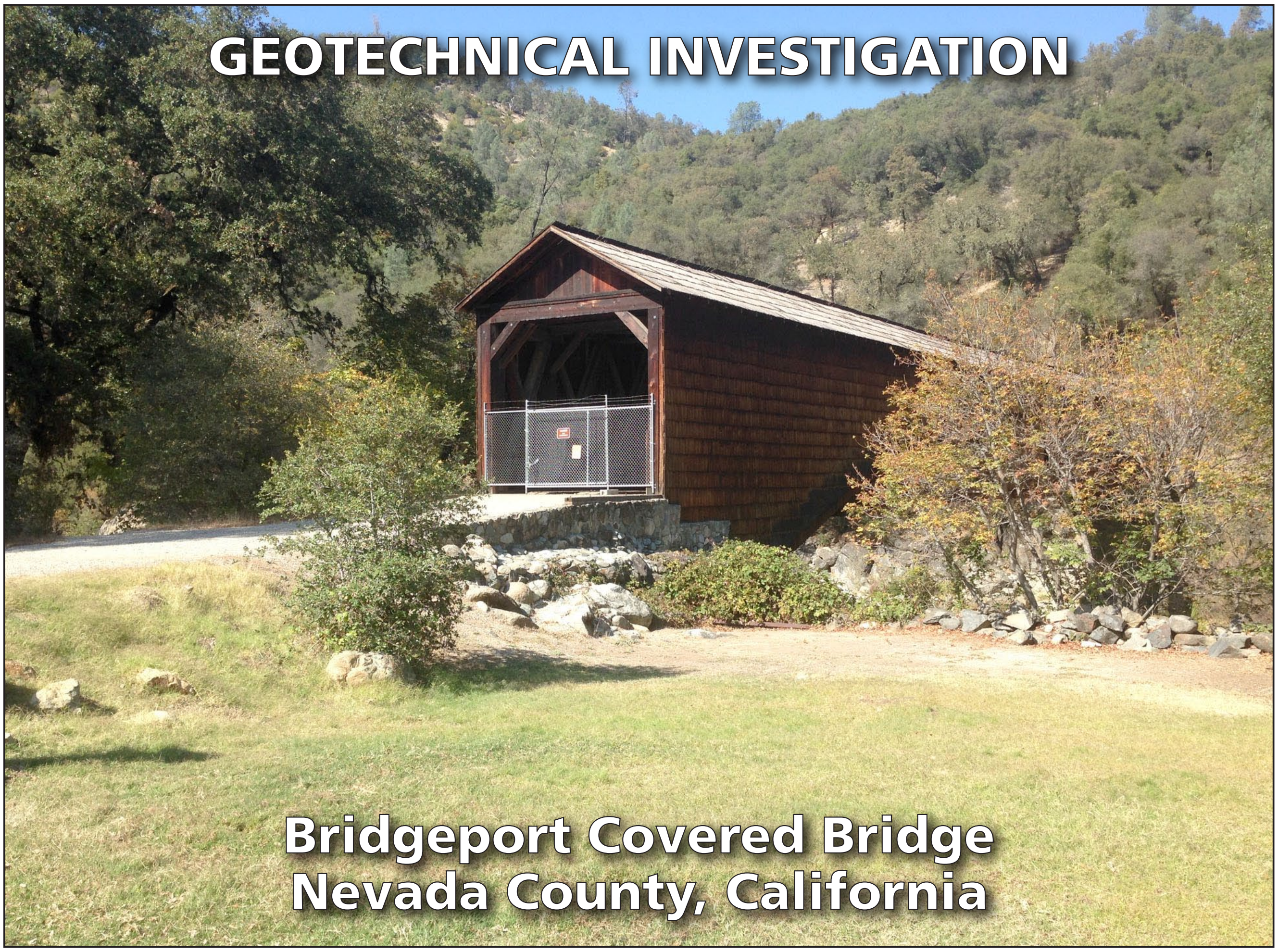
GEOTECHNICAL INVESTIGATION



Bridgeport Covered Bridge
Nevada County, California

PREPARED FOR:

CALIFORNIA STATE PARKS
NORTHERN SERVICE CENTER
ONE CAPITOL MALL, SUITE 410
SACRAMENTO, CALIFORNIA

PREPARED BY:

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GEOCON PROJECT NO. S9030-05-41 **MAY 2015**

Project No. S9030-05-41
May 13, 2015

VIA ELECTRONIC MAIL

Mike Brown
California State Parks – Northern Service Center
One Capitol Mall, Suite 410
Sacramento, California 95814

Subject: GEOTECHNICAL INVESTIGATION
BRIDGEPORT COVERED BRIDGE
SOUTH YUBA RIVER STATE PARK
NEVADA COUNTY, CALIFORNIA

Dear Mr. Brown:

In accordance with Work Order No. 47-802323-16 dated December 4, 2014; we have prepared this geotechnical investigation report for the subject project. The project consists of strengthening and improving the existing Bridgeport Covered Bridge at South Yuba River State Park in Nevada County, California.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. Based on the results of our investigation, the project is feasible from a geotechnical viewpoint provided the recommendations of this report are incorporated into the design and construction of the project.

Please contact us if you have any questions concerning the contents of this report. We look forward to reviewing the project plans as they develop further, providing engineering consultation as-needed, and performing geotechnical observation and testing services during construction.

Sincerely,

GEOCON CONSULTANTS, INC.

Jeremy J. Zorne, PE, GE
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. ZORNE
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GEOTECHNICAL INVESTIGATION

1.0 PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed strengthening and improvements for the existing Bridgeport Covered Bridge at South Yuba River State Park in Nevada County, California. The approximate site location is shown on the Vicinity Map, Figure 1.

The primary purposes of our investigation were to (1) evaluate the as-built conditions of the existing abutments, and (2) evaluate the subsurface conditions within the abutment areas and provide geotechnical recommendations for design and construction of the rehabilitation project as presently proposed.

To prepare this report, we performed the following scope of services:

- Performed a limited geologic literature review to aid in evaluating the geologic and seismic conditions present at the site. A list of referenced material is included in Section 12.0 of this report.
- Reviewed available historical and as-built information for the bridge provided by California Department of Parks and Recreation (DPR).
- Reviewed as-built information for the nearby Pleasant Valley Road Bridge over the South Yuba River, provided by Caltrans.
- Coordinated with DPR staff and performed a site reconnaissance to review project limits, determined exploration equipment access and marked out exploratory excavation locations.
- Performed six exploratory borings (B1 through B6) within abutment and roadway approach areas with a track-mounted drill rig equipped with hollow-stem augers to depths ranging from approximately 1½ to 8 feet.
- Obtained relatively undisturbed and disturbed soil samples from the exploratory borings.
- Performed six air-track borings (AT1 through AT6) using a track-mounted air-track drill equipped with a 3½-inch button bit to depths ranging from approximately 4 to 33 feet.
- Logged the borings in accordance with the Unified Soil Classification System (USCS).
- Upon completion, backfilled the borings with soil cuttings.
- Performed 25 exploratory drill holes (RH1 through RH25) within the mortared joints of the stacked rock of the existing abutments using a roto-hammer equipped with a ½-inch diameter bit to evaluate mortar and abutment material thickness.
- Performed two concrete cores (C1 and C2) within the southwest and northeast concrete arch seats at the south and north abutments, respectively, using portable coring equipment to evaluate arch seat thickness and concrete condition.
- Visually examined and photographed the cores to evaluate (qualitatively) concrete condition. Performed laboratory compression tests on the concrete cores to determine compressive strength.

- Patched the exploratory roto-hammer and core holes with rapid-set concrete upon completion.
- Performed laboratory tests on selected soil samples to determine pertinent geotechnical parameters.
- Prepared this report summarizing our findings, conclusions, and recommendations relative to the geotechnical aspects of the project as presently proposed.

Details of our field exploration program including exploratory boring logs are presented in Appendix A. Approximate locations of exploratory borings are shown on the Site Plan, Figure 2. A section view of the bridge is presented as Cross-Section A-A’, Figure 3. Details of the south and north abutments are presented on Figures 4 and 5. Site photographs are presented as Photos 1 through 8. Details of our laboratory testing program and test results are summarized in Appendix B. Concrete core photographs and laboratory compressive strength test results for concrete cores obtained from the arch seats are presented in Appendix C. As-built information for the nearby *New Bridgeport [Pleasant Valley Road] Bridge across the South Yuba River* is presented in Appendix D.

2.0 PROJECT DESCRIPTION

The Bridgeport Covered Bridge is located in western Nevada County southwest of French Corral and north of Lake Wildwood. The timber bridge clear-spans the South Yuba River (approximately 210 feet) and is the longest single-span covered bridge in the world. Photos of the bridge are presented as Photos 1 and 2. The bridge was originally constructed in 1862 and closed to vehicular traffic in 2010 and pedestrians in 2011 due to deferred maintenance and structural deficiencies. The existing bridge layout (plan view) is depicted on the Site Plan, Figure 2.

We understand that the bridge structural system is a combination of Howe Truss and Burr Arch (Photo 3). A section view of the bridge, showing general framing and construction details, is depicted on Cross-Section A-A’, Figure 3. The bridge abutments (identified as “South” and “North”) are generally constructed of dry-stack granitic rocks of various sizes with some reinforced concrete elements, such as the arch seats. The dry-stack rock abutment walls and wingwalls were pointed with mortar at most locations, although some areas of un-mortared joints exist. The abutments appear to bear directly on bedrock/boulders at the North Abutment and boulder-laden alluvium at the South Abutment. Photographs, dimensions, approximate mortar thickness, and other details of the abutments are presented on Figures 4 and 5. Photographs and laboratory compressive strength test results of concrete cores extracted from the southwest and northeast arch seats are presented in Appendix C.

In 2014/2015, interim stabilization measures designed by Buehler & Buehler Structural Engineers (B&B) were constructed. The measures included two interior, structural steel piers (Photo 4) and two tension anchor foundations (Photos 5 and 6) located outside of the South and North Abutments. The approximate locations of the tension anchor foundations (aka “deadman” foundations) are shown on the Site Plan, Figure 2, and Cross-Section A-A’, Figure 3.

DPR would like to strengthen and rehabilitate the bridge such that it can be reopened to pedestrian and possibly equestrian traffic. B&B is providing structural assessment and design services for the project. Abutment rehabilitation will likely include reconstructing and/or strengthening the abutments and wingwalls. New foundations consisting of spread footings and/or micropile deep foundation elements are currently proposed.

3.0 SOIL AND GEOLOGIC CONDITIONS

The following soil and geologic conditions are based on our field exploration program, geological literature review, and our review of the *Log of Test Borings* (LOTB) presented in the Pleasant Valley Road Bridge as-built plans (Appendix D). Soil and geologic conditions at the site generally consist of fill soil (bridge approach roadway fill) overlying rocky alluvium (at the South Abutment) and variably weathered igneous bedrock at the North Abutment. Interpreted subsurface conditions along the bridge alignment are depicted on Cross-Section A-A', Figure 3.

3.1 Fill

The abutments and approach roadways are composed of fill. Based on our explorations, the fill generally consists of a highly variable mixture of cobbles and boulders. Although there is some sand, gravel, and silt infilling, there are also numerous voids between the cobbles and boulders. Typical fill soil profile at the South Abutment is shown in Photo 7. Approximate fill thickness at the north and south abutments is approximately 6 feet and 10 feet, respectively. Our interpretation of fill thickness at the abutments is shown on Cross-Section A-A', Figure 3.

3.2 Alluvium

Rocky alluvial material underlies the fill at the South Abutment and occupies the riverbed. Based on conditions observed in our borings, the Log of Test Borings (LOTB) presented in the *Pleasant Valley Road Bridge* as-built plans (Appendix D), and our observations of the riverbed material, the alluvium generally consists of cobbles and boulders in a silty, sandy, and gravelly soil matrix (Photo 7). The alluvium appears to be relatively dense with rock-to-rock contact typical. Thickness of the alluvium at the South Abutment ranges from approximately 10 to 15 feet. Our interpretation of alluvium thickness is shown on Cross-Section A-A', Figure 3.

3.3 Bedrock (Pleasant Valley Pluton – Quartz Diorite and Tonalite)

Variably weathered igneous bedrock underlies the fill at the North Abutment. The bedrock generally consists of very dense/hard igneous rock composed of quartz diorite and tonalite (mapped as Pleasant Valley Pluton). The rock is locally overlain by a thin residual soil cover consisting of silty sand with gravel as shown in Photo 8.

Subsurface conditions described in the previous paragraphs are generalized. The exploratory boring logs included in Appendix A detail the soil type, color, moisture, and consistency of the materials encountered at specific locations and elevations.

4.0 GROUNDWATER

We did not encounter groundwater in our borings performed in April 2015. In the vicinity of the abutments, we anticipate that groundwater will be encountered at an elevation near the water level of the South Yuba River. We anticipate that local groundwater elevation is strongly influenced by the level of water in the South Yuba River. Therefore, groundwater is expected to fluctuate seasonally.

5.0 CORROSION EVALUATION

According to Caltrans' *Corrosion Guidelines* (Version 2.0, November 2012), soils are considered corrosive to foundation elements if one or more of the following conditions exist: chloride concentration is 500 parts per million (ppm) or greater, or sulfate concentration is 2,000 ppm or greater, or the pH is 5.5 or less. Resistivity serves as an indicator parameter for the possible presence of soluble salts and is not included as a parameter to define a corrosive area for structures. A minimum resistivity value for soil and/or water less than 1,000 ohm-centimeters may indicate the presence of high quantities of soluble salts and a higher propensity for corrosion. Potential of Hydrogen (pH), resistivity, chloride content, and soluble-sulfate content tests were performed on two representative soil samples to generally evaluate the corrosion potential to subsurface structures. Test results indicate that site soils are not considered a corrosive environment in accordance with Caltrans' criteria. These tests were performed in accordance with California Test Method (CTM) Nos. 643, 417, and 422. The results are summarized in Table 5.

TABLE 5
SOIL CORROSION TEST SUMMARY

Location Boring & Sample No.	Sample Depth (feet)	Resistivity (ohm centimeters)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
B3 / B6 Bulk	0 - 5	6200	8.2	76	2

Geocon does not practice corrosion engineering. If corrosion sensitive improvements are planned, we recommend that further evaluations by a corrosion engineer be performed to incorporate the necessary precautions to avoid premature corrosion on sensitive structures in direct contact with the soils.

6.0 GEOLOGIC HAZARDS AND SEISMICITY

6.1 Regional Active Faults

The numerous faults in Northern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Division of Mines and Geology (CDMG) for the Alquist-Priolo Earthquake Fault Zone Program (Hart, 1999). An active fault has experienced surface displacement within the last 11,000 years. A potentially active fault has experienced surface displacement during Quaternary time (approximately the last 1.6 million years) but has had no known movement within the past 11,000 years. Faults that have not moved in the last 1.6 million years are considered inactive.

Based on our review of geologic maps and reports, the site is not within a currently established Alquist-Priolo (AP) Earthquake Fault Zone. No active or potentially active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the project is considered low.

The Northern California region is considered seismically active, and the site could be subjected to ground shaking in the event of an earthquake on one of the many active Northern California faults. Table 6.1 summarizes the distance of known active faults within 60 miles of the site, based on the computer program *EQFAULT* (Version 3, Blake, 2000).

TABLE 6.1
REGIONAL FAULT SUMMARY

Fault Name	Approximate Distance from Site (miles)	Maximum Earthquake Magnitude, M_w
Foothills Fault System (Spenceville Fault)	12	6.5
Foothills Fault System (Swain Ravine Fault Zone)	13	6.5
Foothills Fault System (Highway 49 Fault)	14	6.2
Mohawk-Honey Lake Fault Zone	40	7.3
Great Valley, Segment 3	58	6.8
Great Valley, Segment 1	58	6.7
Great Valley, Segment 2	58	6.4

While listing faults and potential maximum earthquake magnitudes is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site. The site could be subjected to ground shaking in the event of an earthquake along the faults mentioned above or other area faults.

6.2 Liquefaction and Dynamic Stability

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary loss of shear strength due to pore pressure buildup under the cyclic shear stresses associated with intense earthquakes.

Based on the subsurface conditions at the site, including shallow bedrock and generally dense, cobble and boulder-laded alluvium, we do not consider seismic-induced liquefaction or dynamic instability (lateral spreading) to be significant hazards for the site.

7.0 SEISMIC DESIGN CRITERIA

Based on our discussions with the project structural engineer, seismic design for this project will be based on the 2013 California Building Code (CBC); however, Caltrans seismic design criteria will be used as a comparison.

7.1 Seismic Design Criteria (2013 California Building Code)

We used the United States Geological Survey's (USGS) web application *US Seismic Design Maps* (http://geohazards.usgs.gov/designmaps/us/ application.php) to evaluate site-specific seismic design parameters in accordance with the 2013 CBC/ASCE 7-10. Results are summarized in Table 7.1a. The values presented are for the risk-targeted maximum considered earthquake (MCE_R).

TABLE 7.1a
2013 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2013 CBC / ASCE 7-10 Reference
Site Class	C	Section 1613.3.2/ Table 20.3-1
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	0.580g	Figure 1613.3.1(1) / Figure 22-1
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.247g	Figure 1613.3.1(2) / Figure 22-2
Site Coefficient, F_A	1.168	Table 1613.3.3(1) / Table 11.4-1
Site Coefficient, F_V	1.553	Table 1613.3.3(2) / Table 11.4-2
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	0.678g	Eq. 16-37 / Eq. 11.4-1
Site Class Modified MCE_R Spectral Response Acceleration (1 sec), S_{M1}	0.384g	Eq. 16-38 / Eq. 11.4-2
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.452g	Eq. 16-39 / Eq. 11.4-3
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.256g	Eq. 16-40 / Eq. 11.4-4

Table 7.1b presents additional seismic design parameters for projects with Seismic Design Categories of D through F in accordance with ASCE 7-10 for the mapped maximum considered geometric mean (MCE_G).

TABLE 7.1b
2013 CBC SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.219g	Figure 22-7
Site Coefficient, F_{PGA}	1.181	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.258g	Section 11.8.3 (Eq. 11.8-1)

Conformance to the criteria presented in Tables 7.1a and 7.1b for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid structural damage, since such design may be economically prohibitive.

7.2 Seismic Design Criteria (Caltrans)

The following seismic design criteria was developed in accordance with Caltrans' 2013 *Seismic Design Procedure*. This procedure is based on Caltrans' current *Seismic Design Criteria (Appendix B), ARS Online Report*, *Geotechnical Services Design Manual*, and USGS probabilistic seismic hazard analysis and tools. Site-specific information used in the procedure included the latitude of 39.2929° N and the longitude of -121.1949° W.

Based on Caltrans' web-based ARS Online application (V2.3.06, accessed May 5, 2015) and associated reports, the controlling faults for potential earthquake ground motions at the site are summarized in Table 7.2.

TABLE 7.2
FAULT INFORMATION

Fault Name	Foothills Fault System (Spenceville Fault)	Foothills Fault System (Swain Ravine Fault)	Foothills Fault System (Highway 49 Fault)
Fault ID#	81	71	424
M_{Max}	6.5	6.5	6.2
Fault Type	N	N	N
Fault Dip	50°	50°	50°
Dip Direction	W	W	W
Top of Rupture	0 km	0 km	0 km
Bottom of Rupture	10.0 km	10.0 km	10.0 km
Distance to Site (R_{RUP})	19.28 km	20.08 km	22.37 km
Depth to rock with Shear Wave Velocity of 1 km/sec ($Z_{1.0}$)	n/a*	n/a*	n/a*
Depth to rock with Shear Wave Velocity of 2.5 km/sec ($Z_{2.5}$)	n/a*	n/a*	n/a*

***Note**: Site is not located within sedimentary basin as mapped/defined by Caltrans' *Seismic Design Criteria (Appendix B);* therefore, Basin Factors are not applicable.
km = kilometer

Based on the subsurface conditions at the site and our review of the as-built LOTBs prepared for the adjacent Pleasant Valley Road Bridge, site soils most closely reflect a Caltrans Soil Type C. A shear wave velocity in the top 30 meters, V_{s30}, of approximately 400 meters per second (m/sec) is considered appropriate for the soil profile for the purposes of seismic design.

Deterministic and probabilistic response spectra were estimated using Caltrans' *Deterministic Response Spectrum Spreadsheet, Probabilistic Response Spectrum Spreadsheet* (after USGS), *2008 USGS National Seismic Hazard Map,* and the *ARS Online* web tools. Since the distances of the controlling faults are less than 25 kilometers, near-field factors were applied in the analysis. The recommended design response spectrum is presented on Figure 6.

8.0 FOUNDATION RECOMMENDATIONS

In collaboration with the project designers and considering the subsurface conditions and constructability, spread footings and/or micropile foundations are considered appropriate for the project. As currently envisioned, spread footings may bear directly on bedrock (North Abutment) or within the dense, rocky alluvial soil (south abutment). Due to high variability and the presence of significant voids, we do not recommend new spread footings bearing within existing fill. We note that using micropile foundations may result in less excavation and therefore reduce the risk of damaging the existing abutments and wingwalls. Specific details and recommended design parameters for each foundation type is presented in the following sections.

8.1 Spread Footings

Spread footings may bear directly on bedrock (North Abutment) or within the dense, rocky alluvial soil (South Abutment). Footings should be embedded deep enough into the bearing material to provide confinement, protection against potential scour, and to not surcharge adjacent existing retaining walls to remain. Spread footings may be designed using the allowable bearing capacities provided in Table 8.1.

TABLE 8.1
SPREAD FOOTING ALLOWABLE CAPACITIES

Location	Allowable Bearing Capacity (psf)[1]	
	Dead + Live	**Dead+Live+Seismic**
South Abutment[2]	4,000	5,300
North Abutment[3]	10,000	13,300

Notes:
1. *psf = pounds per square foot*
2. *Assumes footings bear within dense, rocky alluvium.*
3. *Assumes foundations directly on intact igneous rock.*

8.2 Micropiles

Micropiles consist of small-diameter, cast-in-place piles constructed by drilling a cased hole into a bearing layer, placing a reinforcing bar to the bottom of the hole, and pumping grout to form a bond zone as the casing is withdrawn. Worldwide use of micropiles has grown since their original development in the 1950s, and in particular since the mid-1980s. The advantages of micropiles are that their installation procedure causes minimal vibration and noise, they can be installed in difficult ground conditions (such as soil profiles with cobbles and boulders), and they can be used in areas with low headroom and restrictive access.

Micropiles are typically contractor-designed and installed, as there are numerous installation techniques/construction methods available that will directly affect installed capacity. For this project, we anticipate Type A (gravity grout only) micropiles will be used, since pressure grouting in bedrock would have limited effectiveness in increasing bond stress. Micropiles should have a minimum diameter of 7 inches and consist of 0.5-inch wall (minimum) steel casing that is grouted to provide a high-capacity pile. The casing length and plunge length should be determined by the structural engineer. We recommend that the micropile casing extend into bedrock at both abutment locations. An ultimate bond stress of 200 psi should be possible for micropiles bonded within igneous bedrock. This bond stress value is estimated and may be variable due to the contractor's installation method, grouting procedures, as well as variations in subsurface conditions.

Load tests will be required to verify the design and load capacity of the micropiles. Two types of load tests should be performed: verification tests and proof tests. Prior to commencing production pile installation, verification tests on at least one sacrificial pile at each pier location should be performed to confirm the contractor's installation method, design capacity, and bond length. The verification test piles should be tested in tension (uplift) to a minimum of 200% of the maximum design load in accordance with American Society for Testing and Materials (ASTM) D3689. Proof tests should be performed on each of the production piles by applying a tension (uplift) load of 150% of the maximum design load. A successful load test will typically sustain the test load for at least one log cycle of time (1 to 10 minutes) with less than 0.04 inch of movement. In addition, the maximum allowable deflection at the test load needs to be established by the structural engineer.

The contractor should prepare a complete design-build submittal with design details, calculations, proposed testing procedures, and acceptance criteria. Geocon should perform a geotechnical review of the design-build submittal.

8.3 Foundation Excavations

Due to the variable consistency of existing fill, sloughing and caving is possible and flatter excavation slopes may be necessary. Temporary excavation slopes must meet California Division of Occupational Safety and Health (Cal-OSHA) requirements as appropriate. We anticipate that the fill and alluvium will be classified as Cal-OSHA "Type C" soil. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate conditions and to make appropriate recommendations where necessary. It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements.

8.4 Abutment Walls/Wingwalls

The project designer should evaluate the conditions of the abutment wall/wingwall retaining structures (restrained or non-restrained) and use the appropriate design parameters. Walls allowed to rotate more than 0.001H (where H equals the retained height of the wall) at the top of the wall are considered non-restrained. Non-restrained walls having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid density of 35 pounds per cubic foot (pcf). Restrained walls should be designed for an equivalent fluid pressure of 55 pcf. For retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent of 2 feet of fill soil (unit weight of 125 pcf) should be added.

Walls should have a back-drainage system similar to Caltrans' *Standard Plan BO-3, Bridge Detail 3-1* or an approved geocomposite chimney type drain material. The backdrainage system should provide positive drainage to daylight and be maintained such that it does not clog with debris and allow a buildup of hydrostatic pressure.

Backfill soil placed behind abutment walls and wing walls should be primarily granular in nature and conform to Caltrans requirements for structural fill (*Standard Specifications 19-3.06).* All structural backfill should be compacted to 95 percent of the maximum density as determined by ASTM D 1557-02. All compaction on the project should be based on this test method.

9.0 CONSTRUCTION CONSIDERATIONS

Areas to be developed should be cleared and stripped of obstructions, trees, bushes, grass, roots, and the upper few inches of soil containing organic debris. Soils/organics removed by stripping can be transported offsite or stockpiled for use in landscaping. Existing drainage and utility lines or other existing subsurface structures that are not to be utilized, if any, should be removed, destroyed or abandoned in compliance with applicable regulations.

Existing fill and alluvium can be considered Cal-OSHA Type C soil. For temporary excavation purposes, a maximum slope ratio of 1.5:1 (horizontal:vertical) may be used for Type C soil up to 20 feet in height. The Contractor should provide appropriate shoring systems such as sheet piling or soldier beams for any unsupported excavations not meeting Cal-OSHA requirements. Recommendations concerning vertical shoring systems can be provided upon request. Temporary excavations should be in compliance with applicable governing agency regulations. The Contractor should also execute a monitoring program for structures in proximity to deep excavations so that appropriate modifications to the excavation/shoring system can be implemented to minimize the surface deflection or structure damage in a timely manner, if warranted. The contractor should also provide a temporary dewatering system if excavations extend below the groundwater elevation.

Foundation excavations should be observed by a representative of Geocon prior to the placement of reinforcing steel and concrete. Pile installation should also be observed by a representative of Geocon. If unanticipated soil conditions are encountered, foundation modifications may be required.

10.0 CLOSURE

10.1 Foundation Plan Review

Geocon should review the foundation plans prior to final design submittal to determine whether additional analysis and/or recommendations are required.

10.2 Limitations and Uniformity of Conditions

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

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

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years. Our professional services were performed in accordance with generally acceptable geotechnical engineering principles and practices in the site area at this time. No warranty is provided, either express or implied.

11.0 REFERENCES

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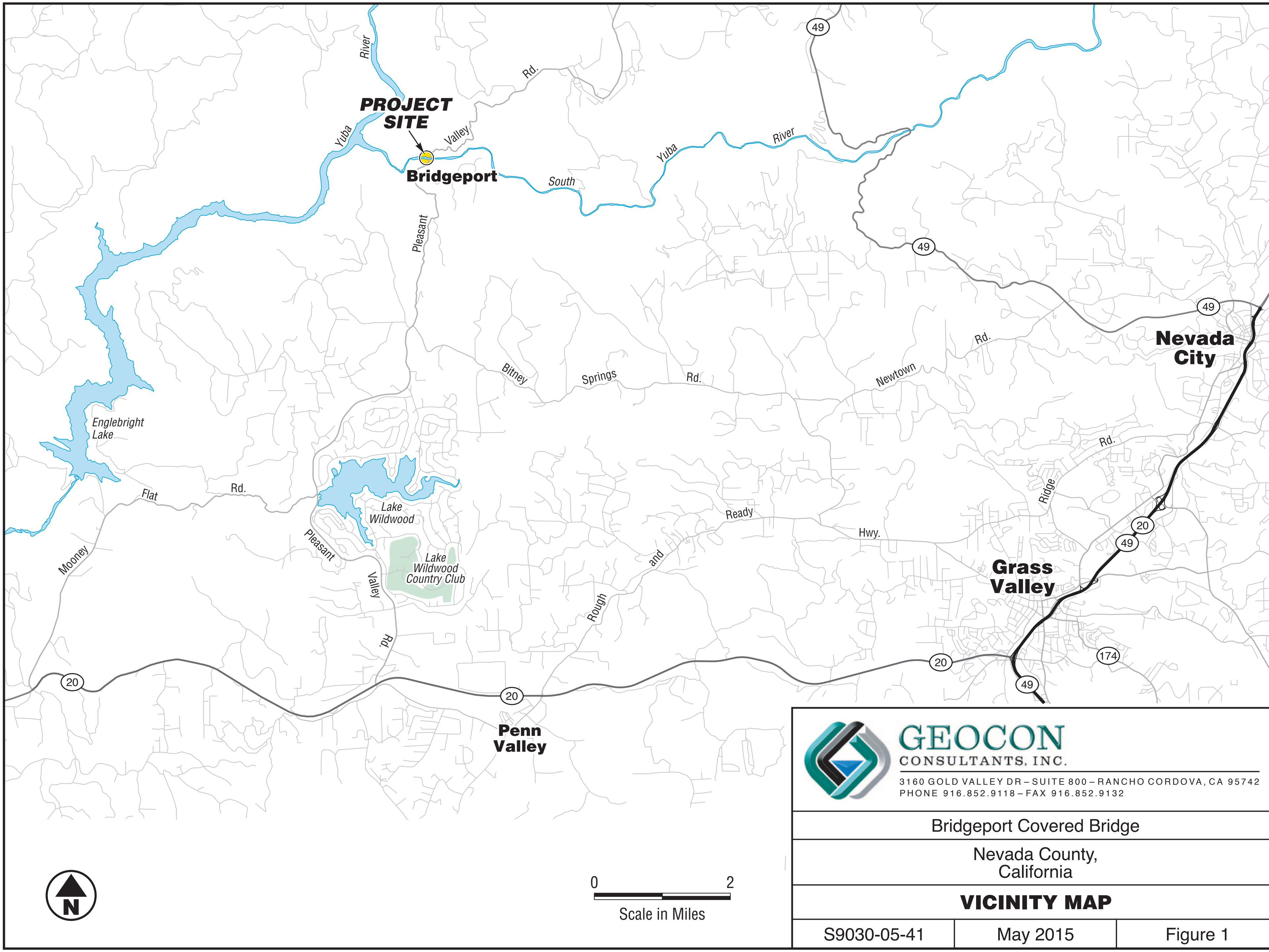

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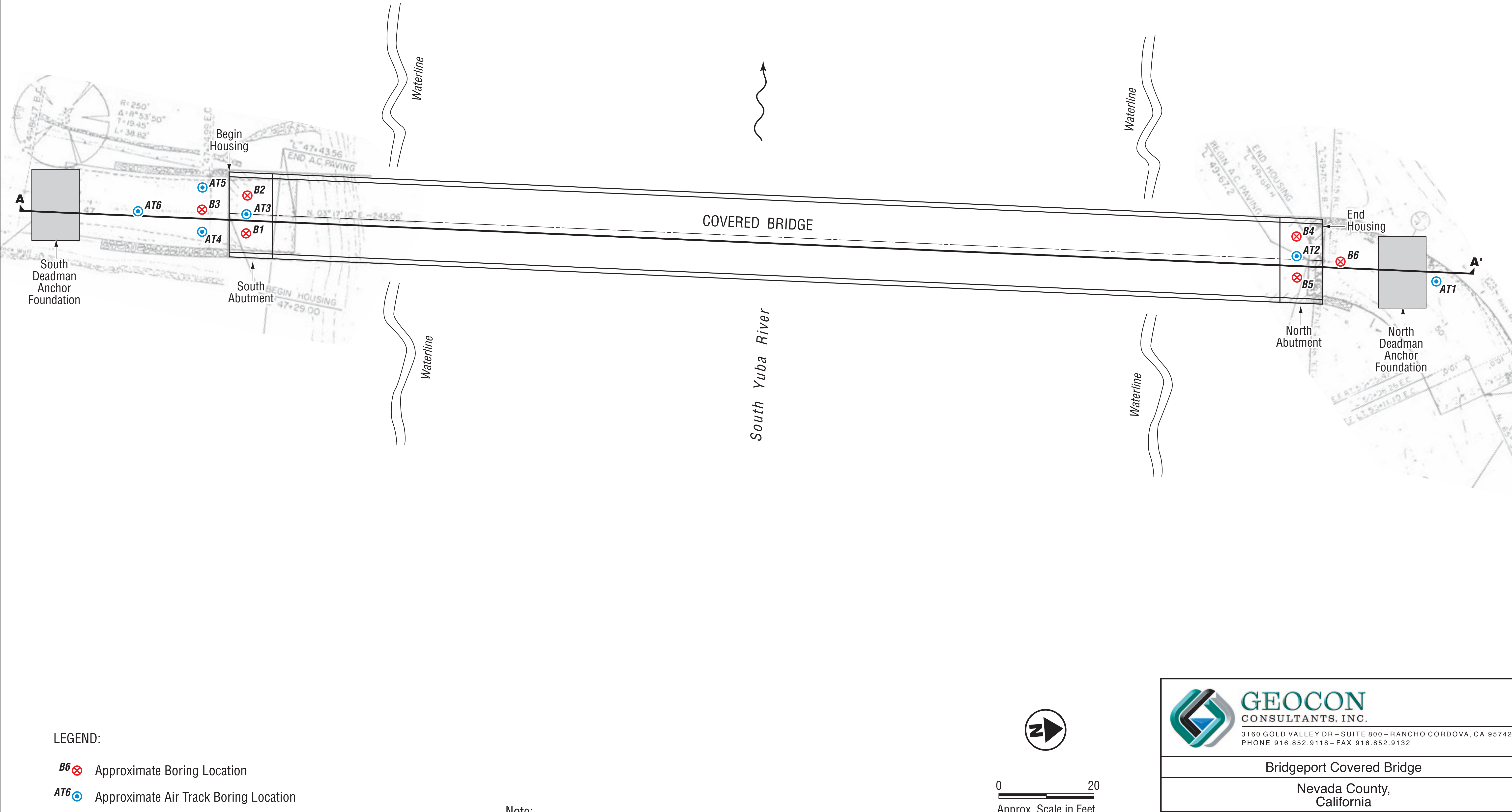
Bridgeport Covered Bridge

Nevada County, California

VICINITY MAP

S9030-05-41	May 2015	Figure 1



LEGEND:

B6 ⊗ Approximate Boring Location

AT6 ⊙ Approximate Air Track Boring Location

A—A' Approximate Cross-Section Location (Figure 3)

Note:

Bridge and layout details are approximate, as estimated from multiple historic plans and various field measurements

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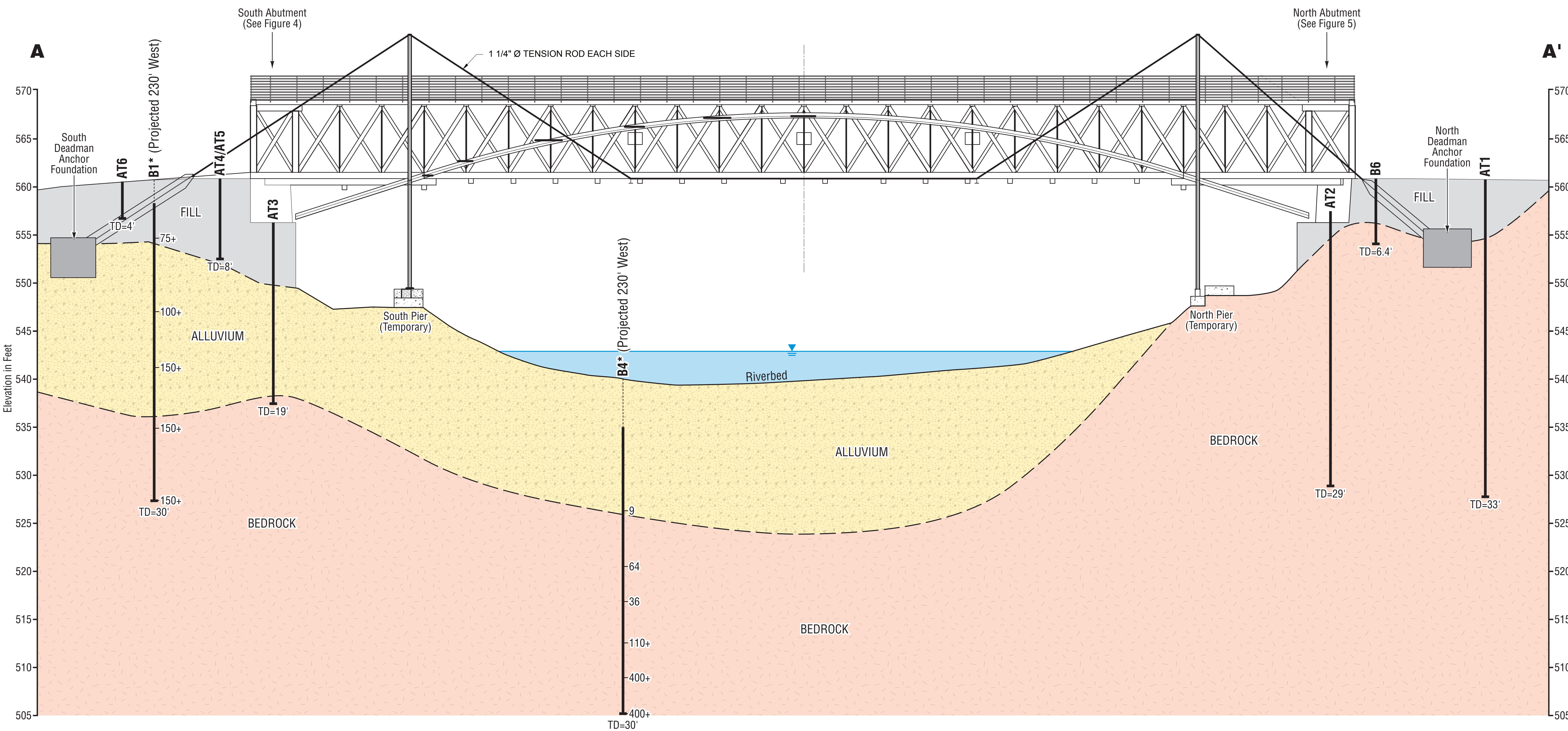
Nevada County, California

SITE PLAN

S9030-05-41	May 2015	Figure 2



AT1 — Boring Location (Geocon 2015)

100+ — Blow Count

TD=Total Depth

Fill (Loose sandy SILT with gravel, cobble, and boulders, numerous voids)

Alluvium (Dense Cobbles and boulders with sand)

Bedrock (Variably weathered granitic rock - quartz diorite and tonalite)

* Borings from *New Bridgeport (Pleasant Valley Road) Bridge Across Yuba River (Bridge 17C-55)*, Moore and Taber, 2/10/71

Note:
Bridge and layout details are approximate, as estimated from multiple historic plans and various field measurements

Vertical Scale in Feet: 0, 10
Horizontal Scale in Feet: 0, 20
Note: 2X Vertical Exaggeration

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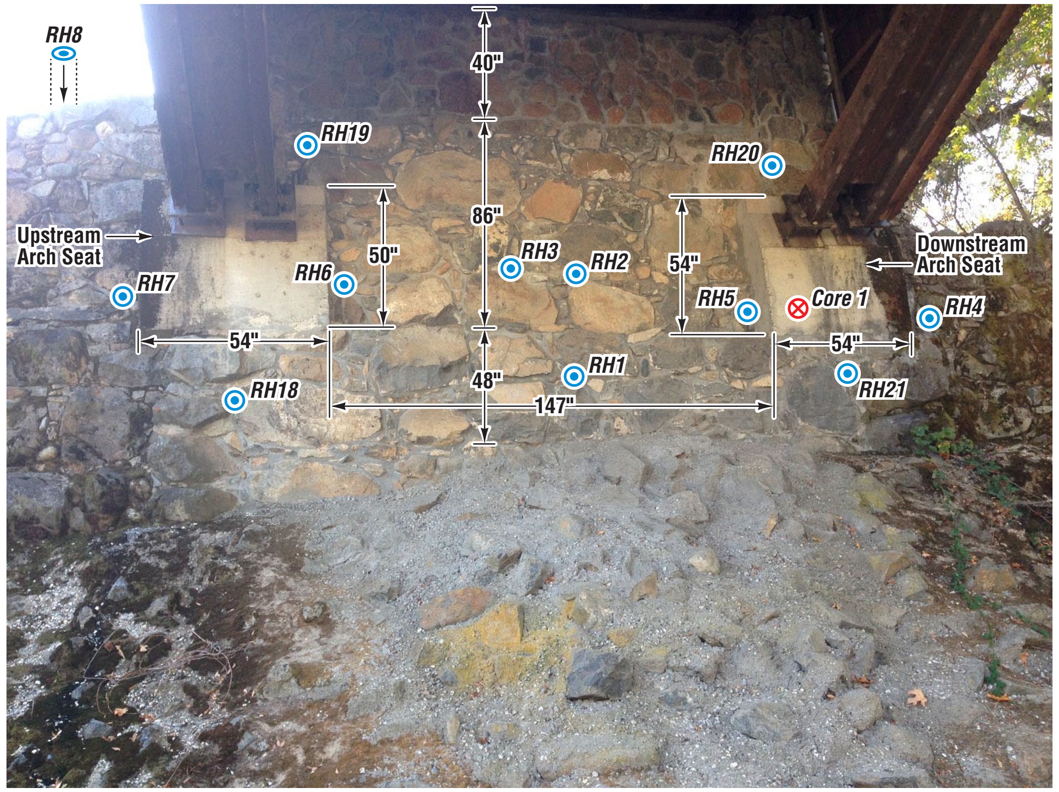
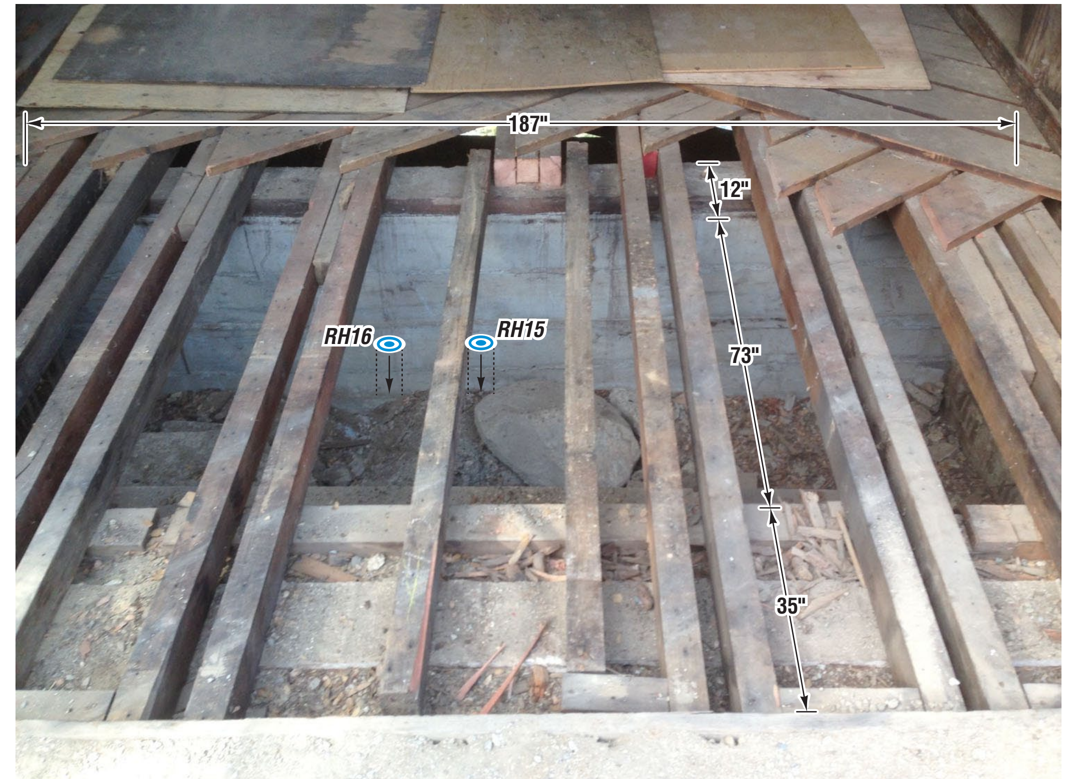
CROSS-SECTION A – A'

S9030-05-41	May 2015	Figure 3



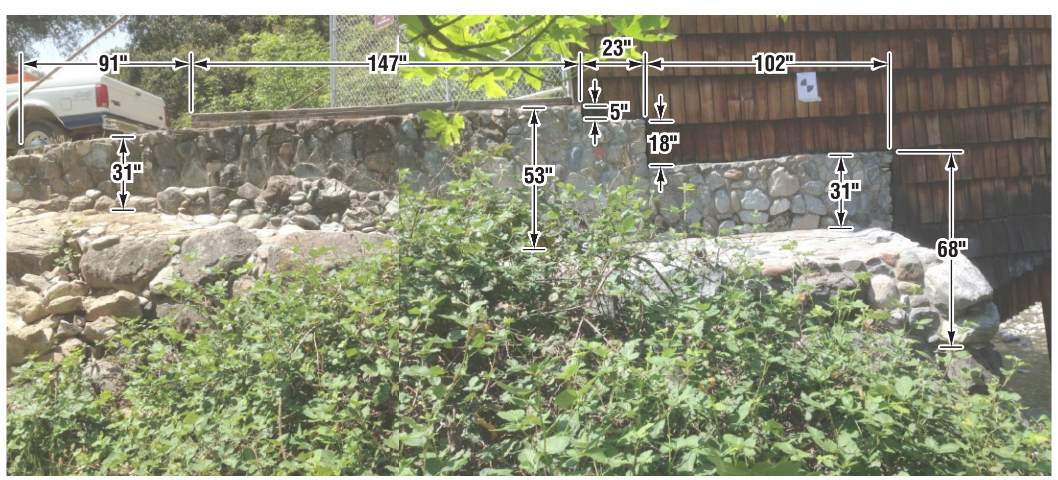
Abutment Face



Back Side of Abutment Face
(as viewed from above)

South Abutment Exploration Details

Rotohammer No.	Concrete/Grout Thickness	Behind face composition
Core 1	11"	Cored 13", last 2" was Rock
RH1	9"	Void/Soil to 15", Rock Refusal
RH2	2"	Void, ~5'
RH3	4"	Void to 13", Rock Refusal
RH4	4"	Angled towards RH5, 9" Soil, Rock Refusal
RH5	24"	Angled towards RH4, Solid/Rock for 24"
RH6	5"	Angled towards RH7, Void/Soil (tan Sandy SILT) for 10" to Rock Refusal
RH7	4"	Angled towards RH6, Void/Soil (brown lean CLAY) for 13"
RH8	10"	Void/Soil (tan Sandy SILT) for 24"
RH15	3"	Void/Soil to 24"
RH16	9"	Voids and Rocks to 15", Refusal
RH18	3"	3-12" dry stack rock, 12-19" conc./grout, 19" Refusal
RH19	1"	1-18.5" m-f tan sand, 18.5-19" grout, 18.5-23" soil/voids
RH20	16"	Refusal on rock at 16"
RH21	3"	3-13" Sand/voids, 13-17" grout/conc., 17" Refusal



Upstream Abutment Profile

Downstream Abutment Profile

LEGEND:

- ⊗ Approximate Core Sample Location
- ◉ Approximate Rotohammer Exploration Location

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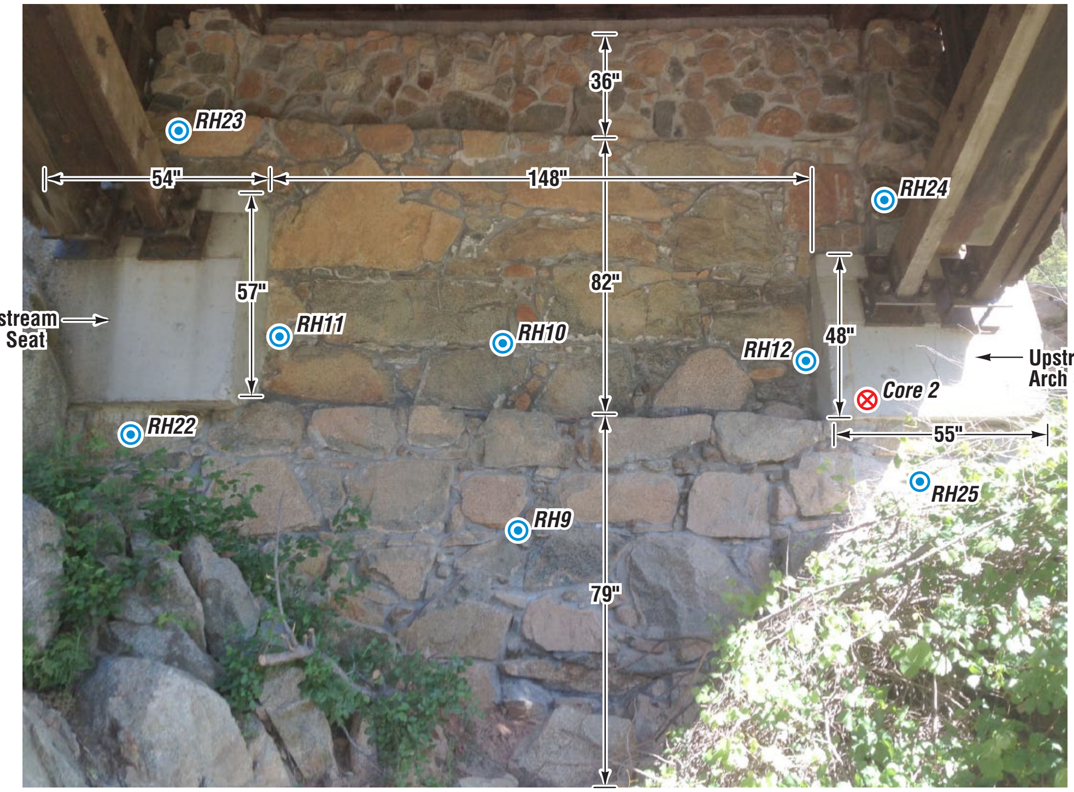
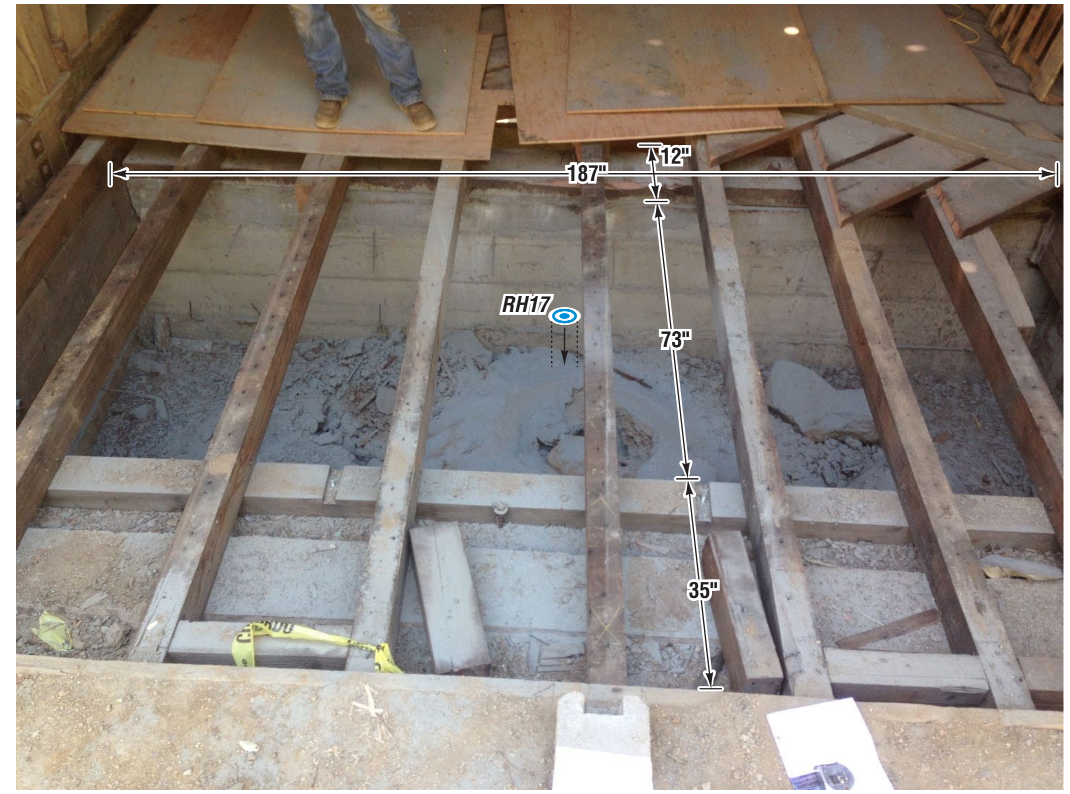
South Abutment Details

S9030-05-41	May 2015	Figure 5



Abutment Face

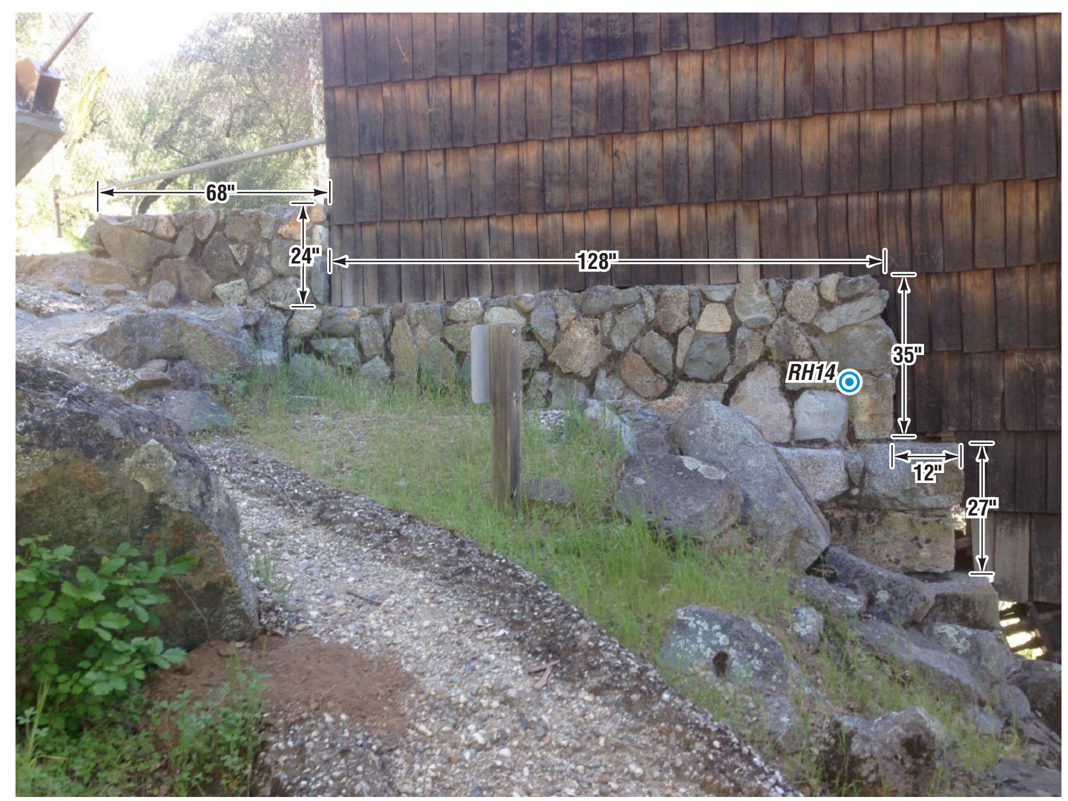


Back Side of Abutment Face
(as viewed from above)

North Abutment Exploration Details

No.	Concrete/Grout Thickness	Behind face composition
Core 2	13"	Core Broke off at Rock at end of core
RH9	2"	Soil to 24"
RH10	3"	Soil to 24"
RH11	3"	Soil/Voids to 24"
RH12	3"	Soil/Voids to rock at 15"
RH13	3"	Soil/Voids and Rocks to 24"
RH14	3"	Soil/Void to 24"
RH17	9"	Rocks and Voids/Soil to 24"
RH22	4"	4-11" Sandy SILT/Voids (dry stacked rock), 11-14" grout/conc., 14" Refusal
RH23	3"	3-12" Soil/Void, 12" grout/conc., 12.5-23" soil/void
RH24	4"	4-23" void (dry stacked rock)
RH25	4"	4-17" Soil/grout/voids, closely spaced stacked rock, refusal at 19" on Rock

Upstream Abutment Profile



Downstream Abutment Profile

LEGEND:

⊗ Approximate Core Sample Location

⦿ Approximate Rotohammer Exploration Location

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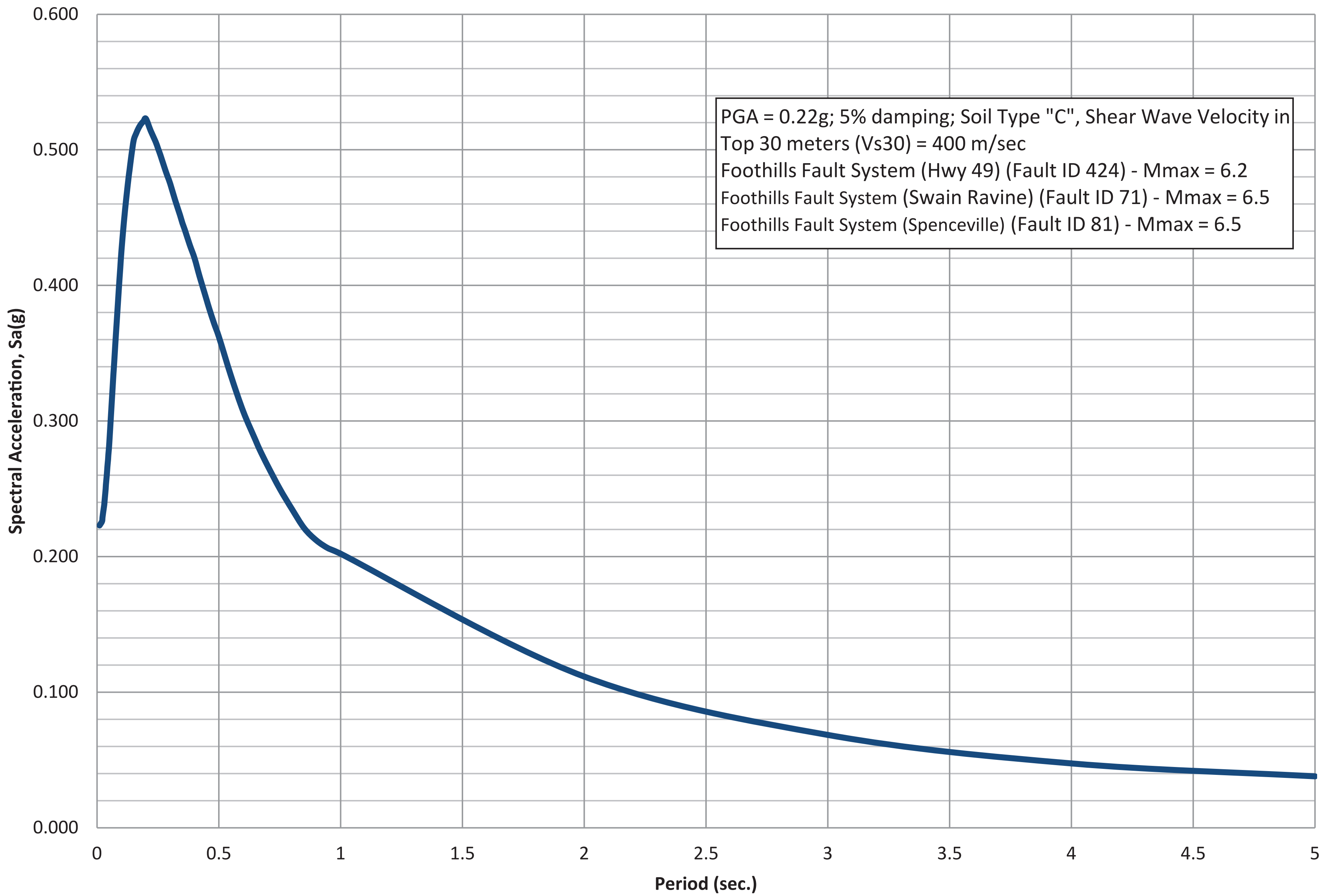
North Abutment Details

S9030-05-41	May 2015	Figure 4



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Recommended Design Response Spectrum

Bridgeport Covered Bridge

Nevada County, California

S9030-05-41	May 2015	Figure 6

Photo No. 1 Existing bridge as viewed from north to south

Photo No. 2 Existing bridge as viewed from below, south to north

PHOTOS NO. 1 & 2

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Photo No. 3 Bridge interior

Photo No. 4 Interim stabilization piers

PHOTOS NO. 3 & 4

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Photo No. 5   Tension anchor for interim stabilization

Photo No. 6   South tension anchor footing

PHOTOS NO. 5 & 6

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Bridgeport Covered Bridge

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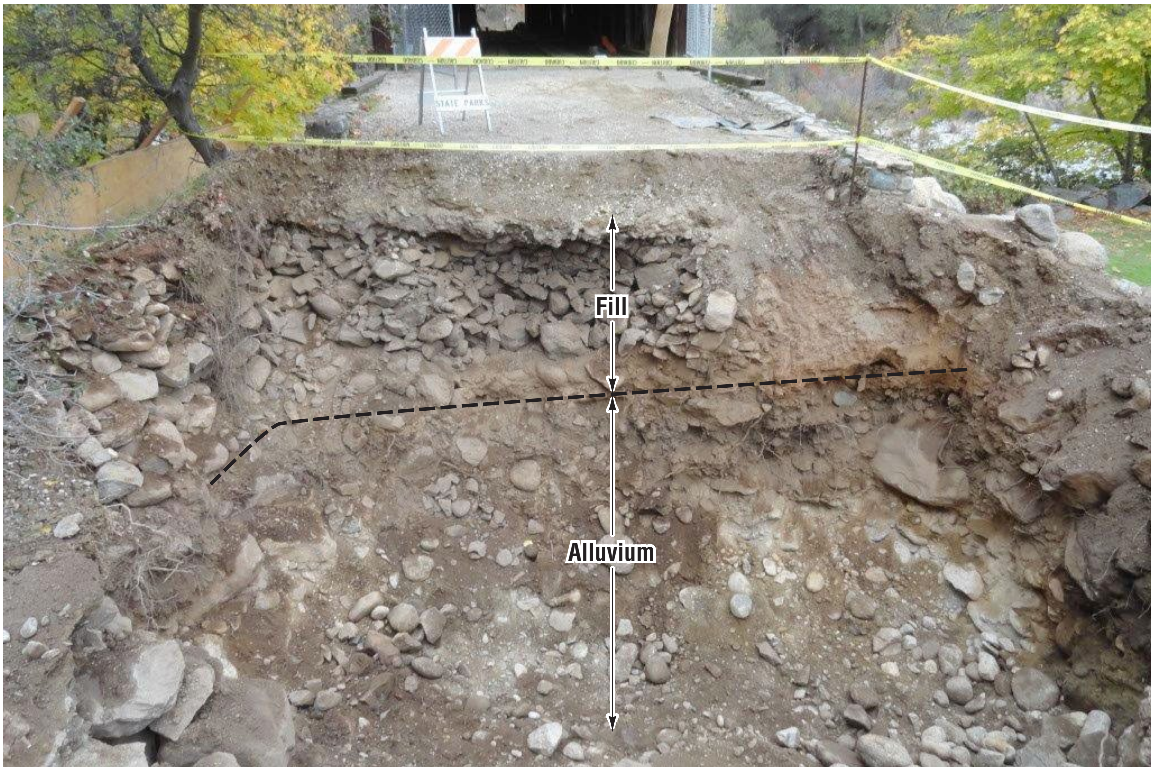

Photo No. 7 Typical subsurface conditions – south abutment area

Photo No. 8 Typical subsurface conditions – north abutment area

PHOTOS NO. 7 & 8

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Bridgeport Covered Bridge	
Nevada County, California	
GEOCON Project No. S9030-05-41	May 2015

APPENDIX A

APPENDIX A

FIELD EXPLORATION

Our field exploration program was performed during the period of April 8 through 17, 2015, and consisted of performing six exploratory borings (B1 through B6), six air-track borings (AT1 through AT6), two concrete cores (C1 and C2), and 25 exploratory drill holes (RH1 through RH25) at the abutments. Approximate exploration locations shown on the Site Plan (Figure 2), Cross-Section A-A’ (Figure 3), and Abutment Details (Figures 4 and 5).

Exploratory borings (B1 through B6) were performed using a track-mounted CME 75 drill rig equipped with 8-inch-diameter hollow-stem augers. Air-track borings (AT1 through AT6) were performed using a track-mounted Ingersoll Rand EM350 air-track rig equipped with a 3½-inch-diameter button bit. Sampling in borings B1 through B6 was accomplished using an automatic 140-pound hammer with a 30-inch drop. Samples were obtained with a 3-inch outside diameter (OD), split spoon (California Modified) sampler and a 2-inch OD Standard Penetration Test (SPT) sampler. The number of blows required to drive the samplers the last 12 inches of the 18-inch sampling interval (or portion thereof) were recorded on the boring logs. Sampling was not performed in the air-track borings. Upon completion, borings were backfilled with the excavated material.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488-90). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, drill rig penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing. A Key to Logs is presented as Figure A1. Logs of the exploratory borings are presented as Figures A2 through A13.

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC	CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS WITH OR WITHOUT GRAVEL
			SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL	ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS		PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

BORING/TRENCH LOG LEGEND

- No Recovery
- Shelby Tube Sample
- Bulk Sample
- SPT Sample
- Modified California Sample
- Groundwater Level (At Completion)
- Groundwater Level (Seepage)

PENETRATION RESISTANCE

SAND AND GRAVEL			SILT AND CLAY			
RELATIVE DENSITY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	CONSISTENCY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	COMPRESSIVE STRENGTH (tsf)
VERY LOOSE	0 - 4	0 - 6	VERY SOFT	0 - 2	0 - 3	0 - 0.25
LOOSE	5 - 10	7 - 16	SOFT	3 - 4	4 - 6	0.25 - 0.50
MEDIUM DENSE	11 - 30	17 - 48	MEDIUM STIFF	5 - 8	7 - 13	0.50 - 1.0
DENSE	31 - 50	49 - 79	STIFF	9 - 15	14 - 24	1.0 - 2.0
VERY DENSE	OVER 50	OVER 79	VERY STIFF	16 - 30	25 - 48	2.0 - 4.0
			HARD	OVER 30	OVER 48	OVER 4.0

*NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE LAST 12 INCHES OF AN 18-INCH DRIVE

MOISTURE DESCRIPTIONS

FIELD TEST	APPROX. DEGREE OF SATURATION, S (%)	DESCRIPTION
NO INDICATION OF MOISTURE; DRY TO THE TOUCH	S<25	DRY
SLIGHT INDICATION OF MOISTURE	25≤S<50	DAMP
INDICATION OF MOISTURE; NO VISIBLE WATER	50≤S<75	MOIST
MINOR VISIBLE FREE WATER	75≤S<100	WET
VISIBLE FREE WATER	100	SATURATED

QUANTITY DESCRIPTIONS

APPROX. ESTIMATED PERCENT	DESCRIPTION
<5%	TRACE
5 - 10%	FEW
11 - 25%	LITTLE
26 - 50%	SOME
>50%	MOSTLY

GRAVEL/COBBLE/BOULDER DESCRIPTIONS

CRITERIA	DESCRIPTION
PASS THROUGH A 3-INCH SIEVE AND BE RETAINED ON A NO. 4 SIEVE (#4 TO 3")	GRAVEL
PASS A 12-INCH SQUARE OPENING AND BE RETAINED ON A 3-INCH SIEVE (3"-12")	COBBLE
WILL NOT PASS A 12-INCH SQUARE OPENING (>12")	BOULDER

BEDDING SPACING DESCRIPTIONS

THICKNESS/SPACING	DESCRIPTOR
GREATER THAN 10 FEET	MASSIVE
3 TO 10 FEET	VERY THICKLY BEDDED
1 TO 3 FEET	THICKLY BEDDED
3 5/8-INCH TO 1 FOOT	MODERATELY BEDDED
1 1/4-INCH TO 3 5/8-INCH	THINLY BEDDED
3/8-INCH TO 1 1/4-INCH	VERY THINLY BEDDED
LESS THAN 3/8-INCH	LAMINATED

STRUCTURE DESCRIPTIONS

CRITERIA	DESCRIPTION
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST 1/4-INCH THICK	STRATIFIED
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN 1/4-INCH THICK	LAMINATED
BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	FISSURED
FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	SLICKENSIDED
COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALLER ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN	BLOCKY
INCLUSION OF SMALL POCKETS OF DIFFERENT SOIL, SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY	LENSED
SAME COLOR AND MATERIAL THROUGHOUT	HOMOGENOUS

CEMENTATION/INDURATION DESCRIPTIONS

FIELD TEST	DESCRIPTION
CRUMBLES OR BREAKS WITH HANDLING OR LITTLE FINGER PRESSURE	WEAKLY CEMENTED/INDURATED
CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE	MODERATELY CEMENTED/INDURATED
WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE	STRONGLY CEMENTED/INDURATED

IGNEOUS/METAMORPHIC ROCK STRENGTH DESCRIPTIONS

FIELD TEST	DESCRIPTION
MATERIAL CRUMBLES WITH BARE HAND	WEAK
MATERIAL CRUMBLES UNDER BLOWS FROM GEOLOGY HAMMER	MODERATELY WEAK
1/8-INCH INDENTATIONS WITH SHARP END FROM GEOLOGY HAMMER	MODERATELY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **ONE** BLOW FROM GEOLOGY HAMMER	STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **COUPLE** BLOWS FROM GEOLOGY HAMMER	VERY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **MANY** BLOWS FROM GEOLOGY HAMMER	EXTREMELY STRONG

IGNEOUS/METAMORPHIC ROCK WEATHERING DESCRIPTIONS

DEGREE OF DECOMPOSITION	FIELD RECOGNITION	ENGINEERING PROPERTIES
SOIL	DISCOLORED, CHANGED TO SOIL, FABRIC DESTROYED	EASY TO DIG
COMPLETELY WEATHERED	DISCOLORED, CHANGED TO SOIL, FABRIC MAINLY PRESERVED	EXCAVATED BY HAND OR RIPPING (Saprolite)
HIGHLY WEATHERED	DISCOLORED, HIGHLY FRACTURED, FABRIC ALTERED AROUND FRACTURES	EXCAVATED BY HAND OR RIPPING, WITH SLIGHT DIFFICULTY
MODERATELY WEATHERED	DISCOLORED, FRACTURES, INTACT ROCK-NOTICEABLY WEAKER THAN FRESH ROCK	EXCAVATED WITH DIFFICULTY WITHOUT EXPLOSIVES
SLIGHTLY WEATHERED	MAY BE DISCOLORED, SOME FRACTURES, INTACT ROCK-NOT NOTICEABLY WEAKER THAN FRESH ROCK	REQUIRES EXPLOSIVES FOR EXCAVATION, WITH PERMEABLE JOINTS AND FRACTURES
FRESH	NO DISCOLORATION, OR LOSS OF STRENGTH	REQUIRES EXPLOSIVES

IGNEOUS/METAMORPHIC ROCK JOINT/FRACTURE DESCRIPTIONS

FIELD TEST	DESCRIPTION
NO OBSERVED FRACTURES	UNFRACTURED/UNJOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1 TO 3 FOOT INTERVALS	SLIGHTLY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 4-INCH TO 1 FOOT INTERVALS	MODERATELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1-INCH TO 4-INCH INTERVALS WITH SCATTERED FRAGMENTED INTERVALS	INTENSELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT LESS THAN 1-INCH INTERVALS; MOSTLY RECOVERED AS CHIPS AND FRAGMENTS	VERY INTENSELY FRACTURED/JOINTED

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KEY TO LOGS

Figure A1

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B1

ELEV. (MSL.) **560 +-**	DATE COMPLETED **4/08/2015**
ENG./GEO. **Joshua Lewis**	DRILLER **All Well Abandonment, Inc.**
EQUIPMENT **Track-mounted CME75 w/ 8" HSA**	HAMMER TYPE **Automatic**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**FILL** Very dense, dry, bluish tan, COBBLE and BOULDERS (Granitic) - Rig chatter from surface			
1								
2								
	B1-2.0				- Refusal on Boulder	50/2.5"		

REFUSAL AT 2.7 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A2, Log of Boring, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B2

ELEV. (MSL.) **560 +-** DATE COMPLETED **4/08/2015**

ENG./GEO. **Joshua Lewis** DRILLER **All Well Abandonment, Inc.**

EQUIPMENT **Track-mounted CME75 w/ 8" HSA** HAMMER TYPE **Automatic**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**FILL** Very dense, dry, bluish tan, GRAVEL, COBBLE and BOULDERS (Granitic), some concrete at surface - Rig chatter from surface			
1								
2					- Refusal on Boulder	34		

REFUSAL AT 2.5 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A3, Log of Boring, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

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

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B3

ELEV. (MSL.) 560 +- DATE COMPLETED 4/08/2015

ENG./GEO. Joshua Lewis DRILLER All Well Abandonment, Inc.

EQUIPMENT Track-mounted CME75 w/ 8" HSA HAMMER TYPE Automatic

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**FILL** Medium dense, damp, tan, Silty medium- to fine-grained SAND with fine gravel			
3	B3-3.0							
	B3-3.5			ML	Very stiff, damp, light tan, medium- to fine-grained Sandy SILT with fine gravel	32		
5						50/5"		
6					**ALLUVIUM** Very dense, dry, bluish tan, COBBLE and BOULDERS (Granitic) - Rig chatter, harder drilling			
7	B3-7.5					50/2"		
8	B3-8.0				- No Recovery - Refusal on Boulder	50/1"		

REFUSAL AT 8.1 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A4, Log of Boring, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B4

ELEV. (MSL.) 560 +- DATE COMPLETED 4/08/2015

ENG./GEO. Joshua Lewis DRILLER All Well Abandonment, Inc.

EQUIPMENT Track-mounted CME75 w/ 8" HSA HAMMER TYPE Automatic

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**FILL** Very dense, dry, bluish tan, COBBLE and BOULDERS (Granitic) - Rig chatter from surface			
1								
2	B4-2.0				- Refusal on Boulder	50/5"		

REFUSAL AT 2.4 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A5, Log of Boring, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B5

ELEV. (MSL.) **560 +-** DATE COMPLETED **4/08/2015**

ENG./GEO. **Joshua Lewis** DRILLER **All Well Abandonment, Inc.**

EQUIPMENT **Track-mounted CME75 w/ 8" HSA** HAMMER TYPE **Automatic**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B5-0.0				**FILL** Very dense, dry, bluish tan, COBBLE and BOULDERS (Granitic) - Rig chatter from surface			
1					- Refusal on Boulder	50/5"		

REFUSAL AT 1.4 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A6, Log of Boring, page 1 of 1

IN PROGRESS S9030-05-41 BRIDGEPORT COVERED BRIDGE.GPJ 05/06/15

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

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

PROJECT NO. **S9030-05-41** PROJECT NAME **Bridgeport Covered Bridge**

BORING B6

ELEV. (MSL.) 560 +- DATE COMPLETED 4/08/2015

ENG./GEO. Joshua Lewis DRILLER All Well Abandonment, Inc.

EQUIPMENT Track-mounted CME75 w/ 8" HSA HAMMER TYPE Automatic

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SP	**FILL** Very dense, moist, brown, coarse- to fine-grained SAND, with gravel, trace clay			
3	B6-3.0							
	B6-3.5			GP	Very dense, moist, brown, Sandy GRAVEL with clay	58/8.5"		
					PLEASANT VALLEY PLUTON Highly weathered granitic rock, excavates as: Very dense, dry, bluish tan, COBBLE and BOULDERS (quartz, diorite, and tonalite) - Rig chatter, harder drilling			
	B6-5.0					50/6"		
6	B6-6.0				- No Recovery - Refusal on Boulder	50/5"		

REFUSAL AT 6.4 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

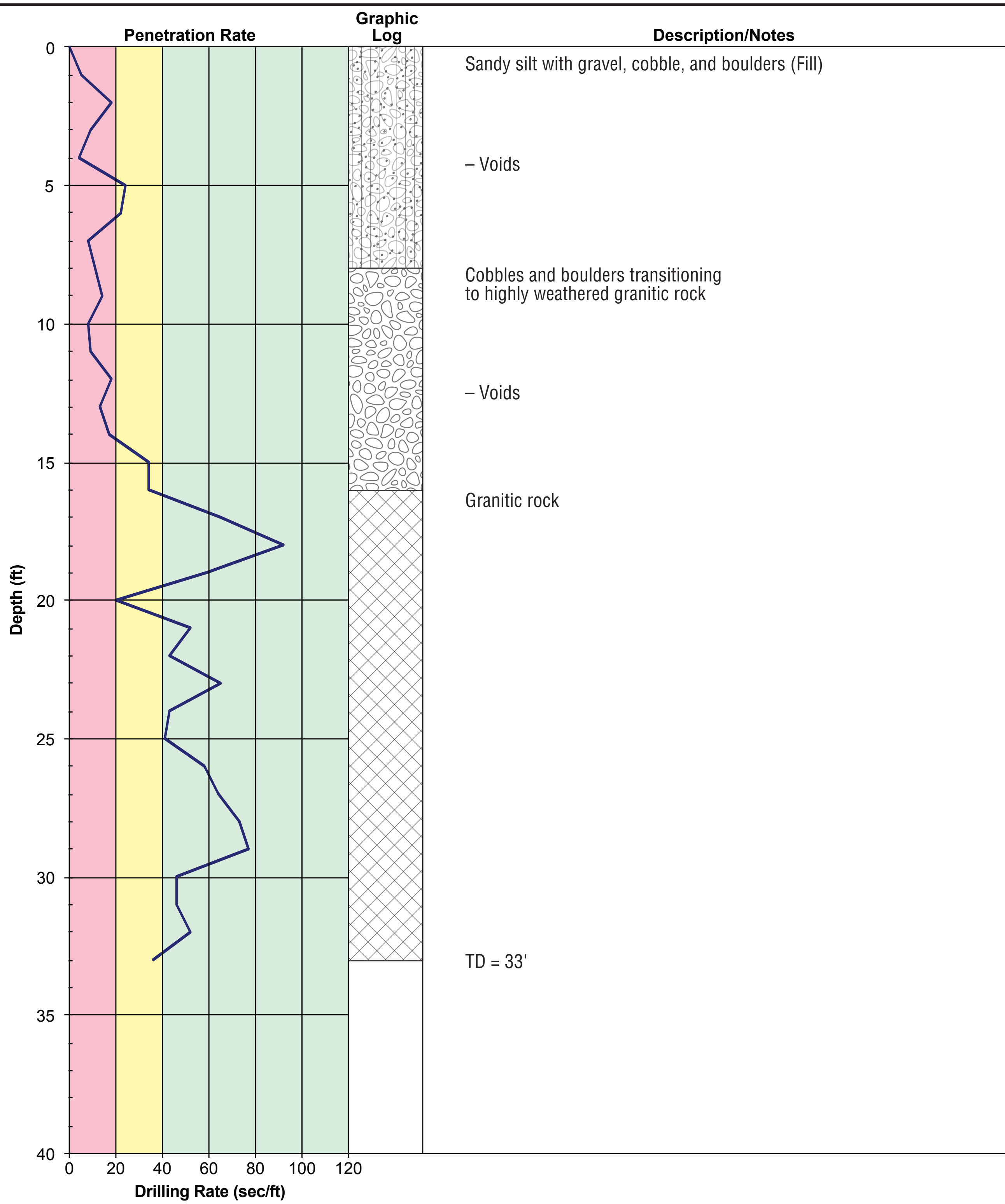
Figure A7, Log of Boring, page 1 of 1

IN PROGRESS S9030-05-41 BRIDGEPORT COVERED BRIDGE.GPJ 05/06/15

GEOCON

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

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



Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

Driller: California Drilling & Blasting Co., Inc.

Logged by: J. Lewis Date: 4/16/15

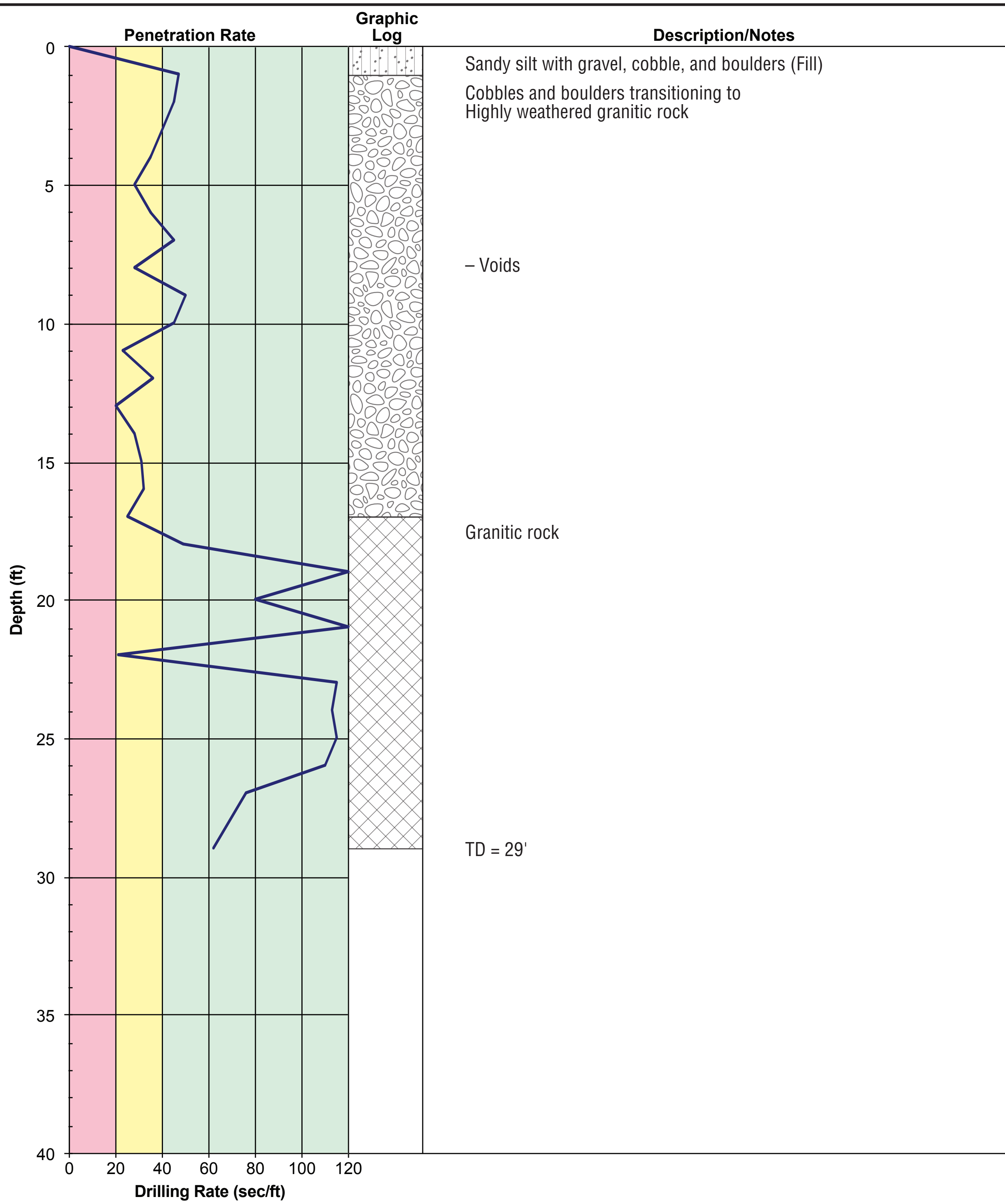
AIR-TRACK BORING AT1

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge

Nevada County, California

S9030-05-41	May 2015	Figure A8



Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

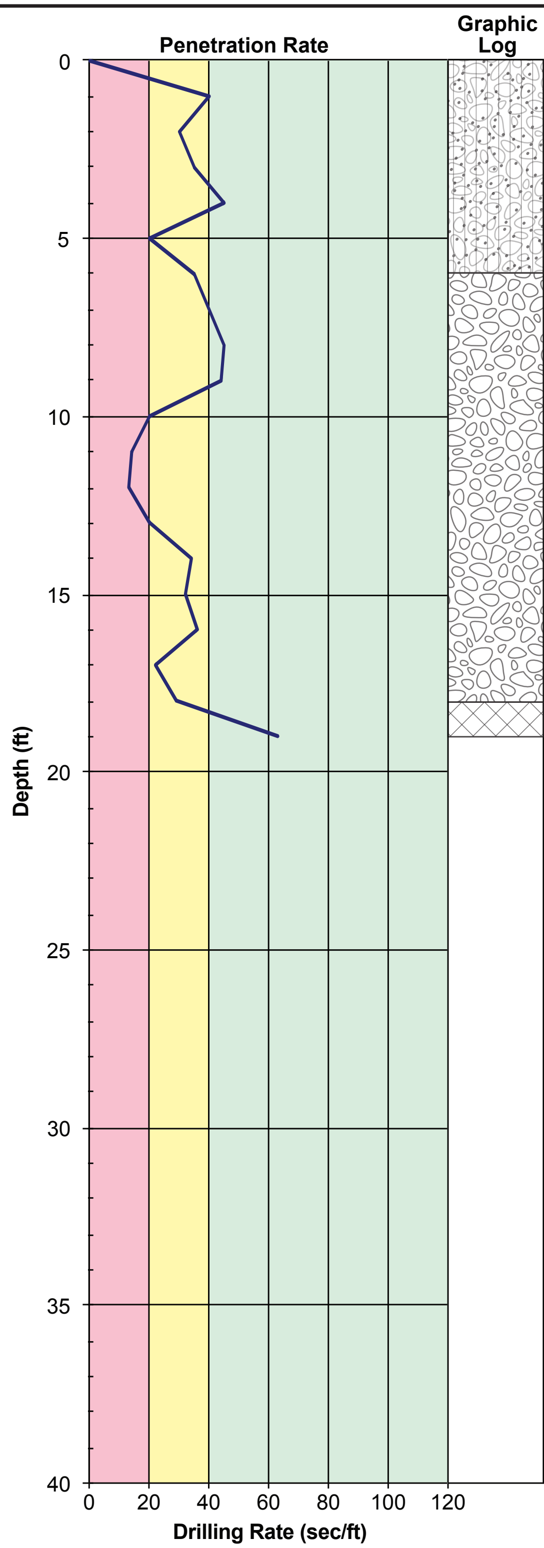
Driller: California Drilling & Blasting Co., Inc.

Logged by: J. Lewis   Date: 4/16/15

AIR-TRACK BORING AT2

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge		
Nevada County, California		
S9030-05-41	May 2015	Figure A9



Description/Notes

Sandy silt with gravel, cobble and boulders (Fill)

– Voids

Cobbles, boulders, sand (ALLUVIUM)

Weathered granitic rock
TD = 19'

Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

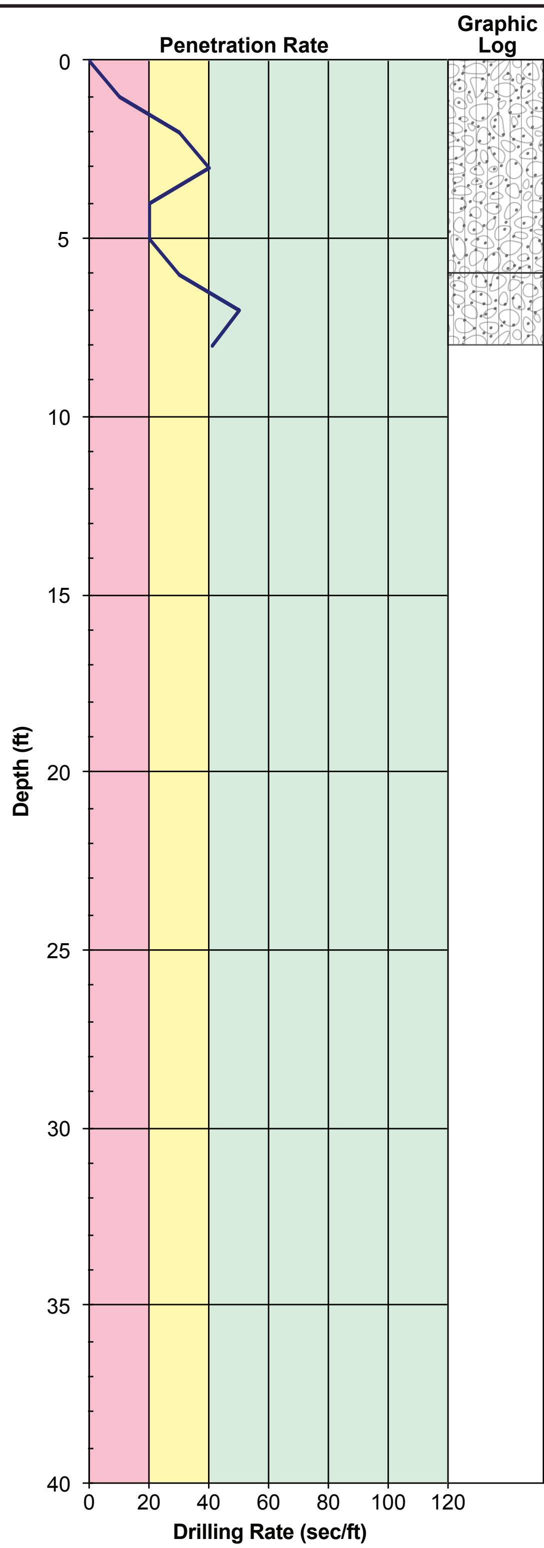
Driller: California Drilling & Blasting Co., Inc.

Logged by: J. Lewis Date: 4/16/15

AIR-TRACK BORING AT3

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge		
Nevada County, California		
S9030-05-41	May 2015	Figure A10



Description/Notes

Sandy silt with gravel, cobble, and boulders (Fill)

– Voids

Cobbles, boulders, sand (Alluvium)

TD = 8'

Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

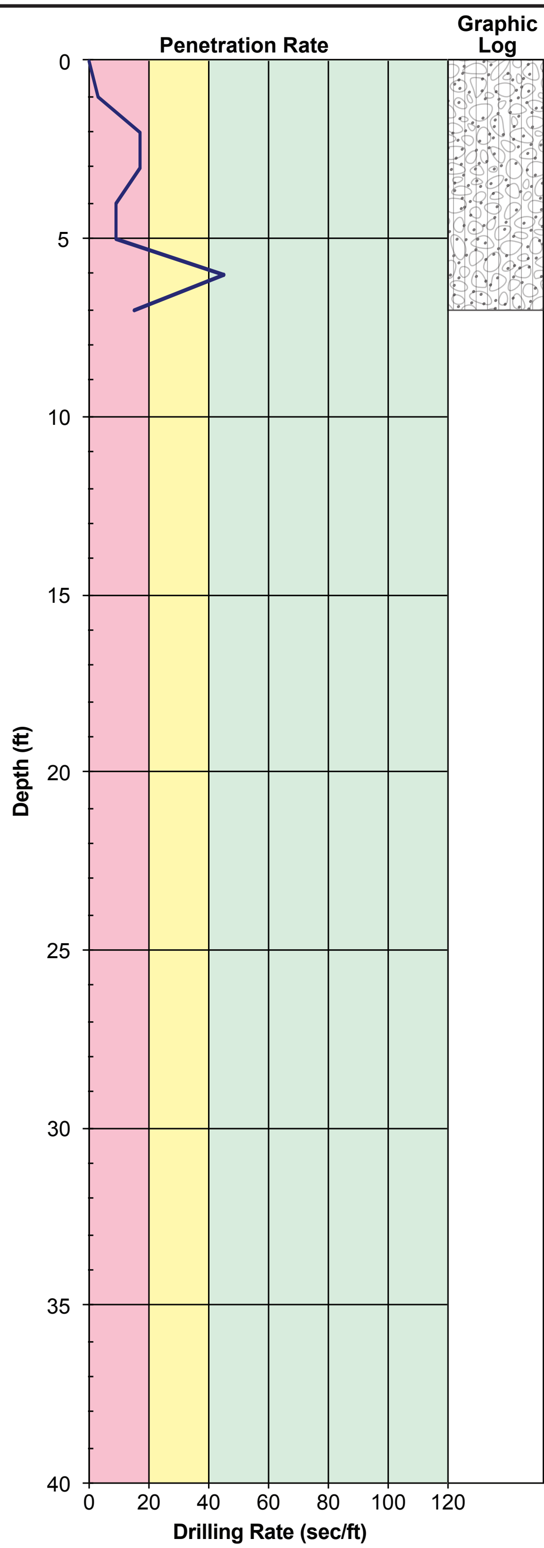
Driller: California Drilling & Blasting Co., Inc.

Logged by: J. Zorne   Date: 4/17/15

AIR-TRACK BORING AT4

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge		
Nevada County, California		
S9030-05-41	May 2015	Figure A11



Description/Notes

Sandy silt with gravel, cobble, and boulders (Fill)

– Voids

TD = 7' – Refusal

Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

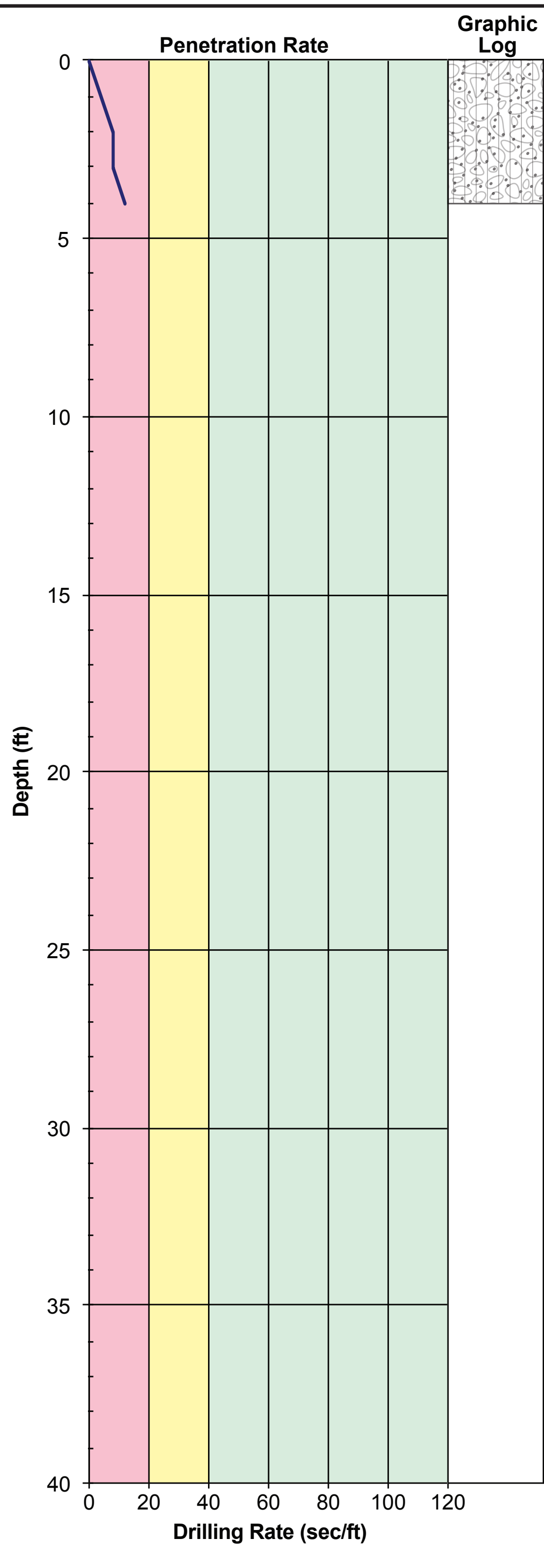
Drillers: California Drilling & Blasting Co., Inc.

Logged by: J. Zorne Date: 4/17/15

AIR-TRACK BORING AT5

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge		
Nevada County, California		
S9030-05-41	May 2015	Figure A12



Description/Notes

Sandy silt with gravel, cobble, and boulders (Fill)

– Voids

TD = 4' – Refusal

Estimated Subsurface Condition

- 0 - 20 sec/ft – Soil/Loose Cobble/FILL
- 20 - 40 sec/ft – Boulders/Highly Weathered Rock
- > 40 sec/ft – Bedrock

Drilling Equipment: Ingersoll Rand Airtrack EM350 3½" Button Bit

Driller: California Drilling & Blasting Co., Inc.

Logged by: J. Zorne Date: 4/17/15

AIR-TRACK BORING AT6

GEOCON CONSULTANTS, INC.

3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge

Nevada County, California

S9030-05-41	May 2015	Figure A13

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected soil samples were tested for their in-situ moisture content, grain size distribution, and corrosion potential. The results of the laboratory tests are presented on the following pages.

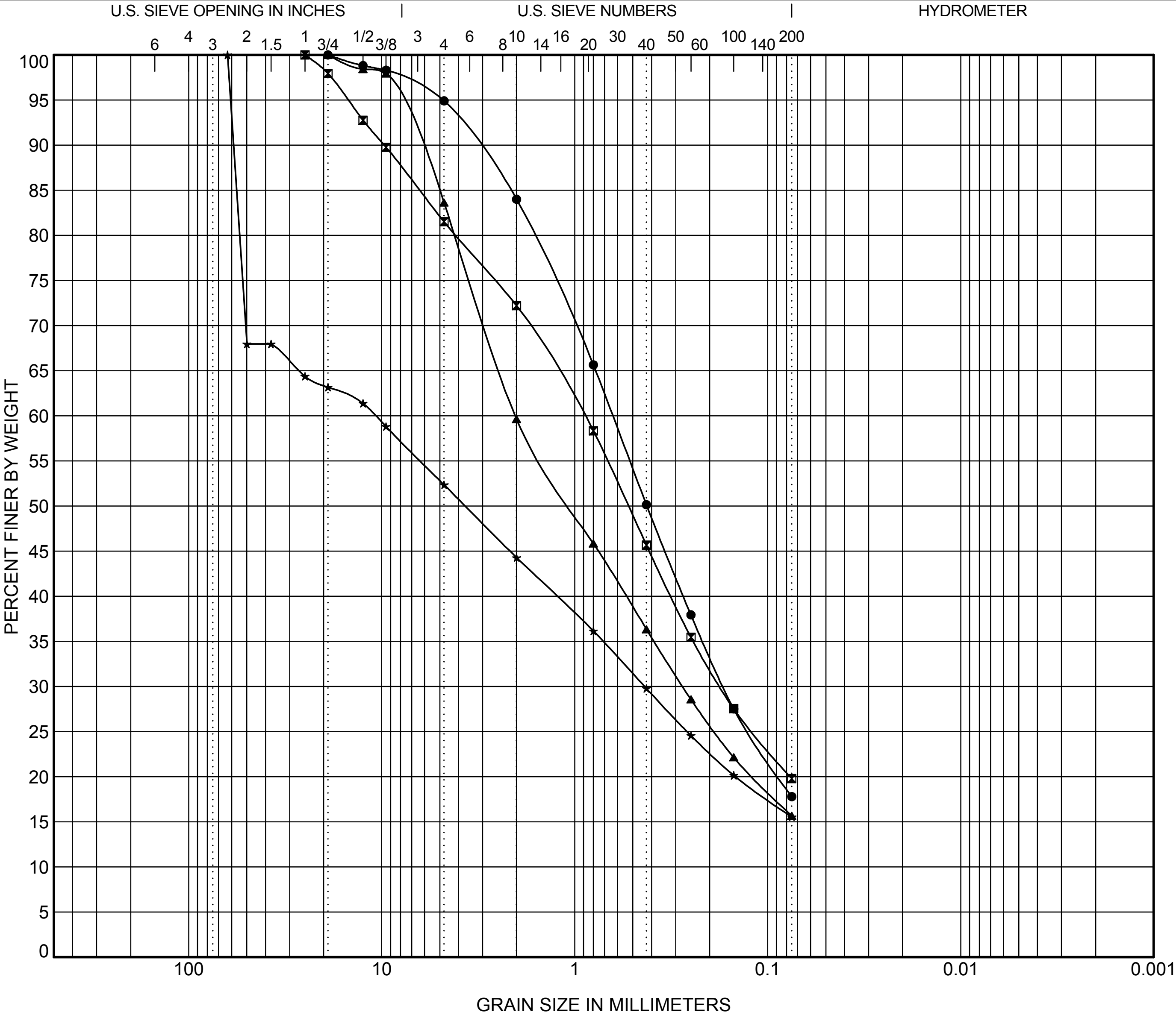
Sample ID	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Water Content (%)	Dry Density (pcf)
B3-3.0					-----	17.8	5.3	
B3-3.5					-----	19.8	3.1	
B6-3.0					-----	15.7	6.4	
B6-3.5					-----	15.5	7.3	

GEOCON

Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Telephone: 916-852-9118
Fax: 916-852-9132

Summary of Laboratory Results

Project: Bridgeport Covered Bridge
Location: Penn Valley, Nevada County, CA
Number: S9030-05-41
Figure: B1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample No.	Classification	LL	PL	PI	Cc	Cu
●	B3-3.0						
⧗	B3-3.5						
▲	B6-3.0						
★	B6-3.5						

	Sample No.	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B3-3.0	19	0.636	0.169		5.1	77.1	17.8	
⧗	B3-3.5	25	0.892	0.176		18.5	61.7	19.8	
▲	B6-3.0	19	2.027	0.276		16.4	68.0	15.7	
★	B6-3.5	63	10.787	0.434		47.7	36.8	15.5	

GEOCON
Geocon Consultants, Inc
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Telephone: 916-852-9118
Fax: 916-852-9132

GRAIN SIZE DISTRIBUTION (ASTM D422, D6913)

Project: Bridgeport Covered Bridge
Location: Penn Valley, Nevada County, CA
Number: S9030-05-41
Figure: B2

APPENDIX C

APPENDIX C

ARCH SEAT CONCRETE EVALUATION

- Concrete Core Photographs, Photos C1 and C2
- Concrete Core Compressive Strength Test Results

GEOCON
CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Unconfined Compressive Strength of Concrete Cores
(ASTM C42)

Project Name:	Bridgeport Covered Bridge	**Project No.:**	S9030-05-41
Coring Date:	8-Apr-15	**Test Date:**	May 5, 2015

TEST DATA

Sample ID	core weight (gms)	Dimensions, (in.)	Test Area (in.^{2})	Maximum Load (lbs)	Compressive Strength (psi)	Unit Weight (pcf)
Core 1 (SW Arch Seat)	316.2	1.73x3.45	2.35	16,427	6,990	148.6
Core 2 (NE Arch Seat)	321.1	1.73x3.46	2.35	17,077	7,270	150.6

Remarks:

Photo C1 Core C1 – south abutment arch seat

Photo C2 Core C2 – north abutment arch seat

CORE PHOTOS NO. C1 & C2

GEOCON
CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Bridgeport Covered Bridge

Nevada County, California

GEOCON Project No. S9030-05-41 | May 2015

APPENDIX D

APPENDIX D

AS-BUILT INFORMATION

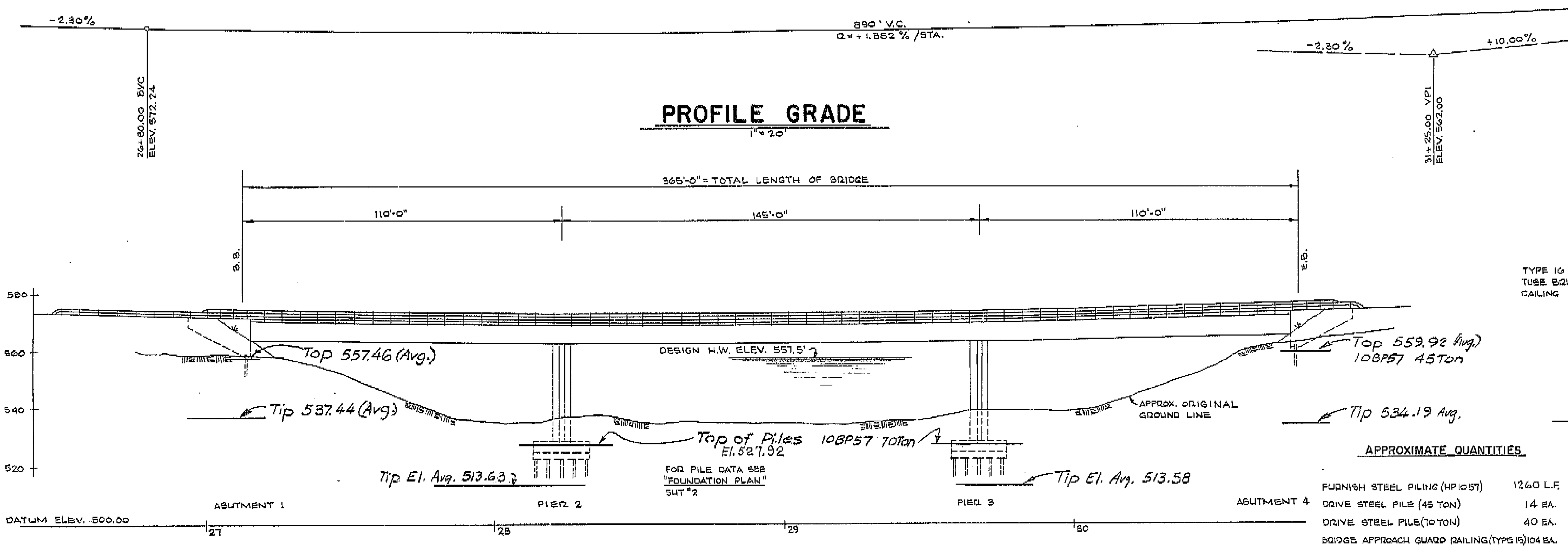
NEW BRIDGEPORT BRIDGE [PLEASANT VALLEY ROAD] ACROSS SOUTH YUBA RIVER

DIST	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	NEV.	939(3)		9	19

V. Harry Hida
DIRECTOR OF PUBLIC WORKS
REGISTERED CIVIL ENGINEER Nº 10348
Approved March 6, 1972
ENGINEER OF DESIGN
REGISTERED CIVIL ENGINEER Nº 8918

PROFILE GRADE

1" = 20'

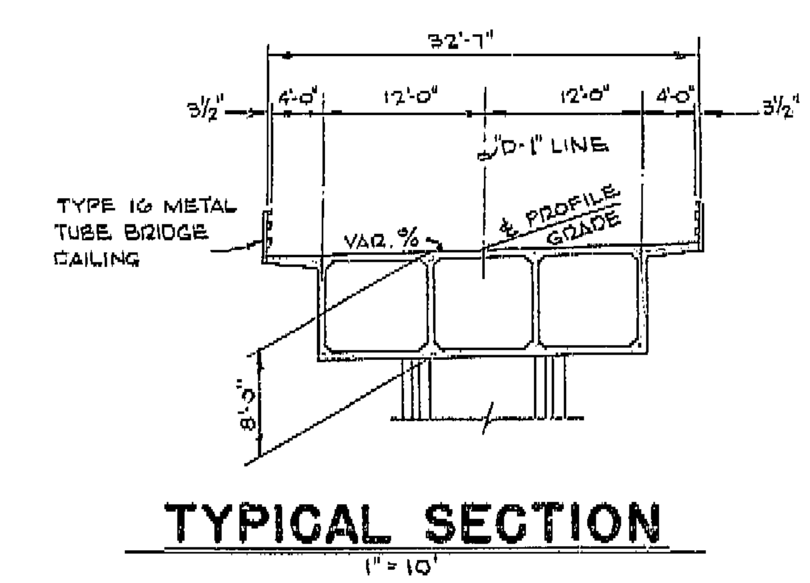


ELEVATION

1" = 20'

TYPICAL SECTION

1" = 10'



APPROXIMATE QUANTITIES

FURNISH STEEL PILING (HP10 57)	1260 L.F.
DRIVE STEEL PILE (45 TON)	14 EA.
DRIVE STEEL PILE (70 TON)	40 EA.
BRIDGE APPROACH GUARD RAILING (TYPE 15)	104 EA.
METAL TUBE BRIDGE RAILING (TYPE 16)	807 L.F.
~~SEAL COURSE CONCRETE~~	~~90 CY~~

Item eliminated - CCO #4

FINAL QUANTITIES

STRUCTURE EXCAVATION (BRIDGE)	130 CY
STRUCTURE EXCAVATION (TYPE A)	325 CY
STRUCTURE BACKFILL (BRIDGE)	55 CY
PERVIOUS BACKFILL MATERIAL	20 CY
STRUCTURE CONCRETE, BRIDGE FOOTING	148 CY
STRUCTURE CONCRETE, BRIDGE	1010 CY
BAR REINFORCING STEEL (BRIDGE)	275,000 LBS

NO AS BUILT HWO 11-73
W.K. KNIGHT
03-101464
DATE 06-12-73

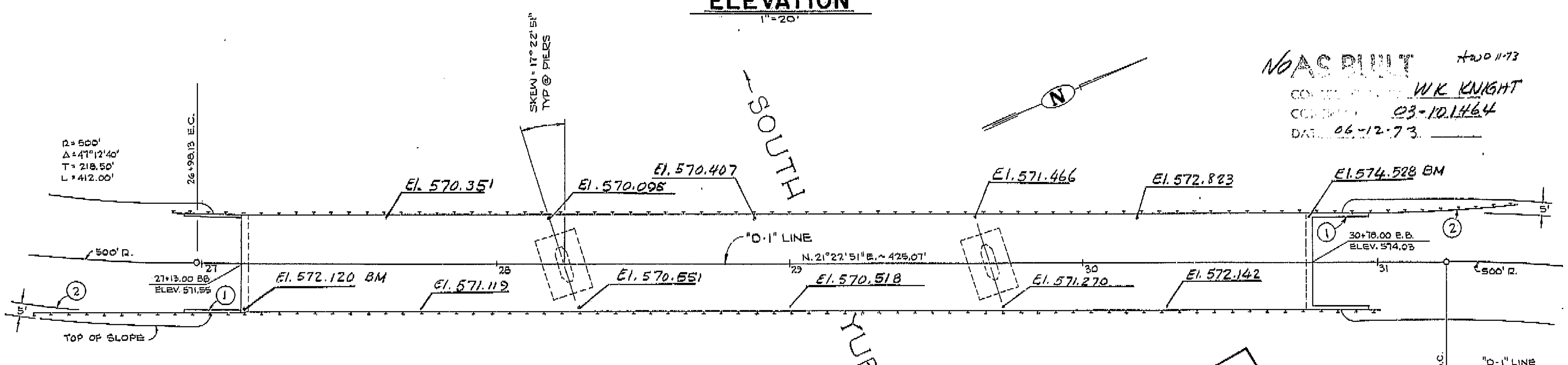
INDEX TO PLANS

SHT. Nº	TITLE
1	GENERAL PLAN
2	FOUNDATION PLAN
3.	ABUTMENTS
4.	WINGWALLS
5.	PIERS
6	GIRDER DETAILS
7.	BOTTOM REINFORCEMENT
8	TOP REINFORCEMENT
9-10	RAILING DETAILS
11	LOG OF TEST BORINGS

STANDARD PLANS DATED JAN. 1971

B7-1	BOX GIRDER DETAILS

S.FK. YUBA RIVER
17C-55



NOTE: FOR CONTOUR GRADING AND TRANSITION - SEE "ROAD PLANS"

(1) PAINT: "NEW BRIDGEPORT BRIDGE" BRIDGE Nº 17C-55 AND YEAR.

(2) 52'-0" BRIDGE APPROACH GUARD RAIL TYPE 15, FLARE LAYOUT ON CURVE.

AS BUILT PLANS
Contract No. 03-101464
Date Completed 6-12-73
Document No. 41163

FOR GENERAL NOTES SEE "FOUNDATION PLAN"
LIVE LOADING HS-20-44 AND ALTERNATIVE.

PLAN

1" = 20'

Structural Details
Checked By
Reviewed
Approval Recommended

9

NEW BRIDGEPORT BRIDGE ACROSS SOUTH YUBA RIVER

GENERAL PLAN

BRIDGE Nº	SCALE	
17C-55	1" = 20'	1 of 11

03017
101461

DIST.	COUNTY	ROUTE	POST MILES - TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	NEV.	939(3)		10	19

(signature)
DIRECTOR OF PUBLIC WORKS
REGISTERED CIVIL ENGINEER No 0948
Approved *March 6, 1972*
(signature)
ENGINEER OF DESIGN
REGISTERED CIVIL ENGINEER No 8918

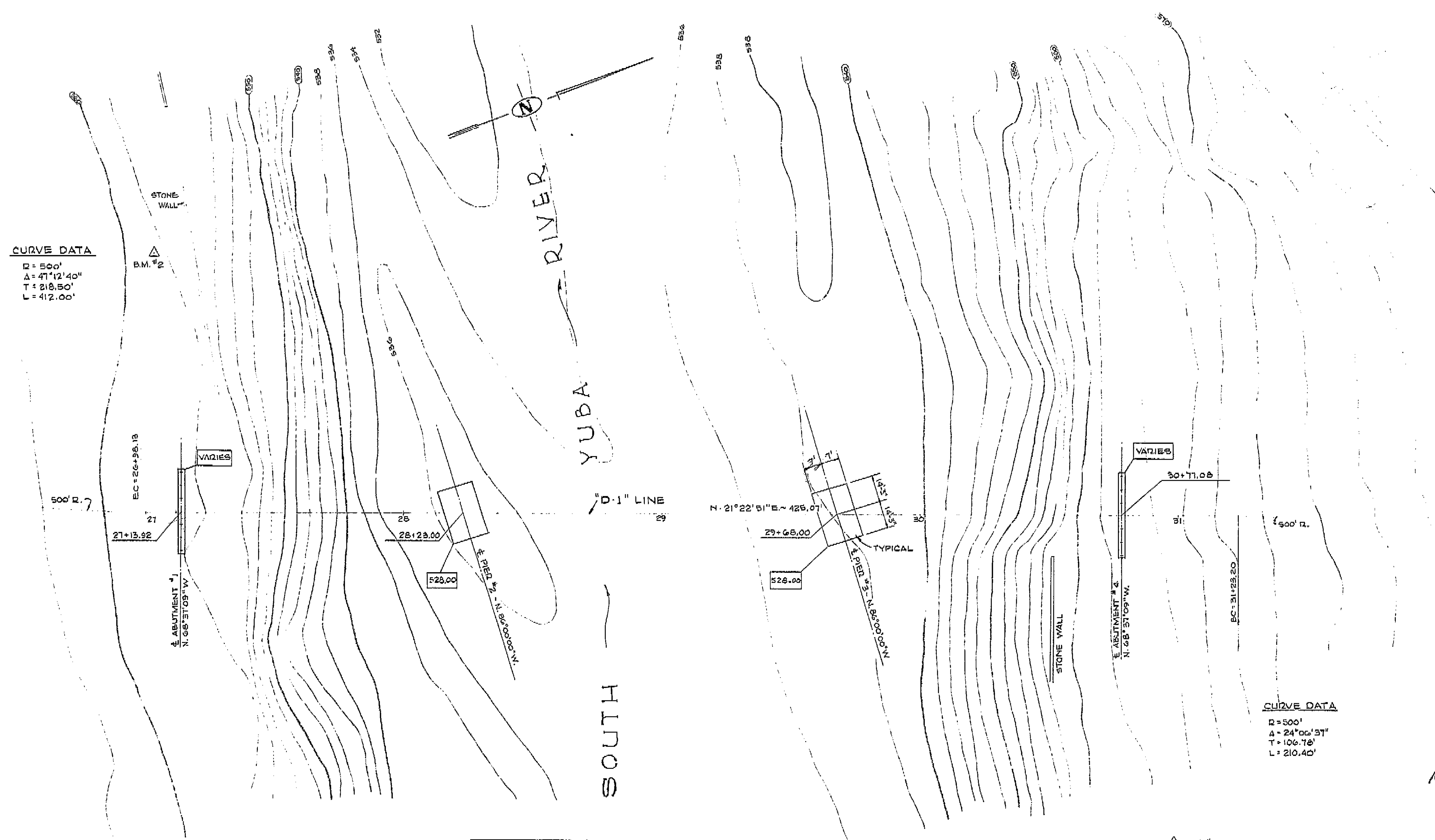
GENERAL NOTES

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 P.S.I., EXCEPT
= 20,000 P.S.I., IN TRANSVERSE DECK SLABS AND STIRRUPS
f_c = 1,300 P.S.I., EXCEPT
= 1,200 P.S.I. IN TRANSVERSE DECK SLABS.
N = 10

PILING: DESIGN LOADING
AT ABUTMENTS 45 TONS
AT PIERS 70 TONS



NOTE:
FOR PILE LAYOUT AND FOOTING DIMENSIONS, SEE THE "DETAIL" SHEETS.
▭ INDICATES BOTTOM OF SEAL ELEVATION IF USED OR BOTTOM OF FOOTING ELEVATION IF SEAL IS ELIMINATED.

No AS BUILT *Hwo 11-73*
W.K. KNIGHT
03-101464
DATE *6-12-73*

BENCH MARKS

B.M. #1 ELEV. 562.55
BENCH SET FROM U.S.G.S. DATUM, PAINTED POINT ON TOP OF ROCK 125' ± E'LY OF ℄ STA. 31+00 ±.

B.M. #2 ELEV. 559.35
BENCH SET FROM U.S.G.S. DATUM, PAINTED POINT ON TOP OF ROCK 100' ± W'LY OF ℄ STA. 27+00 ±

LOCATION	TYPE	TIP ELEVATION		
		SPECIFIED MINIMUM	ESTIMATED MAXIMUM	ESTIMATED AVERAGE
ABUT 1	HP10x57 45 TON	540	532	535
PIER 2	HP10x57 70 TON	514	508	511
PIER 3	HP10x57 70 TON	514	508	511
ABUT. 4	HP10x57 45 TON	535	528	530

Structural Details
Checked By *(initials)*
Reviewed *A.E. Bacher*

10

AS BUILT PLANS
Contract No *03-101464*
Date Completed *6-12-73*
Document No. *4163*

NEW BRIDGEPORT BRIDGE
ACROSS
SOUTH YUBA RIVER

FOUNDATION PLAN

BRIDGE No	POST MILE	DRAWING No	SCALE	SHEET
17C-55			1" = 20'	2 OF 11

5209

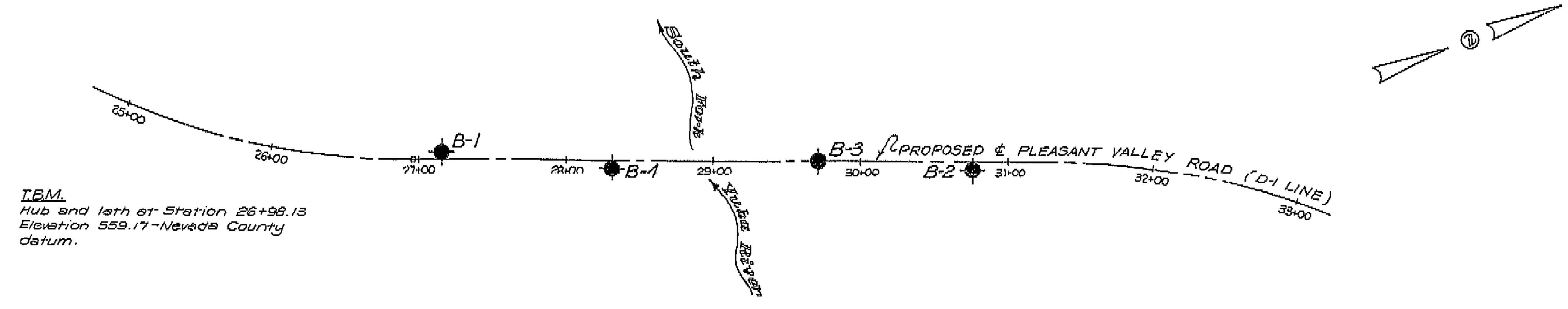
I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

DATE	SIGNATURE	TITLE
15 Nov. 73	*James E. Court*	*SR-RMO*

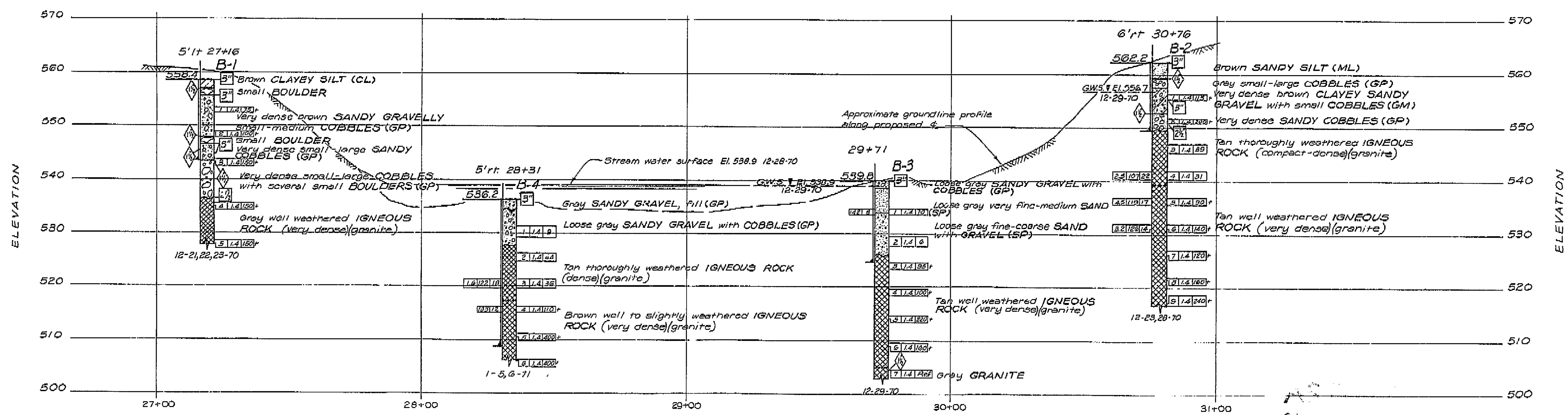
DAS-AS-70

03 NEV 939 (3) 19 19

March 6, 1972



PLAN
Scale: 1" = 50'



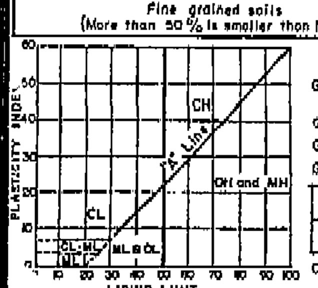
PROFILE
Scale
Horiz: 1" = 20'
Vertical: 1" = 10'

AS BUILT PLANS
Contract No. 03-101464
Date Completed 6-12-73
Document No. 4163

LEGEND OF EARTH MATERIALS

UNIFIED SOIL CLASSIFICATION

Pt	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	GM	GP	GW
Highly organic soils	Silts and clays Liquid limit greater than 50			Silts and clays Liquid limit less than 50			Sands with fines >12% fines		Clean sands <5% fines		Gravels with fines >12% fines		Clean gravels <5% fines	
							Sands - more than 50% of coarse fraction is smaller than Nº 4 sieve.				Gravels - more than 50% of coarse fraction is larger than Nº 4 sieve.			
Fine grained soils (More than 50% is smaller than Nº 200 sieve)							Coarse grained soils (More than 50% is larger than Nº 200 sieve)							



LABORATORY CLASSIFICATION CRITERIA

GW and SW - $C_u = \frac{D_{60}}{D_{10}}$ greater than 4 for GW & 6 for SW; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3.

GP and SP - Clean gravel or sand not meeting requirements for GW and SW.

GM and SM - Atterberg limits below "A" line or P.I. less than 4.

GC and SC - Atterberg limits above "A" line with P.I. greater than 7.

Fines (silt or clay)	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles	Boulders
Sieve sizes	200	40	10 4	3/4"	3"	12"	

Classification of earth materials shown on this sheet is based on field inspection and should not be construed to imply laboratory analysis unless so stated.

MATERIAL SYMBOLS

Gravel; Sand; Silt; Clay; Sandy clay or clayey sand; Sandy silt or silty sand; Silty clay or clayey silt; Peat or organic matter; Fill material; Shale; Sandstone; Limestone; Metamorphic rock; Igneous rock

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

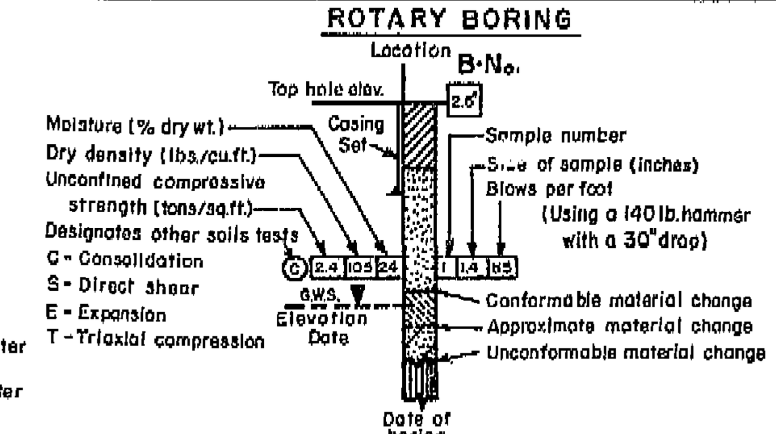
Nº of blows	Granular	Cohesive
0-5	Very loose	Very soft
6-10	Loose	Soft
11-20	Semicompact	Stiff
21-35	Compact	Very stiff
36-70	Dense	Hard
>70	Very dense	Very hard

GRUBING 40-105

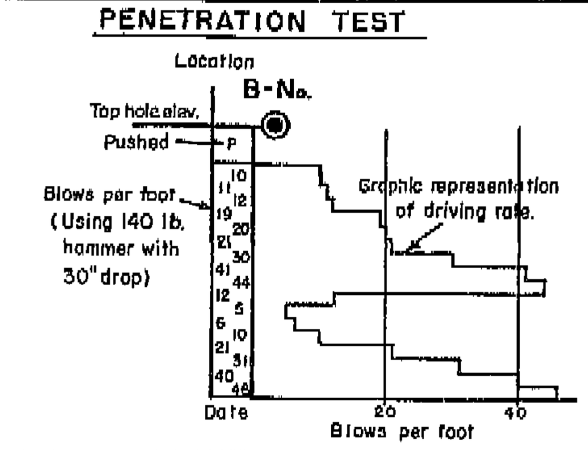
LEGEND OF BORING OPERATIONS

- Plan of any boring
- Rotary boring
- Diamond core boring (inside diameter)
- Auger boring
- Sample boring
- Jet boring
- Test pit
- 2¼" Cone penetrometer
- 2½" Cone penetrometer

ROTARY BORING



PENETRATION TEST



MOORE & TABER NORTHERN CALIFORNIA
CONSULTING ENGINEERS AND GEOLOGISTS

APPROVED H. R. Taber 2-10-71
REGISTERED CIVIL ENGINEER No. 9165
JOB No. 370118F

COUNTY OF NEVADA

NEW BRIDGEPORT BRIDGE ACROSS SOUTH YUBA RIVER

LOG OF TEST BORINGS

Scale As shown	Date Jan 1971	By R.F.E. Check by R.D.M.	Drawing 11 of 11

5209

19

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 TRANSPORTATION.

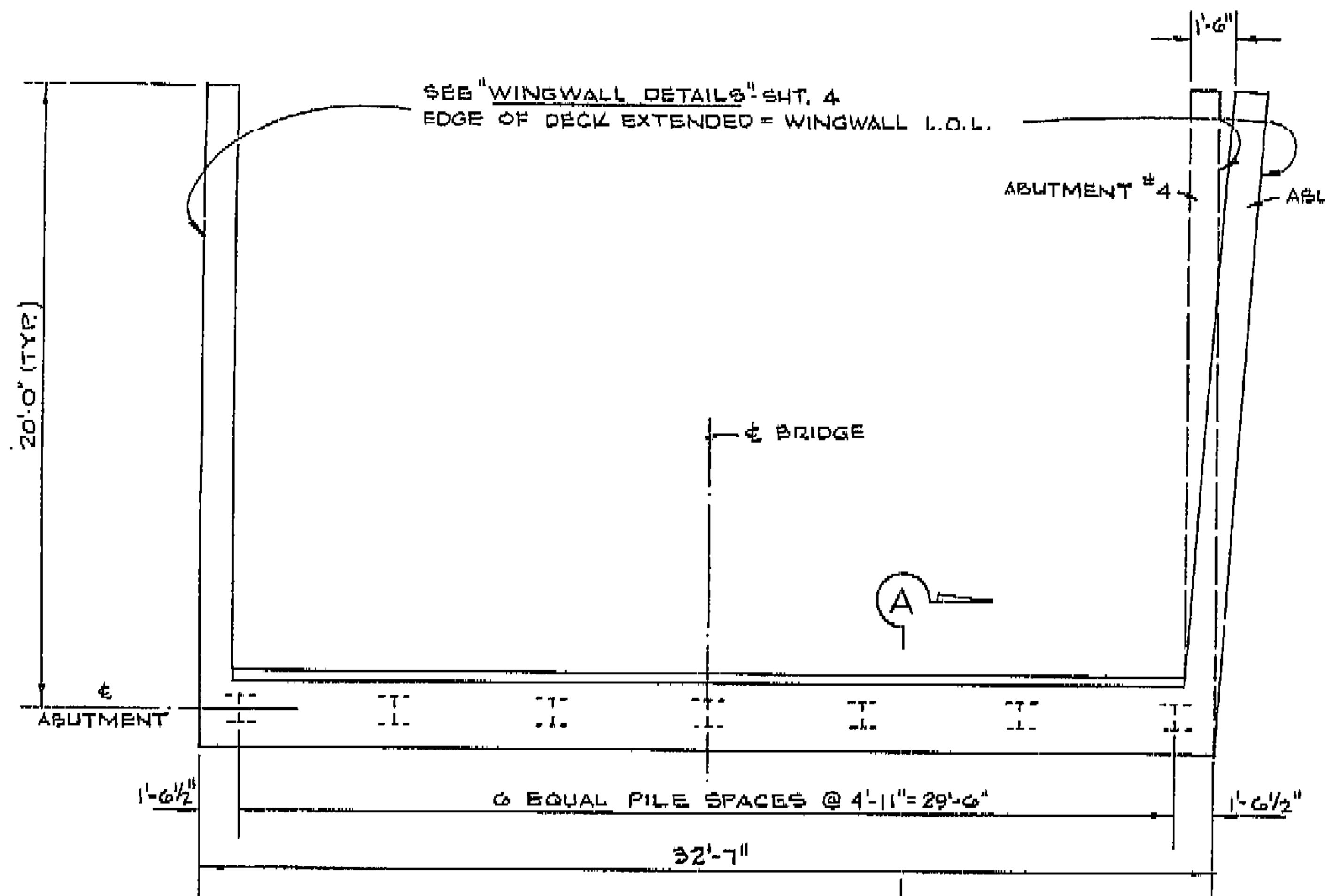
DATE 15 Nov. 73 SIGNATURE James E. Court TITLE SR. RMO

DIST	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	NEV	939(3)		11	19

DIRECTOR OF PUBLIC WORKS
REGISTERED CIVIL ENGINEER Nº 10943

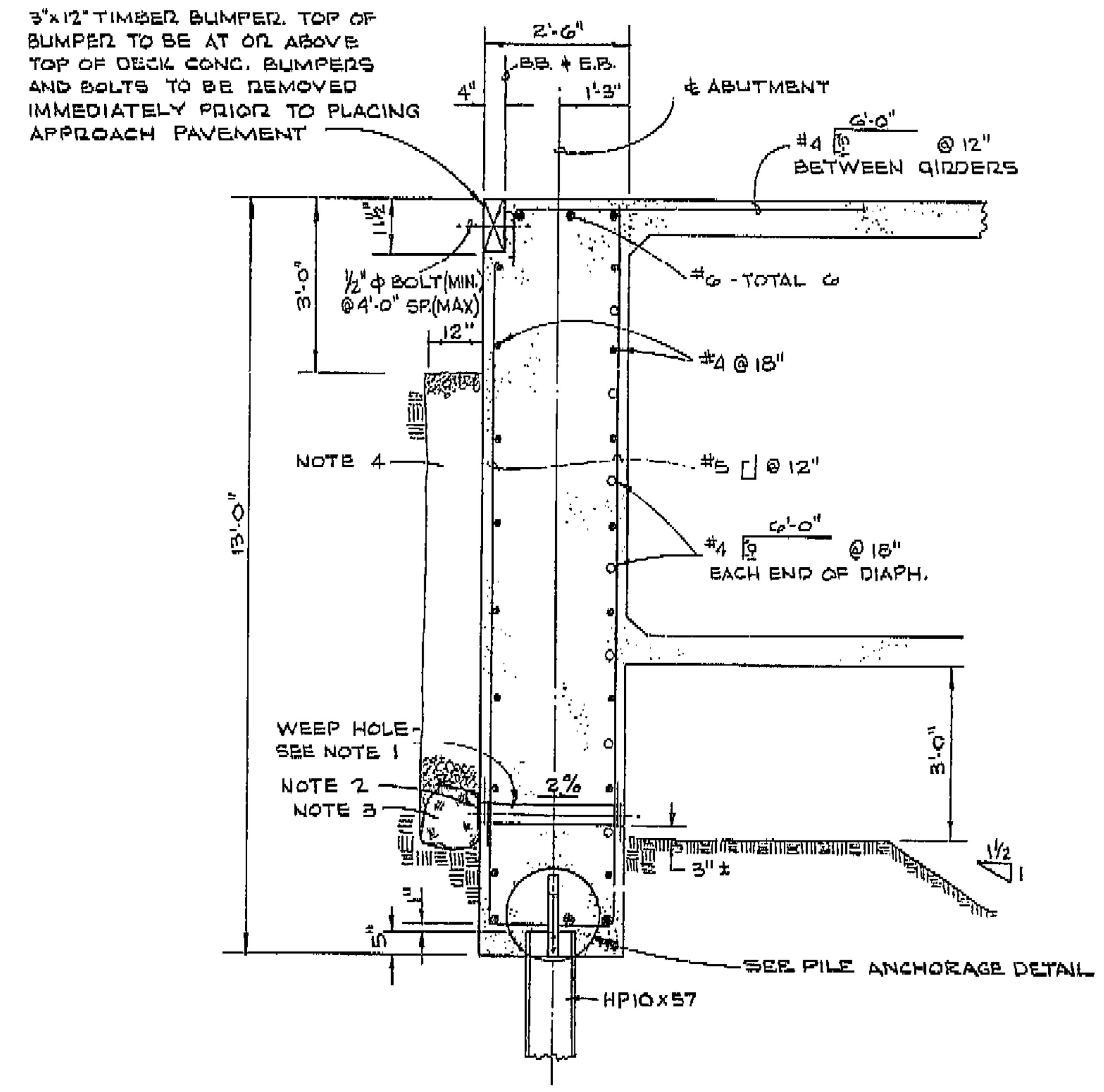
Approved March 6, 1972

ENGINEER OF DESIGN
REGISTERED CIVIL ENGINEER Nº 8918

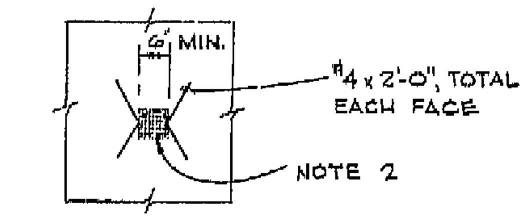


NOTE:
ABUTMENT 1 SHOWN
ABUTMENT 4 SIMILAR

PLAN
¼" = 1'-0"

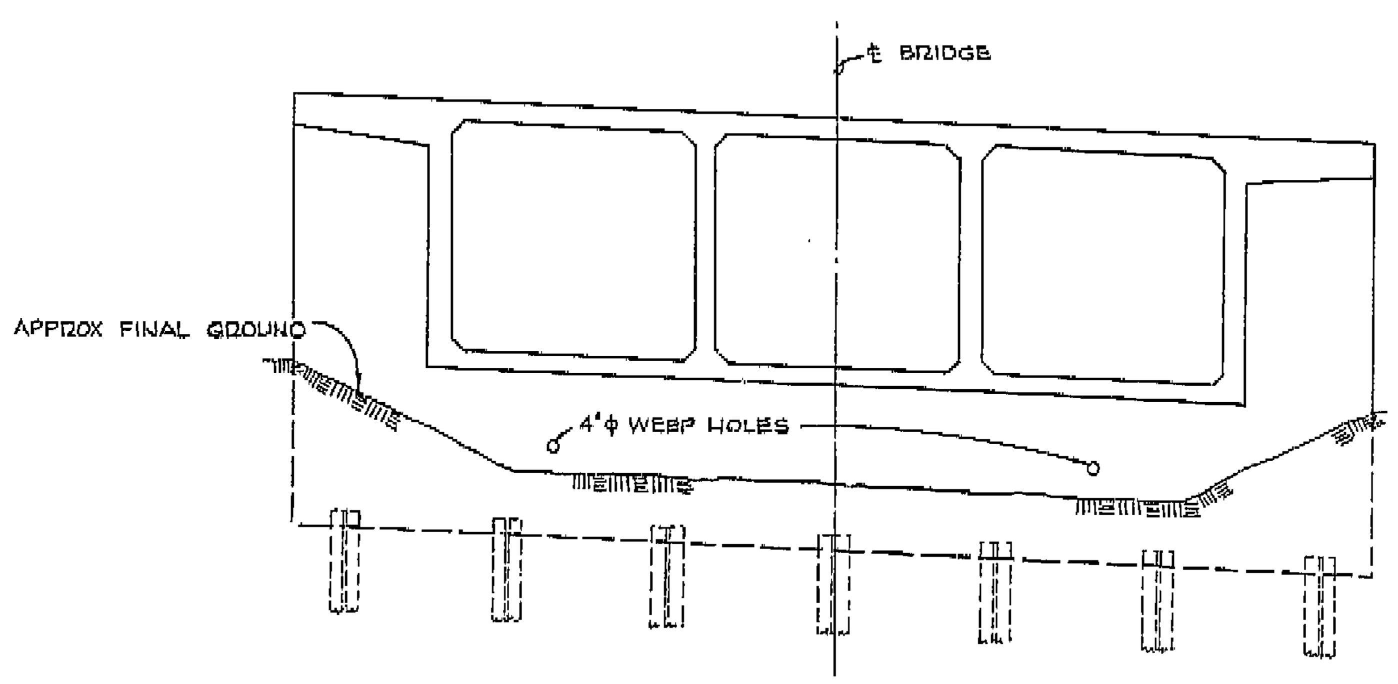


SECTION A·A
½" = 1'-0"

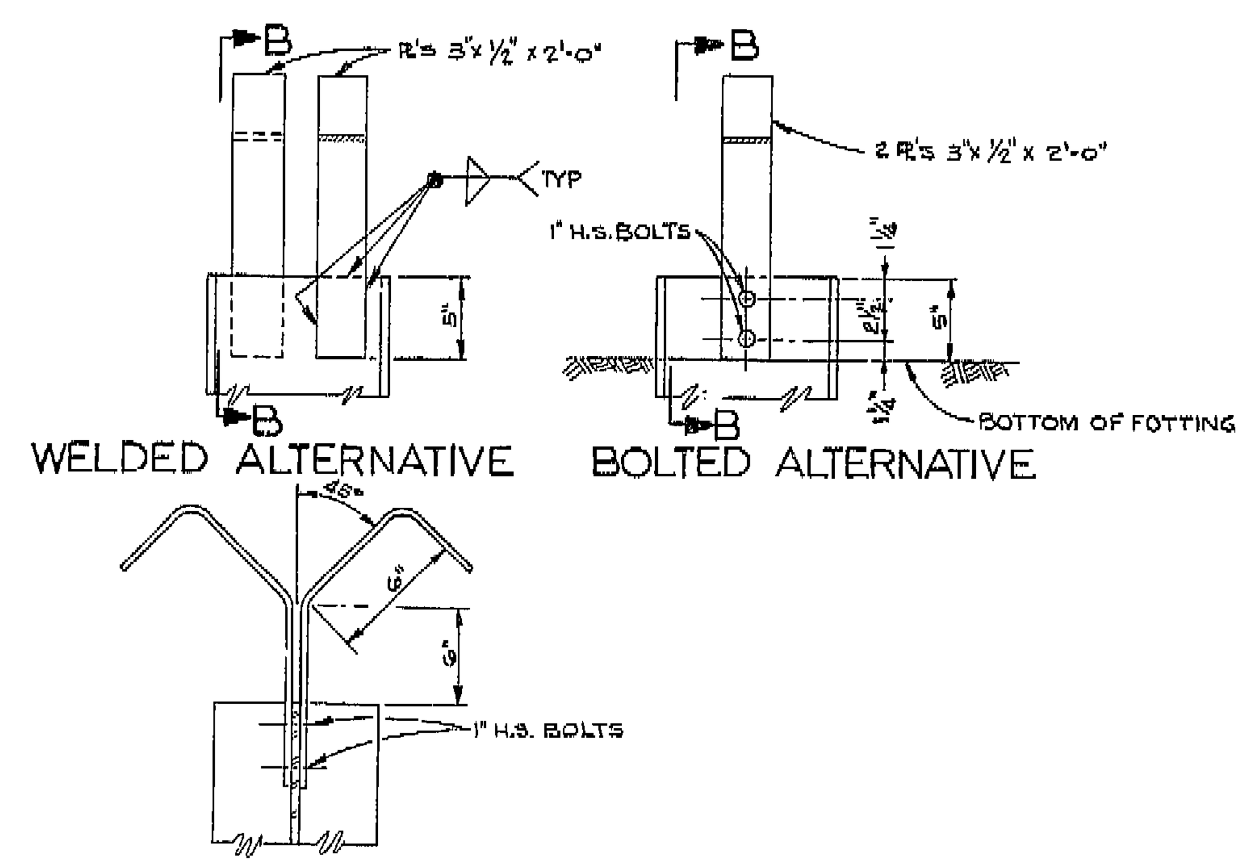


WEEP HOLE
BACK FACE

NOTES
1. 4" ϕ DRAINS @ 25' MAX. CENTER TO CENTER. EXPOSED WALL DRAINS SHALL BE LOCATED 3"± ABOVE FINISHED GRADE.
2. 6" SQUARE ALUMINUM OR GALVANIZED STEEL WIRE MESH HARDWARE CLOTH. (MIN. WIRE DIA. 0.03"). ANCHOR FIRMLY TO BACKFACE.
3. ONE CUBIC FOOT PERVIOUS BACKFILL MATERIAL IN BURLAP SACK, SECURELY TIED.
4. PERVIOUS BACKFILL MATERIAL CONTINUOUS BEHIND ABUTMENT WALL.



ELEVATION
¼" = 1'-0"



PILE ANCHORAGE DETAIL
⅛" = 1"

AS BUILT PLANS
Contract No 03-101464
Date Completed 6-12-73
Document No. 4163

No ... 11-73
... W.K. KNIGHT
CONTRACT 03-101464
DATE 6-12-73

NEW BRIDGEPORT BRIDGE
ACROSS
SOUTH YUBA RIVER

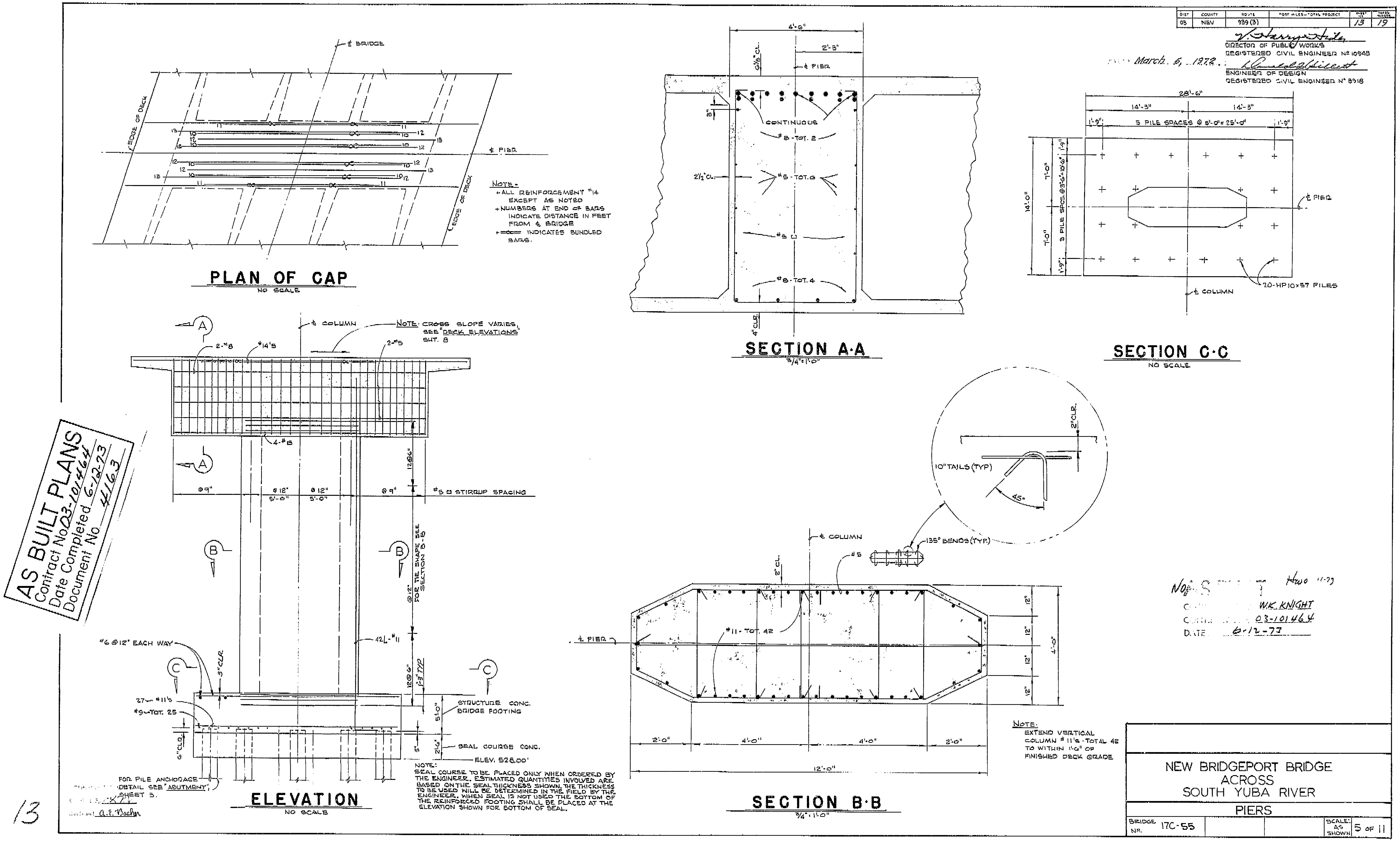
ABUTMENTS

BRIDGE No.				SCALE:	
	17C-55			AS SHOWN	3 OF 11

Structural Details
... A.L. Bacher

11

\# 5209



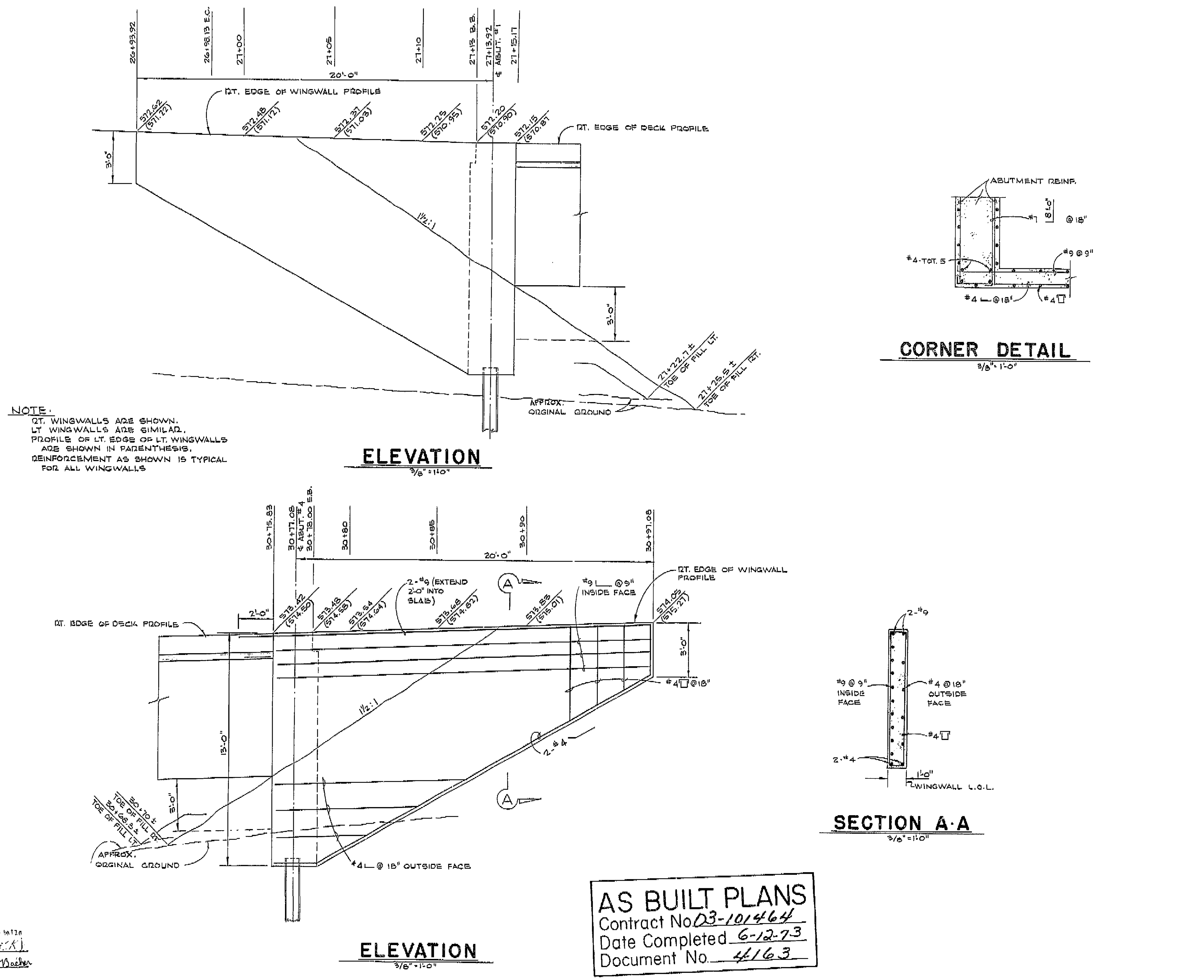
13

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 TRANSPORTATION.

DATE: 15 Nov. 73 | SIGNATURE: James E. Court | TITLE: SR. RMO

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	NEV	939(3)		12	19

V. Harry Fils
DIRECTOR OF PUBLIC WORKS
REGISTERED CIVIL ENGINEER Nº 10948
March 6, 1972
Donald H. Gillett
ENGINEER OF DESIGN
REGISTERED CIVIL ENGINEER Nº 8918



No AS ... 1-73
CONTRACTOR W. K. KNIGHT
CONTRACT No. 03-101464
DATE 6-12-73

AS BUILT PLANS
Contract No 03-101464
Date Completed 6-12-73
Document No. 4163

NEW BRIDGEPORT BRIDGE
ACROSS
SOUTH YUBA RIVER

WINGWALLS

BRIDGE No.	17C-55			SCALE 3/8" = 1'	4 OF 11

12

5209

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 TRANSPORTATION.

DATE 13 Nov 73 SIGNATURE James E. Count TITLE SR-RMO
DAS-58-70