

INFORMATION HANDOUT

For Contract No. 08-[0G7704](#)

At 08-[Riv-15](#)- [PM 0.0/R41.8](#)

Identified by
Project ID [0814000175](#)

MATERIALS INFORMATION

Foundation Recommendation Report for Three Changeable Message Signs on Interstate 15

Memorandum

*Serious drought.
Help save water!*

To: Mr. Luis Penaloza
Project Engineer
District 08
Electrical Design B

Date: June 1, 2016

File: 08-RIV-15-0.0/41.8
EA 08-0G7701
EFIS 0814000175

From: JEFF TESAR
Engineering Geologist
Office of Geotechnical Design-South, Branch-B

Subject: **Foundation Report for the Three Changeable Message Signs on Interstate 15.**

1.0 INTRODUCTION

Pursuant to your request, the Office of Geotechnical Design South (OGDS) Branch-B prepared this Foundation Report (FR) to address the geotechnical design and construction considerations for three Changeable Message Signs (CMS) at three locations along Interstate 15 (I-15) in south west Riverside County and as shown in the attached plan sheet. The CMS are also referred to as Advanced Variable Message Sign (AVMS). The proposed features are presented in the table below. This table also includes borings drilled for each location.

Approx. Station "Route 15" "E" Line	Approx. Offset (ft)	Proposed Feature	Foundation	Boring
632+00	116.5 Rt.	AVMS Truss Single Post Model 710	Pile: L = 22ft, D = 5ft	A-16-001
1069+30	107.5 Rt.	AVMS Truss Single Post Model 710	Pile: L = 22ft, D = 5ft	A-16-002
1504+00	106.5 Lt.	AVMS Truss Single Post Model 710	Pile: L = 22ft, D = 5ft	A-16-003

The purpose of this FR is to document subsurface geotechnical conditions, provide engineering evaluation of site conditions, and provide recommendations relevant to the design and construction

of the foundations. This report also establishes a geotechnical baseline to be used in assessing the existence and scope of changed site conditions.

This FR was prepared in accordance with the guidelines set forth in the *Caltrans: Foundation Report Preparation for Standard Plan Overhead and Changeable Message Signs, October 2014*. The project plans were provided by District 08 Office of Electrical Design B.

2.0 FIELD INVESTIGATION

A subsurface investigation program was conducted by OGDS in May of 2016. Three exploratory hollow stem auger borings utilizing 5T carbide insert finger bit were conducted at the locations of the proposed foundations. The depth of the borings ranged from 26.5 feet to 26 feet below the ground surface. Boring locations were surveyed by the District 08 Office of Land Surveys. The Log of Test Borings (LOTB's) are attached to this report. Boring locations are depicted in the attachments.

3.0 LABORATORY TESTING

Corrosion testing was conducted on one sample collected from each boring. The test results are attached to this report.

4.0 GEOLOGY

The subsurface soil conditions for each location are described below.

Station 632+00, (Boring A-16-001)

This site is underlain by native soils of the decomposed granite origin. They consist of medium dense to dense sands locally with little gravels.

Station 1069+30, (Boring A-15-002)

This site is underlain residual soils belonging to the granitic bedrock. These soils consist of very dense sands.

Station 1504+00 (Boring A-16-003)

This site is underlain by native soils of the decomposed granite origin. They consist of dense and medium dense sands that at the depth of about 19.5 feet below ground surface contain about 6 feet thick layer of very stiff sandy elastic silt.

5.0 Soil Strength

The soils at all locations satisfy minimum soil strength criteria utilized in standard pile design.

6.0 Ground Water

Groundwater was not encountered during the subsurface field investigation. Consequently, groundwater is not anticipated to impact this project design and construction.

7.0 CORROSION

The Caltrans Corrosion Guidelines state that if the minimum resistivity is greater than 1000 Ohm-cm, the soil sample is considered to be non-corrosive and testing to determine sulfate and chloride concentration is not performed. Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500-ppm, sulfate concentration is greater than or equal to 2,000 ppm, or the pH is 5.5 or less. The laboratory test results indicate that at all locations the soils are not corrosive.

8.0 FOUNDATION RECOMMENDATION

- For all the locations, the proposed Truss Single Post traffic signs may be supported by a standard plan CIDH pile foundation shown on Standard Plans S8. Pile diameter is 5.0 feet, and the length is 22 feet.

11.0 CONSTRUCTION CONSIDERATION

- Pile drilling equipment capable of shaft excavation in the soil conditions described in Section 4.0 and in the LOTB's should be utilized.
- Ground water is not anticipated to affect pile construction.

12.0 DIFFERING SITE CONDITIONS

The recommendations contained in this report are based on specific project information regarding structure type and locations that have been provided to OGDS. If any conceptual changes are made during final project design, OGDS should review those changes to determine if these foundation recommendations are still applicable.

The information used to characterize the geotechnical conditions in this area was gathered from project plans, pertinent maps, geologic literature, archived reports, field reconnaissance, subsurface investigation, testing, and engineering analysis. Project design features may change, and localized soil conditions encountered during construction and excavation may vary from those described in this report. If suspected differing site conditions are encountered during construction, or if construction difficulties related to soil conditions are encountered, a representative of OGDS should be consulted to assist with the assessment of the prevailing geotechnical conditions and to assist in formulating appropriate strategies to facilitate project completion.

June 1, 2016

Foundation Report
Three Changeable Message Signs on I-15
EA: 08-0G7701
EFIS: 0814000175

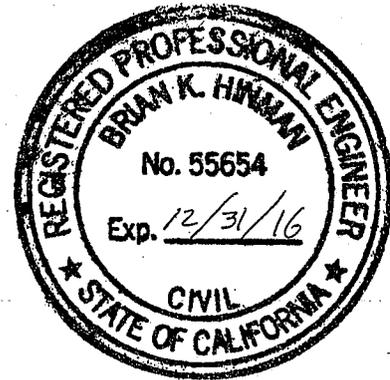
ODDS staff will be available for future assistance. Should you have any questions or comments regarding this report, please contact Jeff Tesar at (8585) 467-2716.



Jeff Tesar, C.E.G.
Engineering Geologist
Office of Geotechnical Design-South Branch B



Brian Hinman, P.E.
Senior Transportation Engineer (Civil)
Office of Geotechnical Design-South Branch B



Attachments:

1. Project Location
2. Boring Locations
3. Log of Test Borings
4. Laboratory Test Results

CC:

- Awais A. Sheikh
- Bruce Kean
- Geotechnical Archive (GeoDog)

Project Manager
District Materials Engineer

June 1, 2016

Foundation Report
Three Changeable Message Signs on I-15
EA: 08-0G7701
EFIS: 0814000175

ATTACHMENTS

FUGRO CONSULTANTS, INC.



5855 Rickenbacker Road
Commerce, California 90040
Tel: (213) 788-3500
Fax: (213) 788-3526

June 3, 2016
Project No. 04.61160004, Task Order 4

State of California, Department of Transportation
Office of Geotechnical Design
100 South Main Street, 11th Floor
Los Angeles, California 90012

Attention: Mr. Jeff Tesar C.E.G., Task Order Manager

Subject: Laboratory Test Report, Changeable Message Signs Project Located on Interstate
15, Riverside County.

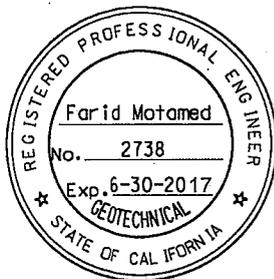
Fugro has completed a laboratory testing program on the soil samples for the subject project. The laboratory testing program as requested by you consisted of:

- Resistivity and pH (CT-643)

All tests were performed in accordance with the applicable standards as indicated above under the supervision of a registered geotechnical engineer. The test results are included in the attachment.

It has been a pleasure working with you on this task. We look forward to receiving your comments regarding this report and continuing to support Caltrans.

Sincerely,
FUGRO CONSULTANTS, INC.



A handwritten signature in black ink that reads "Farid Motamed".

Farid Motamed, P.E., G.E.
Project Manager

Attachments: Corrosivity Test Results

Copies Submitted: (1) Addressee and PDF

CORROSIVITY TEST RESULTS					
Exploration	Sample Depth (ft)	Minimum Resisitivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
A-16-001	5 to 15	10,226	7.7	-	-
A-16-002	5 to 15	5,783	7.4	-	-
A-16-003	5 to 15	2,979	8	-	-

Project: Changeable Message Signs
Location: I-15 Riverside County
Sample Type: Bulk
Date: 6/2/2016

CT Project ID: 08-1400-0175-1
CT EA #: 08-0G7701
Test Methods: CT - 643

Notes: *Per Caltrans Corrosion Guidelines* : Minimum Resisitivity greater than 1,000 ohm-cm does not require testing for sulfates and chlorides



PREP'D BY:
MM
 APP'D BY:
MP
 DATE:
6/2/16
 DWG FILE:

CORROSION TEST RESULTS

I-15 CHANGEABLE MESSAGE
 SIGNS PROJECT
 Riverside County

PLATE

PLATE 1

PROJECT No.

04.61160004, Task Order 4

INDEX OF PLANS

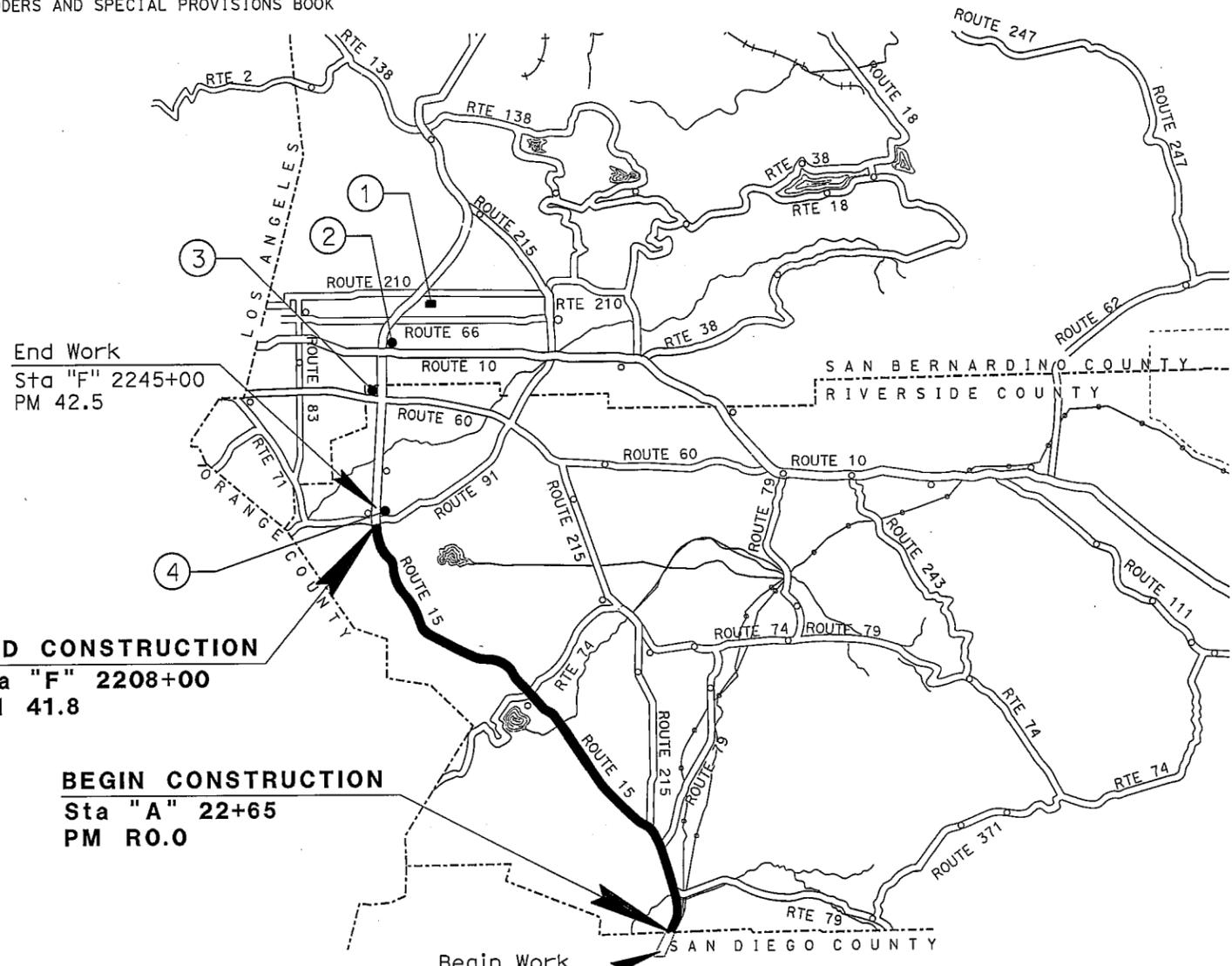
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1	TITLE AND LOCATION MAP
2-4	KEY MAP & LINE INDEX
5-25	LAYOUT
26-28	CONSTRUCTION DETAILS
29-163	UTILITY PLANS
164-167	CONSTRUCTION AREA SIGNS
168-173	TRAFFIC HANDLING PLANS
174	TRAFFIC HANDLING QUANTITIES
175-176	DETOUR PLANS
177	SUMMARY OF QUANTITIES
178-XXX	ELECTRICAL PLANS
XXX-XXX	REVISED STANDARD PLANS

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

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
**PROJECT PLANS FOR CONSTRUCTION ON
 STATE HIGHWAY**
 IN RIVERSIDE COUNTY ON ROUTE 15
 FROM 0.5 MILE SOUTH OF RIVERSIDE COUNTY
 AND SAN DIEGO COUNTY LINE TO 1.0 MILE
 NORTH OF 15/91 JUNCTION IN CORONA

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	Riv	15	RO.0/41.8	1	1



LOCATIONS OF TMC AND HUBS

LOCATION	CO	ROUTE	PM	DESCRIPTION
①	SBd	15	7.5	DOB TMC - 13892 VICTORIA STREET, FONTANA, CA 92336
②	SBd	15	2.4	HUB "D" - ROUTE 10/15 INTERCHANGE (NE QUADRANT)
③	Riv	60	RO.2	HUB "E" - ROUTE 60, WB OFF RAMP TO MILLIKEN Ave
④	Riv	15	41.5	HUB "A" - ROUTE 15/91 INTERCHANGE (NE QUADRANT)

NOTE: EXISTING UTILITY FACILITIES ARE NOT SHOWN ON PLANS. SEE CONTRACT SPECIAL PROVISIONS.

PROJECT MANAGER
 AWAIS SHEIKH
 DESIGN MANAGER
 DIBORO KANABOLO

END CONSTRUCTION
 Sta "F" 2208+00
 PM 41.8

BEGIN CONSTRUCTION
 Sta "A" 22+65
 PM R0.0

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

Begin Work
 Sta "A" 0+00
 PM R53.5

NO SCALE

RELATIVE BORDER SCALE 0 1 2 3
 USERNAME => s118936
 DGN FILE => 0814000175ob001.dgn

TUAN A. TRUONG
 PROJECT ENGINEER
 REGISTERED CIVIL ENGINEER
 No. C60137
 Exp. 6/30/18
 CIVIL
 REGISTERED PROFESSIONAL ENGINEER
 STATE OF CALIFORNIA

CONTRACT No.	08-OG7704
PROJECT ID	0814000175

UNIT 2239 PROJECT NUMBER & PHASE 08140001761

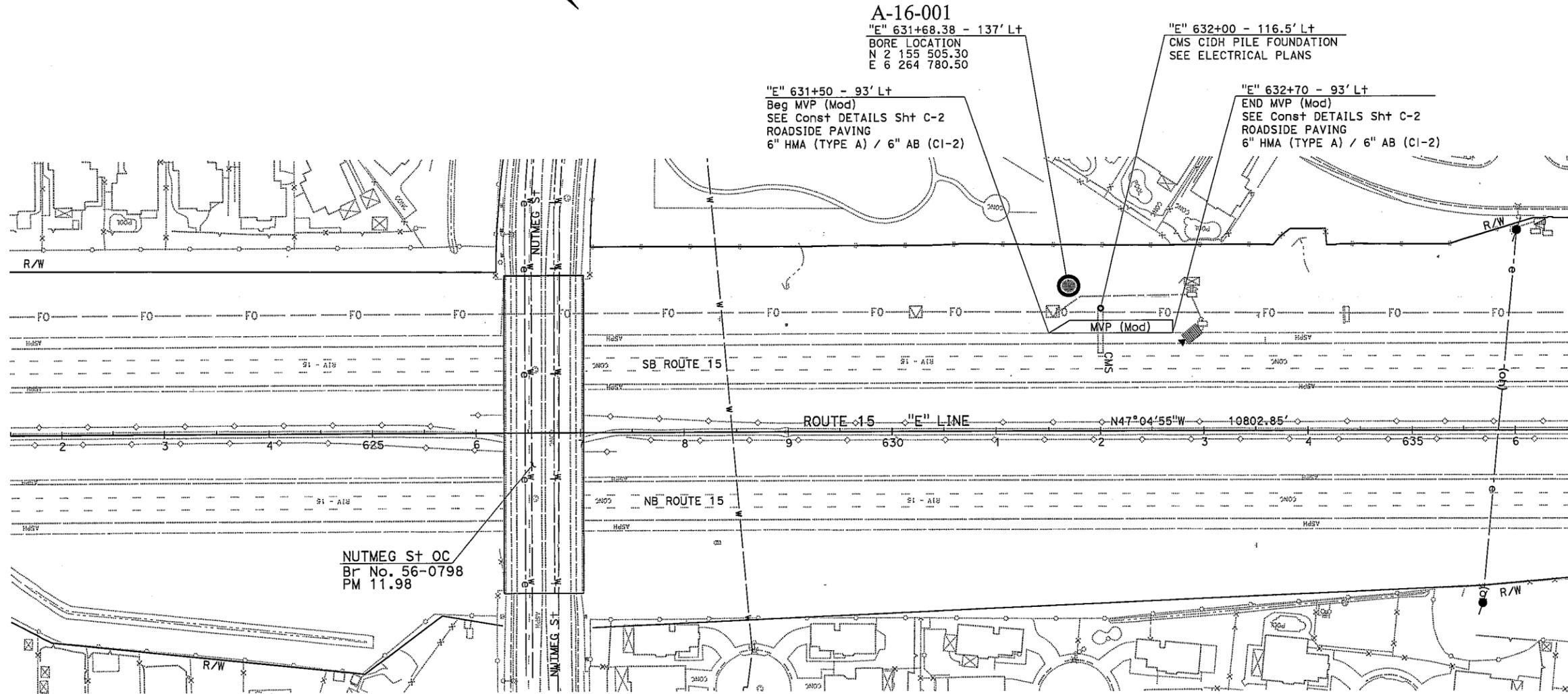
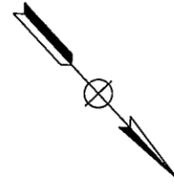
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08	Riv	15	RO.0/41.8		

<i>Tuan Truong</i>		REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE			

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

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



Legend:
 A-XX-XXX Boring Name (Auger-Year-Boring Number)
 Approximate Boring Location

SCALE: 1" = 50'

DATE PLOTTED => 26-MAY-2016
 TIME PLOTTED => 10:40

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
Caltrans	
FUNCTIONAL SUPERVISOR	DIBORO KANABOLO
CALCULATED-DESIGNED BY	CHECKED BY
WILLIAM PETOSKEY	TUAN TRUONG
REVISED BY	DATE REVISED

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	Riv	15	RO.0/41.8		

REGISTERED CIVIL ENGINEER DATE
 TUAN A. TRUONG
 No. CG0137
 Exp. 6-30-18
 CIVIL
 STATE OF CALIFORNIA

PLANS APPROVAL DATE

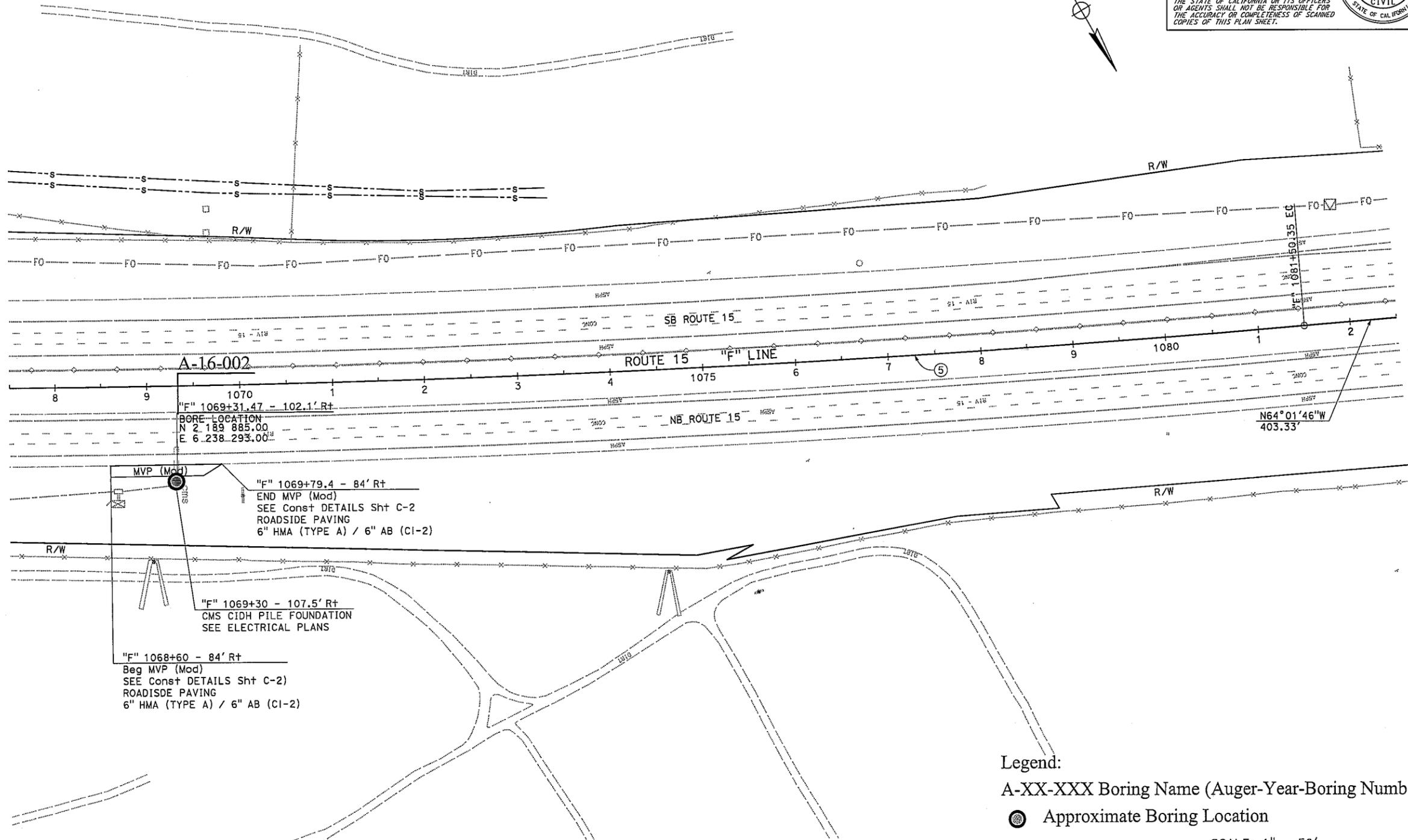
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NOTE:
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA				
No. Ⓢ	R	Δ	T	L
(5)	16998'	35°05'00"	5373.18'	10408.47'



REVISOR: WILLIAM PETOSKEY, TUAN TRUONG
 DESIGNED BY: DIBORO KANABOLO
 CHECKED BY:
 FUNCTIONAL SUPERVISOR: DIBORO KANABOLO
 DEPARTMENT OF TRANSPORTATION DESIGN



Legend:
 A-XX-XXX Boring Name (Auger-Year-Boring Number)
 Ⓢ Approximate Boring Location

SCALE: 1" = 50'

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 TIME PLOTTED => 10:40

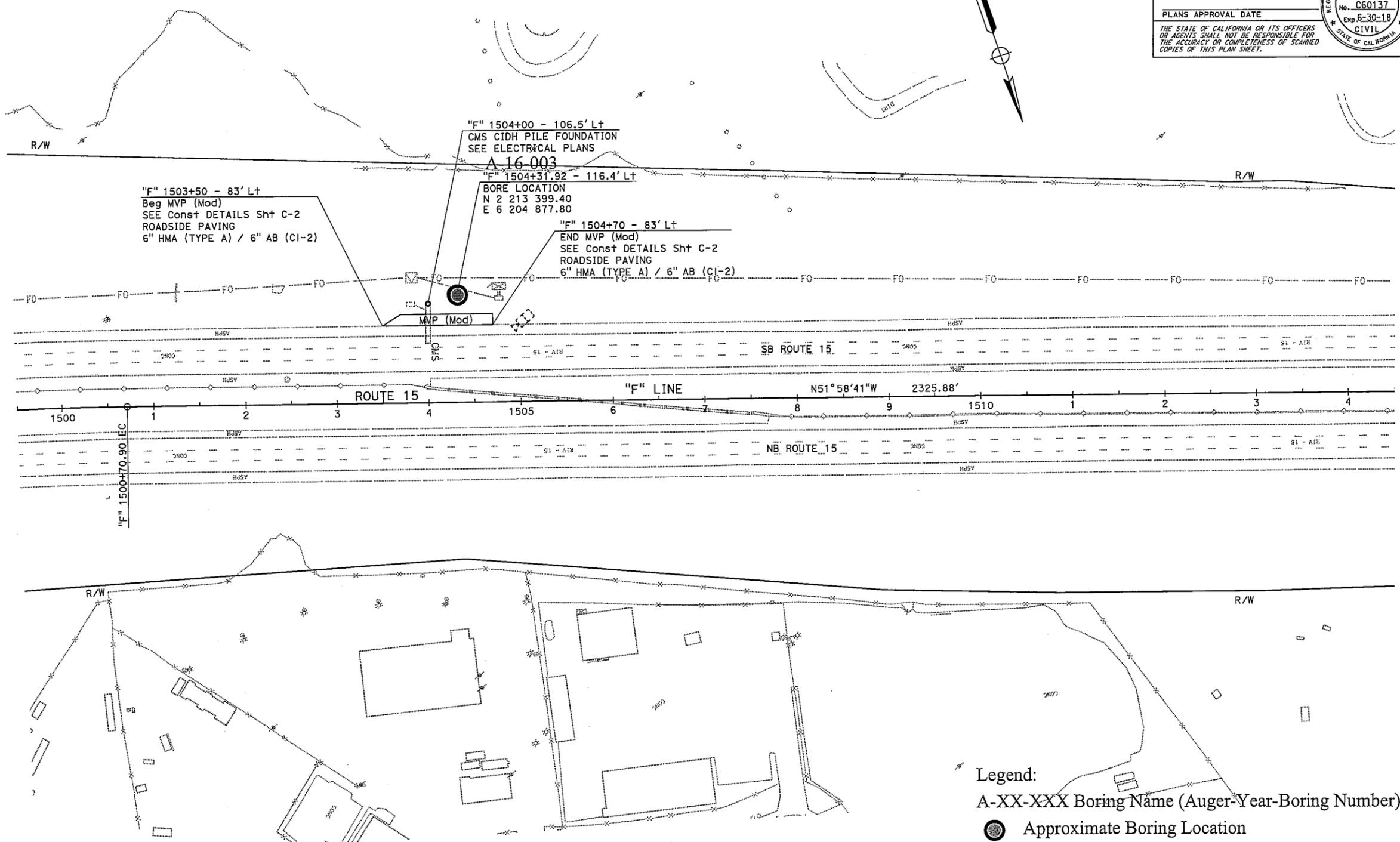
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08	Riv	15	RO.0/41.8		

REGISTERED CIVIL ENGINEER DATE _____
 TUAN A. TRUONG
 No. C60137
 Exp. 6-30-18
 CIVIL
 STATE OF CALIFORNIA

PLANS APPROVAL DATE _____

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NOTE:
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 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



Legend:
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 ● Approximate Boring Location

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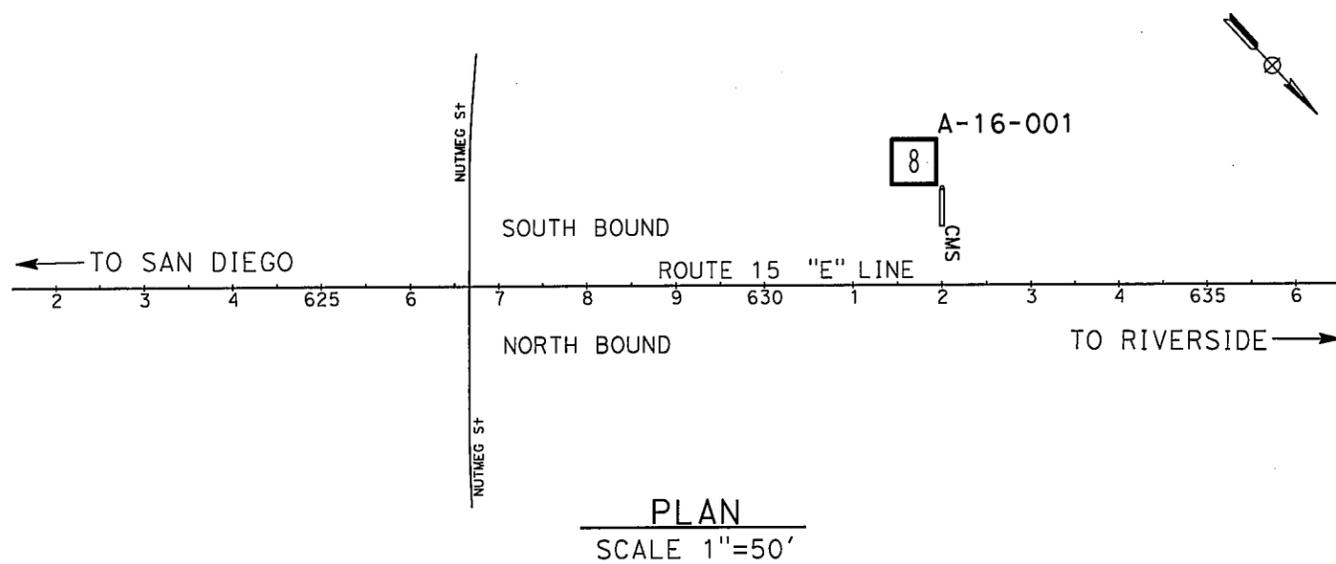
REVISOR	REVISION
WILLIAM PETOSKEY	TUAN TRUONG
CALCULATED-DRAWN BY	CHECKED BY
FUNCTIONAL SUPERVISOR	DIBORO KANABOLO
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
St. Kittans	

BENCH MARK

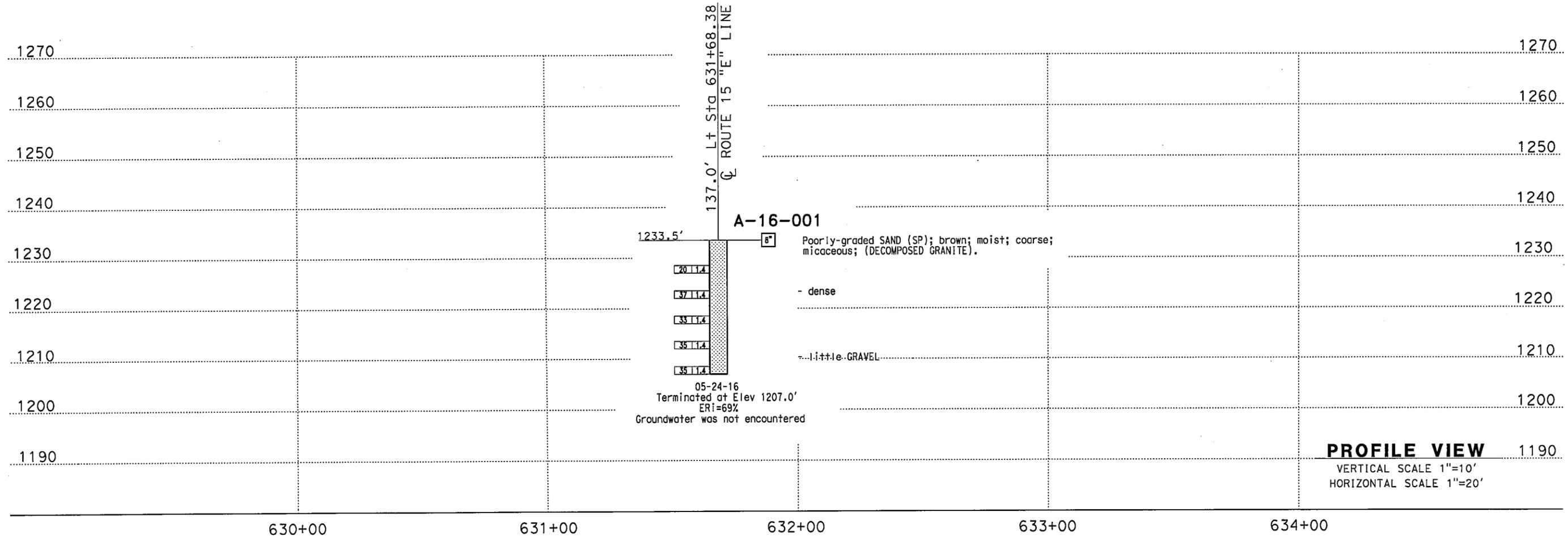
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 VERTICAL DATUM NAVD88

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	Riv	15	RO.0-41.8		

 06/01/16
 CERTIFIED ENGINEERING GEOLOGIST DATE REGISTERED GEOLOGIST
 PLANS APPROVAL DATE
 No. 2137
 CERTIFIED ENGINEERING GEOLOGIST
 STATE OF CALIFORNIA



This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



PROFILE VIEW
 VERTICAL SCALE 1"=10'
 HORIZONTAL SCALE 1"=20'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH SOUTH B		BRIDGE NO.	I-15: CHANGEABLE MESSAGE SIGNS				
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005 CIVIL LOG OF TEST BORINGS SHEET				ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		UNIT: 3659 PROJECT NUMBER & PHASE: 08-1400-0175		CONTRACT NO.: 0G7701	DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES	SHEET	OF
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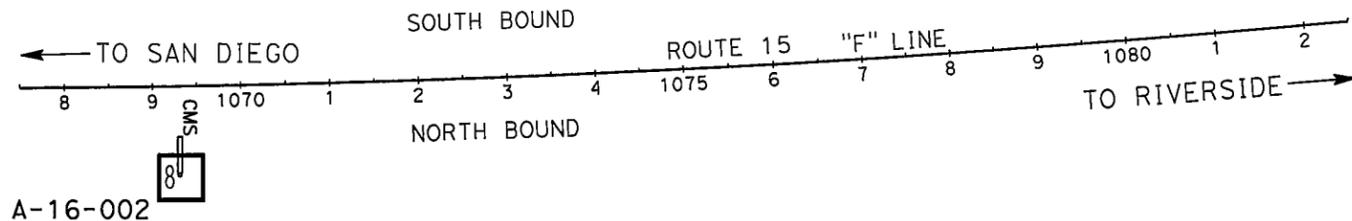
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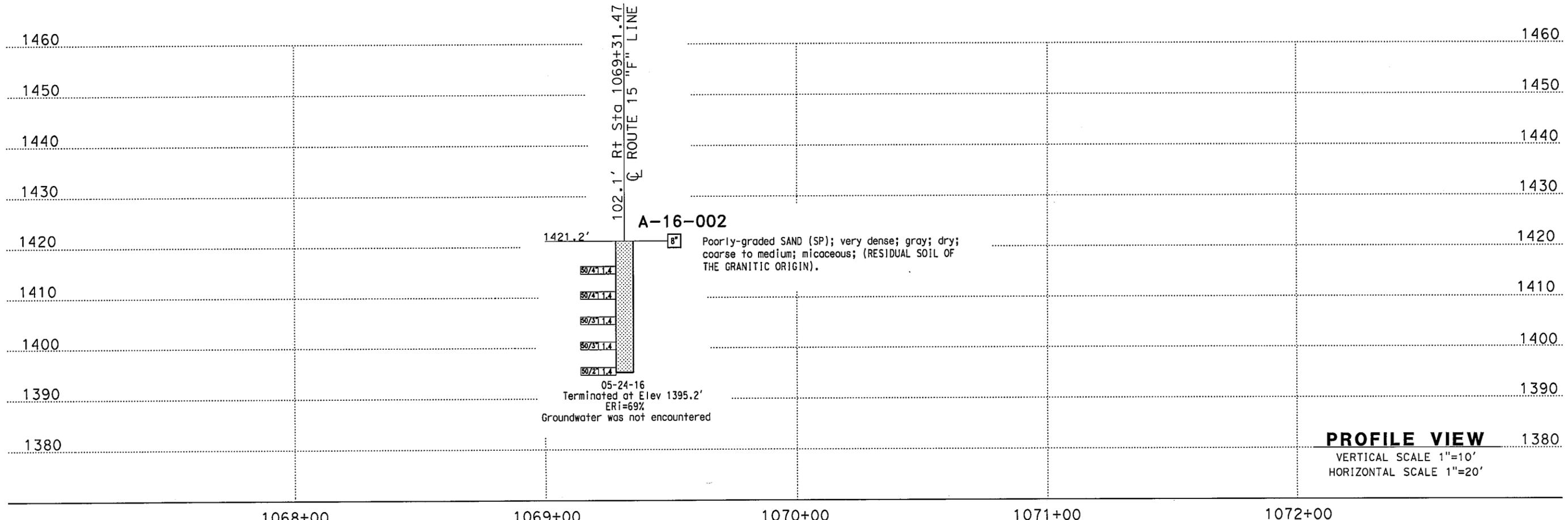
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 VERTICAL DATUM NAVD88

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	Riv	15	RO.0-41.8		

CERTIFIED ENGINEERING GEOLOGIST DATE 06/01/16
 PLANS APPROVAL DATE _____
 JEFF J. TESAR
 No. 2137
 REGISTERED GEOLOGIST
 CERTIFIED ENGINEERING GEOLOGIST
 STATE OF CALIFORNIA
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PLAN
 SCALE 1"=50'



PROFILE VIEW
 VERTICAL SCALE 1"=10'
 HORIZONTAL SCALE 1"=20'

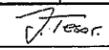
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FUNCTIONAL SUPERVISOR NAME: B.HINMAN		DRAWN BY: T.PANAH/FUGRO CHECKED BY: B.HINMAN		FIELD INVESTIGATION BY: J.TESAR		DESIGN BRANCH SOUTH B		POST MILE RO.0/41.8		LOG OF TEST BORINGS SHEET 2 OF 5	
005 CIVIL LOG OF TEST BORINGS SHEET				ORIGINAL SCALE IN INCHES FOR REDUCED PLANS				UNIT: 3659 PROJECT NUMBER & PHASE: 08-1400-0175		CONTRACT NO.: 0G7701	
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DATE PLOTTED =>
 USERNAME => RUBER

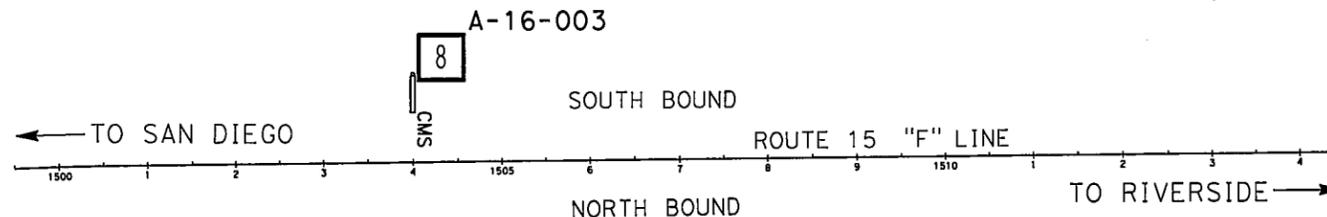
BENCH MARK

GROUND AT BOREHOLE LOCATION
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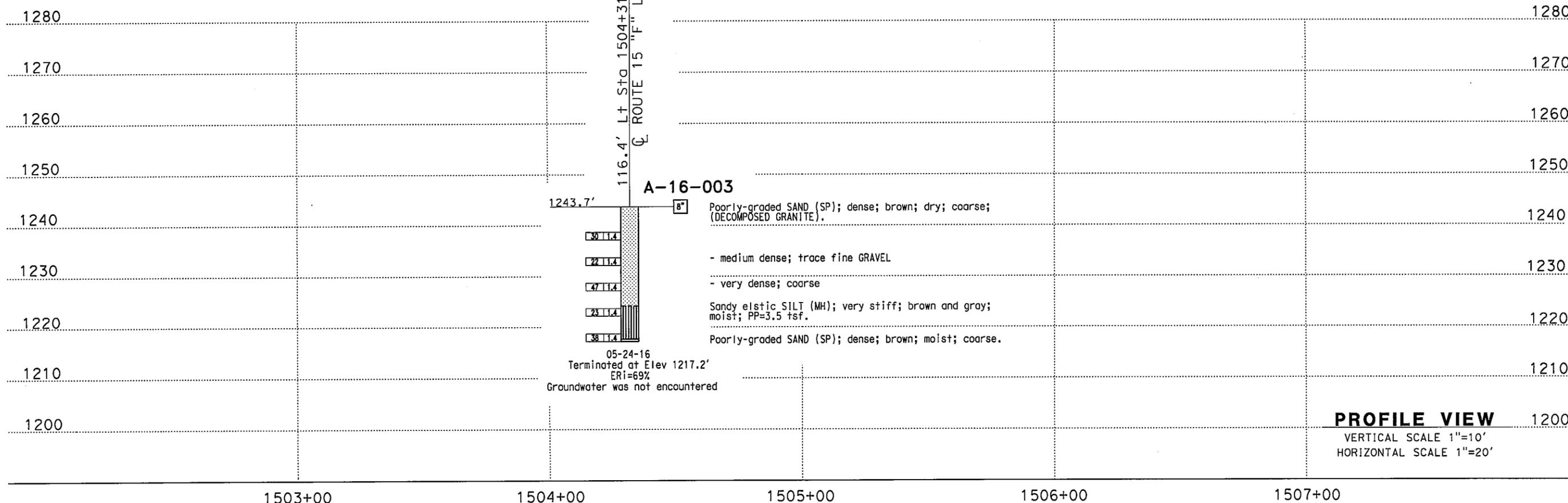
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PLAN
 SCALE 1"=50'



PROFILE VIEW
 VERTICAL SCALE 1"=10'
 HORIZONTAL SCALE 1"=20'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES		STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN		BRIDGE NO.	I-15: CHANGEABLE MESSAGE SIGNS	
FUNCTIONAL SUPERVISOR NAME: B.HINMAN		DRAWN BY: T.PANAH/FUGRO CHECKED BY: B.HINMAN		FIELD INVESTIGATION BY: J.TESAR		DESIGN BRANCH SOUTH B		POST MILE RO.0/41.8	LOG OF TEST BORINGS SHEET 3 OF 5	
OGS CIVIL LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		UNIT: 3659 PROJECT NUMBER & PHASE: 08-1400-0175		CONTRACT NO.: 0G7701		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES

DATE PLOTTED => USERNAME => USER