DIAZ • YOURMAN
& ASSOCIATES
Geotechnical Services

A Report Prepared for:

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1501 Quail Street
Newport Beach, CA 92660

PRELIMINARY GEOTECHNICAL REPORT
I-10 AT GROVE AVENUE AND FOURTH STREET INTERCHANGE AND GROVE AVENUE CORRIDOR PROJECT
PROJECT NO. ST0302
ONTARIO, CALIFORNIA

Project No. 2008-007

by

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1.0 INTRODUCTION

This report provides preliminary geotechnical information for the proposed improvements at the Interstate (I) 10 at Grove Avenue and Fourth Street Interchange and Grove Avenue Corridor Project (Project) in Ontario, California. The information provided in this report was based on Diaz•Yourman & Associates' (DYA) review of available as-built data, existing subsurface and groundwater data in the Project vicinity, a site reconnaissance, and discussions at Project development meetings. No field exploration has been performed at this time. Prior to the preliminary and final design, a detailed subsurface study should be performed followed by laboratory testing and engineering design analyses.

1.1 PROJECT DESCRIPTION

The proposed Project is located in Ontario as shown on the Vicinity Map, Figure 1. Currently Grove Avenue from I-10 to Holt Boulevard is a four-lane arterial and is divided by a striped median. Currently, the only access from Grove Avenue to the I-10 is the offset I-10 at the Fourth Street interchange. The existing Grove Avenue structure at I-10 is an undercrossing. Grove Avenue narrows at the I-10 undercrossing due to constraints from existing bridge abutments. The Project consists of preparing a Project Study Report (PSR) considering the following primary improvements:

- Construction of a new interchange on I-10 at Grove Avenue.
- Reconfigure/reconstruct the existing I-10 at Fourth Street interchange.
- Widen Grove Avenue from four lanes to six lanes between I-10 and Holt Boulevard.
- Improve Fourth Street between Grove Avenue and I-10.

A proposed alternative is shown on Figure 2.

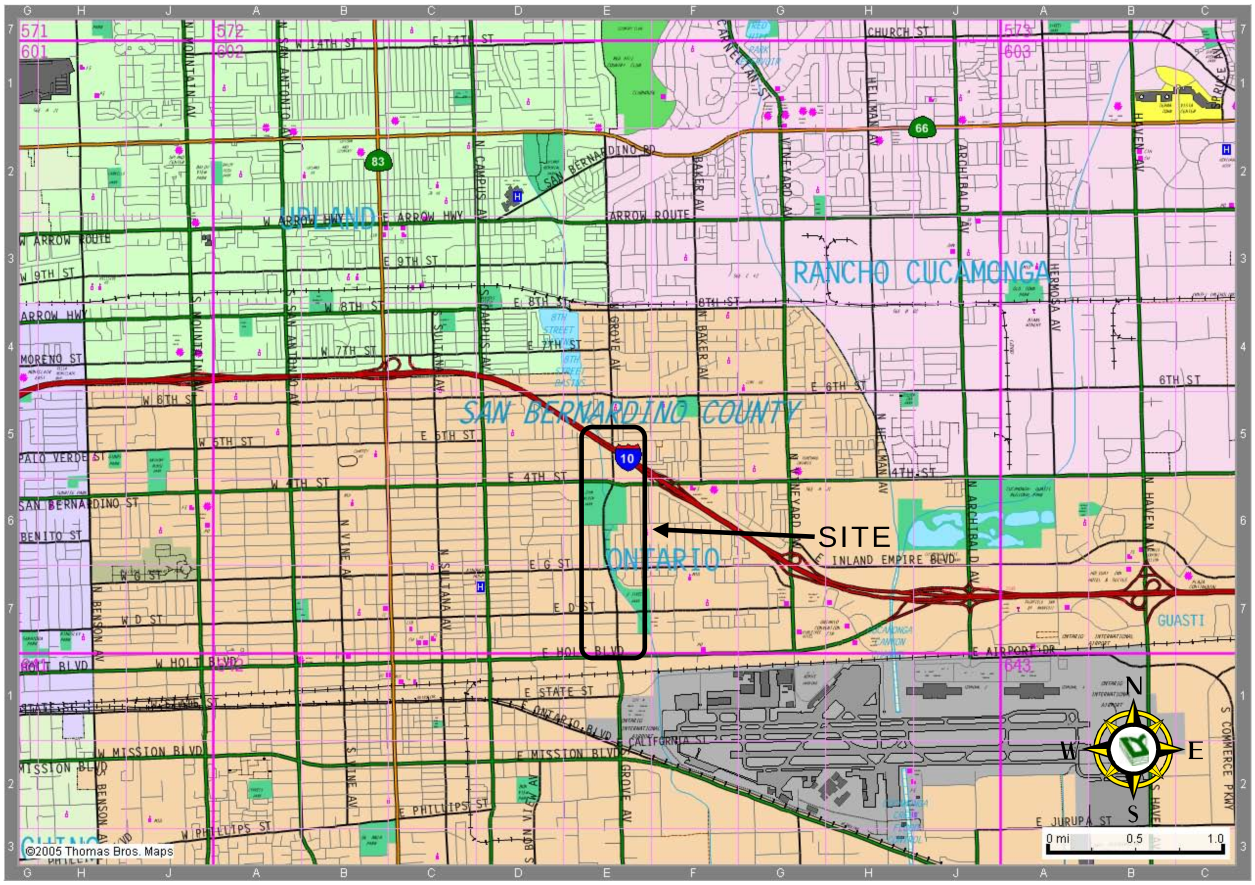
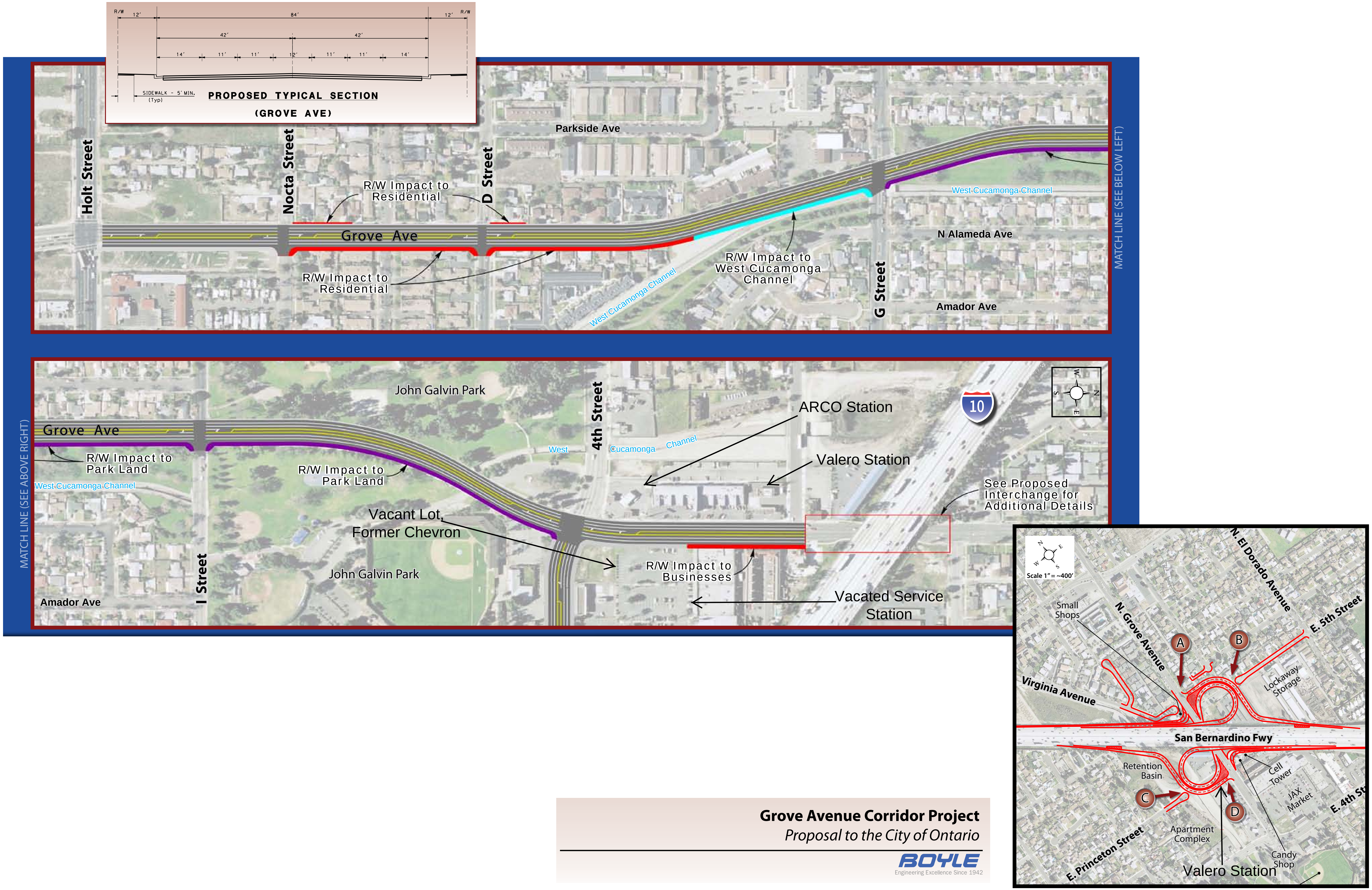


Figure 1 - VICINITY MAP

1.2 PURPOSE AND SCOPE OF WORK

The purpose of our services is to provide preliminary geotechnical input for preparation of the PSR. The scope of our services consisted of reviewing available geological and geotechnical data in the Project vicinity and preparing this preliminary geotechnical report.



Note: Based on electronic plans and provided by Boyle Engineering (2008).

Figure 2 - SITE PLAN

2.0 DATA REVIEW

A list of documents reviewed is presented in the bibliography, Section 7. Relevant as-built plans and logs of test borings (LOTB) are included in Appendix A.

California Department of Transportation (Caltrans) seismic hazards maps were reviewed to obtain peak bedrock acceleration (PBA). Geological maps and strong motion data published by the United States Geological Survey (USGS) and California Geological Survey (CGS; formerly California Division of Mines and Geology [CDMG]) were also reviewed. Caltrans Seismic Design Criteria (SDC) version 1.4 (Caltrans, 2006) was reviewed to develop the acceleration response spectrum (ARS) at the site.

3.0 SITE CONDITIONS

3.1 EXISTING FACILITY AND TOPOGRAPHY

The existing Grove Avenue undercrossing at I-10 (Bridge No. 54-441) is a single span structure that is supported on shallow foundations. The roadway elevation of I-10 at the Grove Avenue Bridge was approximately 1,105 feet above mean sea level (MSL). The surface elevation of Grove Avenue underneath the I-10 was approximately 1,082 feet MSL and the bottoms of the abutment foundation were located at approximately 1,077 feet MSL. The approach embankments are either sloped at 1.5 to 2H:1V (horizontal to vertical) or contained by retaining walls.

The existing Fourth Street undercrossing at I-10 is also a single-span structure that is supported on shallow foundations. The bridge elevation was approximately 1,084 feet MSL. The Fourth Street roadway elevation underneath the bridge was approximately 1,059 feet MSL. The elevation of the bottom of the abutment foundations ranged from approximately 1,050 to 1,054 feet MSL. The side slopes of the approach embankment generally sloped at 2H:1V.

The wing walls at both the bridge locations were supported on shallow foundations.

Grove Avenue had four asphalt concrete (AC)-paved lanes and a striped median within the Project reach. Fourth Street generally had four AC-paved lanes with a striped median except underneath the bridge where there were only three lanes. The ground surface within the Project reach and vicinity (other than the approach embankments for the undercrossing) was generally level with a mild slope in a southeasterly direction.

In the area of the two undercrossings the ground surface slopes to the southeast and south at 1.5 to 2 percent (USGS, 1981); along Grove Avenue the ground slopes to the south-southeast, again at 1.5 to 2 percent. The concrete-lined West Cucamonga Channel is present in the Project vicinity west of Grove Avenue north of Fourth Street and east of Grove Avenue south of Fourth Street.

3.2 GEOLOGY

Three surface geologic units are mapped by Morton and Miller (2006, Sheet 3 of 4) in the area around the bridge abutments and along Grove Avenue south to Holt Boulevard. The bridge abutments are with the older of the three “young” alluvial fan units designated as Qyf1. This early Holocene-late Pleistocene unit is typically a gravelly (pebbly) sand that is slightly to moderately consolidated and indistinctly stratified. Qyf1 and the two younger alluvial fan units, Qyf3 and Qyf5, underlie Grove Avenue with the late Holocene Qyf5 forming an alluvial channel deposit (consisting of unconsolidated to slightly consolidated coarse-sand to possible boulder-rich deposits), which alternately underlies, and lies to the east of, Grove Avenue. From north of D Street south to Holt Boulevard, Grove Avenue is underlain by Qyf3, a middle Holocene slightly to moderately consolidated silt, sand, and gravelly sand deposit. These deposits have their sources some 5 to 6 miles to the north at the San Gabriel Mountain front at Cucamonga Canyon.

Based on site and near-site borings, both bridge abutments contain up to 25 feet of artificial fill associated with manmade construction.

Groundwater withdrawal in the Chino Basin under the site area has caused some subsidence in the past. The bridge sites lie at the north edge of a 1992 to 2001 subsidence area defined by InSAR mapping (Chino Basin Watermaster, 2003). Estimated subsidence at these bridge undercrossings is 0- to approximately 0.8-inch during this period. The potential for future subsidence should be lessened due to groundwater management practices by the Watermaster.

3.3 SOIL PROFILE

Based on LOTBs reviewed, the anticipated subsurface conditions primarily consist of dense to very dense silty sands and gravelly sands. The borings at the site extended to a maximum depth of approximately 30 feet below ground surface (bgs). The borings met refusal at depths ranging from 15 to 30 feet bgs. The subsurface soils at the site will likely classify as Soil Profile C or D in accordance with SDC. We recommend that Soil Profile D be used for preliminary planning.

3.4 GROUNDWATER

Groundwater was not detected in the previous borings to depths of approximately 30 feet at the site. Groundwater was not detected to depths of 60 feet bgs in previous borings in the Project vicinity. The Ontario quadrangle topographic map shows a percolation basin approximately 0.6-mile north-northwest of the Project site (Topozone, 2008). The Project site overlies the Chino Basin groundwater resource. The California Department of Water Resources (CDWR) maintains groundwater level data for wells in the basin. A search of records available on the CDWR website (2008) indicated that the nearest well with available data located approximately 7 miles southeast of the Project site had groundwater levels deeper than 100 feet bgs.

The Chino Basin Watermaster (2006) indicates that the depth to groundwater beneath the Grove Avenue and Fourth Street abutment areas is approximately 450 feet, and the depth to groundwater under Grove Avenue varies from 475 to 375 feet along Grove Avenue between I-10 and Holt Boulevard. It is possible that perched water could exist within the young alluvial deposits, particularly Qyf5 that underlies much of Grove Avenue.

4.0 CONCLUSION AND PRELIMINARY RECOMMENDATIONS

4.1 GEOLOGIC HAZARDS

No mapped surface faults are reported through the Project area. The site is not located within an Alquist-Priolo Earthquake fault zone. The site has not yet been mapped for liquefaction and landslide potential designated on CGS Seismic Hazards Maps. However, due to the low topographic relief, there is no landslide potential in natural slopes.

4.2 SEISMICITY

The site is located within a seismically active region. The characteristics of nearby faults are summarized in Table 1. The horizontal PBA for the site was shown to be between 0.5 and 0.6g in the Caltrans California Seismic Hazard Map (1996). However, based on the distance to faults and using Caltrans methodology (Sadigh et al., 1997), DYA judges that the PBA at the site will be approximately 0.68g.

Table 1 - MAJOR FAULT CHARACTERIZATION IN THE PROJECT VICINITY

FAULT	APPROXIMATE DISTANCE[1] (miles)	TYPE OF FAULT[1]	MAXIMUM EARTQUAKE MAGNITUDE[1] (Mw)
Redhill (Etiwanda Avenue)[2]	2.4[2]	Not known[2,3]	7.0[2]
San Jose	3.6[2] to 4.6	Strike Slip	6.4 to 6.75[2]
Cucamonga	5.4	Reverse	6.9 to 7.0[2]
Sierra Madre	7.4	Reverse	7.2
Chino-Central Avenue	7.5	Reverse Right Oblique	6.7
San Jacinto-San Bernardino Segment	12.8	Strike Slip	6.7
San Andreas	16.2	Strike Slip	8.0

Notes:
1. Fault characterization based on CGS database (Cao, 2003), compiled by the computer program EQFAULT (Blake, 2000 and 2004). Distance, which is defined as the closest distance to rupture surface, is computed using the EQFAULT program with relationship by Sadigh et al., 1997.
2. From Caltrans Seismic Hazard Map.
3. Assumed as reverse, blind thrust for conservative estimate of PBA.

Not accounted for by the EQFAULT (Blake, 2004) and Caltrans Seismic Hazard Map (Caltrans, 1996) is the Fontana Seismic Trend. The Fontana Seismic Trend is a broad, dense band of micro-earthquakes extending approximately 20 miles from Lytle Creek in Fontana southwest toward Euclid Avenue near Prado Regional Park. Studies in Fontana (City of Fontana, 2003) suggest lineaments associated with the trend, but surface evidence of faulting is not known farther to the southwest. It has been speculated that this trend represents seismicity from a steeply northwest dipping buried fault with an unknown earthquake potential. Based on the proximity of other active and potentially active faults noted in Table 1, we judge that even if Fontana Seismic Trend were to be considered it will not govern the seismic design.

The recommended design horizontal ARS is presented on Figure 3 and summarized in Table 2. The ARS was estimated in accordance with SDC, Figure B.8 by using the standard ARS corresponding to a PBA of 0.7g presented for the controlling Redhill (Etiwanda Avenue) fault (Caltrans, 2006). The modification consisted of increasing the spectral coordinates by 20 percent for periods greater than 1 second and increasing the spectral coordinates for periods ranging from 0.5 to 1 second by 0 to 20 percent based on linear interpolation for near fault directivity effect (Caltrans, 2006).

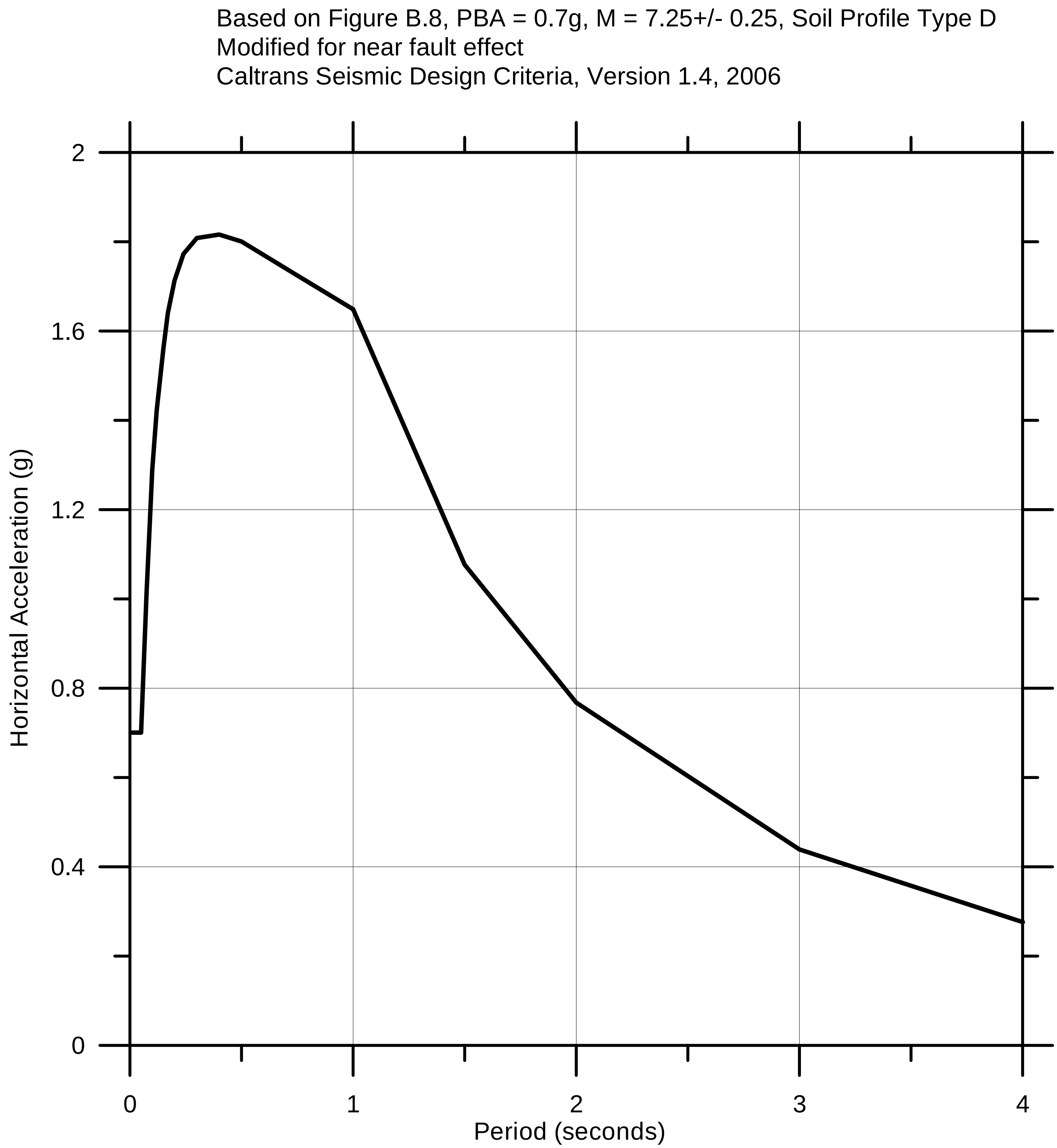


Figure 3 - HORIZONTAL ACCELERATION RESPONSE SPECTRUM

Table 2 - DESIGN ACCELERATION SPECTRUM COORDINATES

TIME (seconds)	SPECTRAL ACCELERATION (g)
0.01	0.700
0.02	0.700
0.03	0.700
0.05	0.700
0.075	1.012
0.1	1.289
0.12	1.422
0.15	1.561
0.17	1.641
0.2	1.713
0.24	1.773
0.3	1.808
0.4	1.816
0.5	1.800
0.75	1.725
1	1.649
1.5	1.077
2	0.768
3	0.439
4	0.276

4.3 LIQUEFACTION POTENTIAL

The site has not yet been included in the liquefaction zone mapping program by the California Geological Survey as part of the Seismic Hazards Mapping Act. However, based on the data reviewed, density description of soil within the previous borings and the depth to groundwater level, we judge that liquefaction potential at the two bridge undercrossing sites is low. Unknown, perched groundwater zones may be present at shallow depths in the Qyf5 alluvial channel unit that is under portions of Grove Avenue. If such shallow perched groundwater conditions are encountered during the field investigations that will be performed in the later phases, liquefaction potential of the wet soils will need to be evaluated prior to final design.

4.4 SCOUR POTENTIAL

Because the structures are not located on or near an active stream bed, scour is not a design concern.

4.5 HYDROCOLLAPSE POTENTIAL

Generally, granular soils with low moisture contents in dry climate, such as that at the site may be subjected to hydrocollapse when inundated with water. Based on our previous experience at adjacent sites, the soils within the upper 10 to 15 feet could have moderate potential for hydrocollapse. However, based on the blow counts noted in the previous borings at the Project site, the soils at the site are dense and, therefore, potential for hydrocollapse is less likely. A field and laboratory investigation during the preliminary/final design should confirm the low hydrocollapse potential.

4.6 CORROSION POTENTIAL

Corrosion test data were not available in the data reviewed. Based on the soil descriptions, we judge that the potential for corrosion is low. Accordingly, for preliminary analyses, the subsurface soils may be assumed to be non-corrosive to concrete foundations.

4.7 STRUCTURE FOUNDATION

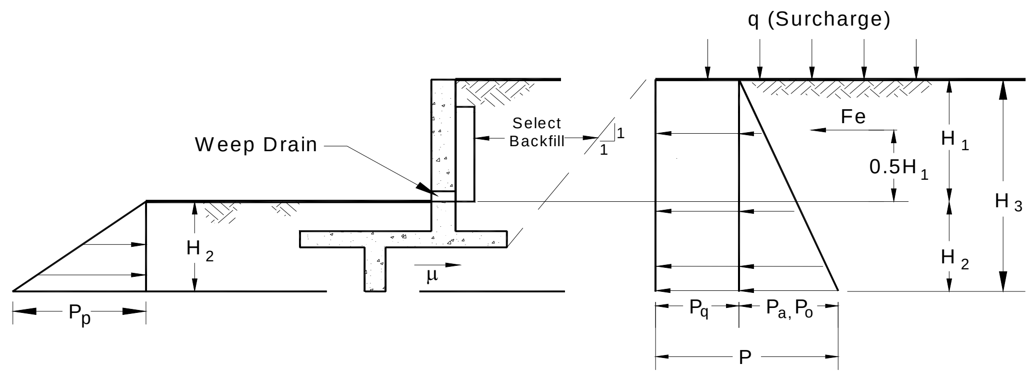
We judge that the proposed single-span bridge structures and retaining walls can be supported on shallow foundations. The dense to very dense granular subsurface can support high bearing loads without significant settlement. Driven pile foundations will be very difficult to install because of the presence of gravels and very dense sands. It should be noted that previous borings encountered refusal at depths of 15 to 30 feet bgs. Cast-in-drilled-hole (CIDH) pile foundations will be difficult to install because they need to be longer in comparison to the driven piles and the granular soils at the site will likely cave when casing or drilling mud is not utilized.

Temporary shoring may be required for installation of shallow foundations because of the right-of-way (ROW) concerns or due to the approach embankments currently in-place.

For preliminary foundation dimensions and cost estimate an allowable net bearing capacity of 6,000 pounds per square foot (psf) can be used.

4.8 LATERAL EARTH PRESSURES

Preliminary lateral earth pressures on retaining walls may be estimated using recommendations provided on Figure 4.



P_p = 400 $H_2 \leq$ 6,000 psf μ = 0.4	Cantilever Walls P = P_a + P_q = 36 H_3 + 0.3q Fe = 16 H_1^2	Restrained Walls P = P_o + P_q = 55 H_3 + 0.5q Fe = 30 H_1^2

Notes:

- All values of height (H) in feet, pressure (P), and surcharge (q) in pounds per square foot (psf) and force (F) in pounds.
- P_p, P_a, and P_o are the passive, active, and at-rest earth pressures, respectively; Fe is the incremental seismic force.
- P_q is the incremental surcharge pressure, and μ is the allowable friction coefficient applied to dead normal (buoyant) loads. Fe is in addition to the active and at-rest pressures. Below groundwater, active and at-rest pressure should be reduced by 50 percent and hydrostatic pressure should be added to active and at-rest pressures. P_p should be reduced by 50 percent below the groundwater.
- For 2H:1V slopes above the wall, increase the active and at-rest pressures by 50 percent; for 1.5H:1V slope, increase the active and at-rest pressures by 100 percent.
- Neglect the upper 1 foot for passive pressure unless the surface is contained by a pavement or slab.
- Seismic coefficients of 0.34g and 0.51g were used to calculate Fe (50 and 75 percent of peak ground acceleration [PGA]) for cantilever and restrained walls, respectively.

Figure 4 - LATERAL EARTH PRESSURES

4.9 RESISTANCE TO LATERAL LOADS

The abutment response can be estimated as recommended in Section 7.8 of Caltrans SDC. The maximum passive pressure for a wall height of 5.5 feet can be taken as 5 kips per square foot (ksf). For wall heights different than 5.5 feet, we recommend that the maximum passive pressure be obtained by multiplying the 5 ksf value with the ratio H/5.5, where H is the backwall/diaphragm height in feet. Maximum passive pressures are mobilized when the deflection of the wall reaches 0.01 x H. For intermediate deflection, the passive pressure mobilized may be estimated using linear interpolation. The initial embankment fill stiffness may be assumed to be 20 kips/inch/feet for a wall height of 5.5 feet. The initial stiffness for wall heights different from 5.5 feet may be obtained proportionally as for maximum passive pressures.

Preliminary lateral resistance of shallow foundations may be estimated using recommendations provided on Figure 4.

4.10 SLOPE STABILITY

For preliminary analyses, the approach embankment slopes should be planned no steeper than 2H:1V or the slopes should be retained.

4.11 EARTHWORK

Low expansive soils (expansion index [EI] less than 50 or sand equivalent [SE] greater than 20) should be used within the approach embankment and beneath the bridge foundations in accordance with standard Caltrans requirements. The site subsurface soils will likely meet the criteria for low expansive soils.

4.12 SETTLEMENT DUE TO RAMP FILL

The alignment and dimensions of the ramp embankment fills have not been determined at this time. For preliminary evaluation, assume a settlement equivalent to 1 percent of the embankment height. However, the majority of the settlement due to embankment fills is anticipated to occur as the loads are applied or shortly thereafter (less than 60 days). Post construction settlement will likely be minor.

4.13 ADDITIONAL PRESSURES DUE TO RAMP FILL

Additional vertical and lateral pressures will be induced by new embankment fill for ramps. Any existing underground utilities that may be influenced by the new ramps should be checked to confirm that the additional pressures and settlements can be accommodated. Additional pressures and settlement are a function of the embankment type, soil type, and relative locations of the utility and embankment. For preliminary pressure evaluation, assume that additional pressures on utilities located within 0.1H (H = height of embankment in feet) of the embankment toe is equivalent to 120H pounds per square foot (psf). Additional vertical and lateral earth pressures for utilities located 0.5(L+H) from the embankment toe may be assumed zero, where L=0.5 * embankment roadway width in feet. A linear interpolation may be assumed to estimate additional pressures on utilities located within 0.1H to 0.5(L+H) of the embankment toe.

4.14 PRELIMINARY PAVEMENT SECTION

A preliminary materials report will be prepared separately and will include preliminary pavement section recommendations.

4.15 SUMMARY

A summary of preliminary recommendations is provided in Table 3.

Table 3 - SUMMARY OF PRELIMINARY RECOMMENDATIONS

BRIDGE NAME	SOIL CONDITIONS[1]	DEPTH TO GROUND-WATER (feet)[1]	CONTROLLING FAULT/ DISTANCE (miles)	MCE	PGA (g)	CALTRANS SDC ARS CURVE	SURFACE RUPTURE POTENTIAL[2]	LIQUEFACTION POTENTIAL[1,3]	CORROSION POTENTIAL[1,3]	SCOUR POTENTIAL[4]	RECOMMENDED FOUNDATION TYPE[1, 5]
I-10 at Grove and Fourth Street	Dense to Very Dense Silty Sands and Gravelly Sands	> 100	Redhill (Etiwanda Avenue)/ 2.4	7.0	0.68	Fig B.8 , PBA =0.7g, modified for near fault effects	Low	Low	Low	None	Shallow

Notes:
1. Based on data reviewed.
2. Project site is not within an Alquist-Priolo zone.
3. Estimated based on data or typical soil types.
4. No active stream beds in project area and accordingly no scour potential.
5. For preliminary estimates assume for a minimum embedment of 3 feet, an allowable bearing pressure of 6,000 pounds per square foot.

5.0 ADDITIONAL GEOTECHNICAL INVESTIGATION

A field investigation and laboratory testing program will be required for preliminary and final design of the proposed Project. The geotechnical investigation should be planned to provide the following information:

- Subsurface conditions for the proposed bridge including SPT data for seismic settlement analyses.
- Subgrade conditions along proposed pavement widening.
- Laboratory testing to evaluate earthwork requirements and design foundations, retaining walls, slopes, and pavement section. The laboratory tests will include moisture/ density, settlement, shear strength, compaction, sand equivalent, R-value, and corrosion potential.

Details of the proposed field investigation can be provided during preliminary design phase.

6.0 LIMITATIONS

This report is intended for the use of Boyle Engineering for the design of the proposed Improvements at the I-10 at Grove Avenue and Fourth Street Interchange and Garden Grove Corridor Project in Ontario, California. This report is based on the project as described and the information obtained from previous geotechnical reports. The findings and recommendations contained in this report are based on data review. In addition, soils and subsurface conditions encountered in the exploratory borings are presumed to be representative of the project site. However, subsurface conditions and characteristics of soils between exploratory borings can vary. The findings reflect an interpretation of the direct evidence obtained. The recommendations presented in this report are based on the assumption that an appropriate level of quality control and quality assurance will be provided during construction. DYA should be notified of any pertinent changes in the project plans or if subsurface conditions are found to vary from those described herein. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations contained in this report are applicable to the specific design element(s) and location(s) that is (are) the subject of this report. They have no applicability to any other design elements or to any other locations, and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of DYA.

DYA have no responsibility for construction means, methods, techniques, sequences, or procedures; for safety precautions or programs in connection with the construction; for the acts or omissions of the CONTRACTOR or any other person performing any of the construction; or for the failure of any worker to carry out the construction in accordance with the Final Construction Drawings and Specifications.

Services performed by DYA have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended.

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APPENDIX A

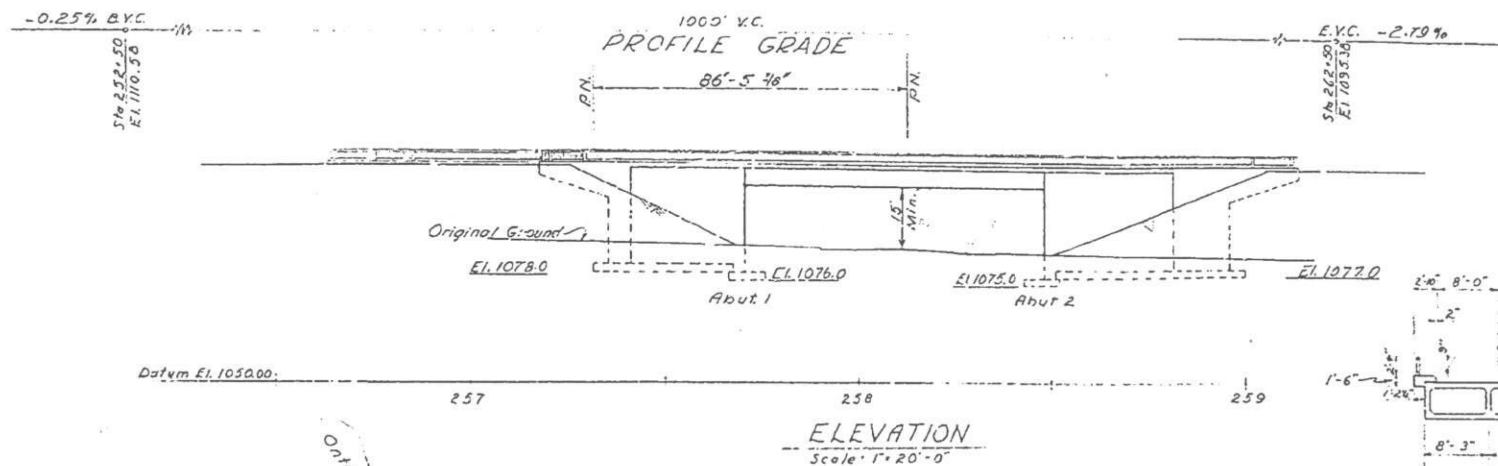
PREVIOUS DATA

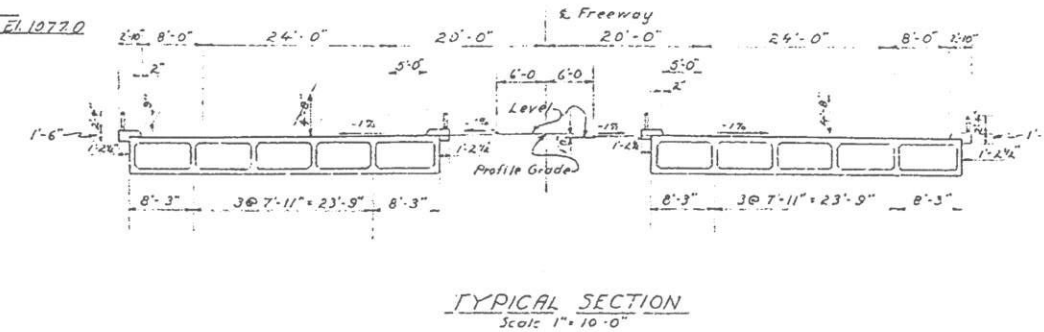
FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			53	105

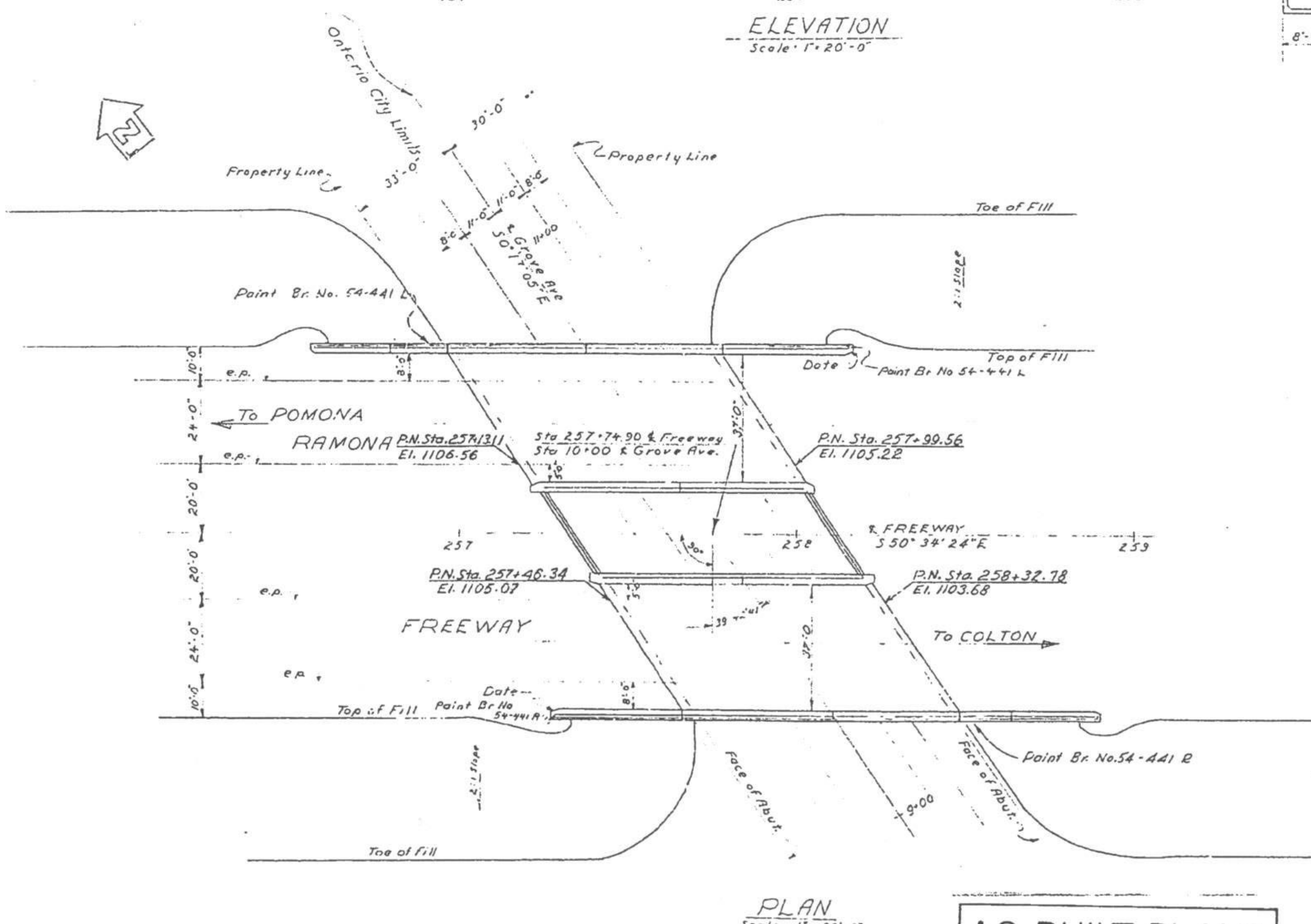
UI-FI-211 (28) Unit 2

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
VIII	S. Bd.	26	Ont. D	1	10

MAY 19 1952







INDEX TO PLANS

Note: Roadway Fills not a part of this contract.

THIS SET OF PLANS HAS BEEN CORRECTED TO CORRESPOND TO THE AS BUILT PRINTS DATED 1-12-53 AS SUBMITTED BY RESIDENT ENGINEER H J Scott
TRACING CORRECTED BY DJL DATE 9-1-60

For General Notes See Foundation Plan

Live Loading H20-S16-44

BRIDGE DEPARTMENT

AS BUILT PLANS
Contract No. 53-14VC8
Date Completed
Document No. 80000906

RAMONA FREEWAY

53-14VC8

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

GROVE AVE UNDERCROSSING
LOCATED AT EAST CITY LIMITS OF ONTARIO
IN SAN BERNARDINO COUNTY

GENERAL PLAN

SCALE As Shown | BRIDGE 54-441 | FILE | DRAWING C-2802-1

PREL. DRAWING NO. P-2802

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE ______ SIGNATURE ______ TITLE ______

U1-F1-211(28) Unit 2

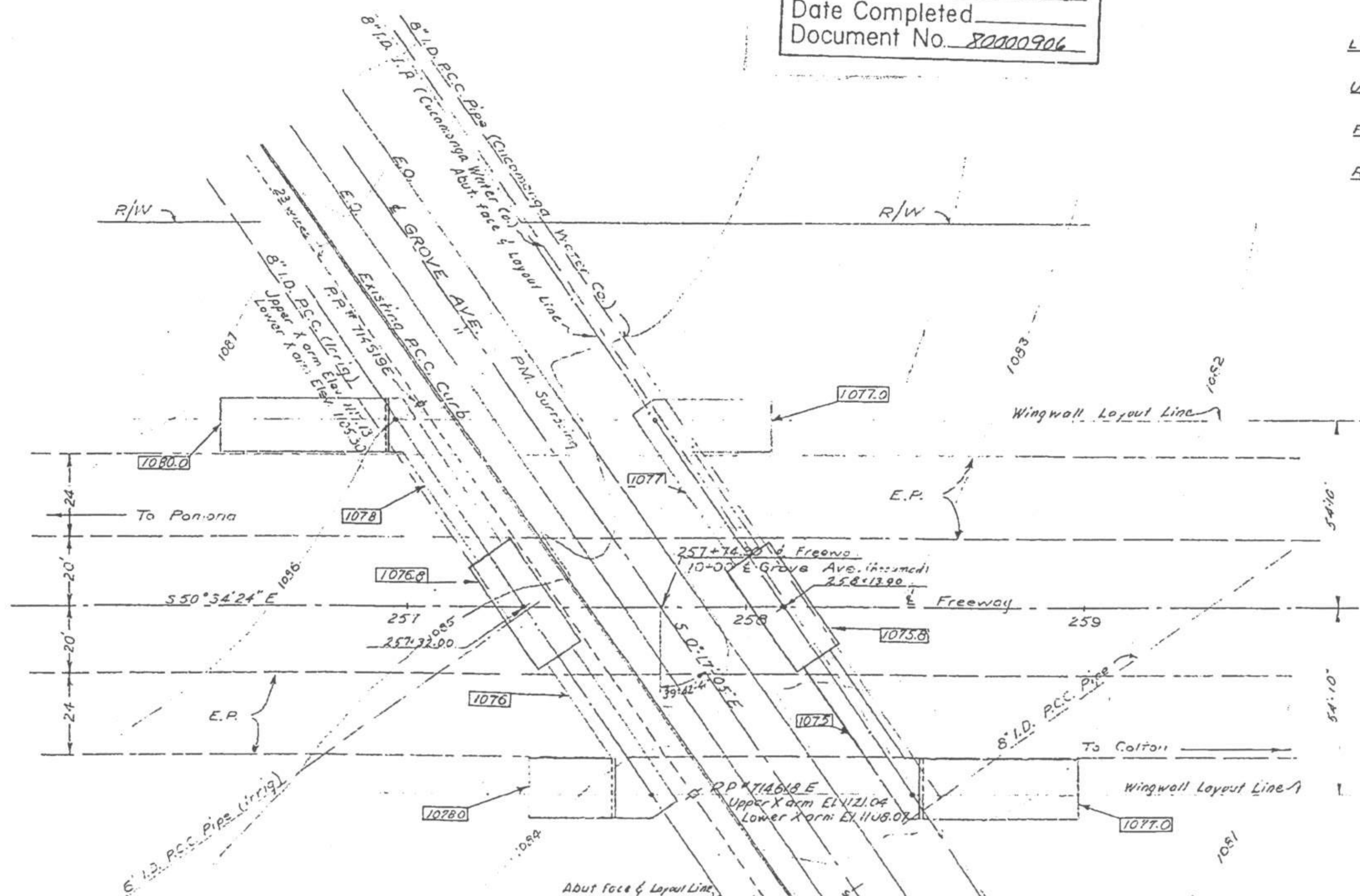
FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			54	105

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
VIII	SBd		Ont,D	2	10

Date approved MAY 1952

BRIDGE DEPARTMENT

AS BUILT PLANS
Contract No. 53-14rc8
Date Completed
Document No. 80000906



GENERAL NOTES

SPECIFICATIONS:
Design: A.A.S.H.O. dated 1949 with subsequent revisions, and Bridge Department Supplement dated 1949.
Construction: Standard Specifications, Division of Highways, dated January, 1949, and the Special Provisions.

LIVE LOADING:
H20 - S16-44

UNIT STRESSES:
Reinforced Concrete: f_s=20,000 p.s.i., f_c=1250 p.s.i., n=10

FOOTING PRESSURE:
2.5 tons p.s.f.

REINFORCEMENT:
Embedment is clear to outside of bar and is 2" to main reinforcement, except as noted. Hooks shall conform to the Manual of Standard Practice, A.C.I. Backing for hooks is four diameters, except as noted. Bar areas are based on rounds for less than 1" and squares for over 1".
Bar deformations shall conform to A.S.T.M. A305-49.
Where reinforcing bars are spliced they shall have a 20 diameter lap unless otherwise called for on the plans.

B.M. No. 27-A-50 ; Elev. 1072.65'
Set chiseled ☐ on top 8" P.C.C. riser 101± Rt. of Freeway Sta. 264+20±

B.M. No. 26-B-50 ; Elev. 1037.99
Chiseled "X" on bolt of water gate valve on westerly side of 30" P.C.C. standpipe, SE corner 5th & Grove Ave. 190±' Lt. of Freeway Sta. 256+84

Elevation bottom of Footing shown thus [0.0] .

Drawn by C.L.S. ; Checked by

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

GROVE AVE UNDERCROSSING

FOUNDATION PLAN

SCALE 1"=20'	BRIDGE 54-441	FILE	DRAWING C-2802-2

DRAWING NO. P-2572

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DATE ______ SIGNATURE ______ TITLE ______

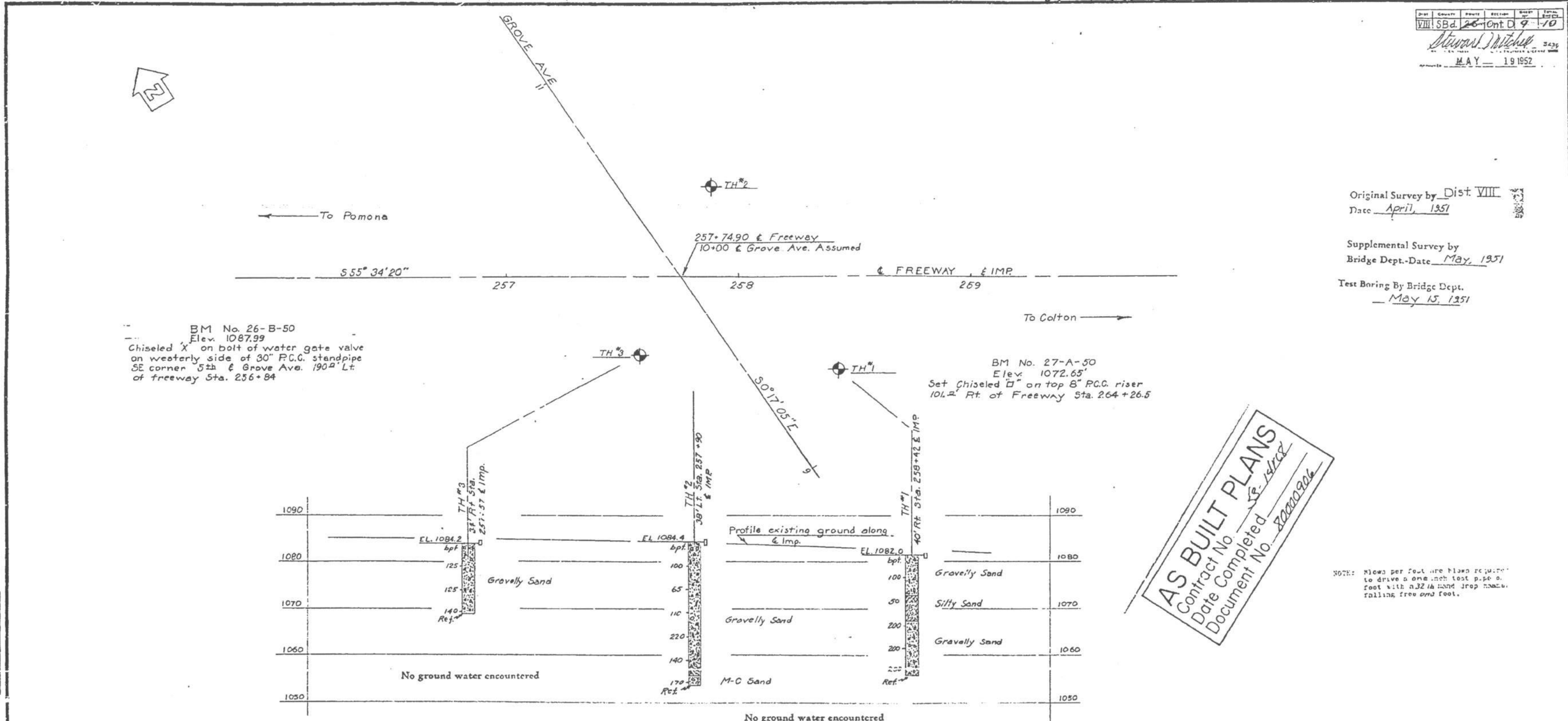
VI-FI-211(28) Unit 2

Dist	County	Route	Section	Sheet No.	Total Sheets
VIII	SBd.	~~26~~	Ont. D	9	10

Stewart Mitchell 3435

MAY 19 1952

BRIDGE DEPARTMENT



Original Survey by Dist. VIII
Date April, 1951

Supplemental Survey by Bridge Dept.-Date May, 1951

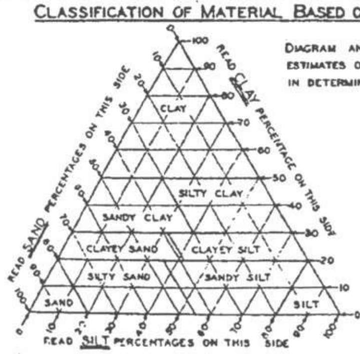
Test Boring By Bridge Dept. May 15, 1951

NOTE: Blows per foot are blows required to drive a one inch test pipe one foot with a 32 lb hand drop hammer falling free one foot.

AS BUILT PLANS
Contract No. 08-...
Date Completed ...
Document No. 80000906

Classification of Material Based on Standard Grade Size Limits

Diagram and table showing the basis for estimates of grade size distribution used in determination of class names.



Grouping Used in Triangular Classification

Class Name	Percentage of Sizes Present: Sand	Silt	Clay
Sand	80-100	0-20	0-20
Silty Sand	45-80	0-35	0-20
Sandy Silt	0-45	35-80	0-20
Silt	0-20	80-100	0-20
Clayey Sand	38-80	0-42	20-30
Clayey Silt	0-38	32-80	20-30
Sandy Clay	30-70	0-40	30-80
Silty Clay	0-30	20-70	30-50
Clay	0-50	0-50	50-100

If gravel is present in appreciable amounts the term "Gravelly" may be added to the class name, vis. "Gravelly sand." The terms "Coarse," "Medium" and "Fine" when used to describe Gravel, Sand and Silt refer to Standard Grade Size limits.

Legend of Boring Operations

- Plan of any boring
- 1" Sampler boring
- Rotary wash boring
- 1" Closed sampler driven
- Core boring
- 2½" Penetrometer driven
- 2" Sampler boring
- 2" to 5" Auger boring
- 6" to 20" Auger boring
- Casing driven
- Jet boring
- (S) Sample taken

The appropriate boring symbols designating the method of operation are shown at the upper right-hand corner of the respective boring. Where tool changes were made during the boring operation symbols are shown at the point of change.

Legend of Earth Materials

- Gravel – G
- Sand – S
- Silt – Si
- Clay – C
- Silty Sand – Si S
- Clayey Sand – CS
- Sandy Silt – S Si
- Clayey Silt – C Si
- Sandy Clay – SC
- Silty Clay – Si C
- Peat or Organic Clay – O
- Sandstone – SS
- Shale – Sh
- Broken Rock (fragments) – Br
- Rock – R

Abbreviations

EL 69.4	Elevation of ground at test hole
bpf	Blows per foot – (see note above)
P	Pulled pipe
M	Moisture as % dry weight
EL 64.3 6-12-49	Elevation of ground water and date

Blows per foot / Moisture as % dry weight

Notes

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

GROVE AVENUE UNDERCROSSING	
LOG OF TEST BORINGS	
SCALE Horiz. 1"=20' Vert. 1"=10'	FILE NO.
BRIDGE NO. 54-441	DRAWING NO. C-2802-9

PREL. DRAWING NO. P-2802 133

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE ______ SIGNATURE ______ TITLE ______

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	10	31/87	124	148

DATE APPROVED April 6, 1970

UTILITIES

Ⓐ PP# 1527072E
1 Cable @ El. 1112.5
3 Wires @ El 1118.5
3 Wires @ El 1144 NES

Underground Utilities

① 1" Electrical Conduit City of Ontario
② 6" SH Water City of Ontario
③ Telephone Conduit Gen Telephone Co
④ 6" SH Gas So. Counties Gas Co
⑤ 8" VCP Sewer City of Ontario
⑥ 3" SH Water City of Ontario

* To remain in place

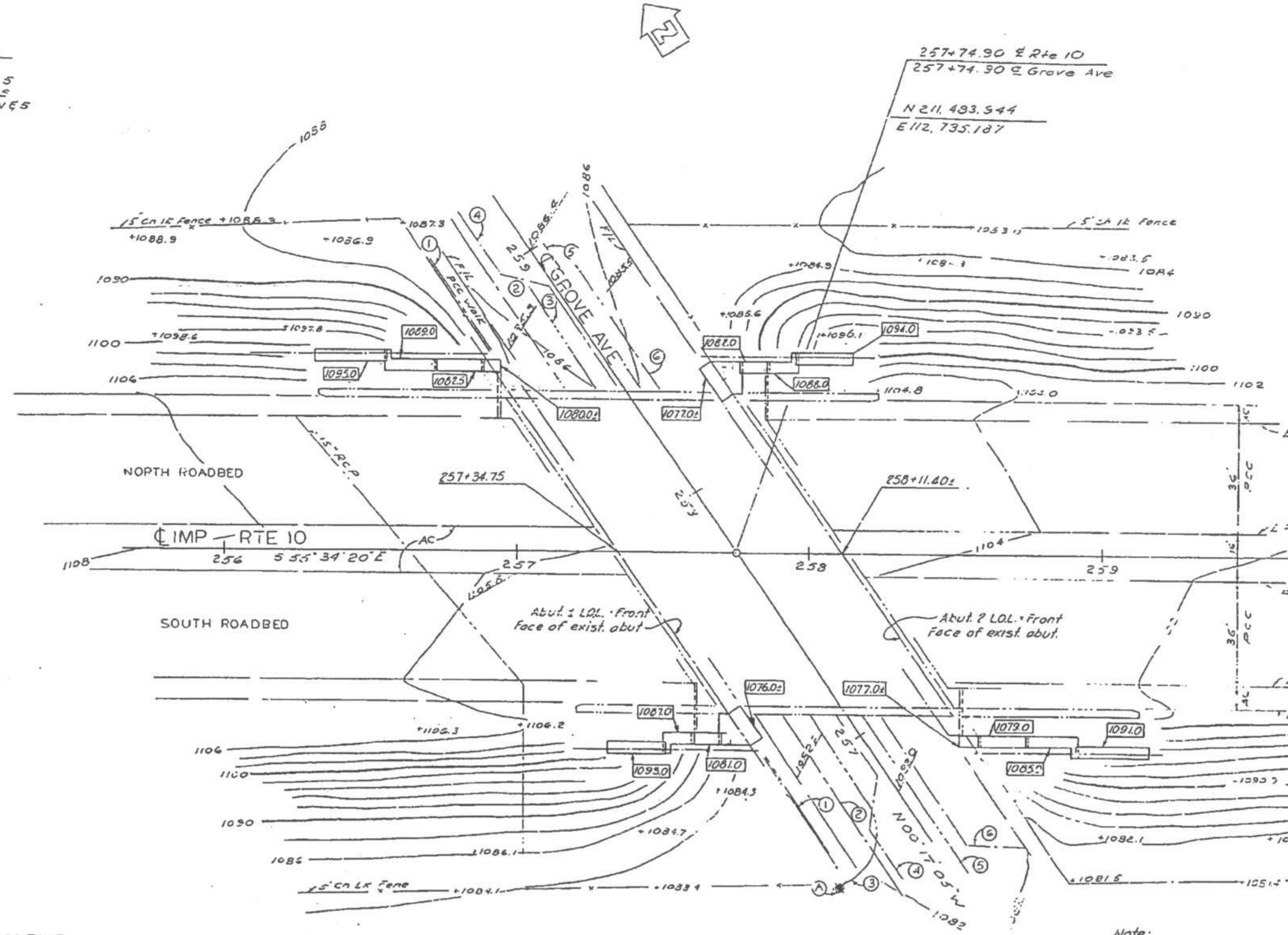
GENERAL NOTES

DESIGN: A.A.S.H.O. DATED 1969 WITH REVISIONS AND AS SUPPLEMENTED BY BRIDGE PLANNING AND DESIGN MANUAL.

LIVE LOADING: HS20-44 AND ALTERNATIVE

REINFORCED CONCRETE: f_s = 24,000 PSI, EXCEPT
= 20,000 PSI IN TRANSVERSE DECK SLABS AND STIRRUPS
f_c = 1,300 PSI, EXCEPT
= 1,200 PSI IN TRANSVERSE DECK SLABS
N = 10

FOOTING PRESSURE: (TONS PER S.F.) ALLOWABLE DESIGN
ABUTMENTS 2.5 2.5



BENCH MARKS

BM# 27-A-68 Elev 1100.81
T-Bar and cap 3' Rt 250+00
℄ Imp. stamped BM 27-A-68

BM# 26-A-68 Elev 1109.66
CDH Brass disc in well stamped
4' Rt 250+00 ℄ Imp.

Notes:
+ Denotes spot elev.

Note:
☐ Indicates bottom of footing elevation
For details not shown, see "Abutment Details #1 and #2" sheets

CONTRACT NO. 08-087123

AS BUILT PLANS
Contract No. 08-087124
Date Completed 7-12-71
Document No. 80000597

124

DRAWN	CHECKED
11-19-68	11-19-68
H R Nakamura	D.V. McNally

BRIDGE DEPARTMENT
DESIGN SECTION 13
Project Engineer H. Lashus

DESIGN	By	Elee	1/69
	Checked	H. Lashus	2/69
DETAILS	By	Elee	1/69
	Checked	H. Lashus	2/69
QUANTITIES	By	WHM	4/69
	Checked	MKM	5/69

STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

GROVE AVENUE UNDERCROSSING
(WIDEN)

FOUNDATION PLAN

BRIDGE NO. 54-441 | POST MILE 4.9 | DRAWING NO. S4441-2 | SCALE 1"=20' | SHEET 2 OF 6

Disregard prints bearing earlier revision dates → REVISION DATES (PRELIMINARY STAGE ONLY)

WO
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DATE ________ SIGNATURE ________ TITLE ________

DIST.	COUNTY	ROUTE		SHEET NO.	TOTAL SHEETS
08	SBd	10	31.1/8.7	130	149

April 6, 1970

GENERAL NOTES

DESIGN: A.A.S.H.O. DATED 1969 WITH REVISIONS AND AS SUPPLEMENTED BY BRIDGE PLANNING AND DESIGN MANUAL.

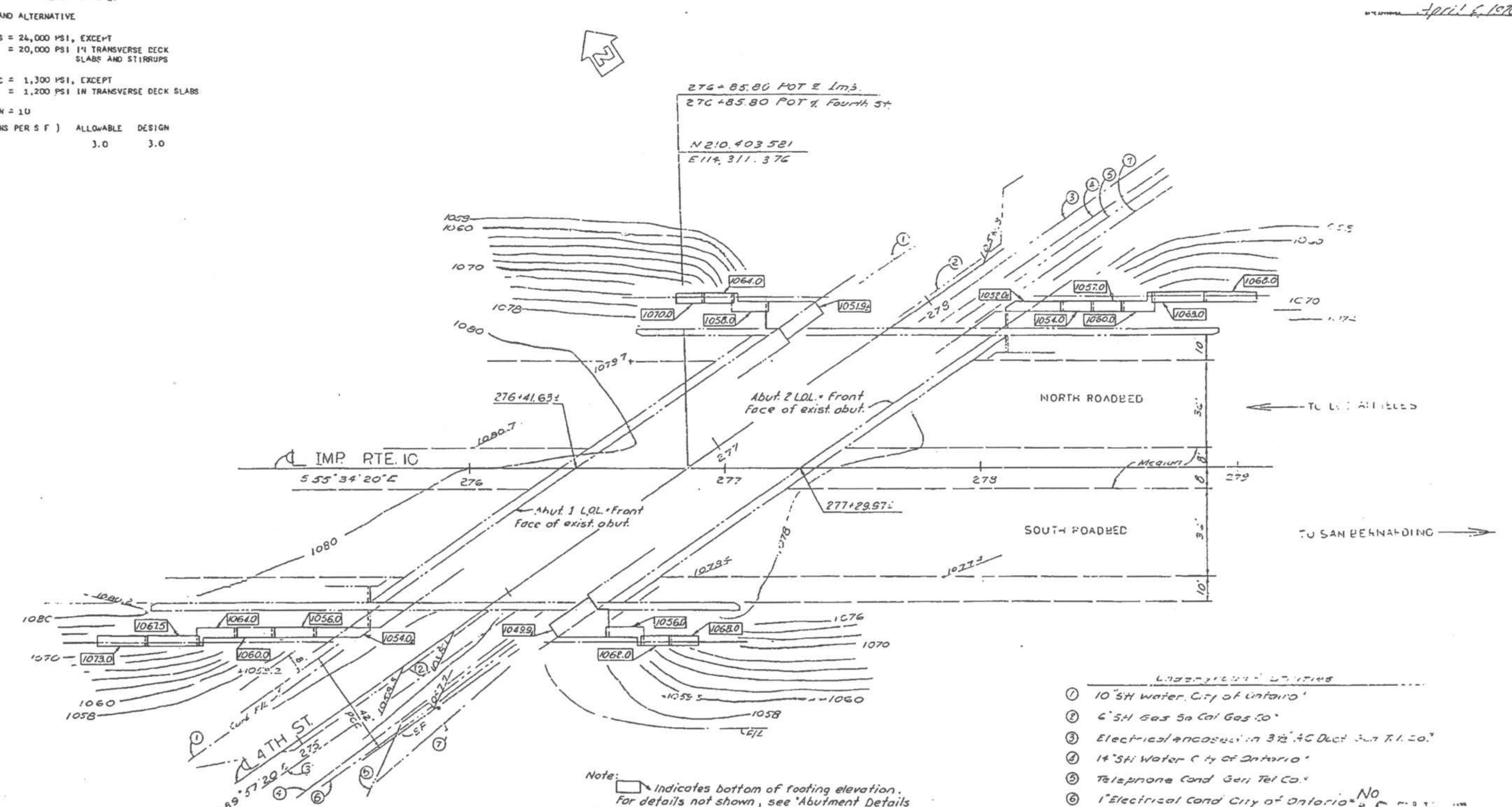
LIVE LOADING: HS20-44 AND ALTERNATIVE

REINFORCED CONCRETE: f_s = 24,000 PSI, EXCEPT
= 20,000 PSI IN TRANSVERSE DECK SLABS AND STIRRUPS

f_c = 1,300 PSI, EXCEPT
= 1,200 PSI IN TRANSVERSE DECK SLABS

N = 10

FOOTING PRESSURE: (TONS PER S F)	ALLOWABLE	DESIGN
	3.0	3.0



Underground Utilities

① 10"SH water, City of Ontario*
② 6"SH Gas So Cal Gas Co*
③ Electrical encased in 3½" AC Duct Gen T.T. Co.*
④ 14"SH Water City of Ontario*
⑤ Telephone Cond Gen Tel Co.*
⑥ 1"Electrical Cond City of Ontario*
⑦ 12"SH Water City of Ontario*

* To remain in place

Note:
Indicates bottom of footing elevation.
For details not shown, see "Abutment Details #1, #2 and #3 sheets

Notes:
+Denotes spot elev.

BENCH MARKS

B.M.# 28-E-53 Br Plug Elev. 1079.45
B-Plug on curb S.E. cor SBd Ave Bridge 53' Rt. 276+58.

BM 28-8-68 Elev. 1076.98
C.G.H Brass Disk in well stam'd 4' Rt 277+70.22 POC ℄ Imp.

CONTRACT NO. 08-087123

AS BUILT PLANS
Contract No. 08-087124
Date Completed 7-12-71
Document No. 80000597

BRIDGE DEPARTMENT DESIGN SECTION		
Project Engineer	H. Joshua	
DESIGN	By E Lee	2/69
	Checked H. Archer	3/69
DETAILS	By E Lee	2/69
	Checked H. Archer	3/69
QUANTITIES	By W H M	5/69
	Checked RAS	5/69

STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

FOURTH STREET UNDERCROSSING (WIDEN)

FOUNDATION PLAN

BRIDGE NO.	POST MILE	DRAWING NO.	SCALE	SHEET	OF
54-440	5.2	54440-2	1"=20'	2	7

WO
CU

Disregard prints bearing earlier revision dates

REVISION DATES (PRELIMINARY STAGE ONLY)

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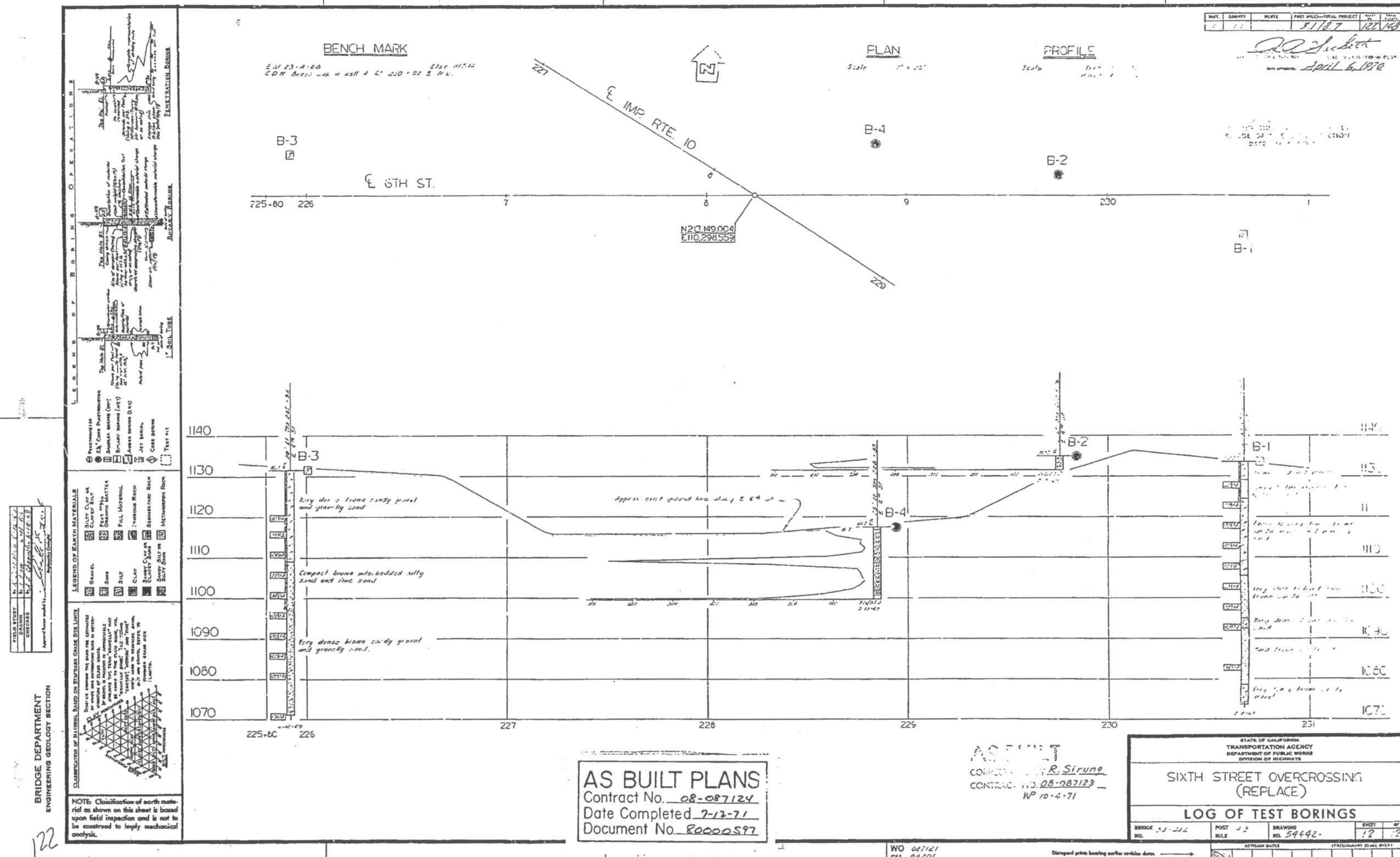
DATE 1-6-72 SIGNATURE TITLE

130

SCALE 1"=50' MICROFILM - STATE OF CALIFORNIA - DEPARTMENT OF PUBLIC WORKS - MICROFILM SCALE 1"=20'



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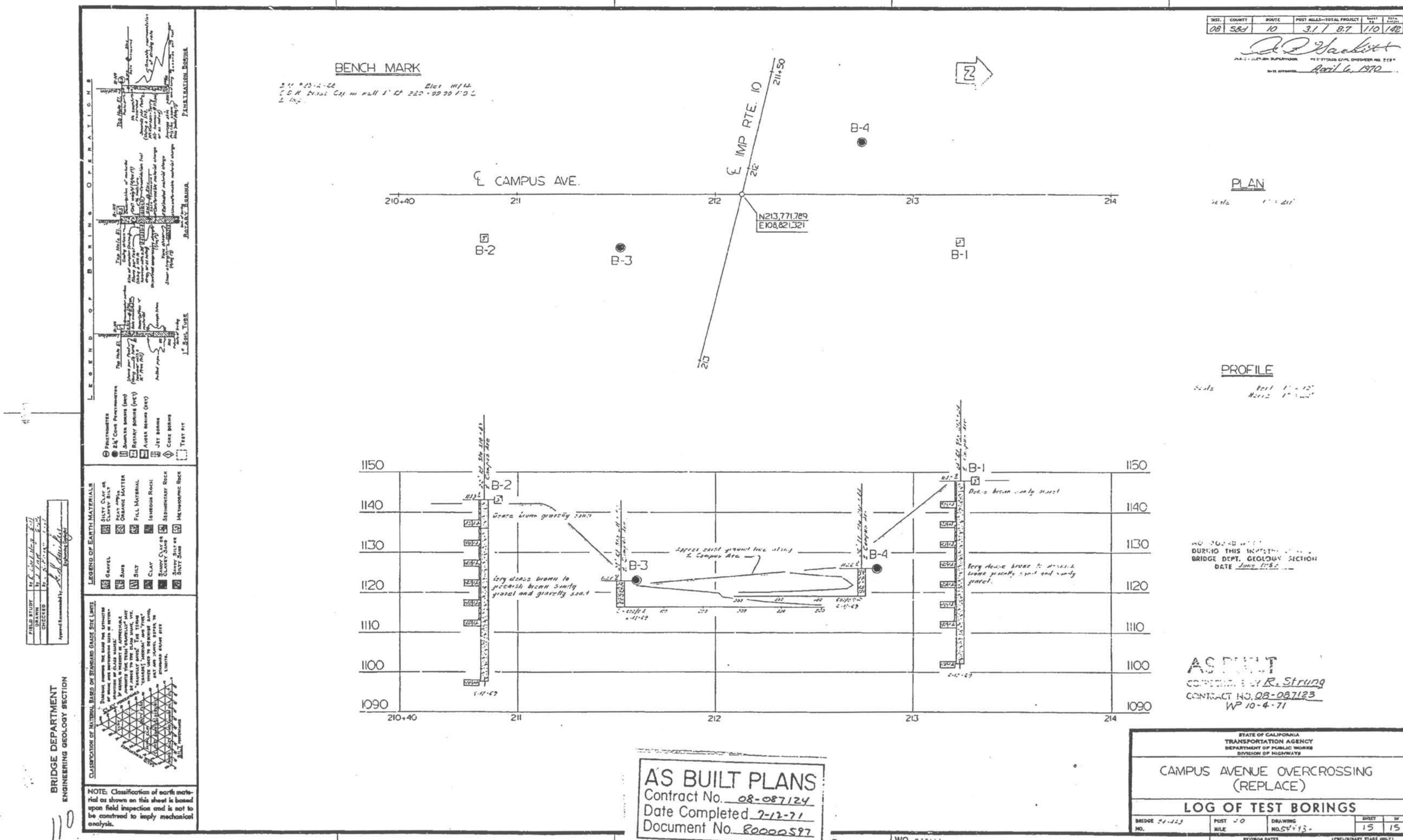
DATE 1-6-72 SIGNATURE [signature] TITLE



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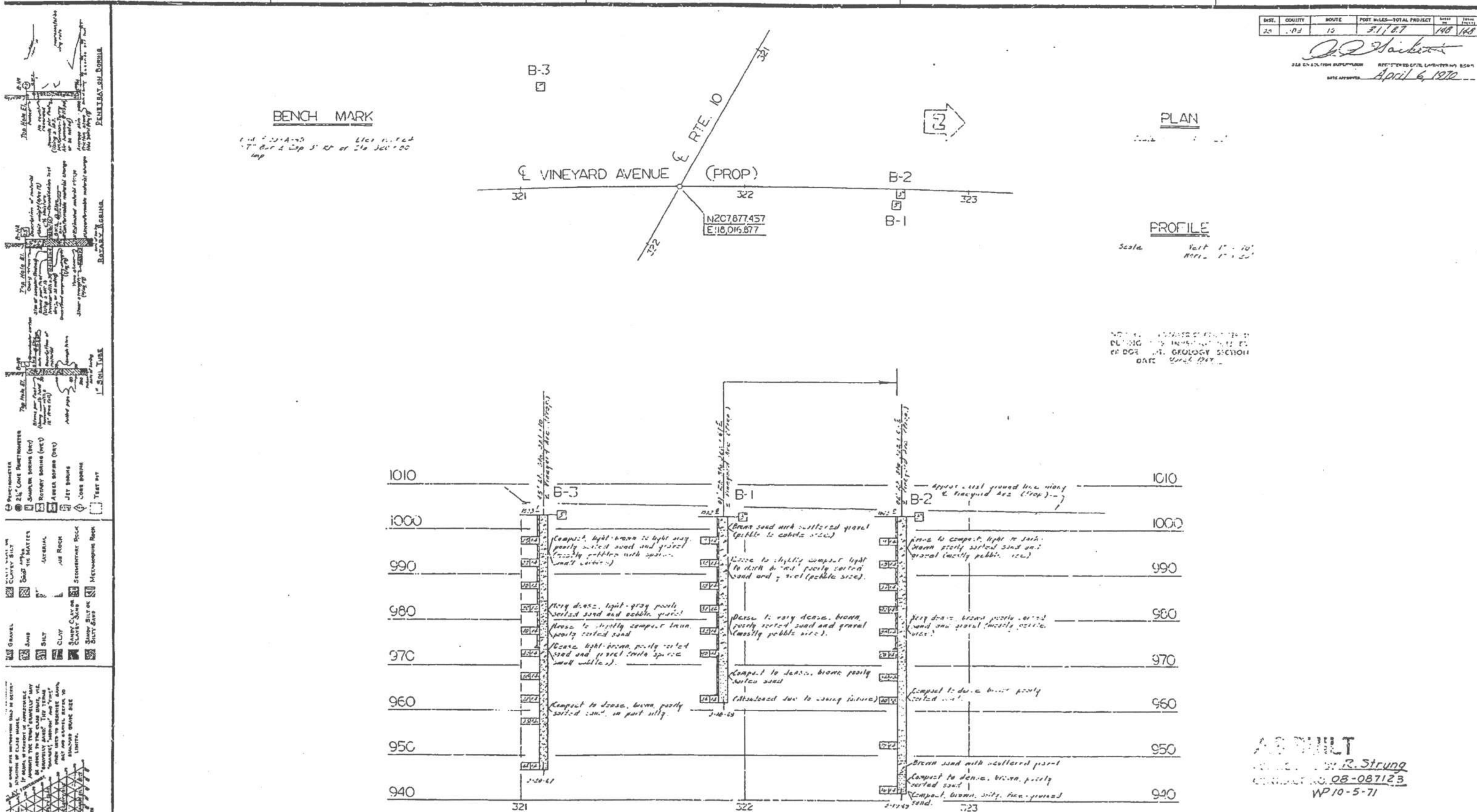
DATE 1-1-72 SIGNATURE ______ TITLE ______



AS BUILT PLANS
Contract No. 08-087124
Date Completed 7-17-71
Document No. 80000597

STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

VINEYARD AVENUE OVERCROSSING (REPLACE)

LOG OF TEST BORINGS

BRIDGE NO. 54-439	POST MILE 6.1	DRAWING NO. 51439-	SHEET 13	OF 13

WO 087121
CU 08201

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY STAGE ONLY)

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DATE 1-6-72 SIGNATURE ______ TITLE ______

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1501 Quail Street
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QUALITY CONTROL REVIEWER

Mr. Saroj Weeraratne, PhD., P.E., G.E.
Senior Engineer

SS/VRN:cfp