GEOTECHNICAL DESIGN REPORT
PROPOSED TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

Prepared for:

T.Y. Lin International
404 Camino Del Rio South, Suite 700
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March 24, 2015

KLEINFELDER
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March 24, 2015
Project No. 20151065.001A

Mr. Jeff Burdick, P.E.
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San Diego, CA 92108

Subject: **Geotechnical Design Report**
Proposed Torrey Meadows Drive Overcrossing at State Route 56
Post Mile 5.6, Caltrans District 11
San Diego, California

Dear Mr. Burdick:

Kleinfelder is pleased to present this Geotechnical Design Report for the proposed Torrey Meadows Drive Overcrossing bridge project at State Route 56 in San Diego, California.

This report is to be used for roadway approach design for the subject bridge.

We appreciate the opportunity to be of service on this project. Please do not hesitate to contact the undersigned if you have any questions, comments, or require additional information.

Respectfully submitted,

KLEINFELDER

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1 INTRODUCTION

1.1 GENERAL

California State Route 56 (SR-56) is a four lane highway that serves the northern communities of the City of San Diego. SR-56 runs approximately 9 miles from Interstate 5 (I-5) in the Carmel Valley neighborhood of San Diego to Interstate 15 (I-15). SR-56 serves as an important connector between I-5 and I-15, being the only east–west freeway between SR-78 and SR-52 in north San Diego County.

We understand that the project consists of the design of a 337-foot long overcrossing bridge to connect Torrey Meadows Drive over SR-56. The project is located in the Carmel Valley area of the City of San Diego, California as presented on Figure 1, Site Vicinity Map. Figure 2 presents the Site Plan along with existing conditions.

The bridge will consist of a two-span structure with a single bent within the existing median of SR-56. We understand that cast-in-place post-tensioned reinforced concrete box girder construction will be used. Some minor grading and paving may be required in the approach areas.

This report presents our evaluation of anticipated geologic and geotechnical conditions associated with the proposed bridge. Geotechnical recommendations are provided based on review of available reports and documents associated with the site.

1.2 BACKGROUND REVIEW

Geologic and geotechnical literature reviewed for this study included reports, maps, and other documents prepared by the California Geological Survey, the U. S. Geological Survey and the City of San Diego. We have reviewed consultant reports and design drawings containing geologic and geotechnical geologic data for the Camino Ruiz/Camino Del Sur Undercrossing (#57-1083 L/R) located approximately 2,700 feet to the southwest and the McGonigle Creek Bridge (#57-1082) located about 650 feet to the northwest.

As-built plans for construction on SR-56 containing geologic data relevant to the site were also reviewed. Per the referenced as-built plans the proposed bridge site is located approximately at Station 100+15 of SR-56. The as-built plans for the Camino Del Sur Undercrossing and McGonigle Creek Bridge were present in the above referenced 2005 as-built plans.

A site reconnaissance was performed by a Kleinfelder engineering geologist as part of the background review.

Documents reviewed and referenced for this study are listed in Section 8 of this report.

Unless otherwise noted, elevation data presented in this report are in feet above Mean Sea Level (MSL) based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

2 EXISTING FACILITIES AND PROPOSED IMPROVEMENTS

2.1 EXISTING FACILITIES

Existing bridges in the vicinity of the proposed bridge include the Camino Del Sur Undercrossing (Bridge No. 57-1083 R/L) located approximately 2,700 feet southeast of the proposed bridge. The existing McGonigle Creek Bridge (Bridge No. 57-1082 R/L) is located approximately 650 feet northwest of the proposed bridge. The northern bridge abutment will be located approximately 100 feet northeast of the westbound shoulder of SR-56. The southern bridge abutment will be located approximately 90 feet southwest of the eastbound shoulder of SR-56. The existing median and slope areas in the vicinity of the proposed bridge are unpaved. Fill was placed in the abutment areas as part of a mass grading operation for the residential subdivision developments in the area. We understand that the future construction of this bridge was foreseen during the original construction of SR-56 and the alignment of Torrey Meadows Drive was established to facilitate the construction of this bridge.

Other existing facilities in the vicinity include residential developments to the north and south of the proposed bridge site. In addition, existing water and sewer lines are located within the alignment on Torrey Meadows Drive. No utilities are expected to traverse the central portion of the bridge.

2.2 PROPOSED IMPROVEMENTS

Based on the General Plan sheets prepared by T.Y. Lin International, the proposed Torrey Meadows Drive Overcrossing Bridge will have a length of approximately 337 feet measured along the center line of Torrey Meadows Drive. The bridge will carry two lanes, one in northbound direction and the other in southbound direction. The bridge will consist of two spans constructed with cast-in-place post-tensioned concrete box girders. The span lengths will be approximately 168 ½ feet and will have a width of approximately 54 feet. The roadway will have a width of approximately 40 feet.

Abutments of the two-span structure were originally proposed to be supported on cast-in-drilled-hole (CIDH) concrete piles. However, foundations for south Abutment 1 could be supported on shallow foundations. The center bent (Bent 2) will have two columns supported by spread footings located within the existing median of SR-56.

Bridge deck elevations will range from approximately +361 feet at Abutment 3 (north abutment), to +359 feet at Abutment 1 (south abutment). The bridge alignment plan and profile is shown on project drawings included in Appendix B.

Design recommendations for bridge foundations and abutments associated with the project are addressed in a separate Structure Foundation Report.

3 METHODS OF STUDY

The methods of study included both intrusive field explorations consisting of drilled boreholes. In addition, laboratory testing of selected samples of encountered soils were performed.

3.1 FIELD INVESTIGATION

The field investigation consisted of the excavation of 5 hollow-stem-auger (HSA) borings performed between July 22 and 25, 2014. Exploration locations are presented on Figures 2 and 3. A detailed description of the exploration activities with corresponding borehole logs are presented in Appendix B. A geologist or geotechnical engineer from Kleinfelder coordinated the field exploration activities, logging of the boreholes, and collected samples for further examination and laboratory testing. The field exploration program is described in Appendix B.

In addition, a limited pavement conditions survey was performed to assess the existing pavement conditions along the approach areas of the planned bridge within portions of Torrey Meadows Drive.

3.2 LABORATORY TESTING

The materials observed in the boreholes were visually classified and evaluated with respect to strength, swelling, compressibility, density, and moisture content. The material physical/mechanical properties and classifications were substantiated by performing selected laboratory tests. Laboratory testing performed consisted of the following tests:

- Moisture content
- Dry density
- Particle size distribution
- Atterberg limits
- Modified proctor compaction
- R-Value
- Direct shear tests

- pH
- Electrical resistivity
- Water soluble sulfate
- Water soluble chloride

Laboratory testing procedures and test results are provided in Appendix C.

4 SITE CONDITIONS

4.1 CLIMATE

The overall climate for San Diego is considered semi-arid with an average annual precipitation of approximately 10-inches. Precipitation records are available from the National Weather Service which date back to 1914. The site is located approximately 6 miles from the Pacific Ocean. Due to this relative close proximity to the ocean, temperatures are cooler during the summer and warmer during the winter compared to the areas east of the site. The average monthly high ranges from 57 degrees in January to 76 degrees in August. The average low temperature ranges from 49 degrees in January to 67 in August. Annual precipitation generally increases as you move further east towards the foothills and mountains. Nearly 90 percent of the precipitation occurs between the months of November and April.

4.2 TOPOGRAPHY AND DRAINAGE

Prior to the construction of SR-56 and the adjacent residential northern and southern subdivisions, the site consisted of a northwest facing hillside on McGonigle Canyon dissected by two small northwest flowing tributary drainage features. The tributary drainages were filled during grading of these subdivisions and construction related activities of SR-56.

The existing ground surface elevation along the alignment is approximately +357 feet at the south abutment, approximately +335 feet near the center, and +361 feet at the north abutment.

Based on the current topographic maps for the project and our site reconnaissance, the existing topography descends slightly downward to the west. Each abutment has a graded slope descending toward the SR-56 centerline at an approximate inclination of 2:1 (horizontal to vertical). The south Abutment 1 and north Abutment 3 slopes are approximately 25 to 30 feet in height. It should be noted that Kleinfelder did not perform a precise survey of the geometry of these slopes.

4.3 MAN-MADE AND NATURAL FEATURES OF ENGINEERING AND CONSTRUCTION SIGNIFICANCE

Torrey Meadows Drive Overcrossing involves the construction of a bridge over highway

SR-56. Construction of the overpass will not require any new cut/fill slopes, fill soils of significant thickness, approach embankments or retaining walls (with the exception of the bridge abutments).

The existing highway SR-56 is a fully developed and functional transportation corridor with drainage control, buried utilities, lane separation barriers, signage and landscaped slopes.

The existing residential street of Torrey Meadows Drive approaches the project site from both the northeast and the southwest. Both segments of Torrey Meadows Drive are paved and have buried utilities within and adjacent to them.

4.4 REGIONAL GEOLOGY

San Diego County resides within the Peninsular Ranges Geomorphic Province (California Geologic Survey (CGS), 2002; Norris and Webb, 1990). This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges north of the Los Angeles Basin and south to the southern tip of Baja California, Mexico. It varies in width from approximately 30 to 100 miles (Norris and Webb, 1990) and is characterized by mountainous terrain on the east composed mostly of Mesozoic igneous and metamorphic rocks, and relatively low-lying coastal terraces (coastal plain) to the west underlain by late Cretaceous, Tertiary, and Quaternary age sedimentary rocks.

The coastal plain which encompasses the site ranges from approximately ¼ mile wide in northern San Diego County and up to approximately 14 miles wide in the central and southern county regions. It is underlain by relatively undeformed, near shore marine sedimentary rocks, deposited during intermittent intervals between late Mesozoic through Quaternary time. These sedimentary units are comprised of a westward thickening clastic wedge deposited on bedrock of Cretaceous to Jurassic age igneous and metamorphic rocks. They are divided into three packages of deposits based on their sequence and age of deposition. The oldest sequence consists of claystone, siltstone, sandstone, and conglomerate deposited during late Cretaceous time as an apparent submarine fan. These units crop out on Mt. Soledad in La Jolla, Point Loma and Carlsbad.

The second sequence of sediments was deposited during the Tertiary period (Eocene and Pliocene) within an embayment that stretched from at least northern San Diego County and into Mexico (Kennedy, 1975; Kennedy and Tan, 2008). The sediments consist of a variety of claystone, siltstone, sandstone and conglomerate. The third sequence is associated with Pleistocene marine terrace deposits and consists of weakly to moderately consolidate conglomerates, sandstone, siltstone and claystone.

The regional geologic map for the area by Kennedy (1975) shown on Figure 4, Regional Geologic Map, indicates the project site is underlain by material of the second sedimentary sequence consisting of Eocene-age Mission Valley Formation and possibly Eocene-age Stadium Conglomerate at the north abutment approach area. The slope areas near both bridge abutments are underlain by artificial fill.

4.5 REGIONAL FAULTING

Southern California is cut by a system of numerous active faults associated with the San Andreas Fault. The San Andreas Fault delineates the boundary between two global tectonic plates consisting of the North American Plate on the east and the Pacific Plate on the west. The San Andreas Fault stretches from the Gulf of California in Mexico along a northwest alignment through the desert region of Southern California up to Northern California, where it eventually trends offshore north of San Francisco. Right lateral slip movement along the plate boundary of the San Andreas Fault is by far the most dominant factor controlling the seismicity throughout northern and southern California (Wallace, 1990; Weldon and Sieh, 1985). Within Southern California, the strain associated with the plate boundary movement extends well westward for up to 150 miles from the main San Andreas fault strand in the Imperial Valley to well offshore of San Diego (CDMG, 1999).

The major faults east of San Diego (from east to west) include the San Andreas Fault, the San Jacinto fault and the Elsinore fault (see Regional Fault Map and Earthquake Epicenters, Figure 5). Major faults west of San Diego include the Palos Verdes-Coronado Bank fault, the San Diego Trough fault, and the Santa Clemente fault (Kennedy and Welday, 1980). The dominant zone of faulting within the San Diego region is several faults associated with the Rose Canyon Fault Zone (RCFZ). Most of the seismic energy and associated fault displacement occurs along the fault structures closest to the plate boundary on the Elsinore, San Jacinto, and San Andreas faults, which account for up to 85% of the total displacement. The remaining 15% is accommodated across the various offshore faults and Rose Canyon fault. Studies within Rose Canyon (east of Mt. Soledad) have revealed fault strands that have clearly displaced Holocene soil horizons with slip rates from 1 to 2.4 mm/yr. (Lindvall et al., 1990, Lindvall and Rockwell, 1995, Rockwell, 2010).

The Rose Canyon fault is part of a more extensive fault zone that includes the Offshore Zone of Deformation and the Newport-Inglewood fault to the north, and several possible extensions southward, both onshore and offshore (Treiman, 1993). The Rose Canyon fault zone is made of predominantly right-lateral strike-slip faults that extend southwest-southeast through the San Diego metropolitan area. Various fault strands display strike slip, normal, oblique, or reverse components of displacement (Treiman, 1993). The fault zone extends offshore at La Jolla and continues north-northwest subparallel to the coastline. To the south in the San Diego downtown area the fault zone appears to splay out into a group of generally right-normal oblique faults extending into San Diego Bay (Treiman, 1993; Kennedy and Clarke, 1999).

4.6 LOCAL FAULTING

The local onshore portion of the RCFZ extends from La Jolla along a south-southeast alignment over Mt Soledad and along the general trend of Interstate 5 into downtown San Diego. Through downtown, the fault appears to branch and is expressed southward across San Diego Bay as three faults consisting of the Silver Strand fault, the Coronado fault and the Spanish Bight fault. The California Geologic Survey has designated portions of the fault zone in the Mount Soledad, Rose Canyon, Port of San Diego, Coronado, and downtown San Diego areas as active Earthquake Fault Zones. An active fault is a fault which has undergone movement within the last 11,000 years which spans the Holocene period. The closest active fault of this zone to the Torrey Meadows Drive Overcrossing site is located approximately 8 miles west.

Approximately 5,400 feet to the north and 5,600 to the east of the site are two un-named faults. These faults have been classified by the referenced City of San Diego Seismic Safety Study (2008) as *"Potentially Active, Inactive, Presumed Inactive or Activity Unknown*". These faults are likely pre-Holocene in age and are likely related to an earlier incipient phase of development of the Rose Canyon Fault. Caltrans (2013) does not consider these faults as seismogenic for design purposes.

4.7 SUBSURFACE CONDITIONS

The subsurface conditions were appraised based on review of published geologic maps, the results of our field explorations, laboratory testing and visual on-site observations. A geologic section depicting conditions at the site is presented in Figure 6.

4.7.1 Artificial Fill

During construction of SR-56 and the adjacent subdivisions, fill was placed within the tributary drainage in the area below the proposed north bridge abutment. The grading on the north abutment area resulted in a west-facing fill slope which descends approximately 90 feet to the slope toe within the bottom of the drainage. Due to the lack of existing borings in this area or as-graded reports, it is unknown whether colluvium and/or alluvium were removed prior to placement of the fill. Extrapolation of native slopes suggests that the fill depth may be in the order of 60 to 65 feet at the north abutment/approach area (approximate project Station 14+00). Note that the fill thickness is estimated to be approximately 10 to 20 feet thick between proposed Stations 6+00 to 8+00. Fill thickness approximately between Stations 15+00 to 16+00 is estimated to be up to 80 feet and is expected to decrease to approximately 40 to 45 feet thick at Station 17+00. The estimated fill thickness at Station 18+00 is approximately 15 feet. See Figure 6 for graphical representations of fill thicknesses along the proposed bridge alignment.

Borehole A-14-003 located near southerly Abutment 1 encountered fill soils to a depth of 17 feet. The fill soils generally consisted of medium stiff to stiff sandy lean clay and loose to medium dense clayey sand. Blow counts ranged from 5 to 17 blows per foot (bpf).

Boreholes A-14-005 and A-14-006 near northerly Abutment 3 encountered fill soils to depths of 61 and 65 feet, respectively. Fine grained fill soils generally consisted of stiff to very stiff lean clay to sandy lean clay with gravel and sandy silt with blow counts ranging from 17 to 40 bpf. Granular fill soils generally consisted of medium dense to very dense silty to clayey sand with little gravel with blow counts ranging from 21 to 86 bpf.

4.7.2 Mission Valley Formation

The geologic maps by Kennedy (1975) and Kennedy and Tan (2008) indicate that the project site is underlain by sandstone and claystone of the Eocene-age Mission Valley Formation. This unit is characteristically described as soft and friable sedimentary rock with the potential of having occasional cobble conglomerate beds. This unit is present at the ground surface at the central Bent 2 and below the fill soils at the north and south abutment locations.

The Mission Valley Formation encountered in the boreholes generally consisted of silty to clayey sandstone and sandy claystone. The color ranged from light brownish grey to dark reddish brown with variable levels of mica and iron staining. The material is highly weathered with weak to strong cementation associated with non-plastic to moderate plasticity. In the area of central Bent 2, borehole A-14-004 encountered a stiff layer of sandy lean clay at a depth of about 40 feet.

4.7.3 Stadium Conglomerate

Although not encountered in any of the borehole explorations, the Eocene-age Stadium Conglomerate is anticipated to underlie the Mission valley Formation below approximately elevation +300 feet MSL at the northern end of the site project limits. This unit typically consists of massive cobble conglomerate with a coarse grained sandstone matrix.

4.8 GROUNDWATER

Groundwater was not encountered within the depths of the borehole explorations performed. A search of the California Department of Water Resources website (http://www.water.ca.gov/waterdatalibrary) did not identify any state monitored wells located within the vicinity of the proposed structure. Based on previous experience in this area, the regional groundwater table depth is anticipated to be in excess of 100 feet below ground surface. However, it is possible that perched groundwater may be present near the bottom of the in-filled canyons. Groundwater levels are subject to seasonal fluctuations.

5 POTENTIAL GEOLOGIC HAZARDS

Potential geologic hazards evaluated include ground surface rupture, seismic shaking, tsunami, seiche and flood, liquefaction, seismic compaction, ground compressibility, slope stability and expansive soils.

5.1 CITY OF SAN DIEGO SEISMIC SAFETY STUDY

The referenced City of San Diego Seismic Safety Study, Geologic Hazards and Faults (2008), has designated the area of the south abutment as a Zone No. 52- "*Other level areas, gently sloping to steep terrain, favorable geologic structure, Low Risk".* The north abutment has been designated as a Zone No. 53 "*Level or sloping terrain, unfavorable geologic structure, Low to Moderate Risk".*

5.2 CALTRANS SEISMIC DESIGN PARAMETERS

Since the structure will be constructed within California Department of Transportation (Caltrans) right-of-way, it is anticipated that the structure will be designed in accordance with Caltrans seismic design criteria. Based on mapping by the California Geologic Survey (Bryant and Hart, 2007) and on the Caltrans ARS Online website (http://dap3.dot.ca.gov/ARS_Online Caltrans, 2013), the Rose Canyon Fault Zone (Del Mar section, fault database ID No. 401) is mapped approximately 8 miles west of the proposed structure and is the governing fault for deterministic seismic hazard analysis. For development of design ground motion parameters, Caltrans (2013) has assigned this fault as right-lateral strike slip dipping 90 degrees with a Maximum Moment Magnitude (M_{Max}) of 6.8. Additional fault characteristics are summarized in Table 1.

Our estimate of the shear wave velocity in the upper 100 feet (30 meters) (V_{S30}) for the site is based on USGS Earthquake Hazard website, Predefined V_{s30} Maps and assumed material types and correlation values. The site is not located within a California deep soil basin region as defined by Caltrans (2013). Site characteristics and governing fault parameters are summarized in Table 1.

Table 1. Site Characteristics and Governing Fault Parameters

Site Coordinates	Latitude = 32.9627 degrees, Longitude = -117.1604 degrees
Shear Wave Velocity, V_{s30}	1,340 ft/s (400 m/s)
Depth to V_s=1.0 km/s, Z1.0	Not Applicable (Not located in a basin)
Depth to V_s=2.5 km/s, Z2.5	Not Applicable (Not located in a basin)
Fault Name and Identification Number	Rose Canyon Fault Zone (Del Mar section), Identification Number. 401
Maximum Magnitude (M_{Max})	6.8
Fault Type	Right Lateral Strike Slip
Fault Dip	90 degrees
Dip Direction	Vertical
Bottom of Rupture Plane	5.0 miles (8 km)
Top of Rupture Plane (Ztor)	0 mile (0 km)
R_{RUP}[1]	8 miles (12.9 km)
R_{JB}[2]	8 miles (12.9 km)
R_X[3]	8 miles (12.9 km)
F_{norm}[4] (1 for normal, 0 for others)	0
F_{rev}[5] (1 for reverse, 0 for others)	0
Design Peak ground Acceleration (PGA)	0.32

Notes: V_{s30} = shear wave velocity in the upper 100 feet (30 meters);
[1] R_{RUP} = Closest distance from the site to the fault rupture plane.
[2] R_{JB} = Joyner-Boore distance; the shortest horizontal distance to the surface projection of the rupture area.
[3] R_X = Horizontal distance from the site to the fault trace or surface projection of the top of the rupture plane.
[4] F_{norm} = Faults identified as a Normal Fault in the Caltrans Fault Database.
[5] F_{rev} = Faults identified as a Reverse Fault in the Caltrans Fault Database.

The deterministic response spectrum was calculated using ARS Online and checked using the Caltrans Deterministic Spreadsheet (version dated February 21, 2012).

The probabilistic response spectrum was developed using ARS Online and compared with results from the 2009 USGS Interactive Deaggregation (Beta) website (USGS 2008) with V_{s30} = 1,340 ft/s (400 m/s) using the Caltrans Probabilistic Spreadsheet (version dated January 16, 2013).

The upper envelope of the deterministic and probabilistic spectral values determines the design response spectrum. The probabilistic spectral values were found to control the design response spectrum for the project site. The recommended acceleration and displacement design response spectra are presented graphically on Figure 8 and numerically on Figure 9.

5.3 GROUND SURFACE FAULT RUPTURE

Based on CGS (1991), a State of California active Earthquake Fault Zones (EFZ) is not present within or nearby the bridge site. As previously discussed in Section 4.6, the closest active fault that has been identified in the area of the proposed bridge is approximately 8 miles west of the site. Based on this data, the surface fault rupture hazard at the proposed site is considered very low.

5.4 LIQUEFACTION AND SEISMIC COMPACTION

Soil liquefaction is a phenomenon in which saturated, cohesionless soils lose stiffness and strength due to the build-up of excess pore water pressure during cyclic loading such as that induced by earthquakes. The primary factors affecting the liquefaction potential of a soil deposit are: 1) intensity and duration of earthquake shaking, 2) soil type and relative density, 3) overburden pressures, and 4) depth to groundwater. Soils most susceptible to liquefaction are saturated, loose sands, and low to non-plastic silts.

Based on the expected lack of significant groundwater and the predominance of dense sandstone (Mission Valley Formation) materials at the site, the liquefaction hazard at the site is expected to be nil. This should be confirmed in the final design through field exploration, laboratory testing and analysis.

Seismic compaction is a phenomenon in which loose, unsaturated sands tend to densify and settle during strong earthquake shaking. Our research into historical aerial photographs indicates that the residential subdivisions on both sides of SR-56 were constructed sometime around 2002 and 2003. Based on the standard of care and City of San Diego grading permit requirements in place during construction, it is anticipated the fill soils were compacted to a minimum of 90% relative compaction and loose native surficial soils were either removed or adequately compacted in-place prior to new fill placement. However, during the writing of this report no grading reports for these residential developments could be located. The condition of the fill will need to be verified as part of the planned geotechnical field investigation.

Based on the anticipated condition of the fill, we expect the seismic compaction hazard to be low to moderate. The sandstone and claystone materials present outside of the canyon fill have a negligible potential for seismic compaction. These findings should be confirmed with the bore hole data analysis in the final design.

5.5 SLOPE STABILITY

The north side of the project site is within a hillside area consisting of a manmade fill slope, and natural slopes. The south side appears to be comprised of a smaller fill slope and possible cut slopes. The existing natural slopes and cut slopes are comprised of the Mission Valley Formation. The existing slopes adjacent to the planned abutment areas have gradients of 2H:1V (or flatter) with heights on the order of 26 feet each. Evidence of instability in the existing slopes was not observed during the Kleinfelder site reconnaissance. The results of slope stability analyses for the abutment areas are presented in the Structure Foundation Report.

5.6 FLOODING AND SCOUR POTENTIAL

The flood hazard potential at the site was evaluated based on flood hazard maps available through the Federal Emergency Management Agency (FEMA) Map Service Center website. Based on review of FEMA Map No. 06073C1335G, flood hazard zones are not present along the bridge alignment. The proposed bridge will not cross over rivers, creeks, channels, or other water bodies. Therefore, the potential for scour is not considered a design issue.

5.7 SOIL CORROSIVITY POTENTIAL

Preliminary soil corrosivity screening was performed on six samples obtained from borings. The results of soil corrosivity are presented in Section 6.5.

6 CONCLUSIONS AND RECOMMENDATIONS

Geotechnical engineering recommendations for the support of the structural elements associated of the proposed Torrey Meadows Drive Overcrossing are presented in the following sections. These recommendations are based on Kleinfelder's understanding of the project, and the results of Kleinfelder's field explorations and laboratory testing and professional judgment.

6.1 EARTHWORK AND GRADING

6.1.1 Soil Characteristics

Based on the field and laboratory data, the soils within the anticipated excavation depths generally consist of compacted fill soils and very dense and cemented soils of the Mission Valley Formation as described in Section 4.7.2. The excavation of these soils should be possible using moderate to strong effort with conventional heavy-duty grading and excavating equipment. Nevertheless, due to the cemented nature of the Mission Valley Formation, difficult excavation may be encountered during the CIDH excavation.

6.1.2 Site Preparation

Site preparation should be performed in accordance with Section 16 and 19 of the Caltrans Standard Specifications (Caltrans 2010c).

6.1.3 Excavation Sloping and Shoring

Temporary trench excavations should be laid back or shored in accordance with the U.S. Occupational Safety and Health Administration (OSHA), Caltrans, and any other applicable regulations. For planning purposes, fill soils can be considered OSHA Type C soil and the Mission Valley Formation OSHA Type B. The actual OSHA soil type should be determined by the contractor's responsible person in the field at the time of construction. Type C soils should have 1½H:1V temporary construction excavation slopes. Type B soils should have 1:1 temporary construction excavation slopes. If stability of an excavation becomes questionable during construction, the excavation should be evaluated promptly by the geotechnical engineer.

The soil classifications presented in this report may be used for the planning of excavations and trench slopes in accordance with OSHA requirements or for the design of shoring and/or the use of trench boxes. Construction personnel should be aware that soil conditions may change rapidly if soil moisture conditions change or if soils that have been disturbed by previous excavations are encountered. Measures should be taken to protect construction personnel from raveling of trench sidewalls. If sloughing or free water is encountered, it may be necessary to reduce trench slopes beyond OSHA requirements or provide shoring. All excavations should comply with current OSHA safety requirements.

No surcharge loads, such as the weight of heavy equipment, should be placed within 10 feet from the top of excavations. Care should be taken during excavation to avoid removing support for any existing improvements, such as foundations, pavements, and buried utilities.

The contractor is responsible for selecting, designing, and constructing temporary shoring systems that adequately protect the existing structures, utilities, and other improvements. The contractor should be required to submit shoring plans to the geotechnical consultant and bridge engineer for review and comment at least two weeks prior to the beginning of construction. The shoring plans should clearly define construction sequencing, particularly the sequence of excavation and tieback installation, if needed.

6.1.4 Fills and Backfills

Any areas of loose or yielding soils should be overexcavated and replaced with compacted Structural Backfill in accordance with Caltrans Standard Specifications Section 19. Any soils that cannot be compacted, or are otherwise unsuitable for the planned use, should be excavated and disposed of from the project site. The exposed surface should be scarified and compacted to the specified density before placement of new fill. New fill placed on or adjacent to existing slopes should be properly benched into the existing fill in accordance with Caltrans Standard Specifications Section 19. Footing excavations for Abutment 1 and Bent 2 are intended to expose Mission Valley Formation. This formation should be undisturbed during excavation below the proposed footing. The geotechnical engineer should be called to verify the complete exposure of the formation within the footing excavations to verify compliance with design assumptions.

All earthwork should be performed in accordance with Caltrans Standard Specifications

Section 19. All materials to be placed as fill should be free of vegetation, organics, debris, and other deleterious materials. All fill placed around foundations and behind walls should be placed in thin loose lifts, moisture-conditioned, and compacted to Caltrans Standard Specifications.

Embankments within 150 feet of bridge abutments should be considered structure approach fills and should conform to the Caltrans Standard Specifications as such. Materials with a dimension greater than 3 inches should not be used in structure approach fills. Abutment backfill shall be structural backfill according to Caltrans standard specifications. Expansive soils, defined as soils with Expansion Index greater than 50 and/or soils with Sand Equivalent less than 20, should be excluded from the bridge abutments as required by Caltrans guidelines. Expansion Index should be determined in accordance with ASTM D 4829. Sand Equivalent should be determined in accordance with California Test Method 217. Fills should be compacted to meet Caltrans specifications.

6.2 PAVEMENTS

6.2.1 Pavement Condition Survey

A pavement condition survey on Torrey Meadows Drive was performed on July 23 and 24, 2014. The location of the surveyed pavement segment is divided into two parts by the presence of SR-56. The south side of the future bridge included the Torrey Meadows Drive from Stations 1+00 to 9+00 and the north side from Stations 16+00 to 23+50.

The existing pavement conditions and distress were observed and categorized in general accordance with ASTM D6433 *Roads and Parking Lots Pavement Condition Index Surveys.* The south side pavement surface consisted of Asphalt Concrete (AC) section that had been rehabilitated with slurry seal. The most of the north side pavement surface consisted of ½-inch size AC mix, except the surface around Station 23+00 (the intersection between Torrey Meadows Drive and Via Sabbia) consisted of ¾-inch size AC mix.

In general the pavement condition on both sides can be considered good. The ride quality is good. The most common pavement distress on the north part was polished aggregate and cracks around the utility risers. In the south part the most common distress were the reflective cracks from utility trench along the South Bound lane for about 400 feet, raveling, and weathering. Pavement scouring/abrasion were also observed in many locations towards the end of the cul-de-sac in the south part (between stations 6+00 and 9+00). Details of distress type and its corresponding location observed during pavement survey are summarized in Table 2.

Table 2. Summary of Pavement Condition Survey on Torrey Meadows Drive

DISTRESS TYPE	STATION	DESCRIPTION
Reflective Cracking from Utility Trench	1+40 to 5+50 SB	Continuous cracks reflecting underlain trench shape for about 400 feet long.
	5+90 SB	Around an area about 15 by 10 feet.
Raveling	2+50 to 3+50 SB	About 100 feet long and 10 inches wide on the wheel path.
	5+50 to 6+00 SB	About 50 feet long and 10 inches wide on the wheel path.
	6+40 NB	Area about 15 by 2 feet.
	19+00 NB	Area of about 10 by 6 feet as shown in Figure 3 (aggregate popout).
	21+10 NB	Area of about 8 by 4 feet (aggregate popout)
	22+60 SB	Area of about 4 inches in diameter.
Weathering	2+50 NB	Area of about 7 by 6 inches.
	2+50 NB	Area of about 6 by 5 inches.
	3+00 NB	Area of about 6 by 4 inches. Other areas were 10 by 3 inches and 12 by 3 inches.
	17+70 SB	Area of about 5 by 5 feet.
	18+60 SB	Area of about 10 by 1 feet, along the edge.
Polished Aggregate	1+00 NB	Low severity about the middle lane about 4 by 3 feet.
	16+55 SB	Medium severity in an area of about 5 by 4 feet.
	17+70 NB	Medium severity in an area of about 10 by 4 feet.
	18+50 NB	Medium severity in area of about 5 by 5 feet.
	19+50 NB	Medium severity in area of about 20 by 6 feet.
	21+90 SB	Medium severity in area of about 8 by 4 feet.
	23+50 NB	Medium severity in area of about 10 by 10 feet.
Pavement Scouring	6+60 NB	Area of about 3 by 2 inches at 3 adjacent locations.
	7+30 NB	Area of about 6 feet long, 2 inches wide, and 1/16 inch deep.
	7+40 NB	Area of about 10 by 2 inches at 2 adjacent locations.
	8+00 SB	Area of about 15 feet long, 4 inches wide and 1/16 inch deep.
	8+10 SB	Area of about 4 inches long, 2 inches wide and 1/4 inch deep.

Table 2. Summary of Pavement Condition Survey on Torrey Meadows Drive (continued)

DISTRESS TYPE	STATION	DESCRIPTION
Pavement Scouring	8+40 SB	Area of about 4 inches long, 2 inches wide and 3/8 inch deep.
	8+60 NB	Various marks, from 1 to 10 inches long, about ½ inch wide, and ¼ inch deep.
	19+75 NB	Area of about 6 inches long, ½ inch wide, and ¼ inch deep at 2 locations.
Cracking around utility riser	5+50 NB	Around an area of about 15 feet long and 10 feet wide. Crack width was about 1/8 inch wide.
	9+00 NB	Area of about 3 by 3 feet. Crack width was about 1/8 inch wide.
	17+80 NB	Around an area of about 6 feet long and 4 feet wide. Crack width was about 1/8 inch wide.
	18+60 SB	Area of about 5 by 3 feet. Crack width was about ¼ inch.
	20+80 Middle Lane	Around area of about 5 feet in diameter. Crack width was about 3/8 inch.
	22+50 Middle Lane	Around area of about 4 feet in diameter. Crack width was about 1/8 inch.
Transverse cracking	3+10 NB	About 12 feet long and 1/8 inch wide.
	5+00 NB	About 6 feet long and 1/8 inch wide.
	17+00 NB	About 10 feet long and 1/8 inch wide.
	17+75 Middle Lane	About 6 feet long and 3/8 inch wide.
	19+20 NB	About 10 feet long and ¼ inch wide.
	20+90 NB	About 5 feet long and ¼ inch wide.
Longitudinal cracking	4+50 to 4+62 NB	Middle of the lane, about 12 feet long and 1/16 inch wide.
	22+50 to 23+00 NB	About 50 feet long and 1/16 inch wide.
Edge Spalling	1+00 NB	About 8 inches long and 2 inches wide.
	4+10 SB	Area of about 12 x 3 inches. Filled with slurry seal.
	5+70 NB	About 8 inches long and 2 inches wide.
	16+85 SB	About 6 by 2 inches at 3 locations.
Edge Cracking	1+05 SB	About 20 feet where the slurry seal surface meet the concrete gutter.
	4+00 NB	About 30 feet where the slurry seal surface meet the concrete gutter.
	7+80 NB	About 30 feet where the slurry seal surface meet the concrete gutter.
	20+10 NB	About 8 feet long and 3/8 inch wide.
Linear cracking at curb and gutter	1+40 SB	Continuing crack from curb construction joint about 1/16 inch wide.
	5+70 NB	Continuous cracks at curb and gutter about ¼ inch wide.

Table 2. Summary of Pavement Condition Survey on Torrey Meadows Drive (continued)

DISTRESS TYPE	STATION	DESCRIPTION
Linear cracking at curb and gutter	9+00 SB	Continuous cracks at curb and gutter about 1/16 inch wide.
	16+85 SB	Continuing crack from curb construction joint at the gutter about ¼ inch wide.
	18+05 NB	Continuing crack from curb construction joint at the gutter about ¼ inch wide.
	19+50 NB	Continuous cracks at curb and gutter about ¼ inch wide.
	21+50 SB	Continuing crack from curb construction joint at the gutter about ¼ inch wide.
Rutting	1+10 SB	Low severity rutting on the wheel path.
Pavement Depression	23+00 NB	Low severity depression around utility riser .
Patching	17+00 SB	Low severity in area of about 10 by 5 feet .
Divided Slab	9+00 SB	Medium severity at curb and gutter cul-de-sac concrete.
Missing Center Line Pavement Marker	18+50 Middle Lane	One marker was missing.
	19+90 Middle Lane	One marker was missing

6.2.2 Flexible Pavement Design

We performed resistance R-value (R-value) tests on bulk soil samples of the near-surface soils at two boring locations during this study to further evaluate pavement support characteristics of the onsite soils for the proposed roadway alignment. The R-value tests were performed in accordance with ASTM D 2844 and the results are presented in Appendix C. The samples selected for testing during this study were collected at locations A-14-002, and A-14-007. The R-values of soils tested were 11 and 6, respectively. Flexible pavement sections were evaluated in general accordance with the Caltrans method for flexible pavement design with subgrade design R-values of 5, 15, and 25. Based on our experience with subsurface soil in the site vicinity, the near surface fill soils are extremely variable and design should be verified at the time of construction by sampling the final elevation subgrade material and performing R-value laboratory testing for verification. The actual limits of areas with variable soil conditions for design should be evaluated by observation during grading and backfill operations.

We have considered design for R-value of 15 and 25 based on the removal and replacement of existing clayey soils with granular select import fill.

Based on our review of the referenced project plans, flexible pavement sections for the roadway are based on Traffic Indexes (TI's) of 6.0, 7.0, and 8.0. An R-value of 78 was used for Caltrans Class II, aggregate base in our design.

Recommended flexible pavement sections for TI of 6.0, 7.0, and 8.0 for various R-values are given in Table 3.

Table 3. Flexible Pavement Sections

SUBGRADE DESIGN R-VALUE	TRAFFIC INDEX					
	6.0		7.0		8.0	
	ASPHALT CONCRETE (INCHES)	CLASS 2 AGGREGATE BASE (INCHES)	ASPHALT CONCRETE (INCHES)	CLASS 2 AGGREGATE BASE (INCHES)	ASPHALT CONCRETE (INCHES)	CLASS 2 AGGREGATE BASE (INCHES)
5 (existing)	3 ½	12 ½	4	15	5	18
15	3 ½	10	4	12 ½	5	15
25	3 ½	8 ½	4	10	5	12

The flexible pavement should conform to, and be placed in accordance with, current Caltrans Specifications. The aggregate base should comply with the specifications in Section 26 of Caltrans Standard Specifications. The aggregate base and the upper 12 inches of subgrade should be compacted to a minimum of 95 percent relative compaction as obtained by the ASTM D 1557 test procedure.

We recommend that all pavement areas conform to the following criteria:

1. All trench backfill should be properly placed and adequately compacted to provide a stable subgrade. Trench backfill below the 18 inches of pavement soil subgrade should be compacted to a minimum of 90 percent relative compaction (ASTM D 1557).
2. An adequate drainage system should be provided to prevent surface water from saturating the subgrade soil.
3. A periodic maintenance program should be incorporated to include sealing cracks and other measures.

4. Concrete curbs, if utilized, should extend below the bottom of adjacent aggregate base materials.

6.3 SOIL CORROSIVITY

Preliminary soil corrosivity screening on six samples obtained from borings to aid in the evaluation of attack to concrete and ferrous metals was performed. Laboratory test results for pH, minimum electrical resistivity, and soluble chloride and sulfate content are presented in Table 4 and included in Appendix C.

Table 4. Soil Corrosivity Test Results

BORING	DEPTH (FEET)	PH	SULFATE (PPM)	CHLORIDE (PPM)	MINIMUM RESISTIVITY (OHM-CM)
A-14-003	3.5	8.4	120	260	500
A-14-004	2.0	8.4	30	32	1100
A-14-005	2.5	8.6	150	160	460
A-14-005	66.5	8.0	350	110	420
A-14-006	13.5	8.8	120	420	350
A-14-006	76.5	7.4	150	1340	250

For reference, Caltrans (2012d) considers a site to be corrosive if one or more of the following conditions exist for the representative soil samples taken at the site: chloride concentration is 500 parts per million (ppm) or greater, sulfate concentration is 2,000 ppm or greater, or the pH is 5.5 or less.

With the exception of the soil sample from Boring A-14-006 at a depth of 76.5 feet in the Mission Valley Formation, the soils at the site may be considered non-corrosive with respect to sulfate and chloride content. The subject exception samples indicated a chloride content of 1,340 ppm which may be considered to have moderate attack potential.

The minimum resistivity tests performed indicated that the soil is considered to be corrosive to severely corrosive to buried unprotected metal objects. A commonly accepted correlation between soil resistivity and corrosivity towards unprotected ferrous metals (National Association of Corrosion Engineers, 1984) is provided in Table 5.

Table 5. Corrosion Potential based on Minimum Resistivity (NACE, 1984)

MINIMUM RESISTIVITY (OHM-CM)	CORROSION POTENTIAL
0 to 1,000	Severely Corrosive
1,000 to 2,000	Corrosive
2,000 to 10,000	Moderately Corrosive
Over 10,000	Mildly Corrosive

The preliminary corrosion tests are only an indicator of potential soil corrosivity for the sample tested. It is recommended that the corrosivity test results be reviewed and evaluated by the project designers considering the improvements and project lifespan requirements. Kleinfelder's scope-of-work does not include corrosion engineering and the purpose of the tests is only to provide a preliminary screening. Additional sampling and testing may be performed after completion of grading for the site improvements. A qualified corrosion engineer should be contacted to for detailed evaluation of corrosion potential with respect to construction materials at this site and review the proposed design.

7 LIMITATIONS

This report has been prepared for the exclusive use of T.Y. Lin International, and the project design team for specific application to the proposed Torrey Meadows Drive Overcrossing bridge project. It is intended solely for their use in the type selection and preliminary design of the project as described herein. It may not contain sufficient information for other uses or purposes of other parties. This report is presented with the understanding that a design-level Structure Foundation Report will be prepared for the subject project in the future.

The findings, conclusions, and recommendations presented in this report were prepared in a manner consistent with the standards of care and skill ordinarily exercised by members of the geotechnical profession practicing under similar conditions in the same geographic vicinity and at the time the services were performed. No warranty or guarantee, express or implied, is made. If any change (i.e., structure type, location, etc.) is implemented which materially alters the project, additional geotechnical services may be required, which could include revisions to the geotechnical recommendations presented herein.

Hazardous materials and solid waste evaluations performed by Kleinfelder Inc. (Kleinfelder) for this project are to be summarized in separate reports. Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

This report may be used only by T.Y. Lin International, and the project design team, and only for the purposes stated within a reasonable time from its issuance, but in no event later than two years from the date of the report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Kleinfelder harmless from any claim or liability associated with such unauthorized use or non-compliance.

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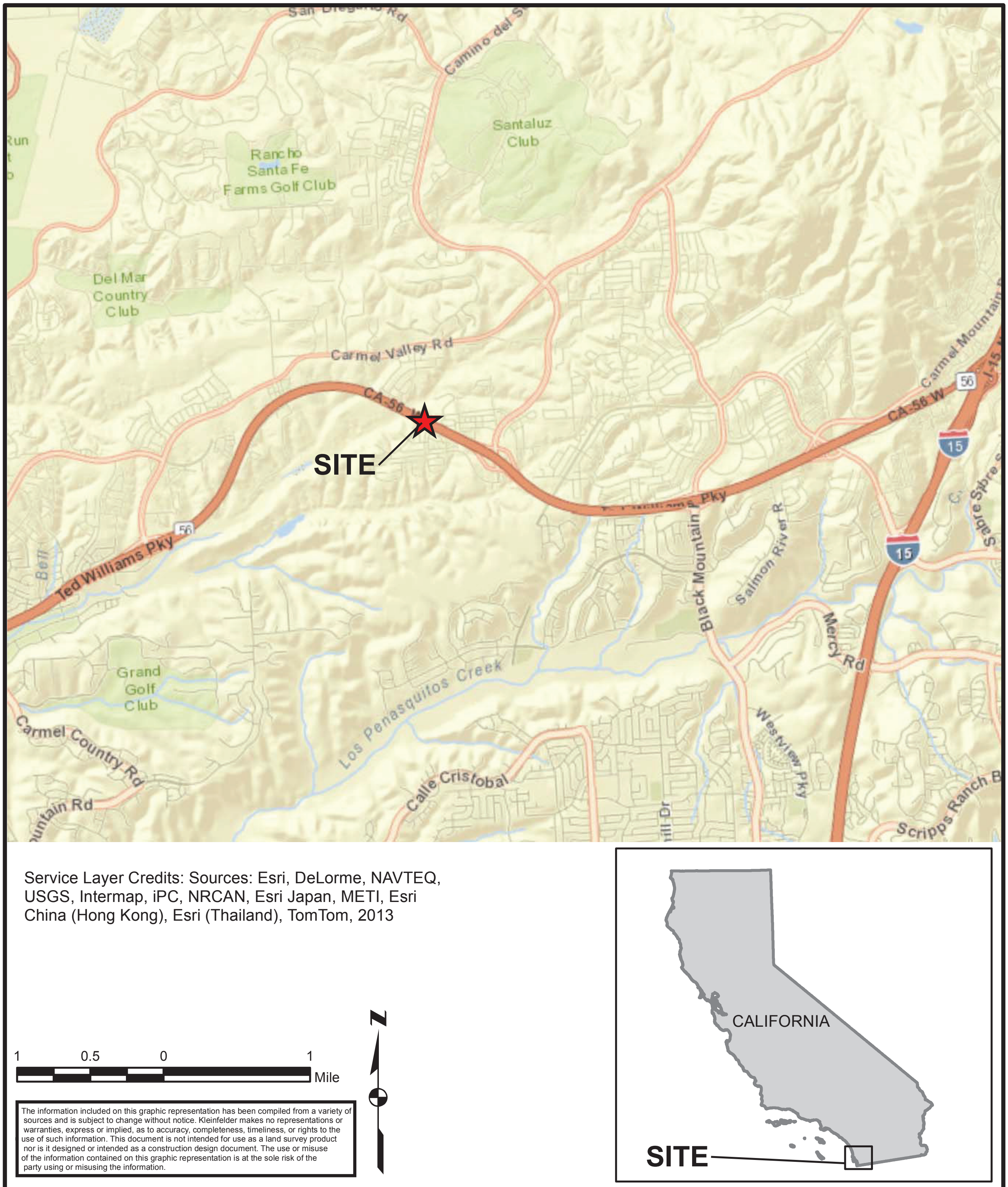
FIGURES



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DRAWN BY: JP
CHECKED BY: EK
FILE NAME: 20151065_Vic.MXD

SITE VICINITY MAP

TORREY MEADOWS DRIVE OVERCROSSING
AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
1

Path: J:_clients\TY_Lin\20151065.001A\20151065_Vic.mxd

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LEGEND

⊕ APPROXIMATE LOCATION AND DEPTH OF BRIDGE BORING

● APPROXIMATE LOCATION AND DEPTH OF ROADWAY BORING

◐ APPROXIMATE LOCATION AND DEPTH OF PAVEMENT CORE

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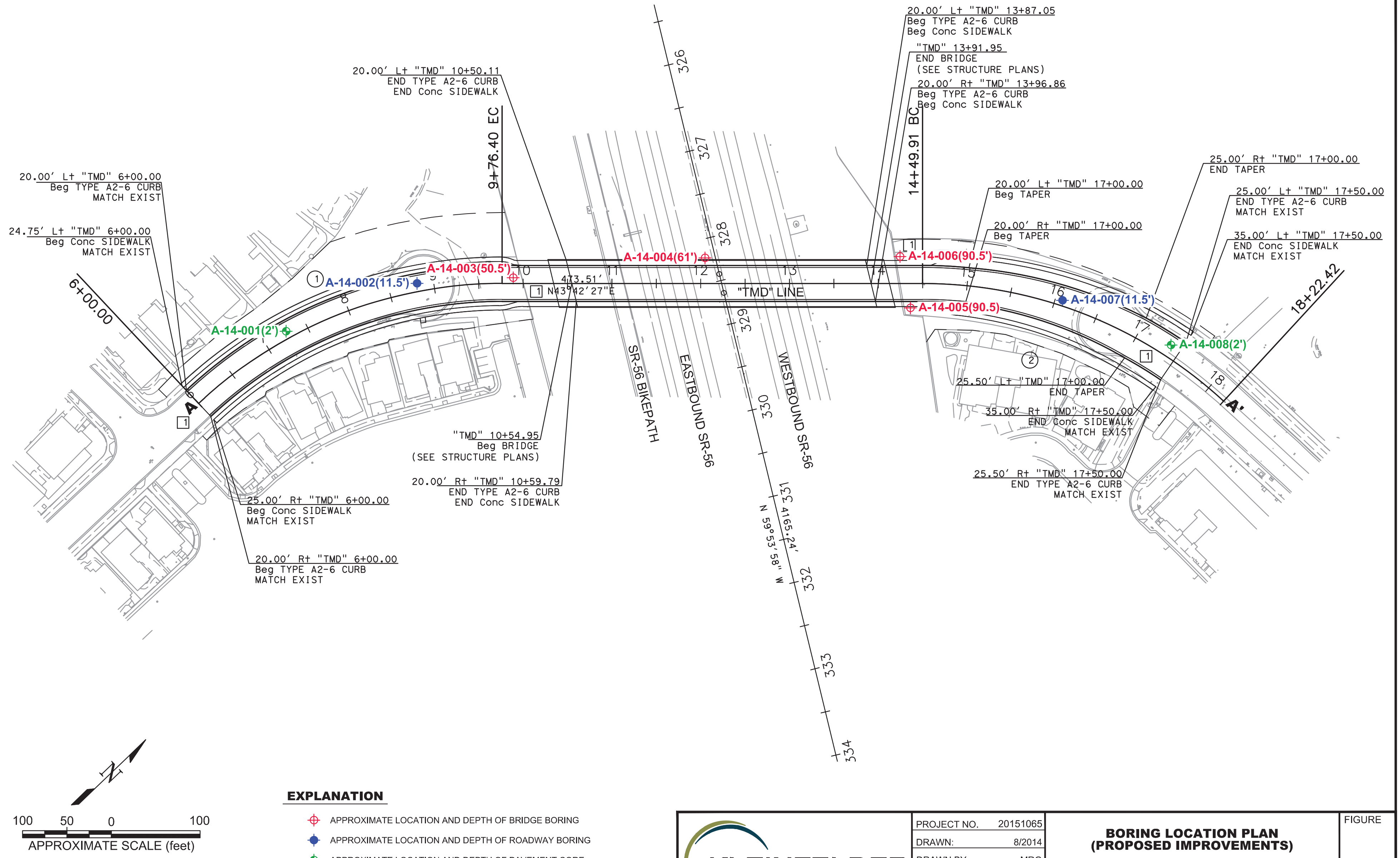
SITE PLAN
(EXISTING CONDITIONS)

TORREY MEADOWS DRIVE OVERCROSSING
AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
2

Path: J:_clients\TY_Lin\20151065.001A\20151065_Site.mxd



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EXPLANATION

- ⊕ APPROXIMATE LOCATION AND DEPTH OF BRIDGE BORING
- ● APPROXIMATE LOCATION AND DEPTH OF ROADWAY BORING
- ⊕ APPROXIMATE LOCATION AND DEPTH OF PAVEMENT CORE
- A—A' APPROXIMATE CROSS-SECTION LOCATION (FIGURE 6)

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FILE NAME:	20151065p3_BLM.dwg

BORING LOCATION PLAN (PROPOSED IMPROVEMENTS)

TORREY MEADOWS DRIVE
OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
3

ATTACHED IMAGES:
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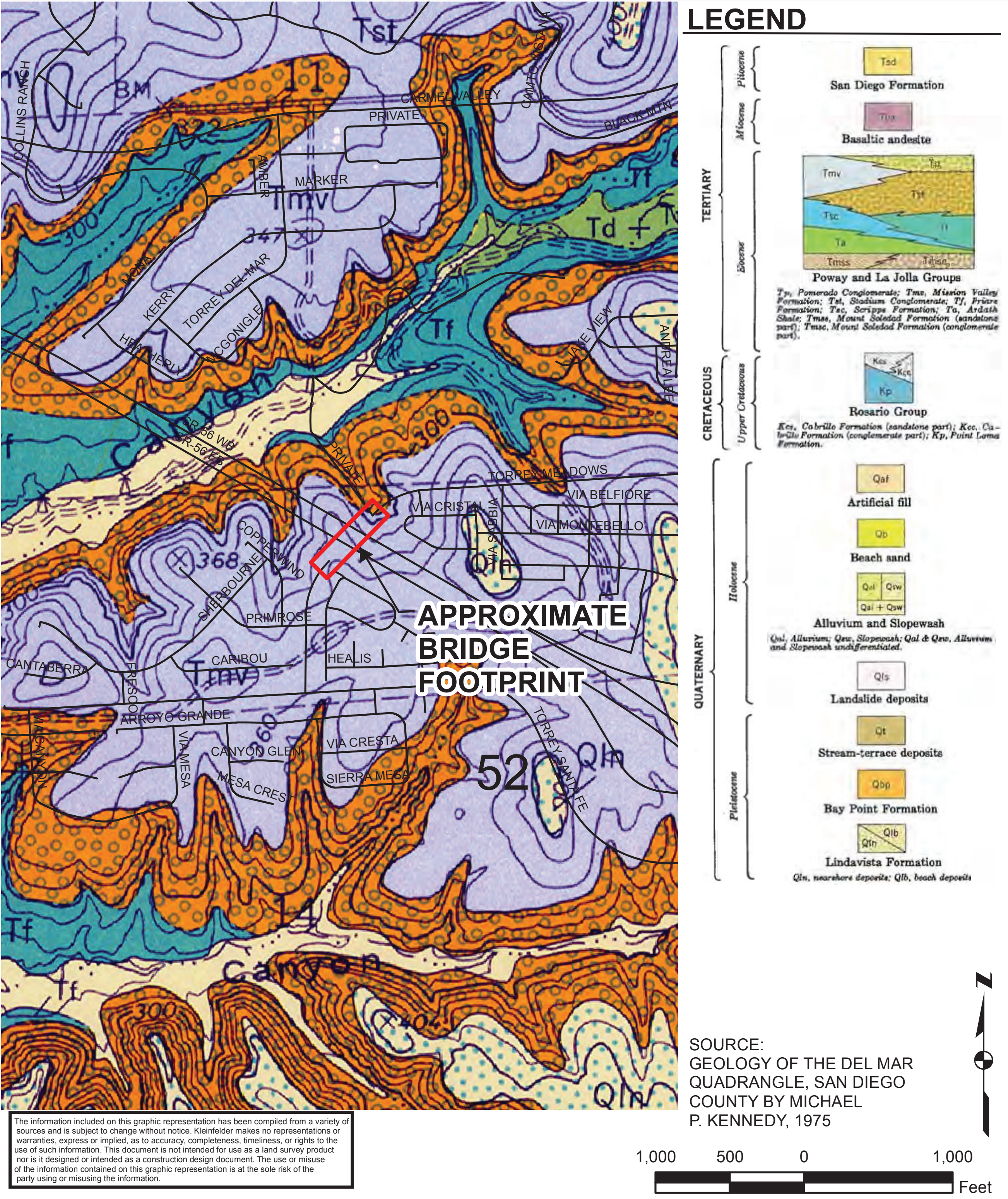

SOURCE:
GEOLOGY OF THE DEL MAR QUADRANGLE, SAN DIEGO COUNTY BY MICHAEL P. KENNEDY, 1975

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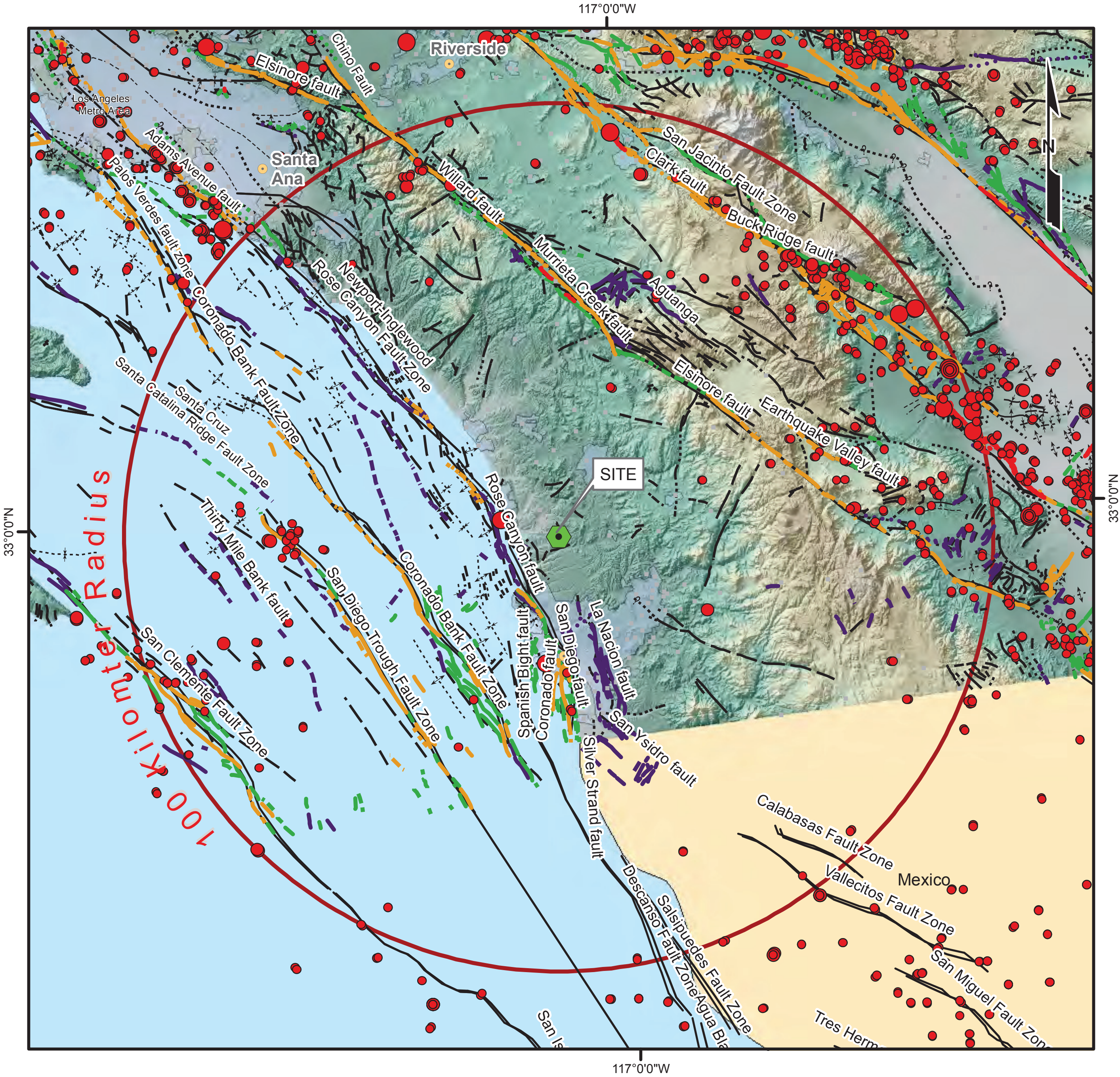
FILE NAME:	20151065_Geo.MXD

REGIONAL GEOLOGIC MAP

TORREY MEADOWS DRIVE OVERCROSSING
AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
4



Faulting Legend

Quaternary Faults (Bryant, 2005; USGS, 2009)

Historic displacement (< 200 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Holocene displacement (< 11,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Late Quaternary displacement (< 750,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Quaternary displacement (< 1,600,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Pre-Quaternary Geologic Structures (CGS, 2000)
- fault, approx. located
- fault, approx. located, queried
- fault, certain
- fault, concealed
- fault, concealed, queried
- fault, inferred, queried

ANSS Earthquakes

Magnitude
- ● 4.0 - 4.9
- ● 5.0 - 5.9
- ● 6.0 - 6.9
- ● 7.0 - 7.9
- ● 8.0 - 8.9

35 17.5 0 35
Kilometers

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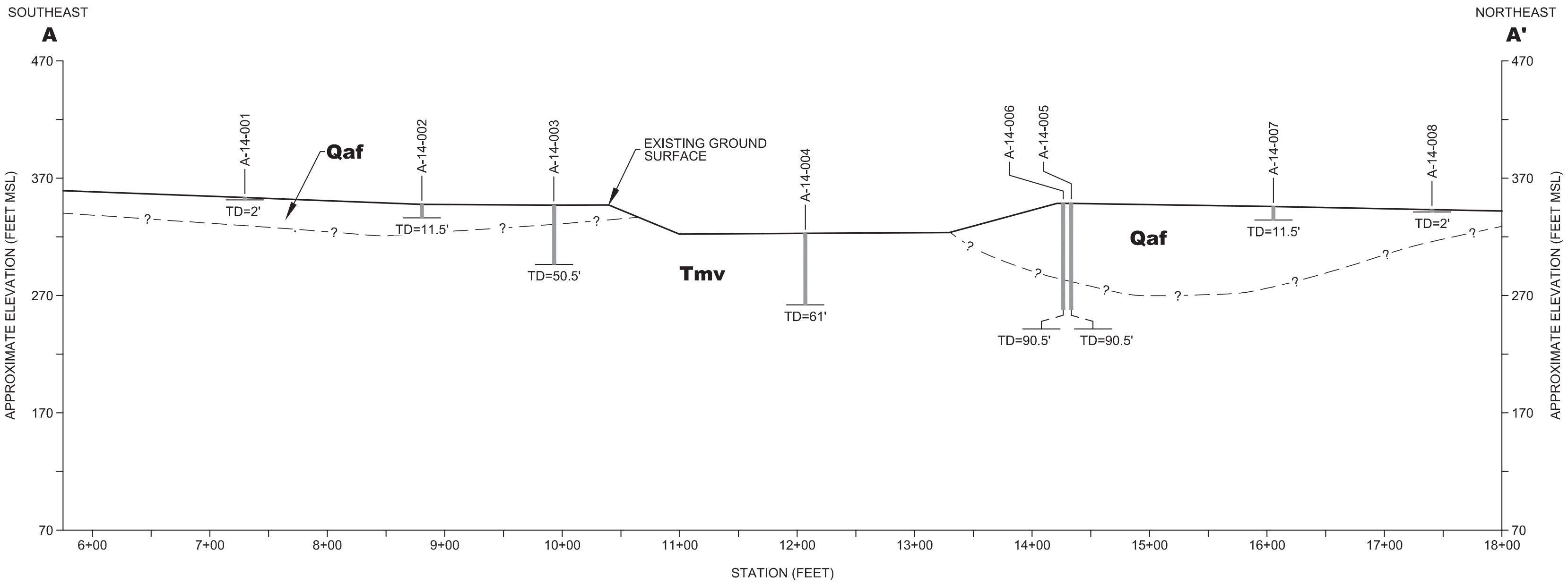
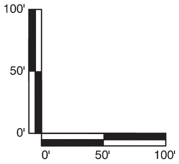
CHECKED BY: EK
FILE NAME: 20151065.MXD

REGIONAL FAULT MAP AND EARTHQUAKE EPICENTERS (1800 - APRIL 2014)

TORREY MEADOWS DRIVE OVERCROSSING
AT SR-56 POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
5





VERTICAL SCALE: 1" = 100'
HORIZONTAL SCALE: 1" = 100'

EXPLANATION

A-14-008	APPROXIMATE BORING ELEVATION
TD=90.5'	APPROXIMATE TEST DEPTH AND LENGTH OF BORING
—?—?—	APPROXIMATE LOCATION OF GEOLOGIC CONTACT
Qaf	ARTIFICIAL FILL
Tmv	MISSION VALLEY FORMATION

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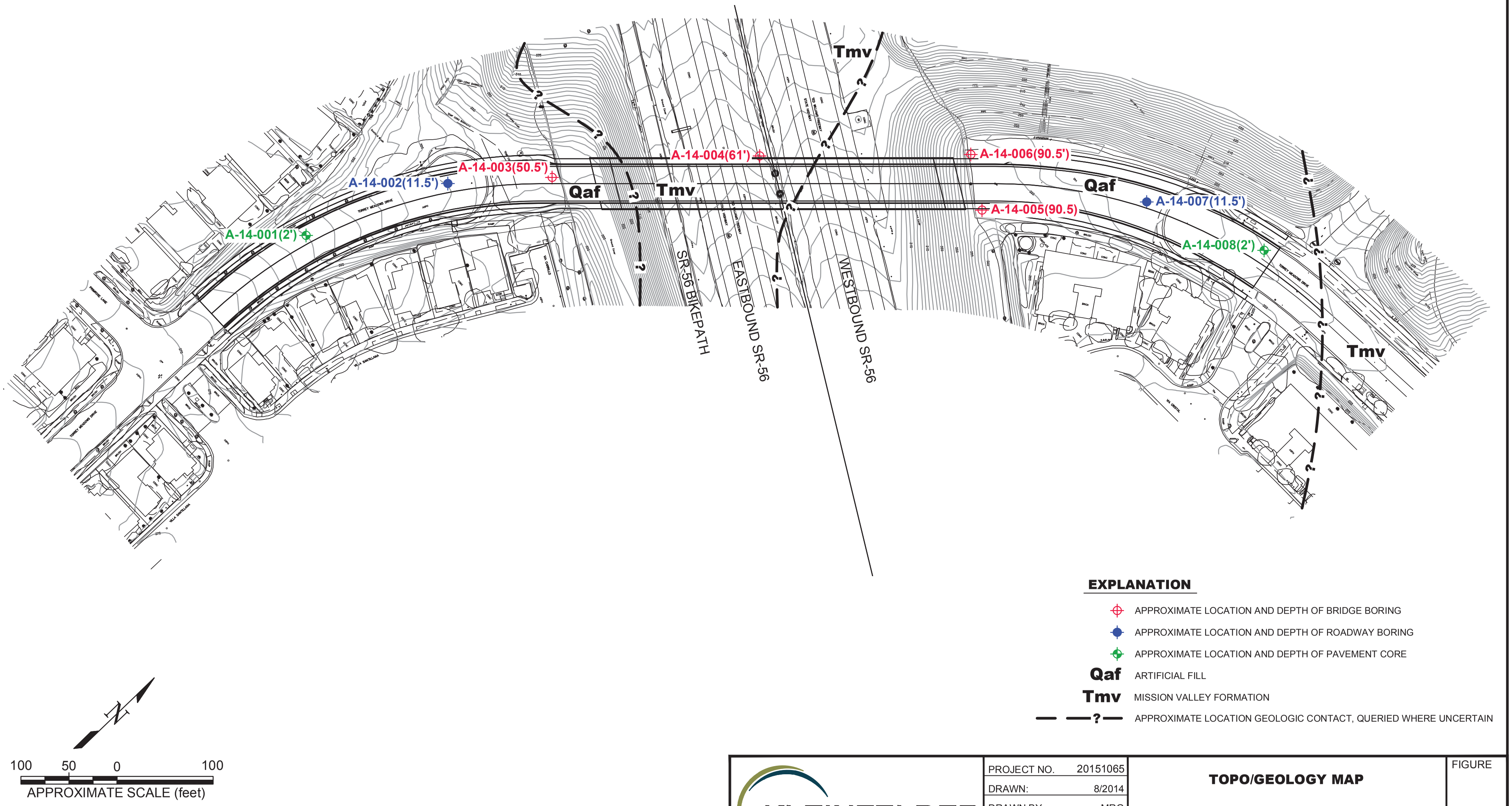
FILE NAME:	20151065p6_CS-A.dwg

CROSS-SECTION A-A'

TORREY MEADOWS DRIVE
OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
6

PLOTTED: 07 Nov 2014, 10:02am, dfahmey
CAD FILE: J:_clients\TY_Lin\20151065.001A\TorreyMdwsDr-OC_8-2014\ LAYOUT: 7
ATTACHED IMAGES: Images: td_Plate6_bottom.jpg Images: td_Plate6_top.jpg Images: td_Plate7_1of2.jpg Images: td_Plate7_2of2.jpg
ATTACHED XREFS:
LONG BEACH, CA



EXPLANATION

⊕	APPROXIMATE LOCATION AND DEPTH OF BRIDGE BORING
●	APPROXIMATE LOCATION AND DEPTH OF ROADWAY BORING
⊕	APPROXIMATE LOCATION AND DEPTH OF PAVEMENT CORE
Qaf	ARTIFICIAL FILL
Tmv	MISSION VALLEY FORMATION
— —?—	APPROXIMATE LOCATION GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	20151065
DRAWN:	8/2014
DRAWN BY:	MRG
CHECKED BY:	EK
FILE NAME:	
20151065p7_TM.dwg	

TOPO/GEOLOGY MAP

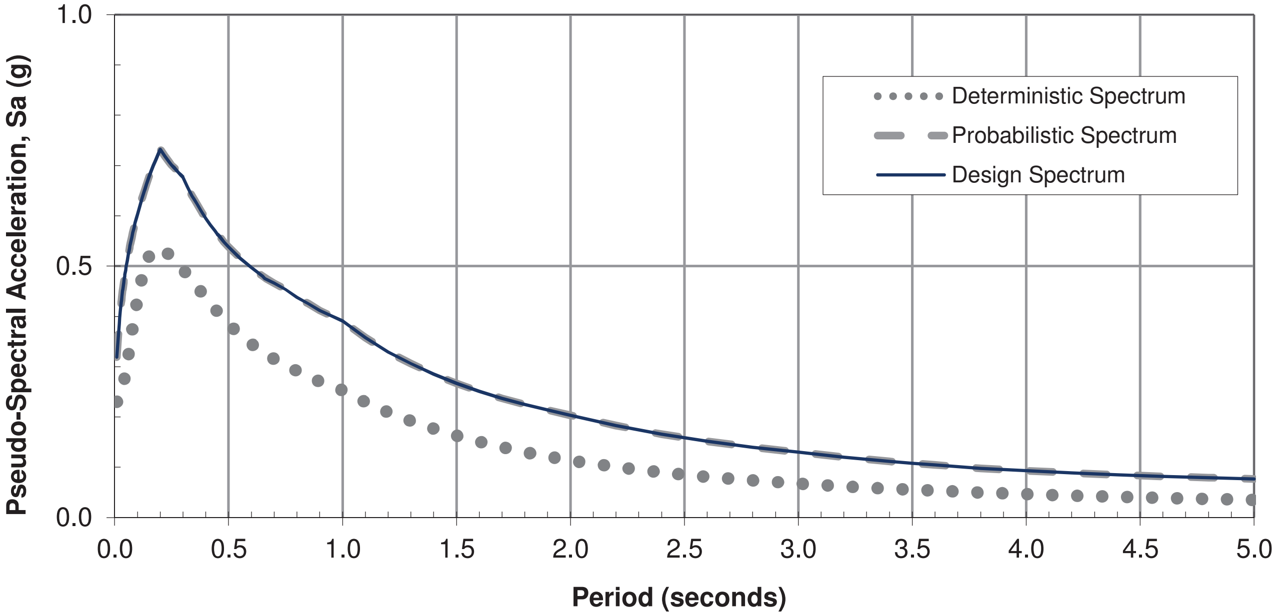
TORREY MEADOWS DRIVE
OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

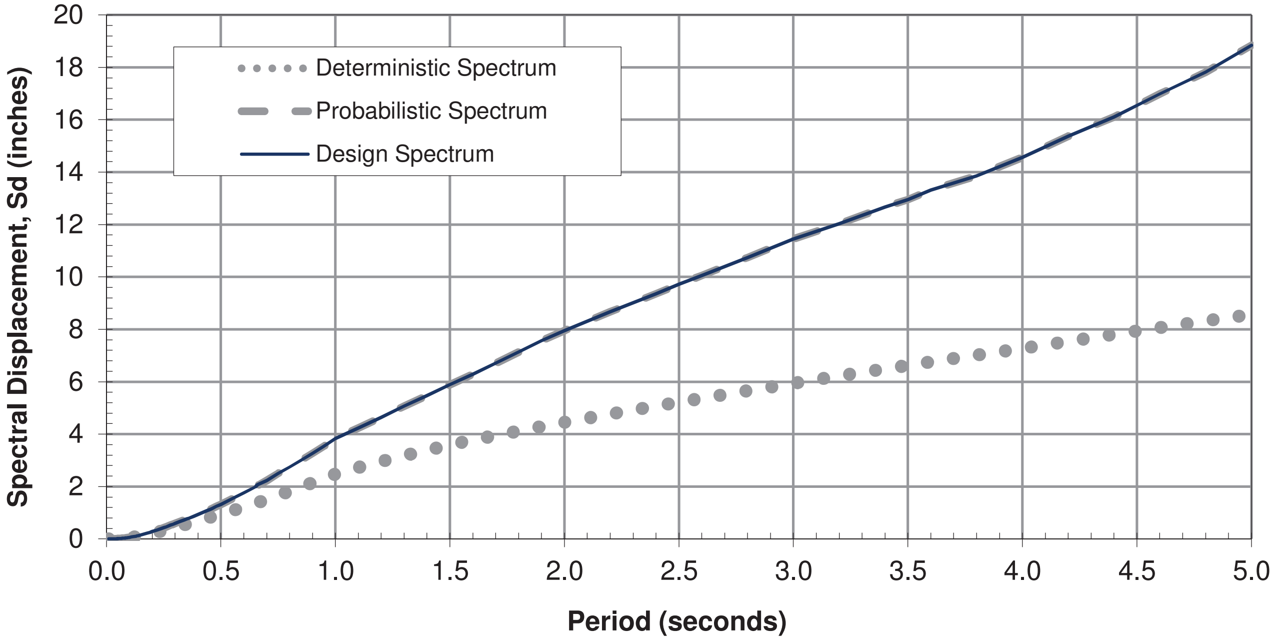
FIGURE
7

ATTACHED IMAGES:
ATTACHED XREFS: XRef: 1118TMD_Civil3D; XRef: 1118_aa05
LONG BEACH, CA CAD FILE: J:_clients\TY_Lin\20151065.001A\TorreyMdwsDr-OC_8-2014\ LAYOUT: Layout1 PLOTTED: 07 Nov 2014, 3:24pm, jpatay

SITE DATA

Latitude (degrees):	32.9628	Shear Wave Velocity, V_{s30}:	400 m/s
Longitude (degrees):	-117.1604	Depth to Vs = 1.0 km/s, $Z_{1.0}$:	NA
		Depth to Vs = 2.5 km/s, $Z_{2.5}$:	NA





KLEINFELDER
Bright People. Right Solutions.

DESIGNED BY: EK	DATE 11/06/14	**PRELIMINARY DESIGN** **CALTRANS ARS CURVES**	FIGURE
DRAWN: EK	11/6/14		
CHECKED BY:		TORREY MEADOWS DRIVE OVERCROSSING AT SR-56 POST MILE 5.6, DISTRICT 11 SAN DIEGO, CALIFORNIA	**8**
T.Y. Lin International			

DESIGN ARS CURVE ORDINATES

Period (s)	Sa (g)	Sd (inches)
0.010	0.319	0.000
0.020	0.386	0.002
0.022	0.397	0.002
0.025	0.411	0.003
0.029	0.428	0.004
0.030	0.432	0.004
0.032	0.440	0.004
0.035	0.451	0.005
0.036	0.454	0.006
0.040	0.468	0.007
0.042	0.474	0.008
0.044	0.480	0.009
0.045	0.483	0.010
0.046	0.486	0.010
0.048	0.492	0.011
0.050	0.498	0.012
0.055	0.511	0.015
0.060	0.523	0.018
0.065	0.535	0.022
0.067	0.540	0.024
0.070	0.546	0.026
0.075	0.557	0.031
0.080	0.567	0.036
0.085	0.576	0.041
0.090	0.586	0.046
0.095	0.594	0.052
0.100	0.603	0.059
0.110	0.619	0.073
0.120	0.635	0.089
0.130	0.649	0.107
0.133	0.653	0.113
0.140	0.663	0.127
0.150	0.676	0.149
0.160	0.688	0.172
0.170	0.700	0.198
0.180	0.711	0.225
0.190	0.722	0.255
0.200	0.732	0.287
0.220	0.719	0.341
0.240	0.707	0.399
0.250	0.701	0.429
0.260	0.696	0.461
0.280	0.686	0.526
0.290	0.681	0.561
0.300	0.677	0.596
0.320	0.658	0.659
0.340	0.640	0.724

Period (s)	Sa (g)	Sd (inches)
0.360	0.624	0.792
0.380	0.609	0.861
0.400	0.595	0.932
0.420	0.582	1.005
0.440	0.570	1.080
0.450	0.564	1.118
0.460	0.559	1.158
0.480	0.548	1.236
0.500	0.538	1.316
0.550	0.516	1.528
0.600	0.497	1.751
0.650	0.480	1.985
0.667	0.475	2.068
0.700	0.466	2.235
0.750	0.454	2.500
0.800	0.438	2.744
0.850	0.425	3.005
0.900	0.412	3.266
0.950	0.401	3.542
1.000	0.391	3.827
1.100	0.358	4.240
1.200	0.329	4.637
1.300	0.306	5.062
1.400	0.285	5.467
1.500	0.267	5.880
1.600	0.251	6.289
1.700	0.237	6.704
1.800	0.225	7.135
1.900	0.214	7.561
2.000	0.203	7.948
2.200	0.183	8.669
2.400	0.166	9.359
2.500	0.159	9.726
2.600	0.152	10.057
2.800	0.140	10.743
3.000	0.130	11.452
3.200	0.120	12.027
3.400	0.112	12.672
3.500	0.108	12.949
3.600	0.105	13.319
3.800	0.098	13.851
4.000	0.093	14.564
4.200	0.089	15.366
4.400	0.085	16.107
4.600	0.082	16.983
4.800	0.079	17.815
5.000	0.077	18.841

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DESIGNED BY: EK	DATE 11/06/14
DRAWN: EK	11/6/14
CHECKED BY:	
T.Y. Lin International	

PRELIMINARY DESIGN
CALTRANS ARS TABLE

TORREY MEADOWS DRIVE
OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CALIFORNIA

FIGURE
9

APPENDIX A

AS BUILT AND PROPOSED IMPROVEMENT PLANS

APPENDIX A

AS-BUILT AND PROPOSED IMPROVEMENT PLANS

AS-BUILT PLANS

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	2.9/10.6	1	856

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SAN DIEGO COUNTY
IN SAN DIEGO
FROM CARMEL COUNTRY ROAD OVERCROSSING
TO CARMEL MOUNTAIN ROAD OVERCROSSING

To be supplemented by Standard Plans dated July, 1999

INDEX OF SHEETS

Sheet No.	Description
1	Title and Location Map
2-13	Typical Cross Sections
14	Key Map and Line Index
15-40	Layouts
41-100	Profiles
101-123	Construction Details
124-164	Temporary Water pollution Control Plans and Details
165-193	Erosion Control Plans
194-219	Contour Grading
220-348	Drainage Plans
349-351	Sanitary Sewer plans, Details and Quantities
352-410	Utility Plans
411-432	Stage Construction and Traffic Handling Plans, Details and Quantities
433-443	Detour Plans
444-445	Construction Area Signs
446-479	Pavement Delineation and Sign Plans, Details and Quantities
480-491	Summary of Quantities
492-502	Sign Plans
503-529	Sound Wall Plans
530-545	Highway Planting Plans
546-587	Electrical Plans
588-618	Revised Standard Plans

STRUCTURE PLANS

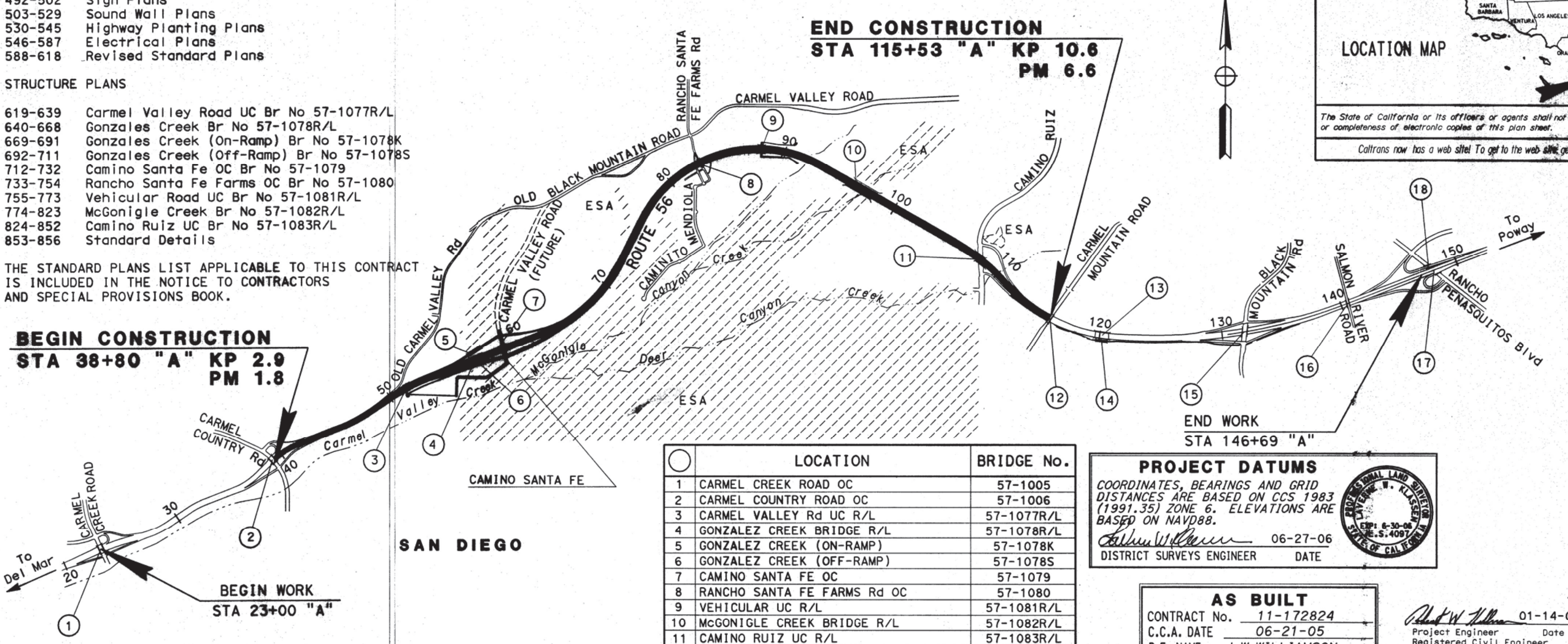
619-639	Carmel Valley Road UC Br No 57-1077R/L
640-668	Gonzales Creek Br No 57-1078R/L
669-691	Gonzales Creek (On-Ramp) Br No 57-1078K
692-711	Gonzales Creek (Off-Ramp) Br No 57-1078S
712-732	Camino Santa Fe OC Br No 57-1079
733-754	Rancho Santa Fe Farms OC Br No 57-1080
755-773	Vehicular Road UC Br No 57-1081R/L
774-823	McGonigle Creek Br No 57-1082R/L
824-852	Camino Ruiz UC Br No 57-1083R/L
853-856	Standard Details

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO CONTRACTORS AND SPECIAL PROVISIONS BOOK.

LOCATION MAP

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

Caltrans now has a web site! To get to the web site go to: http://www.dot.ca.gov



BEGIN WORK
STA 23+00 "A"

BEGIN CONSTRUCTION
STA 38+80 "A" KP 2.9
PM 1.8

END CONSTRUCTION
STA 115+53 "A" KP 10.6
PM 6.6

END WORK
STA 146+69 "A"

ESA ENVIRONMENTALLY SENSITIVE AREA

○	LOCATION	BRIDGE No.
1	CARMEL CREEK ROAD OC	57-1005
2	CARMEL COUNTRY ROAD OC	57-1006
3	CARMEL VALLEY Rd UC R/L	57-1077R/L
4	GONZALEZ CREEK BRIDGE R/L	57-1078R/L
5	GONZALEZ CREEK (ON-RAMP)	57-1078K
6	GONZALEZ CREEK (OFF-RAMP)	57-1078S
7	CAMINO SANTA FE OC	57-1079
8	RANCHO SANTA FE FARMS Rd OC	57-1080
9	VEHICULAR UC R/L	57-1081R/L
10	McGONIGLE CREEK BRIDGE R/L	57-1082R/L
11	CAMINO RUIZ UC R/L	57-1083R/L
12	CARMEL MOUNTAIN Rd OC	———
13	PENASQUITOS OPEN SPACE BRIDGE R/L	———
14	PENASQUITOS OPEN SPACE BIKE BRIDGE	———
15	BLACK MOUNTAIN Rd OC	———
16	SALMON RIVER ROAD OC	———
17	RANCHO PENASQUITOS Blvd UC R/L	———
18	RANCHO PENASQUITOS Blvd UC	———

PROJECT DATUMS

COORDINATES, BEARINGS AND GRID DISTANCES ARE BASED ON CCS 1983 (1991.35) ZONE 6. ELEVATIONS ARE BASED ON NAVD88.

06-27-06
DISTRICT SURVEYS ENGINEER DATE

LAVERNE W. KLASSEN
EXP: 6-30-06
L.S. 4097

AS BUILT
CONTRACT No. 11-172824
C.C.A. DATE 06-21-05
R.E. NAME J.W.WILLIAMSON
John W. Williamson 6/27/06
R.E. Signature for final approval of As-built information

Robert W. Hillman 01-14-02
Project Engineer Date
Registered Civil Engineer

R.W.HILLMAN
No. 50572
Exp. 6-30-05
CIVIL

April 1, 2002
Plans Approval Date

NO SCALE

Contract No. 11-172824

LAST REVISION 01-14-02
DATE PLOTTED => 27-JUN-2006
TIME PLOTTED => 08:41

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
R.W. HILLMAN	XX-XX	C. SAVAGE	XX-XX

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS
0 20 40 60 80

USERNAME => tbchar

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	2.9/10.6	58	856

Robert W Hillman 01-11-02
REGISTERED CIVIL ENGINEER DATE

4-01-02
PLANS APPROVAL DATE

R.W. HILLMAN
No. 50572
Exp. 6-30-05
CIVIL

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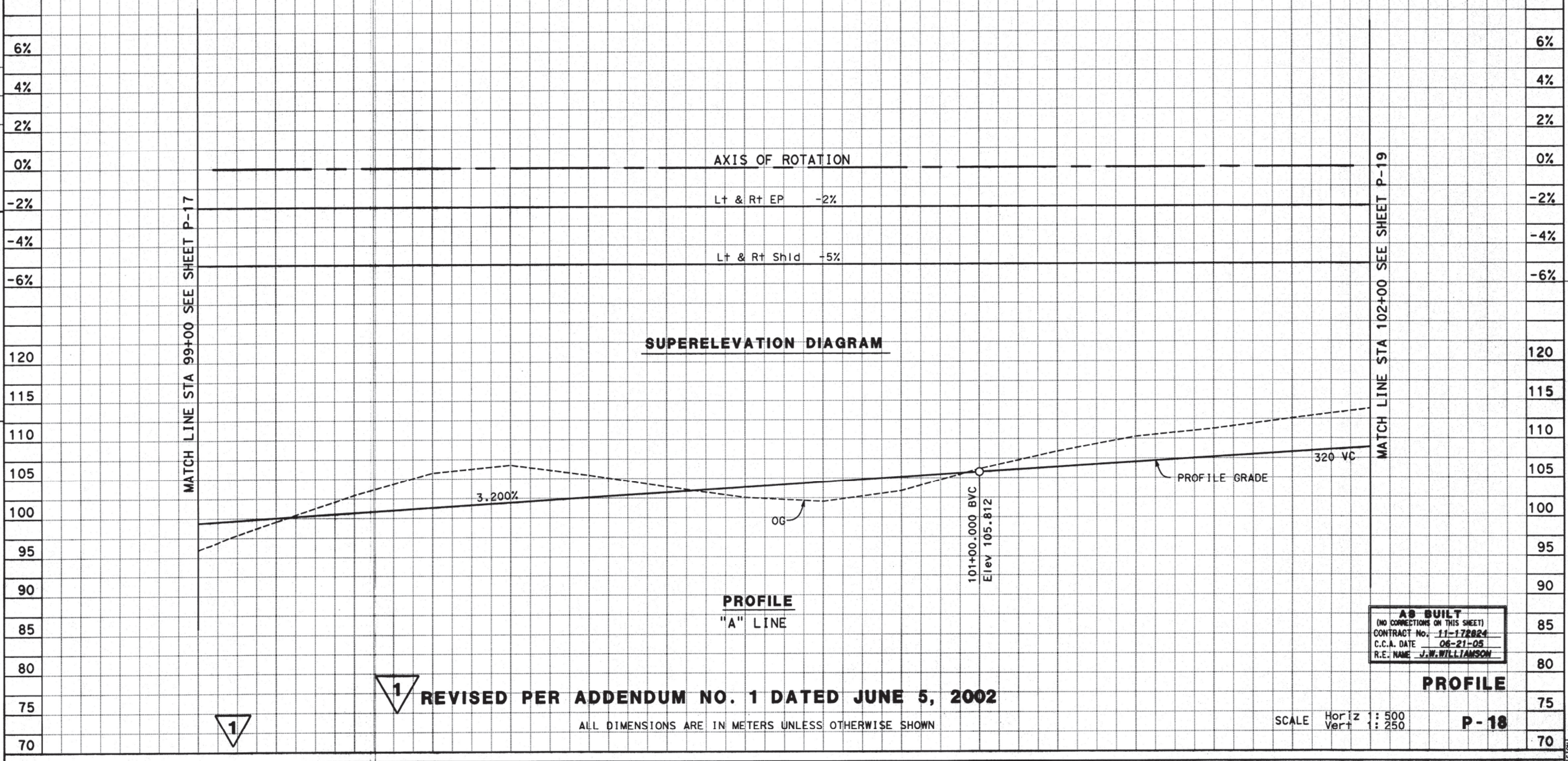
Caltrans Metric



1 REVISED PER ADDENDUM NO. 1 DATED JUNE 5, 2002

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

AS BUILT
(NO CORRECTIONS ON THIS SHEET)
CONTRACT No. 11-172824
C.C.A. DATE 06-21-05
R.E. NAME J.W.WILLIAMSON

PROFILE

SCALE Horiz 1:500
Vert 1:250

P-18

Station	99	+20	+40	+60	+80	100	+20	+40	+60	+80	101	+20	+40	+60	+80	102
m³ Exc	~~536~~	~~2563~~	~~5440~~	~~7331~~	~~7355~~	~~5834~~	~~4108~~	~~2602~~	~~1862~~	~~2335~~	~~4299~~	~~6820~~	~~8701~~	~~9772~~	~~10823~~	
m³ Emb	~~5026~~	~~2753~~	~~1070~~	~~0~~	~~129~~	~~985~~	~~2369~~	~~3115~~	~~2665~~	~~1307~~	~~283~~	~~45~~	~~0~~	~~0~~	~~0~~	

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbchar
DGN FILE => b17282f018_ab.dgn

CU 11227

EA 172821

PROJECT ENGINEER R.W. HILLMAN

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT

LAST REVISION 01-14-02
DATE PLOTTED => 25-MAY-2006
TIME PLOTTED => 09:31

REMOVE AND RECOMPACT AREA	
AREA NAME	DEPTH (m)
G-21A	1.3

1 REVISED PER ADDENDUM NO. 1 DATED JUNE 5, 2002

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	2.9/10.6	214	856

01-14-02
REGISTERED CIVIL ENGINEER DATE

4-01-02
PLANS APPROVAL DATE

R.W. HILLMAN
No. 50572
Exp. 6-30-05
CIVIL

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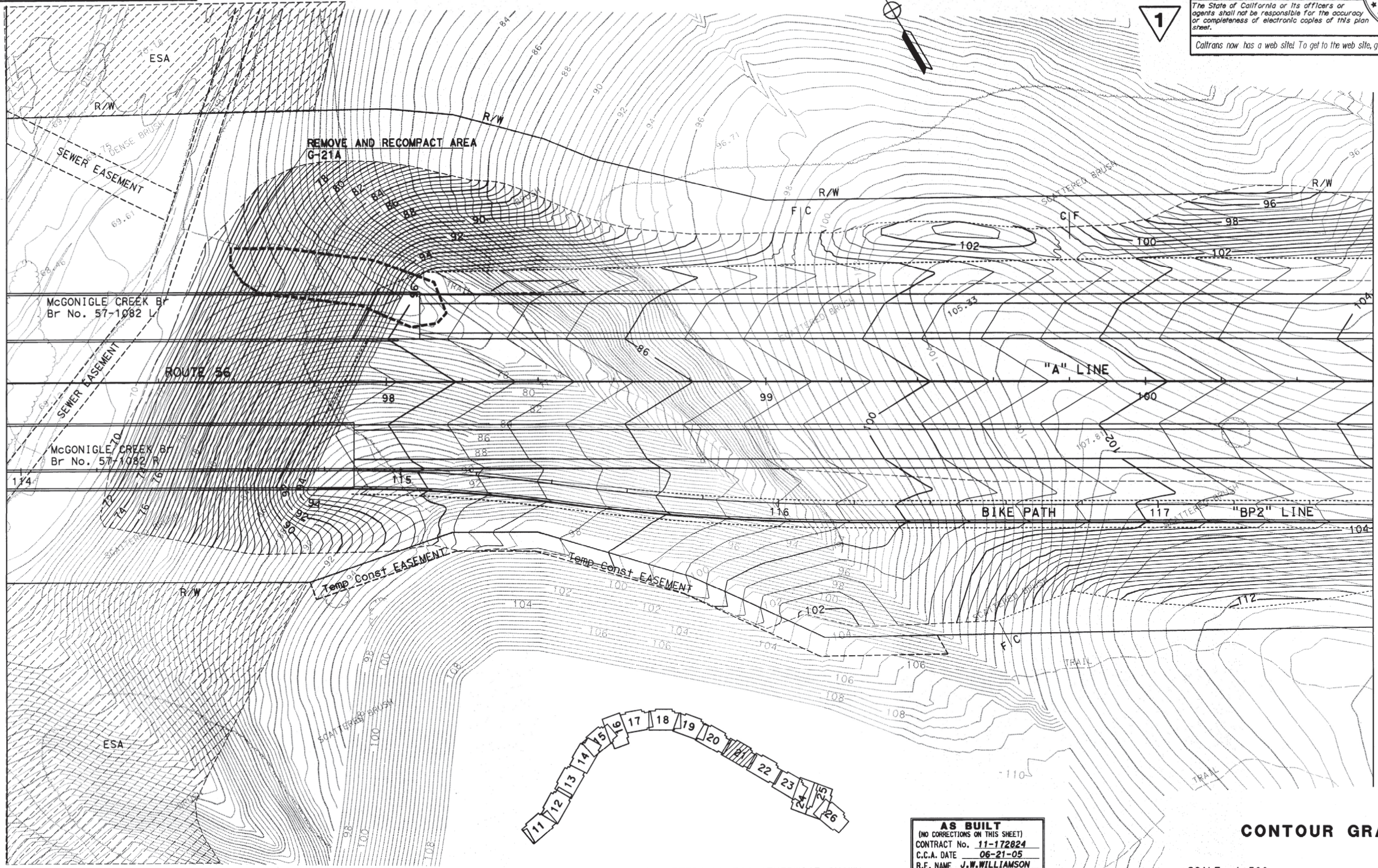
Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov



THIS PLAN ACCURATE FOR CONTOUR GRADING WORK ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

AS BUILT
(NO CORRECTIONS ON THIS SHEET)
CONTRACT No. 11-172824
C.C.A. DATE 06-21-05
R.E. NAME J.W.WILLIAMSON

CONTOUR GRADING

SCALE 1:500

G-21

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER
R.W. HILLMAN

CALCULATED/DESIGNED BY
CHECKED BY

DATE REVISED BY
DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS
0 20 40 60 80

USERNAME => tbchar
DGN FILE => b17282h021_ab.dgn

CU 11227

EA 172821

LAST REVISION 03-22-02
DATE PLOTTED => 01-JUN-2006
TIME PLOTTED => 11:37

PROPOSED PLANS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8	1	XX

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

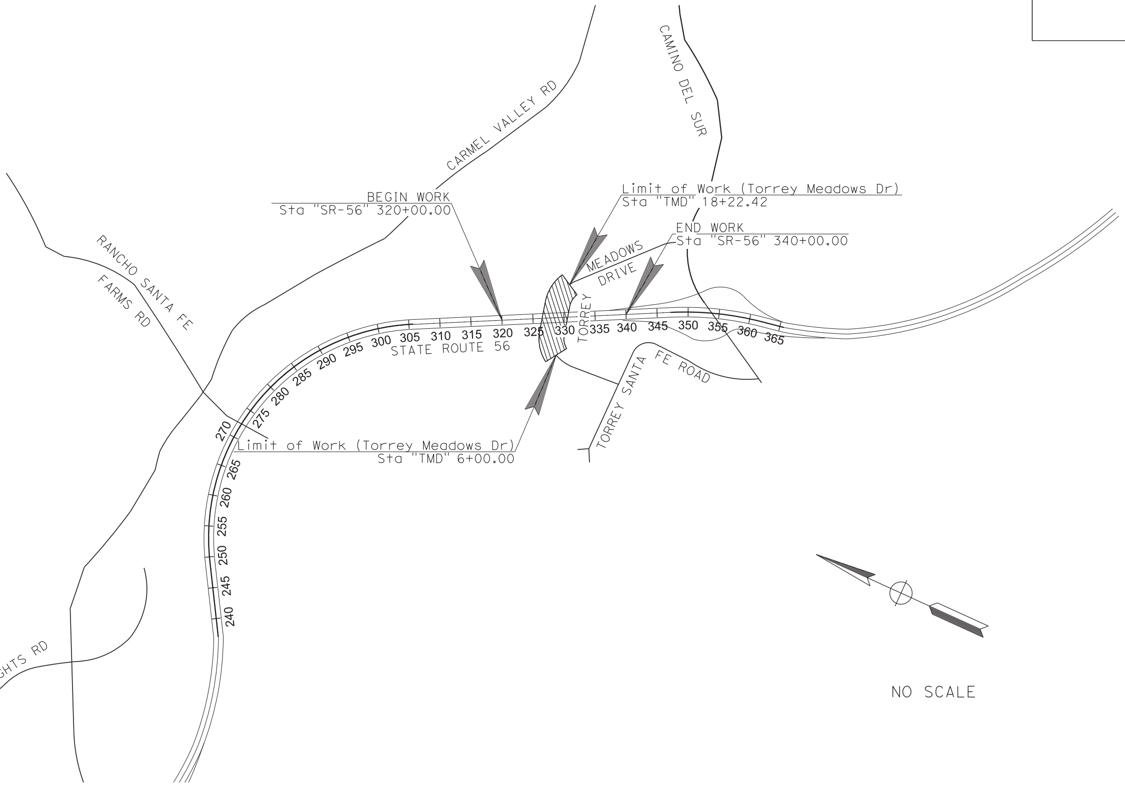
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SAN DIEGO COUNTY IN SAN DIEGO ON STATE ROUTE 56 0.5 MILES WEST OF CAMINO DEL SUR

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2010

INDEX OF PLANS

LOCATION MAP



THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

APPROVED AS TO IMPACT ON STATE FACILITIES AND CONFORMANCE WITH APPLICABLE STATE STANDARDS AND PRACTICES AND THAT TECHNICAL OVERSIGHT WAS PERFORMED.

CONSULTANT DESIGN ENGINEER	CALTRANS DESIGN OVERSIGHT APPROVAL	REGISTRATION No.	LICENSE Exp DATE	DATE SIGNED
CLARK FERNON	ED HAJJ	C42203	3/31/16	

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

PLANS APPROVAL DATE

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T.Y. LIN INTERNATIONAL
404 CAMINO DEL RIO SOUTH, SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET, SUITE 750
SAN DIEGO, CA 92101

CONTRACT No.	**11-404601**
PROJECT ID	**1114000049**

LAST REVISION 02-27-15
DATE PLOTTED => 3/20/2015
TIME PLOTTED => 6:08:43 PM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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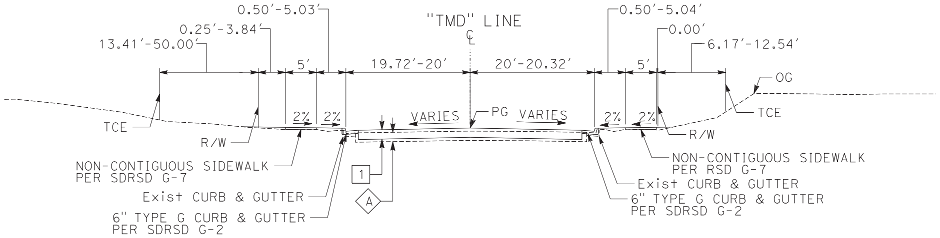
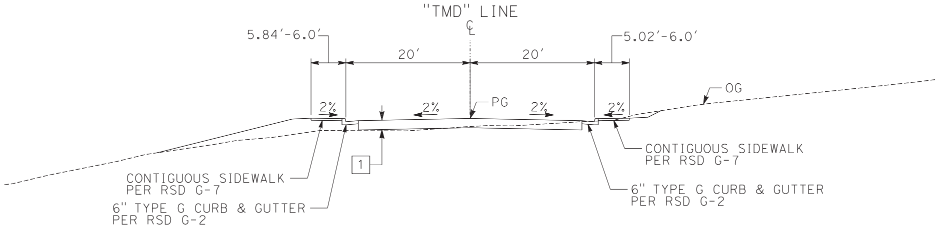
SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101



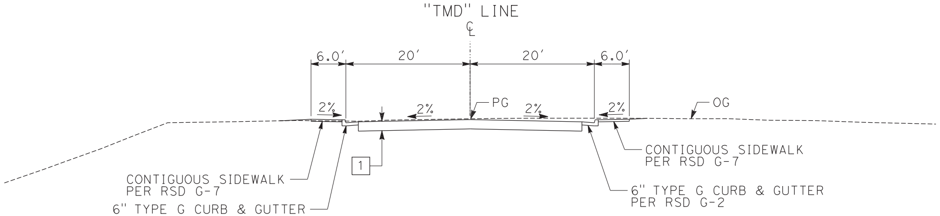
"TMD" 6+00.00 TO "TMD" 09+94.00

TORREY MEADOWS DRIVE



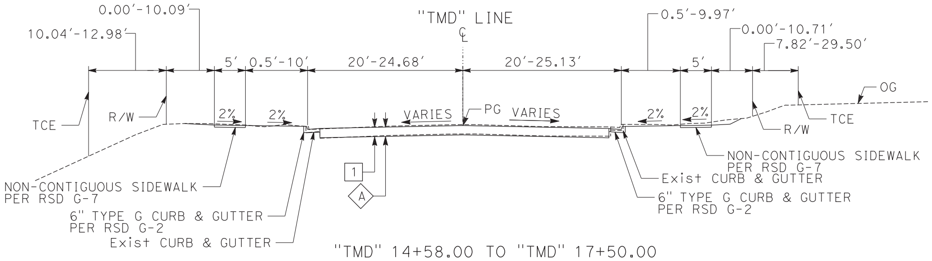
"TMD" 09+94.00 TO "TMD" 10+54.95

TORREY MEADOWS DRIVE



"TMD" 13+91.95 TO "TMD" 14+58.00

TORREY MEADOWS DRIVE



"TMD" 14+58.00 TO "TMD" 17+50.00

TORREY MEADOWS DRIVE

*EXISTING STRUCTURAL SECTIONS

A	0.42' HMA 1.17' CTB

* THE EXISTING STRUCTURAL SECTION DEPTHS MAY VARY AND THE INFORMATION SHOWN IS APPROXIMATE.

STRUCTURAL SECTIONS

1	0.42' HMA (TYPE A) 1.5' AB (CLASS 2)	TORREY MEADOWS DRIVE TRAVELED WAY & SHOULDERS

TORREY MEADOWS DRIVE DESIGN DESIGNATION

ADT (2015)	5,300	D	50%
ADT (2035)	7,000	T	XX
DHV	XX	V	35 mph
ESAL	XX	TI_{20}	8

PAVEMENT CLIMATE REGION

SOUTH COAST

ABBREVIATIONS:

CSDSD	CITY OF SAN DIEGO STANDARD DRAWINGS
SDRSD	SAN DIEGO REGIONAL STANDARD DRAWINGS

NOTE:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. LIMITS OF THE STRUCTURAL SECTIONS ARE SHOWN ON THE LAYOUT SHEETS.
3. LIMITS & TYPE OF CURB, DIKE, & MGS ARE SHOWN ON THE LAYOUT SHEETS.
4. SEE SUPERELEVATION DIAGRAMS FOR COMPLETE SUPERELEVATION INFORMATION.
5. SEE PAVEMENT DELINEATION SHEETS FOR LOCATION OF ETW.

TYPICAL CROSS SECTIONS

NO SCALE

X-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	Caltrans
CONSULTANT FUNCTIONAL SUPERVISOR	CLARK FERNON
CALCULATED-DESIGNED BY	SHANNON JOHNSON
CHECKED BY	JEFFREY BURDICK
REVISED BY	
DATE REVISED	

LAST REVISION 04-03-15
DATE PLOTTED => 3/20/2015
TIME PLOTTED => 6:08:44 PM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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T.Y. LIN INTERNATIONAL
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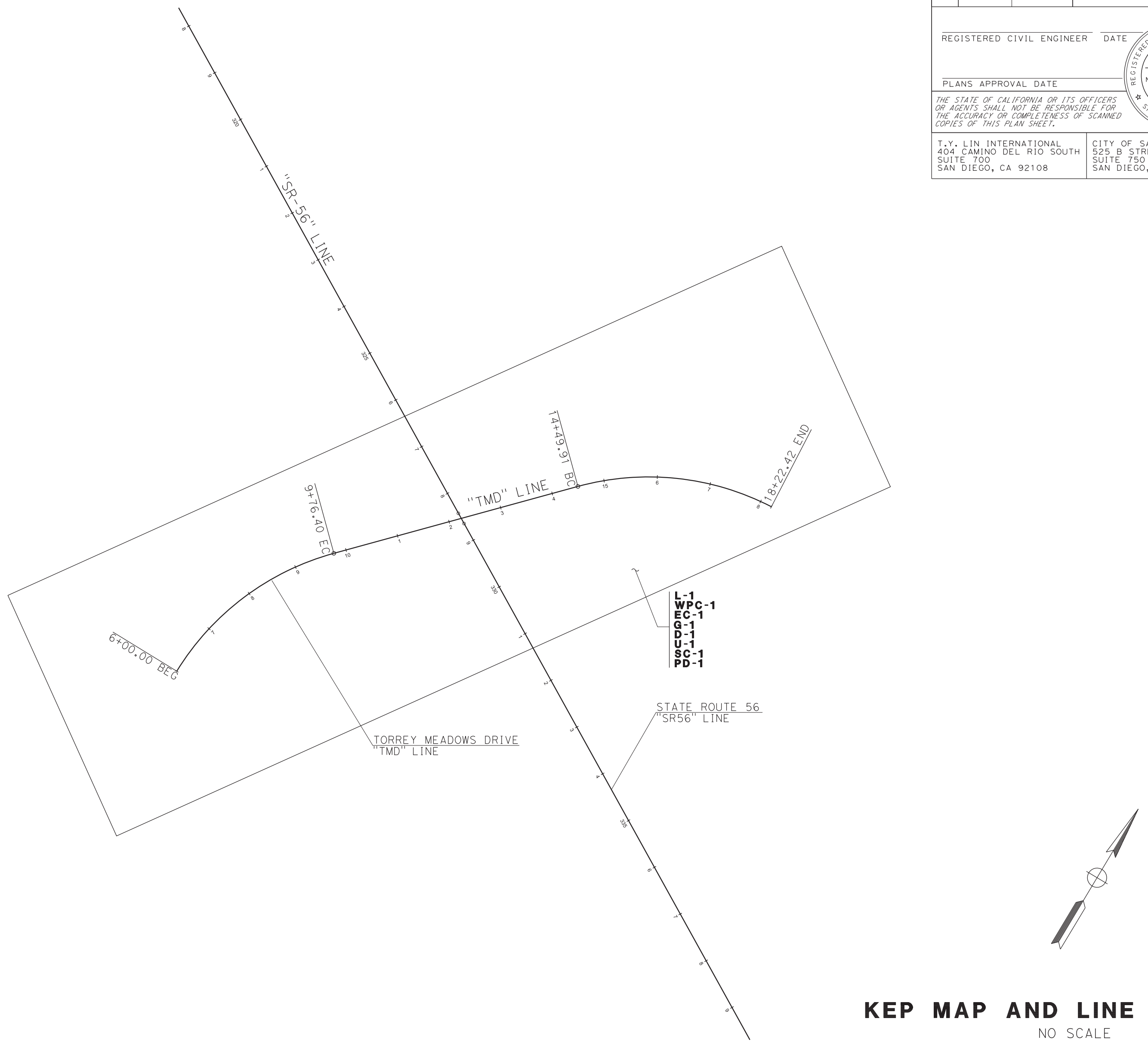
SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101



KEP MAP AND LINE INDEX

NO SCALE

K-1

CALCULATED-DESIGNED BY	SHANNON JOHNSON
CHECKED BY	JEFFREY BURDICK
REVISED BY	
DATE REVISED	

CONSULTANT FUNCTIONAL SUPERVISOR
CLARK FERNON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans®

LAST REVISION 04-03-15
DATE PLOTTED => 3/20/2015
TIME PLOTTED => 6:08:44 PM

BORDER LAST REVISED 7/2/2010
USERNAME => sjohnson1
DGN FILE => 1118_da01.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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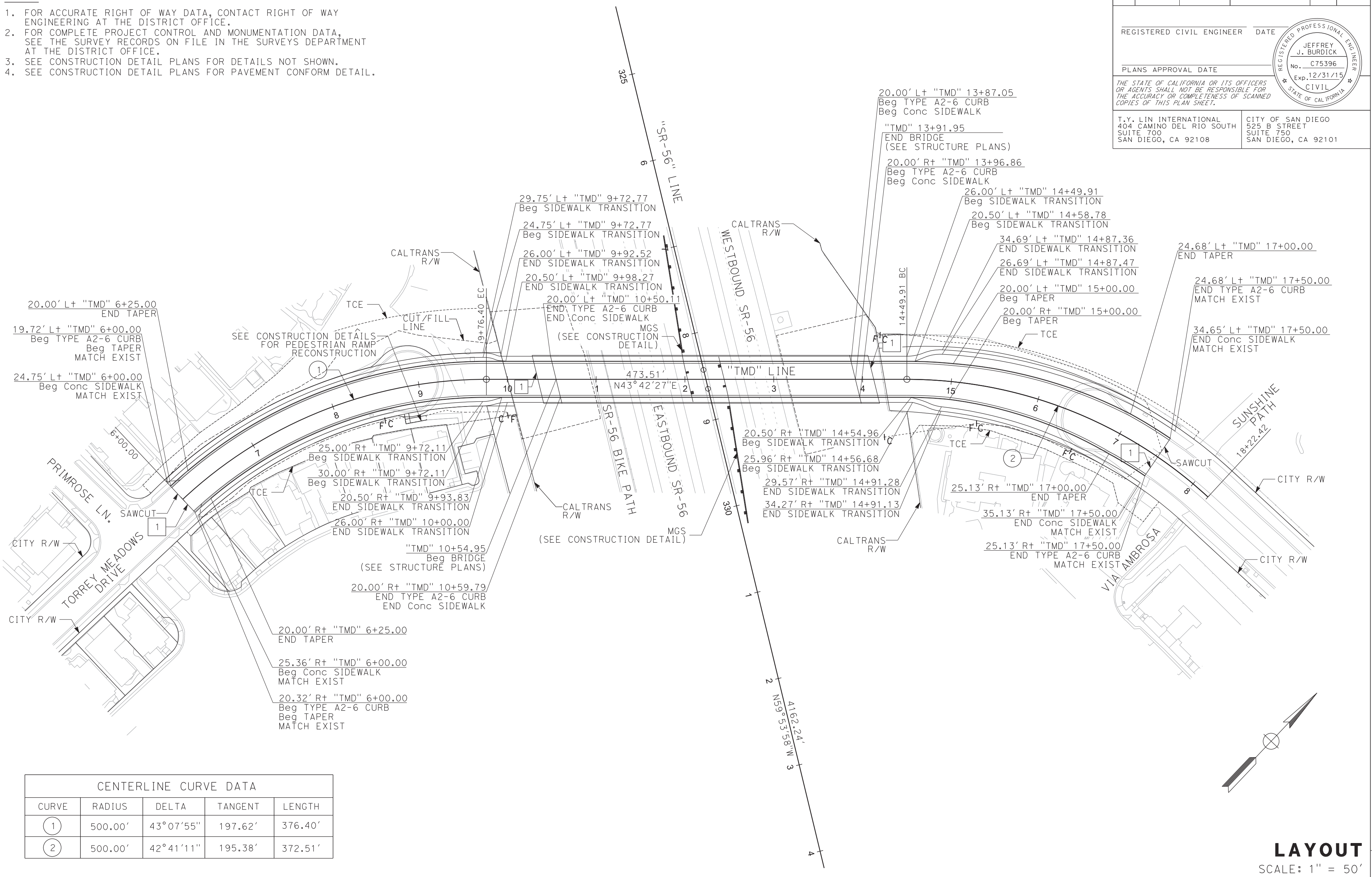
T.Y. LIN INTERNATIONAL
404 CAMINO DEL RIO SOUTH
SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. FOR COMPLETE PROJECT CONTROL AND MONUMENTATION DATA, SEE THE SURVEY RECORDS ON FILE IN THE SURVEYS DEPARTMENT AT THE DISTRICT OFFICE.
3. SEE CONSTRUCTION DETAIL PLANS FOR DETAILS NOT SHOWN.
4. SEE CONSTRUCTION DETAIL PLANS FOR PAVEMENT CONFORM DETAIL.



CENTERLINE CURVE DATA				
CURVE	RADIUS	DELTA	TANGENT	LENGTH
①	500.00'	43°07'55"	197.62'	376.40'
②	500.00'	42°41'11"	195.38'	372.51'

LAYOUT

SCALE: 1" = 50'

L-1

LAST REVISION 04-03-15
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR: CLARK FERNON

CALCULATED-DESIGNED BY: SHANNON JOHNSON

CHECKED BY: JEFFREY BURDICK

REVISED BY

DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => sjohnson1
DGN FILE => 1118_ea01.dgn

RELATIVE BORDER SCALE IS IN INCHES
0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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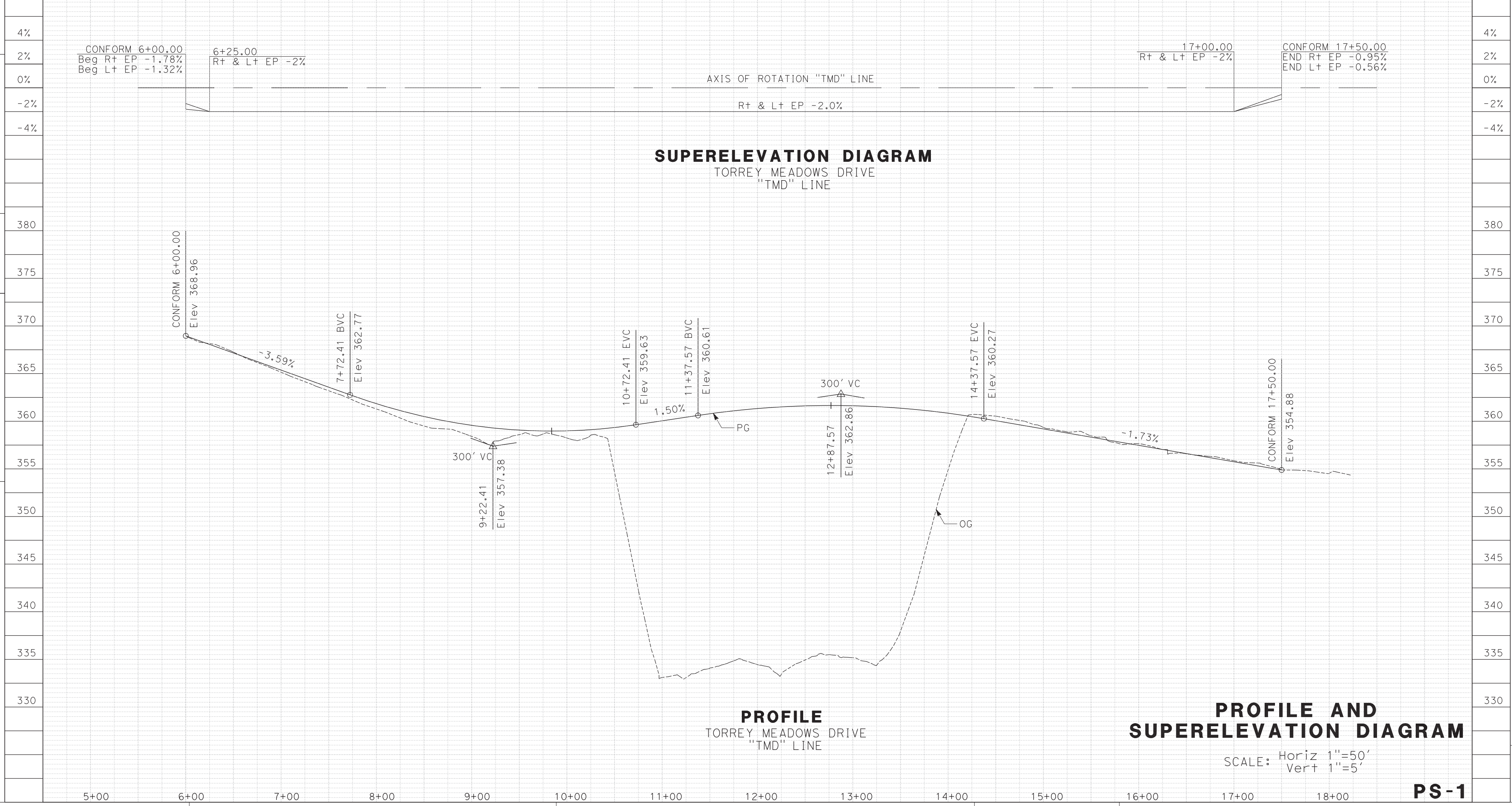
SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101



SUPERELEVATION DIAGRAM
TORREY MEADOWS DRIVE
"TMD" LINE

PROFILE
TORREY MEADOWS DRIVE
"TMD" LINE

PROFILE AND SUPERELEVATION DIAGRAM

SCALE: Horiz 1"=50'
Vert 1"=5'

PS-1

REVISED BY	DATE REVISED
SHANNON JOHNSON	JEFFREY BURDICK
CALCULATED-DESIGNED BY	CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR	CLARK FERNON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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No. C75396
Exp. 12/31/15
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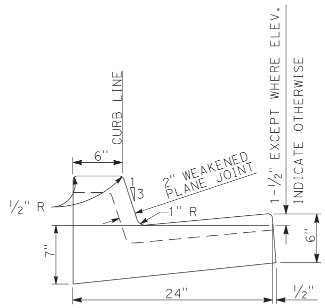
SUITE 750
SAN DIEGO, CA 92101



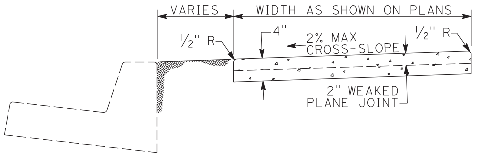
TYPE	W	*AREA
G	24"	1.34 SQ. FT.

* 6" CURB FACE

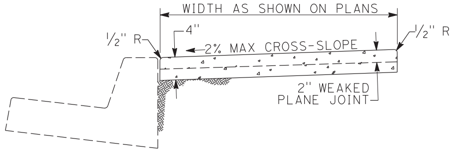
NOTES:
1. CONCRETE SHALL BE 520-C-2500.
2. SEE JOINT DETAIL DRAWINGS.
3. ON THE SIDE OF SUPER ELEVATED CURVES THE GUTTER SHALL BE SLOPED TO MATCH CROSS SECTION GRADE OF THE ROADWAY.
4. PLACE EXPANSION JOINTS AT CURB RETURNS ADJACENT TO STRUCTURES AND AT NO GREATER THAN 45' INTERVALS.
5. PLACE WEAKEND PLANE JOINTS AT DRIVEWAYS AND AT 15' INTERVALS FROM POINT OF CURB RETURN.
6. ALL HISTORICAL STAMPS/IMPRESSIONS SHALL BE PRESERVED.

CSDSD SDG-151
CURB AND GUTTER- COMBINED

NO SCALE



NON-CONTIGUOUS

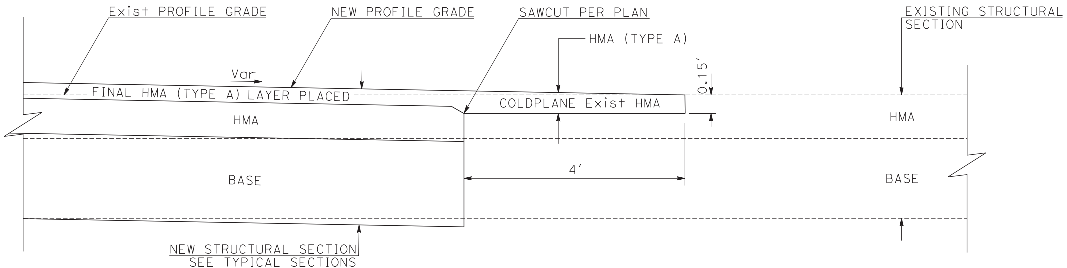


CONTIGUOUS

NOTES:
1. CONCRETE SHALL BE 520-C-2500.
2. SEE JOINT DETAIL DRAWINGS.
3. SIDEWALK SHALL MAINTAIN A MINIMUM CLEAR WIDTH OF 4' OF TRAVEL FROM ANY OBSTRUCTION.
4. ALL HISTORICAL STAMPS/ IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND/OR DATE) SHALL BE PRESERVED.
5. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

CSDSD SDG-155
TYPICAL SIDEWALK SECTIONS

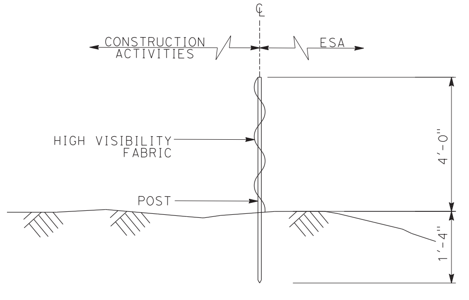
NO SCALE



SECTION

PAVEMENT CONFORM DETAIL

NO SCALE



SECTION

TEMPORARY FENCE (TYPE ESA)

NO SCALE

CONSTRUCTION DETAILS

NO SCALE

C-1

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	CHECKED BY	DATE REVISED
	JEFFREY BURDICK	

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

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PLANS APPROVAL DATE

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No. C75396
Exp. 12/31/15
CIVIL

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SUITE 700
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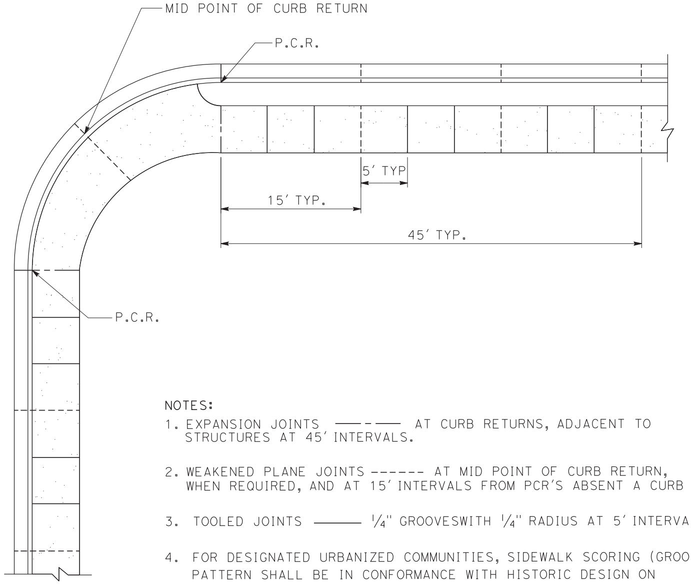
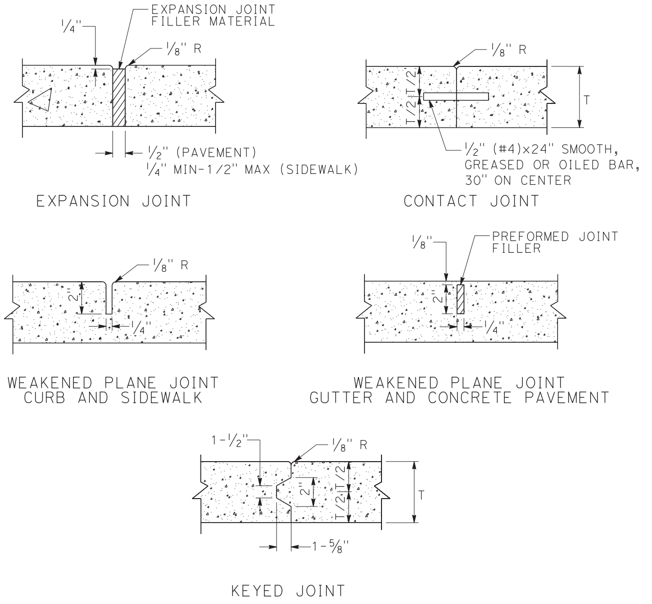


NOTES:

1. EXPANSION JOINTS ——-—— AT CURB RETURNS, ADJACENT TO STRUCTURES AT 45′ INTERVALS.
2. WEAKENED PLANE JOINTS ------ AT MID POINT OF CURB RETURN, WHEN REQUIRED, AND AT 15′ INTERVALS FROM PCR′S ABSENT A CURB RAMP.
3. TOOLED JOINTS ——— 1/4" GROOVESWITH 1/4" RADIUS AT 5′ INTERVALS.
4. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK SCORING (GROOVES) PATTERN SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

CSDSD SDG-109
SIDEWALK JOINT LOCATIONS

NO SCALE



SDRSD G-10
CONCRETE JOINT DETAILS

NO SCALE

CONSTRUCTION DETAILS

NO SCALE

C-2

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USERNAME => sjohnson1
DGN FILE => 1118_ga02.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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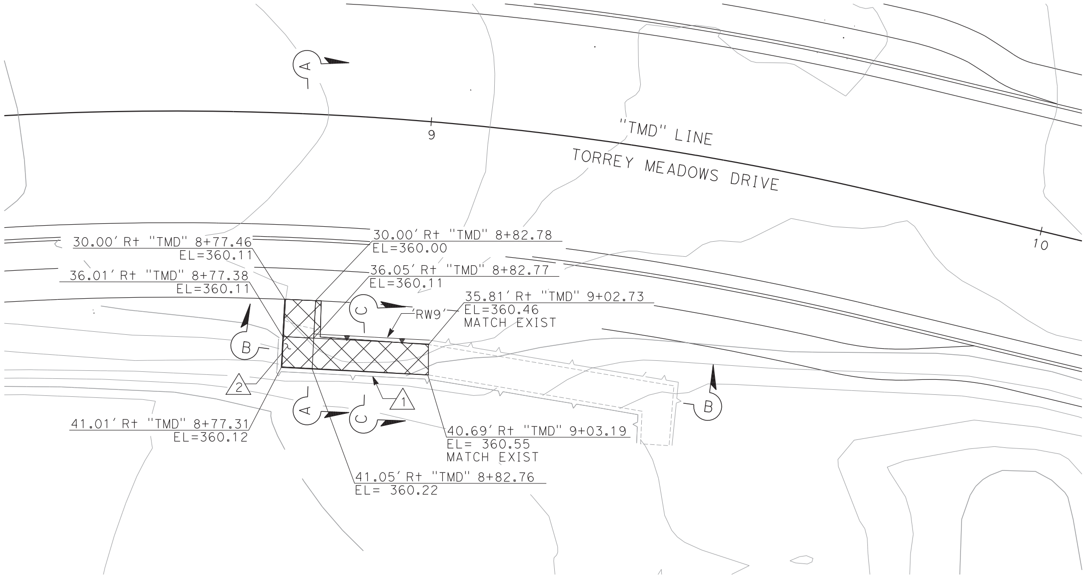
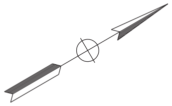
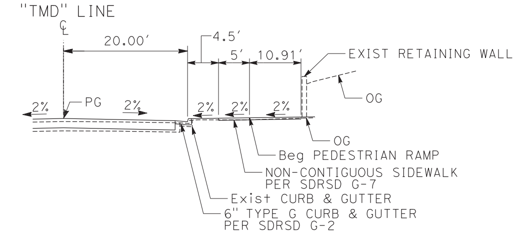


DEMOLITION NOTES

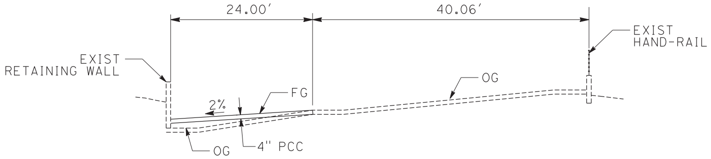
△1 PROTECT IN PLACE

☒ △2 REMOVE EXISTING CONCRETE SIDEWALK AND AGGREGATE BASE

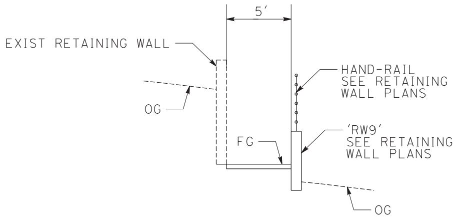




SECTION A-A
NO SCALE



SECTION B-B
NO SCALE



SECTION C-C
NO SCALE

CONSTRUCTION DETAILS

SCALE: 1"=10'

C-3

CALCULATED-DESIGNED BY	SHANNON JOHNSON
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REVISED BY	
DATE REVISED	

CONSULTANT FUNCTIONAL SUPERVISOR
CLARK FERNON

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USERNAME => sjohnson1
DGN FILE => 1118_ga03.dgn
RELATIVE BORDER SCALE IS IN INCHES
0 1 2 3
UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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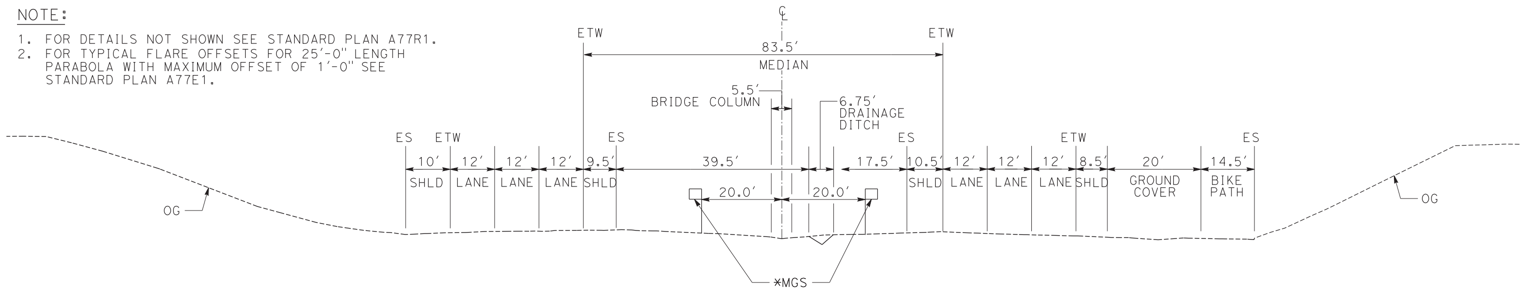
SUITE 700
SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101

NOTE:

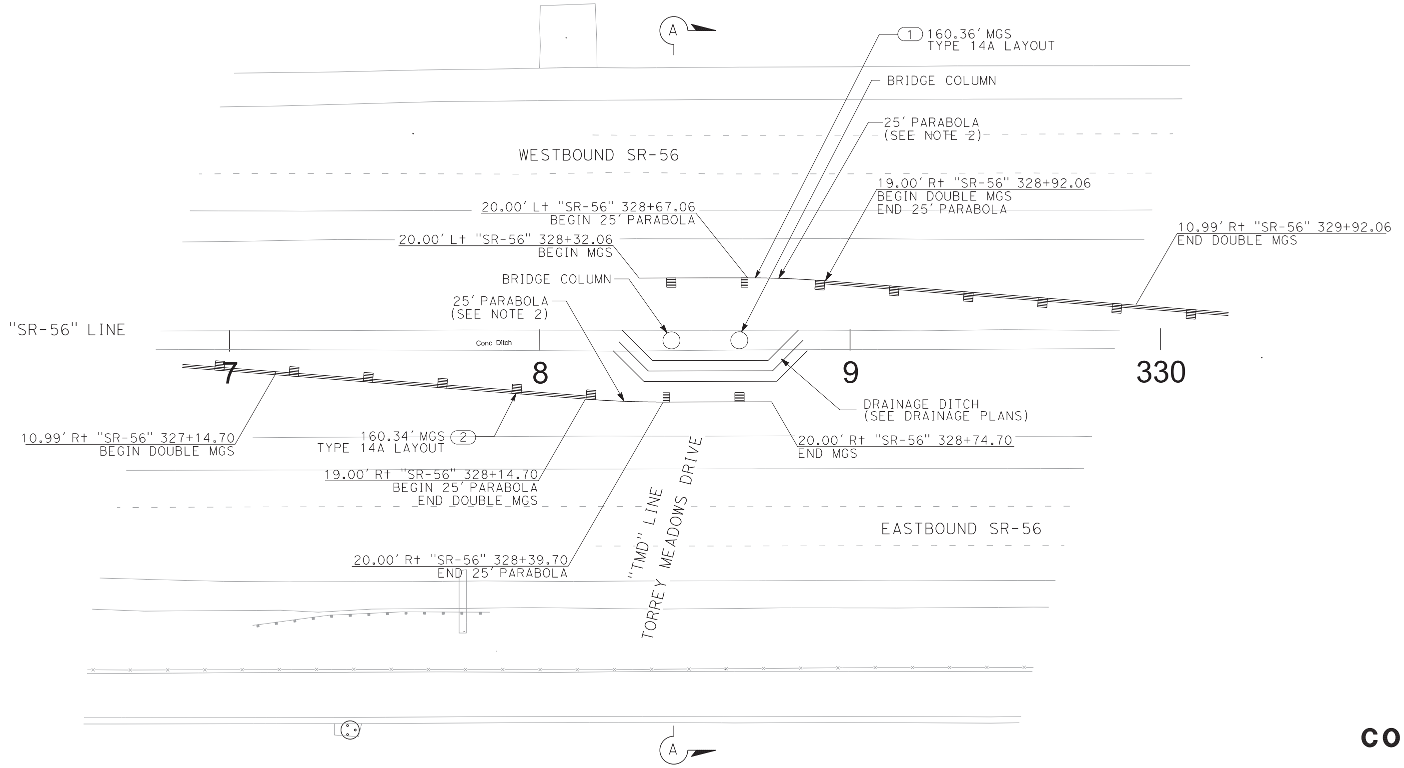
1. FOR DETAILS NOT SHOWN SEE STANDARD PLAN A77R1.
2. FOR TYPICAL FLARE OFFSETS FOR 25'-0" LENGTH PARABOLA WITH MAXIMUM OFFSET OF 1'-0" SEE STANDARD PLAN A77E1.



SECTION A-A

NO SCALE

* FOR DETAILS NOT SHOWN SEE RSP A77R1



MBGR TYPE 14A LAYOUT (Std PLAN A77R1)

CONSTRUCTION DETAILS

SCALE: 1"=20'

C-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
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USERNAME => sjohnson1
DGN FILE => 1118_ga04.dgn

RELATIVE BORDER SCALE IS IN INCHES

0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
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PLANS APPROVAL DATE

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CITY OF SAN DIEGO
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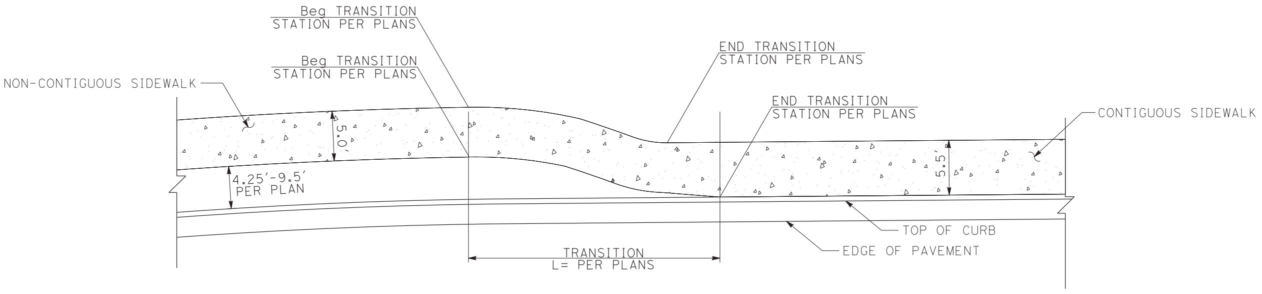

TORREY MEADOWS DRIVE

TYPICAL SIDEWALK TRANSITION

NO SCALE

CONSTRUCTION DETAILS

C-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	Caltrans®
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NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

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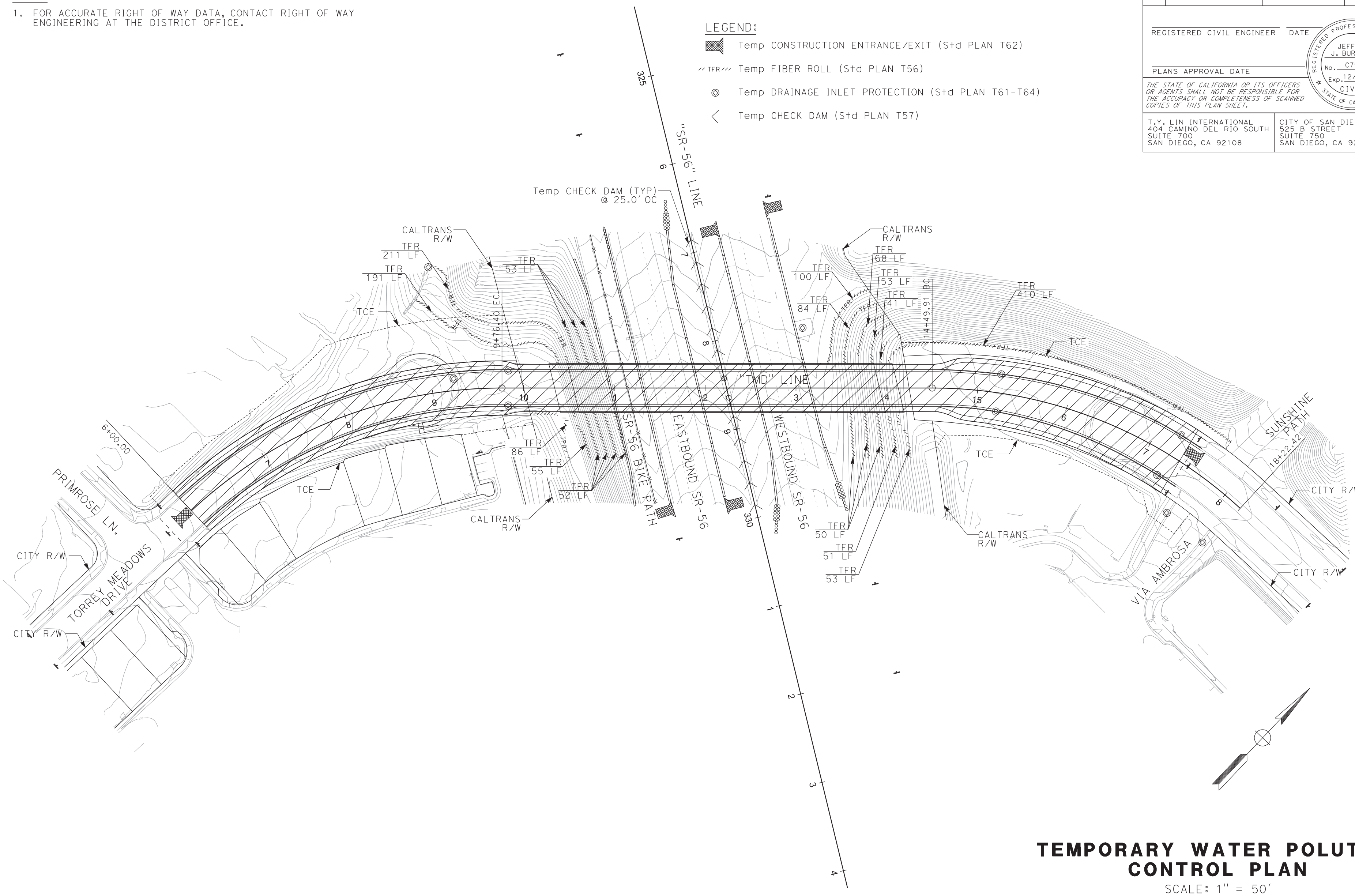
SAN DIEGO, CA 92101

LEGEND:

- ▨ Temp CONSTRUCTION ENTRANCE/EXIT (Std PLAN T62)
- // TFR // Temp FIBER ROLL (Std PLAN T56)
- ◎ Temp DRAINAGE INLET PROTECTION (Std PLAN T61-T64)
- < Temp CHECK DAM (Std PLAN T57)



TEMPORARY WATER POLUTION CONTROL PLAN

SCALE: 1" = 50'

WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL INFORMATION ONLY

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CONSULTANT FUNCTIONAL SUPERVISOR: CLARK FERNON

CALCULATED-DESIGNED BY: SHANNON JOHNSON

CHECKED BY: JEFFREY BURDICK

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

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SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101

TEMPORARY WATER POLLUTION QUANTITIES

ITEM DESCRIPTION	QUANTITY	UNIT
TEMPORARY FIBER ROLL		
TEMPORARY DRAINAGE INLET PROTECTION		
TEMPORARY CONSTRUCTION ENTRANCE		
TEMPORARY CHECK DAM		
TEMPORARY HYDRAULIC MULCH		

(N) - NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CLARK FERNON	CHECKED BY	JEFFREY BURDICK	DATE REVISED

TEMPORARY WATER POLLUTION CONTROL QUANTITIES

WPCQ-1

LAST REVISION 04-03-15
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USERNAME => sjohnson1
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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

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REGISTERED PROFESSIONAL ENGINEER
JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
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STATE OF CALIFORNIA

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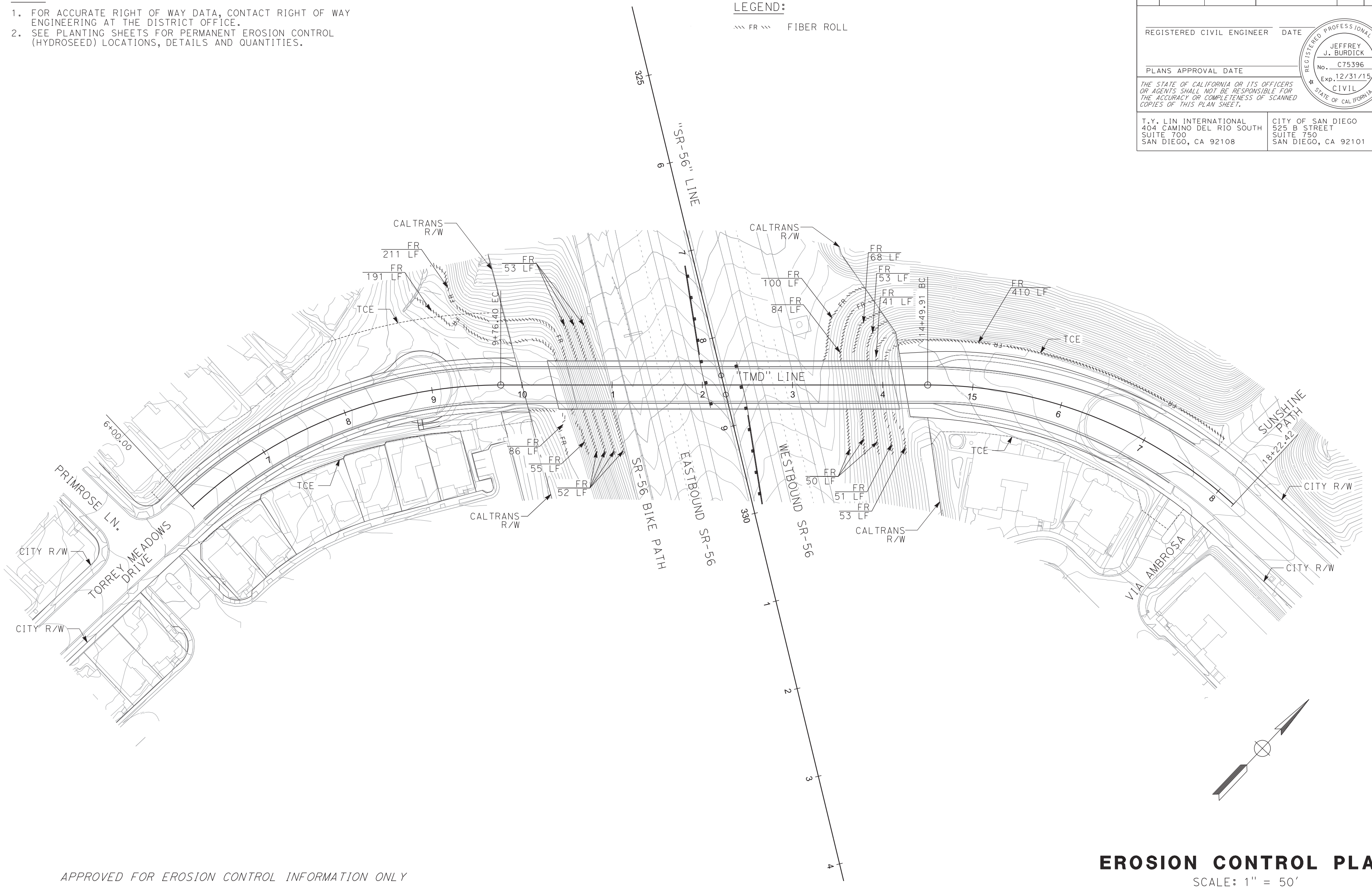
SAN DIEGO, CA 92101

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. SEE PLANTING SHEETS FOR PERMANENT EROSION CONTROL (HYDROSEED) LOCATIONS, DETAILS AND QUANTITIES.

LEGEND:

\\\ FR \\\ FIBER ROLL



APPROVED FOR EROSION CONTROL INFORMATION ONLY

EROSION CONTROL PLAN

SCALE: 1" = 50'

EC-1

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		CHECKED BY	DATE REVISED
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DGN FILE => 1118_ge01.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

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REGISTERED PROFESSIONAL ENGINEER
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EROSION CONTROL QUANTITIES

STATION	LOCATION							
TOTAL								

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CLARK FERNON

CALCULATED-DESIGNED BY SHANNON JOHNSON

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REVISED BY

DATE REVISED

EROSION CONTROL QUANTITIES

ECQ-1

LAST REVISION 04-03-15

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DGN FILE => 1118_gh01.dgn

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
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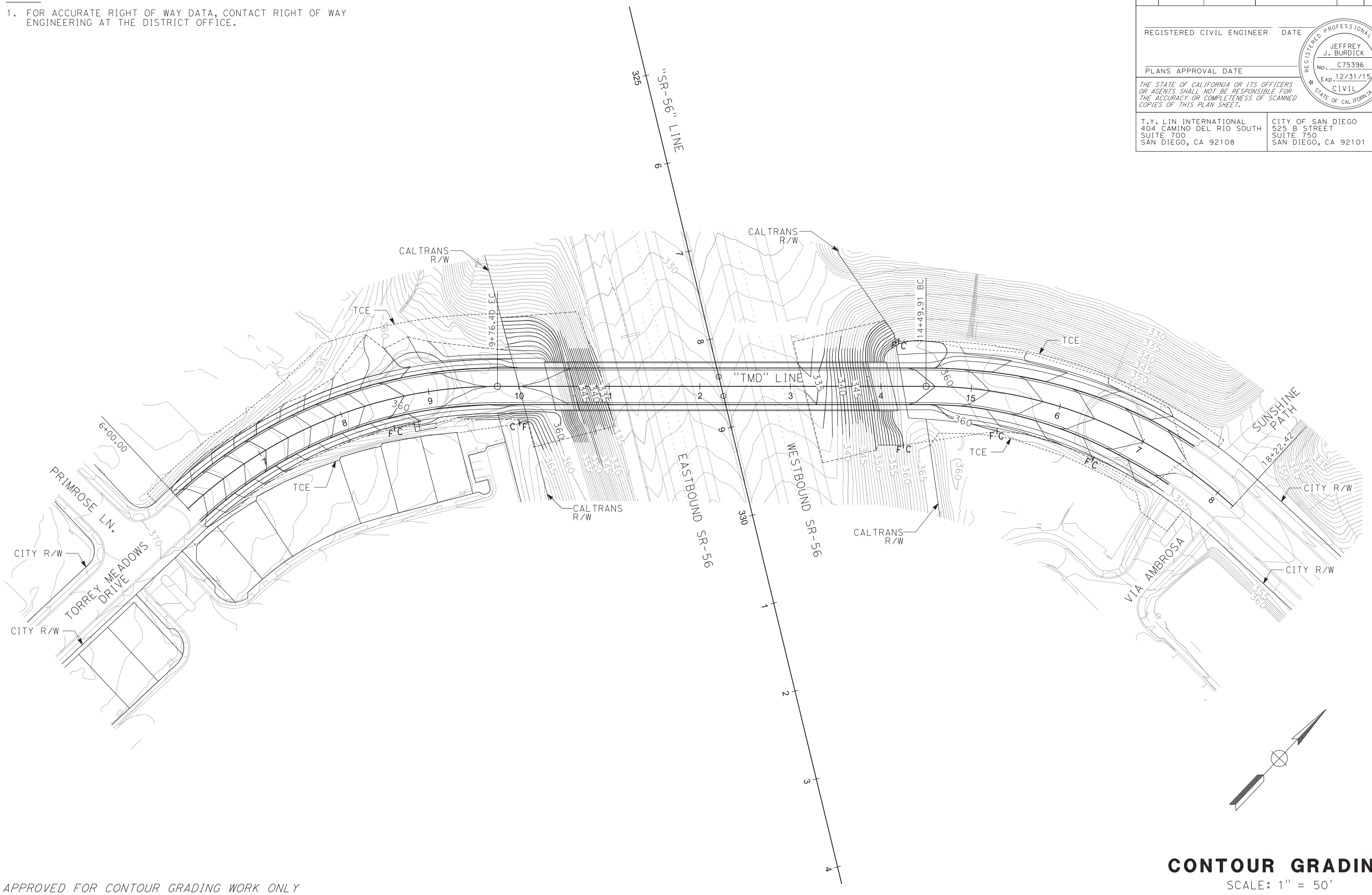
NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



CONTOUR GRADING

SCALE: 1" = 50'

G-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

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SAN DIEGO, CA 92101

NOTES:

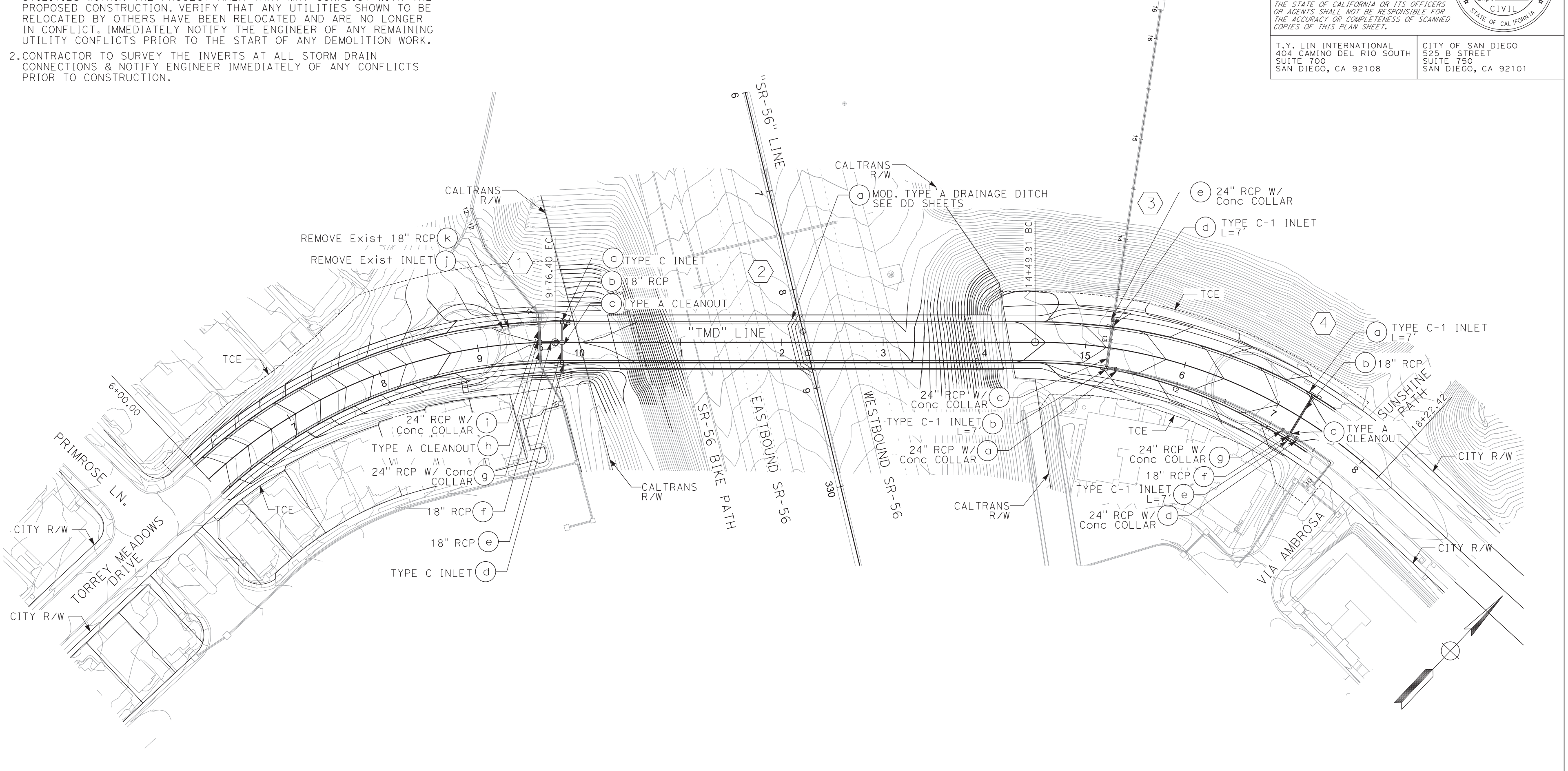
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

GENERAL NOTES:

1. VERIFY THE EXISTENCE AND HORIZONTAL/VERTICAL LOCATION OF ALL UTILITIES WITHIN THE PROJECT AREA THAT MAY CONFLICT WITH THE PROPOSED CONSTRUCTION. VERIFY THAT ANY UTILITIES SHOWN TO BE RELOCATED BY OTHERS HAVE BEEN RELOCATED AND ARE NO LONGER IN CONFLICT. IMMEDIATELY NOTIFY THE ENGINEER OF ANY REMAINING UTILITY CONFLICTS PRIOR TO THE START OF ANY DEMOLITION WORK.
2. CONTRACTOR TO SURVEY THE INVERTS AT ALL STORM DRAIN CONNECTIONS & NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

LEGEND:

⬡X DRAINAGE SYSTEM No.
ⓧ DRAINAGE UNIT



ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1" = 50'

D-1

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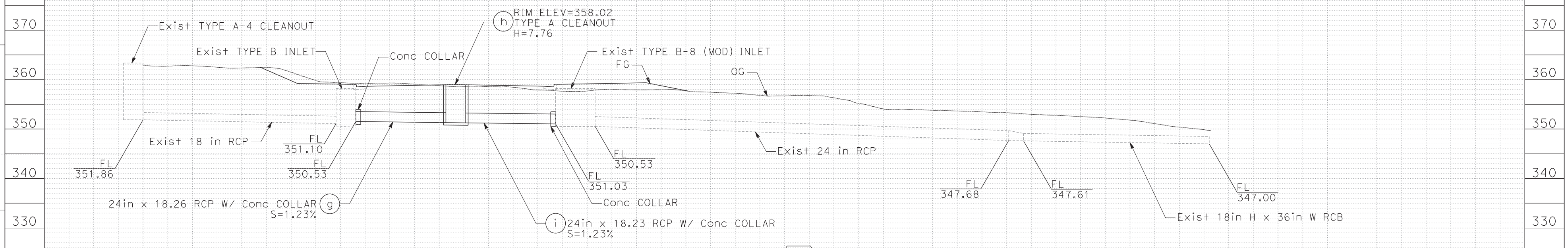
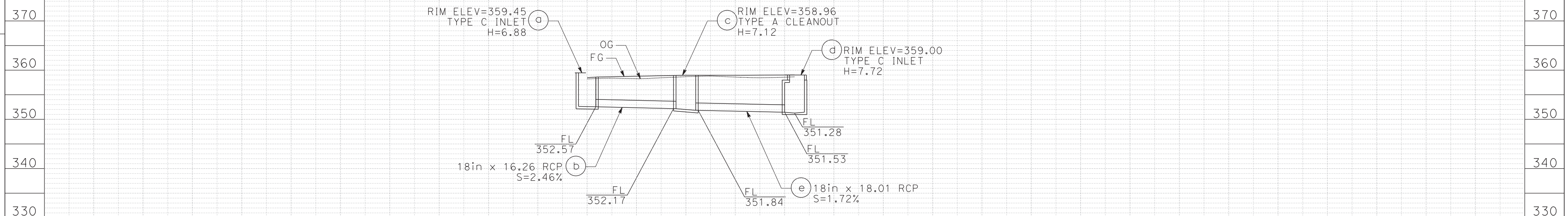


DRAINAGE SYSTEM No. 1a



DRAINAGE SYSTEM No. 1b

1a 1b

DRAINAGE PROFILES

SCALE: Horiz 1"=10'
Vert 1"=10'

DP-1

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UNIT XXXX

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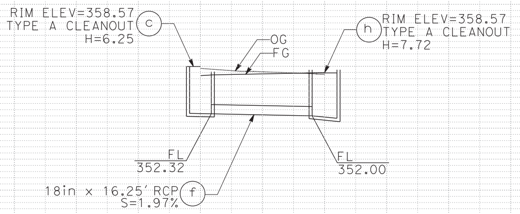

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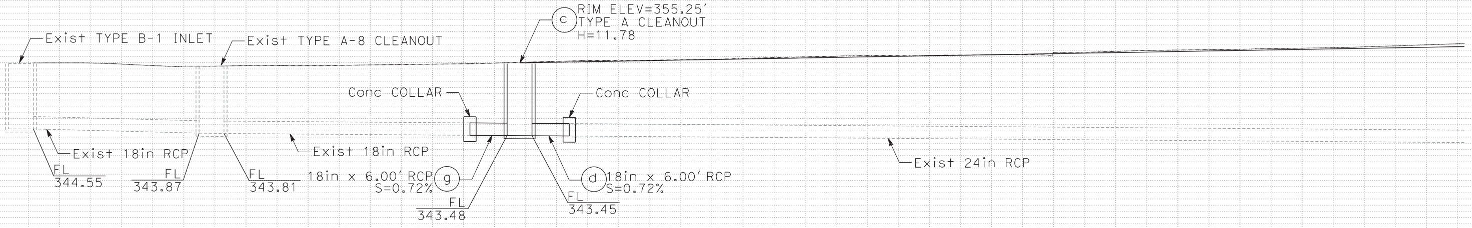

DRAINAGE SYSTEM No. 4

1c 4

DRAINAGE PROFILES

SCALE: Horiz 1"=10'
Vert 1"=10'

DP-2

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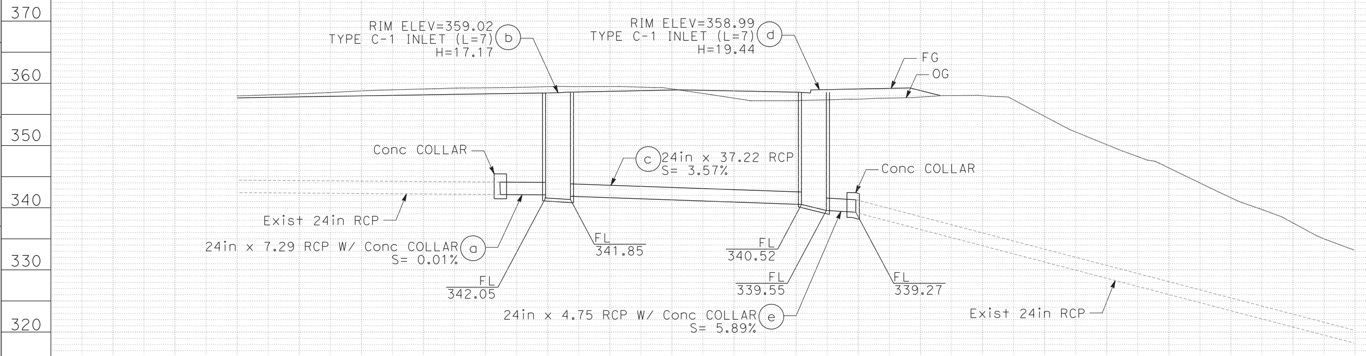
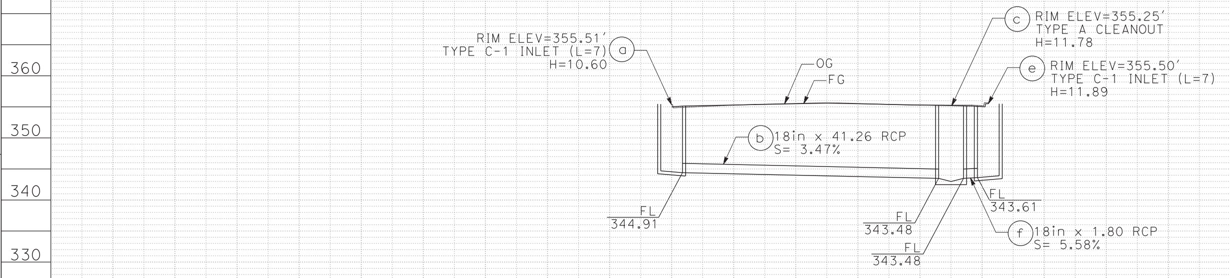


DRAINAGE SYSTEM No. 3



DRAINAGE SYSTEM No. 4

3 4

DRAINAGE PROFILES

SCALE: Horiz 1"=10'
Vert 1"=10'

DP-3

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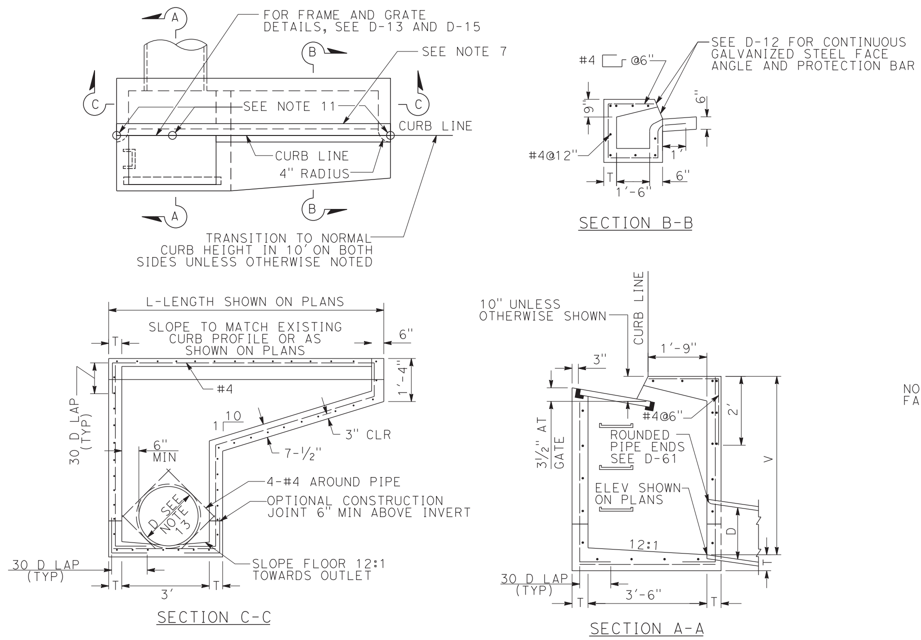
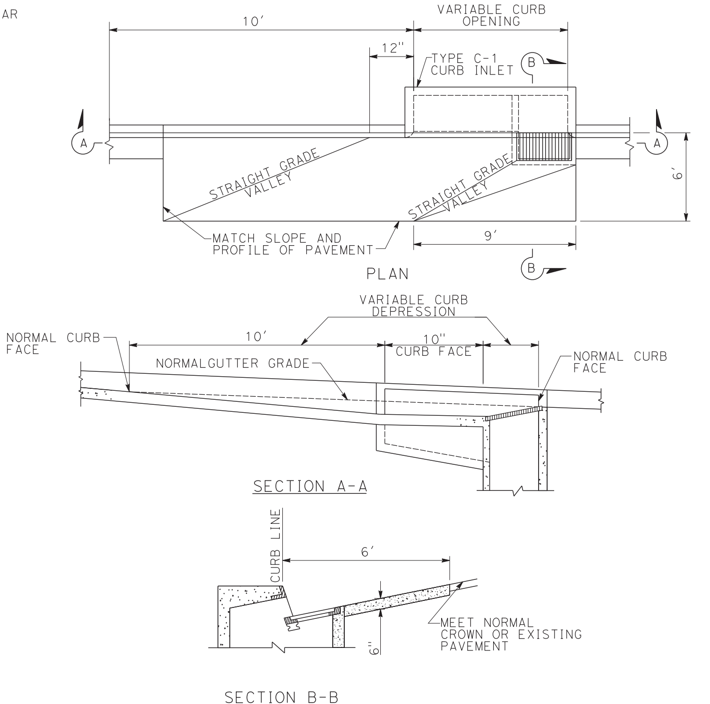


NOTES:
1. TYPES ARE DESIGNATED ON PLANS AS FOLLOWS: C (NO WINGS), C-1 (ONE WING) OR C-2 (TWO WINGS).
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF ½".
3. STEPS SHALL BE INSTALLED WHEN V EXCEEDS 4'.
4. CONCRETE GUTTER TO MATCH ADJACENT GUTTERS.
5. AN EXPANSION JOINT SHALL BE PLACED AT THE ENDS OF THE INLET WHERE THE CURB IS TO ADJOIN.
6. PROVIDE ¼" TOOLED GROOVE IN TOP SLAB IN LINE WITH BACK OF ADJACENT CURB.
7. SURFACE OF TOP SLAB TO MATCH SIDEWALK FINISHED TO DRAIN TOWARD STREET AT A SLOPE OF ¼" PER FOOT.
8. WHERE INLET IS TO BE CONSTRUCTED ON GRADE AND D-3B CONCRETE APRON IS REQUIRED, LIFT DOWN-GRADE END OF GRATE.
9. INSTALL INLET MARKER.
10. ELEVATIONS SHALL BE SHOWN ON PLANS WHERE INDICATED BY "O" SYMBOL
11. DIAMETER "D" SHALL BE 24" MAXIMUM; FOR LARGER DIAMETER PIPES THIS DRAWING MUST BE MODIFIED.

CSDSD SDD-117
CURB INLET- TYPE C

NO SCALE



NOTES:
1. CURB AND APRON TO BE PLACED MONOLITHICICALLY.
2. USE OF FALSE HEADER AT VALLEYS AND SLOPE BREAK LINE IS OPTIONAL.
3. EXTEND VERTICAL STEEL FROM INLET STRUCTURE INTO CONCRETE APRON AS SHOWN ON SECTION B-B OF SDD-117.
4. SCREED DIRECTION ⟷
5. CONCRETE SHALL BE 520-C-2500.

CSDSD D-3B CONCRETE
APRON FOR TYPE C CURB INLET

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-1

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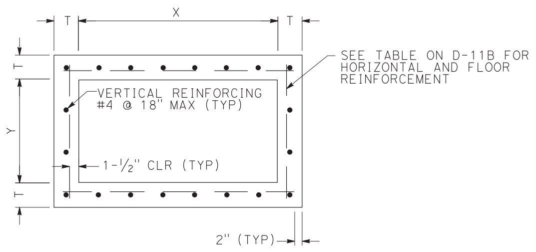
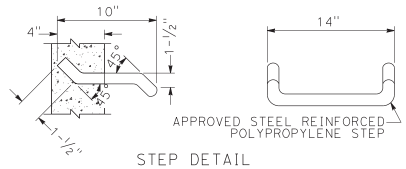


TYPICAL BOX SECTION



STEP DETAIL

NOTES:

1. CONCRETE SHALL BE 560-C-3250 UNLESS NOTED OTHERWISE.
2. REINFORCING STEEL SHALL COMPLY WITH THIS DRAWING UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE DEFORMED CONFORMING TO LATEST ASTM SPECIFICATIONS.
4. BENDS SHALL BE IN ACCORDANCE WITH THE LATEST ACI CODE.
5. MINIMUM SPLICE LENGTH FOR REINFORCING SHALL BE 30 DIAMETERS.
6. FLOOR SHALL HAVE A WOOD TROWEL FINISH AND, EXCEPT WHERE USED AS JUNCTION BOXES, SHALL HAVE A MINIMUM SLOPE OF 1:12 TOWARD THE OUTLET.
7. DEPTH V IS MEASURED FROM THE TOP OF THE STRUCTURE TO THE FLOWLINE OF THE BOX.
8. WALL THICKNESS AND REINFORCING STEEL REQUIRED MAY BE DECREASED IN ACCORDANCE WITH TABLE ON THIS SHEET.
9. WALL THICKNESS SHALL BE STEPPED ON THE OUTSIDE OF THE BOX.
10. WHEN THE STRUCTURE DEPTH, V EXCEEDS 4', STEPS SHALL BE CAST INTO THE WALL AT 15" INTERVALS FROM 15" ABOVE FLOOR TO WITHIN 12" OF STOP STRUCTURE. PLACE STEPS IN WALL WITHOUT PIPE OPENING, OTHERWISE OVER OPENING OF SMALLEST DIAMETER.
11. ALTERNATE STEP MAY BE APPROVED STEEL REINFORCED POLYPROPYLENE STEP.
12. UPON APPROVAL OF THE ENGINEER, AS DEFINED BY SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, THE USE OF PRECAST STORM STRUCTURES IS ACCEPTABLE AS AN ALTERNATE TO CAST-IN-PLACE. PRECAST UNITS SHALLCONFORM TO ASTM STANDARDS AND BE MANUFACTURED IN A PERMANENT FACILITY DESIGNED FOR THAT PURPOSE.
13. TYPICAL REINFORCEMENT LAP SHALL BE 30 TIMES THE BAR DIAMETER MINIMUM. DIMENSION T SHALL BE 6" MINIMUM.
14. MARK EVERY STORM DRAIN INLET WITHIN THE PROJECT BOUNDARIES WITH ADHESIVE DECAL-DISCS ON EXISTING INLETS OR AN IMBEDDED CONCRETE STAMP ON NEW INLETS.
15. ON CURB INLETS, PLACE MARKER ON TOP OF THE INLET ROOF, ON CATCH BASIN, IMPRINT STAMP NEXT TO INLET GRATE.
16. NO RECYCLED WATER SHALL ENTER INTO STORM DRAIN.

CSDSD SDD-114 INLETS AND CLEANOUTS NOTES AND DETAILS

NO SCALE

BOX SECTION REINFORCEMENT (HORIZONTAL AND FLOOR)

MAXIMUM SPAN X OR Y	DEPTH V	THICKNESS T	HORIZONTAL AND FLOOR REINFORCEMENT SIZE AND SPACING
3' TO 4'	4'	6"	#4 @ 18"
4'-1" TO 7'			#4 @ 12"
7'-1" TO 8'			#4 @ 8"
3' TO 4'	4'-1" TO 8'	6"	#4 @ 18"
4'-1" TO 5'			#4 @ 12"
5'-1" TO 6'			#4 @ 8"
6'-1" TO 8'			#4 @ 6"
3' TO 4'	8'-1" TO 12'	6"	#4 @ 15"
4'-1" TO 5'		8"	#4 @ 12"
5'-1" TO 6'			#4 @ 8"
6'-1" TO 8'			#4 @ 6"
3' TO 4'	12'-1" TO 16'	8"	#4 @ 12"
4'-1" TO 5'			#4 @ 12"
5'-1" TO 6'			#4 @ 8"
6'-1" TO 7'			#4 @ 6"
7'-1" TO 8'			#5 @ 8"
3' TO 4'	16'-1" TO 20'	8"	#4 @ 12"
4'-1" TO 5'		10"	#4 @ 12"
5'-1" TO 6'			#4 @ 8"
6'-1" TO 7'			#4 @ 6"
7'-1" TO 8'			#5 @ 8"
3' TO 4'	20'-1" TO 24'	8"	#4 @ 12"
4'-1" TO 5'		10"	#4 @ 12"
5'-1" TO 6'			#4 @ 8"
6'-1" TO 7'			#4 @ 6"
7'-1" TO 8'		12"	#5 @ 8"

CSDSD SDD-114 INLETS AND CLEANOUTS NOTES AND DETAILS

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-2

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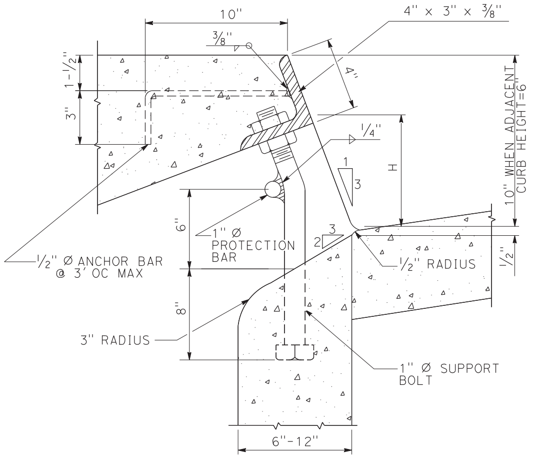
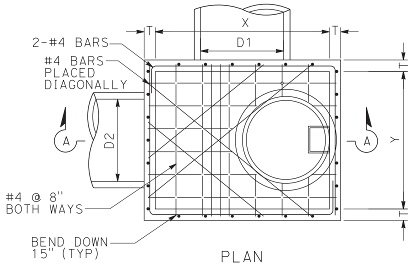


NOTES:

1. FACE ANGLE SHALL BE CAST INTO STRUTURE CONTINUOUS FOR THE FULL LENGTH "L".
2. ALL EXPOSED METAL PARTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
3. WHEN CURB INLET OPENING HEIGHT (H) EXCEEDS 8", INSTALL 1"Ø STEEL PROTECTION BAR. STEEL PROTECTION BAR SHALL BE EMBEDDED 8" INTO CURB INLET.
4. INSTALL ADDITIONAL BARS AT 3-1/2" CLEAR SPACING ABOVE FIRST STEEL PROTECTION BAR WHEN OPENING EXCEEDS 16".
5. WHEN CURB INLET OPEING LENGTH EXCEEDS 8' INSTALL 1"Ø STEEL SUPPORT BOLTS SPACED AT NO MORE THAN 5' OC.

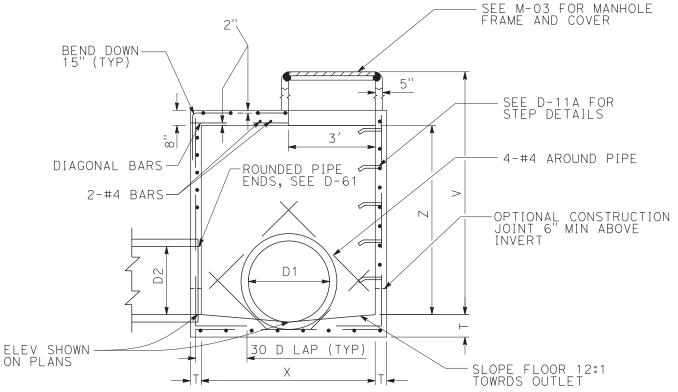
CSDSD SDD-102
CURB INLET OPENING

NO SCALE



PLAN

TYPE	PIPE DIAMETER (D1)	X	Y (SEE NOTE 8)	Z
A4	UP TO 39"	4'	4'	6'



NOTES:

1. SEE SDD-114 FOR ADDITIONAL NOTES AND DETAILS.
2. CONCRETE SHALL BE 560-C-3250
3. ALL PRECAST COMPONENTS SHALL BE REINFORCED WITH 1/4" DIAMETER STEEL, WOUND SPIRALLY ON 4" CENTERS.
4. ALL JOINTS SHALL BE SET IN CLASS C MORTAR.
5. MAINTAIN 1-1/2" CLEAR SPACING BETWEEN REINFORCING AND CONCRETE SURFACE UNLESS OTHERWISE NOTED.
6. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 1/2".
7. MANHOLE COVER TO BE MARKED "STORM DRAIN".
8. MODIFICATIONS TO "Y" DIMENSION REQUIRED IF PIPE (D2) EXCEEDS 39".
9. IF CONSTRUCTED ADJACENT TO SIDEWALK, TOP OF MANHOLE TO MATCH SIDEWALK SLOPE.

CSDSD D-9
STORM DRAIN CLEANOUT- TYPE A

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-3

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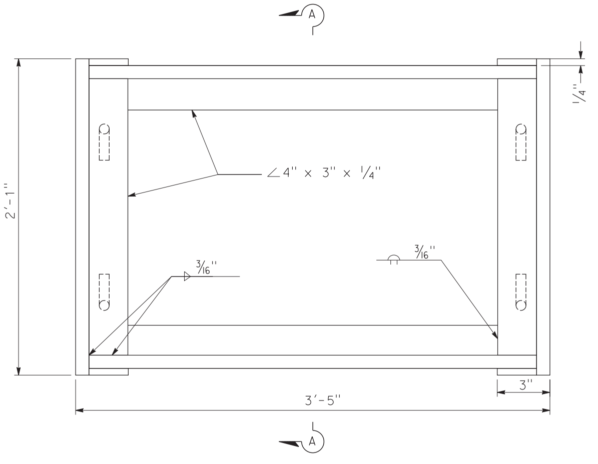
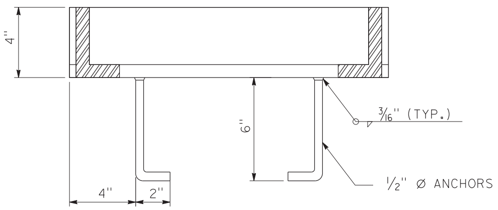


PLAN



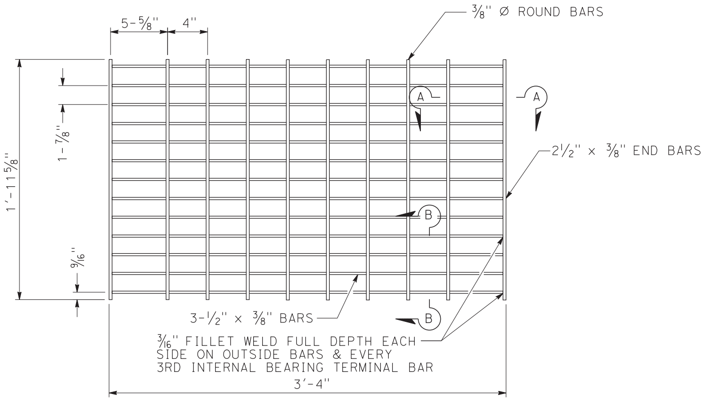
SECTION A-A

NOTE:

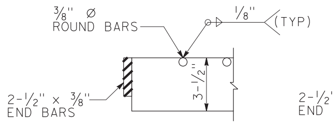
HOT DIP GALVANIZE ALL PARTS AFTER FABRICATION

CSDSD D-13
WELDED STEEL GATE FRAME

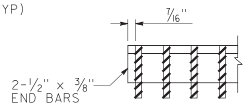
NO SCALE



PLAN



SECTION A-A



SECTION B-B

NOTES:
1. HOT DIP GALVANIZE ALL PARTS AFTER FABRICATION.
2. DIMENSIONS ARE TO CENTERLINE OF BARS UNLESS OTHERWISE NOTED.
3. NOT TO BE USED IN PEDESTRIAN AREAS.
4. WEIGHT: 200lbs +/-

CSDSD D-15
DRAINAGE STRUCTURE GATE

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-4

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
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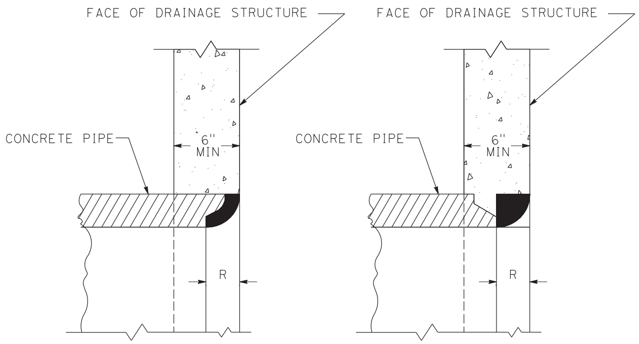
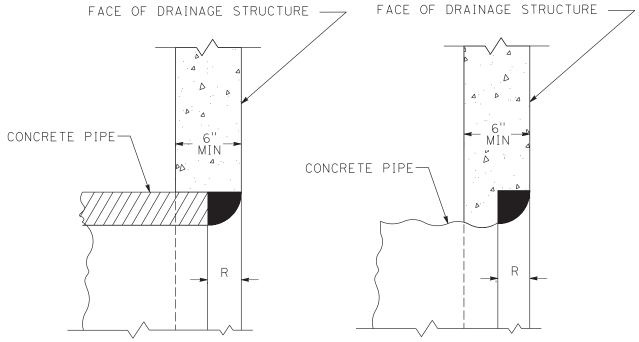


BELL END

R= THICKNESS OF PIPE

SPIGOT END

R= THICKNESS OF PIPE



CUT END

R= THICKNESS OF PIPE

CUT END

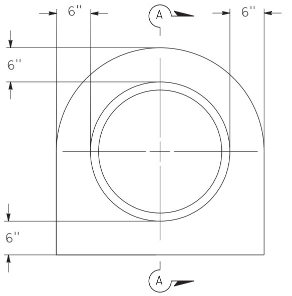
R= $\frac{\text{INSIDE DIAMETER OF PIPE}}{10}$

NOTE:

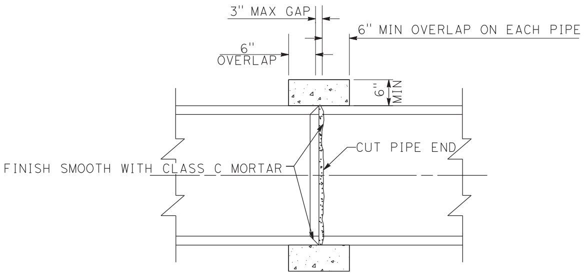
THE ROUNDED AREAS MAY BE BUILT UP OF CEMENT MORTAR OR POURED IN PLACE WITH THE DRIANAGE STRUCTURE

CSDSD D-61 ROUNDED PIPE ENDS IN DRAINAGE STRUCTURE

NO SCALE



ELEVATION



SECTION A-A

NOTES:

1. PIPE COLLAR DOES NOT HAVE TO BE FINISHED IF COVERED
2. CONCRETE SHALL BE 560-C-3250
3. WHERE GAP EXCEEDS 3" BUT IT IS NOT MORE THAN 6" AN INTERNAL FORM SHALL BE USED

CSDSD D-62 PIPE COLLAR

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-5

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PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
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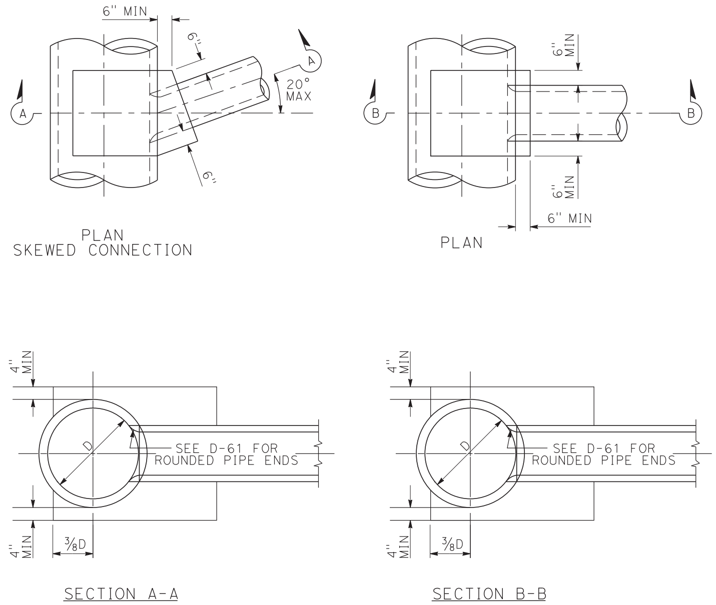
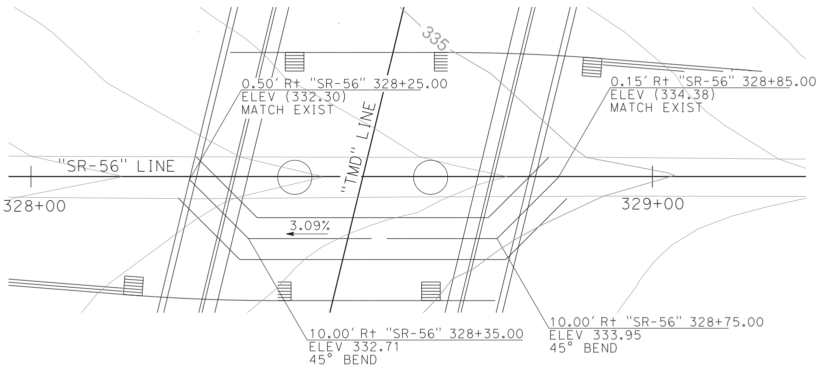


NOTES:

1. THE END OF CONNECTING PIPE SHALL NOT PROJECT INTO THE WATERWAY OF THE LARGER PIPE
2. THE LARGER PIPE SHALL NOT BE LESS THAN 24" ID.
3. THE OD OF SMALLER PIPE SHALL NOT BE MORE THAN 2/3 THE SIZE OF THE LARGER PIPE ID.
4. CONCRETE SHALL BE 470-C-2000.

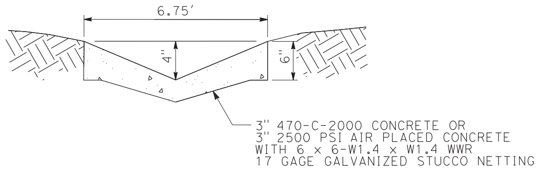
CSDSD SDD-113
CONCRETE LUG

NO SCALE



MODIFIED TYPE A DRAINAGE DITCH
DRAINAGE SYSTEM ⟨2⟩

SCALE: 1"=5'



NOTES:

1. LONGITUDINAL SLOPE OF LINED DITCH SHALL BE 2% MINIMUM.
2. OVER SLOPE DOWN DITCHES SHALL EMPLOY 6" THICKENED EDGE SECTION AT BOTH SIDES OF DITCH.
3. STUCCO NETTING SHALL BE GALVANIZED AND SHALL HAVE 1½" COVER.

CSDSD SDD-106
MODIFIED TYPE A DRAINAGE DITCH
DRAINAGE SYSTEM ⟨2⟩

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-6

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UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

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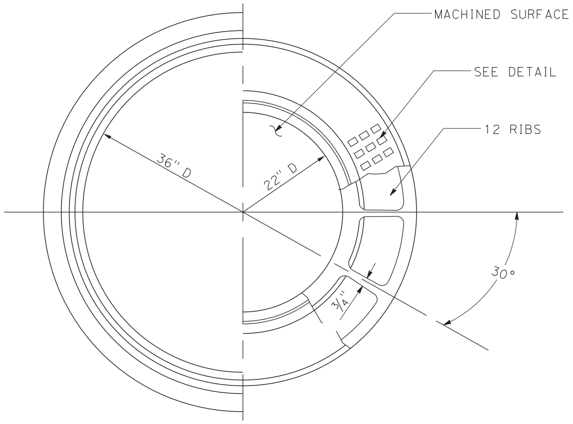
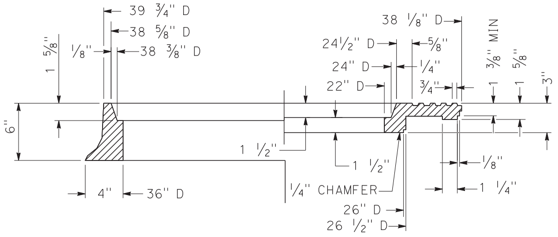


HALF PLAN FRAME & COVER



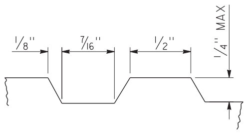
HALF SECTION FRAME & COVER

NOTES:

1. FRAME AND COVER SHALL BE CAST IRON. CAST IRON SHALL CONFORM TO ASTM 48, CLASS 35B.
2. WEIGHTS:

FRAME	314 lbs - 363 lbs
OUTER COVER	285 lbs - 330 lbs
INNER COVER	147 lbs - 171 lbs

3. MACHINE ALL MATCHING SURFACES AND SEATS OF FRAME AND COVER TO PREVENT ROCKING.
4. IMPORTED FRAMES AND COVERS SHALL HAVE THE COUNTRY OF ORIGIN MARKED IN COMPLIANCE WITH FEDERAL REGULATION.



DETAIL

CSDSD M-3 36" MANHOLE FRAME AND TWO CONCENTRIC COVERS HEAVY DUTY

NO SCALE

DRAINAGE DETAILS

NO SCALE

DD-7

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PLANS APPROVAL DATE

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DRAINAGE QUANTITIES

DRAINAGE SYSTEM No. ⬡	DRAINAGE UNIT ○	18" PVC PIPE	24" PVC PIPE	45°BEND (N)	22.5°BEND (N)	MINOR STRUCTURE (CONCRETE VAULT)	REMOVE INLET	REMOVE MANHOLE	REMOVE PIPE				MINOR STRUCTURE (DRAINAGE MANHOLE)	DRAINAGE MANHOLE FRAME & COVER (N)	DESCRIPTION	DRAINAGE PLAN SHEET No.	DRAINAGE SYSTEM No. ⬡	DRAINAGE UNIT ○
		LF	LF	EA	EA	EA	EA	EA	EA	LF	EA	EA	EA	EA				
1	a															D-1	1	a
1	b															D-1	1	b
1	c															D-1	1	c
1	d															D-1	1	d
1	e															D-1	1	e
1	f															D-1	1	f
1	g															D-1	1	g
1	h															D-1	1	h
1	i															D-1	1	i
1	j															D-1	1	j
1	k															D-1	1	k
1	l															D-1	1	l
1	m															D-1	1	m
		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	TOTAL (THIS SHEET)			

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DATE REVISED

DRAINAGE QUANTITIES

DQ-1

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RELATIVE BORDER SCALE IS IN INCHES
0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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11	SD	56	5.4/5.8		XX

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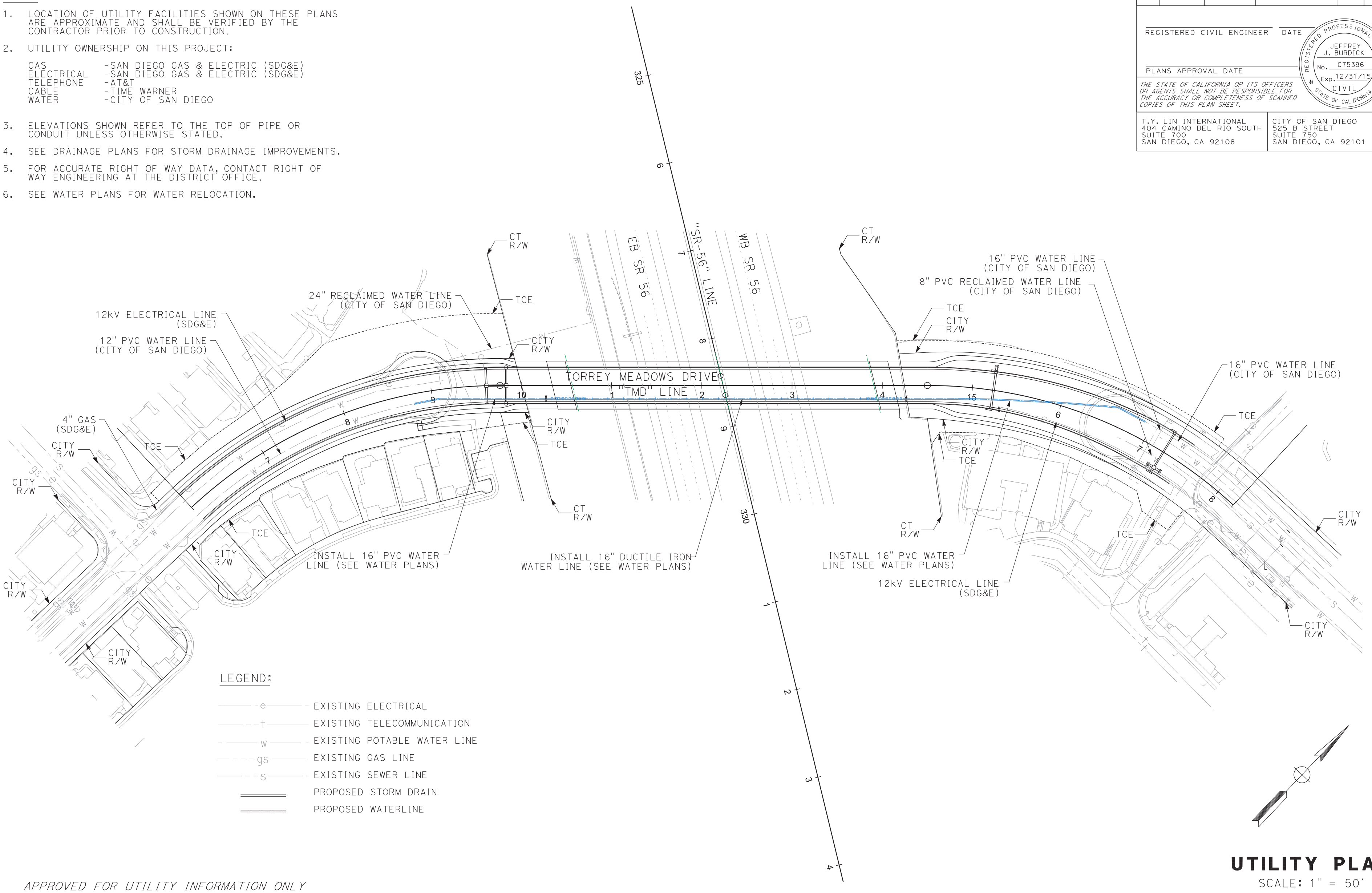
NOTE:

1. LOCATION OF UTILITY FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
2. UTILITY OWNERSHIP ON THIS PROJECT:

   GAS -SAN DIEGO GAS & ELECTRIC (SDG&E)
   ELECTRICAL -SAN DIEGO GAS & ELECTRIC (SDG&E)
   TELEPHONE -AT&T
   CABLE -TIME WARNER
   WATER -CITY OF SAN DIEGO

3. ELEVATIONS SHOWN REFER TO THE TOP OF PIPE OR CONDUIT UNLESS OTHERWISE STATED.
4. SEE DRAINAGE PLANS FOR STORM DRAINAGE IMPROVEMENTS.
5. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
6. SEE WATER PLANS FOR WATER RELOCATION.



LEGEND:

- e EXISTING ELECTRICAL
- t EXISTING TELECOMMUNICATION
- w EXISTING POTABLE WATER LINE
- gs EXISTING GAS LINE
- s EXISTING SEWER LINE
- PROPOSED STORM DRAIN
- PROPOSED WATERLINE

APPROVED FOR UTILITY INFORMATION ONLY

UTILITY PLAN

SCALE: 1" = 50'

U-1

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
DANIEL W. ARUTA
No. C56417
Exp. 06/30/15
CIVIL
STATE OF CALIFORNIA

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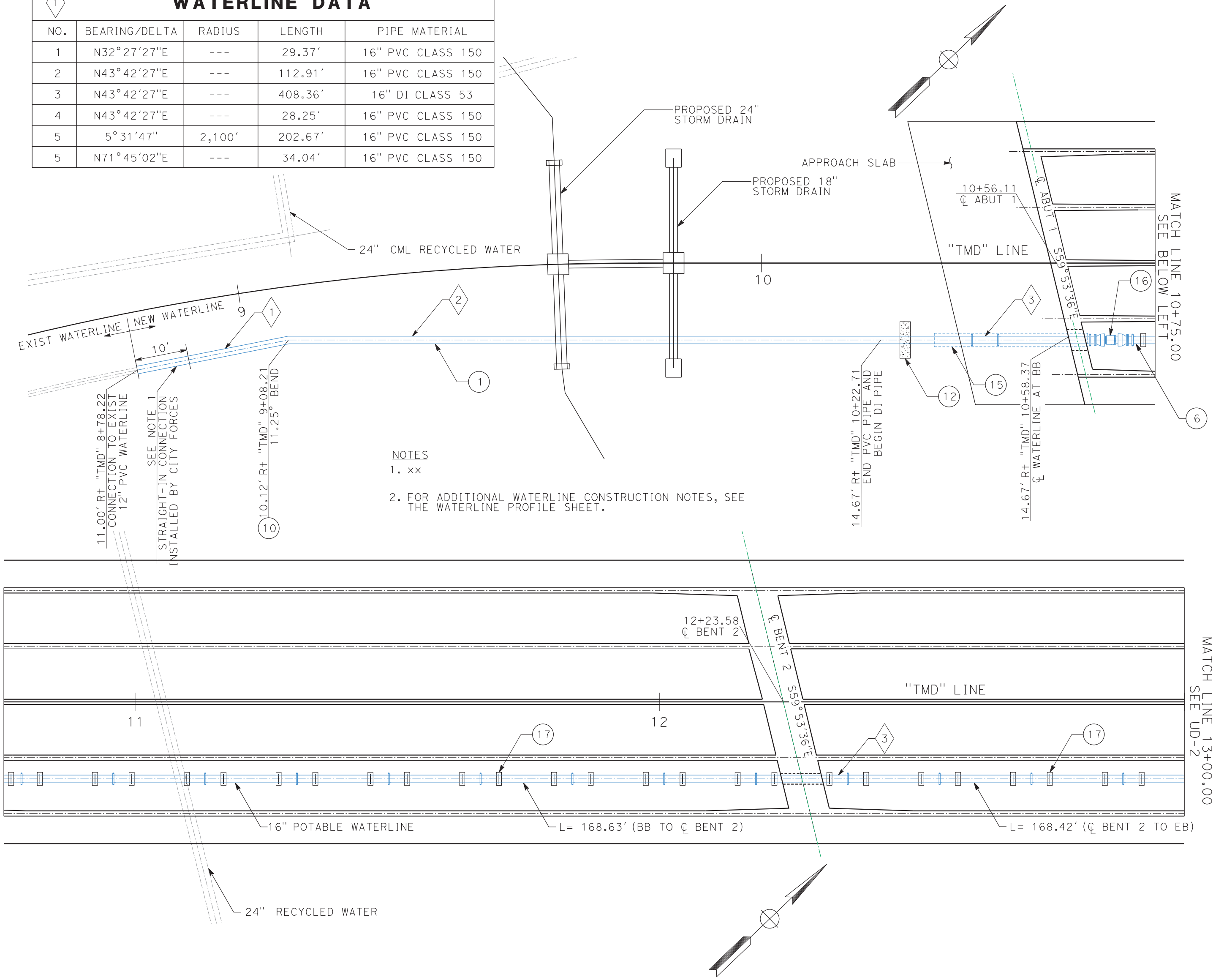
◇1 WATERLINE DATA

NO.	BEARING/DELTA	RADIUS	LENGTH	PIPE MATERIAL
1	N32°27'27"E	---	29.37'	16" PVC CLASS 150
2	N43°42'27"E	---	112.91'	16" PVC CLASS 150
3	N43°42'27"E	---	408.36'	16" DI CLASS 53
4	N43°42'27"E	---	28.25'	16" PVC CLASS 150
5	5°31'47"	2,100'	202.67'	16" PVC CLASS 150
5	N71°45'02"E	---	34.04'	16" PVC CLASS 150



NOTES
1. xx

2. FOR ADDITIONAL WATERLINE CONSTRUCTION NOTES, SEE THE WATERLINE PROFILE SHEET.

MATERIAL SCHEDULE

① 16" CLASS 150 PVC PRESSURE PIPE
② 6" BLOWOFF ASSEMBLY PER CSDSD SDW-145 WITH MJ x FLG TEE-SEE WATERLINE DETAILS
③ 16" RESILIENT-SEATED BUTTERFLY GATE VALVE PER CSDSD SDW-153
④ WATER VALVE BYPASS ASSEMBLY PER CSDSD SDW-154 -SEE WATERLINE DETAILS
⑤ 16" VICTAULIC AWWA COUPLING FOR AWWA DUCTILE IRON PIPE
⑥ 16" DUCTILE IRON PIPE, THICKNESS CLASS 53
⑦ 16" DUCTILE IRON MJ x MJ 45° BEND
⑧ 16" DUCTILE IRON MJ x PE 45° BEND
⑨ 16" DUCTILE IRON MJ x MJ 22.5° BEND
⑩ 16" DUCTILE IRON MJ x MJ 11.25° BEND
⑪ 16" DUCTILE IRON MJ x FLG ADAPTER
⑫ ANCHOR BLOCK WITH 14 SQUARE FEET BEARING AREA-SEE WATERLINE DETAILS
⑬ 2" AIR AND VACUUM VALVE ASSEMBLY PER CSDSD SDW-159 -SEE WATERLINE DETAILS
⑭ CONCRETE THRUST BLOCK PER CSDSD SDW-151 -SEE WATERLINE DETAILS
⑮ 30" ID X 6" WALL THICKNESS STEEL PIPE (CASING PIPE) PER CITY OF SAN DIEGO STANDARD DETAIL C-105.
⑯ 16" FLEXIBLE EXPANSION JOINT WITH MECHANICAL JOINT ENDS AND JOINT RINGS WITH RETAINING WEDGES. TOTAL EXPANSION AND CONTRACTION IS XX"
⑰ PIPE SUPPORT- SEE WATERLINE DETAILS
⑱ 16" x 12" REDUCER MJ x MJ WITH JOINT RESTRAINT

THIS PLAN ACCURATE FOR WATERLINE WORK ONLY

WATERLINE PLAN

SCALE: 1"=10'

UD-1

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PROJECT NUMBER & PHASE 11140000491

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PLANS APPROVAL DATE

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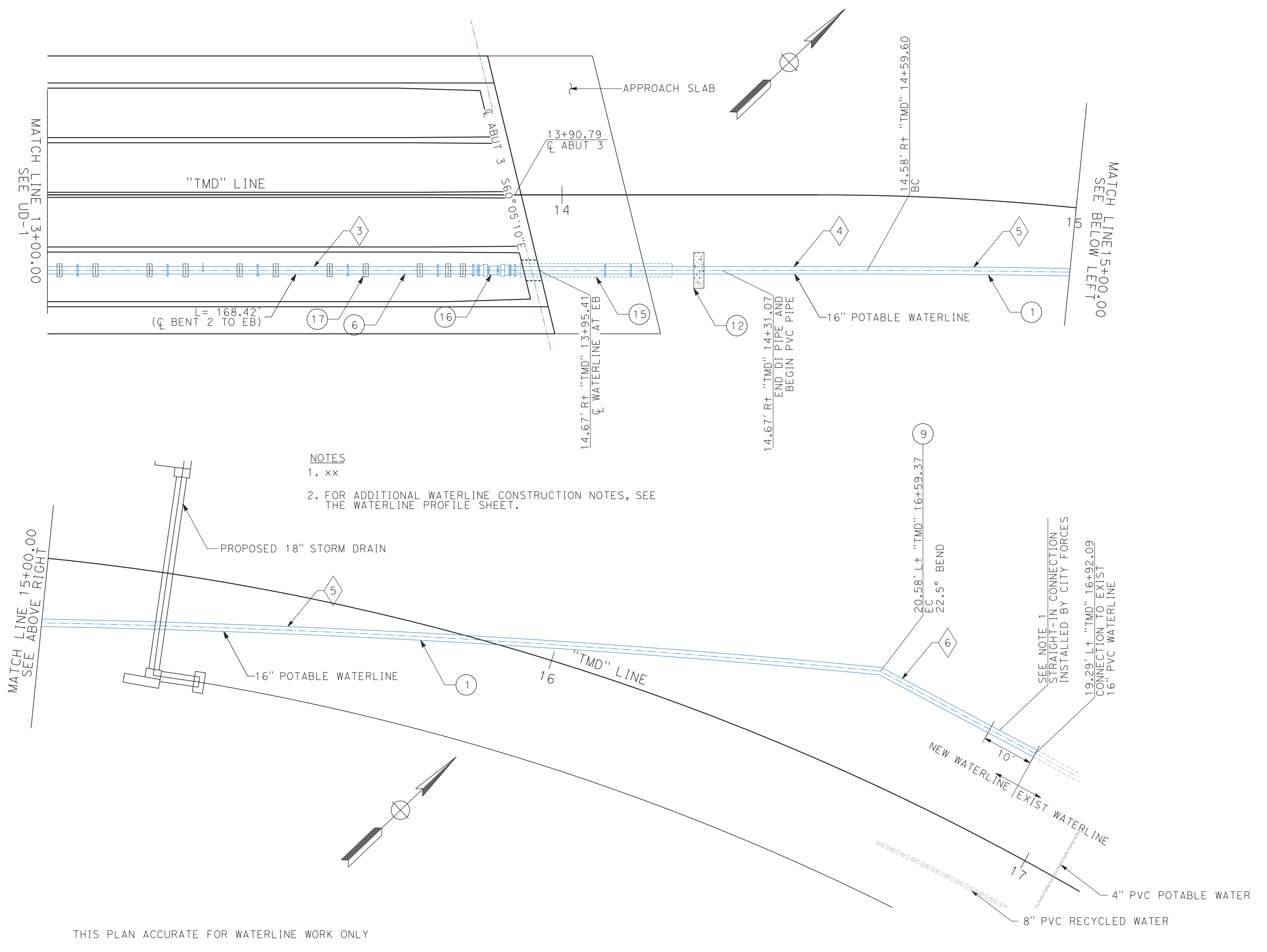

NOTES
1. xx

2. FOR ADDITIONAL WATERLINE CONSTRUCTION NOTES, SEE THE WATERLINE PROFILE SHEET.

THIS PLAN ACCURATE FOR WATERLINE WORK ONLY

WATERLINE PLAN

SCALE: 1"=10'

UD-2

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UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

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REGISTERED PROFESSIONAL ENGINEER
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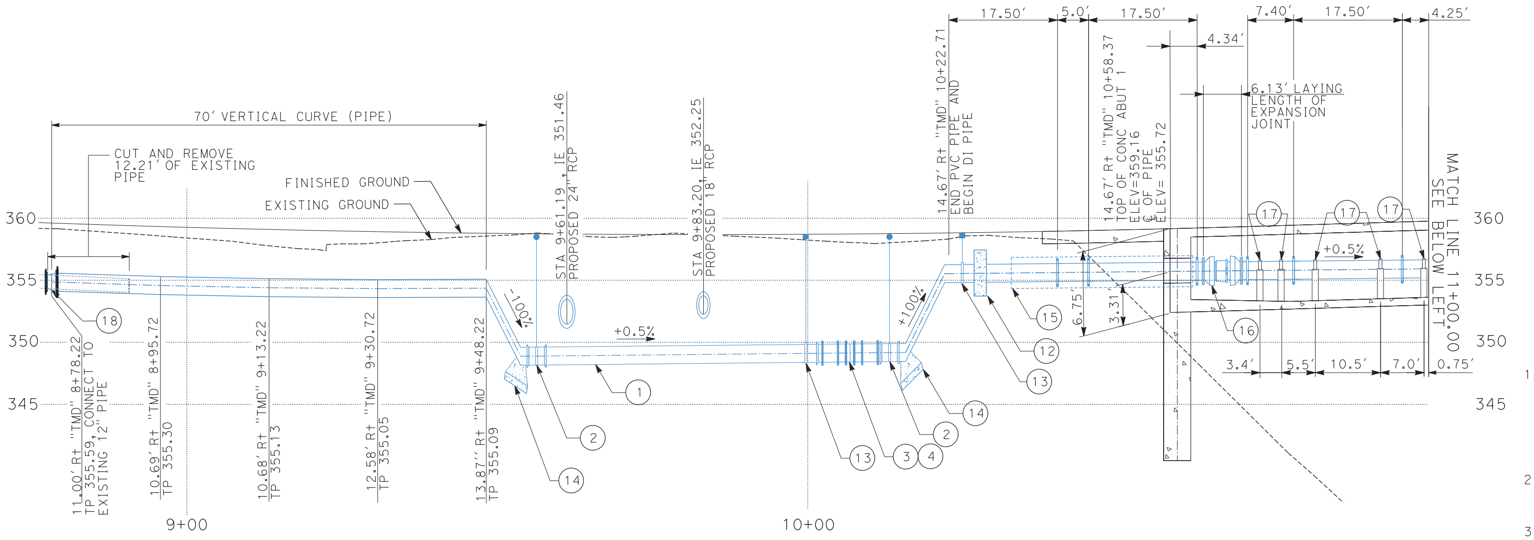
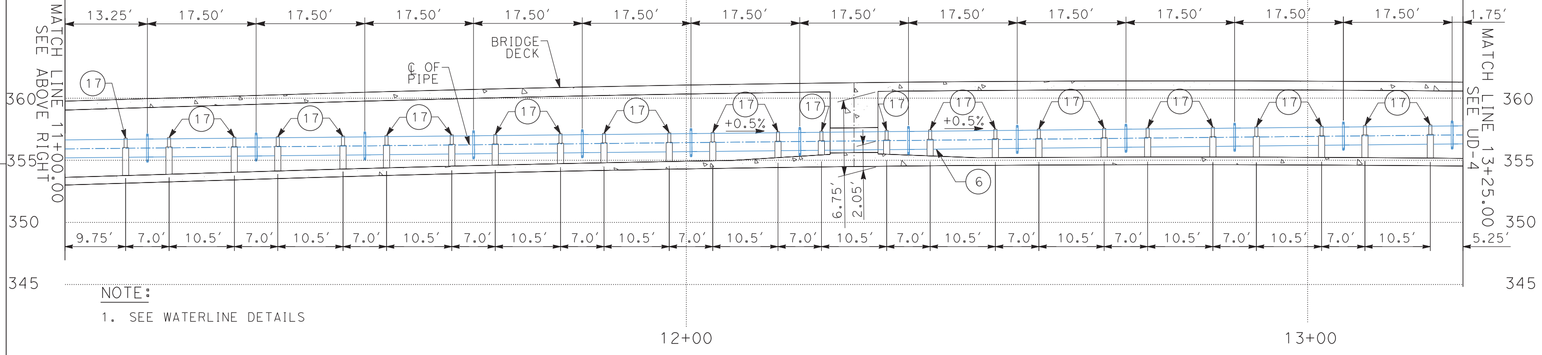


NOTE:

1. SEE WATERLINE DETAILS



NOTE:

1. SEE WATERLINE DETAILS

WATERLINE CONSTRUCTION NOTES:

1. PROVIDE ONE ADDITIONAL LENGTH OF DUCTILE IRON PIPE WITH RESTRAINED JOINTS IN EACH CELL SECTION OF THE BRIDGE FOR A TOTAL OF 2 LENGTHS. SEAL BOTH ENDS OF THE EXTRA PIPE LENGTHS TO PREVENT DEBRIS ACCUMULATION INSIDE OF THE PIPE. PROVIDE TWO SUPPORTS FOR EACH LENGTH AND INSTALL WHERE SHOWN AND SIMILAR TO OTHERS.

2. ALL FORMING MATERIALS AND DEBRIS SHALL BE COMPLETELY REMOVED FROM THE BRIDGE CELLS WHERE WATERLINES HAVE BEEN INSTALLED.

3. SEE THE MATERIAL SCHEDULE OF THE WATERLINE PLAN SHEET FOR A DESCRIPTION OF THOSE COMPONENTS REFERENCED HEREON BY A NUMBER CONTAINED WITHIN A CIRCLE.

4. FIELD COAT EXTERIOR SURFACES OF PIPES AND FLEXIBLE EXPANSION JOINTS LOCATED WITHIN THE BRIDGE CELL STRUCTURE. APPLY TWO COATS OF TWO COMPONENT EPOXY PAINT TO ALL SURFACES AT .005" DRY FILM THICKNESS EACH COAT.

5. THE PIPE SUPPORTS FOR THE DUCTILE IRON PIPE ALL HAVE VARYING DIMENSIONAL HEIGHTS. EACH PIPE SUPPORT HAS BEEN ASSIGNED A NUMBER THAT IS CONTAINED IN THE DETAIL WITH THE VARYING DIMENSIONAL INFORMATION. SEE WATERLINE DETAILS.

THIS PLAN ACCURATE FOR WATERLINE WORK ONLY

WATERLINE PROFILE

SCALE: HORIZONTAL: 1"=10'
VERTICAL: 1"=5'

UD-3

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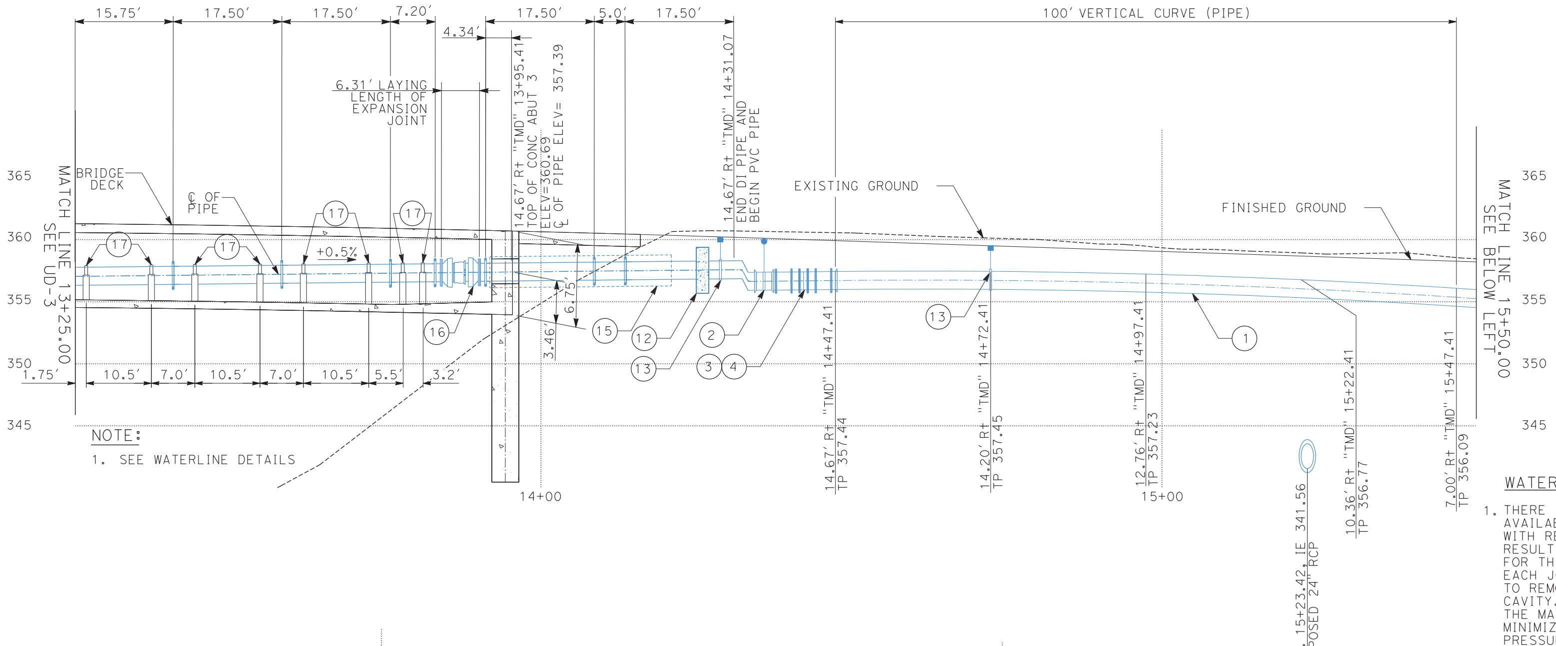
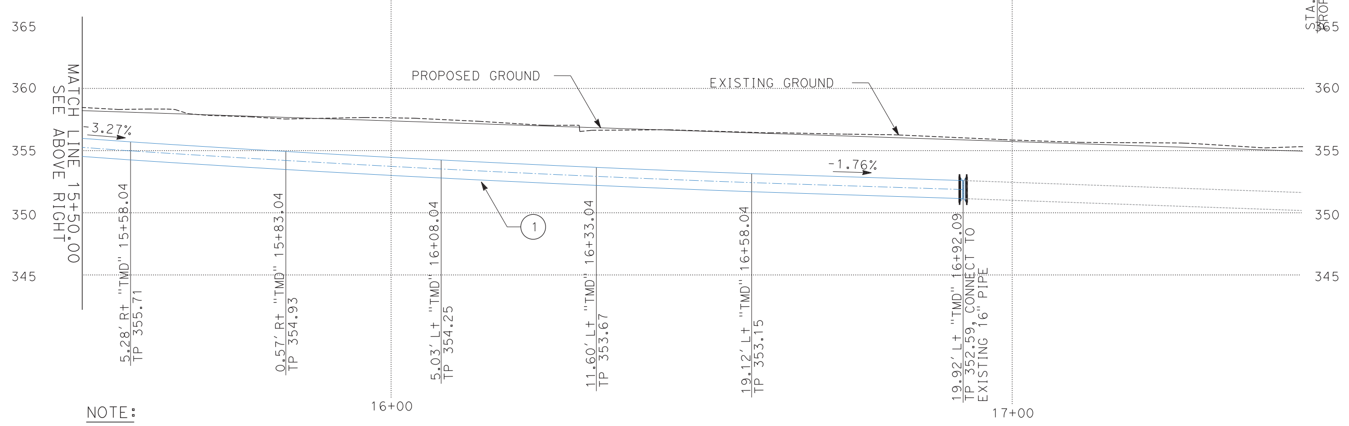


NOTE:

1. SEE WATERLINE DETAILS



NOTE:

1. SEE WATERLINE DETAILS

THIS PLAN ACCURATE FOR WATERLINE WORK ONLY

WATERLINE CONSTRUCTION NOTES:

1. THERE IS A SMALL AMOUNT OF SLACK AND PULLOUT AVAILABLE IN EACH LENGTH OF DUCTILE IRON PIPE WITH RESTRAINED JOINTS. THIS PULLOUT IS THE RESULT OF CLEARANCE INSIDE THE SOCKET REQUIRED FOR THE INSERTION OF THE LOCKING SEGMENTS. AFTER EACH JOINT HAS BEEN ASSEMBLED, EXTEND THE JOINT TO REMOVE THE SLACK IN THE LOCKING SEGMENT CAVITY. JOINT EXTENSION IS NECESSARY TO ATTAIN THE MARKED LAYING LENGTH OF THE PIPE AND TO MINIMIZE GROWTH OR EXTENTION OF THE LINE AS IT IS PRESSURIZED.
2. PROVIDE ONE ADDITIONAL LENGTH OF DUCTILE IRON PIPE WITH RESTRAINED JOINTS IN EACH CELL SECTION OF THE BRIDGE FOR A TOTAL OF 2 LENGTHS. SEAL BOTH ENDS OF THE EXTRA PIPE LENGTHS TO PREVENT DEBRIS ACCUMULATION INSIDE OF THE PIPE. PROVIDE TWO SUPPORTS FOR EACH LENGTH AND INSTALL WHERE SHOWN AND SIMILAR TO OTHERS.
3. ALL FORMING MATERIALS AND DEBRIS SHALL BE COMPLETELY REMOVED FROM THE BRIDGE CELLS WHERE WATERLINES HAVE BEEN INSTALLED.
4. SEE THE MATERIAL SCHEDULE OF THE WATERLINE PLAN SHEET FOR A DESCRIPTION OF THOSE COMPONENTS REFERENCED HEREON BY A NUMBER CONTAINED WITHIN A CIRCLE.
5. FIELD COAT EXTERIOR SURFACES OF PIPES AND FLEXIBLE EXPANSION JOINTS LOCATED WITHIN THE BRIDGE CELL STRUCTURE. APPLY TWO COATS OF TWO COMPONENT EPOXY PAINT TO ALL SURFACES AT .005" DRY FILM THICKNESS EACH COAT.
6. THE PIPE SUPPORTS FOR THE DUCTILE IRON PIPE ALL HAVE VARYING DIMENSIONAL HEIGHTS. EACH PIPE SUPPORT HAS BEEN ASSIGNED A NUMBER THAT IS CONTAINED IN THE DETAIL WITH THE VARYING DIMENSIONAL INFORMATION. SEE WATERLINE DETAILS.

WATERLINE PROFILE

HORIZONTAL: 1"=10'
VERTICAL: 1"=5'

UD-4

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

SCALE:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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No. C56417
Exp. 06/30/15
CIVIL

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CITY OF SAN DIEGO
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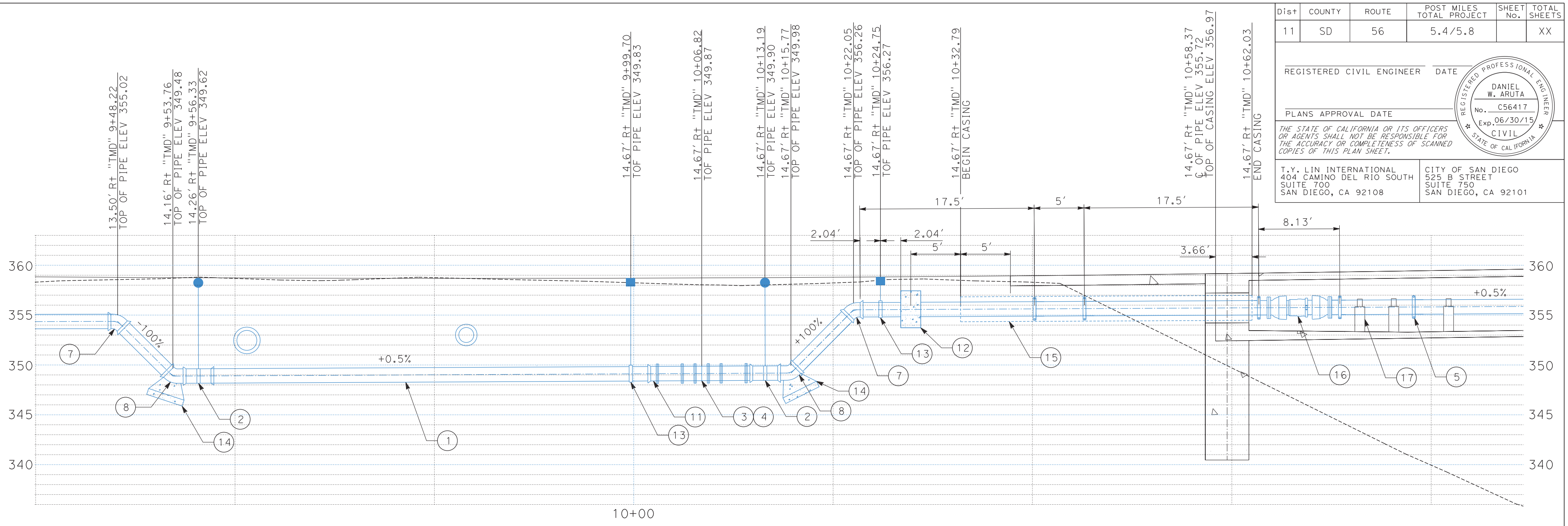
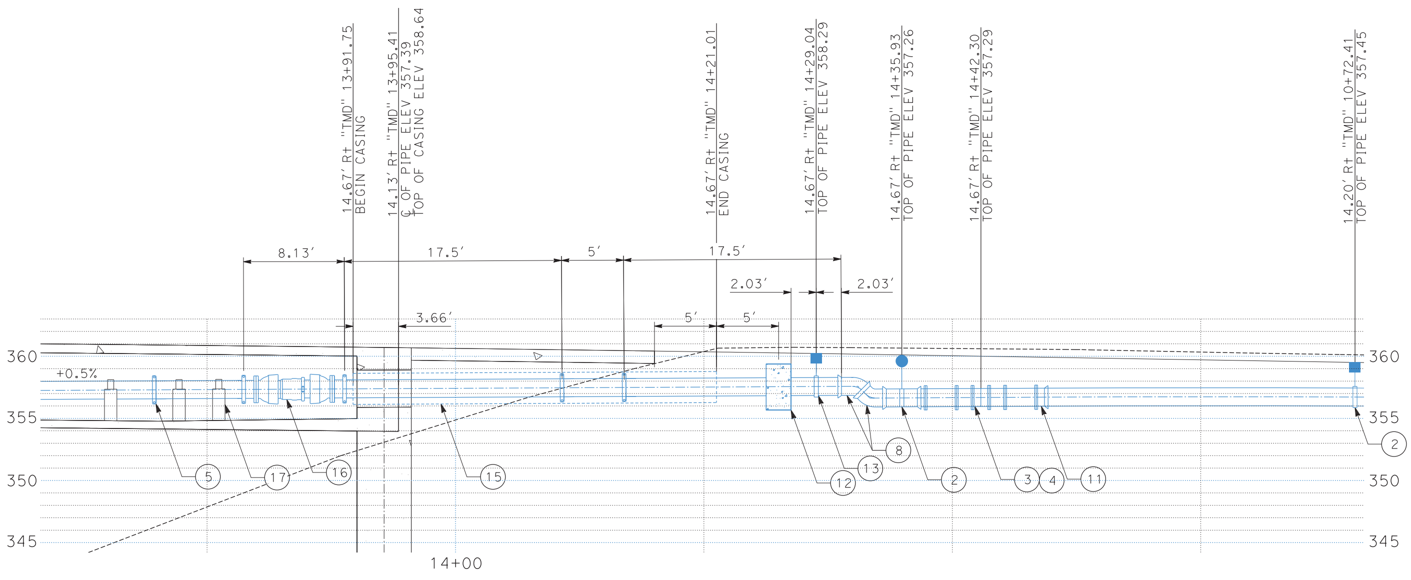
SUITE 750
SAN DIEGO, CA 92101





NOTE:

SEE THE MATERIAL SCHEDULE ON THE WATERLINE PLAN SHEET FOR A DESCRIPTION OF THOSE COMPONENTS REFERENCED HEREON BY A NUMBER CONTAINED WITHIN A CIRCLE.

WATERLINE DETAILS

SCALE: HORIZONTAL: 1"=5'
VERTICAL: 1"=5'

UD-5

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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11	SD	56	5.4/5.8		XX

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PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
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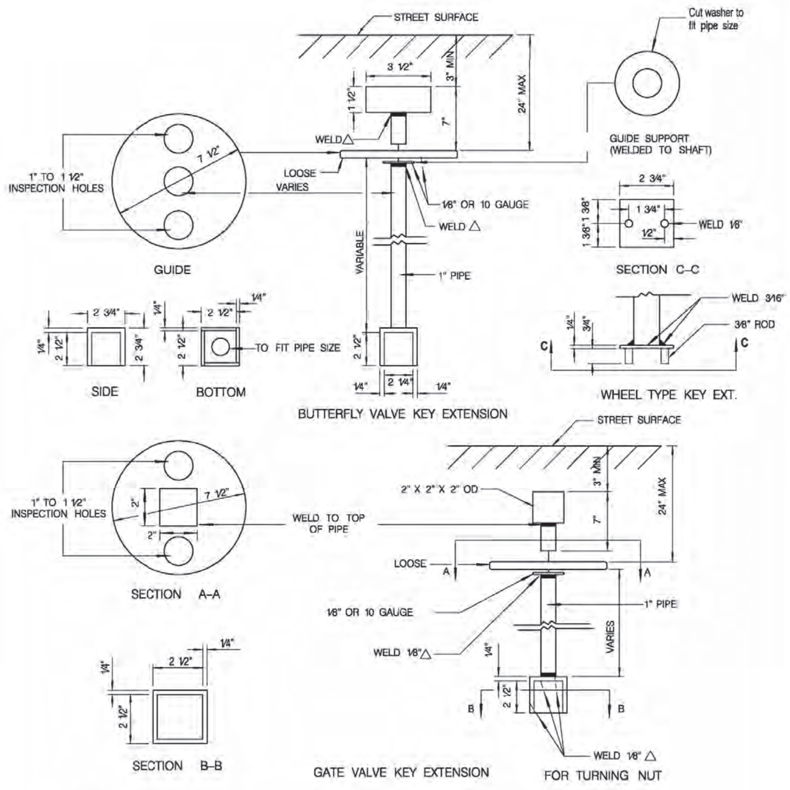
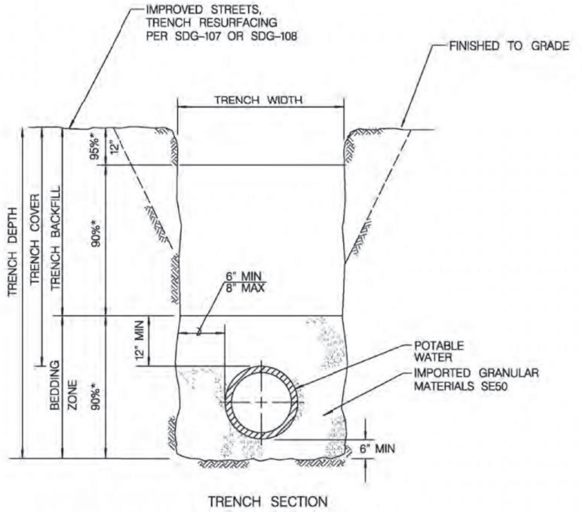


NOTES:

1. INSTALL VALVE KEY EXTENSIONS WHEN TOP OF VALVE IS 6' OR MORE BELOW GROUND OR PAVEMENT SURFACE.
2. PAINT ALL FINISHED SURFACES WITH ASPHALT VARNISH.
3. FOR VALVE BOX AND COVER, SEE OTHER DRAWINGS.
4. ALL WELDS TO CONFORM TO ANSI/AWWA C206 – 91.

CSDSD SDW-109
VALVE KEY EXTENSIONS

NO SCALE



NOTES:

1. (*) INDICATES MINIMUM RELATIVE COMPACTION.
2. MINIMUM COVER: 3' FOR DISTRIBUTION MAINS; 5' FOR TRANSMISSION MAINS.
3. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE: 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
4. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR ALL CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.
5. FOR MAINS LARGER THAN 16", TRENCH WIDTH SHALL BE AS SHOWN ON THE PLANS.

CSDSD SDW-110
PIPE BEDDING AND TRENCH BACKFILL FOR POTABLE WATER MAINS

NO SCALE

WATERLINE DETAILS

NO SCALE

UD-6

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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PLANS APPROVAL DATE

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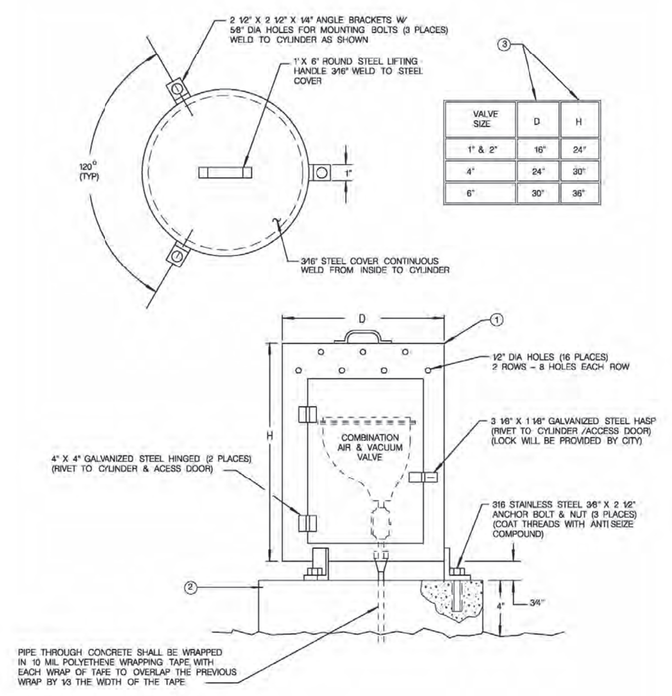

VALVE SIZE	D	H
1" & 2"	16"	24"
4"	24"	30"
6"	30"	36"

ITEMS CALL OUT:

① 3/16" STEEL ENCLOSURE WITH ACCESS DOOR, MISC. HARDWARE. CABINET AND HARDWARE SHOULD BE ZINC RICH EPOXY POWDER PRIMER (2-3 MIL DRY FILM THICKNESS) AND POLYESTER POWDER TOP COAT (2-3 MIL DRY FILM THICKNESS).

② 3' X 3' X 4" CONCRETE PAD 520-C-2500.

③ D AND H CHANGES ONLY WITH APPROVAL OF THE CITY ENGINEER.

CSDSD SDW-117
AIR AND VACCUUM VALVE ENCLOSURE & LOCATION

NO SCALE

WATERLINE DETAILS

NO SCALE

UD-7

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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11	SD	56	5.4/5.8		XX

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PLANS APPROVAL DATE

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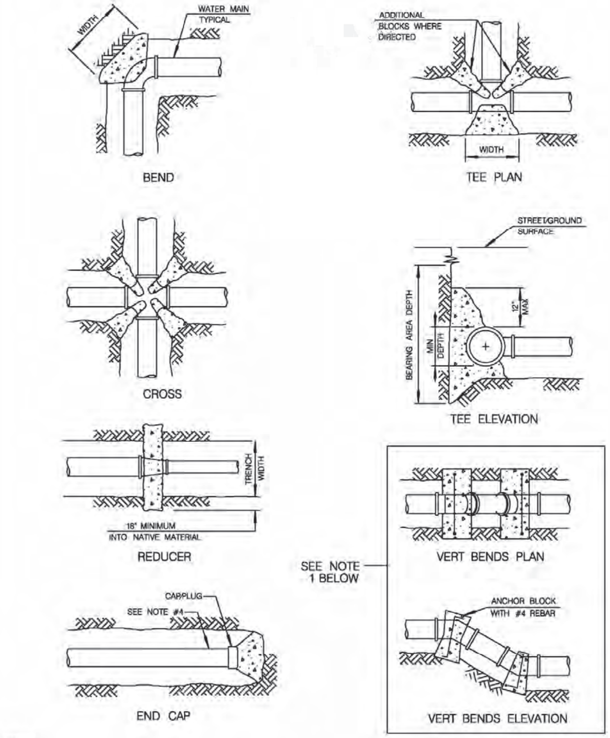

NOTES:

1) THE ANCHOR BLOCKS ON VERTICAL BENDS REQUIRE ENGINEER APPROVAL.

2) A MINIMUM OF 6" OF CONCRETE SHALL BE POURED ON WETTED UNDISTURBED OR COMPACTED SOIL BENEATH EACH INSTALLATION.

3) TEE SHALL BE CONCRETE BLOCKED A MINIMUM OF 6" ON ALL THREE SIDES.

4) USE 12" - 18" LENGTH OF PIPE BETWEEN THE END CAP AND THE LAST JOINT AS A BOND BREAKER ON DEAD END BLOCKING.

CSDSD SDW-145
6" BLOW-OFF INSTALLATION

NO SCALE

CSDSD SDW-151
CONCRETE THRUST AND ANCHOR BLOCK INSTALL

NO SCALE

WATERLINE DETAILS

NO SCALE

UD-8

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
DANIEL W. ARUTA
No. C56417
Exp. 06/30/15
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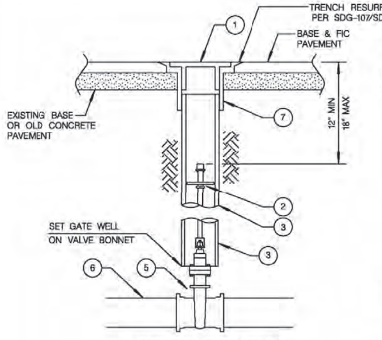
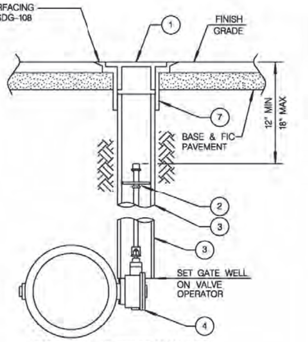
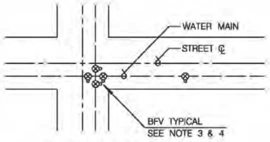


GATE WELL (GATE VALVES)

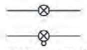


GATE WELL (BUTTERFLY VALVES)



BFV OPERATOR POSITION

NOTES:
1) VALVES DEEPER THAN 6' REQUIRE A VALVE STEM EXTENSION
2) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT
3) GATE WELL AND CAP SHALL BE SET SO THAT NO MORE THAN TWO 1" ADJUSTMENT RINGS ARE USED
4) BFV OPERATORS TO BE LOCATED TO THE CURBLINE SIDE OF WATER MAIN
5) BFV'S INSTALLED AT CROSSES OR TEES REQUIRE A FLANGED DUCTILE IRON SPOOL TO BE INSTALLED BETWEEN THE FITTING AND VALVE IN ACCORDANCE WITH THE SPECIFICATIONS
6) GATE WELLS AND CAPS SHALL BE IDENTIFIED
7) FOR INLINE VALVE ANCHOR BLOCK INSTALLATION
8) VALVE WELL FRAME SHALL BE SET TO SLOPE OF STREET



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	GATE WELL WITH CAP SEE NOTE 6	⑤	RESILIENT WEDGE GATE VALVE
②	VALVE STEM EXTENSION SEE NOTES 1 & 2	⑥	WATER MAIN
③	8" OD x 1/8" STEEL CASING x REQUIRED LENGTH GATE WELL SEE NOTE 6	⑦	1/8" THICK, 8 5/8" OD STEEL PIPE
④	BUTTERFLY VALVE		

CSDSD SDW-152
GATE WELL IDENTIFICATION
NO SCALE

CSDSD SDW-153
GATE WELL & CAN INSTALLATION FOR VALVES
NO SCALE

WATERLINE DETAILS
NO SCALE

UD-9

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0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE
11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

DANIEL W. ARUTA
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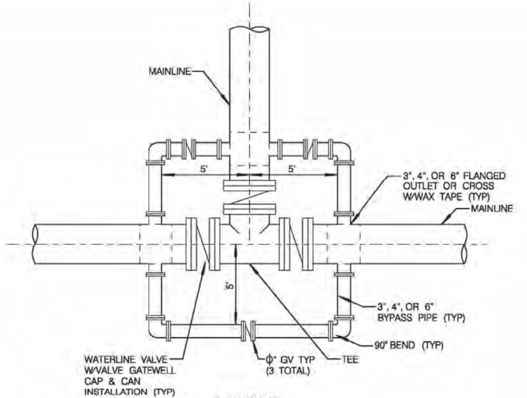
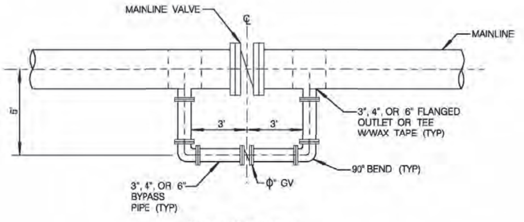


T-MAINLINE



STRAIGHT MAINLINE

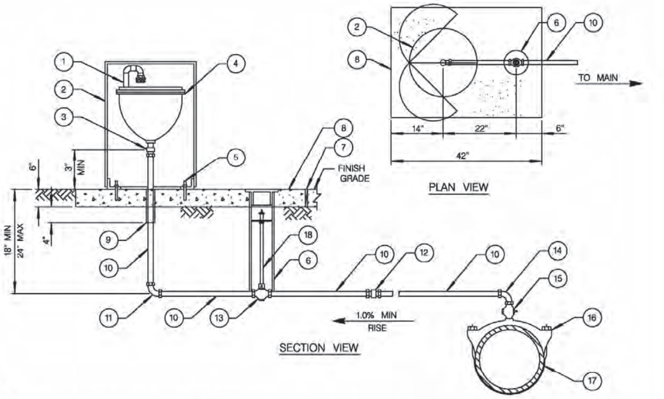
NOTES:

1. BYPASS SHALL BE SAME MATERIAL AS MAINLINE PIPE.
2. THE VALVE SHALL BE THE SAME SIZE AS THE BYPASS PIPE.
3. SEE TABLE FOR BYPASS SIZE.

MAIN SIZE	BYPASS SIZE
16" TRANSMISSION	3"
> 16" AND =< 36"	4"
>36"	6"

CSDSD SDW-154
WATER VALVE BYPASS DETAILS FOR MAINLINE

NO SCALE



PLAN VIEW

SECTION VIEW

NOTES:

1. NO DIPS OR LOW SPOTS WILL BE ALLOWED IN INSTALLATION.
2. LOCATE ENCLOSURE.
3. INSTALL /IDENTIFICATION TAPE.
4. AIR & VACUUM INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE SHOWN ON THE PLANS.
5. ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED).

■-⋈ 2"

LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	2" PVC SCH 80 CLOSE NIPPLE & 2-SCH 80 STREET ELLS& INSECT SCREEN	⑨	2" X 1/2" BLACK FOAM SLEEVE
②	VALVE ENCLOSURE	⑩	COPPER TUBING OR PE 200 FOR 1 INCH PVC (IRON PIPE SIZE) FOR 2 INCHES.
③	2" MIPT X COMPRESSION ADAPTER	⑪	90° ELL (NO SWEAT JOINTS ALLOWED)
④	2" AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE	⑫	2" BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
⑤	1/2" X 3" STAINLESS STEEL DROP-IN ANCHORS (3 EA @120 APART)	⑬	2" COMP BALL BALVE W/TEE HEAD
⑥	4" SDR 35 SEWER PIPE GATE WELL WITH CAP	⑭	2" 90° BRONZE FIPT X COMP ELL
⑦	COLD JOINT STRIP	⑮	2" BRONZE MIPT X MIPT CORPORATION STOP
⑧	3'-6" X 2'-6" X 6" THICK CONCRETE SLAB	⑯	SIZE X 2" SERVICE SADDLE
		⑰	WATER MAIN
		⑱	VALVE STEM EXTNESION

CSDSD SDW-159
2" AUTOMATIC COMBINATION AIR RELEASE & AIR VACUUM VALVE INSTALLATIONS

NO SCALE

WATERLINE DETAILS

NO SCALE

UD-10

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11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

DANIEL W. ARUTA
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[redacted]

[redacted]

WITHIN CASING SHALL BE WELDED

2. CARRIER PIPE SHALL BE TESTED BEFORE INSTALLATION OF END SEALS ON CASING
3. CASING SPACERS SHALL BE SO BOLTED AROUND THE PIPE THAT THE PLASTIC RUNNERS ARE LOCATED SYMMETRICALLY ABOUT THE VERTICAL AXIS OF PIPE
4. INNER DIAMETER OF THE STEEL CASING SHALL BE AT LEAST 12 INCHES LARGER THAN THE OUTER DIAMETER OF THE CARRIER PIPE

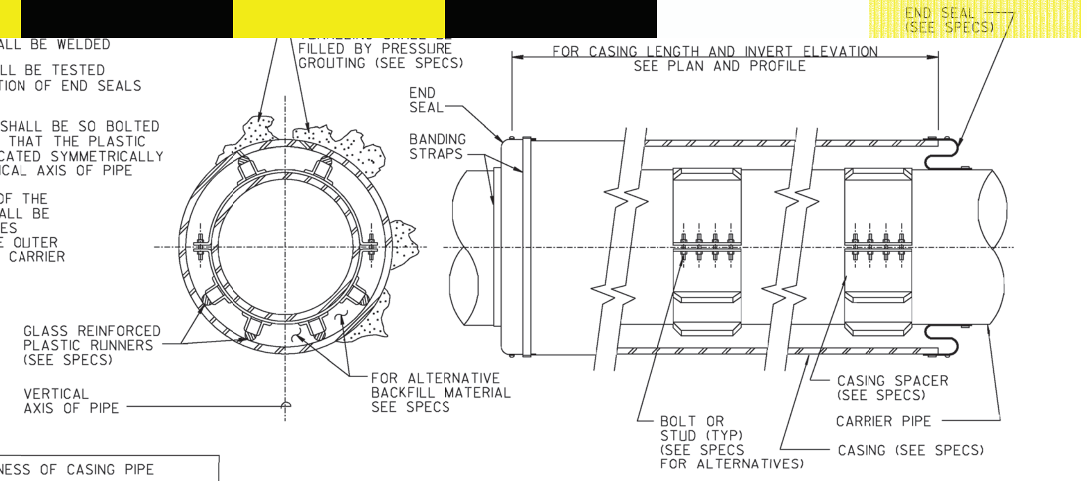

PLATE THICKNESS OF CASING PIPE			
DIAMETER	TO 27″	30″ TO 54″	60″ TO 72″
MINIMUM THICKNESS	3/8″	1/2″	5/8″

CASING SHALL BE SMOOTH STEEL PIPE

STEEL CASING FOR CARRIER PIPE
(SEE SPECS FOR ALTERNATIVES)

C-105
CIP

CITY OF SAN DIEGO WATER DEPARTMENT
STANDARD DETAIL C-105
STEEL CASING FOR CARRIER PIPE

NO SCALE

WATERLINE DETAILS

NO SCALE

UD-11

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER JEFFREY J. BURDICK No. C75396 Exp. 12/31/15 CIVIL STATE OF CALIFORNIA

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STAGE 1

1. ① PLACE Temp RAILING (TYPE K) AND TRAFFIC CONTROL ON SR-56
2. ② PLACE TRAFFIC CONTROL ON TORREY MEADOWS DRIVE
3. ③ CONSTRUCT BRIDGE OVERCROSSING SR-56, MGS AND DRAINAGE SYSTEM 2
4. ④ CONSTRUCT WATERLINE THROUGH BRIDGE OVERCROSSING
5. ⑤ CONSTRUCT DRIANAGE SYSTEMS 1a, 1b, 1c, 3 AND 4 ON TORREY MEADOWS DRIVE
6. ⑥ CONSTRUCT STREET IMPROVEMENTS, RETAINING WALL AND PEDESTRIAN PATH ON TORREY MEADOWS DRIVE
7. ⑦ PLACE STRIPING AND PAVEMENT DELINEATION ON TORREY MEADOWS DRIVE

TRAFFIC STAGE 1

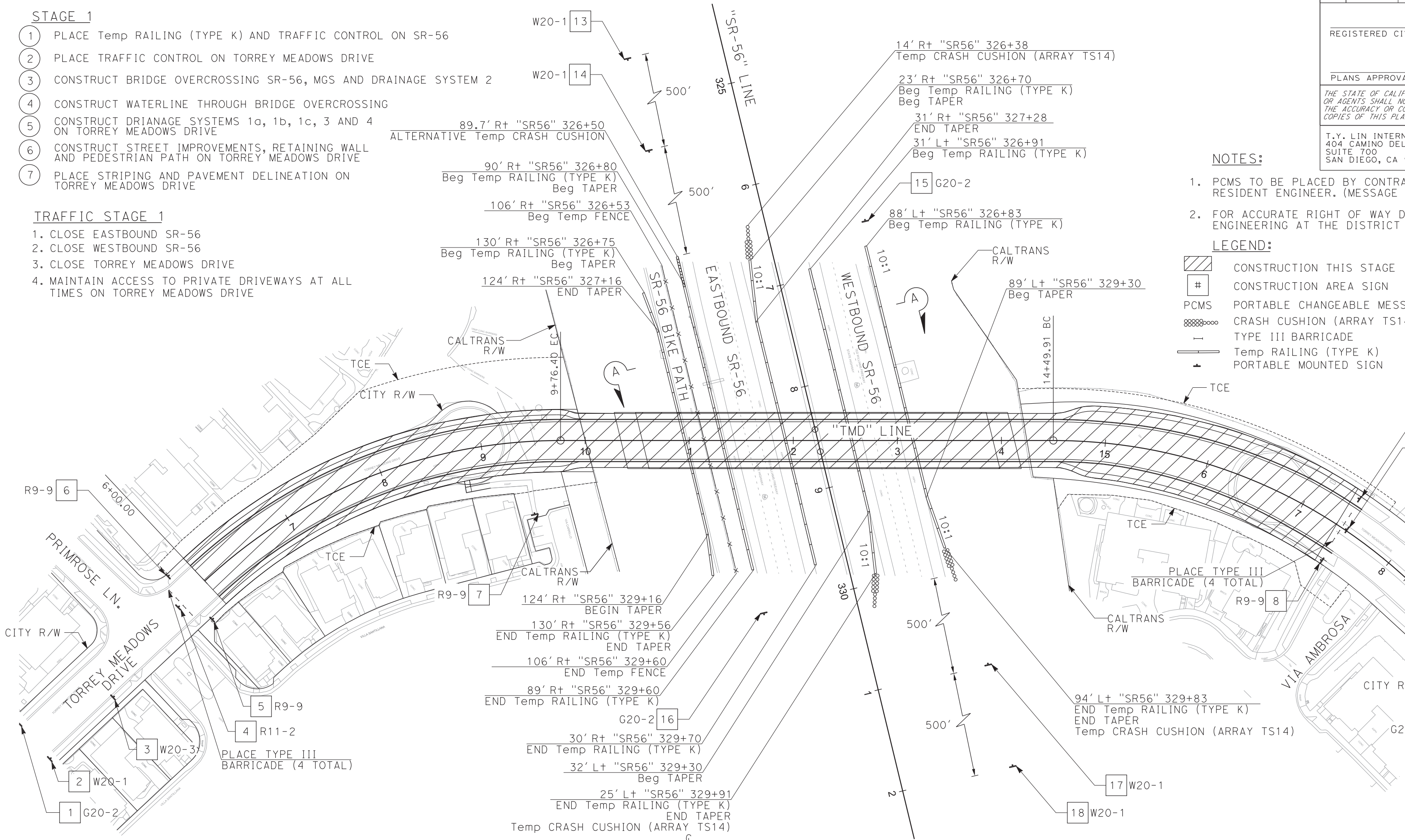
1. CLOSE EASTBOUND SR-56
2. CLOSE WESTBOUND SR-56
3. CLOSE TORREY MEADOWS DRIVE
4. MAINTAIN ACCESS TO PRIVATE DRIVEWAYS AT ALL TIMES ON TORREY MEADOWS DRIVE

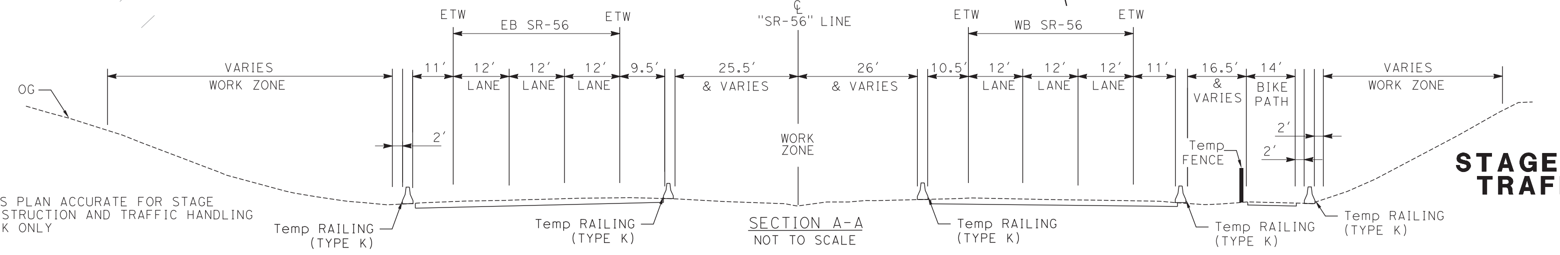
NOTES:

1. PCMS TO BE PLACED BY CONTRACTOR PER DIRECTION FROM RESIDENT ENGINEER. (MESSAGE TO BE APPROVED BY ENGINEER)
2. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

▨	CONSTRUCTION THIS STAGE
#	CONSTRUCTION AREA SIGN
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN
●●●●	CRASH CUSHION (ARRAY TS14)
⊢	TYPE III BARRICADE
▭	Temp RAILING (TYPE K)
┴	PORTABLE MOUNTED SIGN





SECTION A-A
NOT TO SCALE

THIS PLAN ACCURATE FOR STAGE CONSTRUCTION AND TRAFFIC HANDLING WORK ONLY

STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN

SCALE: 1"=50'

SC-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8	XX	XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
CIVIL

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CITY OF SAN DIEGO
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SAN DIEGO, CA 92101

TEMPORARY TRAFFIC CONTROL DEVICES SUMMARY

STAGE	TEMPORARY RAILING (TYPE K)	TYPE III BARRICADE	ALTERNATIVE TEMPORARY CRASH CUSHION	PLASTIC TRAFFIC DRUM (PTD)	TEMPORARY FENCE (TYPE CL-6)
	LF	EA	EA	EA	LF
STAGE 1	--	--	--	--	--
TOTAL	--	--	--	--	--

TEMPORARY SIGN QUANTITY SUMMARY- STAGE 1

SIGN No.	SIGN CODE	SIGN SIZE		STATIONARY		BARRIER MOUNTED	BARRICADE MOUNTED	SIGN MESSAGE	NOTE
		WIDTH	HEIGHT	ONE POST	TWO POST				

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DATE REVISED

STAGE CONSTRUCTION AND TRAFFIC HANDLING QUANTITIES

SCQ-1

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UNIT XXXX

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LEGEND:

▨	CLOSURE
⇨	DIRECTION OF TRAFFIC
⊥	PORTABLE MOUNTED SIGN
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN

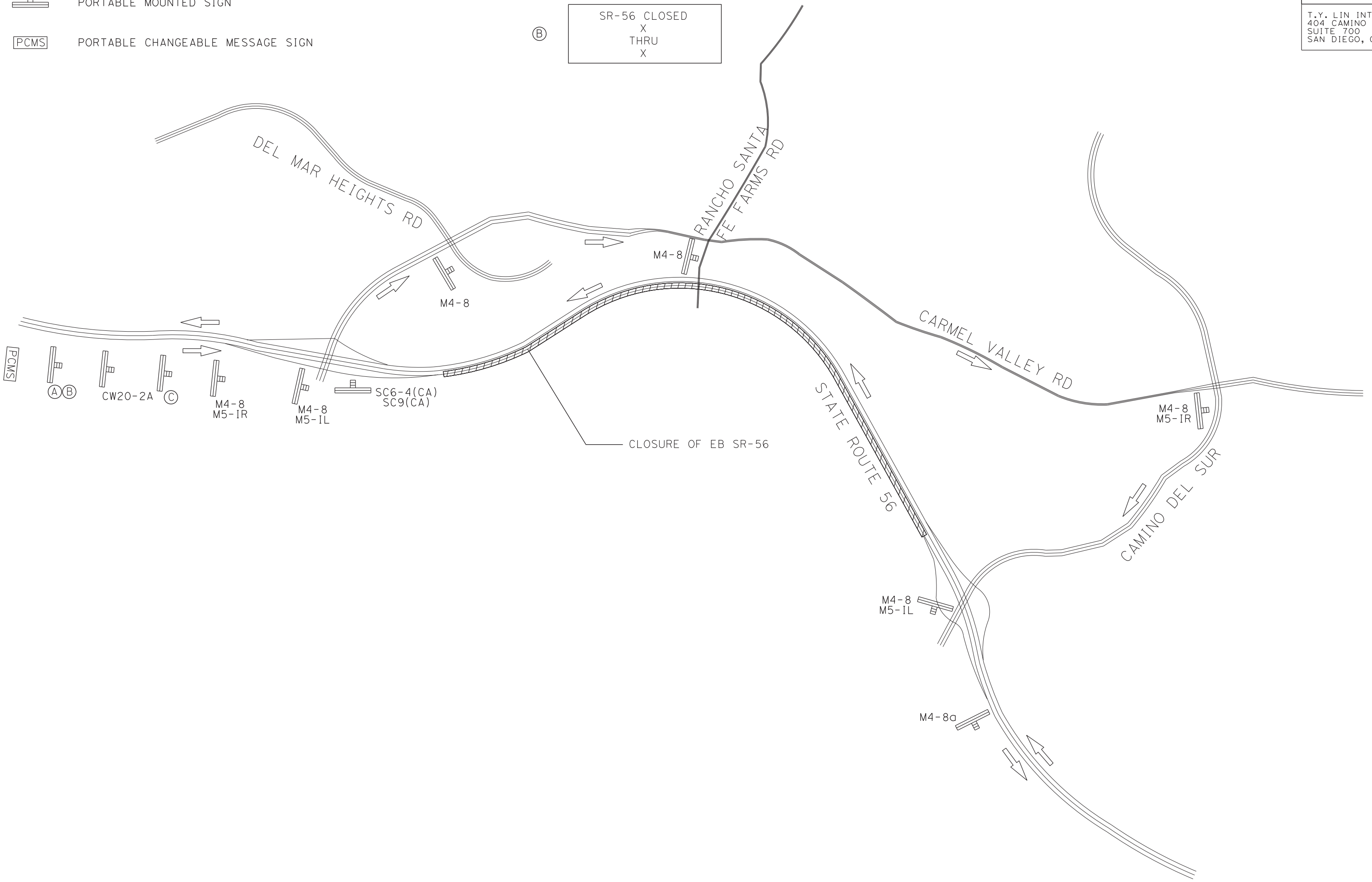
NOTES:

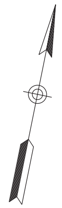
1. ENGINEER TO DETERMINE MESSAGE FOR PCMS

Ⓐ STATE ROUTE 56
CLOSED
USE CARMEL VALLEY
RD

Ⓑ SR-56 CLOSED
X
THRU
X

Ⓒ ROAD CLOSED
USE CARMEL VALLEY
RD





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EASTBOUND SR-56 CLOSURE

DETOUR PLAN

NO SCALE

DE-1

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

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PLANS APPROVAL DATE

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LEGEND:

▨	CLOSURE
⇨	DIRECTION OF TRAFFIC
⊥	PORTABLE MOUNTED SIGN
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN

NOTES:

1. ENGINEER TO DETERMINE MESSAGE FOR PCMS

Ⓐ STATE ROUTE 56
CLOSED
USE CAMINO DEL SUR

Ⓑ SR-56 CLOSED
X
THRU
X

Ⓒ ROAD CLOSED
USE CAMINO DEL SUR

THIS PLAN ACCURATE FOR STAGE CONSTRUCTION AND TRAFFIC HANDLING WORK ONLY

WESTBOUND SR-56 CLOSURE

DETOUR PLAN

NO SCALE

DE-2

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UNIT XXXX

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JEFFREY J. BURDICK
No. C75396
Exp. 12/31/15
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STATE OF CALIFORNIA

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NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

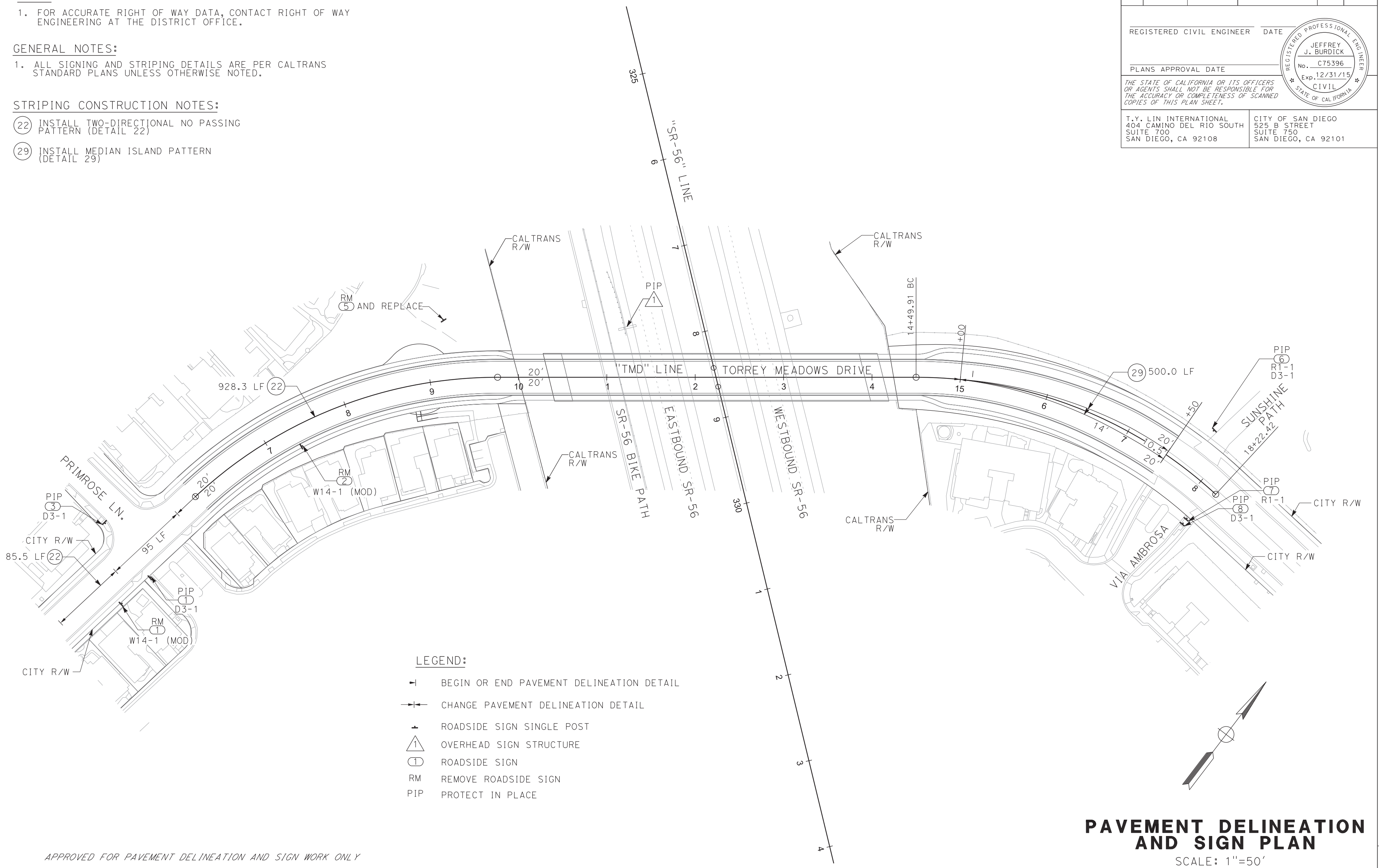
GENERAL NOTES:

1. ALL SIGNING AND STRIPING DETAILS ARE PER CALTRANS STANDARD PLANS UNLESS OTHERWISE NOTED.

STRIPING CONSTRUCTION NOTES:

㉒ INSTALL TWO-DIRECTIONAL NO PASSING PATTERN (DETAIL 22)

㉙ INSTALL MEDIAN ISLAND PATTERN (DETAIL 29)



LEGEND:

⊣	BEGIN OR END PAVEMENT DELINEATION DETAIL
→⊢←	CHANGE PAVEMENT DELINEATION DETAIL
⊥	ROADSIDE SIGN SINGLE POST
△1	OVERHEAD SIGN STRUCTURE
⊂1⊃	ROADSIDE SIGN
RM	REMOVE ROADSIDE SIGN
PIP	PROTECT IN PLACE

APPROVED FOR PAVEMENT DELINEATION AND SIGN WORK ONLY

PAVEMENT DELINEATION AND SIGN PLAN

SCALE: 1"=50'

PD-1

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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PAVEMENT DELINEATION QUANTITIES

SHEET	LINE	STATION	THERMOPLASTIC TRAFFIC STRIPE		PAVEMENT MARKER			TYPE F DELINEATOR (CLASS 1)	REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE)	REMOVE PAVEMENT MARKER
			4"		RETROREFLECTIVE					
			SOLID DOUBLE YELLOW DETAIL 22	SOLID DUAL DOUBLE YELLOW DETAIL 29	TYPE D	TYPE H	TYPE G			
			LF	LF	EA			EA	LF	EA
PD-1	"TMD" LINE									
	SUBTOTAL									
	TOTAL									

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PAVEMENT DELINEATION QUANTITIES

PDQ-1

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11	SD	56	5.4/5.8	XX	XX

REGISTERED CIVIL ENGINEER DATE

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HOT MIX ASPHALT (TYPE A)

SHEET NUMBER	STRUCTURAL SECTION NUMBER	LINE	STATION	SQFT (N)	CF (N)	TON
					HMA DIKE	
					TOTAL	

CLASS 2 AGGREGATE BASE

SHEET NUMBER	STRUCTURAL SECTION NUMBER	LINE	STATION	SQFT (N)	CY
				TOTAL	

PLACE HOT MIX ASPHALT DIKE

SHEET NUMBER	LINE	Rt/Lt	STATION	TYPE C (LF)	TYPE E (LF)	TYPE F (LF)	TON
			TOTAL				*

* QUANTITY ADDED TO HMA (TYPE A) QUANTITY TABLE.

COLD PLANE ASPHALT CONCRETE PAVEMENT

SHEET NUMBER	LINE	STATION	SQFT
		TOTAL	

(N) NOT A SEPERATE PAY ITEM, FOR INFORMATION ONLY

SUMMARY OF QUANTITIES

Q-1

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SHANNON JOHNSON	JEFFREY BURDICK
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CONSULTANT FUNCTIONAL SUPERVISOR	CLARK FERNON

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8	XX	XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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MIDWEST GUARDRAIL SYSTEM

◯ MGS No.	SHEET No.	LINE	STATION	(N) LAYOUT TYPE	MGS (STEEL POST)	END ANCHOR ASSEMBLY (TYPE SFT)	Alt IN-LINE TERMINAL SYSTEM	Alt FLARED TERMINAL SYSTEM	TRANSITION RAILING (TYPE WB-31)	END CAP (TYPE TC)	REMOVE GUARDRAIL	REMOVE TERMINAL SECTION (N)	REMOVE CABLE ANCHOR ASSEMBLY (N)	WEED CONTROL MAT (FIBER)
					LF	EA	EA	EA	EA	EA	LF	EA	EA	SF
				TOTAL										*

* WEED CONTROL MAT (FIBER) ADJACENT TO MGS; SEE SEPARATE TABLE FOR WEED CONTROL MAT (FIBER) ADJACENT TO ROADSIDE SIGNS.

CHAIN LINK FENCE (TYPE CL-6, SLATTED)

SHEET NUMBER	LINE	Rt/Lt	STATION	LF	12' GATE (EA)
			TOTAL		

PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)

SHEET NUMBER	LINE	STATION	SQYD
		TOTAL	

TEMPORARY FENCE (TYPE ESA)

SHEET NUMBER	LINE	Rt/Lt	STATION	LF
			TOTAL	

(N) NOT A SEPERATE PAY ITEM, FOR INFORMATION ONLY

SUMMARY OF QUANTITIES

Q-2

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CHECKED BY	JEFFREY BURDICK	DATE REVISED

CONSULTANT FUNCTIONAL SUPERVISOR
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11	SD	56	5.4/5.8	XX	XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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MINOR CONCRETE (SIDEWALK)

SHEET NUMBER	LINE	Rt/Lt	STATION	SQFT
			TOTAL	

MINOR CONCRETE (DRIVEWAY)

SHEET NUMBER	LINE	Rt/Lt	STATION	CY
			TOTAL	

MINOR CONCRETE (CURB AND GUTTER)

SHEET NUMBER	LINE	Rt/Lt	STATION	TYPE	LF
				TOTAL	

EARTHWORK

LINE	SHEET NUMBER	ROADWAY EXCAVATION	EMBANKMENT (N)
		CY	CY
	TOTAL		

WEED CONTROL MAT (FIBER)

ROADSIDE SIGN TYPE	SQFT
TOTAL	

(N) NOT A SEPERATE PAY ITEM, FOR INFORMATION ONLY

SUMMARY OF QUANTITIES

Q-3

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UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8	XX	XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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CLEARING AND GRUBBING

SHEET NUMBER	LINE	STATION	ACRE
		TOTAL	

RESET MAILBOX

SHEET NUMBER	LINE	STATION	EA
		TOTAL	6

PRE/POST CONSTRUCTION SURVEYS

SHEET NUMBER	LOCATION	CROSSWALKS	NUMBER OF CONSTRUCTION SURVEYS
			EA
		TOTAL	5

REMOVE FENCE

SHEET NUMBER	LINE	STATION	LF
		TOTAL	

REMOVE CONCRETE CURB AND SIDEWALK

SHEET NUMBER	LINE	Rt/Lt	STATION	LF
			TOTAL	

REMOVE BASE AND SURFACING

SHEET NUMBER	LINE	Rt/Lt	STATION	SQFT
			TOTAL	

REMOVE ASPHALT CONCRETE (HMA) DIKE

SHEET NUMBER	LINE	Rt/Lt	STATION	LF
			TOTAL	

(N) NOT A SEPERATE PAY ITEM, FOR INFORMATION ONLY

SUMMARY OF QUANTITIES

Q-4

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UNIT XXXX

PROJECT NUMBER & PHASE
11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JEFFREY J. BURDICK
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Exp. 12/31/15
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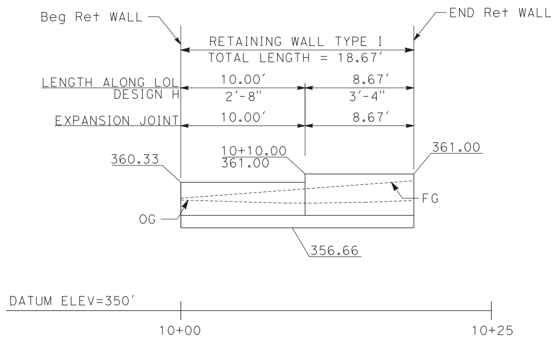
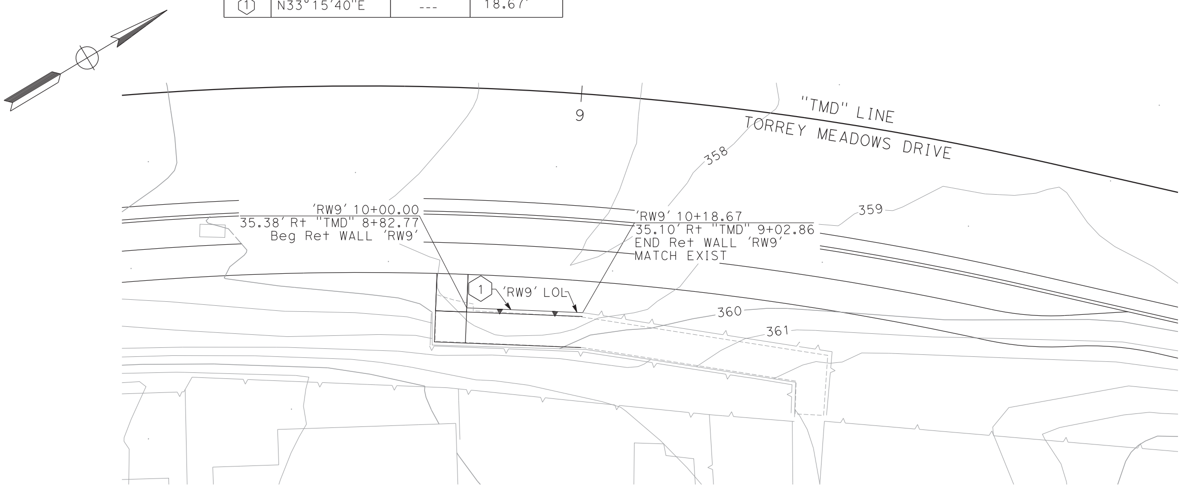


PROFILE
SCALE: 1"=10'

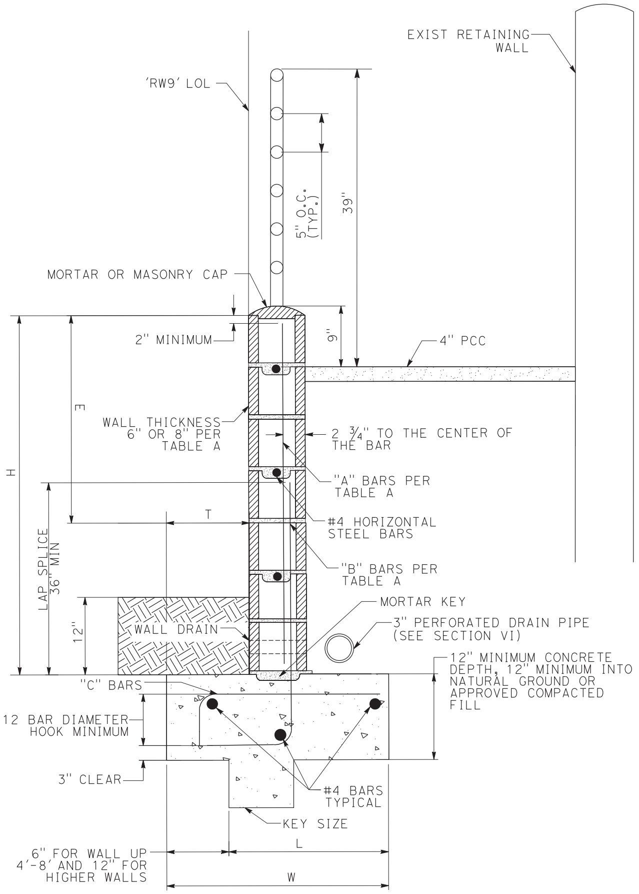
LINE & CURVE TABLE

NO.	BEARING/DELTA	RADIUS	LENGTH
①	N33°15'40"E	---	18.67'



PLAN
SCALE: 1"=10'

APPROVED FOR RETAINING WALL WORK ONLY



TYPICAL SECTION
NO SCALE

RETAINING WALL PLAN-'RW9'

SCALE: 1"=10'

RW-1

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UNIT XXXX

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SAN DIEGO, CA 92101

RETAINING WALL/ LEVEL BACK FILL PER CITY OF SAN DIEGO: INFORMATION BULLETIN 221

Construction of retaining walls, except those less than three feet high, measure from the top of the footing to the top of the wall and not supporting surcharge, requires a permit and is regulated by City of San Diego Municipal Code. Information Bulletin 221 outlines the city's requirements for retaining walls with level backfill. Information Bulletin 222 describes retaining walls with sloping backfill. These bulletins are intended to provide a simple alternative to designing minor retaining walls, but should be used only where appropriate soil condition at the site. See section VII. SOIL. For information on how to obtain a permit for a retaining wall, see Information Bulletin 220.

I. ZONING REGULATIONS

Retaining walls heights are also regulated by zoning laws of the city as follows: The height of a retaining wall is measured from grade on the lower side of the retaining wall to the top of the retaining wall (Exposed height, E), (SDMC 113.0270(b)(2)).

San Diego Municipal Code Chapter 13, Article 2, Division 3 regulates the location and the height of the retaining walls in the required setbacks and in the visibility area as follows:

1. Retaining walls in visibility areas shall not exceed 3 feet in height. (SDMC 142.0340(b)).
2. Two retaining walls with a maximum height of 3 feet each are permitted in the required front and street side yard if the two retaining walls are separated by a minimum horizontal distance equal to the height of the upper wall. (SDMC 142.0340(d)(1)).
3. Two retaining walls with a maximum height of 6 feet each are permitted in the required side and rear yard if the two retaining walls are separated by a minimum horizontal distance equal to the height of the upper wall. (SDMC 142.0340(d)(1)).

Note: Retaining walls higher than 5 feet may require a grading permit.

II. Wall Height

For the purpose of designing the wall in this information bulletin, wall height is measured from the top of the footing to the top of the wall. Walls not shown in Table A on page 3 must be designed specifically for the existing conditions. The walls shown here are designed to retain only level backfill. No building foundation, retaining wall, driveway, parking, fence, or other potential source loading on the upper level is allowed within a distance equal to the height of the wall. See Figure 1.

III. CAL/OSHA PERMIT/WAIVER

A CAL/OSHA construction activity permit is required for construction activity permit is required for construction trenches or excavations which are five feet or deeper and into which a person is required to descend. For more information, please contact:

Cal/OSHA Enforcement Unit district office
7575 Metropolitan Drive, Ste. 207
San Diego, CA, 92108
(619) 767-2280
Fax (619) 767-2299

IV. MASONRY BLOCKS

Concrete masonry units shall be of sizes shown on drawings and conform to ASTM C90 (CBC 2103.1) Medium Weight Units with maximum linear shrinkage of 0.06%, F'm=1,500 psi grouted solid reinforced cells.

All head and bed joints shall be 3/8" thick. Bed joints of the starting course over the concrete foundation may be between 1/4" and 3/4". (ACI 530.1-05 section 3.3B)

No special inspection is required for retaining walls up to 6 feet in height.

V. SPECIFICATIONS

A. CONCRETE

Concrete for footings must have a minimum compressive strength of 2,500 psi at 28 days. (CBC 1805.4.2.1). Cement shall conform to ASTM C 150 (ACI 318-05 section 3.2)
Note: Plastic (Stucco) cement ASTM C1328 is not permitted in retaining walls located in Seismic Design Category D.

B. MORTAR

The mortar mix must have a compressive strength equal to 1,800 psi minimum (CBC Table 2105.2.2.1.2). Mortar for use in masonry construction shall conform to ASTM C 270 and shall conform to the proportion specifications of Table 2103.8(2) of the CBC.

C. GROUT

Grout must have a compressive strength equal to 2,000 psi minimum. Grout shall conform to Table 2103.12 or to ASTM C 476. When grout conforms to ASTM C 476, the grout shall be specified by proportion requirements or property requirements (CBC 2103.12)

D. REINFORCING STEEL

Reinforcing steel must be deformed and comply with ASTM A 615 (CBC 2103.13.1), Grade 60. When one continuous bar cannot be used, a lap or splice of 40-bar diameters is required. All bars shall be clean and loose of flaky rust, grease or other materials likely to impair bond. (ACI 318-05 Section 5.7)
Reinforcement in concrete shall be protected from corrosion and exposure to chlorides. (ACI 318-05 Section 7.7.6). Concrete protection for reinforcement shall be at least $3\frac{9}{32}$ to earth. (ACI 318-05 Section 7.7.1).
One #4 reinforcing bar must be placed longitudinally within the wall in a bond beam block every 16 inches as the blocks are laid up. See Figure 2.

E. MORTAR KEY

To insure proper bonding between the footing and the first course of block, a mortar key must be formed by embedding a flat 2x4 flush with and at the top of the freshly placed footing. It should be removed after the concrete has started to harden (about 1 hour). A mortar key may be omitted if the first course of block is set into fresh concrete and a good bond is obtained.

VI. WALL DRAINS

Wall drains must be places at 6-foot intervals along the length of the wall and located just above the level of the soil or paving on the front face of the wall. The drains may be formed by placing a block on its side at 6-foot intervals, by leaving out the mortar in the vertical spaces between all the blocks in the first course above the soil or paving (head joint) on the front face of the wall. By installing 4-inch diameter drain line behind the wall, or by any other acceptable equivalent method. Backfill behind wall drains or open head joints must be loose rubble or gravel at least 12 inches wide and extending from the top of the wall to the top of the footing.

VII. SOIL DESIGN CRITERIA

This information bulletin is to be used only when the soils to be retained are not expansive (i.e. sandy soils). The design of this information bulletin is based on the following criteria:

1. Soil type: granular, non-cohesive soil backfill.
2. Active earth pressure with an equivalent fluid weight of 30 pounds per cubic foot.
3. Passive earth pressure with an equivalent fluid weight of 150 pounds per cubic foot.
4. Allowable bearing value of 1,500 psf.
5. Soil friction factor 0.25.

If existing soil conditions do not meet these design criteria or the conditions are unknown, walls should be designed by State of California licensed civil engineer or architect. A soil report may be required.

Note: Soil lateral pressure due to earthquake motion is not included.

I. INSPECTIONS

Inspections must be performed during several phases of construction. Please call for inspections at the following times:

A. A footing inspection is needed when the excavation for a footing has been dug with the steel tied securely in its final position, and the site is ready for the concrete to be placed.

B. A masonry pregrout inspection is required when the block has been laid and the steel is in place, but before the grout has been placed.

1. If cleanout holes are used, block may be laid to the full height at the grout pour before calling for the pregrout inspection. Grout shall be placed in a continuous pour in grout lifts not exceeding 6 feet.
2. If cleanout holes are not used, a masonry pregrout inspection is required prior to each grout pour. Block cannot be laid higher than the grout pour. Note that cleanouts are required for all grout pours over 5 feet in height.

C. After grouting is completed and rock or rubble wall drains are in place, but before earth backfill is placed, call for a backfill/drainage inspection.

D. When all work has been completed, call for a final inspection.

Table A/ Requirements for Various Wall Heights[1,2,3,4,5]

Wall Type	I	II			III
Wall Height (H)[6]	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"
Exposed Wall Height (E)[7]	2'-4"	3'-0"	3'-8"	4'-4"	5'-0"
Stem Block Thickness	6"	8"	8"	8"	8"/12"
Heel Dimension (L)	1'-3"	1'-7"	1'-4"	1'-4"	1'-9"
Toe Dimension (T)	6"	6"	11"	1'-6"	1'-4"
Vert Bars (A)	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 16"	#4 @ 16"
Vert Bars (B)	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 16"	#4 @ 16"
Footing Width (W)	1'-9"	2'-1"	2'-3"	2'-10"	3'-1"
Footing Bars (C)	none	none	none	#4 @ 24"	#4 @ 24"
Key Distance from Toe	none	none	6"	12"	12"
Key (W x D)	none	none	6" x 8"	8" x 9"	8" x 12"

FOOTNOTES:

[1] Table A makes the following assumptions:
f'y= 600000 psi
Fs= 24000
Solid grouting
Using half f'm stress

[2] Walls not shown in Table A must be designed specifically for the actual conditions

[3] All construction must comply with the specifications shown in this information bulletin.

[4] When Wall Type III is required, the first 32 inches of block must be 12-inch wide masonry units.
I=6" Block
II= 8" Block
III= 12" Block

[5] Footing depth shall be 24 inches below finish grade and 12 inches of compacted soil is required on top of footing to stabilize the wall.

[6] For the purpose of the structural design, wall height shall be measured from the top of the footing to the top of the wall

[7] For zoning requirements fence height shall be measured from finish grade.

RETAINING WALL DETAILS

NO SCALE

RWD-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CLARK FERNON	CHECKED BY	JEFFREY BURDICK	DATE REVISED

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UNIT XXXX
PROJECT NUMBER & PHASE 11140000491

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	56	5.4/5.8		XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

JEFFREY J. BURDICK
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Exp. 12/31/15
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SAN DIEGO, CA 92108

CITY OF SAN DIEGO
525 B STREET
SUITE 750
SAN DIEGO, CA 92101

RETAINING WALL/ LEVEL BACK FILL
PER CITY OF SAN DIEGO: INFORMATION BULLETIN 221

Figure 1/ Surcharge and Slope Setbacks

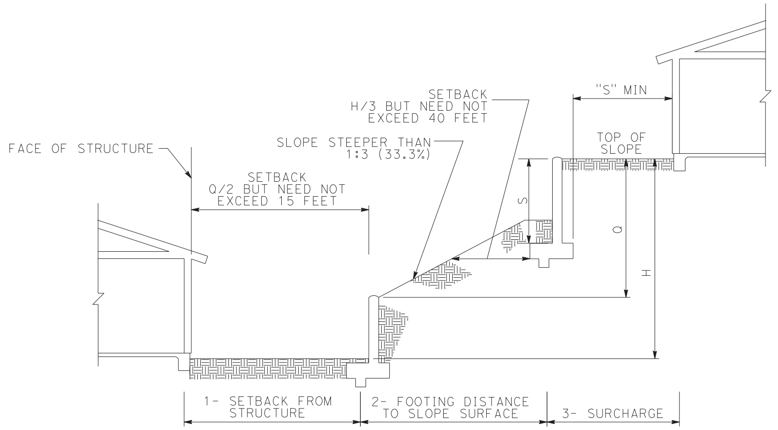
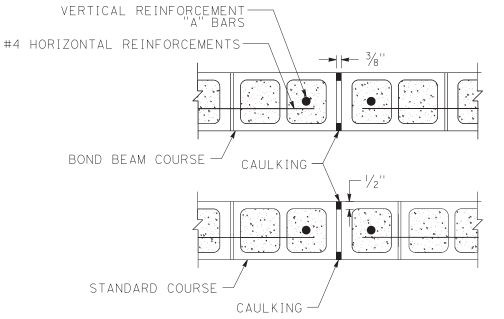


Figure 2/ Typical Control Points



NOTE: CONTROL JOINTS SHALL BE SPACED NO GREATER THAN 25 FEET O.C.

RETAINING WALL DETAILS

NO SCALE

RWD-2

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NOTE:

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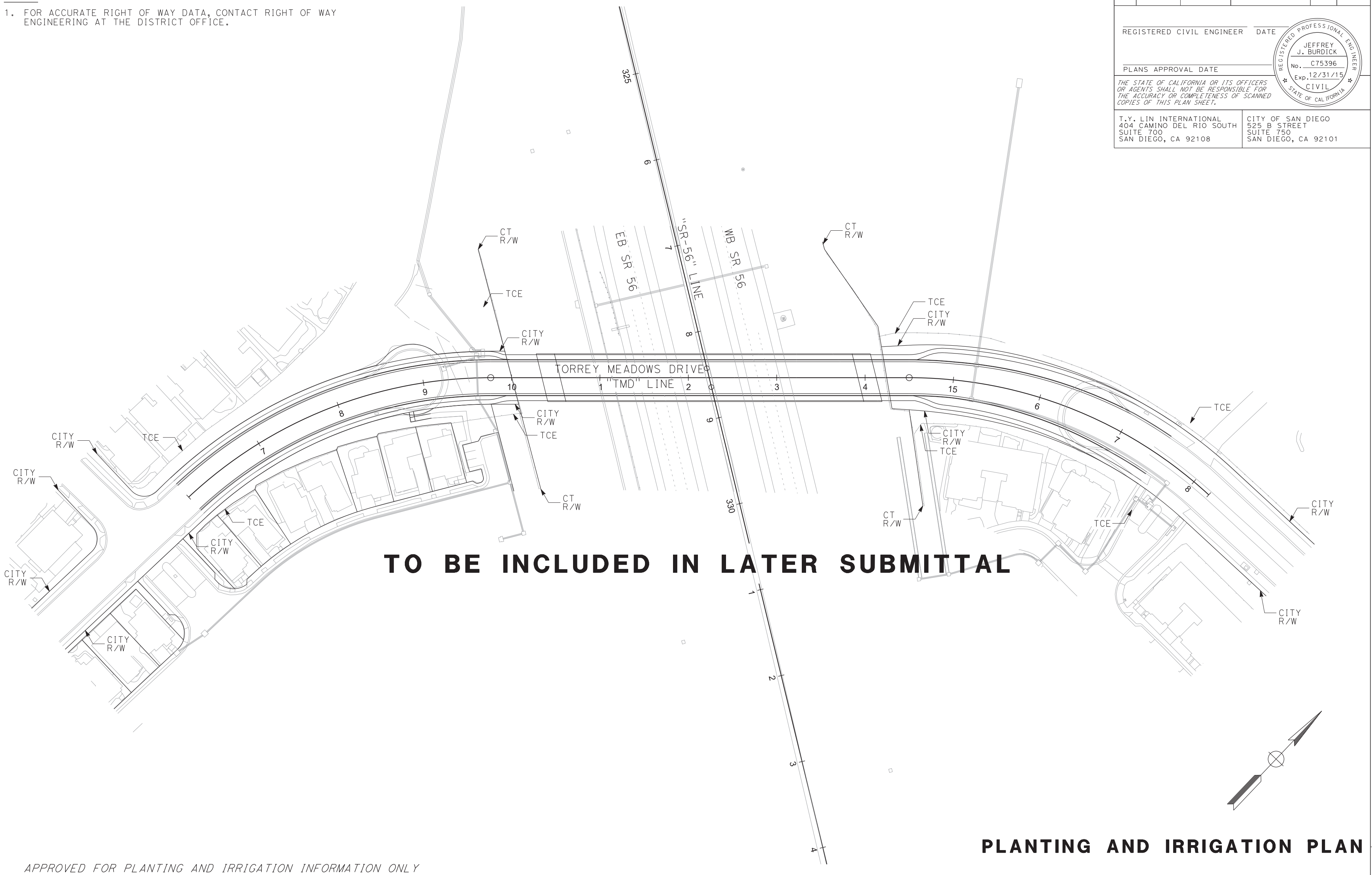

TO BE INCLUDED IN LATER SUBMITTAL

APPROVED FOR PLANTING AND IRRIGATION INFORMATION ONLY

PLANTING AND IRRIGATION PLAN

IP-1

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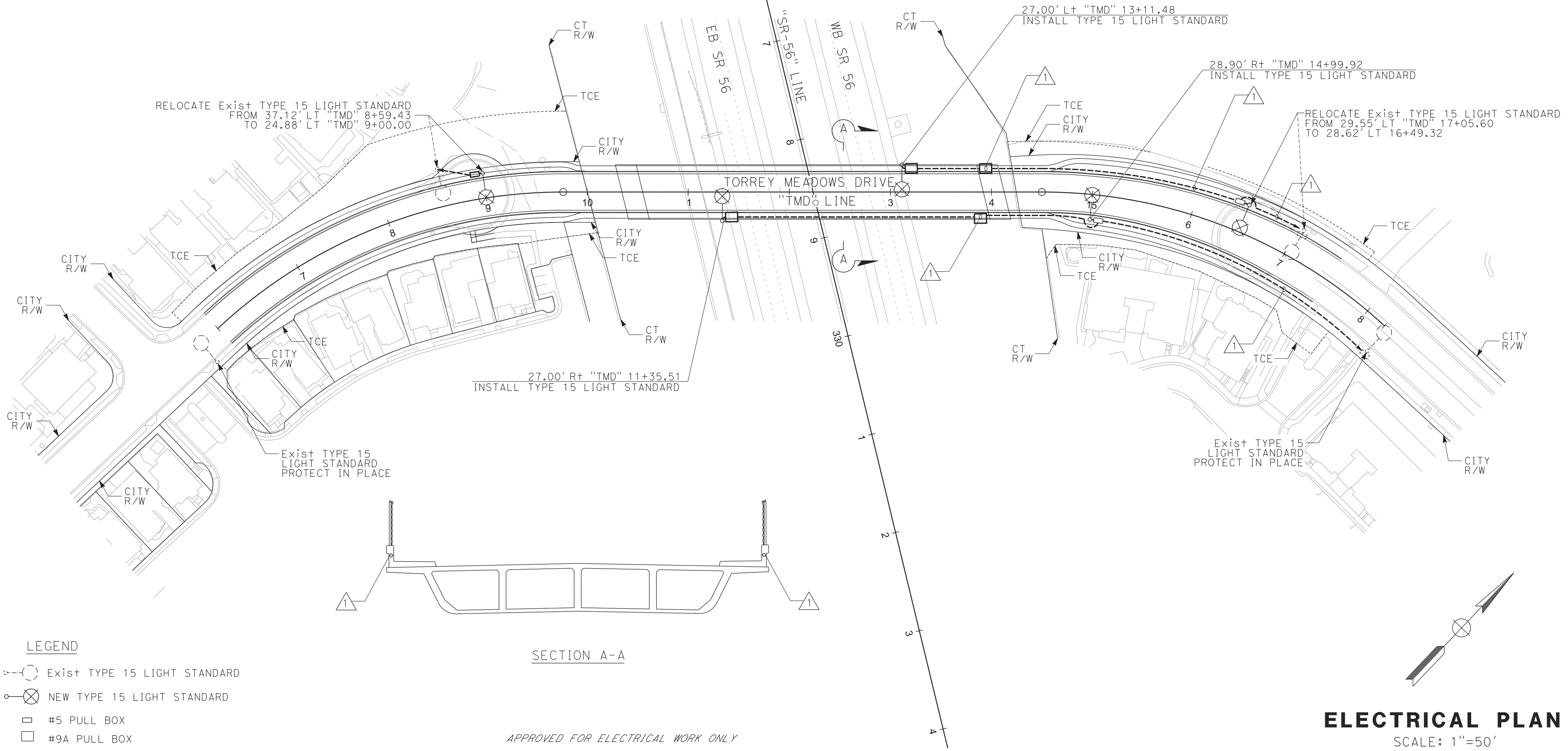
CONDUIT NOTES

△1 2"C, X#X (LTG)



LEGEND

- Exist TYPE 15 LIGHT STANDARD
- NEW TYPE 15 LIGHT STANDARD
- ▭ #5 PULL BOX
- □ #9A PULL BOX

APPROVED FOR ELECTRICAL WORK ONLY

ELECTRICAL PLAN

SCALE: 1"=50'

E-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 11140000491

APPENDIX B

FIELD EXPLORATION

APPENDIX B
FIELD EXPLORATION

The subsurface exploration program included drilling and sampling five hollow stem auger borings for subsurface characterization purposes. The field explorations were performed between July 22 and 25, 2014. Prior to any subsurface exploration, Kleinfelder notified Underground Service Alert (USA) to clear proposed boring locations of conflicts with utilities. The service of Cable Pipe and Leak, a private utility locator, was retained to perform additional utility locating. The borings were advanced by Pacific Drilling and Cascade Drilling utilizing truck mounted drill rigs. The borings were advanced to depths ranging from approximately 2 to 90½ feet below the existing ground surface.

The first five feet of the boreholes were advanced by manual hand augering, and the material encountered in this initial penetration was collected in a large plastic bag. Additional relatively undisturbed soil samples were obtained from the borings using either a Standard Penetration Test (SPT) sampler (2-inch O.D., 1.5 inches I.D.) or California sampler (3-inch O.D., 2.4 inches I.D.) driven a total of 18-inches (or until practical refusal) into the undisturbed soil at the bottom of the boring. These in-situ drive samples were driven using a 140 pound automatic hammer falling 30 inches in general accordance with ASTM D1586. The soil samples were returned to Kleinfelder's laboratory for testing. The total number of hammer blows required to drive the sampler the final 12 inches is termed the "N" value and is recorded on the Logs of Borings. Blow counts shown on the Log of Borings have not been adjusted for the effects of overburden pressure, input driving energy, rod length, sampler size, or boring diameter. Borings were drilled at the site to obtain relatively undisturbed drive samples and SPT blow counts in the fill and weakly cemented materials.

Borings were logged by a Kleinfelder geologist or geotechnical engineer using methods outlined in the Unified Soil Classification System (USCS) and general procedures established in ASTM D 2488. Boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Selected bulk, disturbed, and intact samples were retrieved from the borings, sealed, and transported to Kleinfelder's laboratory for further evaluation. Logs of Borings are presented in Appendix B. Logs of Borings describe the earth materials encountered, samples obtained, and show field and laboratory tests performed. The logs also show the general location, boring number, drilling date, and drilling subcontractor.

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 elastic 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 TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- ☒ Standard Penetration Test (SPT)
- ⧗ Standard California Sampler
- ⧗ Modified California Sampler
- ▯ Shelby Tube
- ▯ Piston Sampler
- ▯ NX Rock Core
- ▯ HQ Rock Core
- ▨ Bulk Sample
- ◪ Other (see remarks)

DRILLING METHOD SYMBOLS

- ▯ Auger Drilling
- ▯ Rotary Drilling
- ▯ Dynamic Cone or Hand Driven
- ☒ Diamond Core

WATER LEVEL SYMBOLS

- ▽ First Water Level Reading (during drilling)
- ▼ Static Water Level Reading (short-term)
- ▼ Static Water Level Reading (long-term)

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Bright People. Right Solutions.

REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	SR-56	5.6	

PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
N/A	Cj	7-28-14	1 of 3

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

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

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION

Descriptor	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.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**SR-56**	**5.6**	

PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
N/A	**Cj**	**7-28-14**	**2 of 3**

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ROCK GRAPHIC SYMBOLS

⊠	IGNEOUS ROCK
☰	SEDIMENTARY ROCK
▨	METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	SR-56	5.6	

PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
N/A	Cj	7-28-14	3 of 3

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LOGGED BY **EK**	BEGIN DATE **7-25-14**	COMPLETION DATE **7-25-14**	
BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96168° / 117.16129°**			HOLE ID **A-14-001**
DRILLING CONTRACTOR **Pacific Drilling**	BOREHOLE LOCATION (Offset, Station, Line) **Sta 7+30**		SURFACE ELEVATION **~364.2 ft**
DRILLING METHOD **Hollow Stem Auger**	DRILL RIG **Diedrich D-50**		BOREHOLE DIAMETER **6 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**	SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**		HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **soil cuttings**	GROUNDWATER READINGS	DURING DRILLING **Not Applicable** AFTER DRILLING (DATE) **Not Applicable**	TOTAL DEPTH OF BORING **2.0 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0														
364.00		■	ASPHALT CONCRETE (10").	▨	1										
		▨	AGGREGATE BASE (2").												
363.00	1	▨	LEAN CLAY (CL); greenish gray; moist; medium plasticity (ARTIFICIAL FILL (QAF)).	▨	2										
362.00	2		Bottom of borehole at 2.0 ft bgs Locations and elevations were approximated from projects topographic maps.												
361.00	3														
360.00	4														
359.00	5														
358.00	6														
357.00	7														
356.00	8														
355.00	9														
	10														

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-001**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **1 of 1**

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LOGGED BY **EK**	BEGIN DATE **7-25-14**	COMPLETION DATE **7-25-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96207° / 117.16113°**	HOLE ID **A-14-002**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 8+80**	SURFACE ELEVATION **~358.8 ft**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**	BOREHOLE DIAMETER **6 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**	HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **soil cuttings**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**	TOTAL DEPTH OF BORING **11.5 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT CONCRETE (8").												
		AGGREGATE BASE (3").												
		SANDY LEAN CLAY (CL); stiff; dark brown to light brownish gray; moist; low plasticity; fine-coarse grained sand, trace fine-grained gravel (ARTIFICIAL FILL (QAF)).	▨	1					15	110				M, UW, PA, PI Additional tests: Seive Analysis, Atterberg Limits, Modified Proctor, R-Value
			⧗	2	10 12 19	31	100							
355.00														
	5	LEAN CLAY (CL); firm; light brownish gray (2.5Y - 6/2); moist; low to medium plasticity.	⧖	3	6 7 12	19	100							
350.00														
	10	broken piece of cobble in sampler.	⧗	4	16 17 19	36	100							
		Bottom of borehole at 11.5 ft bgs Locations and elevations were approximated from projects topographic maps.												
345.00														
	15													
340.00														
	20													
335.00														
	25													
330.00														
	30													
325.00														
	35													

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-002**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **1 of 1**

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LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
EK	**7-25-14**	**7-25-14**	**32.96230° / 117.16089°**	**A-14-003**

DRILLING CONTRACTOR
Pacific Drilling

BOREHOLE LOCATION (Offset, Station, Line)
Sta 9+80

SURFACE ELEVATION
~358.0 ft

DRILLING METHOD
Hollow Stem Auger

DRILL RIG
Diedrich D-50

BOREHOLE DIAMETER
6 in

SAMPLER TYPE(S) AND SIZE(S) (ID)
SPT (1.5"), CAL (2.4")

SPT HAMMER TYPE
Auto; 140 lbs / 30-inch drop

HAMMER EFFICIENCY, ERi
83%

BOREHOLE BACKFILL AND COMPLETION
bentonite

GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**

TOTAL DEPTH OF BORING
50.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		SANDY LEAN CLAY (CL); brown (7.5 YR - 5/3) to dark brown (7.5 YR - 3/4); moist; low plasticity; fine-coarse grained sand, some fine-grained gravel (ARTIFICIAL FILL (QAF)).		1										Additional tests: Corrosion
355.00															
	5		CLAYEY SAND (SC); medium dense; light brownish gray (2.5 Y - 6/2); moist; low plasticity; fine-coarse grained sand.		2	8 8 9	17	100		11	104	PP=>4.5			M, UW, PA, PI Additional tests: Seive Analysis, Atterberg Limits
350.00															
	10		CLAYEY SAND (SC); loose; light brownish gray (2.5 Y - 6/2),; moist; non-plastic; fine-coarse grained sand, some caliche.		3	3 2 3	5	77							Drilling gets hard @ 11-12'
345.00															
	15		.		4	5 6 8	14	89		12	102				M, UW
			(MISSION VALLEY FORMATION (TMV)).												
340.00															
	20		SANDY CLAYSTONE; hard; light brownish gray (2.5 Y - 6/2); moist; non-plastic; fine-coarse grained sand , micaceous, weak cementation, highly weathered.		5	14 22 32	54	100							
335.00			hard; becomes reddish brown to light brownish gray; moist; moderate cementation, moderately weathered.												
	25				6	50/5"	50/5"	100		20	108				M, UW, PA Additional tests: Seive Analysis
			SILTY SANDSTONE; very dense; becomes brownish gray (2.5 Y - 6/2); moist; increase in sand content.												
330.00															
	30				7	11 23 38	61	100							very hard drilling from 31-33'
325.00															
	35														

(continued)

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REPORT TITLE
BORING RECORD

HOLE ID
A-14-003

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**SR-56**	**5.6**	

PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
N/A	**C Johnson**	**7-28-14**	**1 of 2**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	35		very dense; becomes gray (N6/); moist; fine-coarse grained sand, weak cementation, highly weathered.		8	20 50/5"	50/5"	100		13	107				M, UW, PA Additional tests: Seive Analysis, Direct Shear
320.00															
	40		.		9	24 42 50/5"	92/11"	100							
315.00															
	45		becomes finer grained sand, iron-oxide staining.		10	50/6"	50/6"	100		31	97				M, UW, PA Additional tests: Seive Analysis
310.00															
	50		broken pieces of strongly cemented pieces.		11	50/3"	50/3"	100							
			Bottom of borehole at 50.5 ft bgs Locations and elevations were approximated from projects topographic maps.												
305.00															
	55														
300.00															
	60														
295.00															
	65														
290.00															
	70														
285.00															
	75														

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REPORT TITLE **BORING RECORD**			HOLE ID **A-14-003**	
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **2 of 2**

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LOGGED BY **EK**	BEGIN DATE **7-22-14**	COMPLETION DATE **7-22-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96279° / 117.16049°**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 12+10**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**
BOREHOLE BACKFILL AND COMPLETION **bentonite**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**

HOLE ID **A-14-004**

SURFACE ELEVATION **~333.8 ft**

BOREHOLE DIAMETER **6 in**

HAMMER EFFICIENCY, ERi **83%**

TOTAL DEPTH OF BORING **61.0 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		CLAYEY SAND (SC); light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-medium grained sand, some rootlets (MISSION VALLEY FORMATION (TMV)).	▨	1										Additional tests: Corrosion
330.00															
	5		CLAYEY SANDSTONE; very dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-medium grained sand, weak cementation, highly weathered.	⧓	2	20 37 47	84	100		10	116				M, UW
															Drilling gets hard @ 7'
325.00															
	10		becomes micaceous, increase in fines content.	⋈	3	16 24 34	58	100							
320.00															
	15		becomes moderately cemented, intermixed colors of light brownish gray (2.5YR - 6/2) to brown (7.5 YR - 5/3).	⧓	4	30 50/5"	50/5"	100		14	104				M, UW, PA Additional tests: Seive Analysis, Direct Shear
															Some rig shatter @ 18'
315.00															
	20		becomes coarser grained, fine-coarse grained sand, abundent iron-oxide staining.	⋈	5	19 50/2"	50/2"	66							
															Added water to hole to ease drilling conditions @ 20'
310.00															
	25		light brownish gray (2.5Y - 6/2); fine to coarser grained sand, abundant mica flakes.	⧓	6	20 50/4"	50/4"	100		13	109				M, UW
305.00															
	30		CLAYEY SANDSTONE; very dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, micaceous, moderately cemented highly weathered.	⋈	7	40 25 35	60	100							
300.00															
	35														

(continued)

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-004**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **1 of 2**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	35		becomes strongly cemented.		8	27 50/3"	50/3"	83		13	110				Additional tests: Seive Analysis M, UW Drilling gets hard from 35'-37'
295.00															
	40		SANDY LEAN CLAYSTONE; stiff; dark reddish brown (2.5 YR - 3/3); moist; low to medium plasticity; fine grained sand, laminated w/ lenses of gray SM .25" to .5" thick, micaceous.		9	11 15 21	36	100				PP=1.5-2			
290.00															
	45		hard; dark gray; moist; low to medium plasticity; fine-grained sand, moderate cementation, highly weathered, micaceous.		10	47 50/3"	50/3"	100		14	97	PP=3-4			Drilling gets hard from 44'-45' M, UW Additional tests: Seive Analysis, Atterberg Limits
285.00															
	50		SILTY SANDSTONE; very dense; dark gray; moist; non-plastic; fine-coarse grained sand, moderately cemented, highly weathered, micaceous.		11	17 36 38	74	100							
280.00															
	55		gray (N6/); becomes weakly cemented, fine-coarse grained, increase in sand content.		12	50/6"	50/6"	66							
275.00															
	60		becomes gray (N6/); fine-coarse grained sand.		13	40 50/5"	50/5"	100							
			Bottom of borehole at 61.0 ft bgs Locations and elevations were approximated from projects topographic maps.												
270.00															
	65														
265.00															
	70														
260.00															
	75														

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REPORT TITLE
BORING RECORD
HOLE ID
A-14-004
DIST. **11**
COUNTY **San Diego**
ROUTE **SR-56**
POSTMILE **5.6**
EA
PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56
BRIDGE NUMBER **N/A**
PREPARED BY **C Johnson**
DATE **7-28-14**
SHEET **2 of 2**

LOGGED BY **EK**	BEGIN DATE **7-24-14**	COMPLETION DATE **7-24-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96314° / 117.15983°**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 14+30**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**
BOREHOLE BACKFILL AND COMPLETION **bentonite**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**

HOLE ID **A-14-005**
SURFACE ELEVATION **~360.8 ft**
BOREHOLE DIAMETER **6 in**
HAMMER EFFICIENCY, ERi **83%**
TOTAL DEPTH OF BORING **90.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
360.00	0		SANDY CLAY with GRAVEL (CL); yellowish brown (10YR - 5/6); moist; low plasticity; fine-coarse grained sand, angular to subrounded gravel (ARTIFICIAL FILL (QAF)).		1										Additional tests: Corrosion
355.00	5		CLAYEY SAND (SC); dense; light brownish gray (2.5Y - 6/2) to yellowish brown (10YR - 5-6); moist; low plasticity; fine-grained sand, some rootlets.		2	12 20 27	47	100							Additional tests: Sieve Analysis -200
			SILTY SAND to SANDY SILT (SM); firm; light brownish gray (2.5Y - 6/2); moist; low plasticity; fine-grained sand, pieces of broken gravel in sampler, trace coarse grained sand.												
350.00	10				3	7 9 13	22	100							
			CLAYEY SAND (SC); dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, micaceous.												
345.00	15				4	10 23 28	51	100							Additional tests: Sieve Analysis -200
340.00	20		SANDY SILT (ML); firm; brown (7.5 YR - 5/3) to H brownish gray (2.5Y - 6/2); moist; non-plastic to low plasticity; fine-medium grained sand.		5	6 8 12	20	100							
			SILTY SAND (SM); dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, micaceous.												
335.00	25				6	11 21 32	53	66		15	114				M, UW Additional tests: Sieve Analysis -200, Direct Shear
			CLAYEY SAND (SC); medium dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, micaceous.												
330.00	30				7	6 9 12	21	100							
															easier drilling effort between 30' and 35'
	35														

(continued)

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REPORT TITLE **BORING RECORD**			HOLE ID **A-14-005**	
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **1 of 3**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
325.00	35		SILTY SAND (SM); dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, pockets of dark brown CLAY throughout, trace of angular gravel.		8	8 17 34	51	89							
320.00	40		pockets of dark brown and gray CLAY throughout.		9	6 10 13	23	77							
315.00	45		no recovery.			9 13 17	30	NR							easier drilling effort between 40' and 50'
			CLAYEY SAND (SC); dense; light brownish gray to dark browin; moist; low plasticity; intermixed material and color with varying thicknesses, trace gravel.												
310.00	50				10	12 24 40	64	89							Additional tests: Sieve Analysis -200, Atterberg Limits
			CLAYEY SAND (SC); medium dense; dark brown (7.5YR - 3/4); moist; low plasticity; fine-coarse grained sand, trace fine-coarse grained gravel, angular to rounded, 3" thick black colored organic smelling CLAY, few pockets of gray Silty SAND.												
305.00	55				11	11 20 17	37	83							
															Drilling gets hard @ 57'
			decrease in sand content.												
300.00	60				12	17 38 48	86	44				PP=4			Additional tests: Sieve Analysis -200, Atterberg Limits
			CLAYSTONE; very dense; light brownish gray (2.5Y - 6/2); moist; low plasticity; fine-grained sand, abundent reddish brown iron oxide staining, micaceous, weak cementation, highly weathered (MISSION VALLEY FORMATION (TMV)).												
295.00	65		.		13	10 16 20	36	100				PP=3			Additional tests: Corrosion
			decrease in sand content.												
290.00	70				14	50/3"	50/3"	100				PP=>4.5			Added water to hole to ease drilling @ 71'
			SILTY SANDSTONE; very dense; light brownish gray (2.5Y - 6/2) with yellow mottling; moist; non-plastic; fine-coarse grained sand, weak cementation, highly weathered.												
285.00	75				15	36 50/3"	50/3"	100							Drilling gets very hard @ 73'

(continued)

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REPORT TITLE
BORING RECORD

HOLE ID
A-14-005

DIST. **11**
COUNTY **San Diego**
ROUTE **SR-56**
POSTMILE **5.6**
EA

PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56

BRIDGE NUMBER **N/A**
PREPARED BY **C Johnson**
DATE **7-28-14**
SHEET **2 of 3**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
		▤	SILTY SANDSTONE; very dense; light brownish gray (2.5Y - 6/2) with yellow mottling; moist; non-plastic; fine-coarse grained sand, weak cementation, highly weathered.												
280.00	80	▤	iron-oxide staining throughout.	☒	16	50/6"	50/6"	100							
		▤													Hard drilling @ 81'
275.00	85	▤	.	⧗	17	50/6"	50/6"	100		14	110				M, UW Additional tests: Sieve Analysis -200, Direct Shear
270.00	90	▤	increase in sand content.	⧗	18	50/5"	50/5"	100							
			Bottom of borehole at 90.5 ft bgs Locations and elevations were approximated from projects topographic maps.												
265.00	95														
260.00	100														
255.00	105														
250.00	110														
245.00	115														

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REPORT TITLE
BORING RECORD
HOLE ID
A-14-005
DIST.
11
COUNTY
San Diego
ROUTE
SR-56
POSTMILE
5.6
EA
PROJECT OR BRIDGE NAME
Torrey Meadows Drive Overcrossing at SR-56
BRIDGE NUMBER
N/A
PREPARED BY
C Johnson
DATE
7-28-14
SHEET
3 of 3

PLOTTED: 11/06/2014 08:38 AM BY: ekoprulu

LOGGED BY **EK**	BEGIN DATE **7-23-14**	COMPLETION DATE **7-23-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96325° / 117.16004°**	HOLE ID **A-14-006**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 14+20**	SURFACE ELEVATION **~360.1 ft**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**	BOREHOLE DIAMETER **6 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**	HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **bentonite**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**	TOTAL DEPTH OF BORING **90.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		SANDY CLAY with GRAVEL (CL); brown (7.5YR - 5/3); moist; low plasticity; fine-coarse grained sand and gravel, angular to subangular gravel (ARTIFICIAL FILL (QAF)).		1										
355.00	5		LEAN CLAY with GRAVEL (CL); stiff; brown (7.5YR - 5/3); moist; low plasticity; fine-coarse grained sand, fine-grained gravel, pockets of light brownish gray sand.		2	9 12 23	35	100		16	113	PP=1.5			M, UW, PA, PI Additional tests: Sieve Analysis, Atterberg Limits
350.00	10														
			SANDY LEAN CLAY (CL); firm; light brownish gray (2.5Y - 6/2) to brown (7.5YR - 5/3); moist; low plasticity; fine-coarse grained sand.		3	9 10 11	21	100				PP=1			Additional tests: Corrosion
345.00	15		CLAYEY SAND (SC); dense; brown (7.5YR - 5/3); moist; medium to high plasticity; some rootlets. SILTY SAND (SM); medium dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, micaceous.		4	13 17 35	52	100		12	121				Additional tests: Sieve Analysis, Atterberg Limits M, UW, PA, PI
340.00	20		SANDY LEAN CLAY (CL); stiff; brown (7.5YR - 5/3); moist; low to medium plasticity; fine-coarse grained sand, fine-grained gravel, broken pieces of caliche.		5	11 13 15	28	100				PP=1.5-2			
335.00	25		CLAYEY SAND (SC); medium dense; brown (7.5YR - 5/3); moist; non-plastic; fine-coarse grained sand. fine-grained gravel, micaceous.		6	9 11 15	26	100		13	115				M, UW
330.00	30		SANDY LEAN CLAY (CL); firm; gray (6N/); moist; low plasticity; fine-coarse grained sand, some rootlets, trace of fine-grained gravel.		7	6 8 9	17	100				PP=1-1.5			
	35														

(continued)

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-006**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **1 of 3**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	35		SILTY SAND (SM); dense; gray (6N/); moist; low plasticity; increase in moisture content and sand content.												Sampler bouncing, drilled 2' more to re-sample DS
					8	10 17 35	52	100		15	114				Additional tests: Sieve Analysis, Atterberg Limits, Direct Shear M, UW, PA, PI
320.00	40		CLAYEY SAND (SC); medium dense; light brownish gray (2.5Y - 6/2); moist; non-plastic to low plasticity; fine-coarse grained sand, micaceous.		9	7 11 14	25	100							
315.00	45		SANDY LEAN CLAY (CL); firm; brown (7.5YR - 5/3) to dark brown (7.5YR - 3/4); moist; low plasticity; intermixxed coloration, fine-coarse grained sand, trace coarse grained gravel, concretion inside half of sampler.		10	11 17 32	49	100		15	117				M, UW
310.00	50		LEAN CLAY (CL); firm; dark brown (7.5YR - 3/4) to black; moist; medium plasticity; trace fine-coarse grained sand, organic smell, abundent rootlets.		11	11 12 15	27	77				PP=1.5			
305.00	55		CLAYEY SAND (SC); medium dense; brown (7.5YR - 5/3) to yellowish brown (10YR - 5/6); moist; low plasticity; fine-coarse grained sand, micaceous.		12	8 14 18	32	66		16	110				Additional tests: Sieve Analysis M, UW, PA
300.00	60		becomes gray (6N/) to light gray-brown (2.5Y - 4/2).		13	9 10 13	23	100							
295.00	65		SILTY SANDSTONE; very dense; gray (6N/) with abundant reddish brown iron-oxide; moist; low plasticity; fine-grained sand, weakly cemented, highly weathered (MISSION VALLEY FORMATION (TMV)).		14	27 50/4"	50/4"	100		12	114	PP=>4			Additional tests: Sieve Analysis, Atterberg Limits M, UW, PA, PI
290.00	70		no recovery.												Very hard layer (concretion @ 70')
285.00	75				15	14 17 50/5"	67/11"	100							Additional tests: Corrosion

(continued)

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-006**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **2 of 3**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
			CLAYEY SANDSTONE; very dense; reddish brown, gray, yellowish brown, laminated with layers of 1/4" thick; moist; non-plastic; moderate cementation,highly weathered, abundant sulfur and iron-oxide staining.												
280.00	80		no recovery.												
275.00	85		SILTY SANDSTONE; very dense; gray (6N/) with orange/reddish brown mottling; moist; non-plastic; fine-coarse grained sand, micaceous, moderate cementation, highly weathered.		16	50/6"	50/6"	100		13	115				Additional tests: Sieve Analysis, Atterberg Limits M, UW, PA, PI
270.00	90		becomes moderately cemented.		17	50/5"	50/5"	100							
			Bottom of borehole at 90.5 ft bgs Locations and elevations were approximated from projects topographic maps.												
265.00	95														
260.00	100														
255.00	105														
250.00	110														
245.00	115														

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-006**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**		DATE **7-28-14**	SHEET **3 of 3**

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LOGGED BY **EK**	BEGIN DATE **7-25-14**	COMPLETION DATE **7-25-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96352° / 117.15948°**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 16+10**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**
BOREHOLE BACKFILL AND COMPLETION **soil cuttings**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**

HOLE ID **A-14-007**
SURFACE ELEVATION **~357.5 ft**
BOREHOLE DIAMETER **6 in**
HAMMER EFFICIENCY, ERi **83%**
TOTAL DEPTH OF BORING **11.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		SANDY LEAN CLAY (CL); firm; brown (7.5YR - 5/3); moist; non-plastic; fine-coarse grained sand, some pockets of Lean CLAY, piece of broken rock in sampler (ARTIFICIAL FILL (QAF)).		1					14	105				M, UW Additional tests: Seive Analysis, Atterberg Limits, Modified Proctor, R-Value
355.00					2	14 15 40	55	77							
	5		SILTY SAND (SM); very dense; light brownish gray (2.5Y - 6/2); moist; non-plastic; fine-coarse grained sand, trace of fine-grained gravel.		3	9 7 11	18	89							
350.00															
	10		decrease in fines content.		4	13 12 10	22	66							
			Bottom of borehole at 11.5 ft bgs Locations and elevations were approximated from projects topographic maps.												
345.00															
	15														
340.00															
	20														
335.00															
	25														
330.00															
	30														
325.00															
	35														

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REPORT TITLE **BORING RECORD**			HOLE ID **A-14-007**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6** — EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**			
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**	DATE **7-28-14**	SHEET **1 of 1**

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LOGGED BY **EK**	BEGIN DATE **7-25-14**	COMPLETION DATE **7-25-14**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **32.96365° / 117.15907°**	HOLE ID **A-14-008**
DRILLING CONTRACTOR **Pacific Drilling**			BOREHOLE LOCATION (Offset, Station, Line) **Sta 17+40**	SURFACE ELEVATION **~355.0 ft**
DRILLING METHOD **Hollow Stem Auger**			DRILL RIG **Diedrich D-50**	BOREHOLE DIAMETER **6 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **SPT (1.5"), CAL (2.4")**			SPT HAMMER TYPE **Auto; 140 lbs / 30-inch drop**	HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **soil cuttings**			GROUNDWATER READINGS — DURING DRILLING **Not Applicable** — AFTER DRILLING (DATE) **Not Applicable**	TOTAL DEPTH OF BORING **2.0 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	■	ASPHALT CONCRETE (6").												
354.00	1	▩	AGGREGATE BASE (8").	▩	1										
		▨	SANDY LEAN CLAY (CL); brown to dark brown; moist; low to medium plasticity (ARTIFICIAL FILL (QAF)).	▩	2										
353.00	2		Bottom of borehole at 2.0 ft bgs Locations and elevations were approximated from projects topographic maps.												
352.00	3														
351.00	4														
350.00	5														
349.00	6														
348.00	7														
347.00	8														
346.00	9														
	10														

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REPORT TITLE **BORING RECORD**				HOLE ID **A-14-008**
DIST. **11**	COUNTY **San Diego**	ROUTE **SR-56**	POSTMILE **5.6**	EA
PROJECT OR BRIDGE NAME **Torrey Meadows Drive Overcrossing at SR-56**				
BRIDGE NUMBER **N/A**	PREPARED BY **C Johnson**	DATE **7-28-14**	SHEET **1 of 1**	

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APPENDIX C

FIELD EXPLORATIONS

APPENDIX C
FIELD EXPLORATIONS

GENERAL

The materials observed in the borings were visually classified and evaluated with respect to strength, swelling, compressibility, compaction density, and moisture content. Material physical/mechanical properties and classifications were substantiated by performing selected laboratory tests. Testing was performed in general accordance with procedures outlined by the American Society for Testing and Materials (ASTM) and the California Department of Transportation (Caltrans).

CLASSIFICATION

Soils were visually described and classified in accordance with the Unified Soil Classification System (USCS) in accordance with ASTM D2487 and/or ASTM D2488. Soil classifications are indicated on the boring logs in Appendix B.

MOISTURE AND DENSITY DETERMINATIONS

Natural moisture content and dry density tests were performed on relatively undisturbed samples in accordance with ASTM D2216 and D7263. table shown on Figures C-1 through C-2 and on the boring logs.

GRAIN SIZE DISTRIBUTION

Twelve sieve analyses were performed on selected samples from the site to evaluate grain size distribution and to aid in soil classification. The tests were performed in general accordance with ASTM D422. Results of the tests are presented on Figures C-3 through C-18.

ATTERBERG LIMITS

Atterberg limits tests were performed on selected soil samples to assist in classification. Testing was performed in general accordance with ASTM D4318. Test results are presented on Figures C-19 through C-24.

COMPACTION TESTS

Selected soil samples were tested for compaction characteristics in accordance with

ASTM Standard Test Method D1557 (modified Proctor). The results are presented on Figures C-25 and C-26.

DIRECT SHEAR

Direct shear testing was performed on three undisturbed and inundated soil samples and tested for shear strength and cohesion values in accordance with ASTM D3080. The results are presented on Figures C-27 through C-31.

R-VALUE TEST

Resistance value (R-value) tests were performed on selected bulk soil samples to evaluate pavement support characteristics of the near-surface onsite soils. R-value testing was performed in accordance with ASTM Test Method D2844. The test results are summarized in Table C-1 below and on Figures C-32 and C-33.

Table C-1R-value Test Results

BORING ID	DEPTH (FEET)	R-VALUE	SOIL DESCRIPTION
A-14-002	1 to 2	11	Sandy lean CLAY (CL)
A-14-007	0 to 2	6	Sandy lean CLAY (CL)

CORROSION

Selected soil samples were tested by Clarkson Laboratory and Supply Inc. to evaluate the soil corrosion potential. Soil pH was determined in accordance with California Test (CT) 643. Minimum electrical resistivity tests were performed on in accordance with AASHTO test T288-12. The water soluble sulfate and water soluble chloride contents of the selected samples were evaluated in accordance with CT 417 and CT 422, respectively. Kleinfelder’s boring logs and the test results should be reviewed by a qualified corrosion engineer to evaluate the general soil corrosion potential with respect to construction materials to evaluate whether further testing is warranted.

APPENDIX C

Laboratory Testing

Date Tested : 8/4-6/2014

Boring #	Sample #	Depth (ft)	Dry Density (pcf)	Moisture Content (%)	Description
A-14-002	1	1-2	-	14.6%	brown sandy clay with recycled asphalt
A-14-003	2	5-6.5	104.2	10.6%	light brownish gray clayey sand
A-14-003	4	15-16.5	102.3	12.3%	light brown clayey sand
A-14-003	6	25-26.5	108.3	19.5%	yellowish brown sandy lean clay
A-14-003	8	35-36	107.4	13.4%	white silty sand
A-14-003	10	45-45.5	97.3	30.6%	light yellowish brown silty sand
A-14-004	2	5-6.5	116.4	9.8%	light yellowish brown silty sand
A-14-004	4	15-16	104.2	13.6%	light olive brown clayey sand
A-14-004	6	25-26	109.4	13.5%	light brown silty sand
A-14-004	8	35-36	110.3	12.5%	light olive brown clayey sand
A-14-004	10	45-46	96.8	13.7%	gray sandy lean clay
A-14-005	2	5-6.5	-	10.2%	light olive clayey sand
A-14-005	4	15-16.5	-	12.7%	olive brown clayey sand
A-14-005	6	25-26.5	113.9	15.0%	olive brown clayey sand
A-14-005	8	35-36.5	-	14.6%	brown clayey sand
A-14-005	10	50-51.5	-	15.1%	brown clayey sand
A-14-005	12	60-61.5	-	13.2%	yellowish brown clayey sand
A-14-005	15	75-76	-	15.0%	yellow clayey sand

Performed in General Accordance with ASTM D7263 and D2216

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CHECKED BY: Uly/J. Co TECH: Uly/CW
JOB NUMBER: 20151065 DATE: 28-Oct-14

Dry Density and Moisture Content

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-1

Date Tested : 8/4-6/2014

Boring #	Sample #	Depth (ft)	Dry Density (pcf)	Moisture Content (%)	Description
A-14-005	17	85-86.5	110.3	14.5%	brownish yellow clayey sand
A-14-006	2	5-6.5	112.8	16.0%	brown lean clay with sand
A-14-006	4	15-16.5	121.4	12.1%	light olive brown clayey sand
A-14-006	6	25-26.5	114.9	12.9%	light olive brown clayey sand
A-14-006	8	37-38.5	114.5	15.5%	yellowish brown silty sand
A-14-006	10	45-46.5	117.5	15.0%	yellowish brown sandy clay with 1 1/2" gravel
A-14-006	12	55-56.5	109.8	16.0%	brown clayey sand
A-14-006	14	65-66	114.2	11.9%	white silty sand
A-14-006	16	85-85.5	114.6	13.1%	very light brown silty sand
A-14-007	1	0-2	-	14.5%	light brown sandy lean clay

Performed in General Accordance with ASTM D7263 and D2216

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Dry Density and Moisture Content

FIGURE

C-2

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: Uly/J. Co TECH: Uly/CW

JOB NUMBER: 20151065 DATE: 28-Oct-14

Date Tested: **8/1/2014**

Boring No.	**Sample No.**	**Depth (ft)**	**Passing 200 (%)**	**USCS Classification**
A-14-002	1	1-2	69.0	CL

Sample Description	sandy lean CLAY; brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	95
	No. 20	0.85 mm	89
	No. 40	0.425 mm	85
	No. 60	0.25 mm	78
	No 100	0.15 mm	71
	No 200	.075 mm	69.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

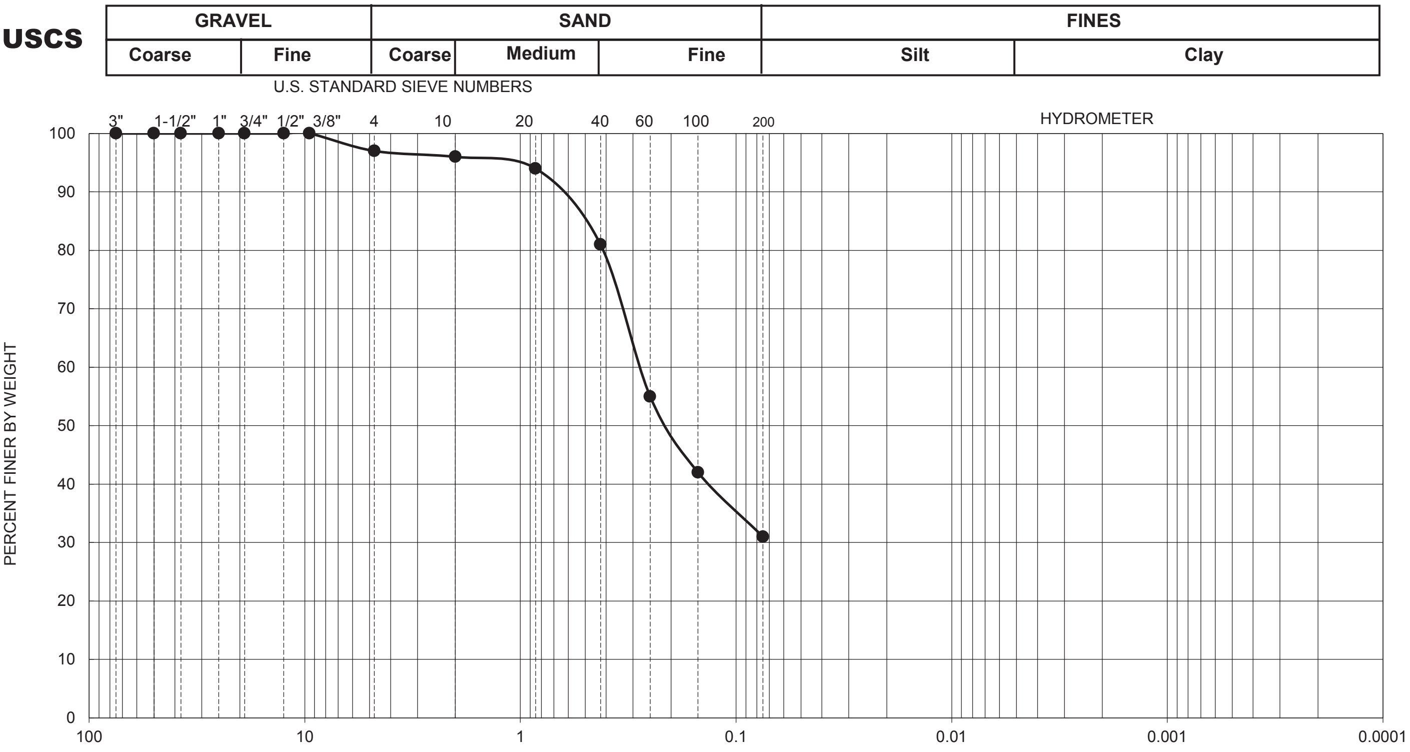
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-3

Date Tested: 8/8/2014



GRAIN SIZE IN MILLIMETERS

Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-003	2	5-6.5	31.0	SC

Sample Description	clayey SAND; light brownish gray

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	97
	No. 10	2.0 mm	96
	No. 20	0.85 mm	94
	No. 40	0.425 mm	81
	No. 60	0.25 mm	55
	No 100	0.15 mm	42
	No 200	.075 mm	31.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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SIEVE ANALYSIS

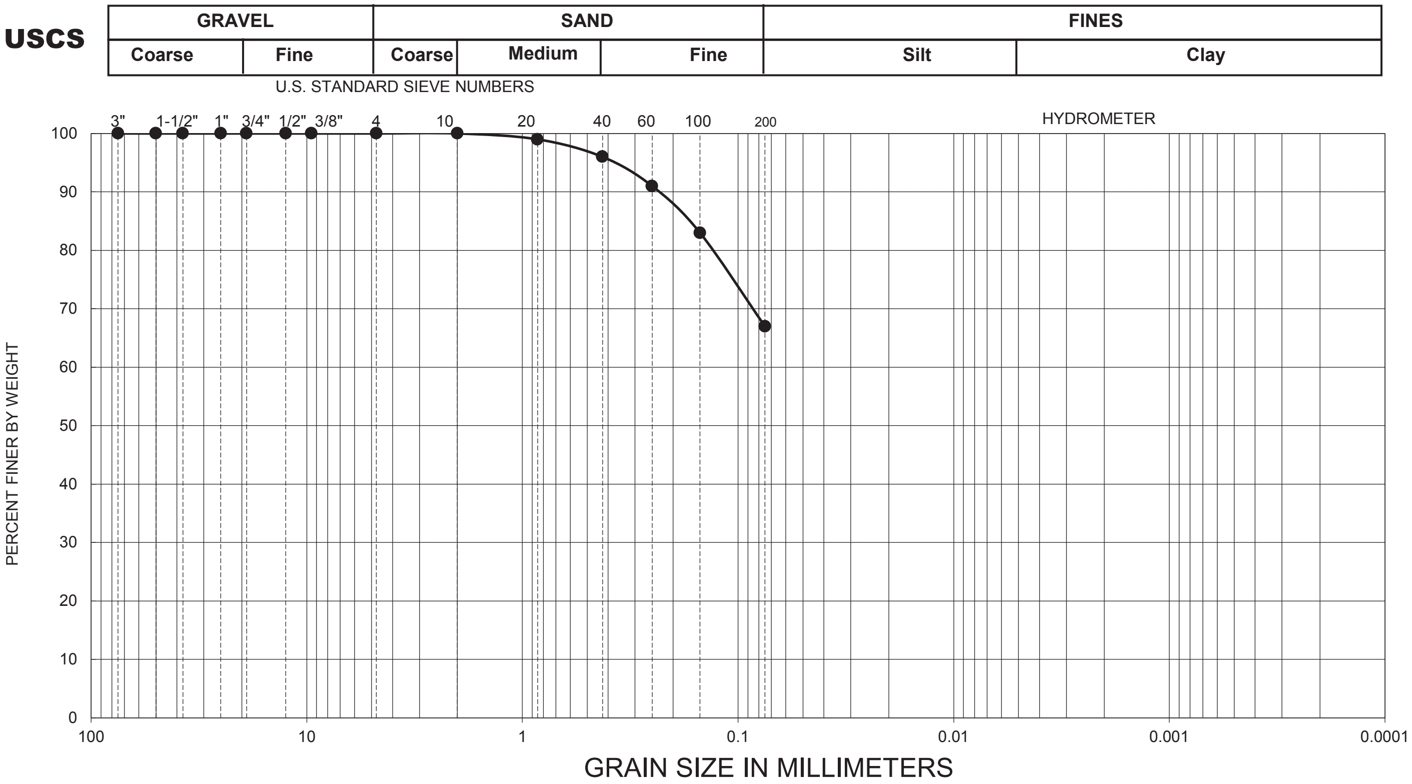
FIGURE

C-4

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

Date Tested: **8/8/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-003	6	25-26.5	67.0	CL

Sample Description	sandy lean CLAY; yellowish brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	99
	No. 40	0.425 mm	96
	No. 60	0.25 mm	91
	No 100	0.15 mm	83
	No 200	.075 mm	67.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

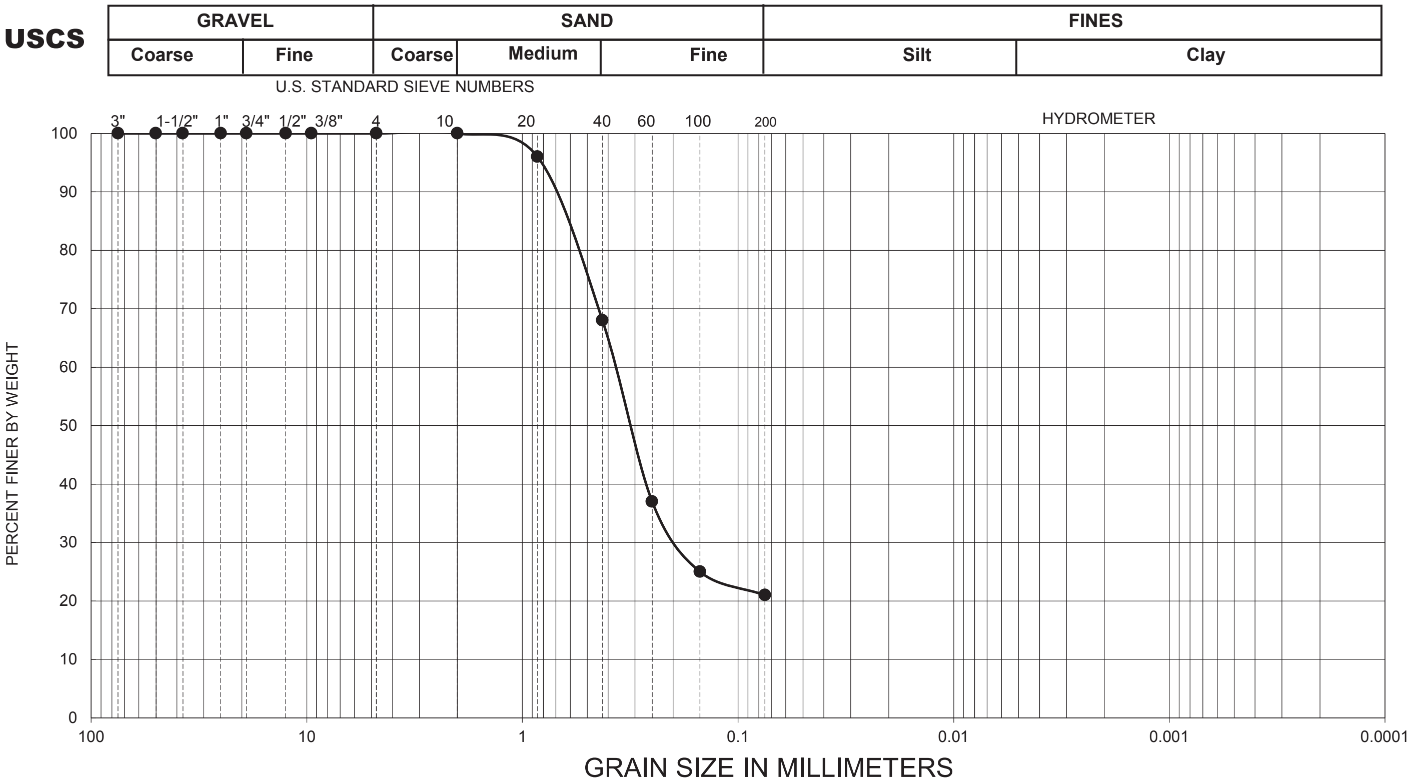
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-5

Date Tested: **8/8/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-003	8	35-36	21.0	SM

Sample Description	Silty SAND; white

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	96
	No. 40	0.425 mm	68
	No. 60	0.25 mm	37
	No 100	0.15 mm	25
	No 200	.075 mm	21.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Project No.	20151065	Date: 28-Oct-14

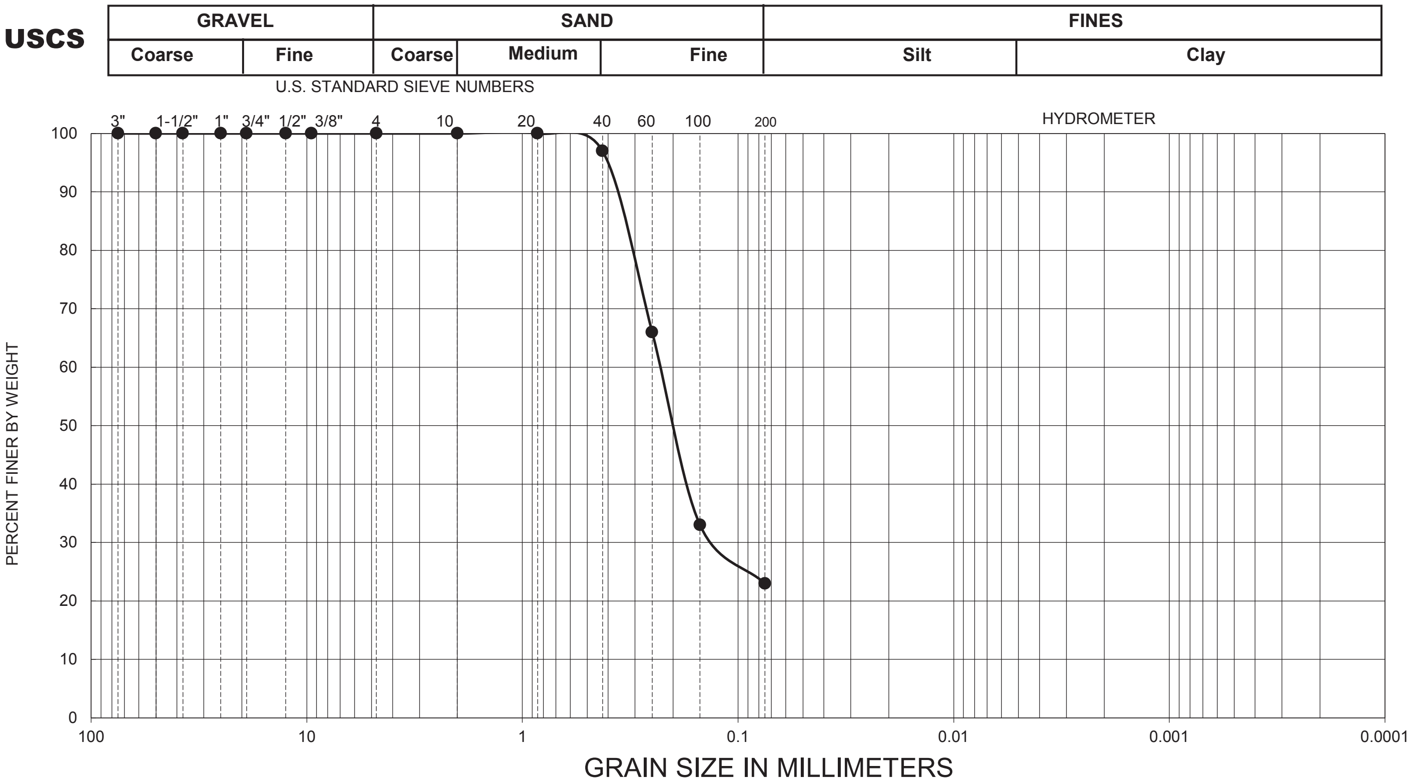
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-6

Date Tested: **8/8/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-003	10	45-45.5	23.0	SM

Sample Description	silty SAND; light yellowish brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	100
	No. 40	0.425 mm	97
	No. 60	0.25 mm	66
	No 100	0.15 mm	33
	No 200	.075 mm	23.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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SIEVE ANALYSIS

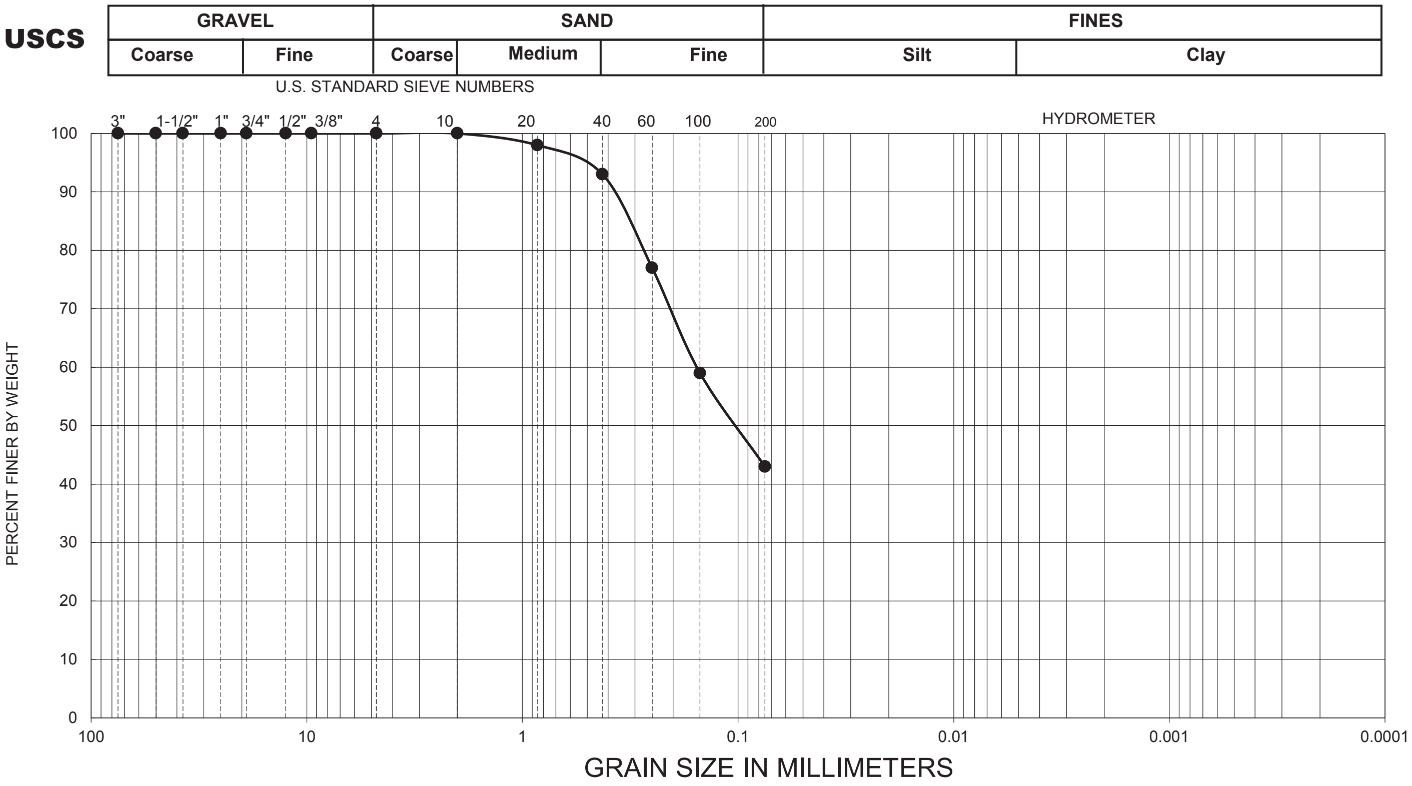
TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-7

Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

Date Tested: **8/6/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-004	4	15-16	43.0	SC

Sample Description	clayey SAND; light olive brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	98
	No. 40	0.425 mm	93
	No. 60	0.25 mm	77
	No 100	0.15 mm	59
	No 200	.075 mm	43.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	J. Co	Tech: Uly
Project No.	20151065	Date: 28-Oct-14

SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-8

Date Tested: 8/8/2014

Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-004	8	35-36	45	SC

Sample Description	clayey SAND; light olive

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	98
	No. 40	0.425 mm	94
	No. 60	0.25 mm	90
	No 100	0.15 mm	75
	No 200	.075 mm	45.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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SIEVE ANALYSIS

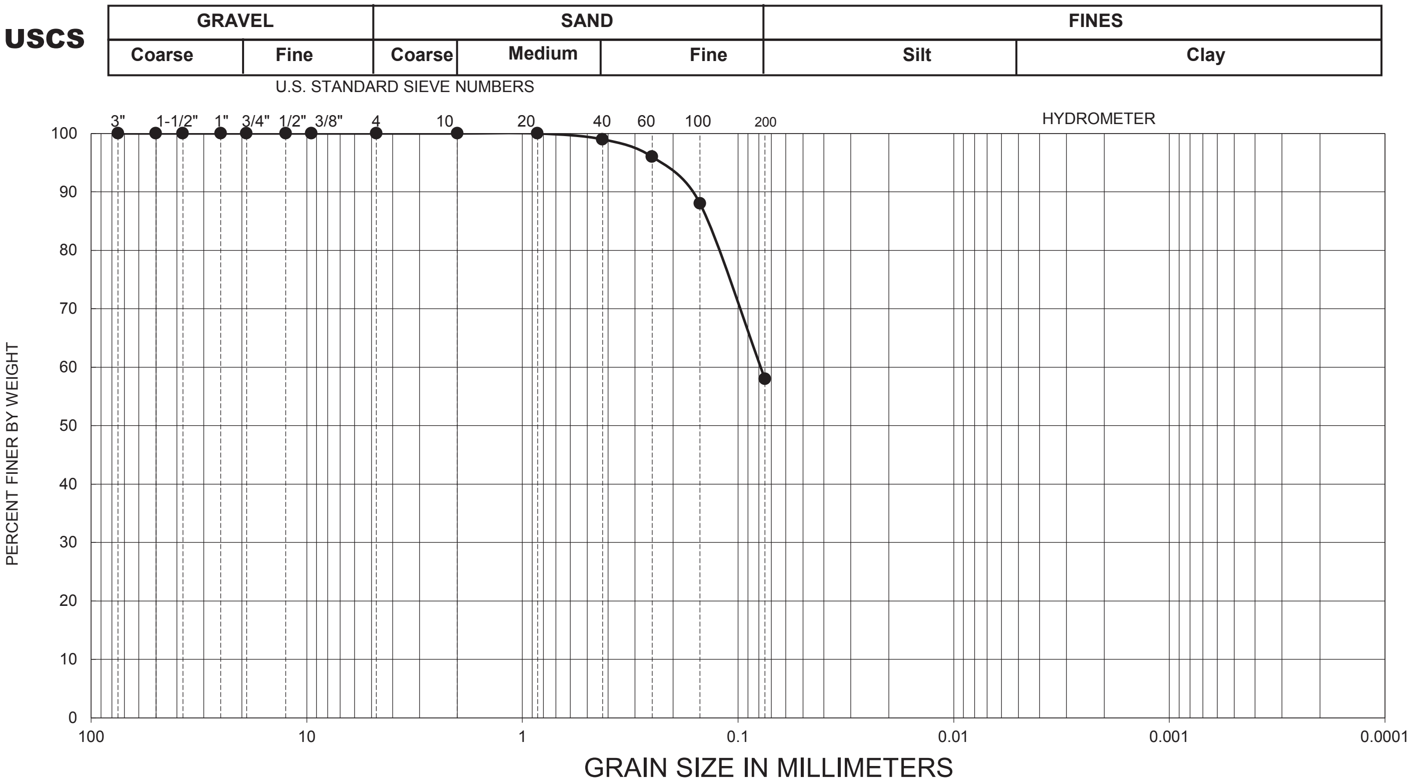
TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-9

Checked by:	Uly	Tech: CW
Project No.	20151065	Date: 28-Oct-14

Date Tested: **8/8/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-004	10	45-46	58	CL

Sample Description	sandy lean CLAY; gray

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	100
	No. 40	0.425 mm	99
	No. 60	0.25 mm	96
	No 100	0.15 mm	88
	No 200	.075 mm	58.0

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Checked by:	Uly	Tech: CW
Project No.	20151065	Date: 28-Oct-14

SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-10

Date Tested: **8/12/2014**

Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	2	5-6.5	74.0	CL

Sample Description	lean CLAY with sand; brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	96
	No. 40	0.425 mm	93
	No. 60	0.25 mm	88
	No 100	0.15 mm	84
	No 200	.075 mm	74.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

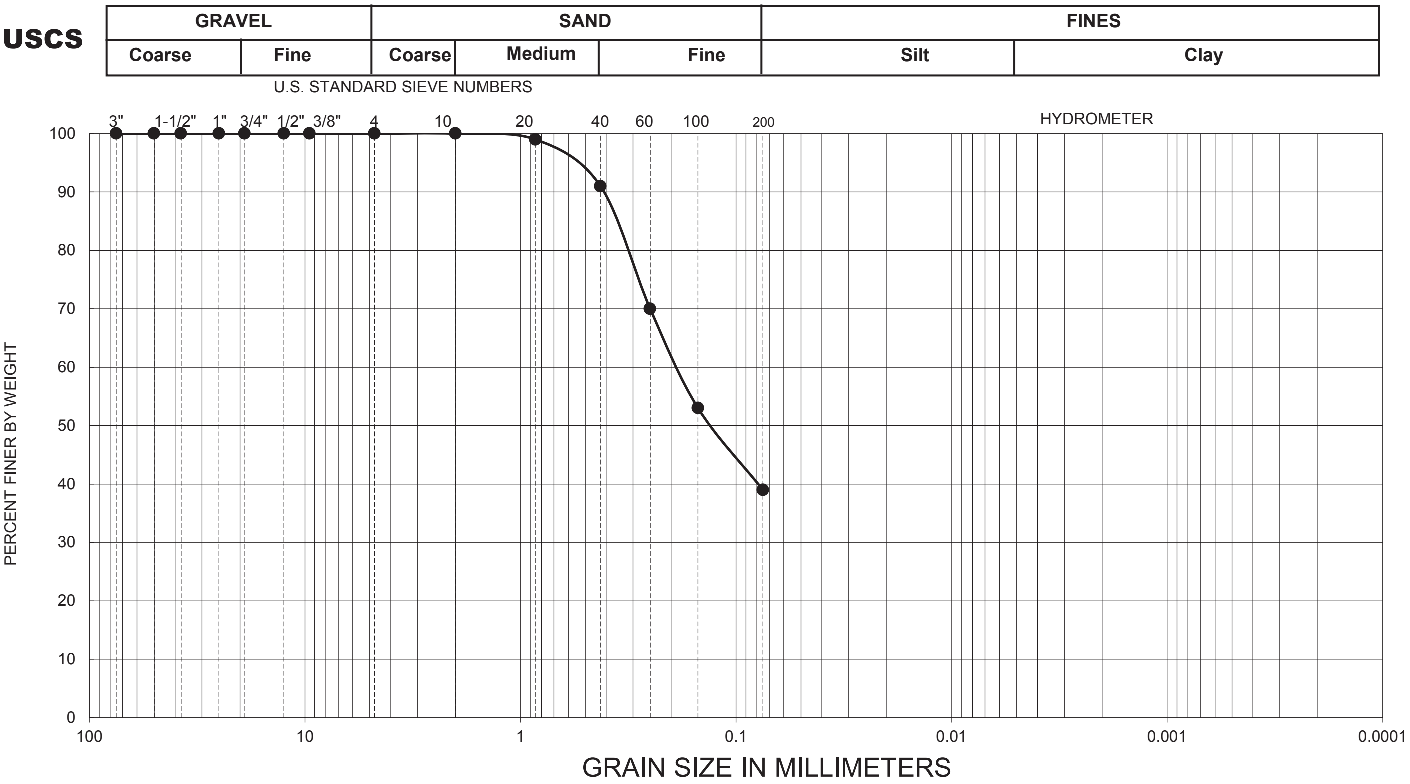
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-11

Date Tested: **8/12/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	4	15-16.5	39	SC

Sample Description	clayey SAND; light olive brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	99
	No. 40	0.425 mm	91
	No. 60	0.25 mm	70
	No 100	0.15 mm	53
	No 200	.075 mm	39

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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SIEVE ANALYSIS

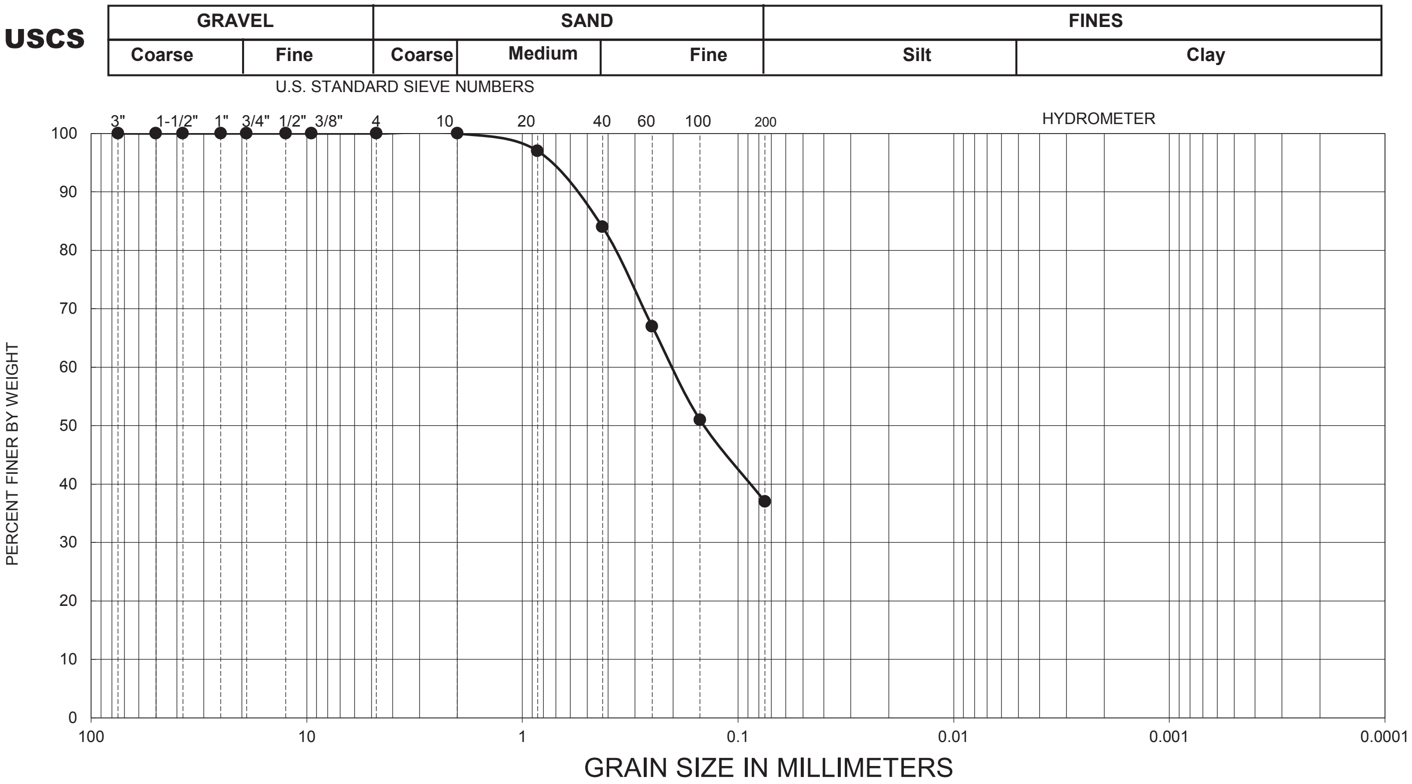
TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-12

Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

Date Tested: **8/12/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	8	37-38.5	37	SM

Sample Description	yellowish brown Silty sand

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	97
	No. 40	0.425 mm	84
	No. 60	0.25 mm	67
	No 100	0.15 mm	51
	No 200	.075 mm	37

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

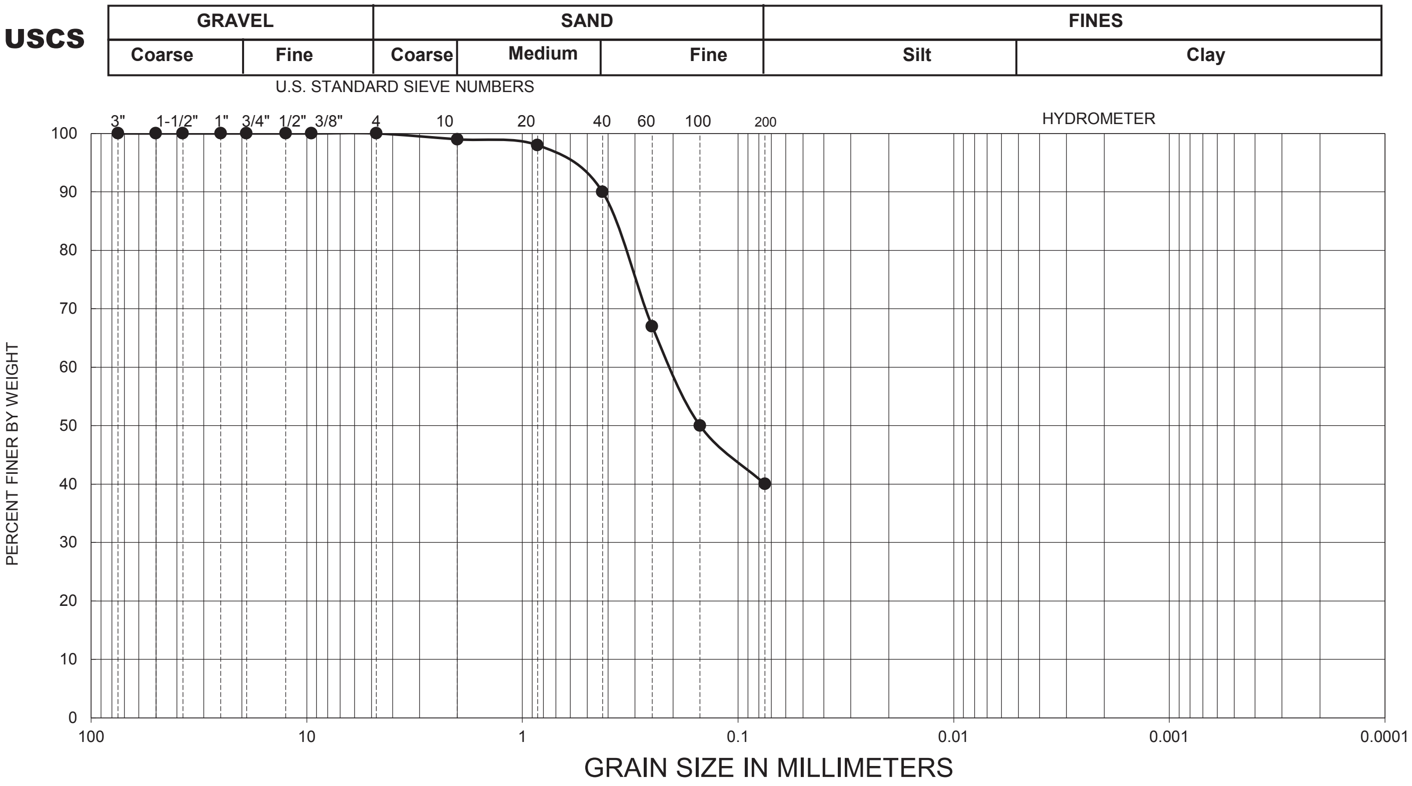
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-13

Date Tested: 8/12/2014



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	12	55-56.5	40	SC

Sample Description	clayey SAND; brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	99
	No. 20	0.85 mm	98
	No. 40	0.425 mm	90
	No. 60	0.25 mm	67
	No 100	0.15 mm	50
	No 200	.075 mm	40

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Project No.	20151065	Date: 28-Oct-14

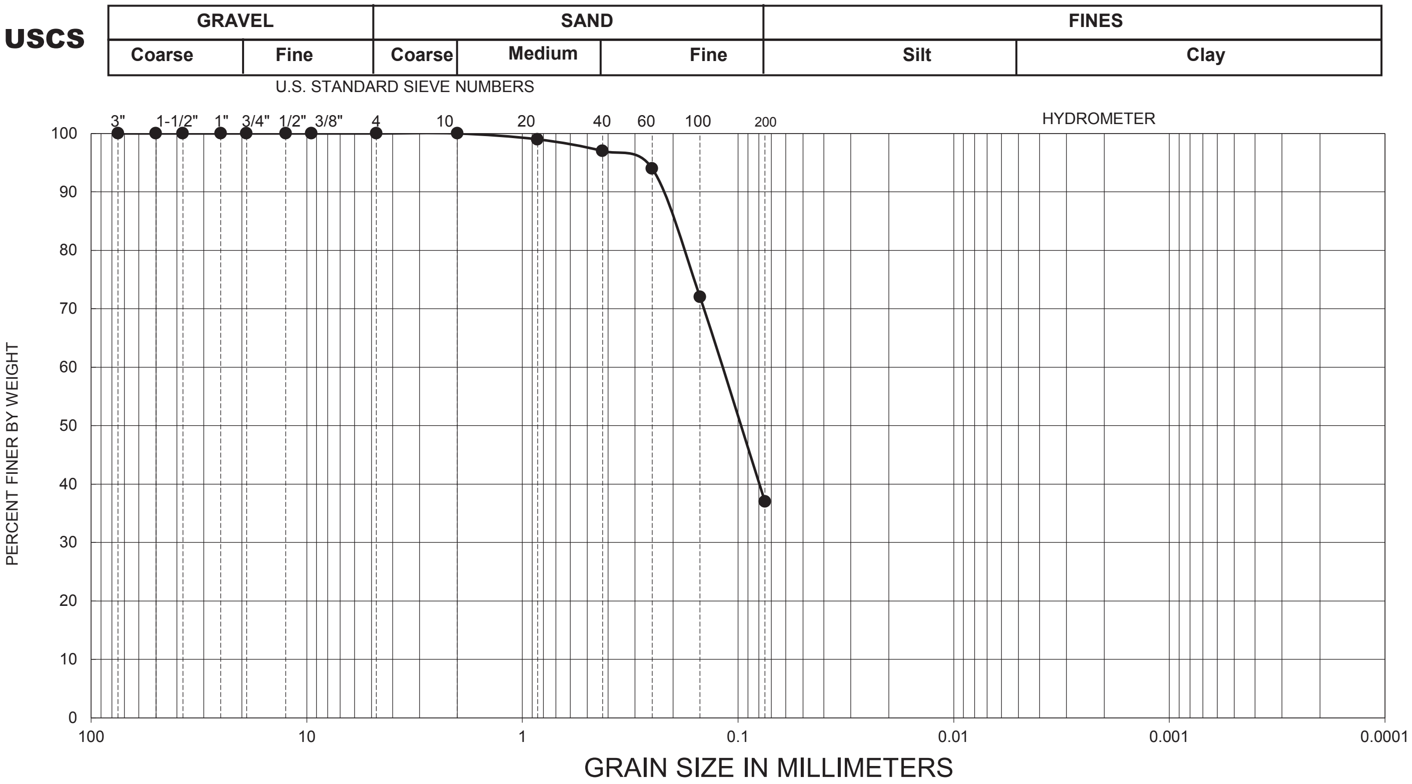
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-14

Date Tested: **8/12/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	14	65-66	37	SM

Sample Description	silty SAND; white

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	99
	No. 40	0.425 mm	97
	No. 60	0.25 mm	94
	No 100	0.15 mm	72
	No 200	.075 mm	37

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	Uly P.	Tech: CW
Project No.	20151065	Date: 28-Oct-14

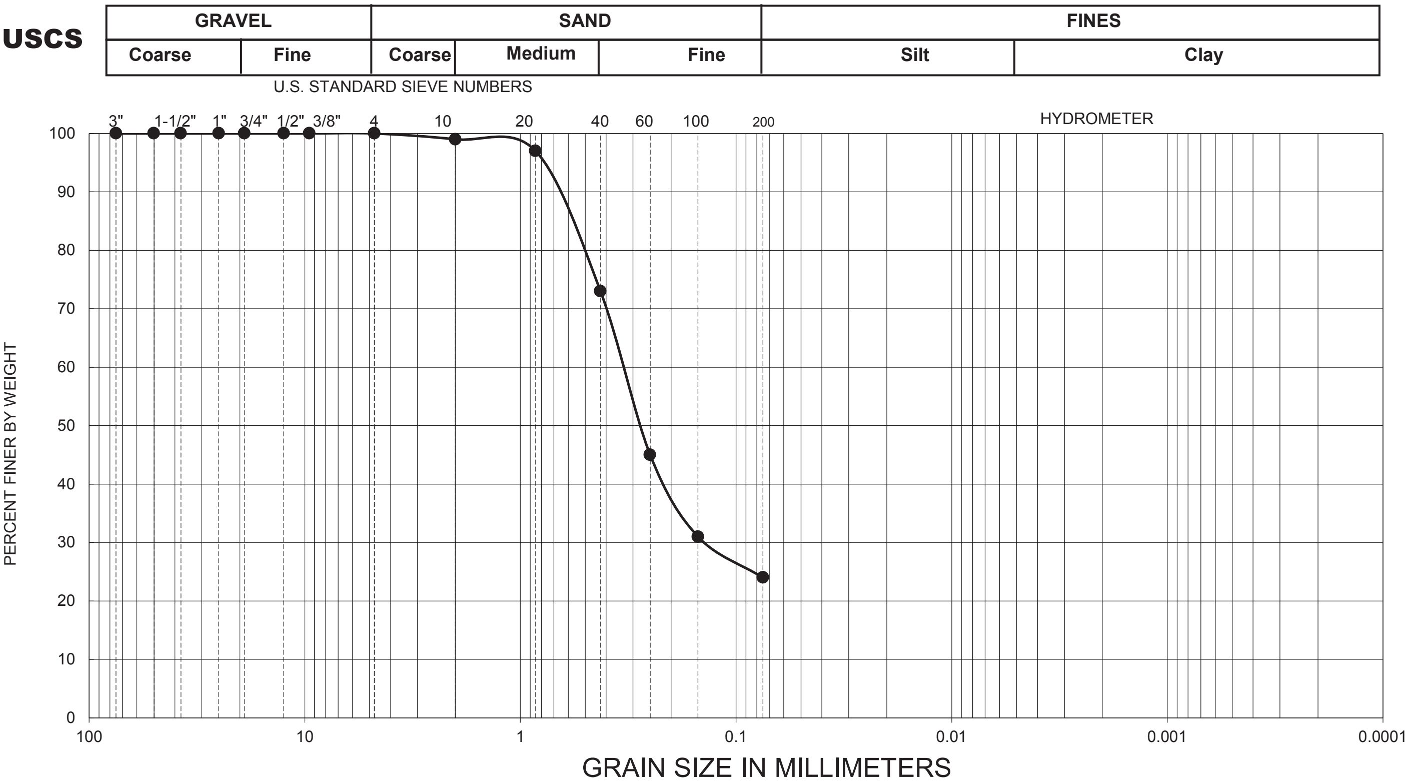
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-15

Date Tested: **8/12/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-006	16	85-85.5	24	SM

Sample Description	silty SAND; very light brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	99
	No. 20	0.85 mm	97
	No. 40	0.425 mm	73
	No. 60	0.25 mm	45
	No 100	0.15 mm	31
	No 200	.075 mm	24

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Project No.	20151065	Date: 28-Oct-14

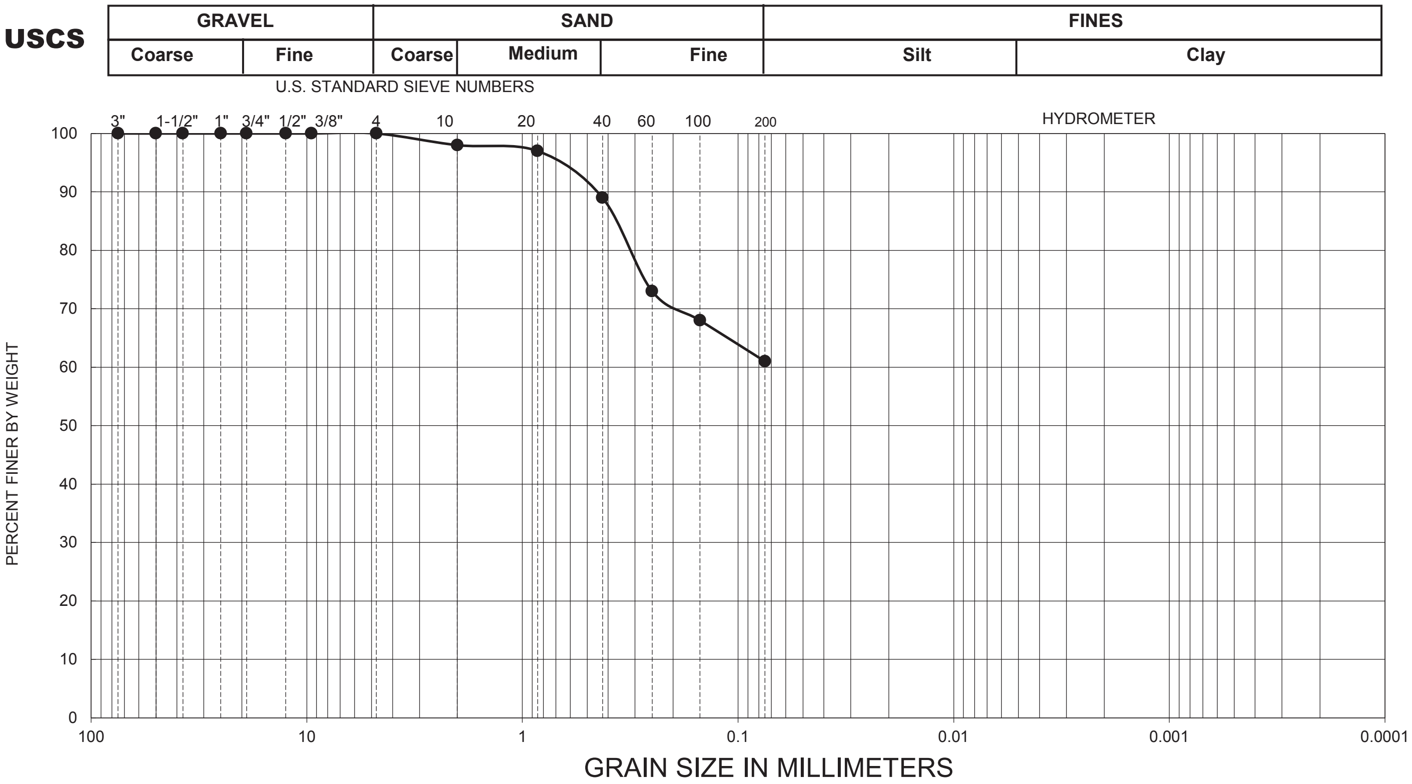
SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-16

Date Tested: **8/6/2014**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
A-14-007	1	0-2	61.0	CL

Sample Description	sandy lean CLAY; light brown

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	98
	No. 20	0.85 mm	97
	No. 40	0.425 mm	89
	No. 60	0.25 mm	73
	No 100	0.15 mm	68
	No 200	.075 mm	61.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

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Checked by:	J. Co	Tech: Uly
Project No.	20151065	Date: 28-Oct-14

SIEVE ANALYSIS

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE

C-17

Date Tested 8/6-11/2014

Boring No		**A-14-005**	**A-14-005**	**A-14-005**
Sample No.		2	4	6
Depth, ft.		5-6.5	15-16.5	25-26.5
Original Dry Mass of sample, g	B	265.9	192.3	292.9
Dry Mass of Sample After Washing,g	C	198.3	134.2	215.4
Material Finer than a 75 um (No 200), %	A	**25.4**	**30.2**	**26.5**
Description		light olive clayey sand	olive brown clayey sand	olive brown silty sand

Boring No		**A-14-005**	**A-14-005**	**A-14-005**
Sample No.		10	12	17
Depth, ft.		50-51.5	60-61.5	85-86.5
Original Dry Mass of sample, g	B	181.5	204.5	301.1
Dry Mass of Sample After Washing,g	C	110.3	127.4	227.0
Material Finer than a 75 um (No 200), %	A	**39.2**	**37.7**	**24.6**
Description		brown clayey sand	yellowish brown clayey sand	brownish yellow clayey sand

A = [(B-C)/B] x 100

TEST PERFORMED IN ACCORDANCE WITH ASTM D 1140

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SIEVE ANALYSIS
Materials Finer than 75 um (No 200) Sieve

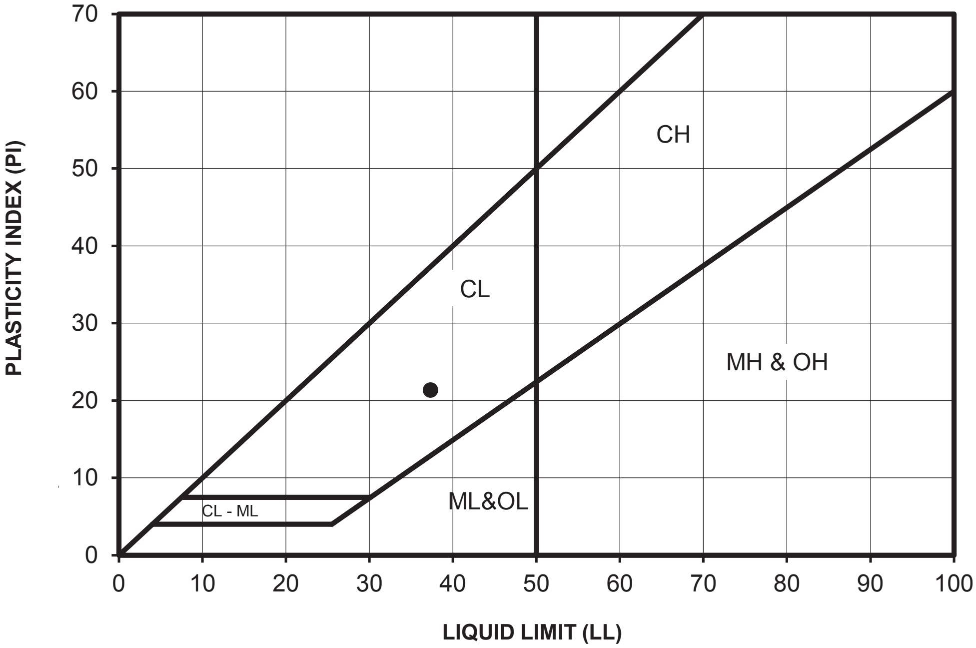
TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

FIGURE
C-18

CHECKED BY: Uly   Tech CW
JOB NUMBER: 20151065   DATE: 28-Oct-14

Date Tested : 8/6/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-002-1	1-2'	37	16	21	CL	CL
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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ATTERBERG LIMITS

FIGURE

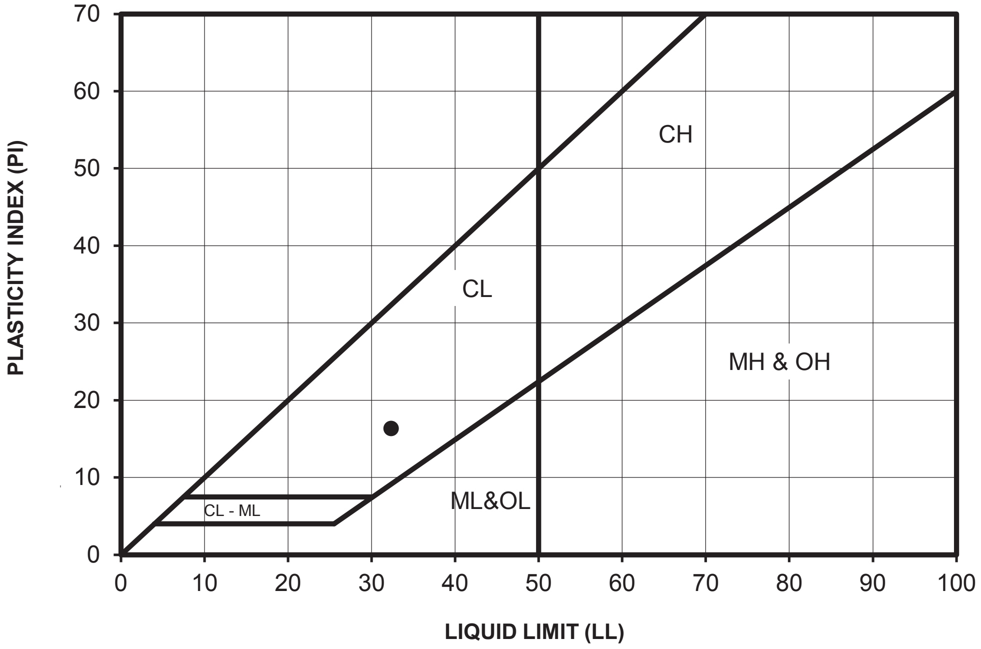
C-19

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: J. Co
TECH: Uly
PROJECT NO: 20151065
3-Nov-14

Date Tested : 8/9/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-003-2	5-6.5'	32	16	16	CL	SC
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

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ATTERBERG LIMITS

FIGURE

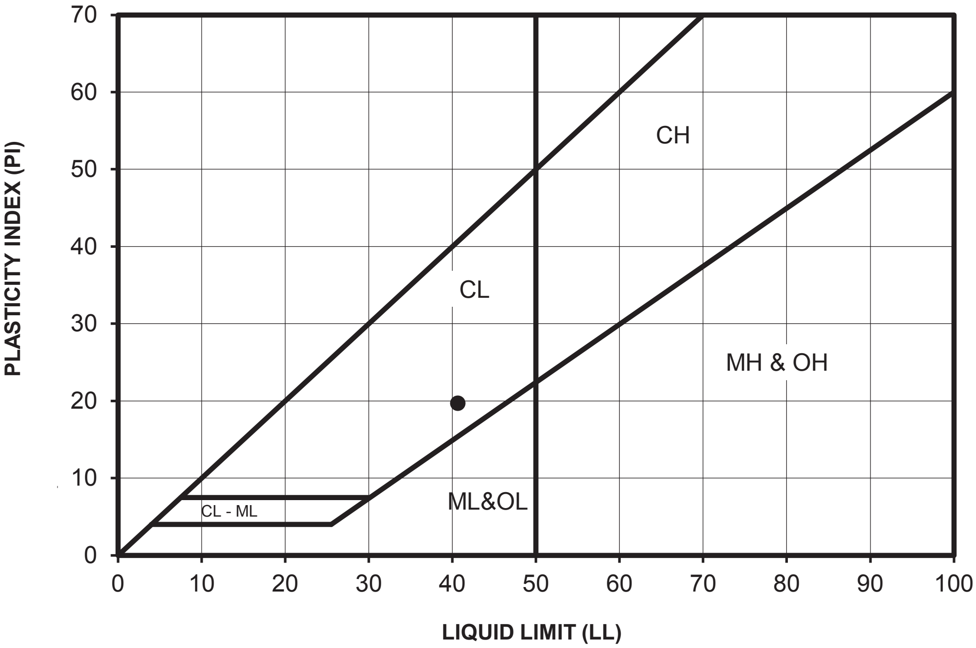
C-20

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: J. Co
TECH: Uly
PROJECT NO: 20151065
3-Nov-14

Date Tested : 8/9/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-004-10	45-46	41	21	20	CL	CL
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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ATTERBERG LIMITS

FIGURE

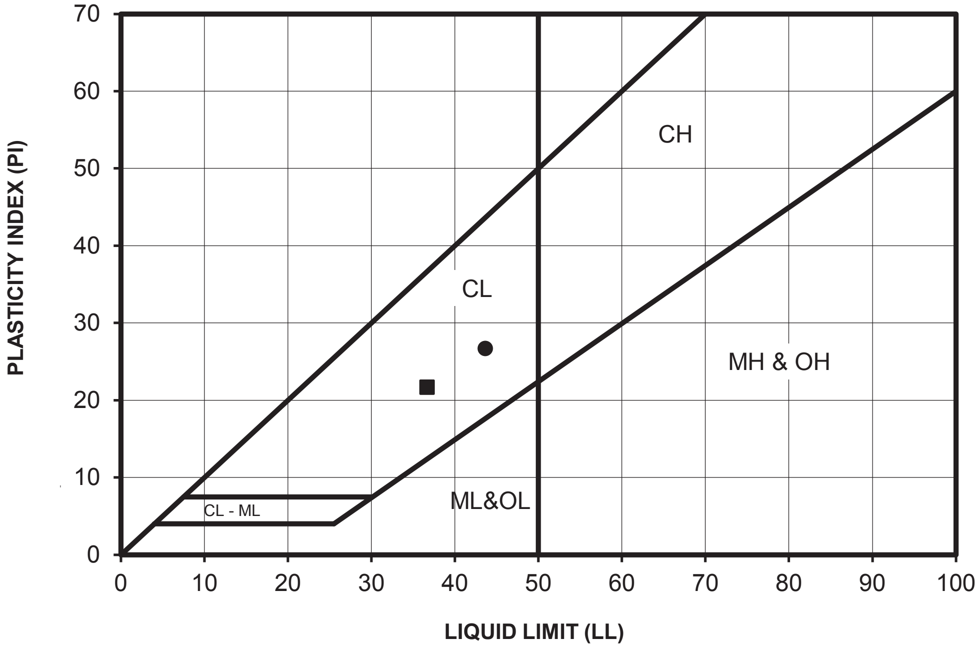
C-21

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: Uly P.
TECH: CW
PROJECT NO: 20151065
3-Nov-14

Date Tested : 8/10/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-005-10	50-51.5	44	17	27	CL	
■	A-14-005-12	60-61.5	37	15	22	CL	
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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ATTERBERG LIMITS

FIGURE

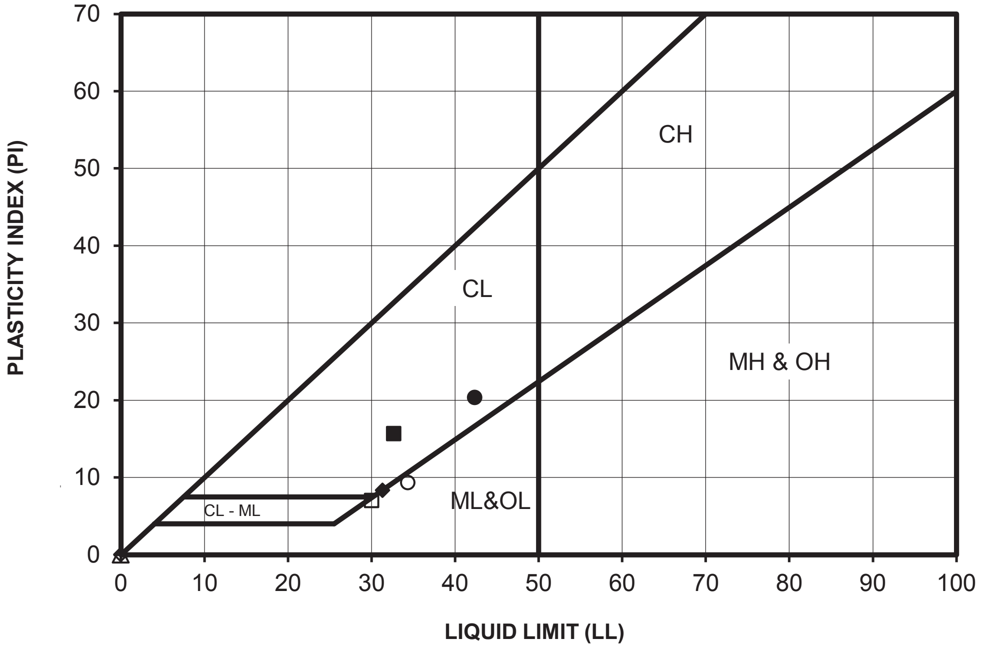
C-22

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: Uly P.
TECH: CW
PROJECT NO: 20151065
3-Nov-14

Date Tested : 8/11-12/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-006-2	5-6.5	42	22	20	CL	CL
■	A-14-006-4	15-16.5	33	17	16	CL	SC
◆	A-14-006-8	37-38.5	31	23	8	ML	SM
○	A-14-006-14	65-66	34	25	9	ML	SM
□	A-14-006-16	85-85.5	30	23	7	ML	SM
△							
+							
◇							



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Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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ATTERBERG LIMITS

FIGURE

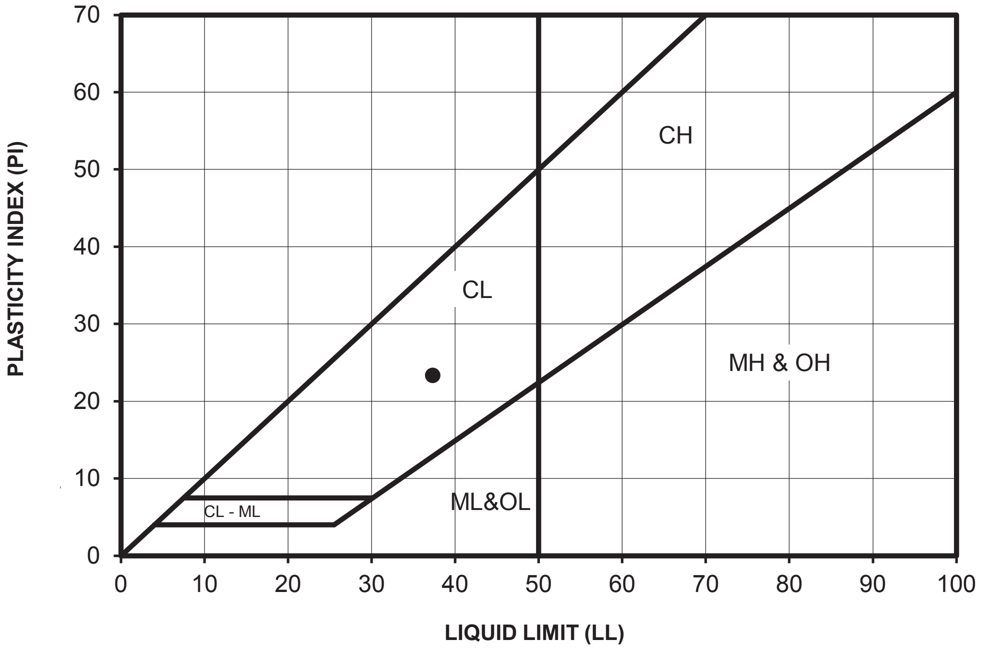
C-23

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: J. Co
TECH: Uly
PROJECT NO: 20151065
3-Nov-14

Date Tested : 8/6/2014

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	A-14-007-1	0-2'	37	14	23	CL	
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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ATTERBERG LIMITS

FIGURE

C-24

TORREY MEADOWS DRIVE OVERCROSSING AT SR-56
POST MILE 5.6, DISTRICT 11
SAN DIEGO, CA

CHECKED BY: J. Co	TECH: Uly
PROJECT NO: 20151065	3-Nov-14

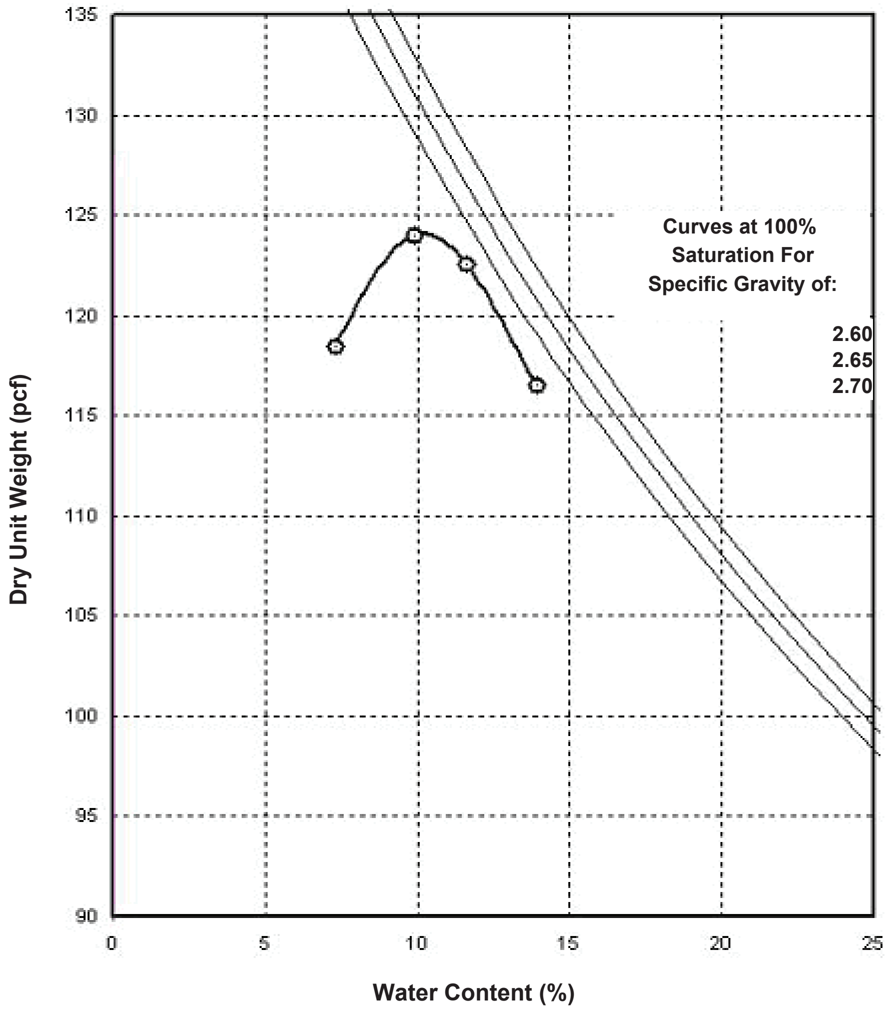
5015 Shoreham Place
San Diego, CA 92122
Phone: (858) 320-2000 Fax: (858) 320-2001

Laboratory Compaction Characteristics of Soil Using Modified Effort ASTM D 1557

Report To:

Report Date: 8/12/2014
Project No.: 20151065.001A
Project: Torrey Meadows Drive Overcrossing
Task: 05-000L Laboratory Testis

TEST RESULTS



Sample No.: SD_20151065.002.1
Date Sampled: 7/25/2014
Sample Location:
A-14-002-1 at 1-2'

Material Description:
Sandy Lean CLAY (CL)

Compaction Test Method:
ASTM D 1557 Method A
Maximum Dry Unit Weight (pcf): 124.1
Optimum Water Content (%): 10.2

Remarks:

Reviewed on 8/12/2014 by:

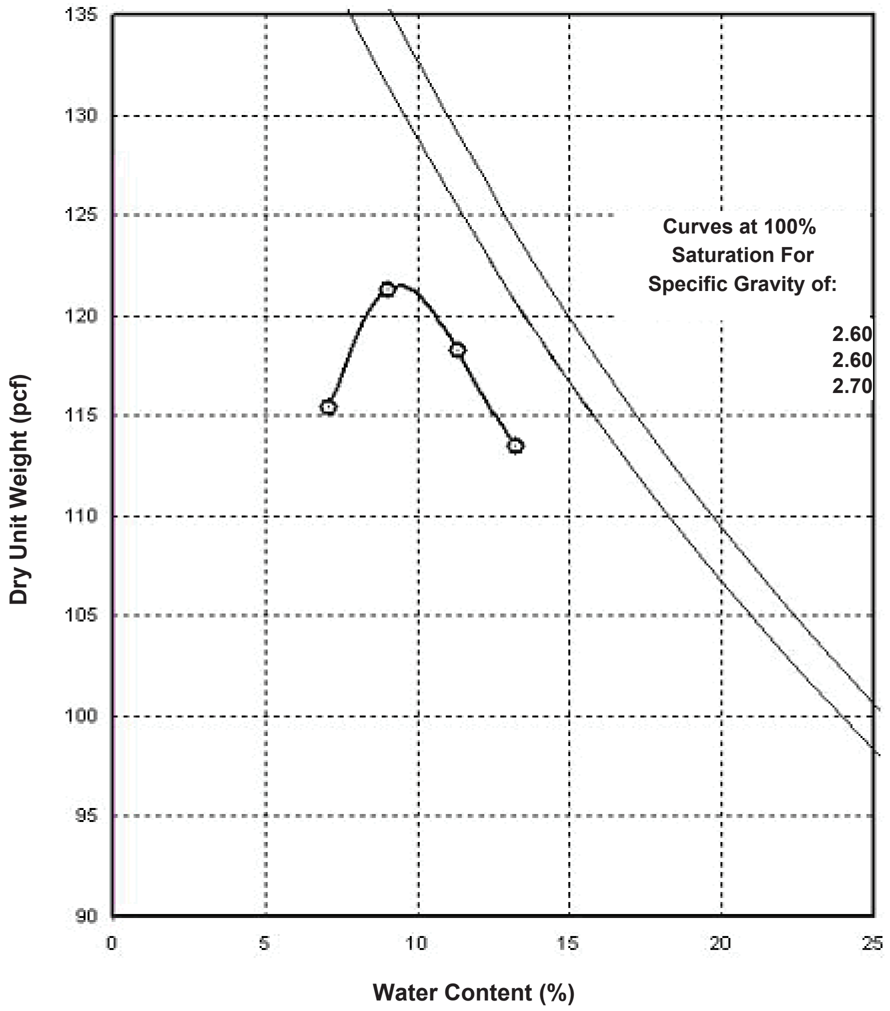
Ulysses Panuncialman
Laboratory Manager

Laboratory Compaction Characteristics of Soil Using Modified Effort ASTM D 1557

Report To:

Report Date:	8/12/2014
Project No.:	20151065.001A
Project:	Torrey Meadows Drive Overcrossing
Task:	05-000L Laboratory Testis

TEST RESULTS



Sample No.: SD_20151065.007.1

Date Sampled: 7/25/2014

Sample Location:

A-14-007-1 at 0-2'

Material Description:

Sandy Lean CLAY (CL)

Compaction Test Method:

ASTM D 1557 Method A

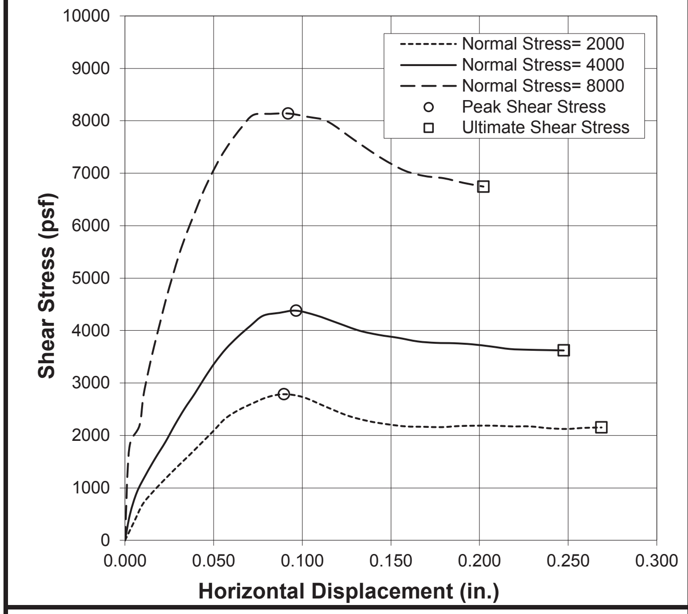
Maximum Dry Unit Weight (pcf): 121.5

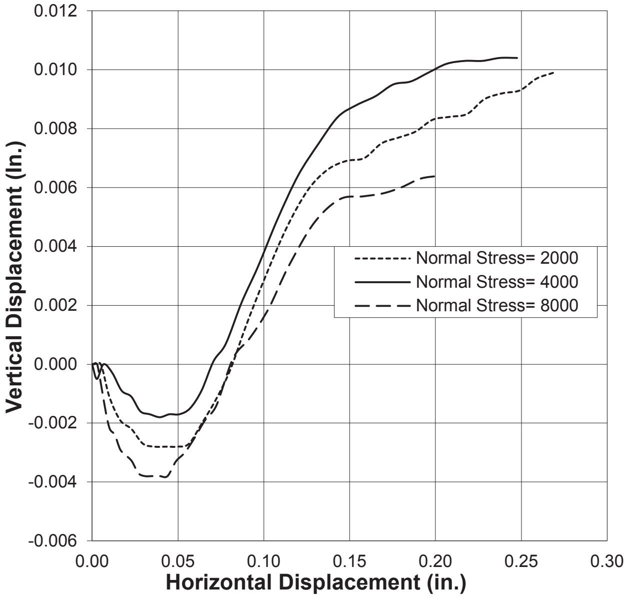
Optimum Water Content (%): 9.4

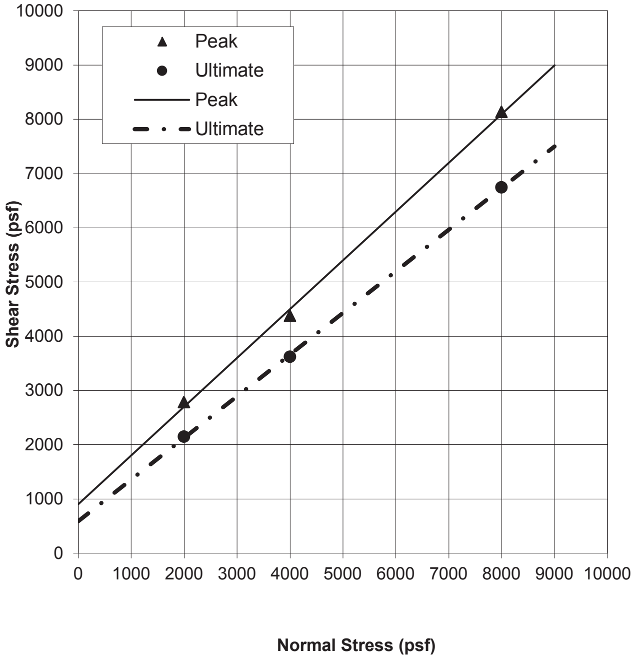
Remarks:

Reviewed on 8/12/2014 by:

Ulysses Panuncialman
Laboratory Manager







Specimen Number		1	2	3	4
Initial	Water Content, %	13.1	12.8	14.1	na
	Dry Density, pcf	106.7	105.0	110.5	na
	Saturation, %	65.5	60.9	78.5	na
	Void Ratio	0.521	0.546	0.469	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	1.00	1.00	1.00	na
Preshear	Water Content, %	19.0	17.7	15.4	na
	Dry Density, pcf	108.5	111.0	116.4	na
	Saturation, %	100.0	99.9	101.6	na
	Void Ratio	0.495	0.461	0.393	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	0.983	0.945	0.949	na
After	Water Content, %	22.5	19.1	17.1	na

Normal Stress, psf	2000	4000	8000	na
Peak Shear Stress, psf	2787	4380	8139	na
Horz. Displ. at Peak Shear Stress, in.	0.090	0.096	0.092	na
Ultimate Shear Stress, psf	2152	3621	6746	na
Horz. Displ. at Ultimate Shear Stress, in.	0.269	0.247	0.202	na
Strain Rate, in./min.	0.0071	0.0071	0.0071	na
	c, psf	**ϕ, deg.**	**Tan ϕ**	
Peak	907	42.0	0.90	na
Ultimate	590	37.5	0.77	na

LL:	nm	PL:	nm	PI:	nm	G_S:	2.60	Assumed

Test Conditions: Undisturbed / Inundated

Sample Description: Silty SAND (SM)

Boring:	A-14-003
Sample:	8
Depth, ft:	35-36
Test Date:	8/5/14

Remarks: nm = not measured, na = not applicable

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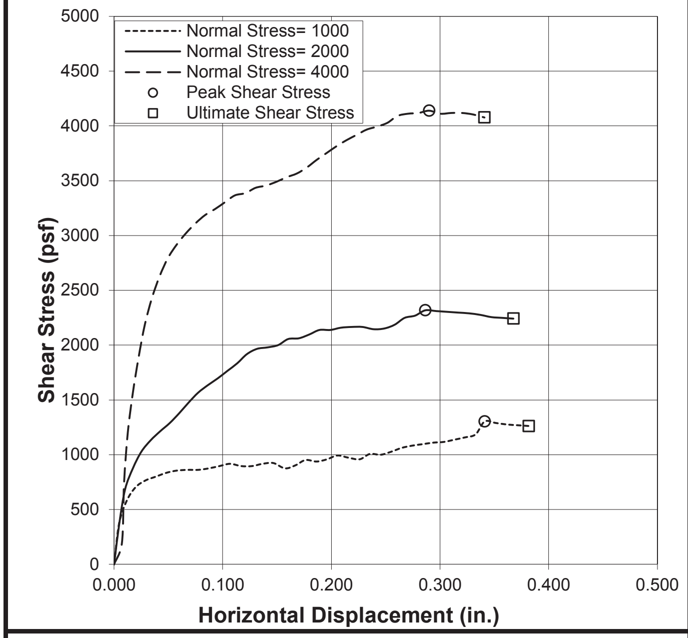
PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/14/2014
REVISED:	

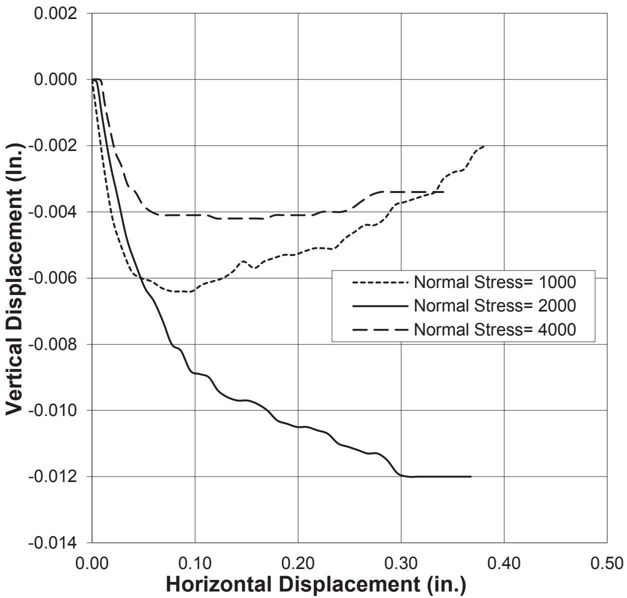
DIRECT SHEAR TEST ASTM D3080

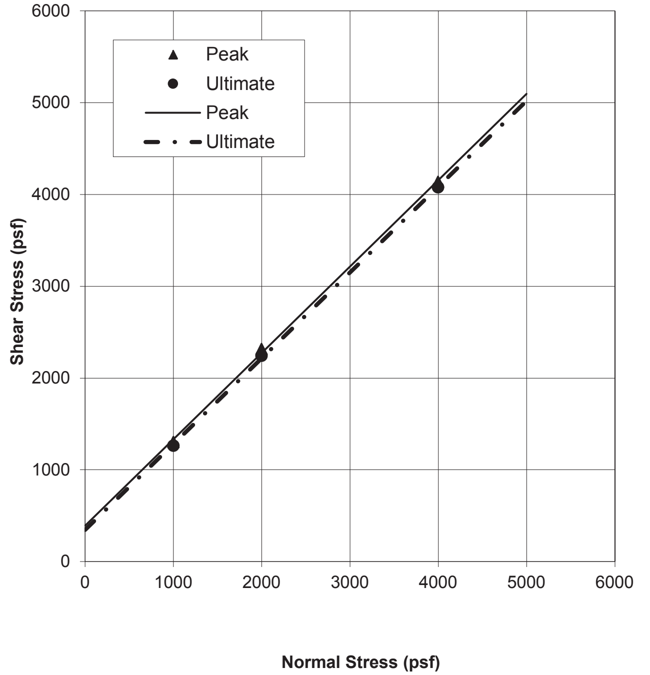
Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE

C-27







Specimen Number		1	2	3	4
Initial	Water Content, %	13.8	13.6	13.3	na
	Dry Density, pcf	104.4	100.7	107.5	na
	Saturation, %	64.8	57.8	67.8	na
	Void Ratio	0.555	0.611	0.509	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	1.00	1.00	1.00	na
Preshear	Water Content, %	20.7	21.2	17.2	na
	Dry Density, pcf	105.7	104.9	112.2	na
	Saturation, %	100.8	100.7	100.3	na
	Void Ratio	0.535	0.546	0.447	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	0.987	0.960	0.959	na
After	Water Content, %	21.6	20.4	19.4	na

	1	2	3	4
Normal Stress, psf	1000	2000	4000	na
Peak Shear Stress, psf	1304	2318	4139	na
Horz. Displ. at Peak Shear Stress, in.	0.341	0.286	0.290	na
Ultimate Shear Stress, psf	1262	2242	4077	na
Horz. Displ. at Ultimate Shear Stress, in.	0.382	0.368	0.341	na
Strain Rate, in./min.	0.0047	0.0047	0.0047	na
	c, psf	**ϕ, deg.**	**Tan ϕ**	
Peak	393	43.2	0.94	na
Ultimate	345	43.1	0.94	na

LL:	nm	PL:	nm	PI:	nm	G_S:	2.60	Assumed

Test Conditions: Remolded / Inundated

Sample Description: Clayey SAND (SC)

Boring:	A-14-004
Sample:	4
Depth, ft:	15-16
Test Date:	8/6/14

Remarks: nm = not measured, na = not applicable

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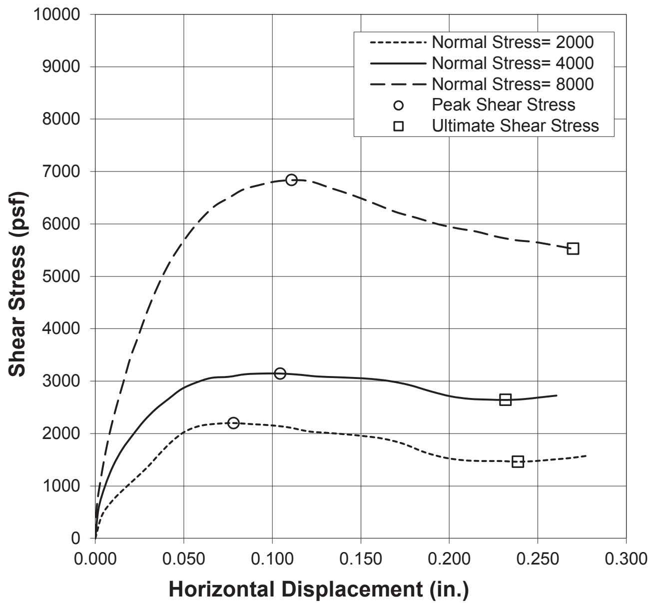
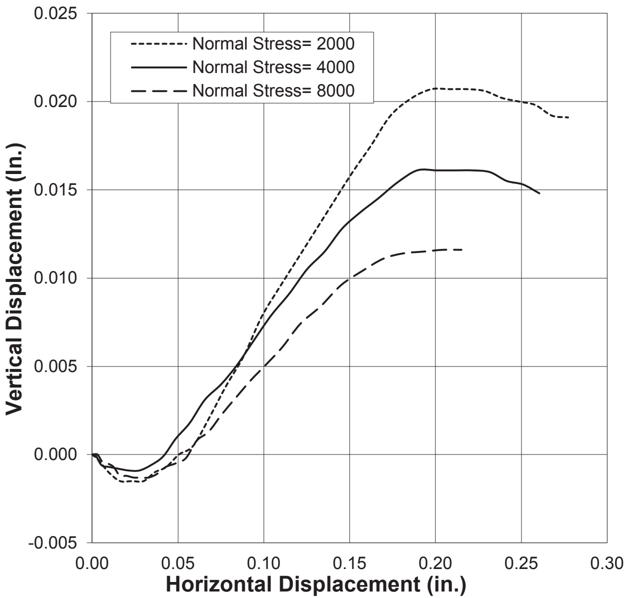
PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/14/2014
REVISED:	

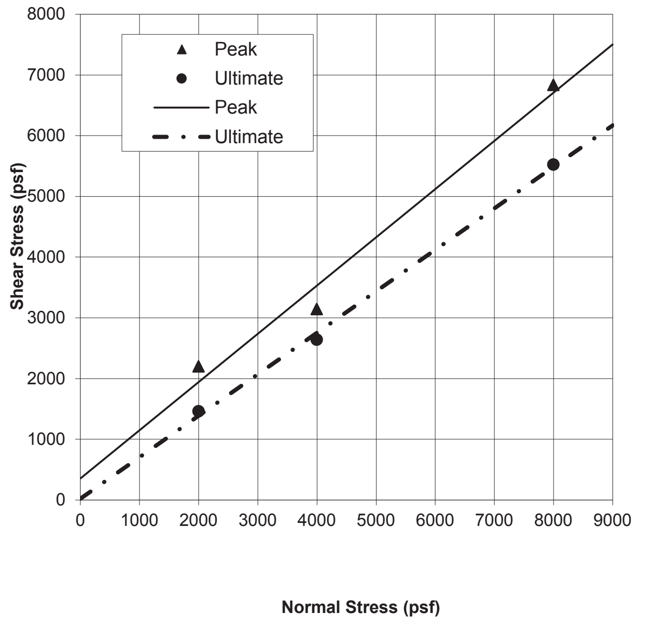
DIRECT SHEAR TEST ASTM D3080

Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE
C-28







Specimen Number		1	2	3	4
Initial	Water Content, %	14.9	15.5	14.5	na
	Dry Density, pcf	115.4	113.1	113.3	na
	Saturation, %	91.4	88.7	83.4	na
	Void Ratio	0.433	0.462	0.460	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	1.00	1.00	1.00	na
Preshear	Water Content, %	16.3	16.9	15.5	na
	Dry Density, pcf	115.6	118.2	119.5	na
	Saturation, %	100.0	112.1	107.1	na
	Void Ratio	0.431	0.399	0.384	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	0.999	0.957	0.948	na
After	Water Content, %	18.5	17.9	17.1	na

Normal Stress, psf	2000	4000	8000	na
Peak Shear Stress, psf	2200	3145	6836	na
Horz. Displ. at Peak Shear Stress, in.	0.078	0.104	0.111	na
Ultimate Shear Stress, psf	1462	2642	5525	na
Horz. Displ. at Ultimate Shear Stress, in.	0.239	0.232	0.270	na
Strain Rate, in./min.	0.0095	0.0095	0.0095	na
	c, psf	**ϕ, deg.**	**Tan ϕ**	
Peak	355	38.5	0.80	na
Ultimate	21	34.4	0.68	na

LL:	nm	PL:	nm	PI:	nm	G_S:	2.65	Assumed

Test Conditions: Undisturbed / Inundated

Sample Description: Silty SAND (SM)

Boring:	A-14-005
Sample:	6
Depth, ft:	25-26.5
Test Date:	8/7/14

Remarks: nm = not measured, na = not applicable

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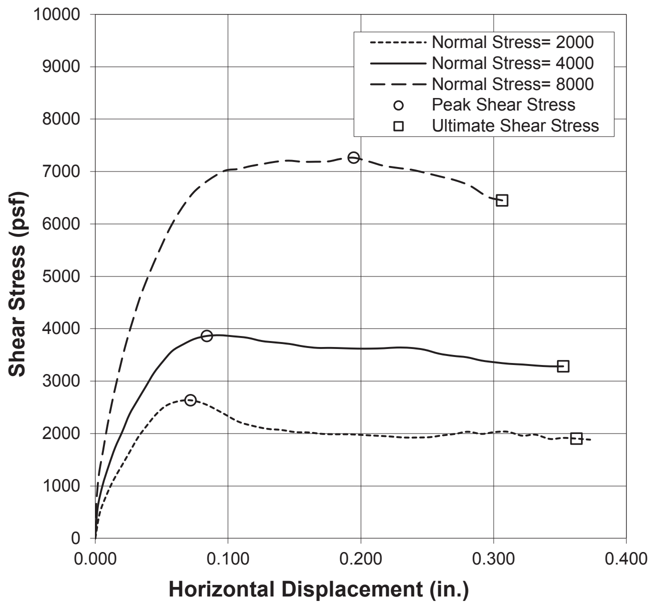
PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/14/2014
REVISED:	

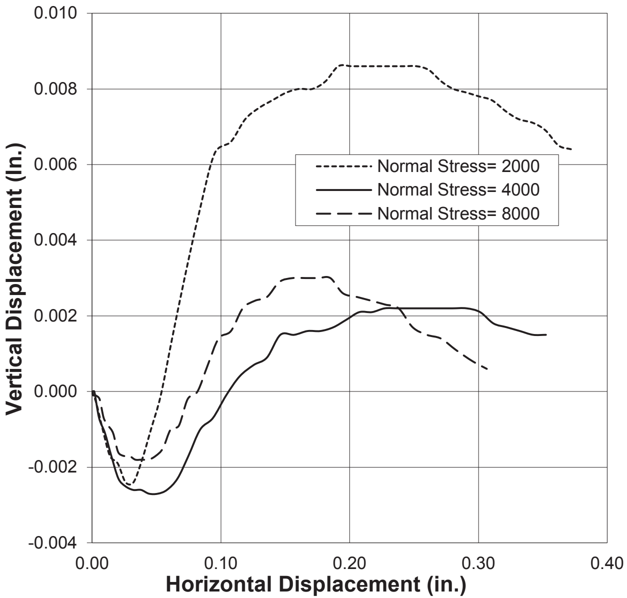
DIRECT SHEAR TEST ASTM
D3080

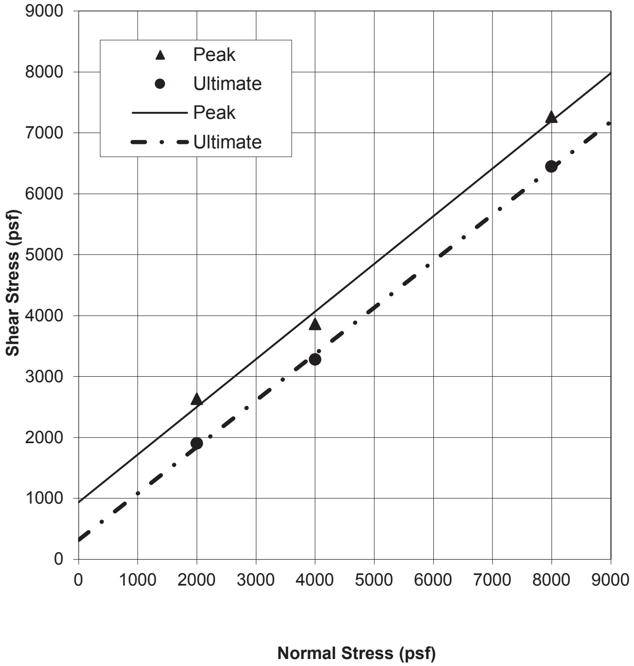
Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE

C-29







	Specimen Number	1	2	3	4
Initial	Water Content, %	15.0	14.3	14.0	na
	Dry Density, pcf	109.6	108.0	113.2	na
	Saturation, %	81.4	74.1	84.2	na
	Void Ratio	0.480	0.502	0.433	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	1.00	1.00	1.00	na
Preshear	Water Content, %	17.5	17.1	15.7	na
	Dry Density, pcf	111.9	113.7	117.9	na
	Saturation, %	101.2	104.4	108.5	na
	Void Ratio	0.450	0.427	0.376	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	0.980	0.950	0.960	na
After	Water Content, %	18.4	19.2	17.5	na

Normal Stress, psf	2000	4000	8000	na
Peak Shear Stress, psf	2635	3863	7263	na
Horz. Displ. at Peak Shear Stress, in.	0.072	0.084	0.195	na
Ultimate Shear Stress, psf	1904	3283	6450	na
Horz. Displ. at Ultimate Shear Stress, in.	0.362	0.352	0.307	na
Strain Rate, in./min.	0.0118	0.0118	0.0118	na
	c, psf	**ϕ, deg.**	**Tan ϕ**	
Peak	935	38.0	0.78	na
Ultimate	321	37.3	0.76	na

LL:	nm	PL:	nm	PI:	nm	G_S:	2.60	Assumed

Test Conditions: Undisturbed / Inundated

Sample Description: Clayey SAND (SC)

Boring:	A-14-005
Sample:	17
Depth, ft:	85-86.5
Test Date:	8/8/14

Remarks: nm = not measured, na = not applicable

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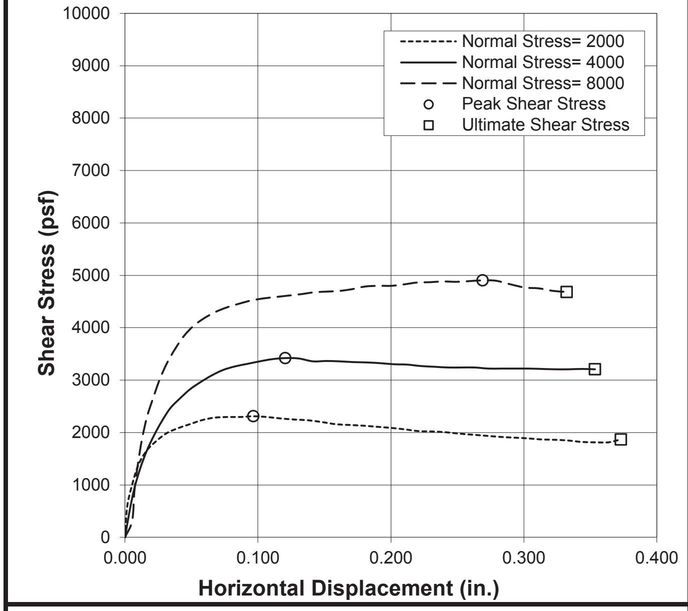
PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J.Co
DATE:	8/14/2014
REVISED:	

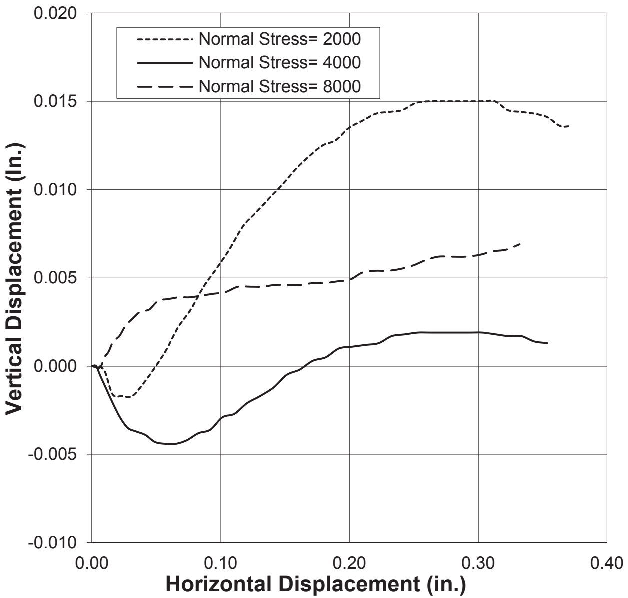
DIRECT SHEAR TEST ASTM D3080

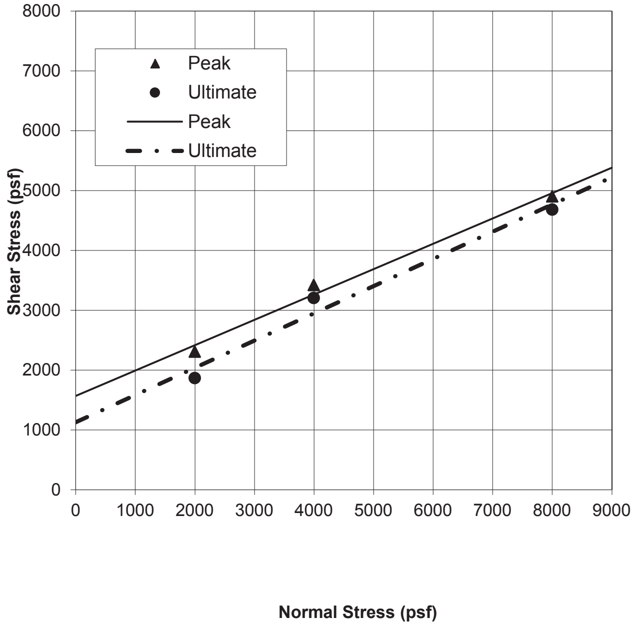
Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE

C-30







Specimen Number		1	2	3	4
Initial	Water Content, %	10.8	19.5	17.6	na
	Dry Density, pcf	110.6	107.8	110.8	na
	Saturation, %	58.0	97.0	94.9	na
	Void Ratio	0.495	0.533	0.492	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	1.00	1.00	1.00	na
Preshear	Water Content, %	19.2	20.2	18.8	na
	Dry Density, pcf	111.4	111.4	114.8	na
	Saturation, %	104.8	110.3	113.1	na
	Void Ratio	0.485	0.484	0.440	na
	Diameter, in	2.39	2.39	2.39	na
	Height, in	0.994	0.968	0.965	na
After	Water Content, %	21.7	20.0	18.8	na

Normal Stress, psf	2000	4000	8000	na
Peak Shear Stress, psf	2311	3421	4904	na
Horz. Displ. at Peak Shear Stress, in.	0.096	0.120	0.269	na
Ultimate Shear Stress, psf	1869	3208	4684	na
Horz. Displ. at Ultimate Shear Stress, in.	0.373	0.353	0.332	na
Strain Rate, in./min.	0.0071	0.0071	0.0071	na
	c, psf	**ϕ, deg.**	**Tan ϕ**	
Peak	1569	22.9	0.42	na
Ultimate	1131	24.5	0.46	na

LL:	nm	PL:	nm	PI:	nm	G_S:	2.65	Assumed

Test Conditions: Undisturbed / Inundated

Sample Description: Clayey SAND (SC)

Boring:	A-14-006
Sample:	12
Depth, ft:	55-59.5
Test Date:	8/11/14

Remarks: nm = not measured, na = not applicable

PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/14/2014
REVISED:	

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Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

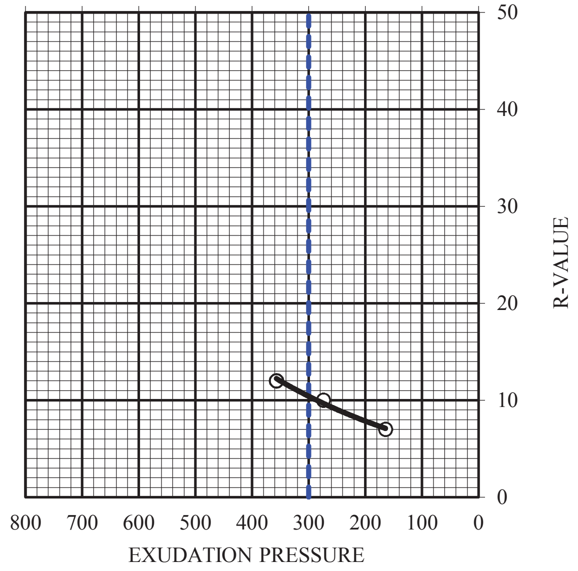
PLATE
C-31

Boring No.	Sample No.	Depth	Description	Date Tested
A-14-002	1	1-2'	Sandy Lean CLAY (CL)	8/4-5/2014

TEST SPECIMEN				
MOLD NO.	5	4	3	
FOOT PRESSURE, psi	**100**	**80**	**50**	
INITIAL MOISTURE, %	14.5	14.5	14.5	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1048.0	1048.0	1048.0	
WATER ADDED, ml	**15**	**30**	**50**	
COMPACTION MOISTURE, %	15.9	17.4	19.3	
HEIGHT OF BRIQUETTE, in.	**2.5**	**2.52**	**2.6**	
WEIGHT BRIQUETTE/MOLD,	**3182.6**	**3192.3**	**3183.3**	
WEIGHT OF MOLD, g	**2107.9**	**2113**	**2105.4**	
WEIGHT OF BRIQUETTE, g	1074.7	1079.3	1077.9	
DRY DENSITY, pcf	112.5	110.7	105.4	
STABILOMETER, 1000 lbs	**55**	**54**	**62**	
2000lbs	**134**	**135**	**146**	
DISPLACEMENT, in	**3.58**	**3.95**	**3.95**	
EXUDATION LOAD, lbs	**4485**	**3439**	**2063**	
EXUDATION PRESSURE, psi	357.1	273.8	164.3	
R-VALUE	12	10	6	
CORRECTED R-VALUE	12	10	7	
DIAL READING, END	0.0395	0.0210	0.0300	
DIAL READING, START	0.0400	0.0200	0.0300	
DIFFERENCE	-0.0005	0.0010	0.0000	
EXPANSION PRESSURE, PSF	0.0	43.7	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	749.1
DRY WEIGHT, g	654.2
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	14.5

R-VALUE:	**11**
Location:	



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/15/2015
REVISED:	

R-Value (ASTM D2844)

Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE

C-32

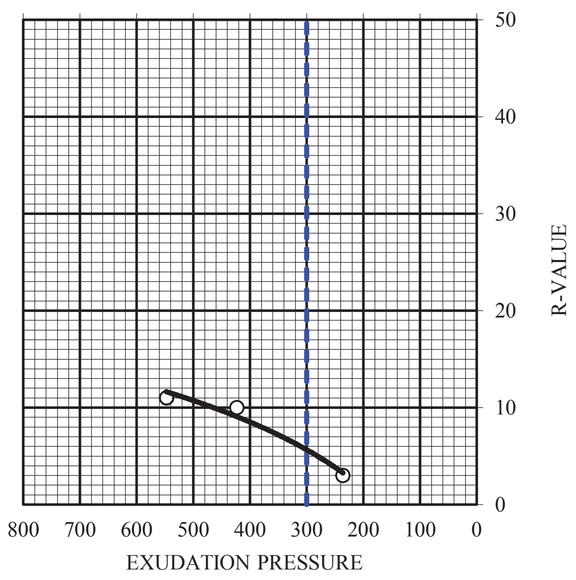
Boring No.	Sample No.	Depth	Description	Date Tested
A-14-007	1	0-2'	Sandy Lean CLAY (CL)	8/6-7/2014

TEST SPECIMEN				
MOLD NO.	3	4	5	
FOOT PRESSURE, psi	**60**	**50**	**40**	
INITIAL MOISTURE, %	14.3	14.3	14.3	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1050.1	1050.1	1050.1	
WATER ADDED, ml	**30**	**50**	**90**	
COMPACTION MOISTURE, %	17.1	19.0	22.8	
HEIGHT OF BRIQUETTE, in.	**2.51**	**2.55**	**2.55**	
WEIGHT BRIQUETTE/MOLD,	**3172.2**	**3171.2**	**3141.1**	
WEIGHT OF MOLD, g	**2105.4**	**2113**	**2107.9**	
WEIGHT OF BRIQUETTE, g	1066.8	1058.2	1033.2	
DRY DENSITY, pcf	110.1	105.7	100.0	
STABILOMETER, 1000 lbs	**54**	**60**	**68**	
2000lbs	**137**	**140**	**152**	
DISPLACEMENT, in	**3.38**	**3.34**	**4.38**	
EXUDATION LOAD, lbs	**6877**	**5317**	**2967**	
EXUDATION PRESSURE, psi	547.5	423.3	236.2	
R-VALUE	11	10	3	
CORRECTED R-VALUE	11	10	3	
DIAL READING, END	0.0296	0.0298	0.0394	
DIAL READING, START	0.0300	0.0300	0.0400	
DIFFERENCE	-0.0004	-0.0002	-0.0006	
EXPANSION PRESSURE, PSF	0.0	0.0	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	580.5
DRY WEIGHT, g	508.0
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	14.3

R-VALUE:	**6**
Location:	

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.	20151065
TESTED BY:	ULY P.
CHECKED BY:	J. Co
DATE:	8/15/2015
REVISED:	

R-Value (ASTM D2844)

Torrey Meadows Drive Overcrossing at SR-56
Post Mile 5.6, District 11
San Diego, California

PLATE

C-33

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 12, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-3 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:
--
One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-003
Sample #: 1
Depth: 0.5-3.5'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.4

Water Added (ml)	Resistivity (ohm-cm)
10	2200
5	800
5	550
5	500
5	510
5	540

23 years to perforation for a 16 gauge metal culvert.
30 years to perforation for a 14 gauge metal culvert.
41 years to perforation for a 12 gauge metal culvert.
53 years to perforation for a 10 gauge metal culvert.
64 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417	0.012% (120 ppm)
Water Soluble Chloride Calif. Test 422	0.026% (260 ppm)

Laura Torres

Laura Torres
LT/ram

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 12, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:

Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-1 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:

One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-004
Sample #: 1
Depth: 0-2'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.4

Water Added (ml)	Resistivity (ohm-cm)
10	2300
5	1500
5	1100
5	1100
5	1200
5	1500

32 years to perforation for a 16 gauge metal culvert.
41 years to perforation for a 14 gauge metal culvert.
57 years to perforation for a 12 gauge metal culvert.
73 years to perforation for a 10 gauge metal culvert.
89 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417	0.003% (30 ppm)
Water Soluble Chloride Calif. Test 422	0.003% (32 ppm)

Laura Torres

Laura Torres
LT/ram

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 12, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:

Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-2 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:

One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-005
Sample #: 1
Depth: 0-2.5'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.6

Water Added (ml)	Resistivity (ohm-cm)
10	2200
5	1100
5	550
5	470
5	460
5	470
5	510
5	

22 years to perforation for a 16 gauge metal culvert.
29 years to perforation for a 14 gauge metal culvert.
40 years to perforation for a 12 gauge metal culvert.
51 years to perforation for a 10 gauge metal culvert.
62 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.015% (150 ppm)

Water Soluble Chloride Calif. Test 422 0.016% (160 ppm)

Laura Torres

Laura Torres
LT/ram

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 14, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:

Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-5 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:

One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-005
Sample #: 13
Depth: 65-66.5'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.0

Water Added (ml)	Resistivity (ohm-cm)
10	2100
5	1100
5	800
5	490
5	420
5	430
5	470

21 years to perforation for a 16 gauge metal culvert.
28 years to perforation for a 14 gauge metal culvert.
39 years to perforation for a 12 gauge metal culvert.
49 years to perforation for a 10 gauge metal culvert.
60 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417	0.035% (350 ppm)
Water Soluble Chloride Calif. Test 422	0.011% (110 ppm)

Laura Torres
Laura Torres
LT/ram

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 12, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-4 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:
--
One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-006
Sample #: 3
Depth: 12-13.5'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.8

Water Added (ml)	Resistivity (ohm-cm)
10	2000
5	1100
5	550
5	370
5	350
5	370
5	380

20 years to perforation for a 16 gauge metal culvert.
26 years to perforation for a 14 gauge metal culvert.
36 years to perforation for a 12 gauge metal culvert.
46 years to perforation for a 10 gauge metal culvert.
56 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate	Calif. Test 417	0.012% (120 ppm)
Water Soluble Chloride	Calif. Test 422	0.042% (420 ppm)

Laura Torres
Laura Torres
LT/ram

LABORATORY REPORT

Telephone (619) 425-1993 Fax 425-7917 Established 1928

CLARKSON LABORATORY AND SUPPLY INC.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
ANALYTICAL AND CONSULTING CHEMISTS

Date: August 14, 2014
Purchase Order Number: PROJECT#20151065.001A
Sales Order Number: 23461
Account Number: KLE
To:

Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO5371-6 Customers Phone: 831-4600
Fax: 831-4619
Sample Designation:

One soil sample received on 08/08/16 at 1:00pm,
marked as follows:
Project: Torrey Meadows Drive Overcrossing
Project #: 20151065.001A
Boring #: A-14-006
Sample #: 15
Depth: 75-76.5'
Date Shipped: 08/08/14

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 7.4

Water Added (ml)	Resistivity (ohm-cm)
10	1600
5	670
5	350
5	250
5	260
5	270
5	

17 years to perforation for a 16 gauge metal culvert.
23 years to perforation for a 14 gauge metal culvert.
31 years to perforation for a 12 gauge metal culvert.
40 years to perforation for a 10 gauge metal culvert.
48 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417	0.015% (150 ppm)
Water Soluble Chloride Calif. Test 422	0.134% (1340 ppm)

Laura Torres
Laura Torres
LT/ram

APPENDIX D

PAVEMENT CONDITION SURVEY PHOTOS

Torrey Meadows Drive (south)

Torrey Meadows Drive (north)

Pavement Conditions Survey Photo Locations (not to scale)

Photo 1. Reflective Cracking From Utility Trench at Sta. 1+40 South Bound.

Photo 2. Raveling on Wheel Path at Sta. 2+40 North Bound.

Photo 3. Transverse Cracking at Sta. 3+10 North Bound.

Photo 4. Edge Cracking at Sta. 4+00 South Bound.

Photo 5. Edge Spalling, Curb/Gutter Cracking, Long.Cracking at Sta. 5+70 North Bound

Photo 6. Pavement Scouring At Sta. 8+00 South Bound.

Photo 7. Divided Slab at Sta. 9+00 South Bound.

Photo 8. Patching 10’x5’ At Sta. 17+10 South Bound.

Photo 9. Cracking Around Utilities at Sta. 17+80 East Bound.

Photo 10. Weathering At Sta. 17+70 South Bound

Photo 11. Ravelling (Aggregate Popouts) at Sta. 19+00 North Bound

Photo 12. Missing Pavement Marker at Sta. 19+90 Middle Lane

Photo 13. Gutter Cracking at Sta. 21+50 South Bound

Photo 14. Longitudinal Cracking At Sta. 22+50 North Bound

Photo 15. Pavement Depression at Sta. 23+00 North Bound

Photo 16. Polished Aggregate at Sta. 23+50 South Bound.