FOR CONTRACT NO.: 11-002704

INFORMATION HANDOUT

PERMITS

NOTICE OF INTENT (NOI), PERMIT APPLICATION No. 6-12-060,
DATED FEBRUARY 20, 2013

AGREEMENTS

RAILROAD RELATIONS AND INSURANCE REQUIREMENTS,
DATED OCTOBER 24, 2012

MATERIALS INFORMATION

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GEOTECHNICAL INVESTIGATION REPORT REVISED,
DATED AUGUST 10, 2012

MEMO IN LIEU OF MATERIALS REPORT REVISED,
DATED FEBRUARY 1, 2012

AERIALLY DEPOSITED LEAD SURVEY REPORT,
DATED APRIL 30,2007

ROUTE: 11-SD-5, 8 - R19.9/R21.2, R0.0/R0.7

CALIFORNIA COASTAL COMMISSION
San Diego Coast Area Office
7575 Metropolitan Drive, Suite 103
San Diego, CA 92108-4402
(619) 767-2370

NOTICE OF INTENT TO ISSUE PERMIT

(Upon satisfaction of special conditions)

THIS IS NOT A COASTAL DEVELOPMENT PERMIT

THE SOLE PURPOSE OF THIS NOTICE IS TO INFORM THE APPLICANT OF THE STEPS NECESSARY TO OBTAIN A VALID AND EFFECTIVE COASTAL DEVELOPMENT PERMIT ("CDP"). A Coastal Development Permit for the development described below has been approved but is not yet effective. Development on the site cannot commence until the CDP is effective. In order for the CDP to be effective, Commission staff must issue the CDP to the applicant, and the applicant must sign and return the CDP. **Commission staff cannot issue the CDP until the applicant has fulfilled each of the "prior to issuance" Special Conditions.** A list of all of the Special Conditions for this permit is attached.

The Commission's approval of the CDP is valid for two years from the date of approval. To prevent expiration of the CDP, you must fulfill the "prior to issuance" Special Conditions, obtain and sign the CDP, and commence development within two years of the approval date specified below. You may apply for an extension of the permit pursuant to the Commission's regulations at Cal. Code Regs. title 14, section 13169.

On **January 11, 2013**, the California Coastal Commission approved Coastal Development Permit No. **6-12-060**, requested by **California Department of Transportation (Caltrans)** subject to the attached conditions, for development consisting of: **Construction of an auxiliary traffic lane on northbound I-5 to include re-striping of the connector ramp between westbound I-8 and northbound I-5, replacement of a concrete barrier and railing along this connector ramp, the realignment of portions of the northbound offramp from I-5 to Sea World Drive, and the installation of a new camera pole within the southwestern quadrant of the I-5 and Sea World Drive interchange**, more specifically described in the application file in the Commission offices. **Commission staff will not issue the CDP until the "prior to issuance" special conditions have been satisfied.**

The development is within the coastal zone **along northbound Interstate 5 (I-5) between Interstate 8 (I-8) and the Sea World Drive/I-5 interchange, City of San Diego, San Diego County.**

If you have any questions regarding how to fulfill the "prior to issuance" Special Conditions for CDP No. 6-12-060, please contact the Coastal Program Analyst identified below.

Sincerely,
CHARLES LESTER
Executive Director

By: GABRIEL BUHR
Coastal Program Analyst
Date: January 31, 2013

ACKNOWLEDGMENT

The undersigned permittee acknowledges receipt of this Notice and fully understands its contents, including all conditions imposed.

2/20/13
Date

Permittee

Please sign and return one copy of this form to the Commission office at the above address.

STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

SPECIAL CONDITIONS:

The permit is subject to the following conditions:

1. **Water Quality Management Plan. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall submit a final detailed water quality plan for review and written approval of the Executive Director. The plan shall address post-construction runoff, and shall consist of the following:

   a. The applicant shall submit final grading plans for the entire alignment of the proposed road work, clearly delineating existing and proposed contours throughout the project site. All excess graded material (cut) shall be disposed of at a legal disposal site. If the disposal site is located in the coastal zone, a coastal development permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required

   b. The applicant shall submit a Water Quality Management Plan (WQMP) addressing post-construction BMPs to protect coastal water quality. The WQMP shall include, but not be limited to, final drainage plans showing the

location and design of bioswales and outlets, and supporting calculations/evidence that demonstrate the facilities are designed to treat, infiltrate or filter stormwater from each runoff event, up to and including the 85th percentile, 24-hour runoff event for volume-based BMPs, and/or the 85th percentile, 1-hour runoff event, with a factor of safety of 2X, for flow-based BMPs.

The WQMP shall prioritize the treatment of the newly created impervious areas. Where it is impractical to hydraulically separate runoff from the existing impervious area, the applicant shall provide treatment for newly created impervious areas and as much of the hydraulically inseparable flow as feasible, based on site conditions and constraints. If it is not possible to separate the flows from newly created impervious areas from the existing impervious areas, the treatment BMPs shall be designed to treat as much of the hydraulically inseparable flow as feasible, and shall bypass or divert any excess around the BMP to prevent overloading the BMP or impairing its performance.

c. All reasonable opportunities to improve water quality, including retrofit of the existing highway within the project boundaries, shall be included in the project. Increases in the size and capacity of the treatment swales, additional locations for swales, and increases in the area of pavement drainage that can be routed through swales should be considered and implemented where feasible.

   Existing pavement shall not be treated in lieu of newly created impervious surface unless it is infeasible to treat the newly added surface. Where it is infeasible or impractical to provide on-site treatment of storm water runoff from the highway, the WQMP shall document why it is impractical or infeasible to treat these areas.

The permittee shall undertake development in accordance with the approved final WQMP. Any proposed changes to the approved final program shall be reported to the Executive Director. No changes to the approved water quality plan shall occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

2. **Aerially Deposited Lead (ADL) Plan. PRIOR TO THE COMMENCEMENT OF SITE CLEARING OR OTHER DEVELOPMENT**, the applicant shall submit an Aerially Deposited Lead (ADL) plan for review and written approval of the Executive Director. The plan will describe how hazardous ADL contaminated soils at the project site identified by the applicant will be managed and/or disposed of, and will:

    1) require that all ADL soils will either be transported off site with full disclosure to the receiving party, be disposed of as hazardous waste at a Class I landfill, or remain on site by being placed beneath pavement at least 5 feet above the maximum groundwater level, and shall be documented in the as-built plans and a record of ADL sample results and volume of contaminated soil be kept in the Caltrans project file for future reference;

    2) provide that ADL soils within ten (10) feet of any drainage features such as an unlined ditch or drain, or structural water quality BMPs such as a bioswale or sand filter, or is within ten (10) feet of ESHA, coastal waters or coastal wetlands, shall be removed and replaced with clean soil for the purpose of preventing movement of ADL to these features;

    3) provide that any ADL soils that are disturbed during construction shall be managed using construction Best Management Practices (BMPs), and that ADL soils remaining on site will involve placing the soils at least 5 feet above the maximum groundwater level and situating the soil under pavement areas to isolate the soils from coastal waters;

    4) ensure that undisturbed ADL soils that remain on site and impermeable protective material covering these soils will not be subject to erosion.

    The permittee shall undertake development in accordance with the approved final ADL plan. Any proposed changes to the approved final program shall be reported to the Executive Director. No changes to the approved ADL plan shall occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

3. **Erosion Control and Construction Best Management Practices Plan. PRIOR TO COMMENCEMENT OF SITE CLEARING OR OTHER DEVELOPMENT**, a Storm Water Pollution Prevention Plan (SWPPP) for review and written approval of the Executive Director. The plan shall describe how impacts to water quality and coastal wetlands from storm water runoff during the proposed construction period will be prevented. The applicant shall develop the SWPPP in consultation with the Regional Water Quality Control Board (RWQCB). The SWPPP shall specify the following:

Erosion Control Plan

a. The plan shall delineate the areas to be disturbed by grading or construction activities and shall include any temporary access roads, staging areas and stockpile areas. The natural areas to be protected on the site (i.e., the ESAs) shall be clearly delineated on the plan and on-site with fencing or survey flags;

b. Include a narrative report describing all temporary run-off and erosion control measures to be used during construction;

c. The plan shall identify and delineate on a site or grading plan the locations of all temporary erosion control measures;

d. The erosion control measures shall be required on the project site prior to or concurrent with the initial grading operations and maintained throughout the development process to minimize erosion and sediment from runoff waters during construction. The plan shall specify that the applicant shall install or construct temporary sediment basins (including debris basins, desilting basins or silt traps); temporary drains and swales; sand bag barriers; silt fencing; stabilize any stockpiled fill with geofabric covers or other appropriate cover; and install geotextiles or mats on all cut and fill slopes during the rainy season (November 1 – March 31), and as needed for precipitation events that occur outside the rainy season. Open trenches shall be closed and stabilized as soon as possible.

e. All fill material and construction debris should be retained on-site or removed to an approved disposal site outside the coastal zone, or to a site within the coastal zone permitted to receive fill. If the disposal site is located in the coastal zone, a coastal development permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required.

Construction Best Management Practices

a. No demolition or construction materials, debris, or waste shall be placed or stored where it may enter sensitive habitat, receiving waters or a storm drain, or be subject to wave, wind, rain, or tidal erosion and dispersion;

b. No demolition or construction equipment, materials, or activity shall be placed in or occur in any location that would result in impacts to environmentally sensitive habitat areas, streams, wetlands or their buffers;

c. Any and all debris resulting from demolition or construction activities shall be removed from the project site within 24 hours of completion of the project;

d. Demolition or construction debris and sediment shall be removed from work areas each day that demolition or construction occurs to prevent the accumulation of sediment and other debris that may be discharged into coastal waters;

e. All trash and debris shall be disposed in the proper trash and recycling receptacles at the end of every construction day;

f. The applicant shall provide adequate disposal facilities for solid waste, including excess concrete, produced during demolition or construction;

g. Debris shall be disposed of at a legal disposal site or recycled at a recycling facility. If the disposal site is located in the coastal zone, a coastal development permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required;

h. All stock piles and construction materials shall be covered, enclosed on all sides, shall be located as far away as possible from drain inlets and any waterway, and shall not be stored in contact with the soil;

i. Machinery and equipment shall be maintained and washed in confined areas specifically designed to control runoff. Thinners or solvents shall not be discharged into sanitary or storm sewer systems;

j. The discharge of any hazardous materials into any receiving waters shall be prohibited;

k. Fuels, lubricants, and solvents shall not be allowed to enter the coastal waters or wetlands. Hazardous materials management equipment shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call. Any accidental spill shall be rapidly contained and cleaned up. Spill prevention and control measures shall be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Measures shall include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent any spillage of gasoline or related petroleum products or contact with runoff. The area shall be located as far away from the receiving waters and storm drain inlets as possible;

l. Best Management Practices (BMPs) and Good Housekeeping Practices (GHPs) designed to prevent spillage and/or runoff of demolition or construction-related materials, and to contain sediment or contaminants associated with demolition or construction activity, shall be implemented prior to the on-set of such activity; and

m. All BMPs shall be maintained in a functional condition throughout the duration of construction activity.

The final SWPPP shall be in conformance with the site/development plans approved by the Coastal Commission. Any changes to the SWPPP shall be reported to the Executive Director and no changes shall occur without an amendment to the coastal development permit, unless the Executive Director determines that no amendment is required.

4. **Landscape Plan.** The applicant shall undertake plant installation in conformance with the Planting Plans developed by Caltrans and received December 4, 2012.

   Final landscaping plans shall identify the following. Vegetation in landscaped areas shall only consist of native plants. No plant species listed as problematic and/or invasive by the California Native Plant Society (http://www.CNPS.org/), the California Invasive Plant Council (http://www.cal-ipc.org/), or as may be identified from time to time by the State of California shall be employed or allowed to naturalize or persist on the site. No plant species listed as a 'noxious weed' by the State of California or the U.S. Federal Government shall be utilized within the property.

   The permittee shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

5. **Other Permits. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION**, the permittee shall provide to the Executive Director copies of all other required state or federal discretionary permits for the development authorized by Coastal Development Permit 6-12-060. The applicant shall inform the Executive Director of any changes to the project required by other state or federal agencies. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this permit, unless the Executive Director determines that no amendment is legally required.

State of California Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: MR. LEON EDMONDS
Office of District 11 Office Engineer

Date: October 24, 2012
File: 11-SD-5/8
P.M..: R19.9/R21.2, R 0.0/R0.7

Attention: Dante Buenviaje
Arlene Gerstner

11162 –002700

From: **Brian Finkbeiner**
District 11 Railroad Coordinator
Right of Way Division – MS 310

Subject: Railroad Clearance

I have reviewed the plans for the above-referenced project and it is now cleared for advertising as far as Metropolitan Transit System (MTS) and North County Transit District (NCTD) is concerned.

The document titled "Railroad Relations and Insurance Requirements" is attached for insertion in the Information Handout Document.

Should the scope of this project, as it is currently proposed, change before Ready To List Date, then this Clearance Letter is revoked, and a new review and new Clearance Letter will be required.

Attachment

cc:	Lou Melendez	Project Manager
	Chris Thomas	Design Manager
	Amy Lamott Vargas	Program/Project Coordination Branch
	Laura Farah	Project Coordination
	Denny Fong	Right of Way Railroad Headquarters
	Claire Dodge	Office Engineer

“RAILROAD RELATIONS AND INSURANCE REQUIREMENTS”

1.01 GENERAL

The term “Railroad” shall mean the Metropolitan Transit System (MTS) and North County Transit District (NCTD).

The term “State” shall mean the California Department of Transportation or Caltrans.

It is expected that the Railroad will cooperate with the Contractor to the end that the work may be handled in an efficient manner. However, except for the additional compensation provided for hereinafter for delays in completion of specific unit of work to be performed by the Railroad, and except as provided in Public Contracts Code Section 7102, the Contractor shall have no claim for damages, extension of time, or extra compensation in the event his work is held up by railroad train operations or other work performed by the Railroad.

The Contractor must understand the Contractor's right to enter the Railroad's property is subject to the absolute right of the Railroad to cause the Contractor's work on the Railroad's property to cease if, in the opinion of the Railroad, the Contractor's activities create a hazard to the Railroad's property, employees, and operations.

1.02 RAILROAD REQUIREMENTS

Contractor shall comply with MTS Right of Entry permit, construction, excavation support system, insurance, and rail safety training requirements specified on the Railroad’s website address as follows:

http://www.sdmts.com/Business/Permits.asp

The Contractor must obtain a Right of Entry Permit from the Railroad prior to construction from MTS Right of Way Engineering Services at 1255 Imperial Avenue, Suite 1000, San Diego, CA 92101-7490, (619) 557-4501. The Contractor must pay all application fees and any other MTS/NCTD costs that may be required.

If flagging is required in the Railroad permit, the State will pay for or reimburse contractor for flagging costs with Railroad.

The Contractor shall cooperate with the Railroad where work is over or under the tracks, or within the limits of the Railroad property to expedite the work and avoid interference with the operation of railroad equipment.

The Contractor shall comply with the rules and regulations of the Railroad or the instructions of its representatives in relation to protecting the tracks and property of the Railroad and the

traffic moving on such tracks, as well as the wires, signals and other property of the Railroad, its tenants or licensees, at and in the vicinity of the work during the period of construction. The responsibility of the Contractor for safe conduct and adequate policing and supervision of its work at the job site shall not be lessened or otherwise affected by the presence at the work site of the Railroad representatives, or by the Contractor's compliance with any requests or recommendations made by the Railroad representatives.

1.05 DELAYS DUE TO WORK BY RAILROAD.

If delays due to work by the Railroad occur, and the Contractor sustains loss which, in the opinion of the Engineer, could not have been avoided by the judicious handling of forces, equipment and plant, the amount of said loss shall be determined as provided in Section 8-1.07, " Delays," of the 2010 Standard Specifications.

If a delay due to work by the Railroad occurs, an extension of time determined pursuant to the provisions in Section 8-1.10, "Liquidated Damages," of the 2010 Standard Specifications will be granted.

State of California Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. PAUL C. CHUNG, Chief
Bridge Design, Branch 19
Office of Bridge Design South 2

Date: February 8, 2012

File: 11-SD-5-PM 19.9/R21.2
EA: 11-002701
Project: 1100000005
Fiesta Island Rd. OC

Attn: Mamunur Rahman

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2

Subject: Geotechnical Design Recommendations For Proposed Retaining Wall

This Geotechnical Design Recommendations memorandum presents the geotechnical information and recommendations for the proposed retaining wall (RW17) near Abutment 1 of the Fiesta Island Road Overcrossing (Br. 57-0606). The proposed 81 feet long retaining wall is to facilitate the widening of the north bound I-5 freeway under the Fiesta Island Road Overcrossing. The maximum wall height is approximately 10 feet. This proposed retaining wall is a part of the I-5 (PM R19.9/R21.2) and I-8 (PM R0.05/R0.7) Interchange Improvement Project in San Diego County. In preparation of this report the following documents were reviewed:

- Proposed Retaining Wall Plans, prepared by Bridge Design Branch 19, dated August 3, 2011
- As-Built Log-of-Test-Borings prepared by the Division of Highways, dated May 21,1994 and July 12, 1965
- Additional proposed cross sections provided by Mr. Rahman, P.E. through email on October 20, 2011. It is our understanding that the final design type of the proposed wall is a modified Type 7 wall.

SITE GEOLOGY

The project site is located within the Peninsular Range Geomorphic Province of California located in southwestern San Diego County. This geomorphic province encompasses an area that extends roughly 125 miles from the Transverse Ranges and the Los Angeles Basin, south to the Mexican border, and beyond another 795 miles to the tip of Baja California. In general, Peninsular Range are underlain by Jurassic- and Cretaceous-age metavolcanic and metasedimentary rocks and by Cretaceous-age igneous rocks of the southern California batholiths. Geologically, the westernmost portion of the province in San Diego County generally consists of Upper Cretaceous-, Tertiary- and Quaternary-age sedimentary rocks.

SUBSURFACE CONDITIONS

At this time, subsurface investigation at the proposed retaining wall has not yet been conducted. However, based on the 1964 As-Built Log-Of-Test-Borings (LOTB's), the wall will be excavated into the existing embankment fill of the Fiesta Island Road OC. The embankment fill is founded on an additional 18 feet of undocumented fill that is in turn underlain by the native alluvial deposits of the area.

The 1964 As Built LOTB's show that the native subsurface materials encountered at the project site consist of inter-bedded layers of very loose to medium dense sandy SILT, silty SAND, and clayey Silt.

To investigate undocumented fill, Brian Hinman, P.E and Richard Rusnak, P.E of Office of Geotechnical Design South 2 went to the site on January 3, 2012. Limited soil explorations were done by using hand augers at the embankment slope where the proposed footing of the wall will be. Based on their experience, they classify the embankment fill as engineered fill.

GROUNDWATER

Groundwater was encountered at the -1.5 feet elevation. This elevation would be approximate 22 feet below present road grade levels. However, groundwater elevations may fluctuate throughout the year due to seasonal precipitation.

SEISMICITY

Based on the 2007 Caltrans fault database, the site is located approximately 0.27 km east of the Newport Inglewood – Rose Canyon Fault "San Diego Section" (Fault ID 224, M_{max} = 7.5, right-lateral strike slip fault, dip = 90 deg) which is the controlling fault for the deterministic seismic procedure. The peak horizontal bedrock acceleration (PBA) at the site is estimated around 0.51 g. A copy of a map showing the location of the bridge and the controlling fault is attached.

LIQUEFACTION

Soil liquefaction is a phenomenon in which saturated loose to medium dense, predominantly granular soils lose most, if not all, of shear strength and stiffness due to the development of excess pore pressure when subjected to ground shaking. Effects of liquefaction on ground surface include foundation settlement and reduction in bearing capacity, sand boils, and ground settlement and lateral spreading.

Based on the soil profiles and groundwater level from the 1964 As Built LOTB's, the potential of liquefaction at the site is high. Several inches of seismically induced ground settlement are expected at the site. It should be noted that the wall may have significant settlement and/or rotation during and after a major earthquake.

GEOTECHNICAL RECOMMENDATIONS

Based on limited soil information and engineering experience and judgment, conservative soil parameters are selected, used and presented in our analyses/recommendations. However, to verify the assumptions of soil properties and justify our recommendations, we request that one of our geotechnical representatives should be present at the site during construction. Our representative will have a chance to observe and verify the soil conditions and our design assumptions. The final design may be modified if there is any appreciable discrepancy with respect to the assumptions in this report.

Soil Engineering Properties

The following soil parameters of the structure fills can be used for design in both lateral earth pressure and bearing capacity of the proposed wall:
Moist unit weight= 125 pcf, friction=34 degree
The active and passive earth pressure coefficients during static conditions: Ka= 0.28, Kp= 3.5
The coefficient of friction between the concrete and the soil: 0.41
It should be noted that these values do not include hydrostatic water pressure and should be used only when adequate drainage behind the wall is provided.
For seismic design of the proposed wall, we recommend using Mononobe-Okabe method with the following horizontal and vertical seismic coefficients: K_h=0.25, K_v=0

Bearing Capacity

Based on the current information, we recommend over-excavating soils beneath the bottom of footing of the wall about 2 feet and replacing it with structure fills. The footing will rest on the structure fills. Following the above technique, the bearing capacity value of 3000 psf can be used in the design.

Corrosivity

No corrosion information is available for this site.

Slope stability

The global stability of the wall was evaluated for static and pseudo-static (during earthquake) conditions using the computer program GSTABL7 (Gregory, 2006). For seismic case, a horizontal acceleration equal to one-third of the PGA was used in analysis. Based on the result of this analysis, there is no concern about global stability issue. However, it should be noted that the wall may rotate or fail during earthquake due to combination of other factors such as liquefaction.

CONSTRUCTION CONSIDERATIONS

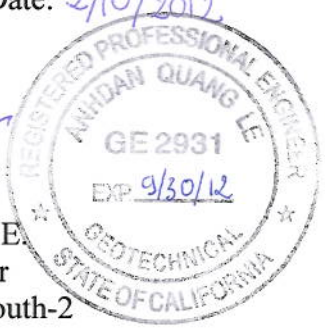
Groundwater is not expected during construction stages. However, seasonal rainfall and fluctuating groundwater elevations may result in perched groundwater to be encountered in wall footing excavations.

Temporary excavations are planned at the project site for the construction of the wall. All shoring systems should be designed and constructed in accordance with Caltrans Trenching and Shoring Manual. Due to the existence of the gravels and cobbles at the site, sheet pile walls may not be the good option for shoring system. In addition, selection of temporary shoring system should consider minimizing the potential disturbance on the piles of the bridge nearby.

Structure fills should be compacted to 95% relative compaction in accordance to Caltrans Standard Specifications.

To verify the assumptions and justify our recommendations, we request that one of our geotechnical representatives should be present during construction to estimate and study the soils at the site. The final design may be changed if there is any problem of soil property assumptions in this report.

Prepared by: Date: 2/10/2012

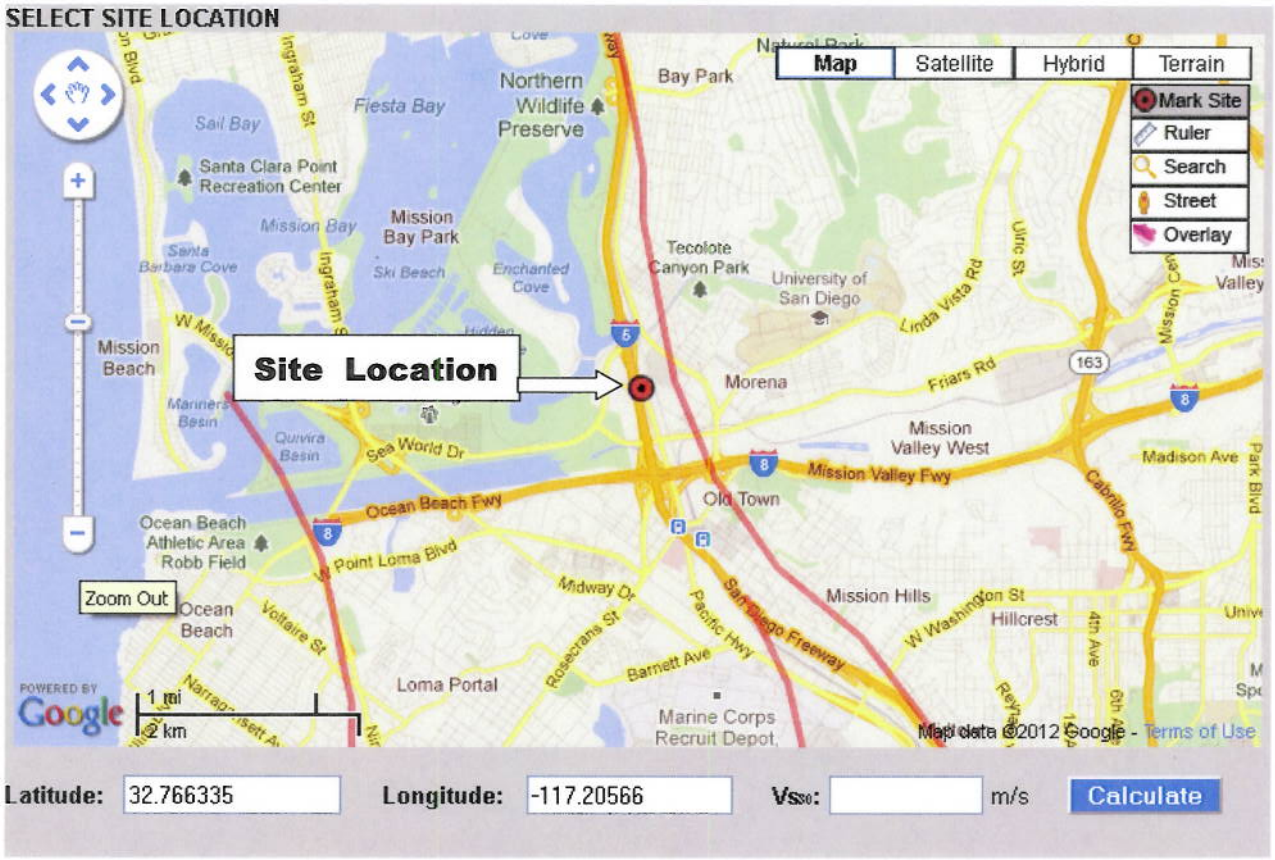


AnhDan Q Le, Ph.D, G.E.
Transportation Engineer
Geotechnical Design South-2

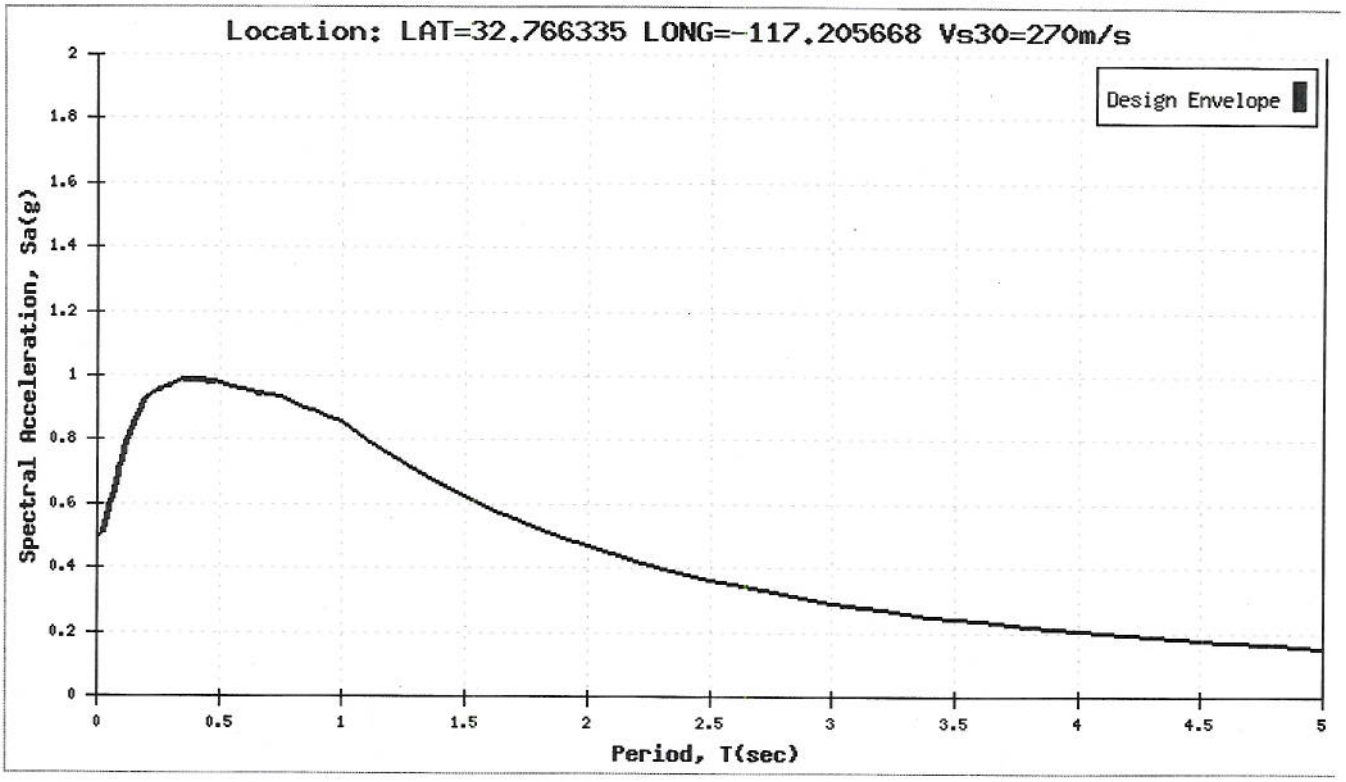
Supervised by: Date: 2/10/12

Angel Perez-Cobo, P.E.
Senior Transportation Engineer
Geotechnical Design South-2

c: Lou Melendez - District Project Manager
Shira Rajendra – GS Corporate
Structure Construction R.E. Pending File (RE_Pending_File@dot.ca.gov)
Al Ochoa – District Materials Engineer
Rebecca Harnagel – DES Office Engineer, Office of PS&E
File



Site location and seismic faults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GEOTECHNICAL INVESTIGATION

I-5/I-8 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA
CALTRANS 11A 1527
TASK ORDER 16

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

DOKKEN ENGINEERING, INC.
SAN DIEGO, CALIFORNIA

JULY 31, 2012
REVISED AUGUST 10, 2012
PROJECT NO. G1483-52-01

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. G1483-52-01
July 31, 2012
Revised August 10, 2012

Dokken Engineering, Inc.
5675 Ruffin Road, Suite 250
San Diego, California 92123

Attention: Mr. Lester Del Rosario

Subject: GEOTECHNICAL INVESTIGATION
I-5/I-8 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA
CALTRANS 11A1527; TASK ORDER 16

Dear Mr. Del Rosario:

In accordance with your authorization of our Proposal No. LG-12124 dated April 30, 2012, we herein submit the results of our geotechnical investigation for the proposed I-5/I-8 Interchange Project in San Diego, California. The proposed improvements consist of a Type 1 or Type 5 retaining wall located along the outside shoulder of the I-8 westbound onramp to I-5 north. The accompanying report presents the results of our study and conclusions and recommendations pertaining to the geotechnical aspects of the proposed development. The site is considered suitable for development provided the recommendations of this report are followed.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Michael C. Ertwine
Senior Staff Geologist

Yong Wang
GE 2775

Joseph J. Vettel
GE 2401

MCE:YW:JJV:dmc

(2/del) Addressee

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of the geotechnical investigation for the proposed I-5/I-8 Interchange Project. The purpose of the geotechnical investigation is to evaluate the surface and subsurface soil conditions and general site geology, and to identify geotechnical constraints that may impact development of the property. In addition, the purpose of this report is to provide foundation design criteria, retaining wall, excavation and remedial grading considerations. The scope of this investigation also included a review of readily available published and unpublished geologic literature (see *List of References*).

To aid in preparation of this report we reviewed:

1. *Preliminary Retaining Wall Plan ("RW 25"),* prepared by Dokken Engineering, plotted May 25, 2012.

2. *As Built Plans, Retaining Wall 80, Log of Test Borings,* prepared by Caltrans, dated July 28, 1969.

We performed a field investigation that included drilling three small-diameter, limited access exploratory borings on the existing embankment fill slope to a maximum depth of approximately 9 feet. The boring logs and other details of the field investigation are presented in Appendix A. We tested selected soil samples obtained during the field investigation to evaluate pertinent physical properties for engineering analyses and to assist in providing geotechnical recommendations for project improvement. Details of the laboratory tests and a summary of the test results are presented in Appendix B. The Log of Test Borings sheets are presented in Appendix C.

2. SITE AND PROJECT DESCRIPTION

The proposed I-5/I-8 Interchange Project is located along the south side of the San Diego River in the Old Town area of San Diego, California (see Vicinity Map, Figure 1). A Type 1 or Type 5 retaining wall is planned along the outside shoulder of the I-8 westbound onramp to I-5 north. The existing site topography generally consists of an elevated I-8 corridor above the surrounding area with slope inclinations of approximately 2:1 (horizontal:vertical) and a maximum slope height of approximately 30 feet. The existing I-5/I-8 Interchange was constructed in the late 1960's. We understand that the proposed retaining wall will extend approximately 576 lineal feet with a design height of 6 feet. Figure 2 is the Site Plan/Geologic Map, depicting the existing conditions and planned wall.

The site description and proposed development are based on a site reconnaissance and the currently available project information. If final plans differ from those described herein, Geocon should be contacted for review of the plans and possible revisions to this report.

3. SOIL AND GEOLOGIC CONDITIONS

During our field investigation, we encountered one surficial material, consisting of artificial fill (Qaf) underlying the planned improvements area. The geologic unit is described herein in Section 3.1. A Regional Geologic Map and a Geologic Cross-Section are presented on Figures 3 and 4 respectively.

3.1 Artificial Fill (Qaf)

We encountered artificial fill in each of the limited access borings to the maximum depth explored of approximately 9 feet. We understand artificial fill was placed as the embankment fill during the original construction of the I-5/I-8 Interchange in the late 1960's. The artificial fill soil consists of dense silty sand with gravel and cobbles. We encountered refusal on gravel and/or cobble using a relatively low torque limited access drill rig. We expect excavations within the artificial fill may require moderate to heavy effort using conventional grading equipment. The artificial fill is considered suitable for additional fill or structural loads. However, remedial grading of the upper portion of the fill will be required as discussed herein.

4. GROUNDWATER

We did not encounter groundwater during our field investigation. The regional groundwater level is expected to be close to the water level in the San Diego River channel. We do not expect groundwater to adversely impact proposed improvements. It is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater elevations and seepage are dependent on seasonal precipitation, irrigation, and land use among other factors and, vary as a result. Proper surface drainage will be important to future performance of the project.

5. LIQUEFACTION POTENTIAL

Liquefaction is a phenomenon in which loose, saturated, and relatively cohesionless soil deposits located beneath the groundwater table lose strength during strong ground motions. Primary factors controlling liquefaction include intensity and duration of ground accelerations, characteristics of the subsurface soil, in situ stress conditions, and depth to groundwater. The potential for liquefaction at the site is considered low due to the presence of dense soils at shallow depth and the lack of permanent, near-surface groundwater.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

6.1.1 From a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed improvements, provided the recommendations presented herein are implemented in design and construction of the project.

6.1.2 Based on information from our subsurface exploration and referenced Log of Test Borings, the study area is underlain by compacted embankment fill up to approximately 70 feet thick. The fill is suitable for the support of additional compacted fill or structural loads. Remedial grading consisting of recompaction of the upper 12 inches of soil below wall foundation should be expected.

6.1.3 We did not encounter groundwater or seepage in the exploratory borings during our investigation. We do not expect groundwater would be encountered during the construction of the planned improvements.

6.2 Excavation and Soil Characteristics

6.2.1 Based on the currently available project plans, cuts on the order of 10 feet or more in height are likely to accommodate the proposed wall construction.

6.2.2 The existing fill can be considered as a Cal-OSHA Type B soil where water is not freely seeping and should be considered a Type C soil of water is freely seeping. For temporary construction purposes, a maximum slope ratio of 1H:1V may be used for Type B soil and maximum slope ratios of 1.5H:1V may be used for Type C soil up to 20 feet in height. Overexcavation in loose sand will require 2H:1V slope or flatter. Shoring will likely be required if the proposed cuts are steeper than allowed, and/or to protect the existing embankment during wall construction.

6.2.3 It is the contractor's responsibility to provide sufficient and safe support for the excavation, as well as nearby utilities, structures and other improvements that could be damaged by earth movements. Temporary excavations should be in compliance with applicable governing agency regulations. The Contractor should also execute a monitoring program for structures in proximity to deep excavations so that appropriate modifications to the excavation/shoring system can be implemented to minimize the surface deflection or structure damage in a timely manner, if warranted. The contractor should also provide a temporary dewatering system if excavations extend below the groundwater elevation.

6.3 Corrosion Evaluation

6.3.1 According to *Caltrans Corrosion Guidelines* (Version 1.0, September 2003), a site is considered corrosive to foundation elements if chloride concentration is 500 ppm or greater, or sulfate concentration is 2000 ppm or greater, or the pH is 5.5 or less. The current Caltrans' Memo to Designer 3-1 also indicates that a site is considered corrosive when pH is 5.5 or less, or when the soil has a minimum resistivity of less than 1000 ohm-centimeters, and either contains a chloride concentration of 500 ppm (or greater) or a sulfate concentration of 2000 ppm (or greater).

6.3.2 Potential of Hydrogen (pH), resistivity, chlorides content, and soluble-sulfate content tests were performed on one sample selected at random to generally evaluate the corrosion potential to subsurface structures. These tests were performed in accordance with California Test Method Nos. 643, 417, and 422. The results are summarized in Table 6.3, which indicates that the site need not be considered a corrosive environment in accordance with Caltrans criteria. The laboratory test results are presented in Appendix B and should be considered for design of underground structures.

TABLE 6.3
SOIL CORROSION TEST SUMMARY

Location Boring/Sample No.	Sample Top Depth (feet)	Resistivity (ohm centimeters)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
A-12-001/B1-1	0 to 6	1,600	9.0	90	10

6.3.3 Proposed improvements in contact with the ground should be designed and constructed in accordance with the Caltrans Standard Specifications and good construction practices. Geocon does not practice in the field of corrosion engineering. If corrosion sensitive improvements are planned, we recommend that further evaluations by a corrosion engineer be performed to incorporate the necessary precautions to avoid premature corrosion on corrosion sensitive structures in direct contact with the soils.

6.4 Slope Stability

6.4.1 The existing 2H:1V embankment slopes appear to have a factor of safety greater than 1.5 against deep-seated and shallow failures under static loading and a factor of safety greater than 1.1 under pseudo-static (seismic) loading. All slopes should be planted, drained, and maintained to reduce erosion. Slope irrigation (if used) should be kept to a minimum to just

support the vegetation cover. Surface drainage should not be allowed to flow over the top of the slopes.

6.5 Rippability

6.5.1 The existing fill soils can be excavated with moderate to heavy effort with conventional heavy-duty grading equipment. Heavy effort may be necessary if very dense or hard materials are encountered.

6.6 Retaining Walls

6.6.1 The propose Type 1 and/or Type 5 retaining walls are typically unrestrained retaining walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining wall portion of the wall) at the top of the wall. Retaining walls not restrained at the top and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid density of 36 pounds per cubic foot (pcf) in accordance with Caltrans Bridge Design Specifications 3.20.1. Walls supporting 2H:1V backfill should be designed for an equivalent fluid pressure of 50 pcf. For retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent of 2 feet of fill soil (unit weight of 125 pcf) should be added.

6.6.2 An allowable bearing capacity of 3,000 pounds per square foot can be used provided wall footings are at least 18 inches wide and founded 12 inches below adjacent grades bearing entirely in structural fill. Lateral loads can be resisted by an allowable passive earth pressure equivalent to a fluid density of 300 pcf for footings or shear keys poured neat against properly compacted fill soils with horizontal ground. The passive earth pressure for subject retaining wall can be mobilized with a displacement of 2 to 2.5 percent of the wall height. The passive pressure should be taken as 150 pcf for walls founded on a 2H:1V slope. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. An allowable friction coefficient of 0.4 may be used for resistance to sliding between soil and concrete. This friction coefficient may be combined with the allowable passive earth pressure when determining resistance to lateral loads.

6.6.3 Bottoms of wall footings should be at least of 3 feet in width and embedded at least one foot below the adjacent grade. Footings at slope should be extended in depth such that the outer bottom edge of the footing is at least 7 feet horizontally from the face of the slope. Alternatively, we understand Caltrans only requires a 4-foot horizontal setback for footings on slopes per Section 4.4.5.1 of Bridge Design Specification given that the footings are

designed appropriately. In this case, the fill beneath footing, including the outer 5 feet of embankment fill, should be structural backfill and compacted to a minimum of 95 percent of the maximum density.

6.6.4 All retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces. The drainage system should consist of weepholes or backdrains. The above recommendations assume a properly compacted granular backfill material with no hydrostatic forces. If conditions different than those described are anticipated, or if specific drainage details are desired, Geocon should be contacted for additional recommendations.

6.6.5 Because the proposed construction does not include significant amounts of new fill, substantial surface settlement is not expected. Settlement of wall footings imposing the maximum allowable bearing pressure is not expected to exceed one inch.

6.6.6 All grading should be performed in conformance with Sections 6-3, 19-3, 19-5, and 19-6 of the Caltrans Standard Specifications or equivalent. Backfill placed retaining walls should have a very low to low expansion potential. The extent and placement of the low-expansive soils should conform to Caltrans Standard Specifications 19-5.03. Backfill should have an Expansion Index (EI) no greater than 50 and a Sand Equivalent of 20 or greater. Ponding or jetting of backfill should not be permitted. All wall backfill should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D 1557-02 or CTM 216.

6.6.7 Foundation excavations should be observed by the Engineer, or a representative of Geocon Incorporated prior to the placement of reinforcing steel and concrete to verify that the exposed soil conditions are consistent with those anticipated. If unanticipated soil conditions are encountered, foundation modifications may be required.

6.7 Grading and Foundation Plan Review

6.7.1 Geocon Incorporated should review the project grading and foundation plans for the retaining walls and new residence prior to final design submittal to check if additional analysis and/or recommendations are required.

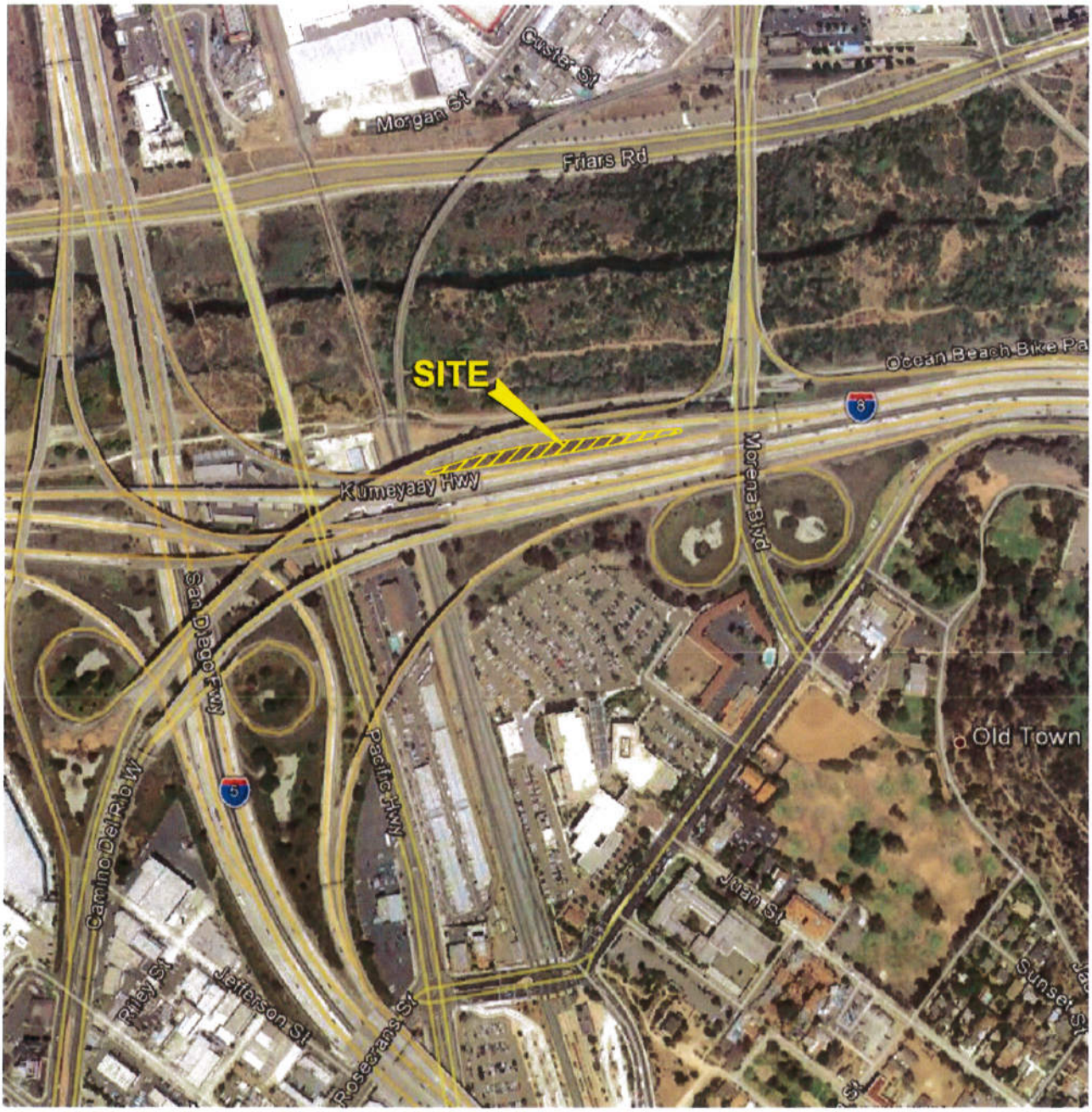
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

2. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

4. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.



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N

SCALE : 1" = 500'

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VICINITY MAP

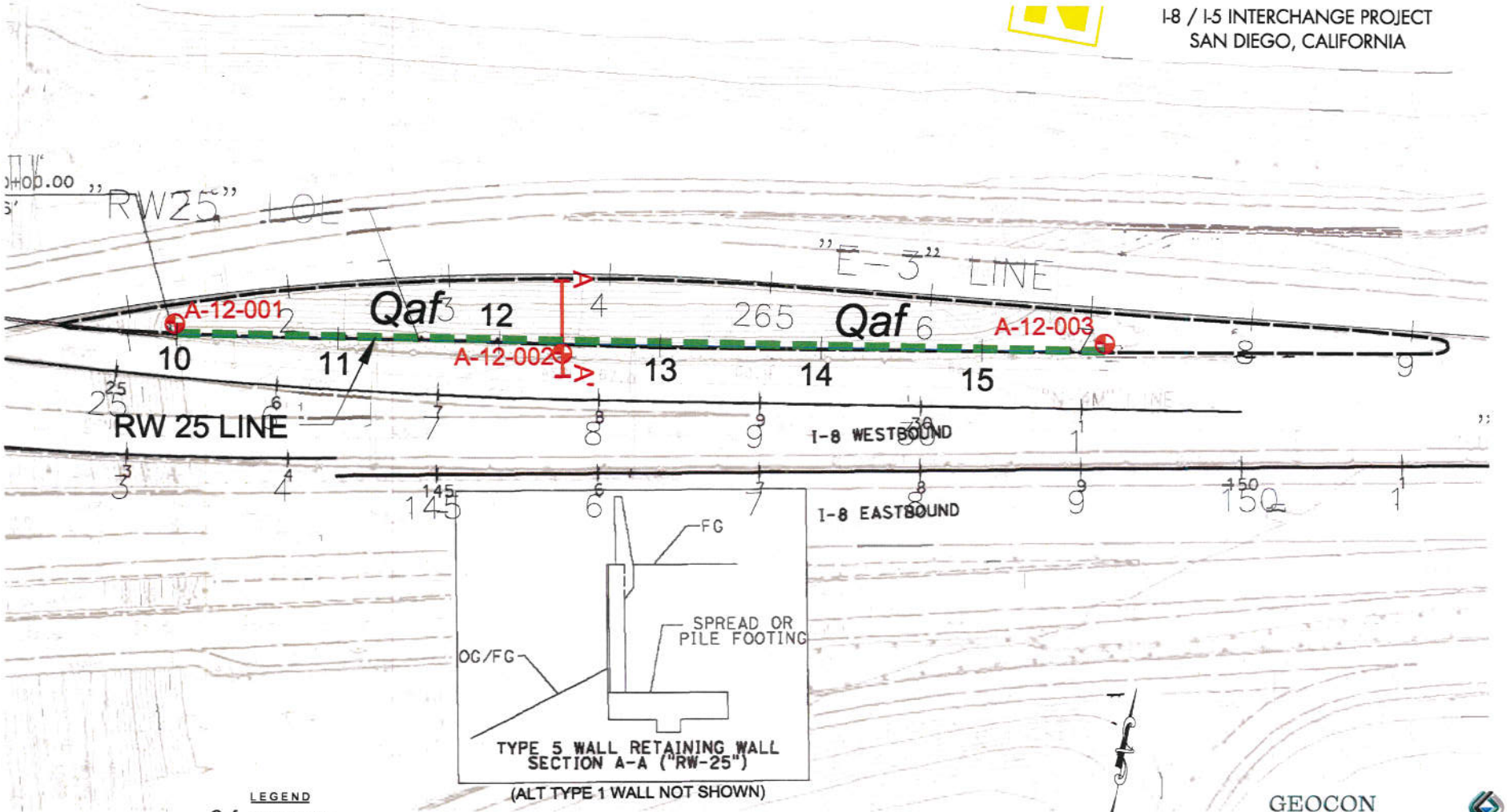
I-5 / I-8 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA

REV DATE 08 - 10 - 2012	PROJECT NO. G1483 - 52 - 01	FIG. 1

VICMAP

Y:\PROJECTS\G1483-52-01 (I-5 AND I-8 Interchange Project)\DETAILS\G1483-52-01_VICMAP_FIG1_REV 8-10-2012.dwg

I-8 / I-5 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA



LEGEND

Qaf.....ARTIFICIAL FILL

.....APPROX. LOCATION OF SITE LIMIT

A A' .....CROSS-SECTION A-A'

A-12-003 .....APPROX. LOCATION OF BORING

0' 60' 120'

SCALE: 1" = 60'

SITE PLAN / GEOLOGIC MAP

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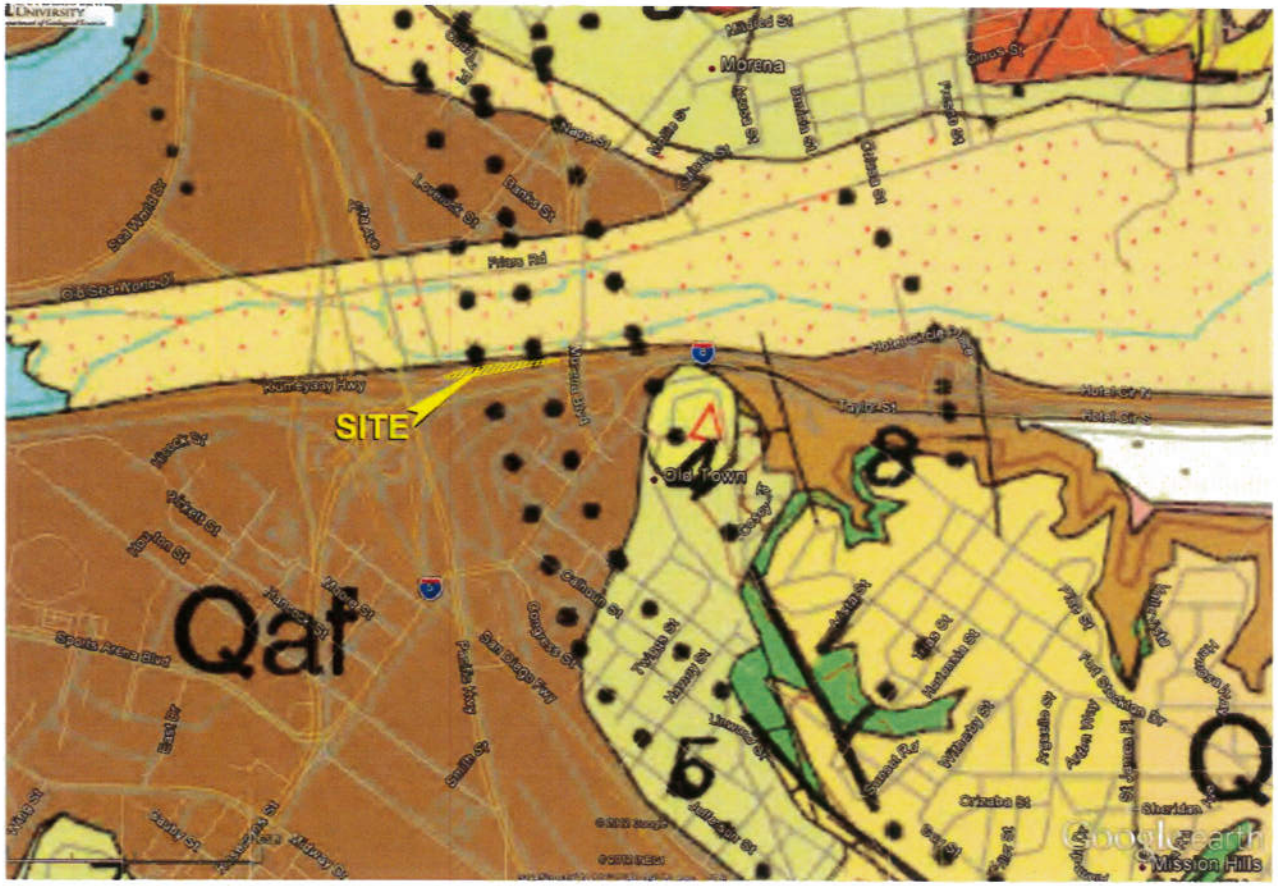
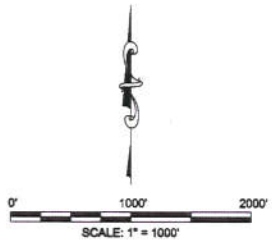
PROJECT NO. G1483 - 52 - 01
FIGURE 2
DATE 07 - 31 - 2012
REVISED DATE 08 - 10 - 2012

Y:\PROJECTS\G1483-52-01 (I-5 AND I-8 Interchange Project)\SHEETS\G1483-52-01_GEOLOGIC MAP_FIG2_REV 8-10-2012.dwg

I-8 / I-5 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA



SOURCE : GEOLOGIC MAP OF THE SAN DIEGO OF THE 30'X60' QUADRANGLE, CA
KENNEDY AND TAN



LEGEND

Artificial fill (late Holocene)—Deposits of fill resulting from human construction, mining, or quarrying activities; includes compacted engineered and non compacted non engineered fill. Some large deposits are mapped, but in some areas no deposits are shown

Young alluvial flood plain deposits (Holocene and late Pleistocene)—Mostly poorly consolidated, poorly sorted, permeable flood plain deposits

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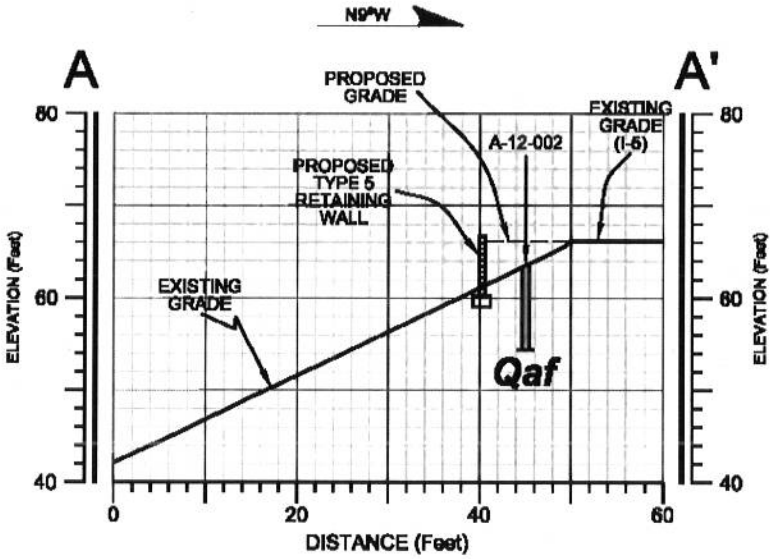
FIGURE 3
DATE 07 - 31 - 2012
REVISED DATE 08 - 10 - 2012

REGIONAL GEOLOGIC MAP

Y:\PROJECTS\G1483-52-01 (I-5 AND I-8 Interchange Project)\DETAILS\G1483-52-01_RGM_FIG3_REV 8-10-2012.dwg



GEOLOGIC CROSS - SECTION A - A'

SCALE: 1" = 20' (Horiz. = Vert.)

GEOCON LEGEND

Qaf .....ARTIFICIAL FILL

A-12-002 .....APPROX. LOCATION OF GEOTECHNICAL BORING

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GEOLOGIC CROSS-SECTION A-A'

I-5 / I-8 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA

REV DATE 08 - 10 - 2012	PROJECT NO. G1483 - 52 - 01	FIG. 4

Y:\PROJECTS\G1483-52-01 (I-5 AND I-8 Interchange Project)\DETAILS\G1483-52-01_SECTION A-A_FIG4_REV 8-10-2012.dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

We performed our field investigation on June 28, 2012, which consisted of drilling 3 limited access borings. Our subsurface exploration limited access borings were advanced using a limited access tripod rig equipped with 6-inch diameter solid-flight auger and extended to a maximum depth of approximately 9 feet below the ground surface. The locations of the borings are shown on the Site Plan/Geologic Map, Figure 2. Boring logs A-12-001 through A-12-003, and an explanation of the geologic units encountered are presented in figures following the text in this appendix. We located the borings in the field using a measuring tape and existing reference points; therefore, actual boring locations may deviate slightly.

We visually examined, classified, and logged the soil encountered in the borings in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488) and Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010 edition). The logs depict the soil and geologic conditions observed and the depth where we obtained samples. The Log of Test Borings sheets in Caltrans format are presented Appendix C.

PROJECT NO. G1483-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING A-12-001** ELEV. (MSL.) **60'** DATE COMPLETED **06-28-2012** EQUIPMENT **TRI POD with 6" SFA** BY: **M. ERTWINE**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	B1-1			SM	SILTY SAND with gravel and cobbles (SM); dense; light yellowish brown; moist; 50% sand, from medium to fine; 35% gravel; 15% fines; 15% cobbles, rounded [FILL-Qaf].			
2								
4					-Dense, difficult drilling, about 15% cobble within fill matrix			
6	B1-2				REFUSAL AT 6 FEET			

Figure A-1,
Log of Boring A-12-001, Page 1 of 1

G1483-52-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. G1483-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING A-12-002** ELEV. (MSL.) **63'** DATE COMPLETED **06-28-2012** EQUIPMENT **TRI POD with 6" SFA** BY: **M. ERTWINE**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	SILTY SAND with gravel and cobbles (SM); dense; light yellowish brown to reddish brown; moist; 55% sand, from medium to fine; 30% gravel; 15% fines; 15% cobbles [FILL-Qaf]			
2	B2-1							
4								
6					-Cobble encountered, very dense, abundant cobble about 15%, refusal			
8	B2-2					50/4"		
					REFUSAL AT 9 FEET			

Figure A-2,
Log of Boring A-12-002, Page 1 of 1

G1483-52-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1483-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING A-12-003** ELEV. (MSL.) **66'** DATE COMPLETED **06-28-2012** EQUIPMENT **TRI POD with 6" SFA** BY: **M. ERTWINE**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	B3-1			SM	SILTY SAND with gravel and cobbles (SM); dense, light yellowish brown, moist, about 60% sand, medium to fine; 20% fines; 20% gravel; 15% cobbles [FILL-Qaf].			
2					-Very difficult drilling from 2 to 3½ feet; piece of glass in fill matrix observed			
4								
6	B3-2					50/6"		
	B3-3				-Dense gravels -Abundant cobble at 7 feet	68/12"		
8					REFUSAL AT 8 FEET			

Figure A-3,
Log of Boring A-12-003, Page 1 of 1

G1483-52-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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APPENDIX B

APPENDIX B

LABORATORY TESTING

We performed laboratory tests in accordance with current generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. We tested selected soil samples for their maximum dry density and optimum moisture content, shear strength, pH and resistivity, chloride ion content, and water-soluble sulfate characteristics. The results of our laboratory tests are presented on Tables B-I through B-IV.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557

Sample No.	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
B2-1	Yellowish brown, Silty, fine to medium SAND with gravel	125.3	10.7

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Dry Density (pcf)	Moisture Content (%)		Unit Cohesion (psf) Peak [Ultimate*]	Angle of Shear Resistance (degrees) Peak [Ultimate*]
		Initial	Final		
B2-1**	112.4	10.7	15.7	440 [260]	31 [32]
B2-1***	117.1	10.6	13.9	605 [390]	35 [35]

*Ultimate herein is defined as strength at approximately 0.2 inches (0.5 cm) of deflection.
**Remolded to a dry density of approximately 90 percent of the laboratory maximum dry density.
***Remolded to a dry density of approximately 95 percent of the laboratory maximum dry density.

TABLE B-III
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (PH), RESISTIVITY, AND CHLORIDE ION CONTENT TEST RESULTS
CALIFORNIA TEST NO. 643 AND EPA NO. 325.3

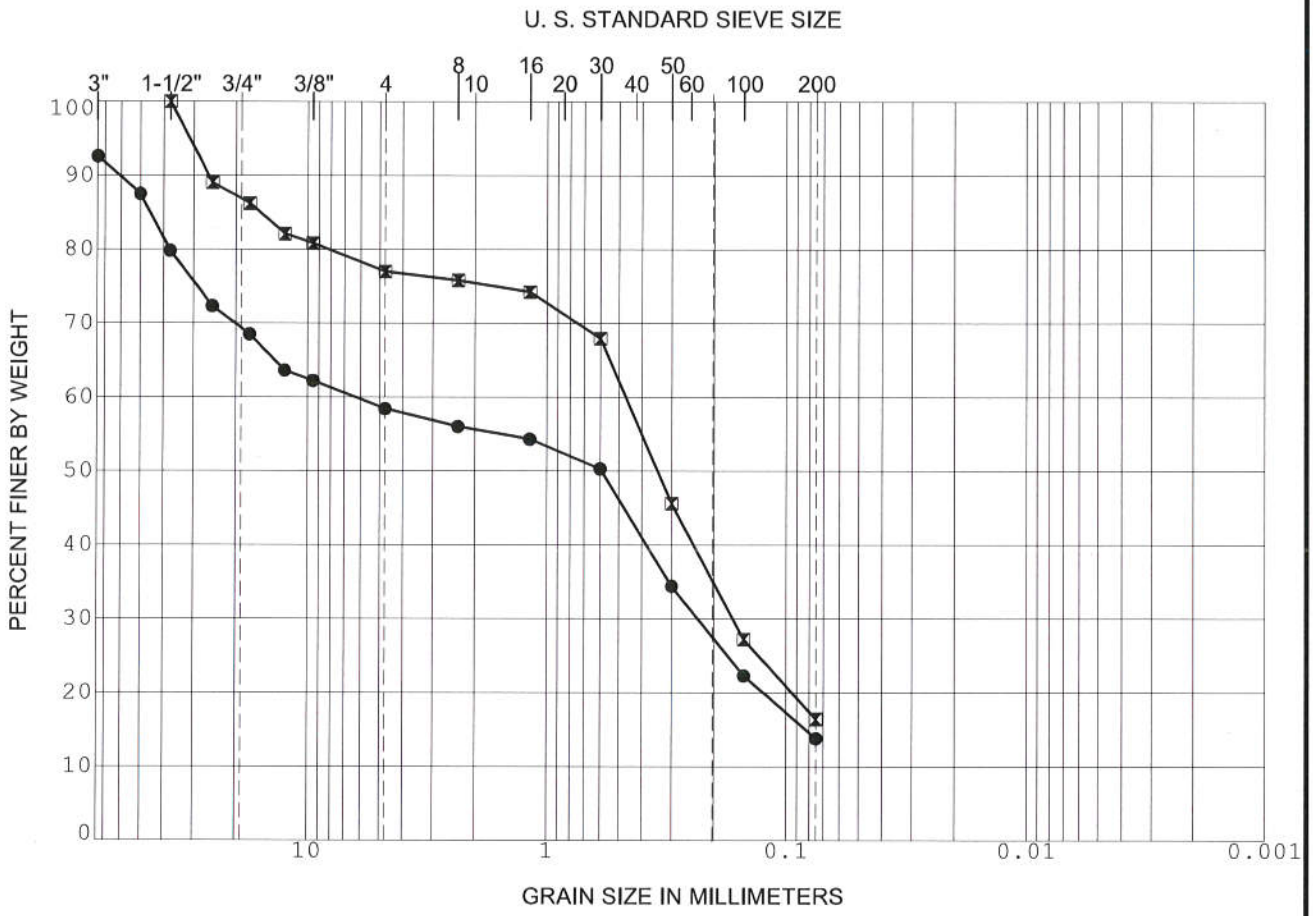
Sample No.*	pH	Resistivity (ohm/cm)	Chloride Ion Content (ppm)
B1-1	9.0	1,600	90

TABLE B-IV
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
CALIFORNIA TEST NO. 417

Sample No.	Water-Soluble Sulfate (ppm)
B1-1	9

PROJECT NO. G1483-52-01

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	B1-1	0.0	(SM) Silty SAND with gravel				
⊠	B3-1	0.0	(SM) Silty SAND with gravel				
▲							

GRADATION CURVE

I-5 / I-8 INTERCHANGE PROJECT

SAN DIEGO, CALIFORNIA

G1483-52-01.GPJ

Figure B-1

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APPENDIX C

APPENDIX C

LOG OF TEST BORINGS

FOR

I-5/I-8 INTERCHANGE PROJECT
SAN DIEGO, CALIFORNIA
CALTRANS 11A 1527
TASK ORDER 16

PROJECT NO. G1483-52-01

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	5,8	R19.9/R21.2 & R0.2/R0.7		

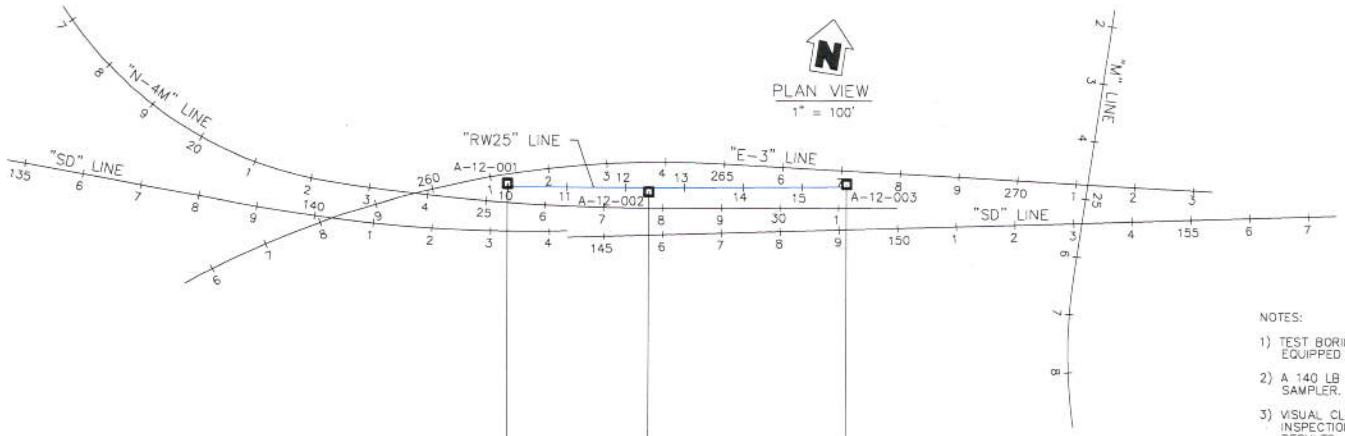
REGISTERED CIVIL ENGINEER — DATE

YONG WANG No. 62819 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

GEOCON, INC.
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE
SAN DIEGO, CALIFORNIA 92121

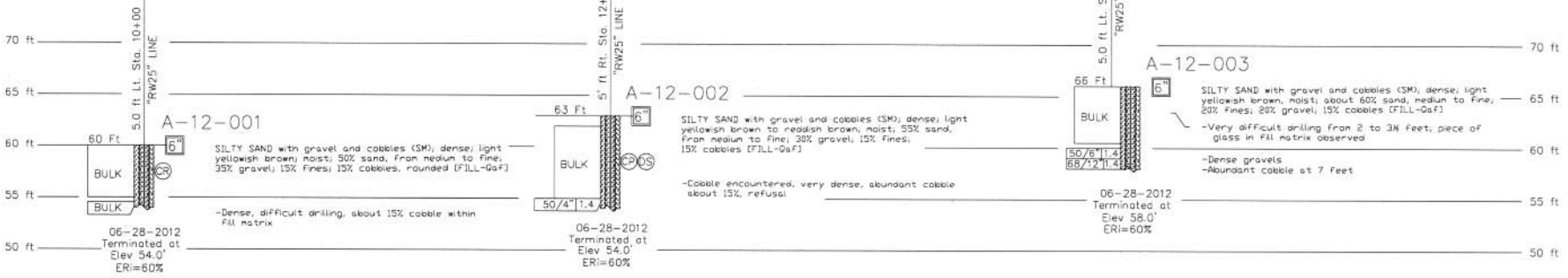


NOTES:

1) TEST BORING WERE DRILLED USING A LIMITED ACCESS TRIPOD DRILL RIG EQUIPPED WITH 6-INCH DIAMETER SOLID-FLIGHT AUGER.
2) A 140 LB CATHEAD HAMMER FALLING 30 INCHES WAS USED TO DRIVE SAMPLER.
3) VISUAL CLASSIFICATION OF EARTH MATERIALS WAS BASED ON FIELD INSPECTION AND WAS CONFIRMED OR REVISED WITH LABORATORY TEST RESULTS.
4) THE BORING LOGS AND RELATED INFORMATION REPRESENT THE OPINION OF THE GEOLOGIST/ENGINEER AS TO THE CHARACTER OF THE MATERIAL AT THE LOCATIONS SHOWN. SOIL AND GROUNDWATER CONDITIONS BETWEEN ADJACENT TEST HOLES AND AT OTHER LOCATIONS MAY DIFFER FROM THOSE SHOWN. GROUNDWATER CONDITIONS MAY CHANGE WITH PASSAGE OF TIME.

BENCHMARK:

MONUMENT IS A 3.75" USC&GS BRASS DISK STAMPED 'RESET E 132' FOUND IN SOUTHWEST CORNER OF CONCRETE ATS&F BRIDGE ABUTMENT OVER THE SAN DIEGO RIVER AND NE OF I-5 AND I-8
ELEVATION: 26.39
DATUM: NAVD 88



PROFILE VIEW
VERT. SCALE: 1" = 5'

LOG OF TEST BORINGS 1 OF 3 ("RW25")

SCALE AS SHOWN

APPROVED FOR RETAINING WALL WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | PROJECT DEVELOPMENT | CONSULTANT FUNCTIONAL SUPERVISOR: MARK TARRALL | CALCULATED-DESIGNED BY: - | CHECKED BY: - | REVISED BY | DATE REVISED

LAST REVISION 07-31-12 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010 | USERNAME => $USER | DGN FILE => $REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 11000000005

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	5,8	R19.9/R21.2 & R0.2/R0.7		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — YONG WANG — No. 62819 — CIVIL — STATE OF CALIFORNIA

GEOCON, INC.
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE
SAN DIEGO, CALIFORNIA 92121

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 – 5
Loose	5 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% – 10%
Little	15% – 25%
Some	30% – 45%
Mostly	50% – 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 – 12
Gravel	Coarse	3/4 – 3
	Fine	1/5 – 3/4
Sand	Coarse	1/16 – 1/5
	Medium	1/64 – 1/16
	Fine	1/300 – 1/64
Silt and Clay		Less than 1/300

LOG OF TEST BORINGS 2 OF 3 ("RW25")

APPROVED FOR RETAINING WALL WORK ONLY

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION | PROJECT DEVELOPMENT | CONSULTANT FUNCTIONAL SUPERVISOR: MARK TARRALL | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 07-31-12 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010 | USERNAME => $USER | DGN FILE => $REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 11000000005

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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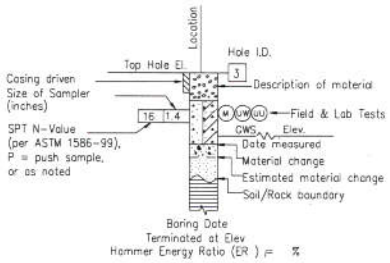
GEOCON, INC.
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE
SAN DIEGO, CALIFORNIA 92121

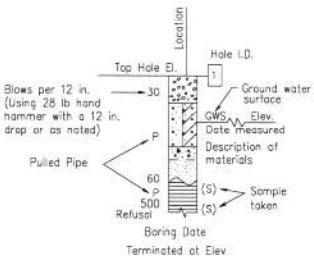
CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Dia	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
	O	Other (note on LOTB)
Note: Size in inches.		

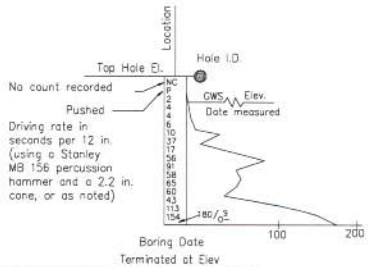
CONSISTENCY OF COHESIVE SOILS				
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 – 0.25	0.25 – 0.5	0.12 – 0.25	0.12 – 0.25
Medium Stiff	0.25 – 0.5	0.5 – 1	0.25 – 0.5	0.25 – 0.5
Stiff	0.5 – 1	1 – 2	0.5 – 1	0.5 – 1
Very Stiff	1 – 2	2 – 4	1 – 2	1 – 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



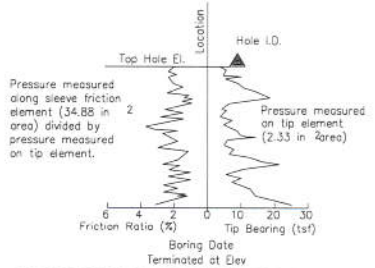
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

LOG OF TEST BORINGS 3 OF 3 ("RW25")

APPROVED FOR RETAINING WALL WORK ONLY

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION | PROJECT DEVELOPMENT | CONSULTANT FUNCTIONAL SUPERVISOR: MARK TARRALL | CALCULATED-DESIGNED BY: – | CHECKED BY: – | REVISED BY | DATE REVISED

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LIST OF REFERENCES

1. Caltrans, *California Amendments to AASHTO LRFD Bridge Design Specification,* Fourth Edition, 2008

2. Caltrans, *Corrosion Guidelines,* Version 1.0, 2003.

3. Caltrans, *Highway Design* Manual, 2009.

4. Caltrans, *Soil and Rock, Logging, Classification, and Presentation Manual,* 2010 Edition.

5. Caltrans, *Standard Specification,* 2006.

6. *Geology and Mineral Resources of San Diego County, California*, California Division of Mines and Geology Publication, 1963.

7. *Geology of San Diego Metropolitan Area, California,* California Division of Mines and Geology, Bulletin 200, 1975.

8. Kennedy, M. P. and S. S. Tan, 2005, *Geologic Map of the San Diego 30'x60' Quadrangle, California*, USGS Regional Map Series Map No. 3, Scale 1:100,000.

9. Unpublished Geotechnical Reports and Information, Geocon Incorporated.

State of California

Business, Transportation and Housing Agency

Memorandum

To : HANH NGUYEN (MS 225)
Project Engineer
Design

Date: February 1, 2012

File: 11-SD-5, 8
PM R19.9/ R21.2 (5)
PM R0.2/ R0.7 (8)
11-002701
Project ID: 1100000005

From : DEPARTMENT OF TRANSPORTATION - DISTRICT 11
MATERIALS ENGINEERING BRANCH

Subject: **MEMO IN LIEU OF MATERIALS REPORT (REVISED)**

This report shall replace the report dated January 10, 2012, due to a change in the structural section recommendations for the NB 5 Inside Shoulder (Alternate 2).

In accordance with your request dated November 9, 2011, we have developed structural section and corrosion recommendations for the Phase 1 of the above project.

Design information, including a basement soil R-value of 10, is based on previous material reports and memorandums. The Traffic Forecasting Branch furnished the various Traffic Indices (TIs).

STRUCTURAL SECTION RECOMMENDATIONS

NB 5 Inside Traveled Way (TI = 13.0, RV=10)

Alternate 1*
0.90 ft. JPCP
0.25 ft. HMA-A
0.65 ft. AB – Class II

* - Based on design without lateral support

NB 5 Inside Shoulder (TI = 8.0, RV=10)

Alternate 1
0.90 ft. JPCP
0.25 ft. HMA-A
0.65 ft. AB – Class II

Alternate 2#
0.40 ft. HMA-A
0.85 ft. AB – Class II
0.55 ft. AS – Class IV

- Using HMA shoulder section requires traveled way lane width of 14 ft.

NB 5 Auxiliary Lane (TI = 15.5, RV=10)

Alternate 1*
1.05 ft. JPCP
0.25 ft. HMA-A
0.65 ft. AB – Class II

* - Based on design without lateral support

NB 5 Auxiliary Lane Shoulder (TI = 10, RV=10)

Alternate 1	Alternate 2#
1.05 ft. JPCP	0.50 ft. HMA-A
0.25 ft. HMA-A	1.10 ft. AB – Class II
0.65 ft. AB – Class II	0.75 ft. AS – Class IV

- Using HMA shoulder section requires traveled way lane width of 14 ft.

NB 5 Off and On-Ramps to/from Sea World Dr. (TI = 10, RV=10)

Traveled Way and Shoulder

Alternate 1	Alternate 2
0.95 ft. HMA-A	0.50 ft. HMA-A
1.80 ft. AB – Class II	1.10 ft. AB – Class II
	0.75 ft. AS – Class IV

The recommended aggregate grading for HMA-A is ¾" maximum.

The grade of asphalt binder for this project shall be PG 64-10.

CORROSION RECOMMENDATIONS

A number of existing culverts were examined and appeared to be in good condition with no apparent corrosion related distresses. With respect to invert abrasion, all locations were classified as being non-abrasive to water flow conditions. The existing culverts can therefore be extended or modified in-kind.

Recommendations for Existing Culverts

1. In accordance with CTM 643, the condition of existing drainage facilities determines design over actual corrosion testing. Therefore, modifications to existing systems should match the "as-builts".

2. Modifications to existing drainage systems could also use Plastic Pipe Culverts that meet the minimum and maximum fill height requirements. Either Corrugated Polyethylene (Type C, D or S), Ribbed Profile Wall Polyethylene or Ribbed Profile Wall Polyvinyl Chloride pipe can be used.

3. Modifications to existing CSPs, such as moving drop inlets, require that any exposed metal be adequately coated on the soil side with a bituminous or mastic compound.

Recommendations for New Culverts

1. Plastic Pipe Culverts, either Type C, D or S Polyethylene Pipe, Ribbed Profile Wall Polyethylene Pipe, or Ribbed Profile Wall Polyvinyl Chloride Pipe that meet Caltrans' current diameter and fill height requirements. Where designated on the plans as corrugated interior wall type, plastic pipe shall be Type C corrugated polyethylene pipe.

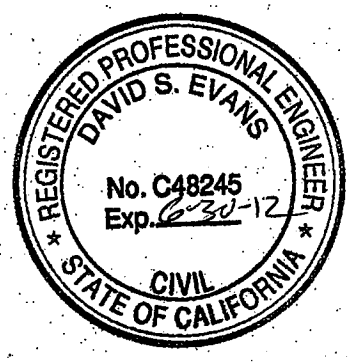
2. Standard Reinforced Concrete Pipe having the following, or equivalently designed specifications: Type IP (MS) Modified cement or Type II Modified cement minimum required by Caltrans Standard Specifications 90-1.01 and maximum water-to-cementitious material ratio of 0.35.

3. The following Steel Pipe Culverts meeting the minimum and maximum fill height requirements: Corrugated Steel Pipe with bituminous coating and paved invert, Steel Spiral Rib Pipes with Polymerized Asphalt Invert, and Steel Spiral Rib Pipes with Polymeric Sheet Coating.

If you have questions or comments about this subject, please telephone R. Avila at (858) 467-4069 or D. Evans at (858) 467-4056.

Ruben Avila
Transportation Engineer, CT/Civil

David Evans
Assoc. Trans. Engineer (Reg.)
Pavement Section



cc: APadilla (63)
P File

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

AERIALLY DEPOSITED LEAD SURVEY REPORT
INTERSTATE 5 WIDENING
SAN DIEGO, CALIFORNIA
EXPENDITURE AUTHORIZATION 002700

PREPARED FOR:
State of California Department of Transportation
4050 Taylor Street
San Diego, California 92110

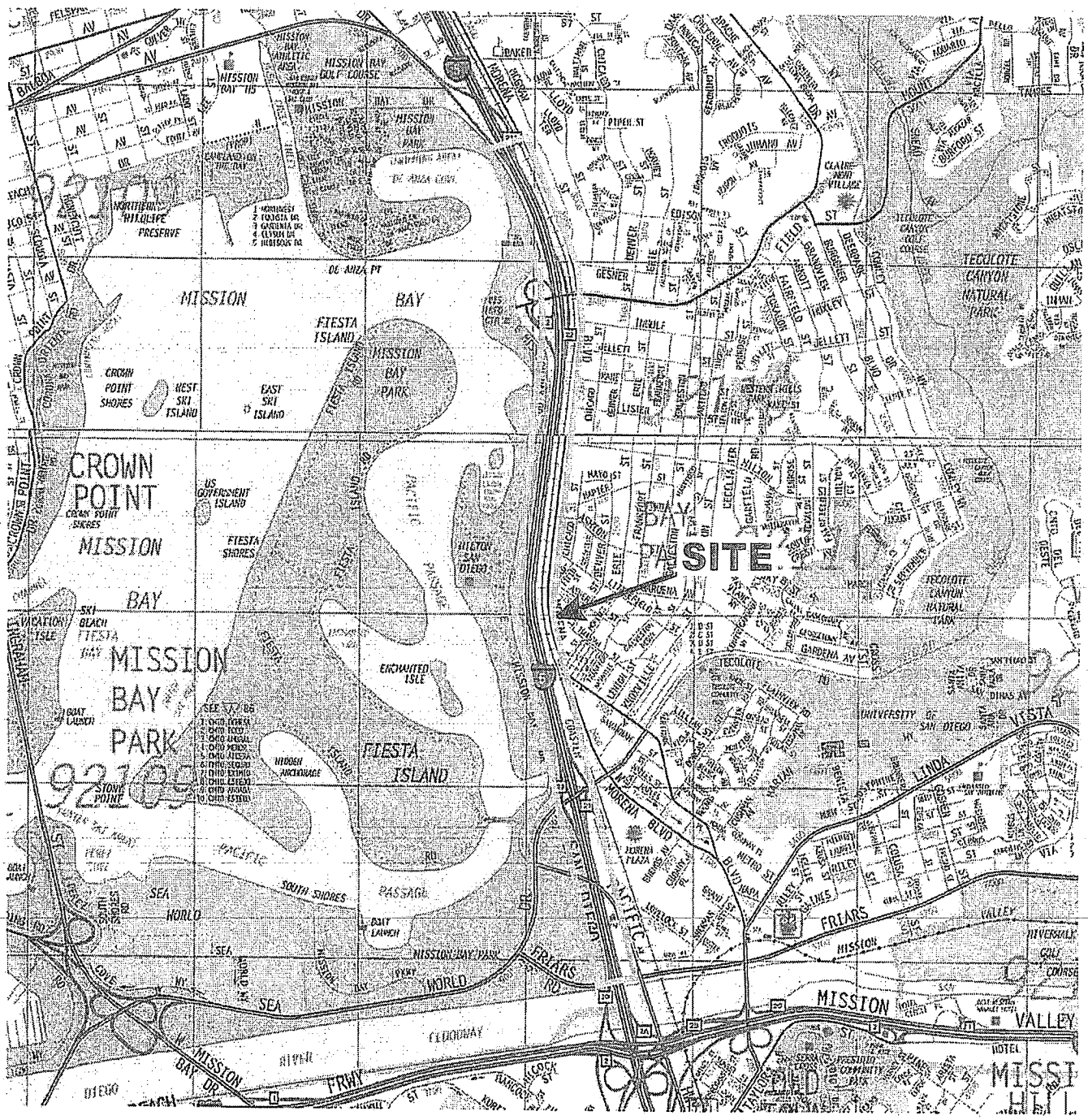
PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
5710 Ruffin Road
San Diego, California 92123

April 30, 2007
Project No. 105388019

Table 1 – Summary of Z1 Soil Sample Results

Sample ID	Depth (meters)	Depth (feet)	Sample Date	Total Lead (mg/kg)	WET (mg/L)	WET DI (mg/L)	TCLP (mg/L)	Lead by XRF (mg/kg)	Lead by XRF with Protocol (mg/kg)	pH
B1-Z1-1.5	0.46	1.5	1/17/2007	**940**	**67**	**1.0**	ND	**856.0±55.0**	--	--
B2-Z1-0.8	0.24	0.8	1/17/2007	**2700**	**220**	**16**	3.1	**2998.0±102.0**	--	--
B3-Z1-1.8	0.55	1.8	1/17/2007	40	1.9	--	--	<50	--	--
B4-Z1-1.4	0.43	1.4	1/17/2007	**270**	**21**	**1.1**	ND	**319.0±40.0**	--	--
B5-Z1-1.4	0.43	1.4	1/17/2007	**160**	**5.1**	ND	ND	**115.0±31.0**	--	--
B6-Z1-1.0	0.30	1	1/17/2007	23	1.2	--	--	<50	--	--
B7-Z1-1.5	0.46	1.5	1/17/2007	**250**	**16**	ND	ND	**216.0±34.0**	--	--
B8-Z1-0.4	0.12	0.4	1/17/2007	**410**	**27**	**2.3**	ND	**612.0±49.0**	--	--
B9-Z1-0.6	0.18	0.6	1/16/2007	**71**	4.3	ND	--	**96±33.0**	**187.0±40.0**	--
B10-Z1-0.3	0.09	0.3	1/16/2007	**260**	**16**	ND	ND	**235.0±41.0**	--	6.2
B11-Z1-0.5	0.15	0.5	1/16/2007	**470**	**36**	**0.87**	ND	**348.0±42.0**	--	--
B12-Z1-0.5	0.15	0.5	1/16/2007	**120**	4.2	ND	ND	**70.0±31.0**	--	6.1
B13-Z1-0.9	0.27	0.9	1/16/2007	35	1.1	--	--	<50	--	--
B14-Z1-0.4	0.12	0.4	1/16/2007	**200**	**12**	ND	ND	**133.0±38.0**	--	7.2
B15-Z1-1.3	0.40	1.3	1/16/2007	13	0.27	--	--	<50	--	--
B16-Z1-1.5	0.46	1.5	1/16/2007	9.1	ND	--	--	<50	--	5.9
B17-Z1-1.2	0.37	1.2	1/16/2007	**130**	**6.3**	ND	ND	**77.3±34.0**	--	--
B18-Z1-0.5	0.15	0.5	1/16/2007	**64**	4.4	ND	--	**82±31**	--	--
B19-Z1-0.2	0.06	0.2	1/16/2007	**110**	**5.8**	ND	ND	**104±32.0**	--	--
B20-Z1-1.1	0.34	1.1	1/16/2007	48	1.8	--	--	<50	--	--
B21-Z1-0.9	0.27	0.9	1/16/2007	36	1.8	--	--	**58.4±29.0**	--	--
B22-Z1-1.4	0.43	1.4	1/17/2007	**54**	2.7	ND	--	**69.5±30.0**	--	--
B23-Z1-1.1	0.34	1.1	1/17/2007	**90**	3.0	ND	--	**54.2±30.0**	--	7.1
B24-Z1-1.9	0.58	1.9	1/17/2007	**52**	2.7	ND	--	48.6±30.0	--	--
B25-Z1-1.1	0.34	1.1	1/17/2007	34	1.4	--	--	<50	--	--
B26-Z1-1.6	0.49	1.6	1/17/2007	28	1.4	--	--	<50	**58.6±34.0**	6.7
B27-Z1-1.2	0.37	1.2	1/17/2007	18	1.0	--	--	<50	--	--
B28-Z1-0.4	0.12	0.4	1/17/2007	**420**	**29**	**1.9**	ND	**413.0±43.0**	--	--
B29-Z1-0.5	0.15	0.5	1/18/2007	**95**	3.1	ND	--	**66.0±27.0**	--	--
B30-Z1-1.5	0.46	1.5	1/18/2007	24	1.1	--	--	36.4±31.0	--	--
B31-Z1-0.8	0.24	0.8	1/18/2007	**190**	**9.7**	**0.57**	ND	**174.0±35.0**	--	--
B32-Z1-0.4	0.12	0.4	1/18/2007	**75**	3.7	ND	--	**68.1±31.0**	**55.8±33.0**	--
B33-Z1-0.2	0.06	0.2	1/18/2007	**490**	**35**	0.47	ND	**430.0±45.0**	--	--
B34-Z1-1.7	0.52	1.7	1/18/2007	21	0.61	--	--	<50	**108±32.0**	6.5
B35-Z1-2.0	0.61	2	1/18/2007	9.6	0.42	--	--	<50	--	--
B36-Z1-2.5	0.76	2.5	1/18/2007	12	0.37	--	--	<50	--	--
B37-Z1-0.5	0.15	0.5	1/18/2007	**160**	**10**	ND	ND	**121.0±31.0**	--	--
B38-Z1-0.7	0.21	0.7	1/18/2007	**140**	**7.9**	0.39	ND	**139.0±33.0**	--	7.0
B39-Z1-0.6	0.18	0.6	1/18/2007	29	1.2	--	--	<50	--	--
B40-Z1-0.5	0.15	0.5	1/18/2007	**99**	**8.3**	0.28	--	**177.0±32.0**	--	--

Notes:
Bold indicates the sample result exceeded a screening and/or hazardous waste criterion.
<50 = Not detected at the specified detection limit of the XRF
mg/kg = Milligrams per kilogram
mg/ℓ = Milligrams per liter
ND = Not detected above the laboratory reporting limit.
-- = not analyzed
WET = waste extraction test
TCLP = toxicity characteristic leaching procedure
XRF = X-ray fluorescence



REFERENCE: 2005 THOMAS GUIDE FOR IMPERICAL COUNTY, STREET GUIDE AND DIRECTORY.

0 732 1464

APPROXIMATE SCALE IN METERS

0 2400 4800

APPROXIMATE SCALE IN FEET

N

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

105388019 sim 1 1.cdr

Ninyo & Moore	SITE LOCATION MAP	FIGURE
PROJECT NO.	DATE	
105388019	4/07	INTERSTATE 5 AERIALLY DEPOSITED LEAD SURVEY SAN DIEGO, CALIFORNIA	1

SOURCE: GOOGLE EARTH AERIAL IMAGE

LEGEND

B40 Approximate location of hand auger borings (Ninyo & Moore 2006)

N

0 700 1,400 2,800 Feet

0 210 420 840 Meters

NOTE: ALL DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

Ninyo & Moore		HAND AUGER LOCATIONS	FIGURE
PROJECT NO.	DATE	INTERSTATE 5 AERIALLY DEPOSITED LEAD SURVEY SAN DIEGO COUNTY, CALIFORNIA	2
105388019	4/07		