure are followed the likelihood of a gas related problem occurring within the structure is remote. If, however, cracks should form in flooring or vents should clog repairs should be initiated immediately. This means that maintenance of the structure should include inspection of vents and the flooring on at least a monthly basis by a resident employee.

The gas concentration monitored in borings indicate that combustible gases are present in the refuse in quantities above the combustible limit. For this reason construction at the site which involves exposing the refuse should be completed carefully with the contemplated grading being done in a manner which would preclude the creation of confined excavations into the refuse. Another potential hazard would be the rupturing of a discarded container of flammable material during excavation. During the progress of such excavation into refuse a substantial supply of water and other fire fighting equipment should be present and easily accessible.

It should be noted that there are case histories of injury where children have tunneled into the refuse or cover material and ignited confined gas. We do not have any control over this potential problem; however, we recommend that areal site grading be carefully planned to discourage such activity on this site.

We hope that this report provides the required information. If you require clarification on any part of this report or further information, please contact this office.

Very truly yours,

WOODWARD-McNEILL & ASSOCIATES

By John A. Barneich
John A. Barneich

JAB/mh

Attachments

cc: Mr. Leason F. Pomeroy
Mr. L. A. Bivens

By Steven C. Haley
Steven C. Haley

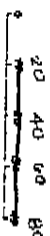
Project: EMCA Preliminary Investigation
Job Number: D1341

SITE PLAN

Reduced,
Not to Scale

APPROXIMATE LINE OF REFERENCE PIT
EMCA CHANGE, CALIFORNIA

Approx. Scale



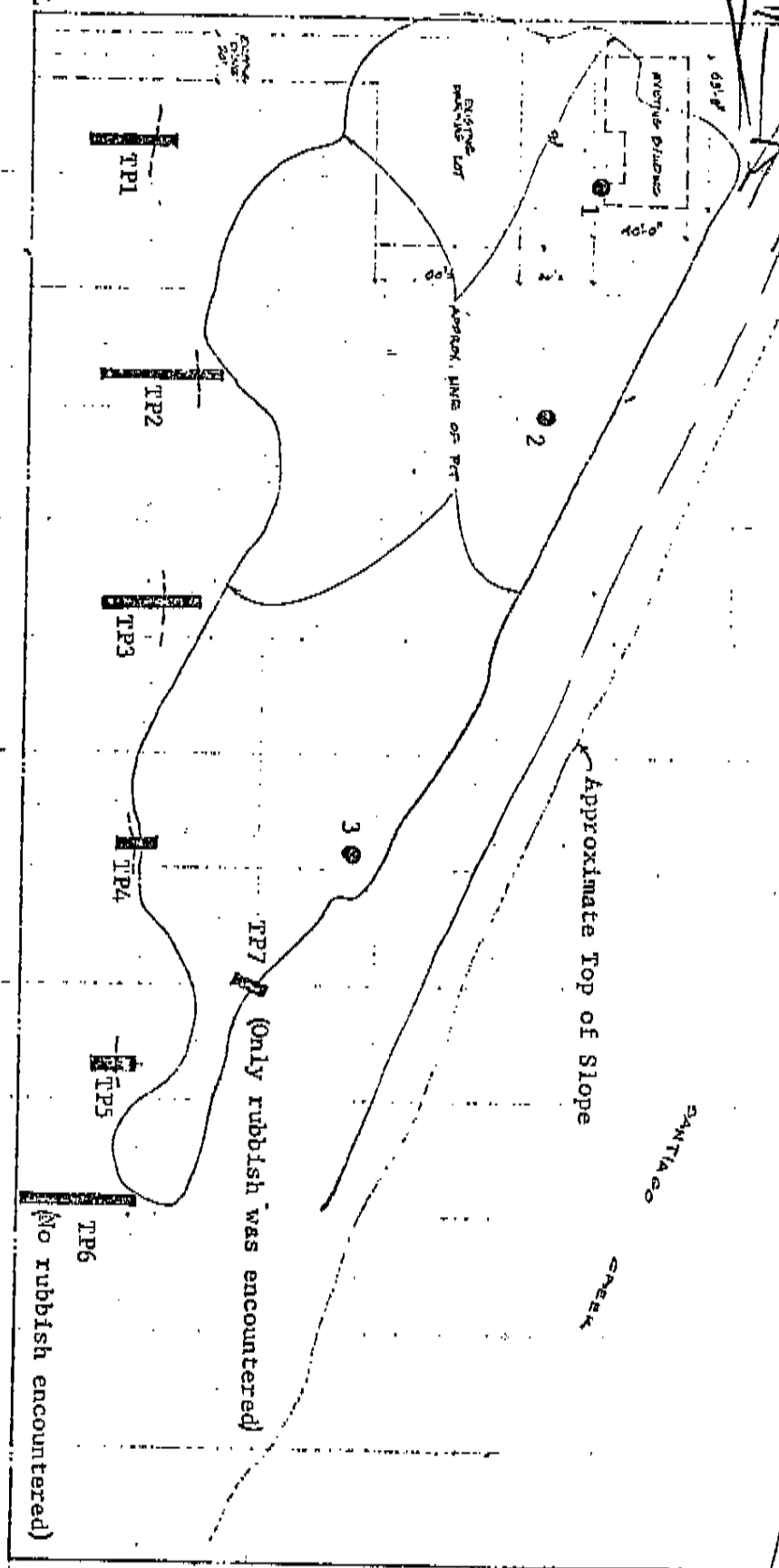
NOTE: Boring and Test Pit locations were determined in the field by direct measurement from existing structures and fences with a steel tape.

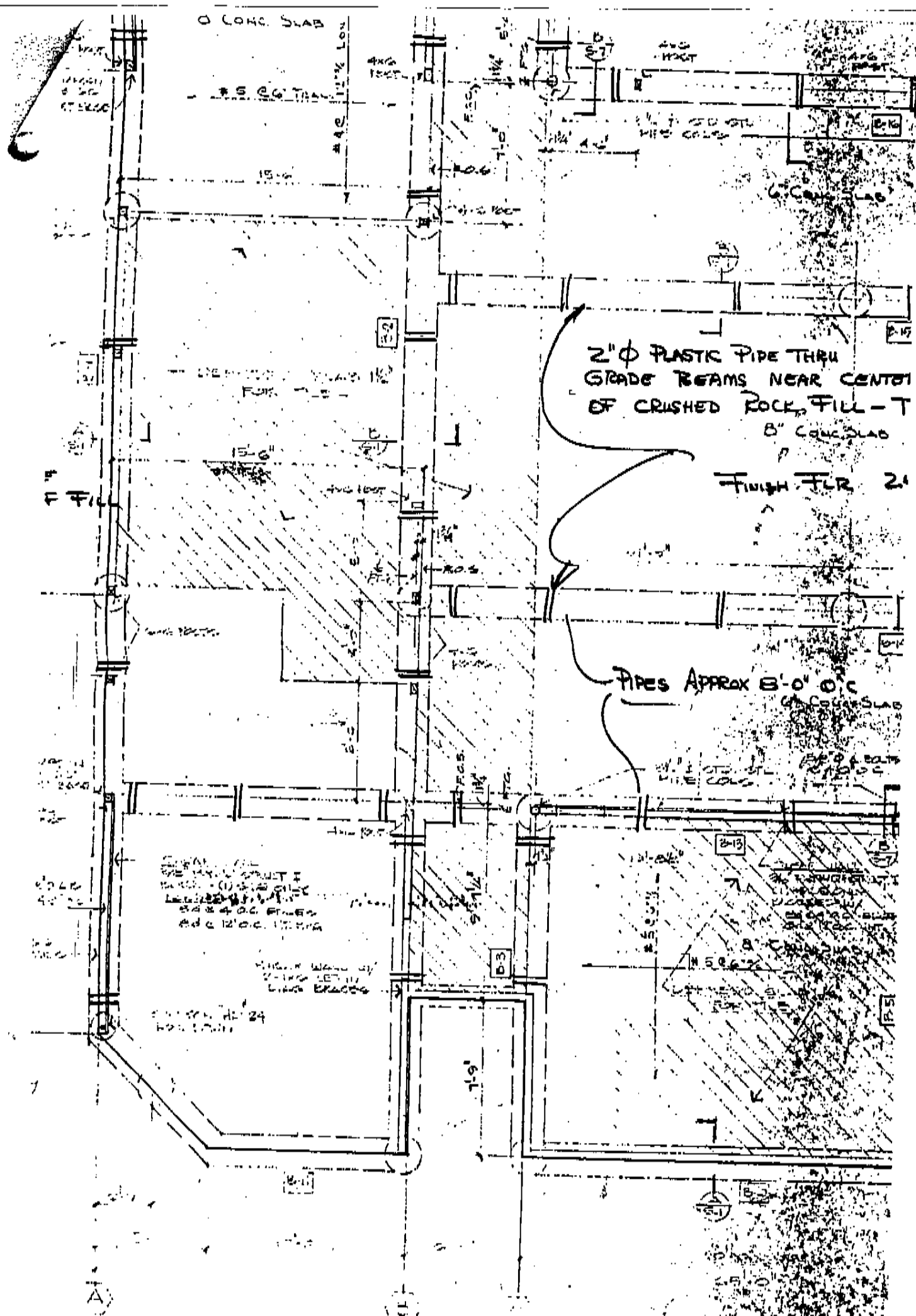
LEGEND:

● 3-Approx. Boring Location

TP7-Approx. Test Pit Location

Indicates Edge of Rubbish Fill





WOODWARD-McNEILL & ASSOCIATES

CONSULTING ENGINEERS AND GEOLOGISTS

AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

2140 W. Olympic Blvd
Los Angeles, Ca. 90006
(213) 380-1966

758 N. Batavia
Orange, Ca. 92668
(714) 633-6316

Please Reply to:

Orange
31 July 1972
Project No. B1341B

Young Mens Christian Association
P.O. Box 5828
Orange, California 92667

Attention: Mr. Donald E. Kent
Executive Director

SUBJECT: ADDENDUM NO. 1 TO
GEOTECHNICAL INVESTIGATION
YMCA-CONROCK SITE
ORANGE, CALIFORNIA

Gentlemen:

At the request of Mr. Bivens, the Structural Engineer for this project, we have prepared a detail for a pile supported, structural concrete slab floor to be constructed on grade and have considered the lateral extent of the placement of compacted fill for the proposed recreation structure. Detailed recommendations for the proposed facility have been transmitted in our letter report dated 11 July 1972. The results of our consideration of the above items are presented in the paragraphs which follow.

PILE-SUPPORTED FLOOR

Details for raised wood and concrete flooring were presented in Fig. 4 of the aforementioned letter report. We understand that it may be desirable to utilize a slab-on-grade floor in lieu of a raised floor for the proposed structure. It is anticipated that settlements under the structure will be significant; therefore, it will be necessary that the slab-on-grade floor be designed in the same way as recommended for the raised concrete floor. Further, it will be necessary to provide positive venting under the slab for gas which might collect in the void created by settlement, and a gas barrier will have to be included in the design. It is our opinion that a combination of drain tile underlying the slab areally and blowers or fans should be incorporated into the slab design. For your convenience we have included a typical detail of such a design on Fig. 1. It is important that all under floor blowers or fans be designed by a mechanical engineer to the maximum specification suggested by Fig. 4 of the previous report for a raised floor and Fig. 1 of this report for a slab-on-grade floor.

AREAL EXTENT OF COMPACTED FILL

The site grading for the proposed recreation structure includes a minimum of 4 ft of fill beneath structural elements. The top 3 ft of this fill are to be compacted to a minimum of 90% of the maximum density determined with ASTM

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31 July 1972

Test Method D1557-70. Further, this fill is to meet the gradation specifications set forth in Appendix B of the 11 July 1972 report. It is recommended that the bottom of the fill extend a distance laterally from the perimeter of the structure equal to 2 times the maximum fill depth. The purpose for this recommendation is to provide the maximum passive resistance of the fill to the lateral loads on the structure. For this reason, the finished exterior grades should be maintained at the same minimum elevation as used in calculating design lateral resistance for this same distance (2 times the maximum fill depth) around the perimeter of the structure.

We hope that this letter provides the information requested. If you should have further questions, please call.

Very truly yours,

WOODWARD-McNEILL & ASSOCIATES

By

John A. Barneich
John A. Barneich

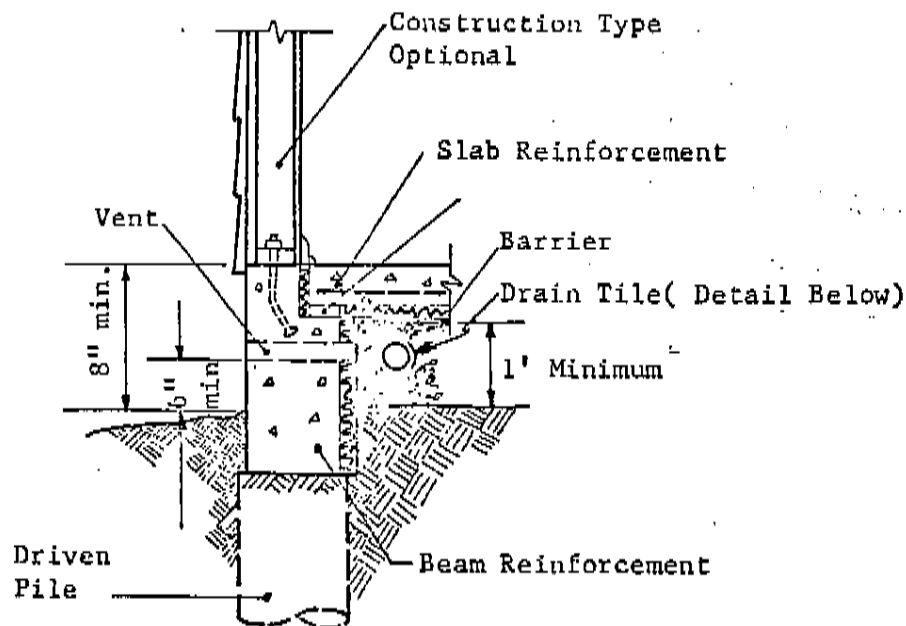
By

Steven C. Haley
Steven C. Haley

JAB/mh

Attachment

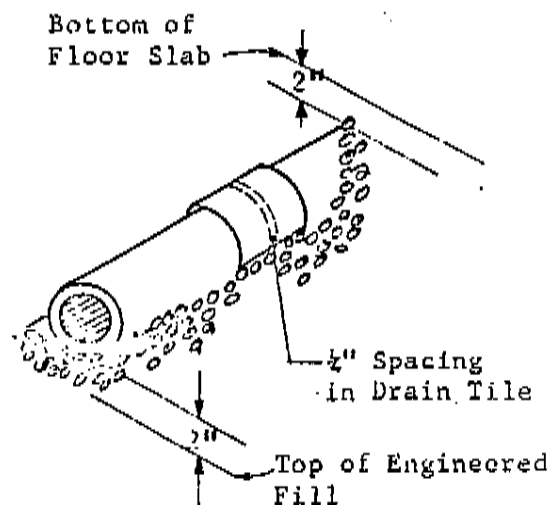
cc: Mr. Leason F. Pomeroy
Mr. L. A. Bivens



PILE SUPPORTED SLAB-ON-GRADE FLOOR DETAIL

NOTE:

1. Install mechanical blowers and/or fans under the floor. The ventilation system must vent all air from below slab at least once every hour, assuming 2 feet clear space beneath the slab.
2. Barriers may be designed using materials of polyvinyl chloride; neoprene; hot mopped asphalt and fifteen pound construction felt paper.
3. Spacing and size of drain tile should be designed for adequate removal of gas. (One change per hour.)



DRAIN TILE DETAIL

WOODWARD-McNEILL & ASSOCIATES

CONSULTING ENGINEERS AND GEOLOGISTS

AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

2140 W. Olympic Blvd.
Los Angeles, Ca. 90006
(213) 380-1966

758 N. Batavia
Orange, Ca. 92668
(714) 633-6316

Please Reply to:

Orange
31 January 1973
Project No. B134F

Young Mens Christian Association
P. O. Box 5828
Orange, California 92667

Attention: Mr. Donald E. Kent
Executive Director

SUBJECT: ADDENDUM NO. 2 TO GEOTECHNICAL INVESTIGATION
YMCA-CONROCK SITE, ORANGE, CALIFORNIA

Gentlemen:

This letter confirms verbal information pertinent to the subject construction transmitted by telephone to Mr. Bivens and Mr. Pomeroy, project structural engineer and architect, respectively. This information is listed below for ease in reference and supplements our letter-report, dated 11 July 1972 and Addendum No. 1 to that report, dated 31 July 1972.

Teleccn--Mr. Bivens--23 January 1973

- advised Mr. Bivens of typographical error on Fig. 2 of our 11 July 1972 report--"12" x 12" H-Pile BP12 @ 65 lb/ft" should read "12" x 12" H-Pile BP12 @ 74 lb/ft"
- advised Mr. Bivens that the BP12 pile and any other 12" x 12" piles proposed should be checked by him structurally for axial load stability over the unsupported length equal to the thickness of refuse (~25 ft)
- all other proposed piles of a size different than those sizes shown on Fig. 2 of the 11 July 1972 report should be checked by Woodward-McNeill for soil bearing capacity and should be checked structurally by Mr. Bivens

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Anchorage • Kansas City • St. Louis • Philadelphia • Clifton, New Jersey • New York City • Washington, D.C.

Mr. Donald E. Kent
31 January 1973
Page 2.

Telecon--Mr. Pomeroy--29 January 1973

- the barrier adjacent to the floor slab shown on Fig. 1 of the 31 July 1972 Addendum No. 1 should consist of either:
 - (a) hot mopped asphalt and 15-lb construction paper (min. 1/2-in. thickness of asphalt placed above paper just prior to placement of concrete), or
 - (b) 10 mil. (minimum) polyvinyl chloride membrane. Any other proposed membrane should be reviewed by this office.
- a second membrane of 10 mil. (minimum) should be placed below the aggregate base beneath the building
- the permeable material below the floor slab indicated in Fig. 1 of Addendum No. 1, should conform to the State of California Standard Specifications for Class-2 permeable material (Section 68-1.025)
- the ventilation system, exterior vents, interior vents and drain pipe should be designed such that it could accommodate a volume per unit time equal to 2 ft times the plan area of the structure per hour as indicated on Fig 1 of the 31 July 1972 Addendum No. 1

It should be noted that at the present time there is little quantitative data on which to base recommendations such as those presented in this letter. The recommendations presented herein are based on our understanding of the limited experience and general specifications of others such as the County of Los Angeles and research projects. We cannot give any assurance as to building performance based on these recommendations.

I hope this letter provides the required information. Please don't hesitate to call if further questions should arise.

Very truly yours,

WOODWARD-McNEILL & ASSOCIATES

By John A. Barneich
John A. Barneich

By Steven C. Haley
Steven C. Haley

JAB/SCH/cjo

cc: Mr. L. A. Bivens, Structural Engineer
Mr. L. F. Pomeroy, AIA

WOODWARD-McNEILL & ASSOCIATES
AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

WOODWARD-McNEILL & ASSOCIATES

CONSULTING ENGINEERS AND GEOLOGISTS

AN AFFILIATE OF WOODWARD-CLYDE CONSULTANTS

2140 W. Olympic Blvd.
Los Angeles, Ca. 90006
(213) 380-1966

758 N. Batavia
Orange, Ca. 92668
(714) 633-6316

Please Reply to:

Orange

5 March 1973

Project No. B134F

YMCA
P.O. Box 5828
Orange, California 92667

Attention: Mr. Donald Kent
Executive Director

SUBJECT : YMCA PILE DRIVING OPERATIONS
YMCA CONROCK SITE;
ORANGE, CALIFORNIA

Gentlemen:

We understand that pile driving operations have commenced at the subject site. Our recommendations pertinent to these operations were conveyed in our Soil Investigation Report dated 11 July 1972, and Addendums 1 and 2 to that report dated 31 July 1972 and 31 January 1973.

We have not been furnished with specifications for review, but we understand that the formula for driving criteria was set in the specifications. This, coupled with the fact that we were not notified of the commencement of pile driving operations, leads us to the conclusion that you are satisfied with the value in the specifications; and that you are properly documenting compliance to the specifications.

If you have any question pertinent to this letter, please contact the undersigned.

Very truly yours,

WOODWARD-McNEILL & ASSOCIATES

By John A. Barneich
John A. Barneich

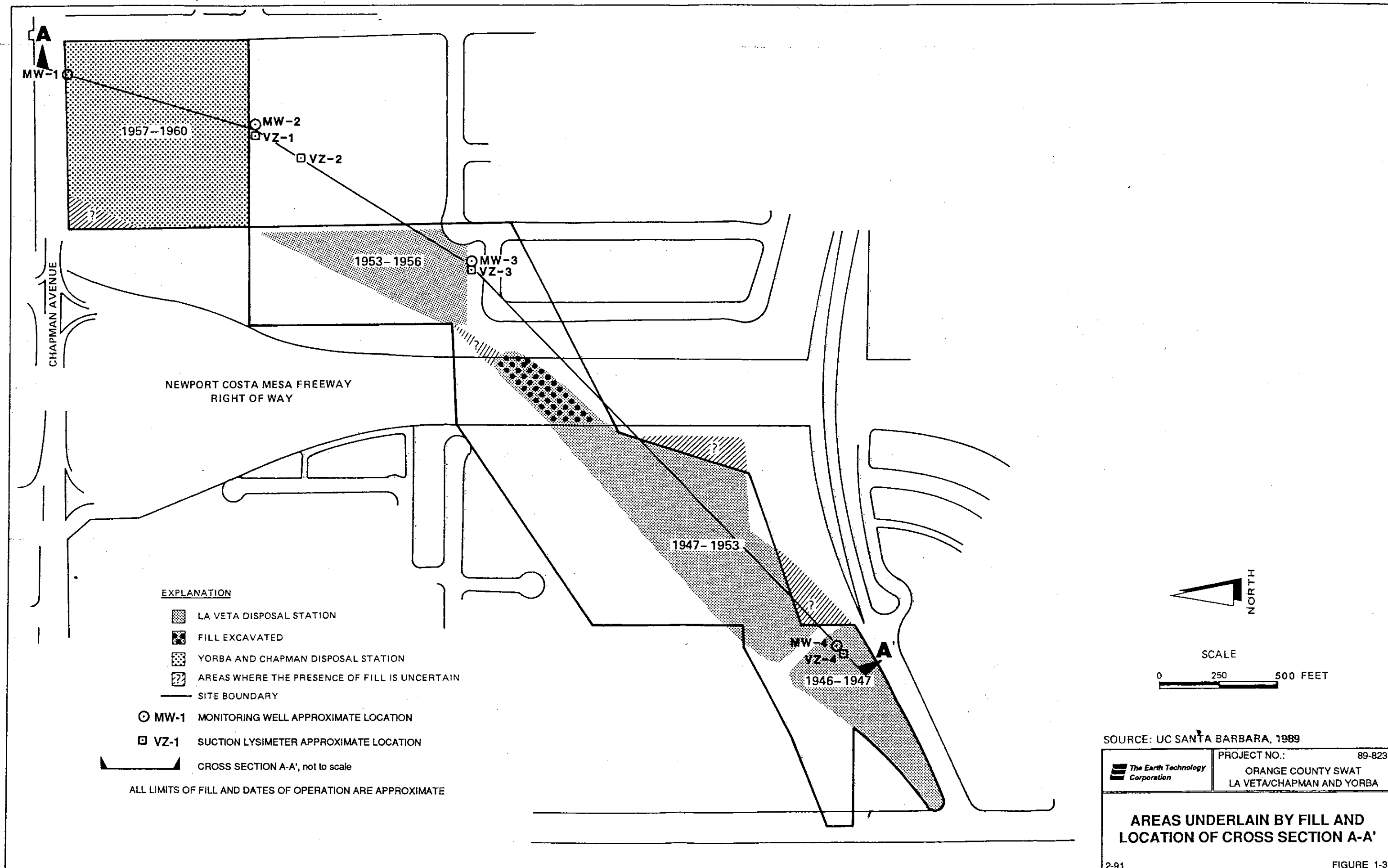
By Robert L. McNeill
Robert L. McNeill

JAB/kt

cc: Mr. L. A. Bivens, Structural Engineer
Mr. L. F. Pomeroy, AIA

AFFILIATES LOCATED IN:

San Francisco • Oakland • San Jose • Los Angeles • Orange • San Diego • Denver
Anchorage • Kansas City • St. Louis • Philadelphia • Clifton, New Jersey • New York City • Washington, D.C.



KEY TO WELL CONSTRUCTION DIAGRAM



Blank PVC Casing In Portland Cement Concrete



**Blank PVC Casing In Portland Cement Grout
With 5 % Bentonite**



Blank PVC Casing In Bentonite Plug



Blank PVC Casing In Filter Pack



Screen With Filter Pack



**Filter Pack Below PVC Casing Or Heaving Native
Sand**



PROJECT NO. 89-823

ORANGE COUNTY SWAT
LA VETA/CHAPMAN AND YORBA

**KEY TO WELL CONSTRUCTION
DIAGRAM**

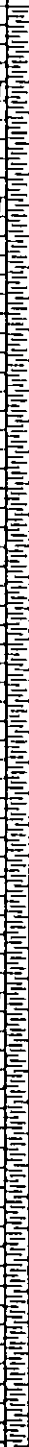
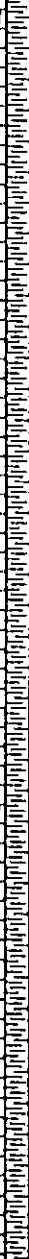
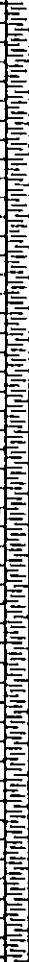
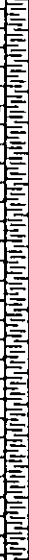
BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills						Project Number: 89-823	
Borehole Location: In gravel parking lot S.E. of YMCA				Borehole Number: MW-3		Sheet 1 of 7	
Drilling Agency: Layne Environmental				Driller: Louie Monje			
Drilling Equipment: AP1000 Perc. Hammer				Date Started: 11/5/90		Total Depth (feet): 253.0	
Drilling Method: Reverse Air Dual Wall		Number of Samples: 31		Date Finished: 11/9/90		Depth to Bedrock(feet): N/A	
Drilling Fluid: none used		Borehole Diameter (in): 9 5/8		Depth to Water(feet): Initial: 237.0 Completion: 228.50			
Completion Information: See well completion diagram. Blank Sch 80 PVC from 0-222.5'. Screen (0.01 inch slot) Sch 80 PVC from 222.5'-253'. All casing 4" ID. Filter pack #1-C from 253' to 216'. Bentonite plug 216-213'. Cement grout from 213'-3'.				Elevation and Datum: Ground: 237.00 Casing: 236.61		Logged By: D. Dawson	
						Checked By: G. Miller	

Depth (feet)	Sample		Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit				Graphic
0			140 lbs	15:31	BG @ 5			af		SM	SILTY SAND (SM); moderate yellowish brown, dry, dense, fine-grained sand, low plastic silt, moderately porous	Cristy Box. Concrete and 12" OD steel protective casing from 0 to 3'.
5	D1	15 17 17	15:39	3.3							wood and ceramic fragments, organic odor	BG @ 4.6 ppm BZ @ 4.8 ppm Blank 4" I.D. sch 80 PVC casing from 0.5' to 222.5'.
10	D2	10 13 15	15:46	3.3							dark yellowish brown to moderate brown, dry to moist glass and wood fragments	BG @ 2.6 ppm BZ @ 2.6 ppm Portland Cement with 5% bentonite from 3' to 213'.
15	D3	14 54	15:57	3.4				Qal		SW	SAND (SW); moderate yellowish brown, dry to moist, dense, fine- to coarse-grained sand, some fine gravel, highly porous, no trash moist to wet, very dense	BG @ 2.6 ppm BZ @ 2.6 ppm
20			11/6 08:52							SM	SILTY SAND (SM); moderate yellowish brown, dry to moist, fine-grained sand, low plastic silt, some fine to coarse gravel, moderately to highly porous	Resume Drilling on 11/6
25	D4	22 30 50 for 1"	09:03		BG @ 10					SW	SAND (SW); moderate yellowish brown, dry to moist, very dense, fine- to coarse-grained sand, some fine to coarse gravel, trace silt, highly porous moist to wet, fine to coarse gravel	
30	D5	11 10	09:18	47						SC	CLAYEY SAND (SC); see below	BG @ 9.0 ppm BZ @ 9.1 ppm

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823			
Borehole Location: In gravel parking lot S.E. of YMCA										Borehole Number: MW-3		Sheet 2 of 7	
Depth (feet)	Sample		Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks		
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit				Graphic	USCS or Rock Type
35	D6	10 140 lbs	5 10 14	10:34	2.0			Qal		SC	CLAYEY SAND (SC); light olive gray, moist, medium dense, fine-grained sand, highly plastic clay, trace fine gravel, slightly to moderately porous		BG @ 10 ppm BZ @ 11 ppm
										SW	SAND (SW); moderate yellowish brown, moist, medium dense, fine- to medium-grained sand, some coarse-grained sand, some fine gravel, trace silt, moderately to highly porous		
40	D7	9 21 50	10:45	2.2						GP	GRAVEL (GP); light gray to grayish yellow, moist, fine gravel, fine- to coarse-grained sand, trace subrounded coarse gravel, highly porous		BG @ 10 ppm BZ @ 10 ppm
										SW	SAND (SW); yellowish gray, dry to moist, very dense, fine- to coarse-grained sand, some fine gravel, trace silt, highly porous		
45	D8	8 15 19	11:03	11						SW	fine to coarse gravel, trace subrounded cobble clasts		BG @ 10 ppm BZ @ 9 ppm
										GW	GRAVEL (GW); light gray, medium dense		
50	D9	13 16 17	11:14	8						CH	SANDY CLAY (CH); moderate brown, moist, very stiff, medium to highly plastic clay, fine-grained sand, slightly to moderately porous		BG @ 10 ppm BZ @ 10 ppm
										SC	CLAYEY SAND (SC); moderate brown, moist, medium dense to dense, fine-grained sand, highly plastic clay, trace fine gravel, slightly to moderately porous		
55	D10	18 56 50 for 3"	11:31	3						SP	SAND (SP); moderate brown to moderate yellowish brown, moist, medium dense, fine-grained sand, trace to some clay, trace medium-grained sand and fine gravel, moderately porous		BG @ 11 ppm BZ @ 12 ppm
										SW	SAND (SW); moderate yellowish brown, moist, very dense, fine- to coarse-grained sand, fine gravel, trace coarse gravel, highly porous		
60	D11	8 14 50 for 5"	11:44	2.5							yellowish gray, dry to moist		BG @ 11 ppm BG @ 11 ppm
										GW	GRAVEL (GW)		
65	D12	8 8 44 for	12:15	2.3						SW			FID is not working; therefore, using PID.

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823		
Borehole Location: In gravel parking lot S.E. of YMCA								Borehole Number: MW-3		Sheet 3 of 7		
Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit	Graphic	USCS or Rock Type			
70	D13	2" 140 lbs 10 13 17	12:35	2.5			Qal		SW	SAND (SW); yellowish gray, dry to moist, medium dense, fine- to coarse-grained sand, fine gravel, trace silt, highly porous trace subrounded coarse gravel very dense, trace to some silt		BG @ 0.1 ppm BZ @ 0.1 ppm
75	D14	6 7 50 for 3"	13:13									BG @ 0.1 ppm BZ @ 0.2 ppm
80	D15	8 25 30	13:29	3.0					CL	SANDY CLAY (CL); dark yellowish brown, moist, very stiff, low plastic clay, fine-grained sand, slightly to moderately porous		BG @ 0.1 ppm BZ @ 0.1 ppm
									SC	CLAYEY SAND (SC); moderate yellowish brown, moist, medium dense, fine-grained sand, low plastic clay, slightly to moderately porous some low plastic clay, trace fine gravel		
85	D16	15 50 for 1"	13:51	2.7					SW	SAND (SW); moderate yellowish brown, moist, very dense, fine- to coarse-grained sand, some fine gravel, trace coarse gravel and silt, moderately to highly porous		BG @ 0.1 ppm BZ @ 0.2 ppm
90	D17	5 7 20	14:11									BG @ 0.1 ppm BZ @ 0.1 ppm
95												
									SM/SP	SILTY SAND (SM/SP); light yellowish gray, dry to moist, dense, fine-grained sand, low plastic silt, some fine to coarse gravel, moderately porous		
100	D18	14 15 16	15:08	2.0					GP	GRAVEL (GP); light gray to yellowish gray, dry, medium dense, fine gravel, some fine- to coarse-grained sand, trace coarse gravel and silt, highly porous		BG @ 0.1 ppm BZ @ 0.1 ppm
									SW	SAND (SW); dark yellowish brown, moist, dense, fine- to coarse-grained sand, some fine gravel, trace silt, highly porous; cobble clast at 103'		
105												

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823											
Borehole Location: In gravel parking lot S.E. of YMCA								Borehole Number: MW-3		Sheet 4 of 7											
Depth (feet)	Sample		Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks										
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/B*	PID (ppm) S/B*	IR (ppm)	Geologic Unit				Graphic	USCS or Rock Type								
110	D19	140 lbs	15:36					Qal		SW	SAND (SW); see above moist to wet, no silt, trace clay										
115										SW	very dense, fine gravel										
120	D20	37 62 for 5"	15:51		1.3							trace to some clay -cobble clast up to 4" in diameter									BG @ 0.1 ppm BZ @ 0.1 ppm
125										SW	some fine gravel										
130	D21	35 50 for 4"	16:33							GW	GRAVEL (GW); light gray, dry to moist, very dense, fine to coarse gravel, some fine- to coarse-grained sand, trace cobbles up to 5" in diameter, highly porous										Resume Drilling on 11/7 Using different FID #9.
135										SC	CLAYEY SAND (SC); moderate yellowish brown, moist, medium dense, fine-grained sand, medium plastic clay, some medium-grained sand, slightly to moderately porous										
140	D22	12 21 25	08:34		1.2					GP	GRAVEL (GP); yellowish gray to light gray, dry to moist, medium dense, fine gravel, some fine-grained sand, trace coarse gravel and silt, highly porous										BG @ 0.8 ppm BZ @ 0.8 ppm
										SW	SAND (SW); yellowish gray, moist, medium dense, fine- to coarse-grained sand, some fine gravel, trace clay, highly porous										
										SC	CLAYEY SAND (SC); moderate yellowish brown, moist, medium dense, fine-grained sand, highly plastic clay, slightly to moderately porous										
										CH	CLAY (CH); moderate yellowish brown, moist, medium stiff, highly plastic clay, trace fine-grained sand, slightly porous										
											stiff										BG @ 1.5 ppm BZ @ 1.5 ppm

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823				
Borehole Location: In gravel parking lot S.E. of YMCA							Borehole Number: MW-3		Sheet 5 of 7					
Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks		
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit	Graphic				USCS or Rock Type	
145			140 lbs					Qal		CH		CLAY (CH); moderate yellowish brown, moist, stiff, highly plastic clay, trace fine-grained sand, slightly porous		
										CH		SANDY CLAY (CH); fine-grained sand, trace coarse gravel		
150	D23		11 17 27	09:40	0.8	0				CH				BG @ 0.8 ppm BZ @ 0.8 ppm
					BG @ 0.8	BG @ 0								
160	D24		23 30 35	10:26	1.1	0				SC/SP		CLAYEY SAND (SC/SP); moderate yellowish brown, moist, medium dense, fine-grained sand, highly plastic clay, moderately porous		BG @ 0.8 ppm BZ @ 0.8 ppm
										CH		CLAY (CH); moderate yellowish brown, moist, stiff, highly plastic clay, trace fine-grained sand, slightly porous		
												trace medium- to coarse-grained sand		
170	D25		8 9 13	11:34	1.3	0				SC/SW		CLAYEY SAND (SC/SW); moderate yellowish brown, moist, loose, fine- to coarse-grained sand, highly plastic clay, trace fine gravel, moderately porous		BG @ 0.8 ppm BZ @ 0.8 ppm
										SW		medium dense, trace to some highly plastic clay		
180	D26		18 21 24	12:20	2.6	0				SW		SAND (SW); moderate yellowish brown, moist, medium dense, fine- to coarse-grained sand, some fine gravel, trace clay, moderately to highly porous		BG @ 0.8 ppm BZ @ 2 ppm

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823		
Borehole Location: In gravel parking lot S.E. of YMCA								Borehole Number: MW-3		Sheet 6 of 7		
Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count Drilling Time	FIO (ppm) S/B*	PID (ppm) S/B*	IR (ppm)	Geologic Unit	Graphic	USCS or Rock Type			
185			25 140 lbs				Qal		SW	SAND (SW); moderate yellowish brown, moist, medium dense, fine- to coarse-grained sand, some fine gravel, trace clay, moderately to highly porous some fine to coarse gravel		
190	D27	12 20 29	13:32	1.8					SC	CLAYEY SAND (SC/SP); moderate yellowish brown, moist, medium dense, fine-grained sand, highly plastic clay, slightly to moderately porous highly plastic clay		BZ @ 0.8 ppm BZ @ 0.8 ppm
195									CH	SANDY CLAY (CH); moderate yellowish brown, moist, stiff, highly plastic clay, fine-grained sand, slightly to moderately porous trace medium- to coarse-grained sand and fine gravel		
200									CH	CLAY (CH); moderate yellowish brown, moist, stiff, highly plastic clay, trace fine-grained sand, slightly porous		BG @ < 1 ppm BZ @ < 1 ppm
205												
210	D28	12 22 31	14:37	1.9								BG @ < 1 ppm BZ @ < 1 ppm
215												Bentonite Plug.

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE/WELL CONSTRUCTION LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823			
Borehole Location: In gravel parking lot S.E. of YMCA								Borehole Number: MW-3		Sheet 7 of 7			
Depth (feet)	Sample		Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks		
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit				Graphic	USCS or Rock Type
220	D29	140 lbs 17 20 24	15:22		2.0			Qal		CH	CLAY (CH); moderate yellowish brown, moist, stiff, highly plastic clay, trace fine-grained sand, slightly porous		BG @ < 1 ppm BZ @ < 1 ppm Filter pack consist of Lapis Luster # 1/c sand. Screen consists of 0.01" slot 4" ID Sch 80 PVC casing from 222.5' to 252.5'.
225													
230	D30	17 27 53	16:37		1.7						-6" thick CLAYEY SAND (SC) lens		BG @ < 1 ppm BZ @ < 1 ppm
235			08:20							SC	CLAYEY SAND (SC); moderate yellowish brown, moist to wet, very dense, fine- to coarse-grained sand, highly plastic clay, some fine gravel, moderately to highly porous		Resume Drilling on 11/8 
240	D31	23 63	09:00		2.2					SW	SAND (SW); moderate yellowish brown, wet, very dense, fine- to coarse-grained sand, fine gravel, some clay, highly porous		BG @ 1.7 ppm BZ @ 1.7 ppm
245										SC/SP	SAND (SP); moderate yellowish brown, wet, very dense, fine-grained sand, fine to coarse gravel, trace to some clay, highly porous		
250											some subrounded igneous cobble clasts up to 7" in diameter		
255			10:00							CH	CLAY (CH); moderate yellowish brown, moist, hard, highly plastic clay, trace fine-grained sand, slightly porous		
Boring terminated at 253 feet. Groundwater encountered at approximately 237 feet.												End cap.	

* S/B = sample reading/background reading; NA = not analyzed



BOREHOLE LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills		Project Number: 89-823	
Borehole Location: In gravel parking lot S.E. of YMCA		Borehole Number: MW-3A	Sheet 1 of 1
Drilling Agency: Layne Environmental		Driller: Louie Monje	
Drilling Equipment: AP1000 Perc. Hammer		Date Started: 11/5/90	Total Depth (feet): 10.5
Drilling Method: Reverse Air Dual Wall		Date Finished: 11/5/90	Depth to Bedrock(feet):
Drilling Fluid: none used		Number of Samples: 2	Depth to Water(feet):
Completion Information: Boring backfilled with Portland cement with 5% Bentonite to ground surface.		Borehole Diameter (in): 9 5/8	Elevation and Datum: 235.00
		Logged By: D. Dawson	Checked By: G. Miller

Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit	Graphic	USCS or Rock Type			
1	D1		13:42	BG @ 10			af		SM	SILTY SAND (SM); grayish orange, dry, dense, fine-grained sand, low plastic silt, some fine to coarse gravel, moderately to highly porous		
2												
3												
4												
5												
6	D2		13:50	210					SW	SAND (SW); yellowish gray, dry to moist, very dense, fine- to coarse-grained sand, fine gravel, trace coarse gravel, highly porous		BG @ 16 ppm BZ @ 16 ppm
7												
8												
9												
10												
11										black, municipal trash consisting of wood, plastic and metal fragments, strong organic odor, very stained		BG @ 16 ppm BZ @ 16 ppm
12										Boring terminated at 10.5 feet. No free groundwater encountered.		
13												
14												
15												

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills		Project Number: 89-823	
Borehole Location: In gravel parking lot S.E. of YMCA		Borehole Number: MW-3B	Sheet 1 of 1
Drilling Agency: Layne Environmental		Driller: Louie Monje	
Drilling Equipment: AP1000 Perc. Hammer		Date Started: 11/5/90	Total Depth (feet): 10.5
Drilling Method: Reverse Air Dual Wall		Date Finished: 11/5/90	Depth to Bedrock(feet):
Drilling Fluid: none used		Number of Samples: 2	Depth to Water(feet):
Completion Information: Boring backfilled with Portland cement with 5% Bentonite to ground surface.		Borehole Diameter (in): 9 5/8	Elevation and Datum: 236.00
		Logged By: D. Dawson	Checked By: G. Miller

Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit	Graphic	USCS or Rock Type		
1				14:34				af		SM		
2					BG @ 10							
3												
4												
5	D1		19	14:39	12					black to dark yellowish brown, municipal trash consisting of sheet metal, glass and wood fragments		BG @ 13 ppm BZ @ 13 ppm
6			21									
7			25									
8												
9	D2			14:46						moist to wet		D2 had no blow counts recorded. BG @ 14 ppm BZ @ 15 ppm
10												
11										Boring terminated at 10.5 feet. No free groundwater encountered.		
12												
13												
14												
15												

* S/B = sample reading/background reading; NA = not analyzed

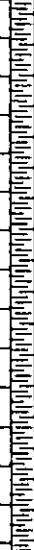
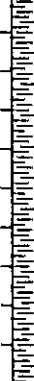
BOREHOLE LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills		Project Number: 89-823	
Borehole Location: In gravel parking lot S. of YMCA.		Borehole Number: VZ-3	Sheet 1 of 3
Drilling Agency: Layne Environmental		Driller: Louie Monje	
Drilling Equipment: AP 1000 Perc. Hammer		Date Started: 11/9/90	Total Depth (feet): 49.0
Drilling Method: Reverse Air Dual Wall Percussion		Date Finished: 11/10/90	Depth to Bedrock(feet): N/A
Drilling Fluid: none used		Number of Samples: 4	Depth to Water(feet):
Completion Information: See well completion diagram. Timco 2' lysimeter with 200 mesh silica slurry from 49' to 47'. Sch 40 2" PVC with two nylon hoses from 47' to 1'. Silica sand 60 from 47' to 42'. Bentonite plug from 42' to 39'. Valve head 1' to 0.		Borehole Diameter (in): 9 5/8	Elevation and Datum: 236.64
		Logged By: D. Dawson	Checked By: G. Miller

Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/B*	PID (ppm) S/B*	IR (ppm)	Geologic Unit	Graphic	USCS or Rock Type		
1			140 lbs					af		SM		SILTY SAND (SM); dark yellowish brown to moderate brown, dry to moist, dense, fine-grained sand, low plastic silt, slightly to moderately porous municipal trash, wood and metal, organic odor some fine gravel and trace coarse gravel rubber, glass and wood SAND (SW); yellowish gray, dry to moist, dense, fine- to coarse-grained sand, fine gravel, trace to some silt, moderately porous dense, chunks of concrete
2												
3												
4												
5												
6												
7												
8												
9	D1		16	12:17								
10			18									
11			18	12:31								
12												
13										SM/ SW		
14												
15												

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823			
Borehole Location: In gravel parking lot S. of YMCA.								Borehole Number: VZ-3		Sheet 2 of 3			
Depth (feet)	Sample			Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/B*	PID (ppm) S/B*	IR (ppm)	Geologic Unit	Graphic				USCS or Rock Type
16	D2	24 50 for 3"	140 13:00					Qal		SM		SAND (SW); yellowish gray, dry to moist, dense, fine- to coarse-grained sand, fine to coarse gravel, trace to some silt, trace subrounded cobbles up to 4" in diameter, moderately porous	BG @ <1 ppm BZ @ <1 ppm
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28									SW		SAND (SW); yellowish gray, moist, very dense, fine- to coarse-grained sand, fine to coarse gravel, trace subrounded cobbles up to 4.5" in diameter, trace silt, highly porous		
29													
30													
31													
32													
33									SC		CLAYEY SAND (SC); light olive gray, moist, medium dense, fine-grained sand, highly plastic clay, trace fine gravel, slightly to moderately porous	BG @ <1 ppm BZ @ <1 ppm	
34													
									SW			SAND (SW); see below	

* S/B = sample reading/background reading; NA = not analyzed

BOREHOLE LOG

Project Name: Orange County SWAT La Veta and Yorba Landfills										Project Number: 89-823				
Borehole Location: In gravel parking lot S. of YMCA.								Borehole Number: VZ-3		Sheet 3 of 3				
Depth (feet)	Sample		Field Analysis			Log			Lithologic Description	Well Construction Diagram	Remarks			
	Number	Type	Blow Count	Drilling Time	FID (ppm) S/Bx	PID (ppm) S/Bx	IR (ppm)	Geologic Unit				Graphic	USCS or Rock Type	
34			140 lbs	13:33				Qal		SW	SAND (SW); moderate yellowish brown to dark yellowish brown, dry to moist, medium dense, fine- to coarse-grained sand, fine gravel, trace silt, moderately to highly plastic			
35														
36										GW	Gravel (GW); fine to coarse gravel, fine- to coarse-grained sand, some cobbles			
37														
38										SW				BG @ <1 ppm BZ @ <1 ppm
39				13:39										
40											trace to some silt			
41														
42														
43														Silica Sand 60 from 42' to 47'.
44											moderate yellow, fine to coarse gravel, trace clay and cobbles			
45	D3	7		13:58										BG @ <1 ppm BZ @ <1 ppm
46		13												
47		13								CH	SANDY CLAY (CH); moderate yellowish brown, moist, very stiff, highly plastic clay, fine-grained sand, trace fine gravel, slightly porous			
48	D4	25		14:20										200 mesh silica slurry.
49		20								SC	CLAYEY SAND (SC); moderate yellowish brown, moist, medium dense, fine- to medium-grained sand, highly plastic clay, moderately porous			
50		12												
51		14												Ceramic cup.
52											Boring terminated at 49 feet. No free groundwater encountered.			

* S/B = sample reading/background reading; NA = not analyzed

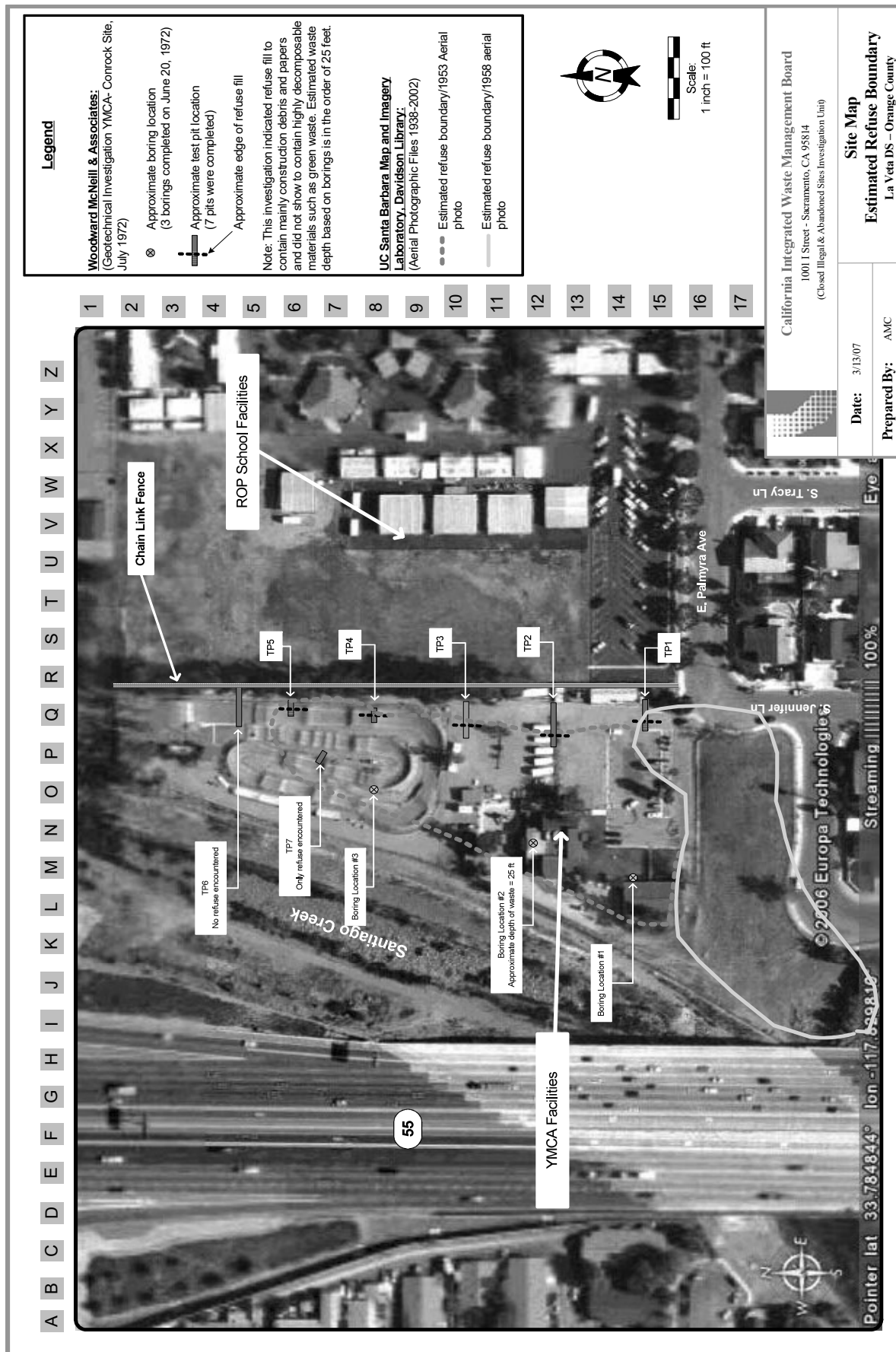
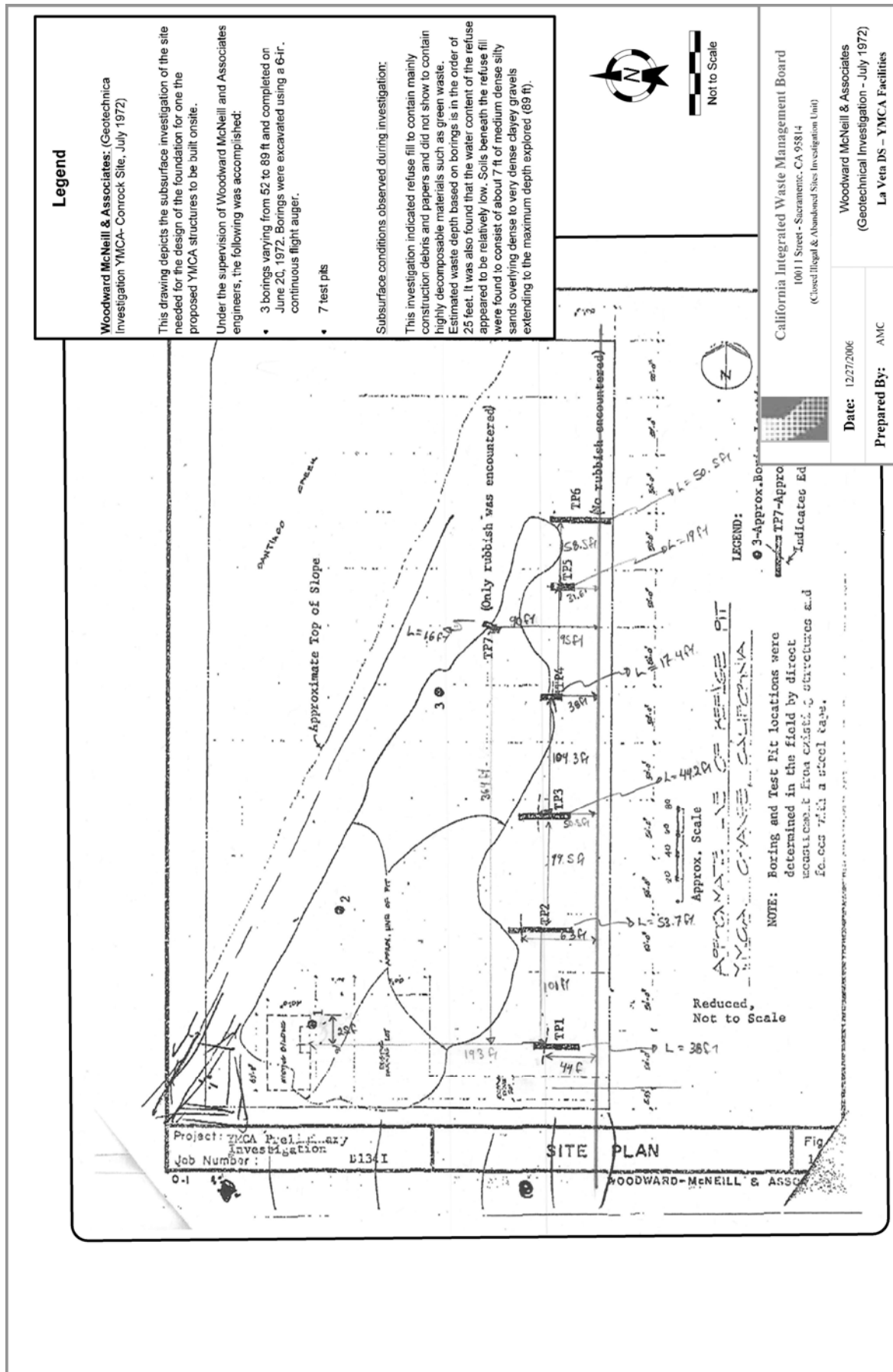


Exhibit 10





SCS ENGINEERS

BORING LOG

3900 Kilroy Airport Way, Suite 100
Long Beach, California 90806-6816

BORING/PROBE NUMBER: LFG-1

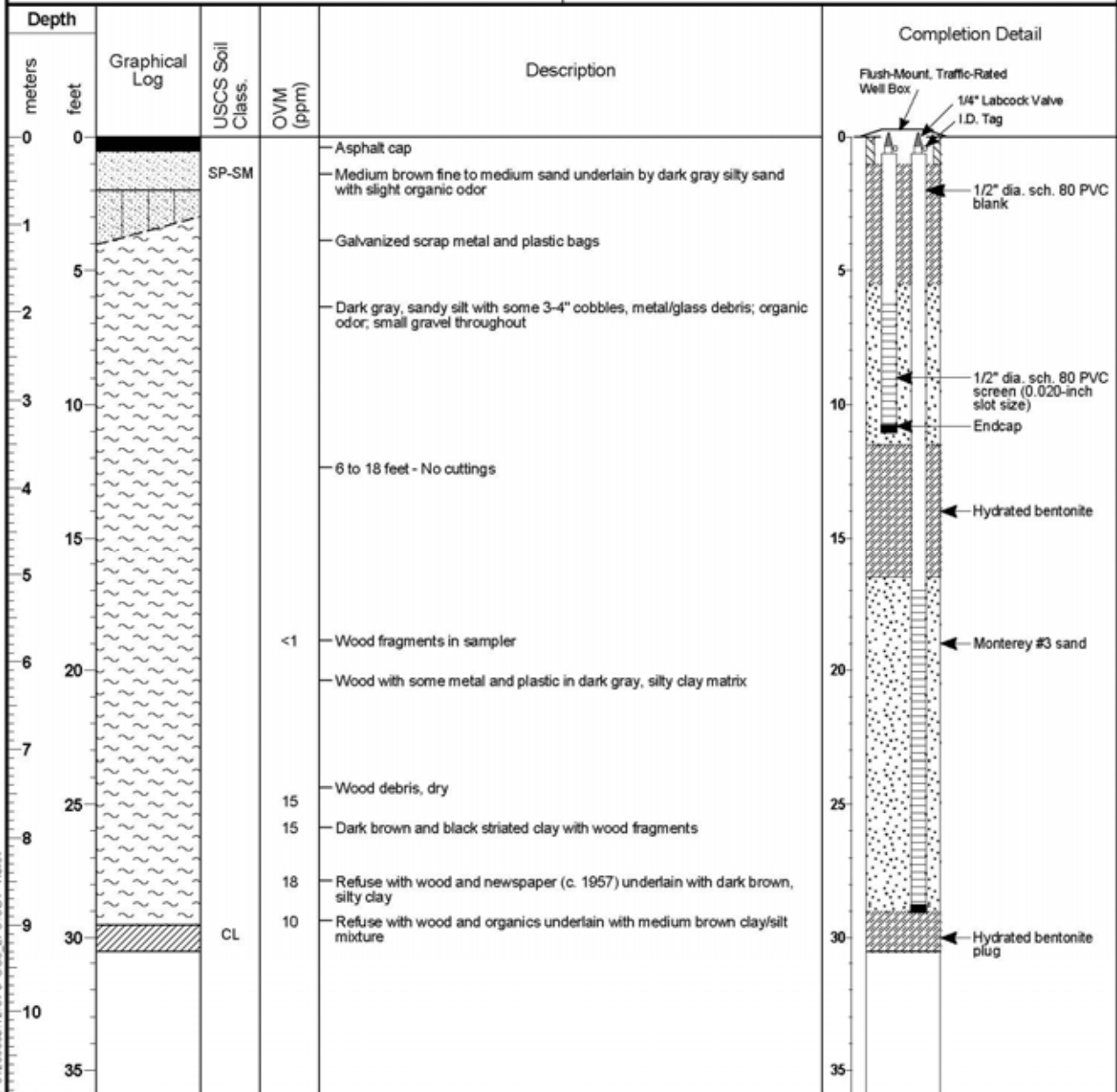
Page 1 of 1

La Veta Refuse Disposal Station
2241 E. Palmyra Ave.
Orange, CA 92869

JOB NUMBER: 01206053.12 Task 2

REMARKS:

COORDINATES N:2232699.85 E:6081632.1



Drilling Company: Layne Christensen

Drilling Method: Dual-Wall Casing Advance

Logged By: A. Wdowin

Sampling Method: Cuttings

Date Started: 5/14/07

Time Started: 08:20

Date Ended: 5/14/07

Time Ended: 12:30

Boring Diameter: 9 in.

Elevation: 229.5 ft.

Well Diameter: 1/2 in.

Total Depth: 30.5 ft.

STANDARD LOG L PROBE 01206053.12.GPJ SCS LFG GDT 7/3/07

SCS ENGINEERS

BORING LOG

3900 Kilroy Airport Way, Suite 100
Long Beach, California 90806-6816

BORING/PROBE NUMBER: LFG-2

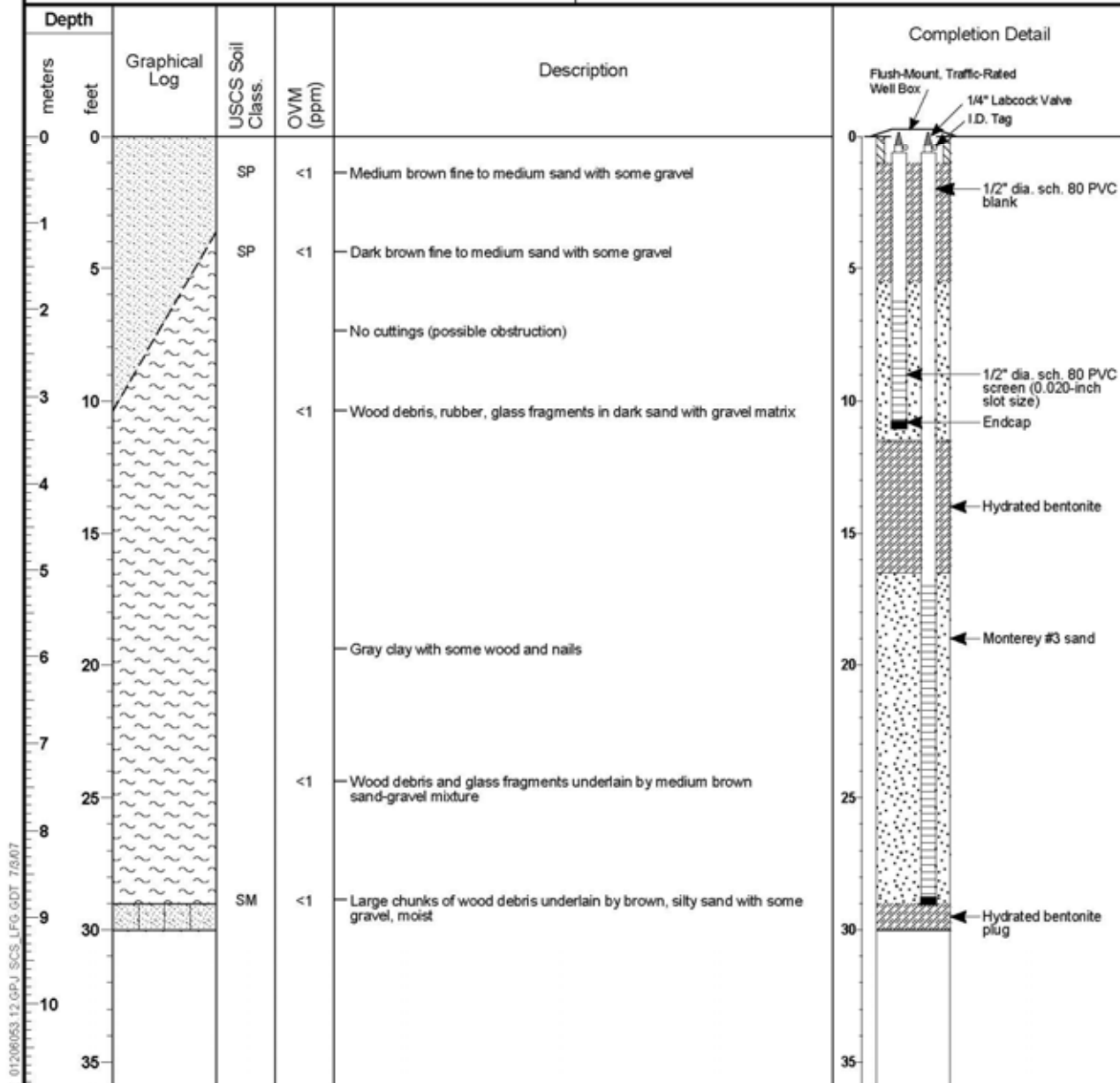
Page 1 of 1

La Veta Refuse Disposal Station
2241 E. Palmyra Ave.
Orange, CA 92869

JOB NUMBER: 01206053.12 Task 2

REMARKS:

COORDINATES N:2232435.25 E:6081450.67



STANDARD LOG L PROBE 01206053.12.GPJ SCS LFG.GDT 7/6/07

Drilling Company: **Layne Christensen**
Drilling Method: **Dual-Wall Casing Advance**
Logged By: **A. Wdowin**
Sampling Method: **Cuttings**

Date Started: **5/14/07** Time Started: **14:00**
Date Ended: **5/14/07** Time Ended: **16:20**
Boring Diameter: **9 in.** Elevation: **229.4 ft.**
Well Diameter: **1/2 in.** Total Depth: **30.0 ft.**

SCS ENGINEERS

BORING LOG

3900 Kilroy Airport Way, Suite 100
Long Beach, California 90806-6816

BORING/PROBE NUMBER: MP-1

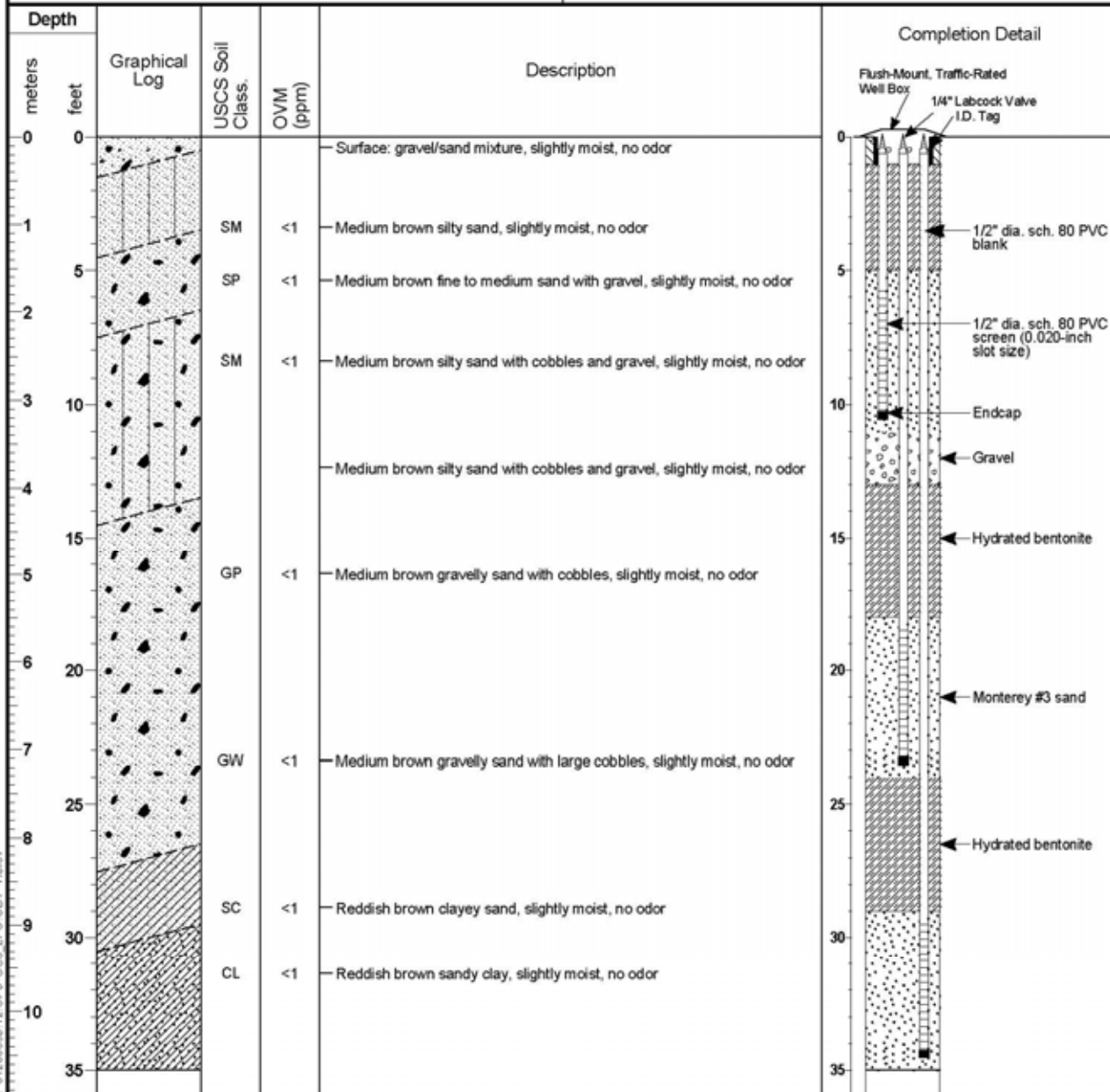
Page 1 of 1

La Veta Refuse Disposal Station
2241 E. Palmyra Ave.
Orange, CA 92869

JOB NUMBER: 01206053.12 Task 2

REMARKS:

COORDINATES N:2232875.93 E:6081799.03



Drilling Company: **Layne Christensen**
Drilling Method: **Dual-Wall Casing Advance**
Logged By: **A. Wdowin**
Sampling Method: **Cuttings**

Date Started: **5/15/07** Time Started: **12:10**
Date Ended: **5/15/07** Time Ended: **14:50**
Boring Diameter: **9 in.** Elevation: **235.0 ft.**
Well Diameter: **1/2 in.** Total Depth: **35.0 ft.**

STANDARD LOG - L PROBE 01206053.12.GPJ SCS LFG GDT 76.07

SCS ENGINEERS

BORING LOG

3900 Kilroy Airport Way, Suite 100
Long Beach, California 90806-6816

BORING/PROBE NUMBER: MP-2

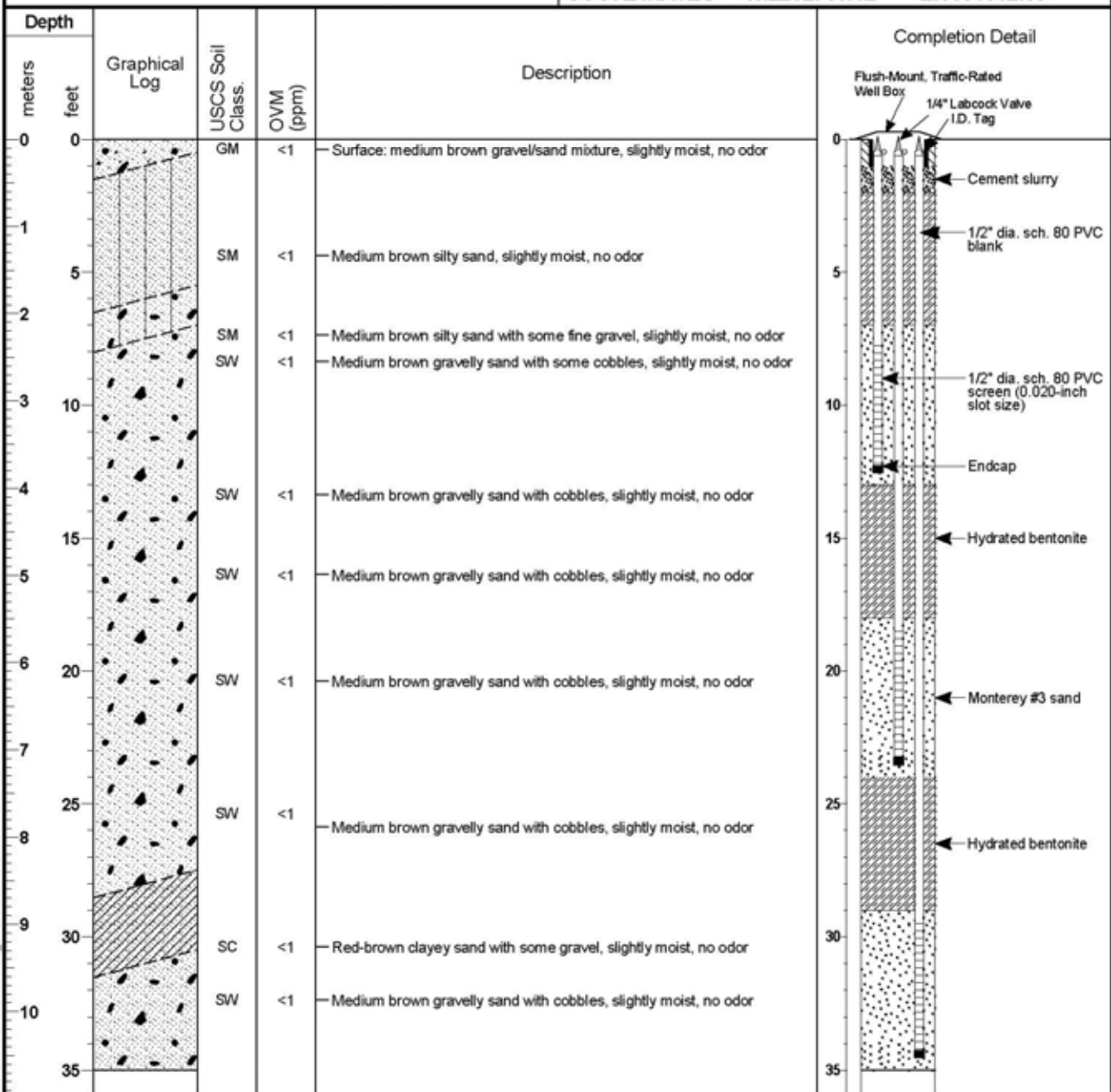
Page 1 of 1

La Veta Refuse Disposal Station
2241 E. Palmyra Ave.
Orange, CA 92869

JOB NUMBER: 01206053.12 Task 2

REMARKS:

COORDINATES N:2232766.62 E:6081812.85



Drilling Company: **Layne Christensen**

Drilling Method: **Dual-Wall Casing Advance**

Logged By: **A. Wdowin**

Sampling Method: **Cuttings**

Date Started: **5/15/07**

Date Ended: **5/15/07**

Boring Diameter: **9 in.**

Well Diameter: **1/2 in.**

Time Started: **15:10**

Time Ended: **17:15**

Elevation: **235.2 ft.**

Total Depth: **35.0 ft.**

STANDARD LOG L PROBE 01206053.12.GPJ SCS LFG.GDT 7/8/07

SCS ENGINEERS

BORING LOG

3900 Kilroy Airport Way, Suite 100
Long Beach, California 90806-6816

BORING/PROBE NUMBER: MP-3

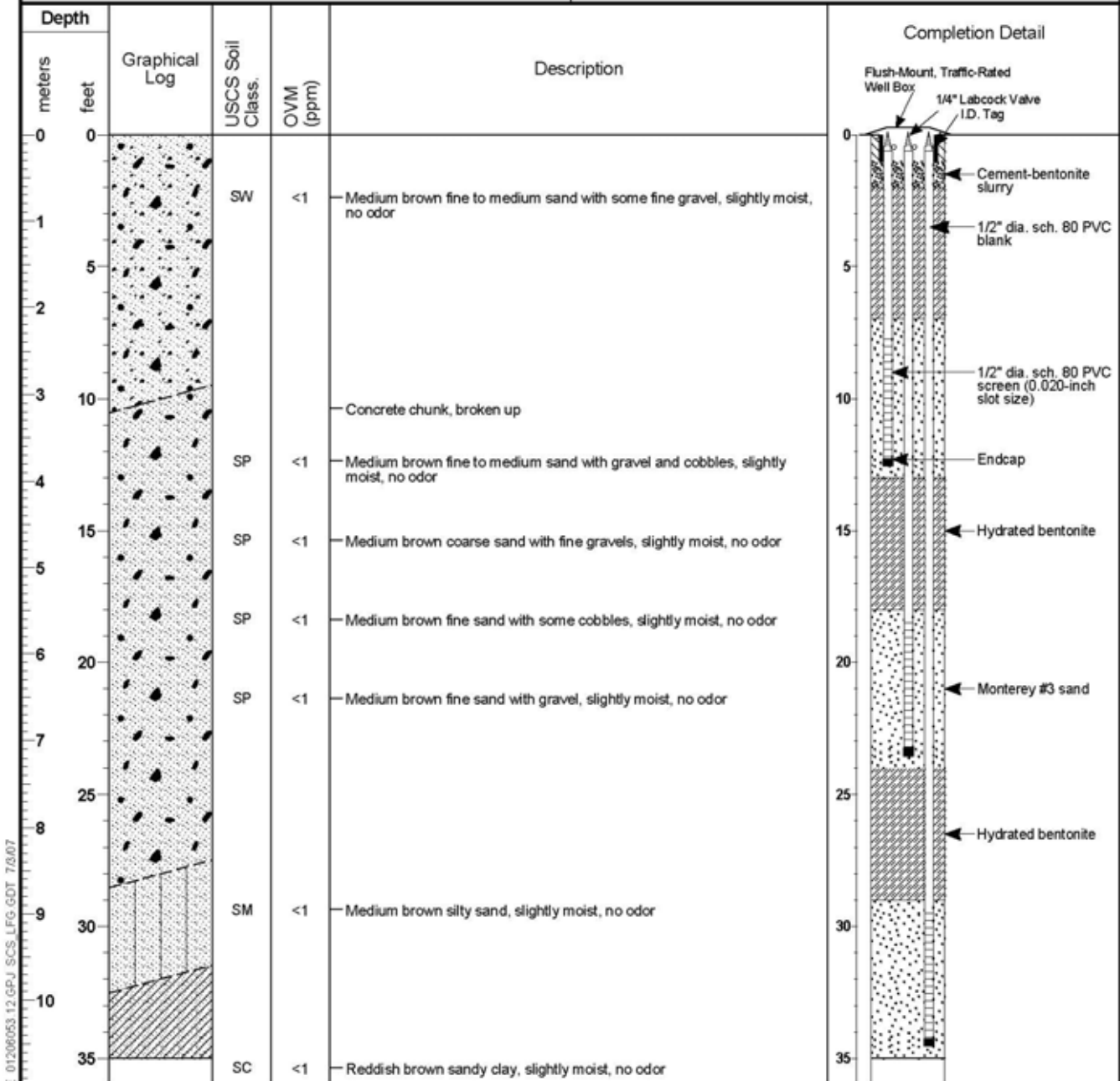
Page 1 of 1

La Veta Refuse Disposal Station
2241 E. Palmyra Ave.
Orange, CA 92869

JOB NUMBER: 01206053.12 Task 2

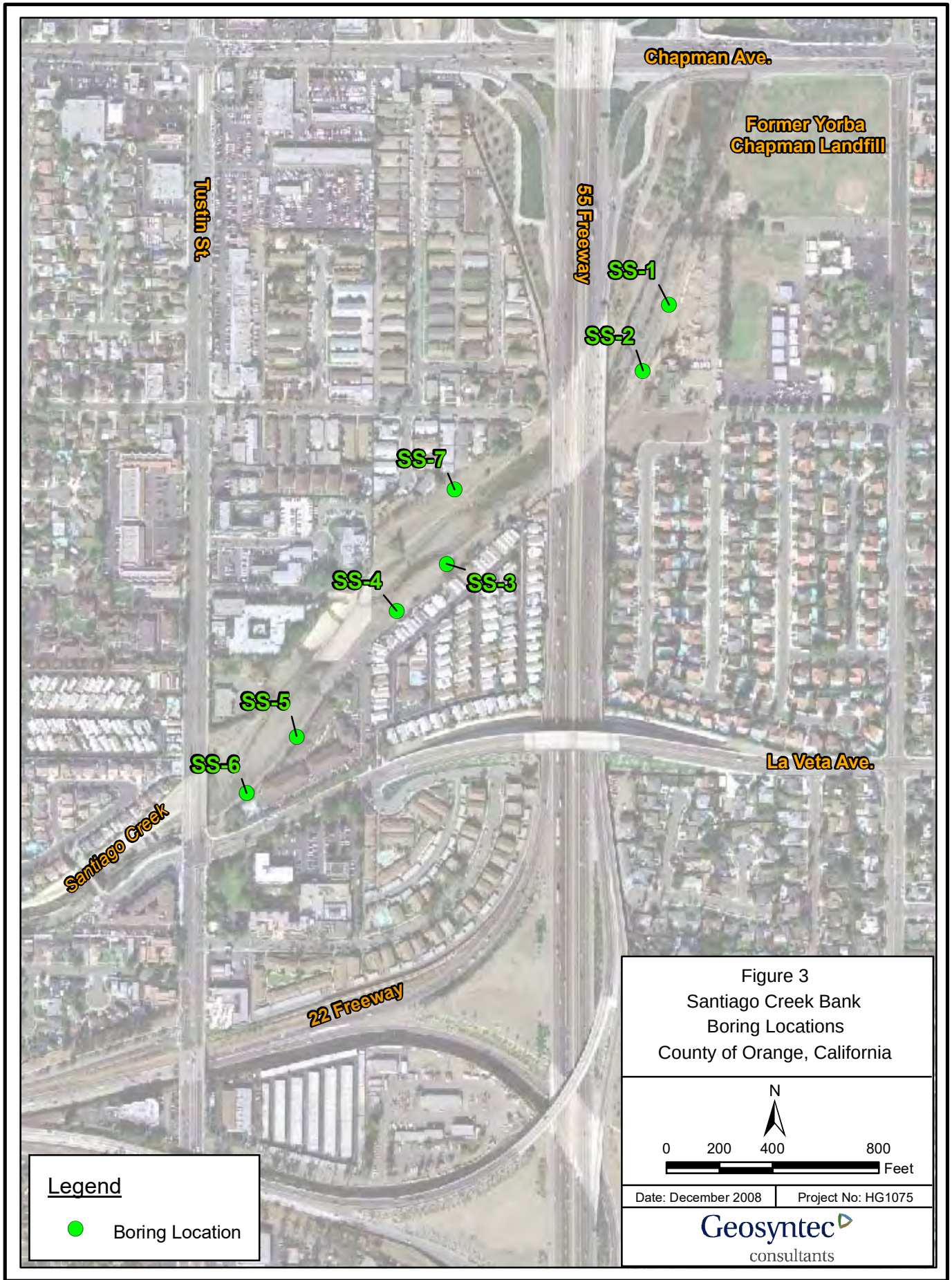
REMARKS:

COORDINATES N:2232518.96 E:6081733.15



Drilling Company: **Layne Christensen**
Drilling Method: **Dual-Wall Casing Advance**
Logged By: **A. Wdowin**
Sampling Method: **Cuttings**

Date Started: **5/15/07** Time Started: **08:00**
Date Ended: **5/15/07** Time Ended: **11:32**
Boring Diameter: **9 in.** Elevation: **230.9 ft.**
Well Diameter: **1/2 in.** Total Depth: **35.0 ft.**



KEY SHEET - CLASSIFICATIONS AND SYMBOLS

GS FORM:
KEY/SYMBOLS 01/04

EMPIRICAL CORRELATIONS WITH STANDARD PENETRATION RESISTANCE N VALUES *

	N VALUE * (BLOWS/FT)	CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (TONS/SQ FT)		N VALUE * (BLOWS/FT)	RELATIVE DENSITY
FINE GRAINED SOILS	0 - 2	VERY SOFT	<0.25	COARSE GRAINED SOILS	0 - 4	VERY LOOSE
	3 - 4	SOFT	0.25 - 0.50		5 - 10	LOOSE
	5 - 8	FIRM	0.50 - 1.00		11 - 30	MEDIUM DENSE
	9 - 15	STIFF	1.00 - 2.00		31 - 50	DENSE
	16 - 30	VERY STIFF	2.00 - 4.00		>50	VERY DENSE
	31 - 50	HARD	>4.00			
	>50	VERY HARD				

* ASTM D 1586; NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 IN. O.D., 1.4 IN. I.D. SAMPLER ONE FOOT.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

MAJOR DIVISIONS			SYMBOLS	DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		LITTLE OR NO FINES		GP POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM SILTY GRAVELS, GRAVEL- SAND-SILT MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO.4 SIEVE	APPRECIABLE AMOUNT OF FINES		GC CLAYEY GRAVELS, GRAVEL- SAND-CLAY MIXTURES
		CLEAN SANDS		SW WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		LITTLE OR NO FINES		SP POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
FINE GRAINED SOILS	MORE THAN 50% OF MATERIAL COARSER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO.4 SIEVE		SM SILTY SANDS, SAND-SILT MIXTURES
		APPRECIABLE AMOUNT OF FINES		SC CLAYEY SANDS, SAND-CLAY MIXTURES
		Liquid Limit LESS THAN 50		ML INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	SILTS AND CLAYS	Liquid Limit LESS THAN 50		CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		Liquid Limit GREATER THAN 50		OL ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		Liquid Limit GREATER THAN 50		MH INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILT
HIGHLY ORGANIC SOILS	SILTS AND CLAYS	Liquid Limit GREATER THAN 50		CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		Liquid Limit GREATER THAN 50		OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
		Liquid Limit GREATER THAN 50		PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT
		Liquid Limit GREATER THAN 50		PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT

NOTE: DUAL SYMBOLS USED FOR BORDERLINE CLASSIFICATIONS

PARTICLE SIZE IDENTIFICATION

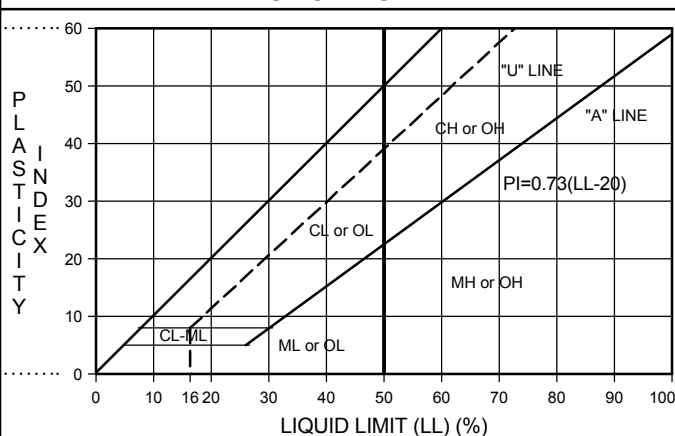
USCS (SOILS ONLY) *		SEDIMENTARY (ROCK ONLY)	
BOULDER	>300 mm	BOULDER	>256 mm
COBBLE	75 - 300 mm	COBBLE	64 - 256 mm
GRAVEL: COARSE	20 - 75 mm	PEBBLE	4 - 64 mm
GRAVEL: FINE	4.75 - 20 mm	GRANULE	2 - 4 mm
SAND: COARSE	2 - 4.75 mm	SAND: V. COARSE	1 - 2 mm
SAND: MEDIUM	0.42 - 2 mm	SAND: COARSE	0.5 - 1 mm
SAND: FINE	0.074 - 0.42 mm	SAND: MEDIUM	0.25 - 0.5 mm
SILT/CLAY	<0.074 mm	SAND: FINE	0.125 - 0.25 mm
		SAND: V. FINE	0.063 - 0.125 mm
		SILT	0.004 - 0.063 mm
		CLAY	<0.004 mm

* WELL GRADED - HAVING WIDE RANGE OF GRAIN SIZES AND APPRECIABLE AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES

* POORLY GRADED - PREDOMINANTLY ONE GRAIN SIZE, OR HAVING A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING

PERCENTAGE OF PARTICLE TYPE IN DECREASING ORDER OF PARTICLE SIZE (GRAVEL, SAND, FINES)

PLASTICITY CHART



OTHER MATERIAL SYMBOLS

	Conglomerate		Sandy Claystone		Marker Bed
	Sandstone		Granitic/Intrusive		
	Silty Sandstone		Volcanic/Extrusive		Artificial Fill
	Clayey Sandstone		Metamorphic		Refuse
	Sandy Siltstone		Limestone		Concrete/Asphalt
	Siltstone		Dolomite		
	Claystone		Glacial Till		
	Clayey Siltstone/ Silty Claystone		Landslide Debris		

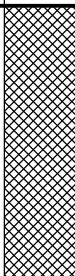
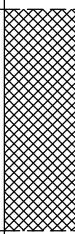
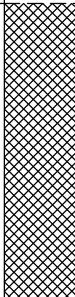
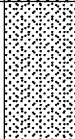
WELL SYMBOLS

	CONCRETE
	GROUT
	BENTONITE SEAL
	TRANSITION SAND
	SAND PACK
	GRAVEL PACK
	NATIVE/SLUFF
	CENTRALIZER

SAMPLE TYPE AND OTHER SYMBOLS

	BULK SAMPLE		Water Level at Time Drilling, or as Shown
	STANDARD PENETRATION TEST		Static Water Level
	MODIFIED CALIFORNIA SAMPLE		Pump Inlet
	CORE SAMPLE		Loss of Drilling Fluid
	SHELBY TUBE		MSL: Mean Sea Level
	DRIVE SAMPLE		AGS: Above Ground Surface
			BGS: Below Ground Surface
			BTOC: Below Top of Casing
			HSA: Hollow Stem Auger

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane		
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)			
5	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose; shards of glass @ 2' - w/ small cobbles, trace wood @ 4' - nail, piece of ceramic material No Recovery			SS-1-0.5						0815 0820	Start hand augering pH = 7.0 Very difficult to hand auger Unable to get deeper with hand auger, begin drilling at 4'		
										0			
													0900
10	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose @ 7' - Slightly larger, increased gravel content @ 8' - Charred/burned wood fragments for 0.25' @ 9' - predominantly gravels, Light gray; fine No Recovery			SS-1-8						80	0		
15	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose @ 13' - Dark red for 0.25', hard, dry @ 14' - Wood chunks @ 14.5' - Dark red, hard fragments @ 16.5' - Red fragments, hard									60	0		
20	NATIVE Sand with cobbles and gravel (SW): Grayish brown; dry to moist; (20, 70, 10); medium Terminated boring at 20 ft bgs			SS-1-19						95	0		
25													

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2 in.
LOGGER A. S.

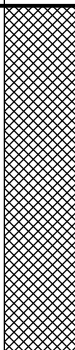
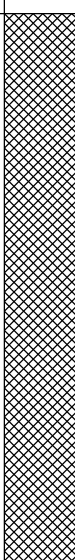
NORTHING
EASTING
COORDINATE SYSTEM:

REVIEWER M. R.

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	FILL Silty Sand (SM): Grayish brown; dry; fine grained; (5, 60, 35) @ 1' - with cobbles; (20, 50, 30) @ 2' - red; solid fragments @ 4' - 0.5' whitish gray for 0.5'			SS-2-0.5							1000	Start hand augering pH = 7.0
											1013	Hand auger broken on cobble, replaced
											1020	Unable to advance beyond 1', step over 1' to try again
									75	0	1100	Receive approval from OC W & R to drill at 1'
5	No Recovery											
	FILL Silty Sand (SM): Grayish brown; dry; fine grained; (5, 60, 35) @ 8' - 0.25' whitish gray @ 13' - 0.25' burned material @ 13.5' - red; solid fragments @ 14' - Increased gravels			SS-2-7.5					60	0	1120	
									95			
15	Terminated boring at 15 ft bgs											Boring completed

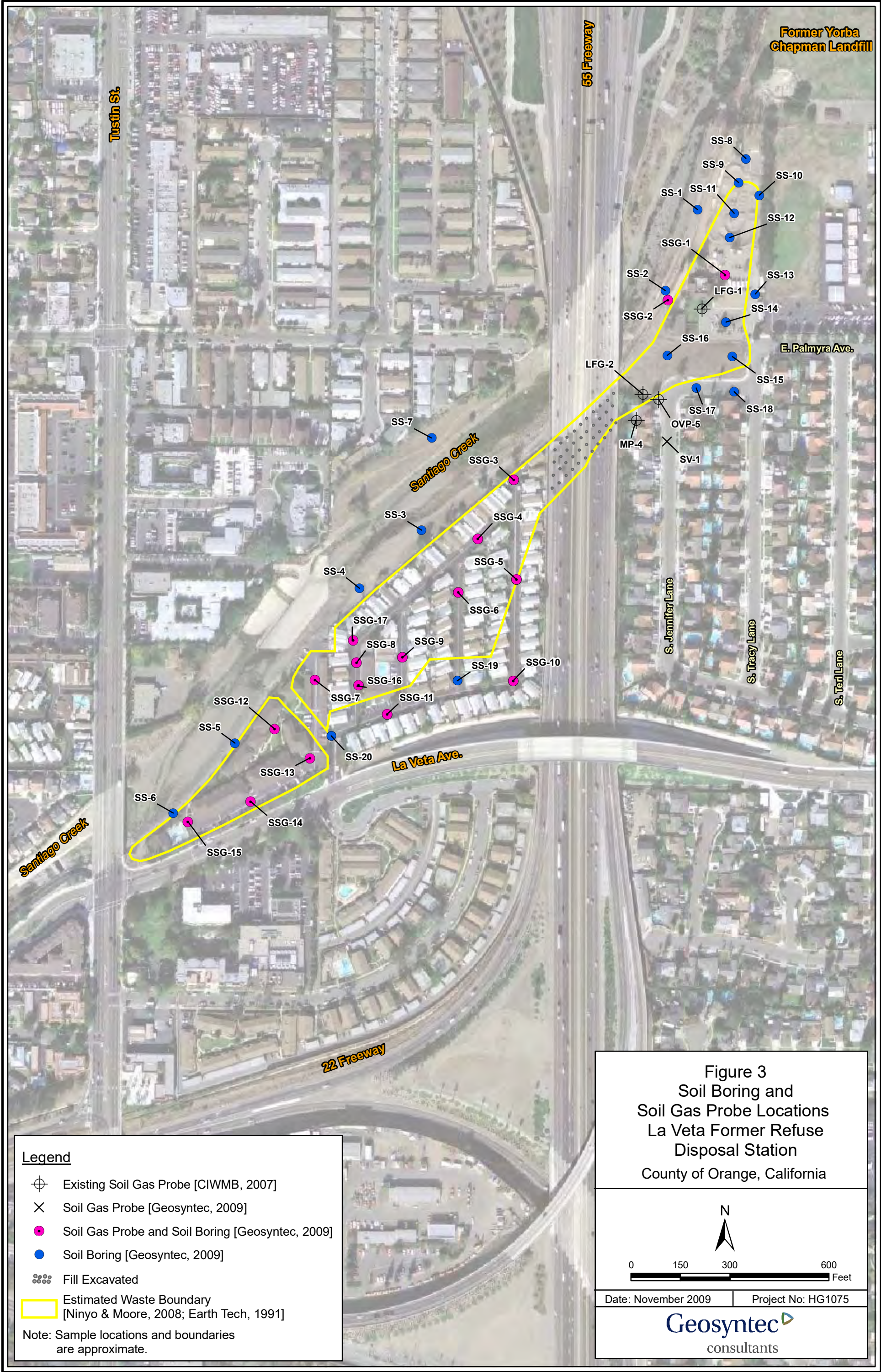
CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2 in.
LOGGER A. S.

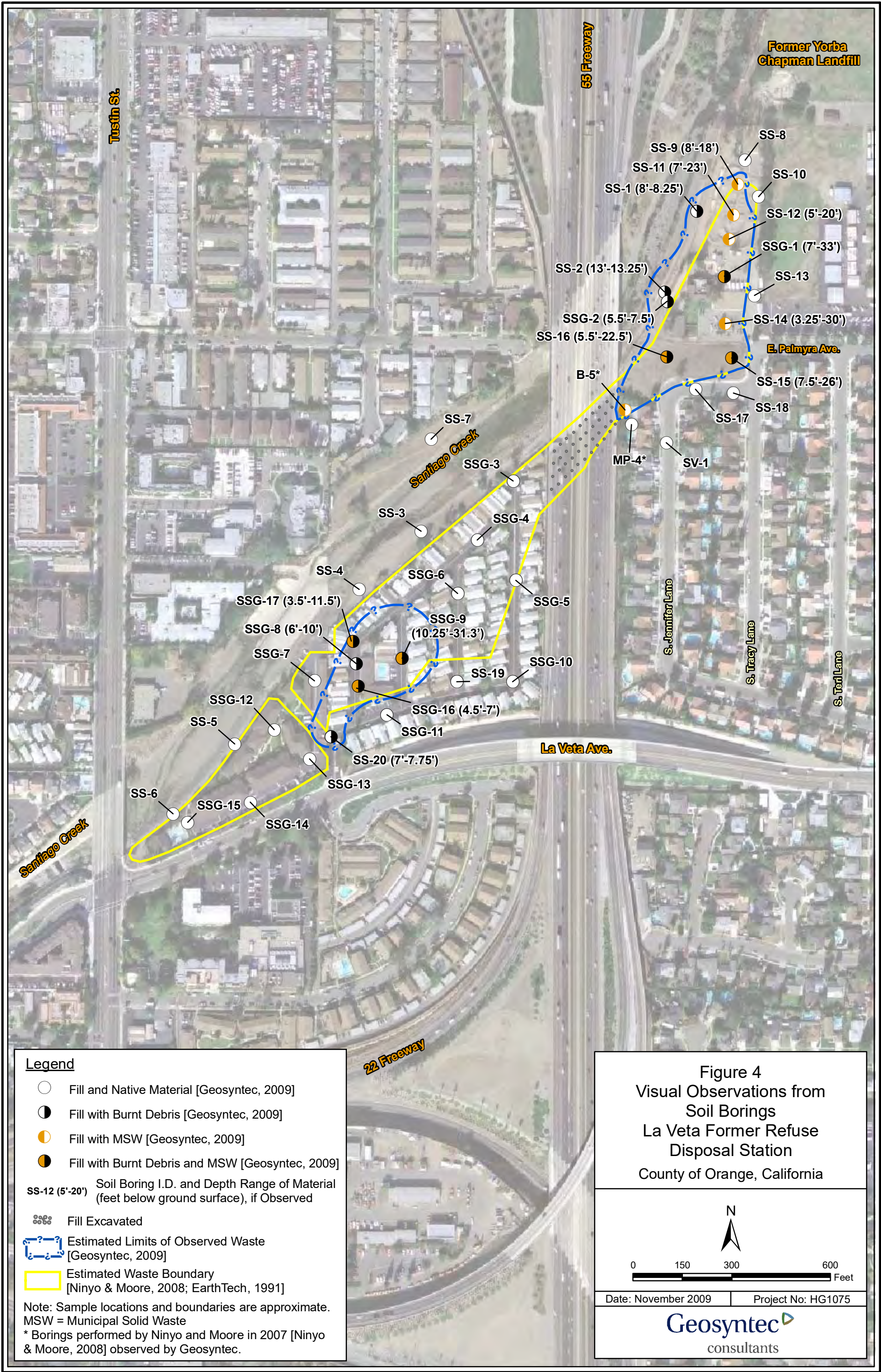
NORTHING
EASTING
COORDINATE SYSTEM:

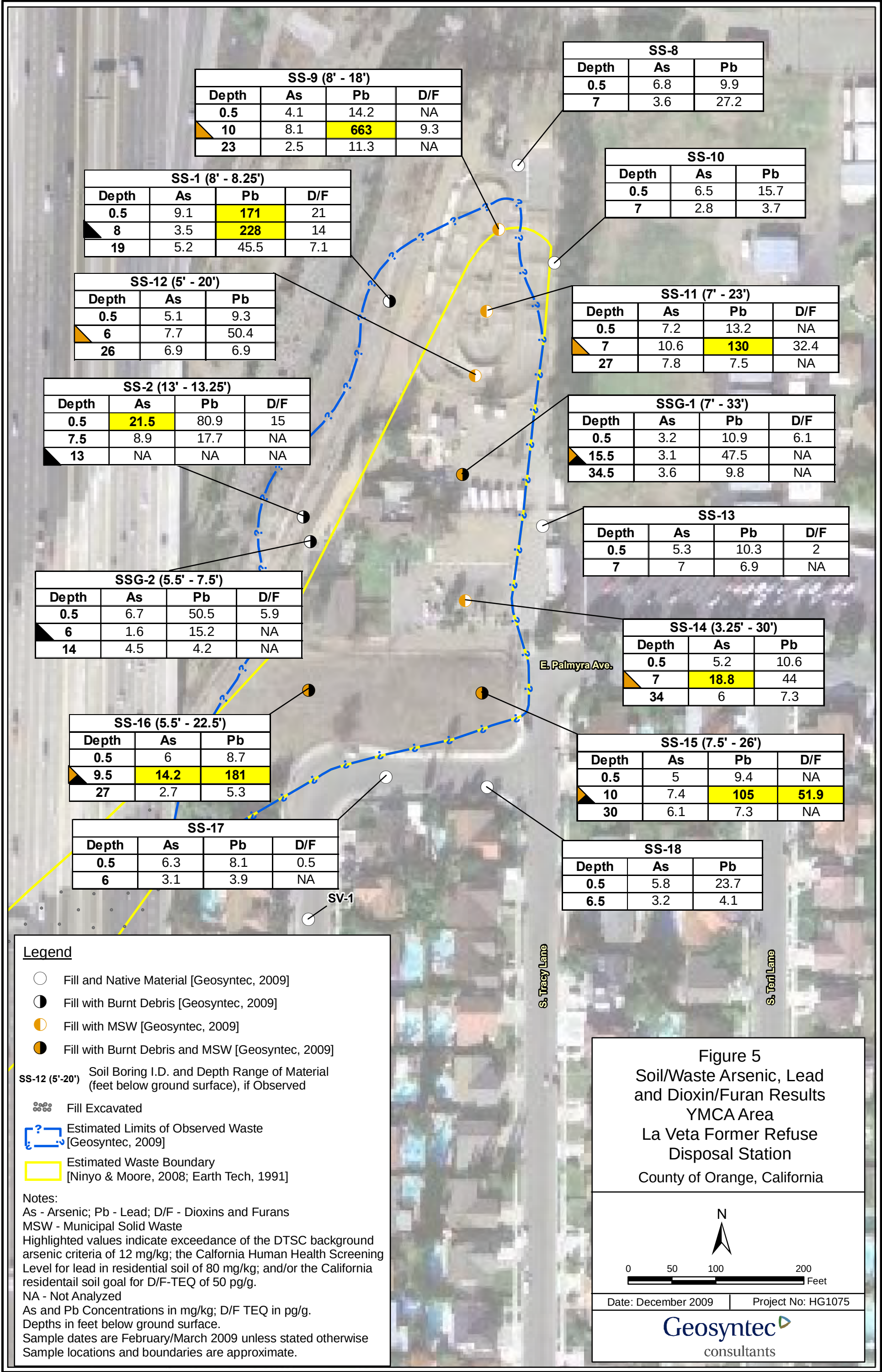
REVIEWER M. R.

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

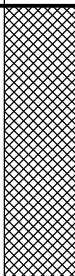
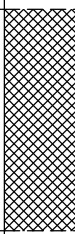
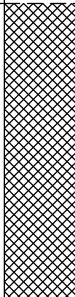
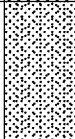
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS







BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
5	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose; shards of glass @ 2' - w/ small cobbles, trace wood @ 4' - nail, piece of ceramic material No Recovery			SS-1-0.5						0815 0820	Start hand augering pH = 7.0 Very difficult to hand auger Unable to get deeper with hand auger, begin drilling at 4'
										0	
										0900	
10	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose @ 7' - Slightly larger, increased gravel content @ 8' - Charred/burned wood fragments for 0.25' @ 9' - predominantly gravels, Light gray; fine No Recovery			SS-1-8						80 0	
15	FILL Silty Sand (SM): Dark grayish brown; dry; fine grained, trace gravel; (5, 60, 35); loose @ 13' - Dark red for 0.25', hard, dry @ 14' - Wood chunks @ 14.5' - Dark red, hard fragments @ 16.5' - Red fragments, hard									60 0	
20	NATIVE Sand with cobbles and gravel (SW): Grayish brown; dry to moist; (20, 70, 10); medium Terminated boring at 20 ft bgs			SS-1-19						95 0	Boring Completed
25											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2 in.
LOGGER A. Simons

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	FILL Silty Sand (SM): Grayish brown; dry; fine grained; (5, 60, 35) @ 1' - with cobbles; (20, 50, 30) @ 2' - red; solid fragments @ 4' - 0.5' whitish gray for 0.5'			SS-2-0.5							1000	Start hand augering pH = 7.0
											1013	Hand auger broken on cobble, replaced
											1020	Unable to advance beyond 1', step over 1' to try again
								75		0	1100	Receive approval from OC W & R to drill at 1'
5	No Recovery											
	FILL Silty Sand (SM): Grayish brown; dry; fine grained; (5, 60, 35) @ 8' - 0.25' whitish gray @ 13' - 0.25' burned material @ 13.5' - red; solid fragments @ 14' - Increased gravels			SS-2-7.5							1120	
								95				
15	Terminated boring at 15 ft bgs											Boring completed

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2 in.
LOGGER A. Simons

NORTHING
EASTING
COORDINATE SYSTEM:

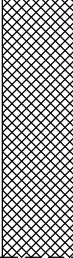
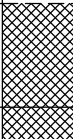
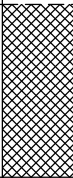
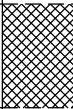
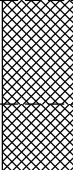
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)										1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
	2 inches of Asphalt FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,80,15); loose. @ 2.5 ft bgs: 0.25 inch layer of light gray broken cobble (10YR 7/1). No Recovery 4 ft - 6 ft			SS-8-0.5							@ 12:05, Begin Hand Auger to 1.5 ft, collect surface sample. Begin Drilling @ 12:15
5	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,80,15); loose. FILL Silty SAND with gravel (SM); Dark brown (10YR 3/3); moist; fine-grained Sand with gravel; (5,85,10); loose; trace wood and glass fragments; broken cobbles. No Recovery 8 ft - 9.5 ft			SS-8-7				50		0.4	Collect Sample @ 12:35
10	FILL Silty SAND with gravel (SM); Dark brown (10YR 3/3); moist; fine-grained Sand with gravel; (5,85,10); loose; trace wood and glass fragments; broken cobbles. @ 10.75 ft bgs: 0.25 inch broken cobble layer; light gray (10YR 7/2). No Recovery 12 ft - 14.5 ft							75		0.6	
15	FILL Broken Cobbles; pale brown (10YR 6/3). @ 15 ft bgs: 6 inch layer of black and white Sand with gravel. FILL SAND with Gravel (SW); white (10YR 8/1); dry; fine-to coarse-grained Sand; (10,90,0); loose. No Recovery 16 ft - 17.5 ft							38			
20	FILL SAND with Gravel (SW); white (10YR 8/1); dry; fine-to coarse-grained Sand; (10,90,0); loose. @ 18 ft bgs: Color change to light brownish gray (10YR 6/2). FILL Silty SAND with Gravel (SW); brown (10YR 5/3); dry;							62	6.3		

CONTRACTOR InterPhase

EQUIPMENT Geoprobe 6610 DT

DRILL MTHD Direct Push

DIAMETER 2.25"

LOGGER E. Ortenberg

NORTHING

EASTING

COORDINATE SYSTEM:

REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	fine- to coarse-grained Sand; (15, 75,15); loose; broken cobble. No Recovery 20 ft - 22 ft										
	FILL SAND with Gravel (SW): white (10YR 8/1); dry; fine- to coarse-grained Sand; (10,90,0); loose.							50			
	NATIVE SAND with Gravel (SP); dark grayish brown (10YR 4/2); dry; fine-grained Sand; (10,90,0); loose.								0.6		
25	NATIVE Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand with gravel; (10,70,20); loose. No Recovery 24 ft - 25.5 ft										
	NATIVE Well graded SAND with Gravel (SW); grayish brown (10YR 5/2); moist; fine- to coarse-grained Sand; (30,70,0); loose.							38			
	NATIVE Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,80,20); loose to medium consistency.										
	@ 29.5 ft bgs: increase in broken cobbles; (20,60,20).							100			
30	Terminated boring at 30 ft bgs. Backfill to surface with No. 8 Bentonite Chips, and asphalt patch at surface.										Boring Complete @ 13:05
35											
40											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand with small gravel; (0,90,10); loose; cobbles.			SS-9-0.5								@ 10:55, Begin Hand Auger to 2 ft. Collect surface sample.
	@ 3 ft bgs: 0.25 inch color change to light gray (10YR 7/1).									0.1		Begin Drilling @ 11:05
	@ 3.75 ft bgs: 0.25 inch color change to light gray (10YR 7/1).											
5	No Recovery 4 ft - 6.5 ft							38				
	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand with small gravel; (0,90,10); loose; cobbles.									0.2		Collect Sample @ 11:20
	FILL SAND with Silt and Gravel (SP); very dark gray (10YR 3/1); moist; fine- to medium-grained Sand; (5,90,5); loose; wood, glass, newspaper and cardboard fragments; odor.											
10	No Recovery 8 ft - 9.5 ft			SS-9-10'				62		3.2		
	FILL SAND with Silt and Gravel (SP); black (10YR 2/1); moist; fine- to medium-grained Sand; (5,90,5); loose; wood, glass, newspaper and cardboard fragments; odor.											
	No Recovery 12 ft - 14 ft											
	FILL SAND with Silt and Gravel (SP); very dark gray (10YR 3/1); moist; fine- to medium-grained Sand; (5,90,5); loose; wood, glass, newspaper and cardboard fragments; odor.							50		0.4		
15	@ 15.5 ft bgs: 6 inch zone of broken cobble with reddish color											
	@ 16 ft bgs: light gray broken cobbles											
	No Recovery 16 ft - 18 ft											
	FILL SAND with Gravel (SW); light gray (10YR 7/2); moist to dry; fine- to coarse-grained Sand; (15,85,0); loose; broken cobbles.							50		0.5		
20	FILL Clayey SAND (SC); white (10YR 8/1) with fryable thin											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS



2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

BORING **SS-9**
START DRILL DATE Feb 26, 09
FINISH DRILL DATE Feb 26, 09
LOCATION Orange, CA
PROJECT La Veta Landfill
NUMBER HG1075 F07

SHEET 2 OF 2

ELEVATION DATA:
GROUND SURF.
TOP OF CASING
DATUM

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
25	strips of black (10YR 2/1); moist; fine-grained Sand; (0,80,20); medium consistency. NATIVE Silty SAND with Gravel (SW); brown (10YR 5/3); moist; fine- to coarse-grained Sand; (10,80,10); loose; broken cobbles.			SS-09-23				50		0.3		Collect Sample @ 11:55
	Terminated boring at 26 ft bgs. Backfill to surface with No. 8 Bentonite Chips.							50				Boring Complete @ 11:25
30												
35												
40												

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS



2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

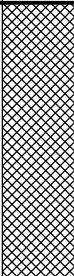
GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

BORING SS-10
START DRILL DATE Feb 26, 09
FINISH DRILL DATE Feb 26, 09
LOCATION Orange, CA
PROJECT La Veta Landfill
NUMBER HG1075 F07

SHEET 1 OF 1

ELEVATION DATA:
GROUND SURF.
TOP OF CASING
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE						COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)		TIME (00:00)
	FILL Silty SAND (SM); brown (10YR 5/3); moist; fine-grained Sand; (0,80,20); loose; trace gravel.			SS-10-0.5							@ 14:15, Begin Hand Auger, Collect surface sample. Begin Drilling 14:20
5	No Recovery to 4 ft - 12 ft								0.9		
10									0		
15	Move 2 ft to the south and redrill, new boring will be SS-10A. Backfill to surface with No. 8 Bentonite Chips.										Move to new location 14:40
20											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

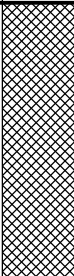
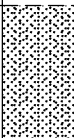
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,80,20); loose.										@ 14:50 Begin drilling
	@ 2.5 ft bgs: 0.25 inch layer of broken cobbles.										
5	No Recovery 4 ft - 6 ft										
	NATIVE SAND with Gravel (SW); brown (10YR 5/3); dry; fine- to coarse-grained Sand; (15,85,0); loose to very loose; broken cobbles.			SS-10A-7				50			Collect Sample @ 15:20
	No Recovery 8 ft - 16 ft										
10											
15								0			
20	Terminated boring at 16 ft bgs. Encounter refusal. Backfill to surface with No. 8 Bentonite Chips.										

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

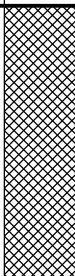
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,85,10); loose.			SS-11-0.5								@ 08:40, Begin Hand Auger to 2 ft, collect surface sample.
	@ 3 ft bgs: Small 3 inch zone of broken cobbles.									0.5		Begin Drilling @ 09:00
5	No Recovery 4 ft - 5.5 ft											
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,85,10); loose.							62				
	FILL Silty SAND (SM); very dark grayish brown (10YR 4/3); moist; fine-grained Sand with some Gravel; (5,90,5); loose; organic wood fragments and broken glass prevalent.			SS-11-7								Collect Sample @ 09:15
10	No Recovery 8 ft - 11 ft							25				
	FILL Silty SAND (SM); very dark grayish brown (10YR 4/3); moist; fine-grained Sand with some Gravel; (5,90,5); loose; organic wood fragments and broken glass prevalent.									1.4		
15	No Recovery 12 ft - 16 ft							0				
	No Recovery 16 ft - 19 ft							25				
20	FILL Silty SAND (SM); very dark grayish brown (10YR 4/3); moist; fine-grained Sand with some Gravel;									3.4		

CONTRACTOR InterPhase

EQUIPMENT Geoprobe 6610 DT

DRILL MTHD Direct Push

DIAMETER 2.25"

LOGGER E. Ortenberg

NORTHING

EASTING

COORDINATE SYSTEM:

REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	(5,90,5); loose; black organic wood fragments, metallic shards, and broken glass. No Recovery 20 ft - 23 ft							25			
	FILL Well Graded SAND with Gravel (SW); dark gray (10YR 4/1); moist; fine- to coarse-grained Sand with gravel and broken cobbles; (15, 85, 0); loose. No Recovery 24 ft - 25 ft								1.1		
25	FILL Well Graded SAND with Gravel (SW); dark gray (10YR 4/1); moist; fine- to coarse-grained Sand with gravel and broken cobbles; (15, 85, 0); loose.							75			
	NATIVE Silty SAND (SM); dark yellowish brown (10YR 4/6); moist; fine-grained Sand; (0,70,30); medium consistency.			SS-11-27				75	0.6		Collect Sample @ 09:30
30											
	Terminated boring at 32 ft bgs. Backfill to surface with No. 8 Bentonite Chips.										Boring Complete @ 09:30
35											
40											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6610 DT
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine- to medium-grained Sand; (5,80,15); loose.			SS-12-0.5							@ 09:45, Begin Hand Auger to 2 ft, collect surface sample.
									0.4		Begin Drilling @ 09:55
	No Recovery 4 ft - 5 ft										
5	FILL Silty SAND (SM); very dark gray (10YR 3/1); moist to dry; fine-grained Sand with some gravel; (5,85,10); loose; wood fragments; strong odor. @ 6.5 ft bgs: Color change to black (10YR 2/1)			SS-12-6				75	0.6		Collect Sample @ 10:25
	No Recovery 8 ft - 11 ft										
10								25			
	FILL Silty SAND (SM); very dark gray (10YR 3/1); moist to dry; fine-grained Sand with some gravel; (5,85,10); loose; wood fragments prevalent; strong odor. No Recovery 12 ft - 13.5 ft			SS-12-11					19.1		Collect VOC Sample
								62			
15	FILL Silty SAND (SM); very dark gray (10YR 3/1); moist to dry; fine-grained Sand with some gravel; (5,85,10); loose; wood fragments prevalent; strong odor; wood and metallic shavings @ 13.75 ft bgs: Change to fine- to medium-grained Sand (SW). @ 14.75 ft bgs: 6 inch layer of Silty Sand (SM). @ 15.5 ft bgs: Prevalent glass and wood shards/fragments. No Recovery 16 ft - 18.5 ft			SS-12-15					23.5		Collect VOC Sample
								38			
	FILL Silty SAND (SM); grayish brown (10YR 5/2); moist fine-grained Sand; (0,80,20); loose; strong odor.								6.2		
20											

CONTRACTOR InterPhase

EQUIPMENT Geoprobe 6610 DT

DRILL MTHD Direct Push

DIAMETER 2.25"

LOGGER E. Ortenberg

NORTHING

EASTING

COORDINATE SYSTEM:

REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS



BOREHOLE LOG

SHEET 2 OF 2

ELEVATION DATA:

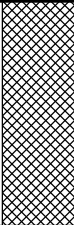
GROUND SURF.
TOP OF CASING
DATUM

002-GEOTECH1 LA VETA 040909.GPJ GEOSNTEC.GDT 4/9/09

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE						COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane		
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)		TIME (00:00)	
	FILL Silty SAND with trace Gravel (SM); brown 10YR 4/3; dry; fine-grained Sand with trace gravel; (0,80,20); loose.			SS-13-0.5						0.3		@ 15:40, Begin Hand Auger to 2 ft. Collect surface sample. Begin Drilling @ 15:45
5	NATIVE SAND with Silt and Gravel (SW); gray (10YR 5/1); dry; fine- to coarse-grained Sand; (15,75,10); loose; broken cobbles. No Recovery 4 ft - 6 ft											
	NATIVE SAND with Silt and Gravel (SW); gray (10YR 5/1); dry; fine- to coarse-grained Sand; (15,75,10); loose; broken cobbles.								50			
	NATIVE Silty SAND with trace Gravel (SM); brown 10YR 4/3; dry; fine-grained Sand with trace gravel; (0,80,20); loose.			SS-13-7							0.5	Collect Sample @ 16:00
10	NATIVE SAND with Silt and Gravel (SW); gray (10YR 5/1); dry; fine- to coarse-grained Sand; (15,75,10); loose; broken cobbles. No Recovery 8 ft - 11 ft								25			
	NATIVE SAND with Silt and Gravel (SW); gray (10YR 5/1); dry; fine- to coarse-grained Sand; (15,75,10); loose; broken cobbles. No Recovery 12 ft - 14 ft									1.1		
15	NATIVE SAND with Silt and Gravel (SW); gray (10YR 5/1); dry; fine- to coarse-grained Sand; (15,75,10); loose; broken cobbles. Terminated boring @ 15 ft bgs. Backfill to surface with No. 8 Bentonite Chips, and asphalt patch at surface.								33	1.1		Boring Complete @ 15:55
20												

CONTRACTOR InterPhase

EQUIPMENT Geoprobe 6610 DT

DRILL MTHD Direct Push

DIAMETER 2.25"

LOGGER E. Ortenberg

NORTHING

EASTING

COORDINATE SYSTEM:

REVIEWER M. Reardon

NOTES: Boring backfilled with Enviroplug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand with small gravel; (5,80,15); loose. @ 1.5 ft bgs: color change to very dark gray (10YR 3/1)			SS-14-0.5						0.7	@ 08:20, Begin Hand Auger to 2 ft
											Begin Drilling
5	FILL Silty SAND (SM); black (10YR 4/3); moist; fine-grained Sand; (0,80, 20); loose; odor; wood fragments. No Recovery 4 ft - 6.5 ft									2.0	
	FILL Silty SAND (SM); black (10YR 4/3); moist; fine-grained Sand; (0,80, 20); loose; odor; wood and glass fragments. No Recovery 8 ft - 10 ft			SS-14-7						38	Collect Sample
				SS-14-7.5						45.8	Collect VOC Sample
10	FILL Sandy CLAY with Silt (CL); dark gray (10YR 4/1); moist; fine-grained Sand; (0,10, 90); medium plasticity (only 10% silt); trace wood organic fragments. FILL Silty SAND (SM); black (10YR 4/3); moist; fine-grained Sand; (0,80, 20); loose; odor; wood fragments. No Recovery 12 ft - 15.5 ft									50	
										0.6	
15										12.5	
	FILL Clayey SAND with Gravel (SC); dark gray (10YR 4/1); moist; fine- to coarse-grained Sand with gravel; (10,75,15); medium to loose consistency; some broken cobbles. No Recovery 16 ft - 19.5 ft									0.9	
20	FILL									2.0	

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

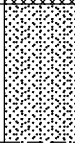
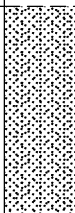
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 6) Plasticity 2) Color 7) Density/Consistency 3) Moisture 8) Other (Mineral Content, 4) Grain Size Discoloration, Odor, etc.) 5) Percentage	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
25	Silty SAND (SP); black (10YR 4/3); moist; fine-grained Sand; (0,80, 20); loose; odor; wood fragments. No Recovery 20 ft - 29 ft							0			
30	FILL Silty SAND (SP); black (10YR 4/3); moist; fine-grained Sand; (0,80, 20); loose; odor; wood fragments. NATIVE SAND with Gravel (SW); dark grayish brown (10YR 4/2); moist; fine- to coarse-grained well graded Sand; (15,85,0); loose. No Recovery 32 ft - 33 ft	 						75	2.1		
35	NATIVE SAND with Gravel (SW); dark grayish brown (10YR 4/2); moist; fine- to coarse-grained well graded Sand; (15,85,0); loose. @ 35 ft bgs: Color change for 0.25 inch zone to reddish brown (2.5YR 4/4). Terminated boring at 36 ft bgs. Backfill to surface with No. 8 Bentonite Chips.			SS-14-34				75	0.6		Collect Sample
40											Boring Complete 09:30

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,60,40); loose, root fragments.			SS-15-0.5							@ 15:20, Begin Hand Auger to 1.5 ft, collect surface sample.
	No Recovery 4 ft - 5 ft										Begin Drilling @ 15:30
5	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,60,40); loose, root fragments.							75			
	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor.								0.7		
	No Recovery 8 ft - 9 ft										
10	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor.			SS-15-10				75			Collect Sample @ 16:00
	No Recovery 12 ft - 13 ft								1.5		
	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor.							75			
15	No Recovery 16 ft - 17 ft								5.3		
	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor. @ 17.25 ft bgs: 0.75 inch layer of whitish gray broken cobbles							75			
	@ 19.5 ft bgs: Color change to dark grayish brown								3.5		
20											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 6) Plasticity 2) Color 7) Density/Consistency 3) Moisture 8) Other (Mineral Content, 4) Grain Size Discoloration, Odor, etc.) 5) Percentage	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	(10YR 4/2) No Recovery 20 ft - 23 ft								25			
25	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor. No Recovery 24 ft - 25 ft									3.2		
	FILL SAND with Silt, Gravel and Debris (SP); black (10YR 2/1); moist; fine-grained Sand with gravel; (10,85,5); loose to medium consistency; burnt wood and glass fragments; strong odor.								75	0.8		
30	NATIVE SAND to Silty SAND (SP); very dark grayish greenish gray (10G 3/1); moist; fine-grained Sand; (0,80,20); medium consistency. @ 28 ft bgs: Color change to grayish brown (10YR 5/2)			SS-15-30					100			Collect Sample @ 16:05
	No Recovery 32 ft - 23 ft											
35	NATIVE SAND with Silt and Gravel (SW); light brownish gray (10YR 6/2); moist; fine- to coarse-grained Sand with small gravel and broken cobble; (20,75,5); loose. Terminated boring at 34 ft bgs. Backfill to surface with No. 8 Bentonite Chips.								50	0.8		Boring Complete @ 16:10
40												

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,60,40); loose, root fragments.			SS-16-0.5								@ 14:10, Begin Hand Auger to 5 ft, collect surface sample.
5	No Recovery 5 ft - 6 ft											Begin Drilling @ 14:30
	FILL Clayey SAND (SC); dark grayish brown (10YR 4/2); wet; fine-grained Sand; (0,70,30); medium consistency.							75		1.1		
	FILL SAND with Clay (SP); bluish black (10B 2.5/1); wet; fine-grained Sand with gravel; (5,85,15); medium consistency; burnt debris prevalent; wood and glass fragments; strong odor.											Collect Sample and duplicate @ 14:45
10	No Recovery 8 ft - 8.5 ft			SS-16-9.5				87.5		4.2		
	No Recovery 12 ft - 14 ft											
	@ 14 ft bgs: 6 inch layer of whitish broken cobbles							50				
15	FILL SAND with Clay (SP); bluish black (10B 2.5/1); wet; fine-grained Sand with gravel; (5,85,15); medium consistency; burnt debris prevalent; wood and glass fragments; strong odor.											
	No Recovery 16 ft - 19 ft											
								25				
20	FILL SAND with Clay (SP); bluish black (10B 2.5/1); wet; fine-grained Sand with gravel; (5,85,15); medium									2.0		

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS



BOREHOLE LOG

SHEET 2 OF 2

ELEVATION DATA:

GROUND SURF.
TOP OF CASING
DATUM

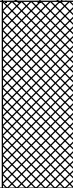
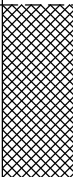
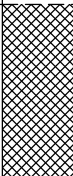
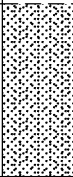
CONTRACTOR	InterPhase	NORTHING
EQUIPMENT	Geoprobe 6600	EASTING
DRILL MTHD	Direct Push	COORDINATE SYSTEM:
DIAMETER	2.25"	
LOGGER	E. Ortenberg	REVIEWER M. Reardon

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

002-GEOTECH1 LA VETA 040909.GPJ GEOSNTEC.GDT 4/9/09

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	4 - 6 inches of Asphalt FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,75,20); loose.			SS-17-0.5								@ 09:55, Begin Hand Auger to 3.5 ft. Collect surface sample.
	@ 3 ft bgs: Becomes fine- to coarse-grained well graded Sand.									0.3		Begin Drilling
	No Recovery 4 ft - 5.5 ft											
5	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,75,20); loose.			SS-17-6.0				62				Collect Sample @ 10:15
	@ 7.25 ft bgs: 6 inch zone of broken cobble; light gray (10YR 7/1).									0.3		
	No Recovery 8 ft - 9.5 ft											
10	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,75,20); loose.							62				Boring Complete @ 10:20
	@ 10.75 ft bgs: 0.25 inch zone of broken cobble; light gray (10YR 7/1).									0.6		
	No Recovery 12 ft - 12.5 ft											
	NATIVE Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,75,20); loose.							83.5			0.8	
15	Terminated boring at 15 ft bgs. Backfill to 1.5 ft bgs with No. 8 Bentonite Chips, 1.0 ft bgs with No. 3 Cemex Lapis Lustre, and to surface with concrete per city specifications.											
20												

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

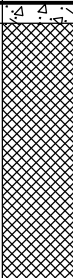
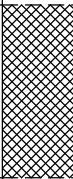
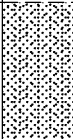
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
GEOTECH1 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Soil Name (USCS Sym.) 2) Color 3) Moisture 4) Grain Size 5) Percentage 6) Plasticity 7) Density/Consistency 8) Other (Mineral Content, Discoloration, Odor, etc.)	GRAPHIC LOG	ELEV. (ft)	SAMPLE							COMMENTS 1) Rig Behavior 2) Air Monitoring 3) Pocket Pen 4) Tor Vane	
				SAMPLE NO.	TYPE	BLOWS PER 6"	N VALUE	RECOVERY (%)	PID READING (ppm)	TIME (00:00)		
	4 inches of Asphalt FILL Silty SAND with Gravel (SM); brown (10YR 4/3); moist; fine-grained Sand; (5,75,20); loose.			SS-18-0.5								@ 10:45, Begin Hand Auger to 2.5 ft. Collect surface sample.
	No Recovery 4 ft - 5.5 ft									0.3		Begin Drilling
5	FILL @ 5.5 ft bgs: Sand becomes well graded fine- to coarse-grained.			SS-18-6.5				62				Collect Sample
	No Recovery 8 ft - 11.75 ft									0.5		
10								12.5				
	NATIVE SAND with Gravel (SW); light gray (10YR 7/1); dry; fine- to coarse-grained Sand; (20,80,0); loose; broken cobbles.									0.7		
	No Recovery 12 ft - 13 ft											
	NATIVE Silty SAND with Gravel (SW); brown (10YR 4/3); moist; fine- to coarse-grained well graded Sand; (5,75,20); loose.							67	0.8			
15	Terminated boring at 15 ft bgs. Backfill to 1.5 ft bgs with No. 8 Bentonite Chips, 1.0 ft bgs with No. 3 Cemex Lapis Lustre, and to surface with concrete per city specifications.											Boring Complete @ 11:40
20												

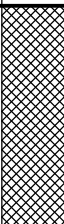
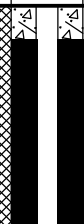
CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Boring backfilled with Enviropug No. 8 hydrated bentonite

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE					COMMENTS 1) Rig Behavior 2) Air Monitoring	
						SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)		TIME (00:00)
	FILL Well Graded SAND with Gravel (SW); brown (10YR 4/3); moist; fine to coarse grained Sand with Gravel pieces; (10,90,0); loose. @ 2.5 ft bgs: increasing fines (10,80,10) No Recovery 4 ft - 7 ft					SSG-1-0.5			50	5.5		@ 10:15, Begin Hand Auger to 2 ft, collect surface sample. Begin Drilling @ 10:35
5									25	3.5		
	FILL @ 7 ft bgs: Very dark gray to black (10YR 2/2-2/1); contains glass, wood and newspaper fragments, some material appears burnt, heavy odor. No Recovery 8 ft - 11 ft								25	3.5		
10												
	FILL @ 11 ft bgs: Very dark gray to black (10YR 2/2-2/1); contains glass, wood and newspaper fragments, some material appears burnt, heavy odor. No Recovery 12 ft - 15 ft								25	3.5		
15												
	FILL @ 15 ft bgs: Very dark gray to black (10YR 2/2-2/1); contains glass, wood and newspaper fragments, some material appears burnt, heavy odor. No Recovery 16 ft - 20 ft					SSG-1-15.5				7.0		
									0			
20	No Recovery 20 ft - 23.75 ft											
									12.5			
25	FILL @ 23.75 ft bgs: Very dark gray to black (10YR 2/2-2/1); contains glass, wood and newspaper											

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Probe (4.75' - 5.25'): 6" SS; Tubing: 0.25" NylaFlow; Backfill (5.5' - 40'): No. 8 Enviroplug Chips, hydrated; Filter pack (4.5' - 5.5'): Cemex No. 3 Sand; Seal (1' - 4.5'): Same as Backfill; Completion: 6" traffic rated well box set in concrete.

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
WELL BORE 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE					COMMENTS 1) Rig Behavior 2) Air Monitoring	
						SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)		TIME (00:00)
	fragments, some material appears burnt, heavy odor. No Recovery 24 ft - 29 ft								0			
30	FILL Silty SAND to Sandy SILT (SP-SM); brown (10YR 4/3); moist; fine-grained Sand with trace gravel; (0,50,50); loose to medium consistency; debris still prevalent, some appears burnt; strong odor.								1.6			
35	NATIVE SAND with Silt and Gravel (SW); light brownish gray (10YR 6/2); moist; fine-grained sand with gravel and broken cobbles; (25,65,10); loose. No Recovery 36 ft - 37 ft					SSG-1-34.5			75	0.8		Collect Sample @ 11:50
40	NATIVE SAND with Silt and Gravel (SW); light brownish gray (10YR 6/2); moist; fine-grained sand with gravel and broken cobbles; (25,65,10); loose. Terminated boring at 40 ft bgs.								75			Boring Complete @ 09:30
45												
50												

CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER E. Ortenberg

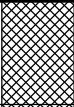
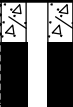
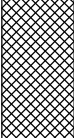
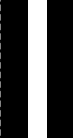
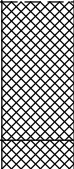
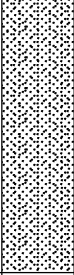
NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Probe (4.75' - 5.25'): 6" SS; Tubing: 0.25" NylaFlow; Backfill (5.5' - 40'): No. 8 Enviroplug Chips, hydrated; Filter pack (4.5' - 5.5'): Cemex No. 3 Sand; Seal (1' - 4.5'): Same as Backfill; Completion: 6" traffic rated well box set in concrete.

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
WELL BORE 01/04

BOREHOLE LOG

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE					COMMENTS 1) Rig Behavior 2) Air Monitoring	
						SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)		TIME (00:00)
	FILL Well Graded SAND with Gravel (SW); brown (10YR 5/3); moist; fine- to coarse-grained Sand with small gravel; (10,90,0); loose to very loose.					SSG-2-0.5						@ 08:35, Begin Hand Auger to 1.5 ft, collect surface sample.
	FILL Silty SAND with Gravel (SM); brown (10YR 4/3); mois; fine-grained Sand; (10,70,20); medium consistency.									0.2		Begin Drilling @ 08:55
	@ 3.5 ft bgs: 4 inch layer of grayish brown cobbles.										09:00	
5	FILL SAND with Silt and Gravel (SP); dark gray (10YR 4/1); moist; fine- to medium-grained poorly graded Sand; (10,80,0); loose; some cobble pieces. No Recovery 4 ft - 5.5 ft					SSG-2-6			62			Collect Sample @ 09:15
	FILL SAND with Silt and Gravel (SP); dark gray (10YR 4/1); moist; fine- to medium-grained poorly graded sand; (10,80,10); loose; some burned debris.										09:05	
	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,80,20); medium consistency; loose. No Recovery 8 ft - 9 ft											
10	FILL Silty SAND (SM); brown (10YR 4/3); moist; fine-grained Sand; (0,80,20); medium consistency; loose.								75	0.2		
	NATIVE Well Graded SAND with Gravel (SW); gray (10YR 6/1); moist; fine- to coarse-grained Sand with small and medium gravel; (30,70,0); loose; some cobbles.					SSG-2-14			67			Collect Sample @ 11:50
15	Terminated boring at 15 ft bgs.										09:12	Boring Complete @ 09:20
20												

CONTRACTOR InterPhase

EQUIPMENT Geoprobe 6610 DT

DRILL MTHD Direct Push

DIAMETER 2.25"

LOGGER E. Ortenberg

NORTHING

EASTING

COORDINATE SYSTEM:

REVIEWER M. Reardon

NOTES: Probe (4.75' - 5.25'): 6" SS; Tubing: 0.25" NylaFlow; Backfill (5.5' - 15'): No. 8 Enviroplug Chips, hydrated; Filter pack (4.5' - 5.5'): Cemex No. 3 Sand; Seal (1' - 4.5'): Same as Backfill; Completion: 6" traffic rated well box set in concrete.

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
WELL BORE 01/04

BOREHOLE LOG

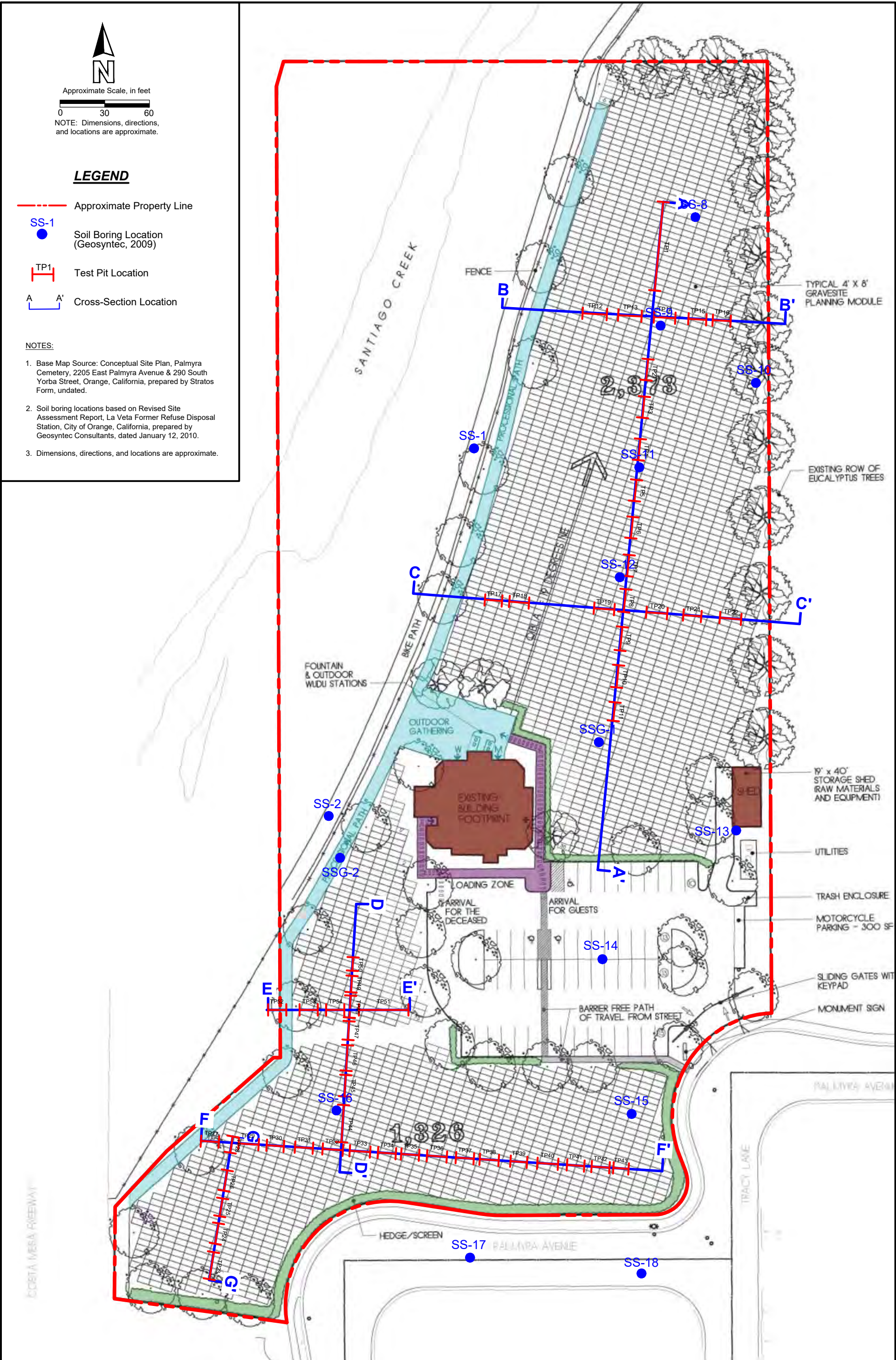
DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE					COMMENTS 1) Rig Behavior 2) Air Monitoring	
						SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)		TIME (00:00)
	FILL Well Graded SAND with Gravel (SW); brown (10YR 5/3); moist; fine- to coarse-grained Sand; (10,90,0). No Recovery 1.5 ft - 3 ft										13:05	Begin Hand Auger to 1.5 ft.
											13:15	Begin Drilling
	FILL Well Graded SAND with Gravel (SW); brown (10YR 5/3); moist; fine- to coarse-grained Sand; (10,90,0).							38		0.0		
5	FILL Silty SAND (SM); brown (10YR 5/3); moist; fine-grained Sand with gravel; (10,60,30). Terminated boring at 5.5 ft bgs.										13:30	Boring Complete
10												
15												
20												

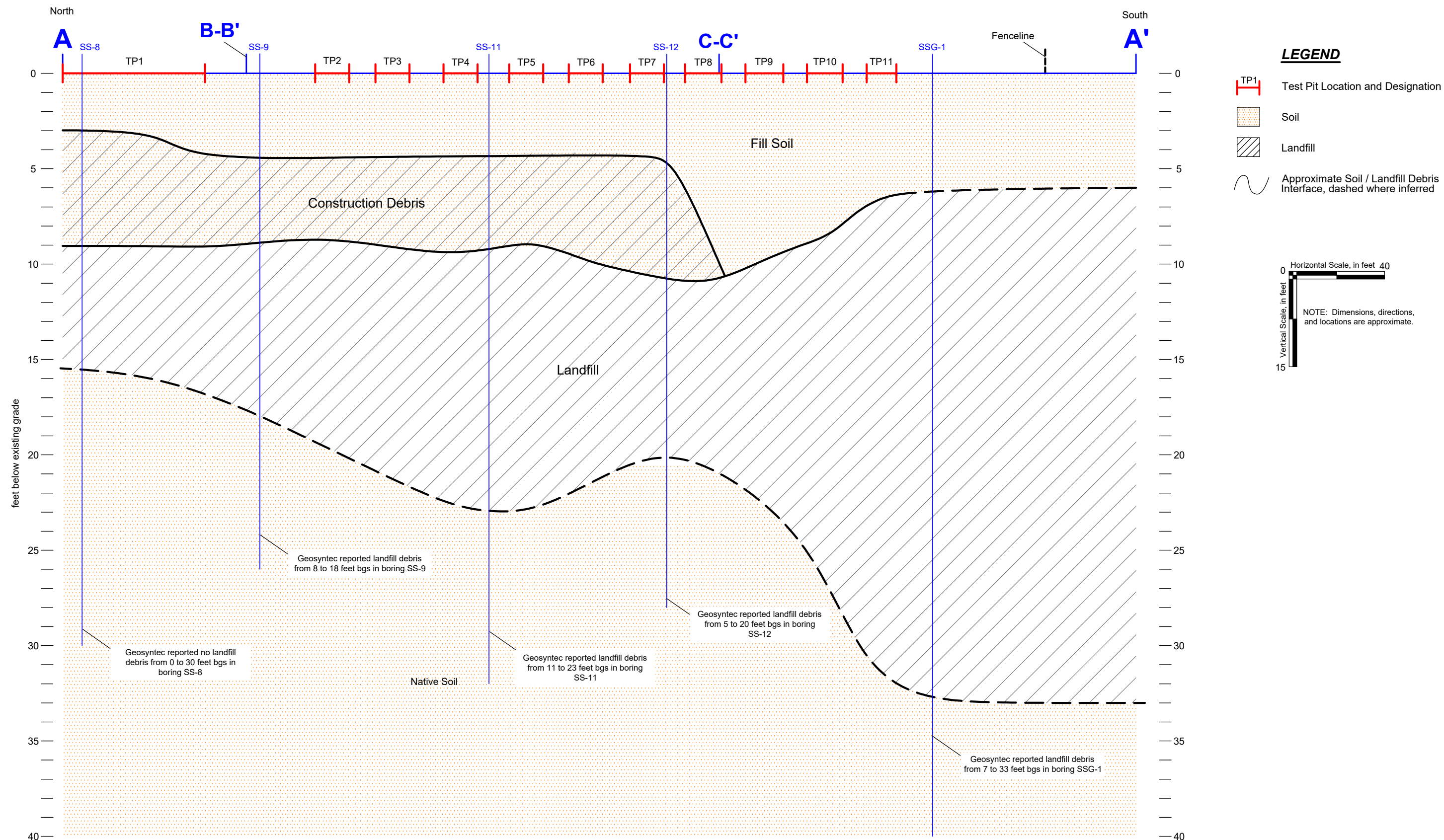
CONTRACTOR InterPhase
EQUIPMENT Geoprobe 6600
DRILL MTHD Direct Push
DIAMETER 2.25"
LOGGER A. Simons

NORTHING
EASTING
COORDINATE SYSTEM:
REVIEWER M. Reardon

NOTES: Probe (4.75' - 5.25'): 6" SS; Tubing: 0.25" NylaFlow; Filter pack (4.5' - 5.5'): Cemex No. 3 Sand; Seal (1.5' - 4.5'): No. 8 Enviroplug Chips, hydrated; Completion: 6" traffic rated well box set in concrete over 6" of sand.

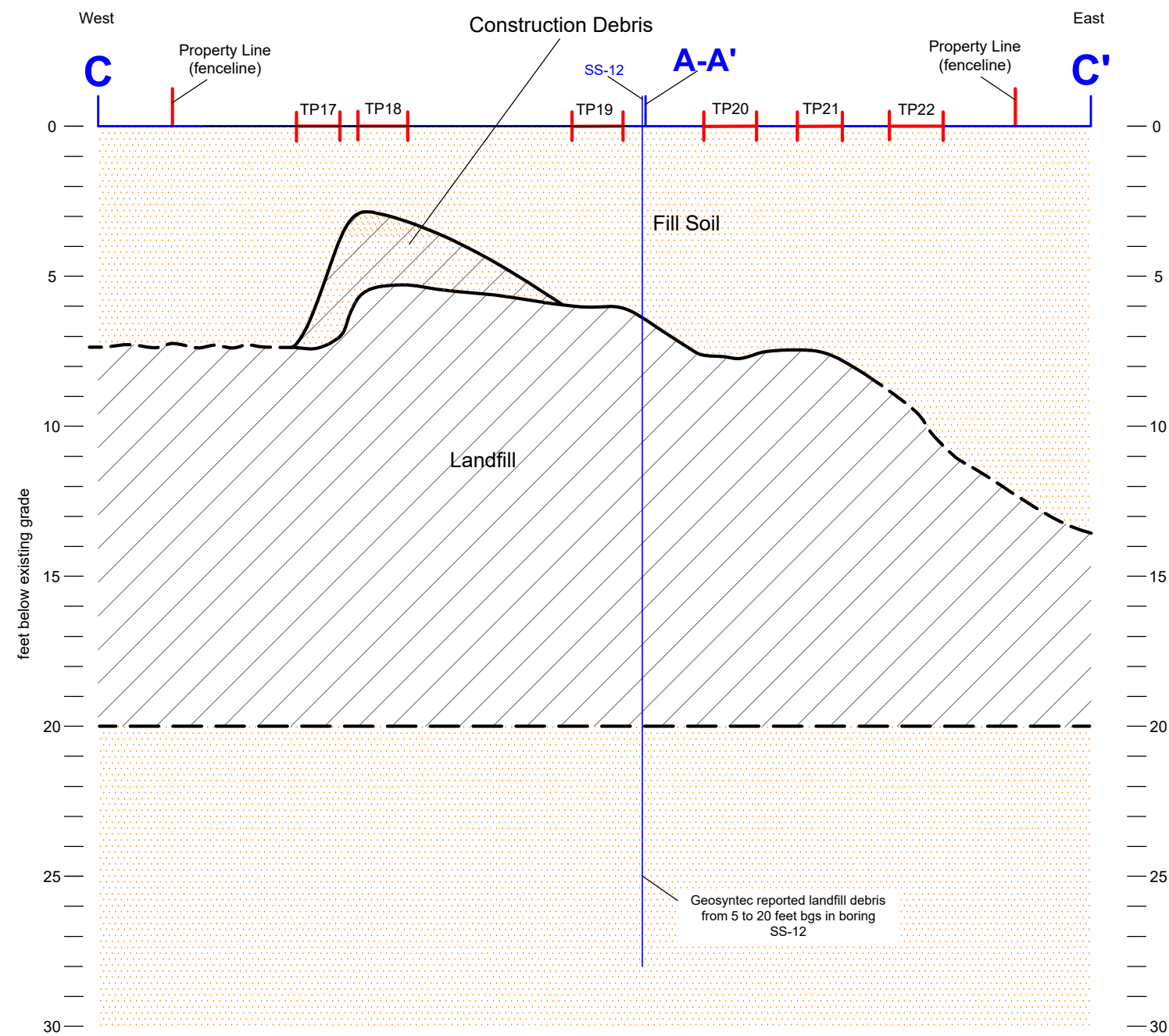
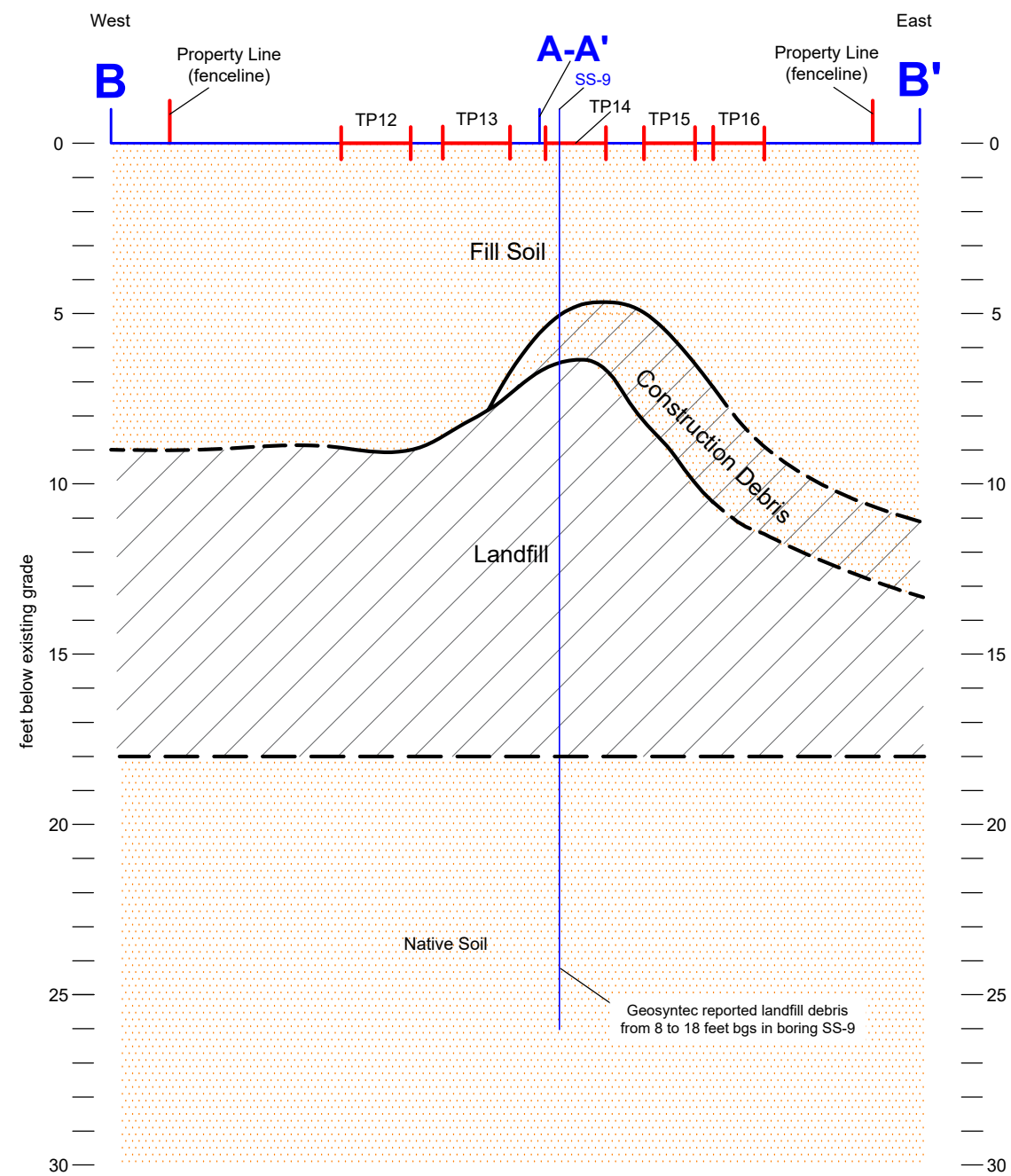
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS





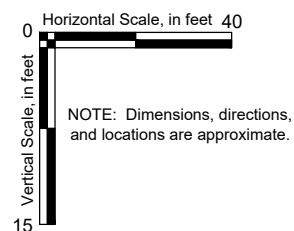
PROJECT NO. 100081004	CROSS SECTION LOCATION - A-A'
DATE DRAFT	FORMER LA VETA REFUSE DISPOSAL STATION ORANGE, CALIFORNIA

FIGURE
5



LEGEND

- TP1 Test Pit Location and Designation
- Soil
- Landfill
- Approximate Soil / Landfill Debris Interface, dashed where inferred



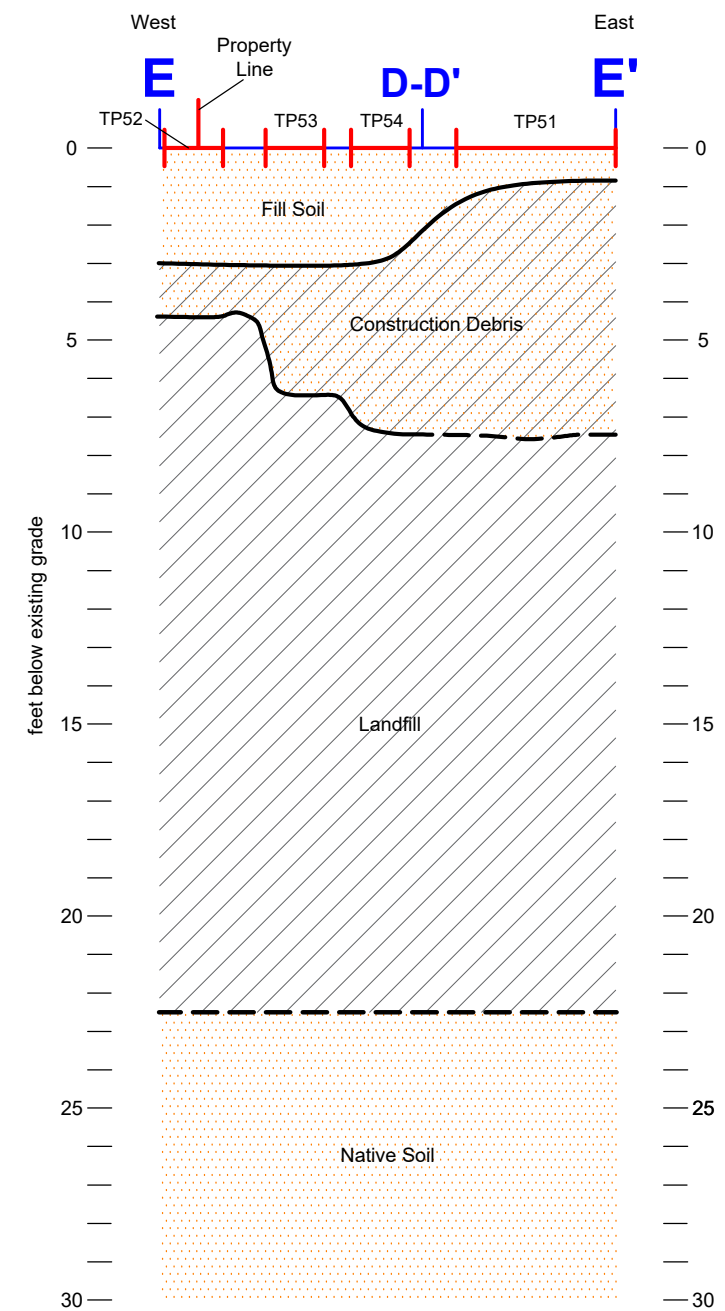
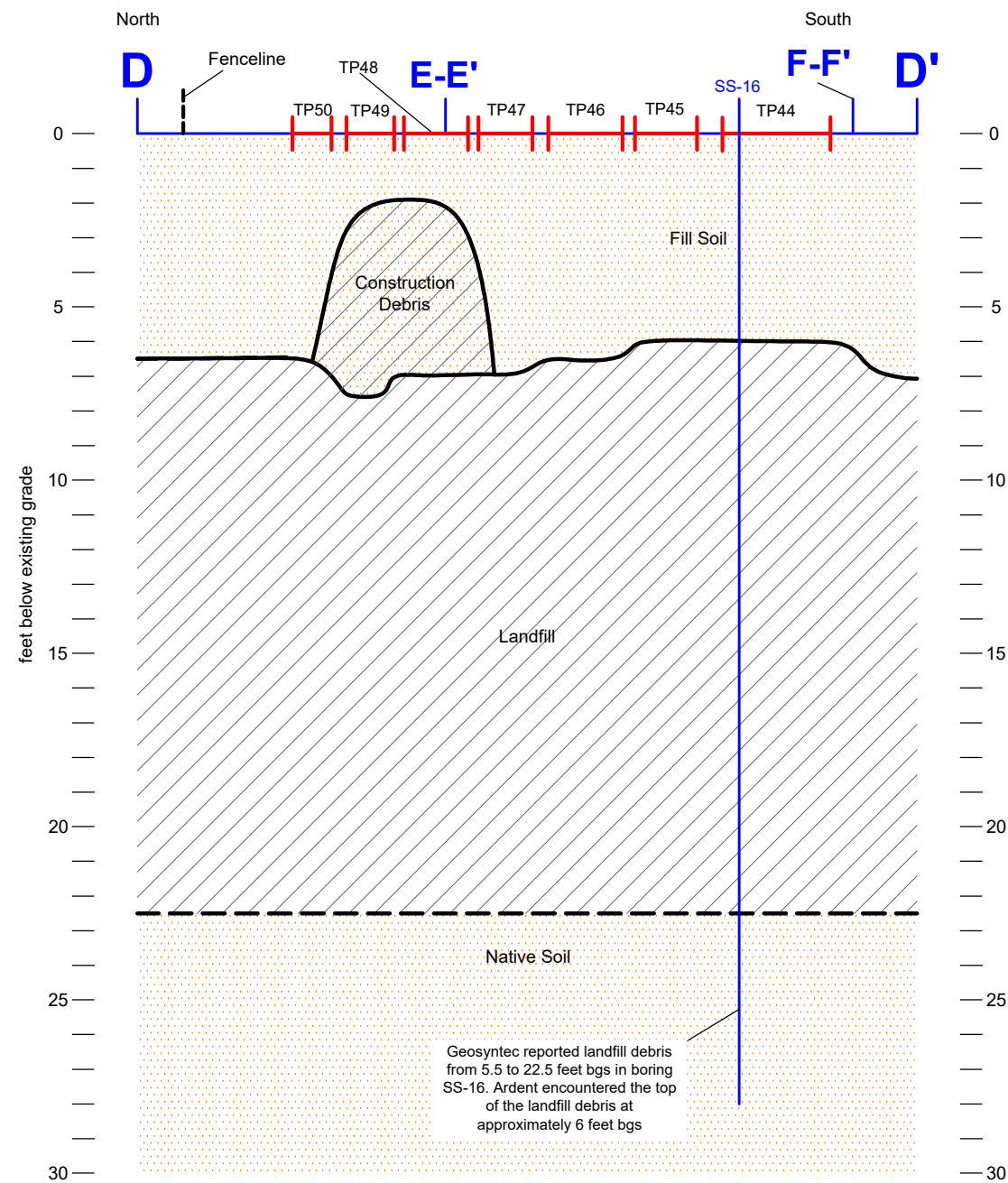
PROJECT NO.
100081004

DATE
DRAFT

CROSS SECTION LOCATIONS - B-B' AND C-C'

FORMER LA VETA REFUSE DISPOSAL STATION
ORANGE, CALIFORNIA

FIGURE
6



LEGEND

-  TP1 Test Pit Location and Designation
-  Soil
-  Landfill
-  Approximate Soil / Landfill Debris Interface, dashed where inferred

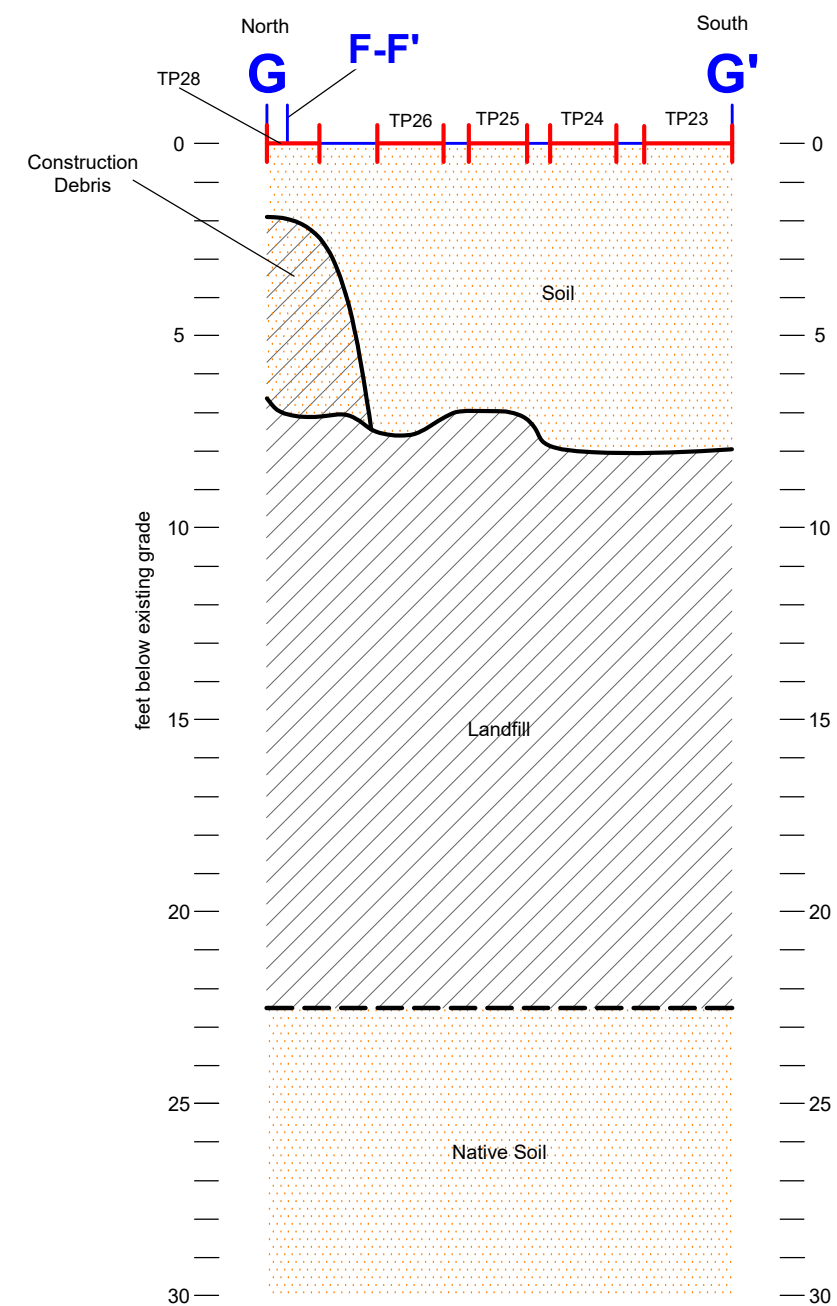
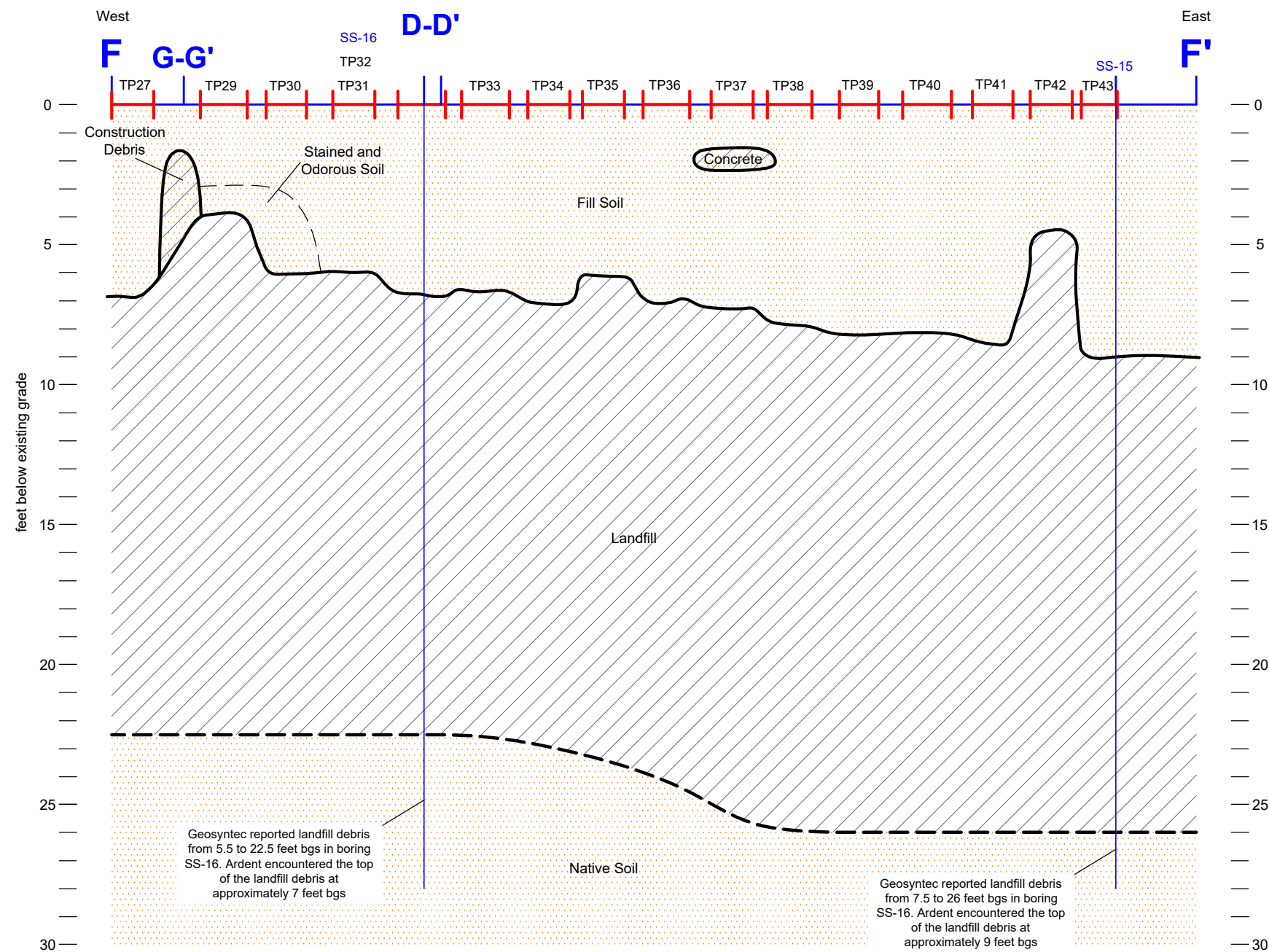
Horizontal Scale, in feet 40
Vertical Scale, in feet 15
NOTE: Dimensions, directions, and locations are approximate.



PROJECT NO.
100081004
DATE
DRAFT

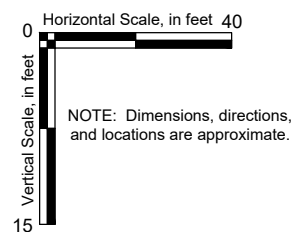
CROSS SECTION LOCATIONS - D-D' AND E-E'
FORMER LA VETA REFUSE DISPOSAL STATION
ORANGE, CALIFORNIA

FIGURE
7



LEGEND

- TP1 Test Pit Location and Designation
- Soil
- Landfill
- Approximate Soil / Landfill Debris Interface, dashed where inferred



	PROJECT NO. 100081004	CROSS SECTION LOCATIONS - F-F' AND G-G'	FIGURE 8
	DATE DRAFT		
		FORMER LA VETA REFUSE DISPOSAL STATION ORANGE, CALIFORNIA	