

DEPARTMENT OF TRANSPORTATION**DISTRICT 3**

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JUN 20 2016

PLANNING & BUILDING SERV
FORT BRAGG CA

June 17, 2016

Mendocino County Department of Planning & Building Services

Attn: Julia Acker

120 West Fir Street

Fort Bragg, CA 95437

Dear Ms. Acker:

The California Department of Transportation (Caltrans) proposes to conduct geotechnical drilling at the Albion River Bridge on State Route (SR) 1 between post miles (PM) 43.3 through 44.2 in Mendocino County, California. The purpose of this project is to collect subsurface geotechnical data. This project is needed in order to aid future bridge foundation design for the proposed bridge replacement project. Geotechnical drilling will be performed adjacent and below the bridge. The following items are enclosed for your review:

- Plan to Perform Geotechnical Investigation memo dated February 12, 2015
- Mapping of proposed drill sites
- Check in the amount of \$640

Pursuant to Public Resource Code Section 30601.3, Caltrans is requesting that the project be consolidated and processed by the California Coastal Commission as the project crosses both state and local jurisdictional boundaries.

Please respond that you agree to consolidate this permit. If you have questions or need additional information, please contact me at (530) 741-4139.

Sincerely,

A handwritten signature in black ink that reads "Liza Walker".

Liza Walker, Branch Chief
Environmental Management E-M2 Branch

cc: Tamara Gedik, Coastal Program Analyst, California Coastal Commission

Enclosures

Memorandum

*Flex your power!
Be energy efficient!*

To: LENA ASHLEY
DESIGN SENIOR
OFFICE of DESIGN NORTH
DESIGN BRANCH E-3

Date: February 12, 2015

File: 01-MEN-01-
PM 43.3/44.2
Albion River Bridge
(Replacement)
EA 01-401100
ID 0100000154

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Plan to Perform Geotechnical Investigation (PPGI)

BACKGROUND

Per your request, the Office of Geotechnical Design North (OGDN) has prepared this foundation design investigation Site Plan for the replacement of the existing Albion River Bridge on Route 01, PM 43.3-44.2 in Mendocino County. At the time of this writing there are two alternative Alt. "A" (single arch) and Alt. "B" (double arch bridge) replacement design proposals. The purpose of this memorandum is to describe the unique aspects of each possible drill site or group of drill sites for in-house drilling planning purpose. These aspects include:

1. Location of the 8 drill sites.
2. Drilling specifications.
3. Drill site terrain, undergrowth and tree conditions.
4. Proposed earthwork using heavy equipment and/ or handwork that will be required to construct site ingress/regress routes, drill pad/staging areas.
5. Drill and support vehicles including cranes and possible use of helicopter.
6. Site environmental protection and restoration measures during and after completion of work.

DRILL SITES

Drill Site 1a, 1b and 1c –Retaining Wall or Cut Slope

Access will be from Highway 1 at approximately Station 115+80. The three drill sites are located on the east facing slope above the south bound travel lane (Stations 119+40, 122+72 and 124+45 respectively) The sites are situated on a natural or cut bench approximately 10 ft wide. Vegetation is sparse. Patches of grass and occasional bush are present. Minor use of the dozer at the entrance of the site and bench area is expected. Boring depths are expected to be approximately 50 ft.

Drill Site 1 - Abutment 1 (Alt “A” and “B”)

Access will be from Highway 1 at approximately Station 123+50. Temporary removal of the guard railing will be required. The site terrain ranges from flat to moderately steep. Extensive cut grading will be necessary to construct an access route and a sufficient level pad area (30 feet by 40 feet). An approximate 10 to 12 feet vertical cut into the hillside will be required. The cut will be laid back sufficiently to be stable. Vegetation is sparse to moderately dense and consists mainly of underbrush, small trees and grass. Vegetation removal and trimming will be required. A rubber tired truck mounted drill rig will be used at this site. The estimated depth of the boring depth is approximately 70 to 90 feet.

Drill Site 2 - Pier 2 (Alt “A” and “B”)

Access will be from Highway 1 (Station 123+50). The site is located on a relatively steep patchy sparse to densely vegetated hillside below Site 1. Grading to provide direct vehicle access to the site is not considered feasible. Utilizing Site 1 as a staging area, a self leveling track mounted drill or a crane delivered steel platform and drill rig to the drill site will be employed. Support vehicles will be located on Site 1. Brush trimming will be required. The estimated depth of the boring is 100 feet.

Drill Site 3 – Inclined Boring - Pier 3 (Alt “A” and “B”)

Access to Site 3 will be difficult. Two approaches are being considered. From Site 1 a crane will be utilized to deliver a steel platform, drill rig and supplies to the site. Alternatively, a helicopter may be employed to deliver the equipment and supplies. Vegetation within the platform area is dense and will require trimming to near ground level. The support vehicles will be located on Site 1. The estimated depth of the boring is

approximately 125 feet.

Drill Site 4 – Pier 4 (Alt “B”)

Access to Drill site 4 (Station 129+10) will be from Albion River North Side Road that leads to the Albion River trailer/campground. The drill site is located west just beyond the existing bridge and at the end of the camp grounds. The terrain is generally level and firm up to about the end of the camp grounds. From that point on to the drill site the ground consist of very loose sand. Vegetation is generally sparse and consists mainly of ice plants. From the end of the camp grounds the site is generally accessible; a few large boulders may have to be moved a few feet to accommodate the passage of the drill rig. An all-terrain rubber tire or track mounted drill will be required to reach the site. Support vehicles will be located at the north end of the camp grounds. The estimated depth of the boring is approximately 150.

Drill Site 5 Inclined Boring -Pier 4 (Alt “A”) and Pier 5 (Alt “B”)

Drill Site 5 is located at Station 132+40 near the base of a steep slope that descends from the edge of Highway 1. The drill site will be approached by proceeding generally north from Drill Site 4. The terrain is level for the first 250 feet but loose sand followed by possibly old sawdust waste underlies the entire route. The terrain of the last 85 feet to the site forms an approximately 6 foot deep swale. An all-terrain rubber tire or track mounted drill will be required to reach the site. Additionally, mats may be required to facilitate getting the drill rig to the site. Also, moving sand to temporarily bridge the swale may be required to reach the drill site. The terrain will be restored once the drilling is completed. Support vehicles can be located near the north end of the campground. The estimated depth of the boring is 125 feet.

Drill Site 6 – Pier 5 (Alt “A”) and Pier 6 (Alt “B”) and Drill Site 7- Pier 6 (Alt “A”) and Pier 7 (Alt “B”)

These drill sites are located generally on the steep slope above Drill Site 5. The sites will be accessed from Highway 1 at station 134+00 and/or Station 136+85. The Drill Sites most likely will be serviced by crane from the top of the slope at about Station 134+00 (D.S. 6) and Station 134+20 (D.S.7). Drilling will be performed from steel platforms placed by crane. The top of the slope area including at drill site 8 will be graded to create level ground to accommodate vehicle access and staging. At the top of the slopes and on the slopes above the drill sites much of the existing vegetation including a number of

eucalyptus trees would have to be trimmed and/or removed. Possibly a row of trees adjacent to the roadway could be retained. Alternatively, a self-leveling track mounted drill would be utilized. Trimming of brush and cutting some trees along the path to and at the drill site would be required. There is the possibility that a helicopter would be needed to deliver a rig and materials to Drill Site 6. The estimated boring depth is 125 ft.

Drill Site 8 – Abutment 7 (Alt “A”) and Abutment 8 (Alt “B”)

The abutment site is located just west of the existing Highway 1. Access to the site will also be off Highway 1 at approximately Station 134+00 and/or Station 136+85 as noted above. The site as discussed above will be graded to accommodate access for vehicles and staging. The ground would be leveled and much of the existing vegetation including a number of eucalyptus trees would have to be removed. A standard truck mounted drill rig will be utilized for the inboard boring. The out board boring located slightly down slope would be drilled using the track or rubber tire mounted drill rig. The depth of the boring(s) will be approximately 70 to 90 feet.

DRILLING EQUIPMENT

The drill equipment will include track mounted All-Terrain drill rigs, truck mounted drill rigs and a smaller skid mounted rig. Support vehicles include an equipment/water tender, drill crew cab and geologist/engineer vehicles. The drilling and sampling will be done using a rotary wash wire-line system with drill pipe diameters of 57, 94 and 114-mm. The boring depths have been previously noted. Drilling fluids consisting of water mixed with bentonite and/or polymer that will be re-circulated through a closed system that includes drill pipe, pump, hoses and a mud tank. After completion of the drilling the drill cuttings and fluids will be pumped into 55 gallon drums and transported to the Transportation Laboratory in Sacramento for processing. After the drilling fluids removal a combined slope inclinometer/piezometer will be installed in selected boring to monitor ground movement and changes in groundwater elevations.

ENVIRONMENTAL PRECAUTIONS

Precautions during drilling will be employed to mitigate any possible equipment leaks or drilling fluid spillage. They may include plastic tarps, absorption mats and jute waddles. Contained drill fluids generated during drilling will be pumped in to 55-gallon steel drums and transported to Caltrans facilities for processing.

SITE RESTORATION

Ground conditions altered due to work activities will be restored utilizing Best Management Practices (BMP). The BMP restoration will include re-seeding, placement of straw and jute waddles. Where more extensive earthwork occurred (Drill Sites 1, 6, 7 and 8) the ground will be re-graded to conform to State drainage and erosion protection standards. The borings will be backfilled following the GS-01 Directive.

SEISMIC REFRACTION SURVEY

A seismic refraction survey will be employed to supplement the drilling data and geologic mapping of the bridge site. To facilitate the placement of the geophone arrays some brush removal may be required. Locations of the proposed seismic refraction lines are shown on Plate 1.

If more information and/or clarifications are needed, please contact William Bertucci at 916.203.7992 or John Huang at 916.227.1037

WILLIAM BERTUCCI
Associate Engineering Geologist
Office of Geotechnical Design North

JOHN HUANG
Materials and Research Engineer
Office of Geotechnical Design North

Appendix – Seismic Refraction Surveys and Environmental Impacts

Attachment: Geotechnical Exploration Plan

cc: FDemling	District Project Manager
KHallis	Structure Maintenance
KWaxman	Right of Way
LAshley	District Design Branch Chief
TPhillips	District Design-Project Engineer
RHaralson	Surveys
APommerenck	Environmental
JHaney	Culture
CPitts	Community Impact Study

APPENDIX

Seismic Refraction Surveys and Environmental Impacts

This document summarizes typical scope and environmental impacts posed by seismic refraction surveys conducted for the Department of Transportation.

General Description of Work

Geophones (small 2 inch square sensors on a 3 inch long, by 2 inch diameter spike) are inserted into the ground at specific intervals (3 to 10 feet typical) and connected to a cable that is in turn attached to a battery-powered seismograph.

Geophones record vibratory impulses generated by active sources. Three types of sources are used and are listed in order of increasing power: hammer and striker-plate, down-hole shotgun, and explosive. The number of source locations used on a typical seismic line varies from 5 to 20, depending on required resolution.

Survey locations are selected based on the goals of the investigation, safety requirements and access restrictions imposed by environmental and entry permits. Access to survey locations may be by motor vehicle or by foot, again depending on access restrictions.

Environmental Impacts

Site Access

Site access is by motor vehicle or by foot, depending on access restrictions. When used, motor vehicle access is limited to existing roads and trails. Motorized or non-motorized boats may be used for water access, depending on depth of water and access restrictions.

Hours of Work

All work is conducted during daylight hours from Monday through Friday. Exceptions occur during stated emergencies only.

Equipment Storage

Unless placed in a designated and secure construction area, no equipment is stored on-site. All equipment is portable and secured in vehicles when not in use.

Footprint and Area of Related Ground Disturbance

Twenty four (24) or more geophones (small 2" square sensors on a 3"spike) are planted at the ground surface. The geophones are removed after work is completed. The spike is approximately 12-inch in diameter, and leaves no lasting impression in the ground surface. Ground and vegetation disturbance is isolated to foot-traffic areas and locations where the sources are employed. (Additional discussion of source effects is provided below). The extent of source disturbance at the ground surface increases with source strength. Typical maximum disturbance consists of a circular area of raised earth approximately 5 feet in diameter centered over the source's original location. An effort is made to conceal disturbed brush and tamp down disturbed soil to return it to its original condition. Minor brush cutting is occasionally required for access and is minimized wherever possible. Effort is made to restore visual impacts at the conclusion of the survey.

Source Effects

Three types of sources are used and are listed in order of increasing energy: hammer and striker plate, clown-hole shotgun, and explosive. The number of source locations used on atypical seismic line varies from 5 to 20, depending on required resolution.

The hammer and striker plate source consists of a 12- to 16-lb sledgehammer struck against a small metal plate placed on the ground. This creates the least ground disturbance (a dent or divot in ground in the shape of the plate). Contrary to expectation, however, this source typically creates the greatest noise. The "ping" from the hammer striking the plate may exceed 120 dB in the vicinity of the operator, so hearing protection is required when operating this source.

The down-hole shotgun uses an industrial shell fired in a 1.5-foot deep water-filled hole. The hole is created by manually driving a 2 by 2-inch diameter gad bar into the ground. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are typically triggered approximately 20 minutes apart. Shot gun detonations may leave an area of disturbed earth up to 2 feet in diameter. An effort is made to tamp down the soil to return it to its original condition. There are no appreciable effects on flora or fauna

outside that diameter. Detonation of the shells occurs below ground and does not pose a fire hazard. With well-prepared shot holes, the highest anticipated noise generated consists of a muffled "thump" of approximately 60 dB. More often than not, the fired shells are barely audible.

Small explosive charges may also be employed. All work related to explosives is conducted by licensed blasters. When used, the charges are placed below the ground surface in a 1.5- to 3-foot deep hole. The hole is created by manually driving a 2 by 2-inch diameter gad bar into the ground. The charge is placed in the hole and the hole is then backfilled. The charge is detonated by means of an electric cap. Charges are typically triggered approximately 30 minutes apart. With well-prepared shot holes, the highest anticipated noise generated during detonation is an approximately 60-80 dB muffled "thump". More often than not, the detonations are barely audible. The extent of disturbed ground post-detonation consists of a circular area of raised earth up to 5 feet in diameter and centered over the original charge. An effort is made to tamp down the soil to return it to its original condition. There are no appreciable effects on flora or fauna outside that diameter. The charges are detonated down hole and do not pose a fire hazard.

