Meeting of the Central Valley Flood Protection Board
June 22, 2018

Permit Staff Report

Union Pacific Railroad Company
Replacement of existing Union Pacific Railroad Bridge, Tehama County

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1.0 – ITEM

Consider approval of Permit No. 19165 (Attachment B).

2.0 – APPLICANT

Union Pacific Railroad Company (UPRR).

3.0 – PROJECT LOCATION

The proposed bridge replacement project crosses Elder Creek at UPRR Milepost (MP) 213.49, approximately 300 feet southwest from the intersection of San Benito Avenue and Worthington Avenue in the community of Gerber (Elder Creek, Tehama County, see Attachment A).

4.0 – PROJECT DESCRIPTION

UPRR proposes to remove and replace two existing bridges that are part of the UPRR Valley Subdivision. The new bridges will each be an 8-span, 248-foot-long, double-track, pre-stressed concrete box girder (30-inch deep) bridge. The new bridges will be founded on 20-inch diameter driven concrete-filled steel pipe piles with closed-end conical tips. Class II Rock Riprap will be placed along the north and south sloping abutments.

5.0 – AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 – 8710

California Code of Regulations, Title 23, Division 1 (Title 23):

- § 6, Need for a Permit
- § 13.3, Consent Calendar
- § 112, Streams Regulated and Nonpermissible Work Periods

- § 120, Levees
- § 121, Erosion Control
- § 128, Bridges

6.0 – PROJECT ANALYSIS

The proposed project will replace the two existing bridges crossing Elder Creek with two 8-span, 30-inch pre-stressed concrete box girder bridges with concrete ties. Elder Creek is a Sacramento River Flood Control Project channel with levees on both north and south direction.

The new bridges will be approximately 248 feet long. The north- and south-bound tracks on the existing bridges will be temporarily filled and leveled for equipment access and mobility during construction of the new bridges. Existing grouted riprap within the Elder Creek channel will be avoided.

The existing north and south abutments currently intersect the project levees. The timber abutment will be replaced as part of the proposed project. Per the recommendation of the U.S. Army Corps of Engineers, an auger will be used to pre-drill through the levee to a depth below the clay layer for each pile within the levee footprint. The pile will be grouted with cementitious material. Replacing the existing timber abutment and setting the new precast concrete abutment will require excavation approximately 5 feet back and 10 feet down, resulting in approximately 150 cubic yards of temporary excavation. Class II Rock Riprap will be placed along the north and south sloping abutments.

All work will occur within UPRR's right-of-way. Bridge materials (piles, caps, and girders to create the bridge span) will be transported to the project site by rail. The existing bridge timber spans will be removed and hauled offsite. The existing piles from the old bridges will be cut 3 feet below the natural ground surface.

All work will be conducted during the dry season when saturated soils are not present in the work area. Dewatering of the work area and temporary work bridges will not be required. No permanent access roads will be constructed. No wetland areas were identified within the project area (See Attachment C).

6.1 – Hydraulic Analysis

A hydraulic model was created using HEC-RAS to investigate the hydraulic impacts of the proposed new bridges. The project design discharge for Elder Creek is 17,000 cubic feet per second (cfs) and this flow was used in the hydraulic model. The proposed bridges will have an opening area of 1,909 square feet, a 5-percent increase in opening area compared to the existing bridge's opening area of 1,820 square feet, due to fewer bents within the channel. The analysis determined that there is no change to the design

water surface elevation (DWSE) for both the pre-project and post-project condition which is 243.93 feet (North American Vertical Datum 1988).

The lowest soffit elevation for both the existing and proposed bridges is 242.25 feet. The soffit will be 1.40 feet below the DWSE for the project design discharge under both existing and proposed conditions.

The hydraulic analysis also considered 100-year and 200-year flows for both existing and proposed conditions. The corresponding 100-year and 200-year WSE associated with the existing bridge at the upstream face are 245.79 feet and 247.30 feet, respectively. The corresponding DWSEs for the with-project conditions are 245.48 feet and 246.92 feet, respectively.

As mentioned above, the soffit elevation of the existing and proposed bridge is the same. Per CCR, Title 23, Division 1, Section 128 (a) (16) replacement railroad bridges must have the soffit members no lower than those of the replaced bridge, but are not required to have a specified amount of clearance above the design flood plain. Therefore, the proposed project is compliant with Title 23.

6.2 – Geotechnical Analysis

As provided in the project analysis, the existing north and south abutments currently intersect project levees where piles will be driven for supporting bridge abutments. An auger will be used to pre-drill through the levee to a depth below the clay layer, located approximately 10 feet below the ground surface for each pile within the levee footprint. The pile will be grouted with cementitious material.

Replacing existing timber abutments and setting the new precast concrete abutments will require excavation approximately 5 feet back and 10 feet down, resulting in approximately 150 cubic yards of temporary excavation. Fill material will be placed in 4- to 6-inch layers and compacted to a relative compaction of not less than 90 percent per ASTM D 1557, with moistures between -2 and +3 percent of optimum moisture content. Fill material within four feet of the bridge will be compacted by appropriate hand-operated compaction equipment. Density tests by a certified soils laboratory will be completed to verify compaction of levee fill. All disturbed areas along the levee will be returned to existing grades and pre-project conditions.

Class II Rock Riprap will be placed along the north and south sloping abutments.

Based on the geotechnical analysis, there are no anticipated negative impacts to the levee as a result of this project.

7.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies, are shown below:

- USACE 33 U.S.C. 408 approval letter has not yet been received for this application. Staff anticipates receipt of a letter indicating that the USACE Sacramento District Engineer approves the request to alter the Federal flood risk reduction project, subject to conditions. Upon receipt of the letter, staff will review to ensure its conformity with the permit language and incorporate it into the permit as Exhibit A.

- Tehama County Flood Control District endorsed this application on March 23, 2017, with conditions. All applicable conditions have been incorporated into the draft permit.

8.0 – CEQA ANALYSIS

Board staff determined that the project is statutorily exempt under the provisions of CEQA and the State CEQA Guidelines. The Board's approval involves issuing an encroachment permit for replacement of an existing railroad bridge that is related to the institution or increase of passenger or commuter service on rail lines already in use, which is exempt under the statutory exemption at Public Resources Code Section 21080(b)(10) and CEQA Guidelines Section 15275(a).

9.0 – CALIFORNIA WATER CODE SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

   The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that relates to the scientific issues presented by the executive officer, legal counsel, the Department of Water Resources or other parties that raise credible scientific issues.

   The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on facilities of the State Plan of Flood Control (SPFC), and consistency of the proposed project with the Central Valley Flood Protection Plan (CVFPP).

   The proposed replacement bridges were designed such that it results in a "no adverse impacts" condition for the design flood events. The bottom most member of

the soffit of the replacement bridge has the same elevation as that of the existing bridge. The proposed replacement bridges are expected to result in no adverse hydraulic impacts to the facilities of the SPFC and are consistent with the CVFPP.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

   The proposed replacement bridges will result in no change to hydrology. Therefore, it is expected that there will be no effects on the reasonable projected future events due to the proposed replacement bridge.

10.0 – STAFF RECOMMENDATION

Adopt:

- CEQA finding that the permit is statutorily exempt under Public Resources Code Section 21080(b)(10) and CEQA Guidelines Section 15275(a),

Approve:

- Encroachment Permit No. 19165 in substantially the form provided in Attachment B; and,

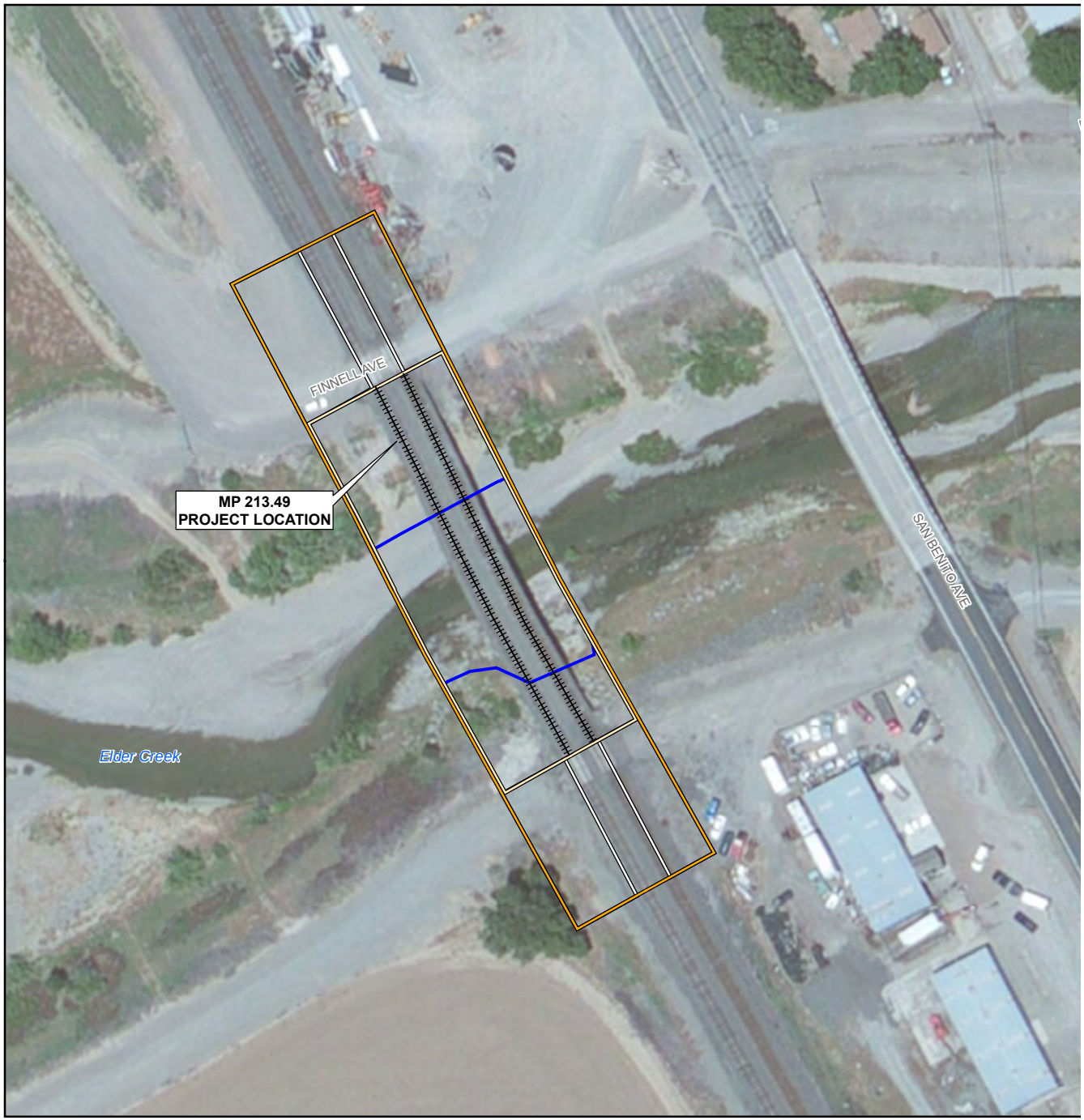
Direct:

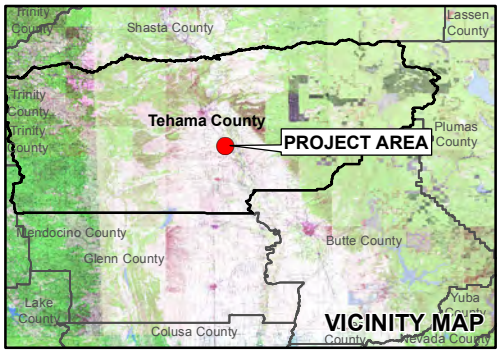
- The Executive Officer to take the necessary actions to execute the permit and file a CEQA Notice of Exemption with the State Clearinghouse.

11.0 – LIST OF ATTACHMENTS

A. Location Maps and Photos
B. Draft Permit No. 19165
C. Project Plans and Sections

Design Review:	Deb Biswas, Permitting Section
Environmental Review:	Itzia Rivera, Environmental Scientist
Document Review:	Gary W. Lemon, P.E., Permitting Section Chief
	Kelly Soule', P.E., Acting Operations Branch Chief
	Geoffrey Shaw, P.E., Chief Engineer
Legal Review:	Christina Morkner, Deputy Attorney General





LEGEND

- MP 213.49 BRIDGE LOCATION
- PROJECT AREA
- TEMPORARY WORK AREA
- TEMPORARY STAGING AREA
- ORDINARY HIGH WATER MARK – NATURAL WATERCOURSE (100 LINEAR FEET / 0.26 ACRE)

NOTES:

DELINEATION CONDUCTED ON JULY 25, 2016, BY RUSS HUDDLESTON AND GAVIN DOWNS.

ELEVATION AT ELDER CREEK IS APPROXIMATELY 270 FEET NORTH AMERICAN VERTICAL DATUM OF 1988.

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY(IMAGE DATE: JULY 13, 2014).

0 100 200
Feet

N

FIGURE 1
PROJECT AREA MAP

PROJECT DESCRIPTION
MP 213.49 VALLEY SUBDIVISION BRIDGE PROJECT
UNION PACIFIC RAILROAD
TEHAMA COUNTY, CALIFORNIA

Photograph 1. View to the southeast from Finnell Road showing the existing MP 213.49 bridge in midframe. The Elder Creek channel is visible to the right of frame.

Photograph 2. View to the north from the Elder Creek channel showing the MP 213.49 bridge to the right of frame.

Photograph 3. View to the east from the Elder Creek channel. The MP 213.49 bridge is visible in midframe, and the San Benito Avenue bridge is visible in the background.

Photograph 4. View to the north from the Elder Creek channel with the MP 213.49 bridge visible to the left of frame.

Photograph 5. View to the south from the north bank of Elder Creek showing the MP 213.49 bridge to the right of frame.

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 19165 BD

This Permit is issued to:

Union Pacific Railroad
1400 Douglas St
Omaha, Nebraska 68179

To remove and replace the existing Union Pacific Railroad (UPRR) bridge at UPRR Milepost (MP) 213.49 on the Valley Subdivision.

The project is located southwest from the community of Gerber, west of San Benito Avenue and south of Finnell Avenue, at 40.05146˚N 122.14986˚W, Unknown, Elder Creek, Tehama County, CA.

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 19165 BD

LIABILITY AND INDEMNIFICATION

THIRTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board (Board) and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

FOURTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Board and the State, safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

FIFTEEN: The Board, Department of Water Resources, and Tehama County Flood Control District shall not be held liable for any damages to the permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

AGENCY CONDITIONS

SIXTEEN: All work approved by this permit shall be in accordance with the submitted drawings and specifications dated April 17, 2018 except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Board.

SEVENTEEN: Permittee shall pay to the Board, an inspection fee(s) to cover inspection cost(s), including staff and/or consultant time and expenses, for any inspections before, during, post-construction, and regularly thereafter as deemed necessary by the Board.

EIGHTEEN: In the event that levee or bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Board, to prevent further erosion.

NINETEEN: The permittee shall be responsible for the repair of any damages to the project levee, channel, banks, floodway, or other flood control facilities due to construction, operation, or maintenance of the proposed project.

TWENTY: The permittee shall comply with all conditions set forth in the letter from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District) dated _____, which is attached to this permit as Exhibit A and is incorporated by reference.

TWENTY-ONE: The permittee agrees to notify new property/encroachment owner(s) that they are required to submit a permit Name Change request form to the Board upon completion of the sale. The new owner(s) will be required to comply with all permit conditions. Name Change forms are available at http://cvfpb.ca.gov/

TWENTY-TWO: The Board reserves the right to add additional, or modify existing, conditions when there is a change in ownership and/or maintenance responsibility of the work authorized under this permit.

PRE-CONSTRUCTION

TWENTY-THREE: Upon receipt of a signed copy of the issued permit the permittee shall contact the Board by telephone at (916) 574-0609, and submit the enclosed postcard, to schedule a preconstruction conference with the inspector that is assigned to your project. Failure to do so at least 10 working days prior to start of work may result in a delay of the project.

CONSTRUCTION

TWENTY-FOUR: No construction work of any kind shall be done during the flood season from November 1 to April 15 without prior approval of the Board. Failure to submit a Time Variance Request to the Board at least 10 working days prior to November 1 may result in a delay of the project.

TWENTY-FIVE: The bents shall be constructed parallel to the direction of flow.

TWENTY-SIX: The soffit of the bridge shall be no lower than that of the replaced bridge.

TWENTY-SEVEN: The abandoned or dismantled bridge shall be completely removed and disposed of outside the limits of the levee section and floodway.

TWENTY-EIGHT: Piers, bents, and abutments being dismantled shall be removed to at least 1 foot below the natural ground line and at least 3 feet below the bottom of the low-water channel.

TWENTY-NINE: Backfill material for excavations within the levee section and within 4 feet of bridge supports within the floodway shall be placed in 4- to 6-inch layers and compacted to a minimum of 90 percent relative compaction as measured by the current ASTM D1557 standard and above optimum moisture content.

THIRTY: Temporary staging, formwork, stockpiled material, equipment, and temporary buildings shall not remain in the floodway during the flood season from November 1 to April 15.

THIRTY-ONE: If erosion occurs adjacent to the permitted encroachment(s), the permittee shall repair the eroded areas and place adequate revetment on the affected areas to prevent further erosion.

THIRTY-TWO: If the bridge is damaged to the extent that it may impair the channel or floodway capacity, it shall be repaired or removed prior to the next flood season.

THIRTY-THREE: Revetment shall be uniformly placed and properly transitioned into the bank, levee slope, or adjacent revetment and in a manner which avoids segregation.

THIRTY-FOUR: Revetment shall be quarry stone and shall meet the following grading or equivalent:

Stone Size	Percent Passing
15 inches;	100
8 inches;	80-95
6 inches;	45-80
4 inches;	15-45
2 inches;	0-15

THIRTY-FIVE: The revetment shall not contain any reinforcing steel, floatable, or objectionable material. Asphalt or other petroleum-based products may not be used as fill or erosion protection on the levee section or within the floodway.

POST-CONSTRUCTION

THIRTY-SIX: All debris generated by this project shall be properly disposed of outside the Elder Creek floodway and project right-of-way.

THIRTY-SEVEN: The levees shall be restored to at least the condition that existed prior to commencement of work.

THIRTY-EIGHT: Upon completion of the project, the permittee shall submit as-constructed drawings to the Board and to: Department of Water Resources, Flood Project Inspection Section, 3310 El Camino Avenue, Suite 256, Sacramento, California 95821.

OPERATIONS AND MAINTENANCE

THIRTY-NINE: After each period of high water, debris that accumulates at the site shall be completely removed from the floodway.

FORTY: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Board, Department of Water Resources, Tehama County Flood Control District, or any other agency responsible for maintenance and shall, at all times, allow officials from these agencies to access the levee, levee slope, and any adjacent areas as necessary for flood control.

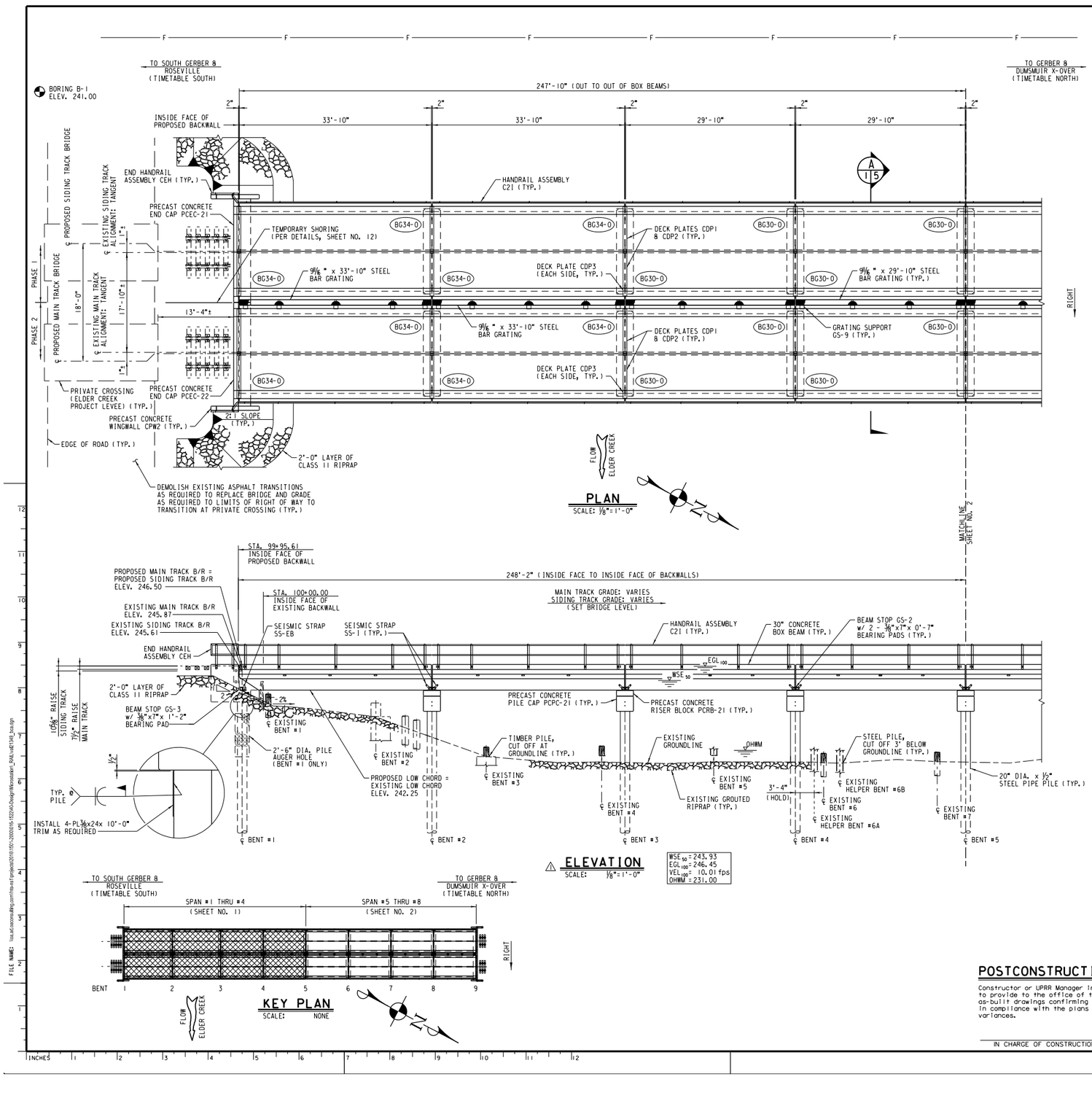
FORTY-ONE: The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Board or Department of Water Resources. If the permittee does not comply, the Board may modify or remove the encroachment(s) at the permittee's expense.

PROJECT ABANDONMENT / CHANGE IN PLAN OF FLOOD CONTROL

FORTY-TWO: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Board at the permittee's or successor's cost and expense.

FORTY-THREE: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if in the discretion of the Board the removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if the project is not maintained or is damaged by any cause. If the permittee does not comply, or in the event of an emergency, the Board may remove the encroachment(s) at the permittee's expense.

END OF CONDITIONS



DRAWING SCHEDULE

THIS SET

SHEET NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION (1 OF 2)
2	GENERAL PLAN AND ELEVATION (2 OF 2)
3	PILE LAYOUT AND PILE DRIVING DIAGRAM
4	GENERAL NOTES AND BILL OF MATERIAL
5	PHASING SECTIONS (1 OF 2)
6	PHASING SECTIONS (2 OF 2)
7	PRECAST CONCRETE RISER BLOCK PCRB-21 & PRECAST CONCRETE PILE CAP PCPC-21 DETAILS
8	PRECAST CONCRETE END CAP PCEC-21 DETAILS
9	PRECAST CONCRETE END CAP PCEC-22 DETAILS
10	BEARING PAD PLACEMENT DETAILS
11	BENT SKIRTING DETAILS
12	TEMPORARY SHORING DETAILS
13	MISCELLANEOUS STEEL DETAILS
14	MAIN TRACK TOP OF RAIL PROFILE
15	SIDING TRACK TOP OF RAIL PROFILE
16	BORING LOGS

REF.

NO.	DWG. NO.	SHEET NO.	REV. NO.	DESCRIPTION
1	530000	A1-A5	B	BOX AND SLAB BEAM, CONSTRUCTION PLANS
2	530000	B1-B4	A	30" BOX BEAM, CONSTRUCTION DETAILS
3	500000	BG1-BG3	F	30" DOUBLE BOX BEAM, FABRICATION PLANS
4	501000	A1	A	PRECAST END CAP FOR 30" BOX BEAM
5	501000	C1-C2	A	PRECAST CONCRETE PILE CAP
6	531010	1	A	PRECAST CONCRETE PILE CAP BEARING PADS
7	502000	1-4	B	STEEL HARDWARE AND HANDRAIL ASSEMBLIES
8	531800	8	B	CAPMASTER PRECAST CONCRETE 15' PILE CAP WITH COIL INSERT DETAILS
⚠1 9	520000	1	-	20" DIA. STEEL PIPE PILE DETAILS AND NOTES

——F—— = FIBER OPTIC CABLE

NOTE:
LOCATION OF KNOWN UTILITIES IS APPROXIMATE. LOCATION SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. NOTIFY UNDERGROUND SERVICE ALERT NORTH, 1-800-277-2600, LEVEL 3 COMMUNICATIONS, 1-877-366-8344, AND QWEST COMMUNICATIONS, 1-800-283-4237, AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

NOTES:
1. FOR PILE LAYOUT AND PILE DRIVING DIAGRAM, SEE SHEET NO. 3.
⚠2 2. BENT SKIRTING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET NO. 11.
3. REMOVE GROUTED RIPRAP AS REQUIRED TO DRIVE PILE. REPLACE AND REPAIR DAMAGED GROUTED RIPRAP AFTER PILE DRIVING.

LETTER SERIES
SHEET NO. CUT ON — SHEET NO. SHOWN ON

SECTION DESIGNATION

EST. WT. OF PRECAST CONCRETE
BOX BEAM BG34-0 = 59,400 LB. EA. (29.7 TON)
BOX BEAM BG30-0 = 52,300 LB. EA. (26.2 TON)
END CAP PCEC-21 = 24,100 LB. EA. (12.1 TON)
END CAP PCEC-22 = 24,100 LB. EA. (12.1 TON)
PILE CAP PCPC-21 = 19,700 LB. EA. (9.9 TON)
RISER BLOCK PCRB-21 = 6,900 LB. EA. (3.5 TON)
WINGWALL CPW2 = 4,900 LB. EA. (2.5 TON)

NO.	DATE	REVISIONS
	/ /	
3	5/17/18	UPDATED COMPACTION NOTES ON PAGE 4
2	4/17/18	UPDATED NOTES ON PAGE 4
1	2/26/18	20" DIA. PIPE PILE AND BENT SKIRTING SHT. NOS. 1-6 AND 11-13; ADDED LOGS

SP ROUTE SYMBOL C, FORMER BRIDGE NO. 213.52

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION:
BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY:
8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE:
GENERAL PLAN AND ELEVATION (1 OF 2)

PROJECT ID: 97193	UP ENGINEER: UP-DGW OLSSON-TMS
WORK ORDER: 35715	LATITUDE: 40.05149° N
DESIGN BY: MJH	LONGITUDE: 122.14980° W
CHECKED BY: KAS	
DRAWN BY: JEJ	SHEET NO. 1 of 16
CHECKED BY: TMS	C E NUMBER 120893
SCALE: AS SHOWN	

POSTCONSTRUCTION COMPLIANCE

Constructor or UPRR Manager in charge of construction to provide to the office of the Director Structures Design as-built drawings confirming that the project was constructed in compliance with the plans and indicating any construction variances.

IN CHARGE OF CONSTRUCTION — DATE

Damian Wallner 2/28/17
APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES
BY: T. M. Stuff
DATE: DECEMBER 06, 2016

FILE NAME: \\sa.ad.oaconsulting.com\Projects\2016\1157\1-CD\2016-1157-CADD\01b-1522ACADsrc\Drawings\Reinforcement_BAR_1x8E1348_bha.dgn

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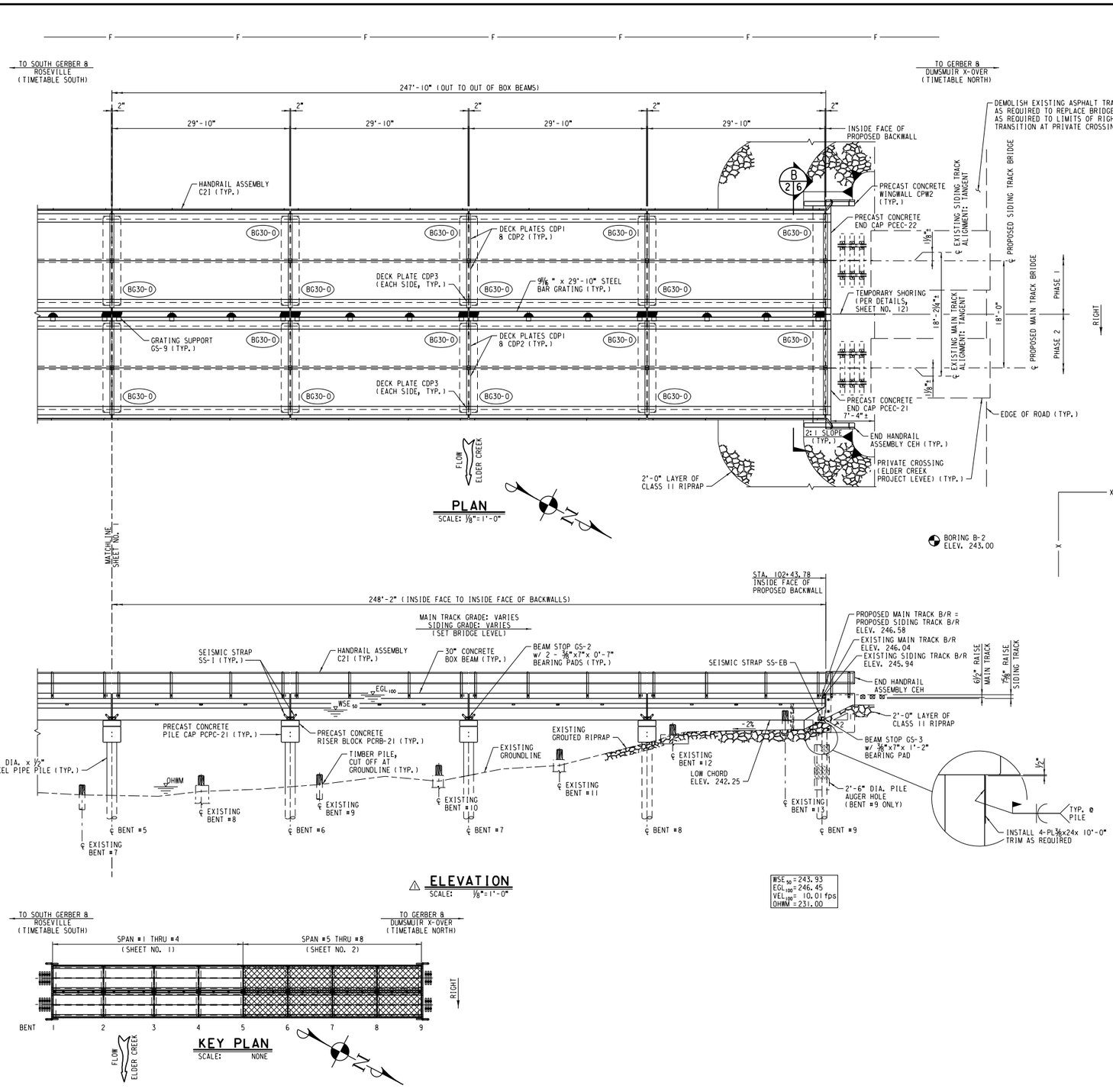

NOTE:
LOCATION OF KNOWN UTILITIES IS APPROXIMATE. LOCATION SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. NOTIFY UNDERGROUND SERVICE ALERT NORTH, 1-800-277-2600, LEVEL 3 COMMUNICATIONS, 1-877-366-8344, AND QWEST COMMUNICATIONS, 1-800-283-4237, AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

NOTES:
1. FOR PILE LAYOUT AND PILE DRIVING DIAGRAM, SEE SHEET NO. 3.
2. BENT SKIRTING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET NO. 11.
3. REMOVE GROUTED RIPRAP AS REQUIRED TO DRIVE PILE. REPLACE AND REPAIR DAMAGED GROUTED RIPRAP AFTER PILE DRIVING.
4. EXCAVATE AT PILE LOCATIONS AS REQUIRED TO PLACE PRECAST CONCRETE PILE CAPS.

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	20" DIA. PIPE PILE AND BENT SKIRTING

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION:
BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY:
8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE:
GENERAL PLAN AND ELEVATION (2 OF 2)

Damian Wallner 2/28/17
APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES
BY:
DATE: DECEMBER 06, 2016

PROJECT ID: 97193	UP ENGINEER:	LATITUDE:	
WORK ORDER: 35715	UP- DGW	40.05149° N	
DESIGN BY: MJH	OLSSON- TMS	LONGITUDE:	
CHECKED BY: KAS		122.14980° W	
DRAWN BY: JEJ	SHEET NO.	C E NUMBER	
CHECKED BY: TMS	2 of 16	120893	
SCALE: AS SHOWN			

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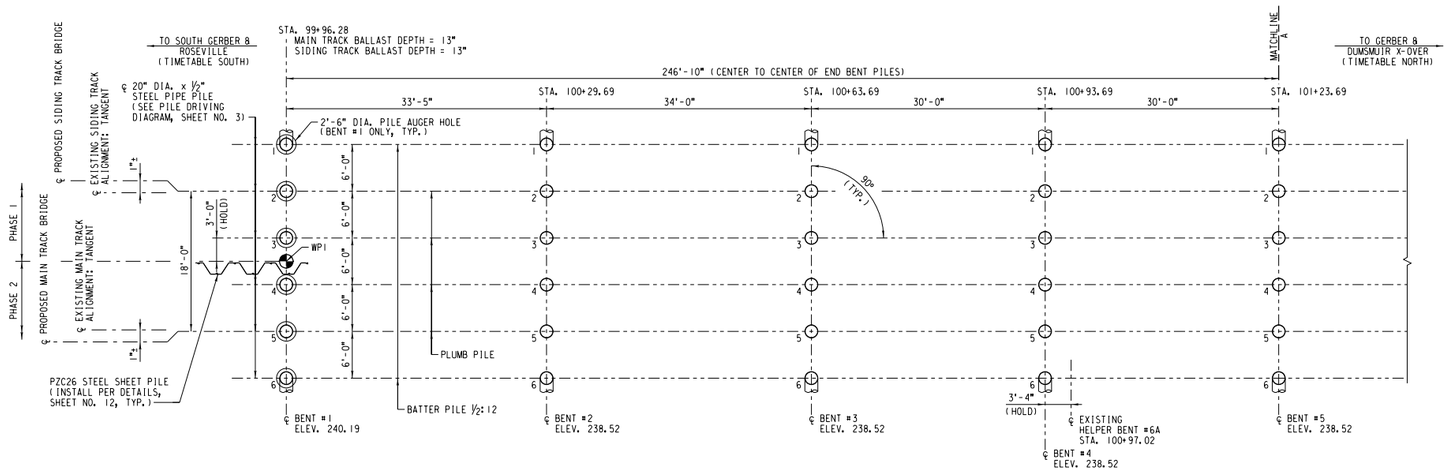
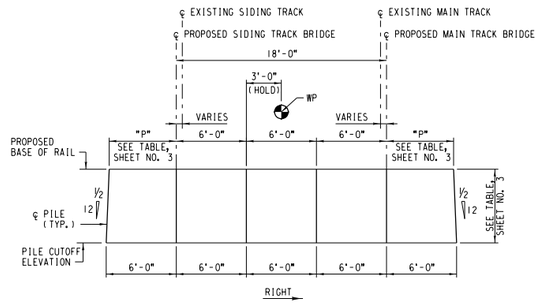




PILE DRIVING DIAGRAM

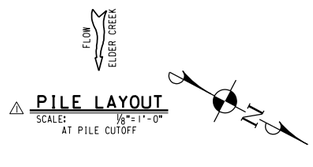
SCALE: NO SCALE

BENT #1 THRU #9

BENT #	BALLAST DEPTH	PROPOSED B/R TO PILE CUTOFF	PROPOSED B/R TO TOP OF SEAT	"P"
1	13"	6'-3¾"	4'-3¾"	5'-8⅞"
2	13¾"	8'-0½"	4'-4½"	5'-8"
3	14¼"	8'-1"	4'-5"	5'-8"
4	14⅝"	8'-1⅜"	4'-5⅜"	5'-8"
5	14¾"	8'-1½"	4'-5½"	5'-8"
6	14¾"	8'-1½"	4'-5½"	5'-8"
7	14⅝"	8'-1⅜"	4'-5⅜"	5'-8"
8	14⅜"	8'-1⅛"	4'-5⅛"	5'-8"
9	14"	6'-4¾"	4'-4¾"	5'-8¾"

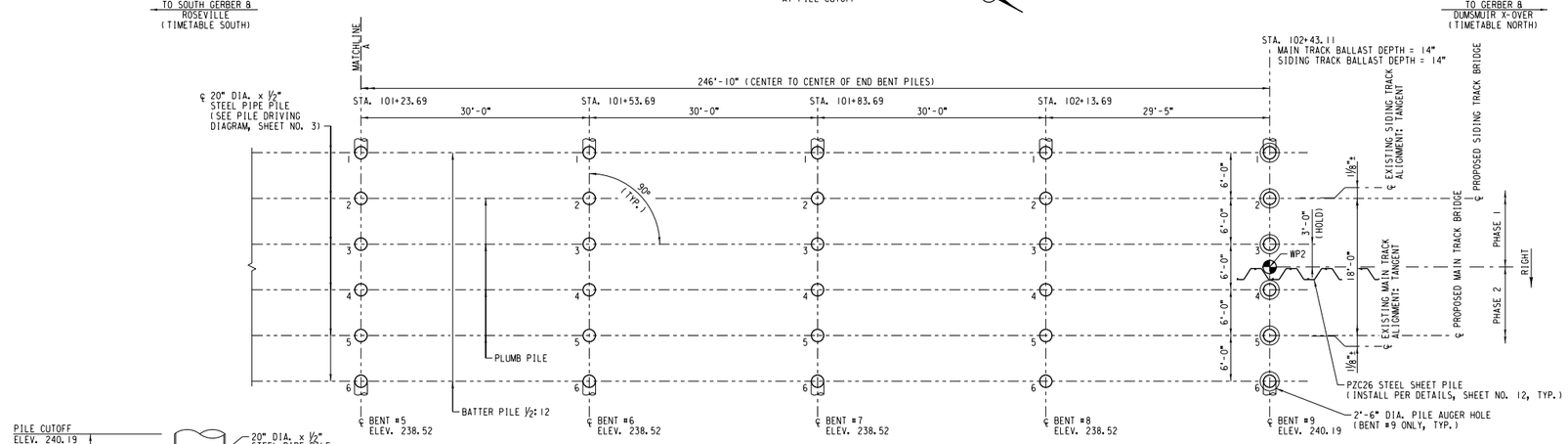
NOTE:
WP1 IS LOCATED MIDPOINT BETWEEN TRACKS AT CENTERLINE OF BENT #1

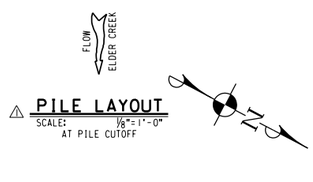
WP2 IS LOCATED MIDPOINT BETWEEN TRACKS AT CENTERLINE OF BENT #9



⚠ PILE LAYOUT

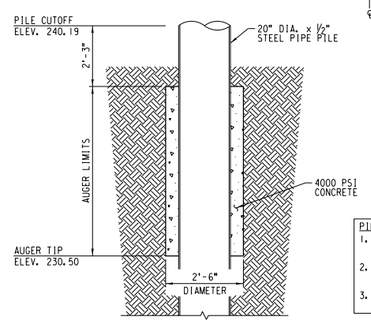
SCALE: ⅛"=1'-0" AT PILE CUTOFF





⚠ PILE LAYOUT

SCALE: ⅛"=1'-0" AT PILE CUTOFF



PILE AUGER HOLE NOTES:
1. DEPTH OF PILE AUGER HOLE SHALL BE TO ELEV. 230.50 AT BENTS #1 AND #9 ONLY.
2. PILING SHALL BE PLACED INTO AUGERED HOLE AND DRIVEN TO ELEV. 155.19 OR TO RESISTANCE (120'-0" MAX.)
3. PILE SHALL BE ENCASED IN AUGERED HOLE WITH 4000 PSI CONCRETE TO 2'-3" BELOW PILE CUTOFF.

⚠ PILE AUGER HOLE DETAIL

SCALE: NO SCALE

EST. VOLUME OF CONCRETE = 0.6 CU. YD. PER 5' AUGER HOLE DEPTH

Damian Wallner 2/28/17

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	UPDATED TO 20" DIA. PIPE PILE

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49, 1.4 MILES SOUTH OF GERBER, CA — VALLEY SUB.

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: PILE LAYOUT AND PILE DRIVING DIAGRAM

PROJECT ID: 97193	UP ENGINEER: UP-DGW OLSSON-TMS	LATITUDE: 40.05149° N	
WORK ORDER: 35715		LONGITUDE: 122.14980° W	
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO. 3 of 16	C E NUMBER 120893
CHECKED BY: TMS			
SCALE: AS SHOWN			

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GENERAL NOTES

1. All work requirements shown on these drawings and not otherwise detailed shall be accomplished as specified in Union Pacific Railroad (UPRR) Specifications and the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering. In the event of conflicts between specifications, the more restrictive shall apply.
2. **Construction means and methods shall comply with the All Permits Issued (API) package.**
3. Information used to prepare this drawing in addition to reference drawings:

   Location survey prepared by Olsson Associates, dated 10/27/16.

   Geotechnical investigation and recommendation prepared by Shannon & Wilson, Inc., dated 08/29/17.
4. Field verify all dimensions, stations and elevations prior to start of construction.
5. **Contact the Union Pacific "Call Before You Dig" number 90 days (not less than 60 days) prior to proposed construction start date. Prior to construction, confirm that all necessary relocations have been completed. The CBYD number is: 1-800-336-9193.**
6. **Location of known utilities is approximate. Location shall be verified prior to construction. Notify Underground Service Alert North, 1-800-227-2600, at least 48 hours prior to construction.**

RIGHT-OF-WAY

1. 100' both sides of existing Main Track centerline.

LAYOUT

1. Stationing: Sta. 100+00.00, North face of South backwall of existing Main Track bridge No. 213.49.
2. Elevation Datum: Elev. 245.87, base of East rail of existing Main Track, Sta. 100+00.00.
3. Temporary Benchmark: Elev. 246.72, established by mag nail with survey disk in crossing, 9.97' left of existing Main Track centerline, Sta. 102+52.54.
4. Profile: See Main Track Top of Rail Profile, Sheet No. 14 and Siding Track Top of Rail Profile, Sheet No. 15.
5. Alignment: Tangent.

PILE DRIVING

1. **All piles shall be driven to 123 ton capacity.**
2. If any numbered pile cannot be driven to these capacities, the Structures Design group of the UPRR Office of AVP Engineering Design shall be notified.
3. Estimated capacity of driven piles shall be calculated using the Modified ENR formula, with Factor of Safety of 5. Direct questions to the Structures Design Group, Office of AVP Engineering Design. Pile driving records and estimated capacities shall be submitted to the Structures Design Group, Office of AVP Engineering Design.
4. Vibratory hammers shall not be permitted to drive any portion of any bearing piles.
5. Splice pile per standard drawing Plan No. 520000, Sheet No. 1. Pile splices shall be located a minimum of 15' below the proposed or existing ground surface, whichever is lower.
6. Mark every pile with a dimension indicating the pile depth from cutoff to point of pile. The dimension shall be rounded to the nearest foot. The mark shall be welded on the outside face, low mile post side on the pile flange, approximately 1'-0" below the bottom of the cap, and in numbers of approximately 3" in height. If a pile is not exposed, no mark is required.
7. Expected minimum penetration of piles from B/R to pile tip is about 93 feet. Due to the presence of cobbles, gravel and other possible obstructions, hard driving conditions are anticipated. If any numbered pile cannot be driven to this minimum depth, the Structures Design Group of the UPRR Office of AVP Engineering Design shall be notified.
8. **After pile driving is complete, provide pile driving logs to:**

   UPRR Director Structures Design
   1400 Douglas St., Stop 0910
   Omaha, NE 68179

FIELD WELDING

1. Welding shall be accomplished with the SMAW or FCAW Process.
2. Welding shall be in compliance with the requirements specified in AWS D1.5, except 5/16" fillet welds may be made with a single pass.
3. Welding electrodes shall be E7018 for SMAW or E71T-7 for FCAW.
4. Welders shall possess valid qualifications.

GRADING

1. Provide and place all fill and subballast material per UPRR Grading Specifications. Perform grading as required to drain and match existing embankments and upstream and downstream channel flowline.
2. Perform grading as required for construction of the new structure and replace areas removed and disturbed in the course of construction to a condition equal to or better than existing.

RIPRAP

1. Riprap shall be placed in such a manner as to avoid segregation of the various sizes of rock. Individual rocks shall be placed in tight contact with one another in such a way to produce the least amount of void spaces.
2. Riprap shall be solid, unfractured rock or concrete, bulky in shape with sharp angular edges. Weight of individual rocks shall vary from a minimum of 200 lb. to a maximum of 1000 lb. for Class II, UPRR Item No. 562-3430.

WELL-COMPACTED FILL

1. Well-compacted fill shall be well-graded granular soil free of any organic material, stones larger than 3 inches, frozen lumps, debris or excessive moisture. All compaction shall be determined using ASTM D1556 for field test and ASTM D1557 for moisture and density. Fill shall be compacted to 95% of maximum dry density as defined in ASTM D1557 (Modified Proctor) at mositures between -2 and +3 percent of optimum moisture content obtained from ASTM D1557. Fill shall be placed in layers not to exceed 6 inches.
2. Fill shall be compacted using hand operated equipment such as vribating plate or trench roller.

DESIGN NOTES

1. The proposed superstructure and substructure have been designed in accordance with the AREMA Manual for Railway Engineering, Chapter 8: Concrete Structures and Foundations, except longitudinal load, which is designed per the 1996 AREA Manual for Railway Engineering.
2. This structure was designed for Cooper E80 Live Load plus impact with a 30" maximum total depth of ballast.
3. Pile Design Load (NOT TO BE USED FOR CONSTRUCTION):
   End Bent: 82 Ton
   Interior Bent: 123 Ton
4. Bent Design Parameters:
   Maximum Bent Height: 18'-0"
   Equilibrium Superelevation: 0"
5. This drawing was prepared using 13" (min.) of ballast under timber ties.

CONSTRUCTOR NOTES (WHEN APPLICABLE)

DIVISION OF RESPONSIBILITY

A. RAILROAD

1. Remove ties, rail and OTM from existing bridge.
2. Provide and install ballast, ties, rail and OTM for proposed bridge.
3. Provide material as shown in the Bill of Material.
4. Provide and install Private Property/No Trespassing sign and bridge marker signs on right side at each end of bridge.

B. CONSTRUCTOR

1. Coordinate all construction activities with the Railroad.
2. **Before ordering any materials, Constructor shall make a detailed field inspection of the site verifying all pertinent dimensions and elevations. Any variations in dimensions or elevations from those shown on the drawings shall be reported immediately to the UPRR Project Manager.**
3. Any modifications to this design shall be approved by the UPRR Office of AVP Engineering Design prior to construction.
4. **Verify the location, relocation, abandonment and/or temporary support of all utilities affected by the construction of the structure and embankment and coordinate these activities with the appropriate utility companies, agencies and/or authorities.**
5. Apply for and obtain all construction permits necessary to perform the work.
6. Bill of Material and Schedules are provided for information only. Constructor shall be responsible for providing all material, not provided by the Railroad, required to complete the work.
7. Perform all work not performed by the Railroad.
8. Provide the Railroad with a detailed construction plan defining the activity, schedule and procedure for each aspect of the work. Construction shall not begin until the construction plan has been approved by the Railroad.
9. Provide all temporary structures (shoring, bracing and/or falsework) required to support and protect the existing embankments and structures affected by the work. Provide the Railroad with details, design and procedure for all temporary structures. All temporary structures shall be designed, signed and sealed by a professional engineer registered in the State of California. All temporary structures shall be approved by the UPRR Office of AVP Engineering Design prior to beginning construction. The requirements in BNSF/UPRR Temporary Shoring Guidelines shall be met, including the provisions on Plan No. 710000, Sheet No. 1.
10. Provide temporary guardrail system as directed by UPRR Project Manager. Guardrails on shoring shall include but not be limited to the following:

    The top edge height of the top rail shall be 42" +/- 3" above the walking/working surface.

    At least one midrail shall be provided, evenly spaced between walking/working surface and top rail.

    Metal or timber posts or uprights shall be spaced at maximum intervals of 10'-0".

    Entire guardrail system, including anchorages, shall be capable of withstanding without failure, a force of 200 lbs. applied in any outward or downward direction at any point.

    Guardrail system shall be surfaced to prevent injuries from punctures and lacerations and prevent snagging of clothing. The ends of top rails and midrails shall not extend past the posts of uprights.

    If conditions warrant, i.e. pedestrian traffic/weather, additional protection shall be provided such as screens or mesh to prevent slipping between the midrail and walking/working surface.
11. Direct channel flow as required to perform work.
12. Accomplish all activities within the schedule specified in the approved construction plan.

MISCELLANEOUS STEEL NOTES

1. Materials, fabrication and workmanship shall be in accordance with Chapter 15: Steel Structures of the current AREMA Manual for Railway Engineering.
2. Miscellaneous steel shall conform to ASTM A36 specifications unless noted otherwise. Miscellaneous steel shall be plain unless noted otherwise.
3. Where galvanizing is indicated, miscellaneous steel shall be pickled in accordance with SSPC-SP8 and hot-dipped galvanized in accordance with ASTM A123 specifications. Coating weight shall be 2.3 oz. per sq. ft.
4. Bolts and nuts to be zinc plated in accordance with ASTM A153 specifications unless noted otherwise.
5. Welding shall be by the arc process per AREMA Manual for Railway Engineering and AWS D1.1 Structural Welding Code. Welding shall be performed by qualified welders.

PROPOSED CONSTRUCTION SEQUENCE

All work performed by the contractor, except where noted in parentheses.

PHASE 1

1. Install Phase 1 piles and precast concrete pile caps.
2. Close Elder Creek Project Levee crossing at both ends of bridge.
3. Install temporary shoring as required.
4. Take existing Siding Track out of service (by Railroad). Traffic may continue to operate on existing Main Track.
5. Remove portion of existing Siding bridge and install temporary ballast retainers as required to construct Phase 1.
6. Install Phase 1 precast concrete end caps, riser blocks, and wingwalls, and place riprap.
7. Install phase 1 superstructure.
8. Install ballast, ties, rail and OTM for new Siding Track (by Railroad).
9. Place existing Siding Track into service (by Railroad).

PHASE 2

1. Install Phase 2 piles and precast concrete pile caps.
2. Take existing Main Track out of service (by Railroad). Traffic may continue to operate on existing Siding Track.
3. Remove existing Main Track bridge as required to construct Phase 2.
4. Install Phase 2 precast concrete end caps, riser blocks, and wingwalls, and place riprap.
5. Install Phase 2 superstructure.
6. Install ballast, ties, rail and OTM for new Main Track (by Railroad).
7. Place Main Track into service (by Railroad).
8. Regrade and reopen Elder Creek Project Levee crossing at both ends of bridge.
9. Restore area to original condition or better.

BILL OF MATERIAL

REQ'D.	UNIT	DESCRIPTION	STORE ITEM NO.	ORDERED BY
8	EA.	30" x 33'-10" PRESTRESSED CONCRETE BOX BEAM BG34-0, TYPE I w/ SLOPED CURB (PER STD. DWG. 500000 SHT. BG1-BG3)	511-7832	MANAGER TRACK PROJECTS
24	EA.	30" x 29'-10" PRESTRESSED CONCRETE BOX BEAM BG30-0, TYPE I w/ SLOPED CURB (PER STD. DWG. 500000 SHT. BG1-BG3)	511-7828	
2	EA.	PRECAST CONCRETE END CAP PCEC-21 (PER DETAILS, SHEET NO. 8)	120893-1	
2	EA.	PRECAST CONCRETE END CAP PCEC-22 (PER DETAILS, SHEET NO. 9)	120893-2	
4	EA.	PRECAST CONCRETE WINGWALL CPW2 FOR 30" CONCRETE BOX BEAM (PER STD. DWG. 501000 SHT. A1)	511-0036	
14	EA.	PRECAST CONCRETE PILE CAP PCPC-21 FOR USE WITH CAPMASTER (PER DETAILS, SHEET NO. 7)	120893-3	
14	EA.	PRECAST CONCRETE RISER BLOCK PCRB-21 (PER DETAILS, SHEET NO. 7)	120893-4	
54	EA.	PIPE 20.000x0.500 STEEL PILE, 60' LENGTHS, BEVELED ENDS (ASTM A252 GRADE 3, PLAIN)	510-7624	
54	EA.	PIPE 20.000x0.500 STEEL PILE, DOUBLE RANDOM (38' TO 43') LENGTHS, BEVELED ENDS (ASTM A252 GRADE 3, PLAIN)	510-7620	
54	EA.	20" DIA. PIPE PILE SLEEVE (PER STD. DWG. 520000 SHT. 1)	510-7619	
54	EA.	20" DIA. PILE POINT, APF-P13006 (PER STD. DWG. 520000 SHT. 1)	510-7621	
15	EA.	PZC26 x 35'-0" STEEL SHEET PILE (ASTM A572, GR. 50, PLAIN)	510-3571	
2	EA.	BACKWALL PLATE BWP-1 (PER NOTES, SHEET NO. 4 AND DETAIL, SHEET NO. 13)	120893-5	
84	EA.	DOWEL BAR G204 (#8 x 2'-4") (ASTM A615, GR. 60)	512-2865	
28	EA.	BEAM STOP GS-2 (PER STD. DWG. 502000 SHT. 1-4)	510-0595	
8	EA.	BEAM STOP GS-3 (PER STD. DWG. 502000 SHT. 1-4)	510-0596	
56	EA.	SEISMIC STRAP SS-1 (PER STD. DWG. 502000 SHT. 1-4)	510-0601	
8	EA.	SEISMIC STRAP SS-EB (PER STD. DWG. 502000 SHT. 1-4)	510-0602	
4	EA.	HANDRAIL ASSEMBLY C21 FOR 33'-10" CONCRETE INTERIOR SPAN (PER STD. DWG. 502000 SHT. 1-4)	510-0488	
12	EA.	HANDRAIL ASSEMBLY C21 FOR 29'-10" CONCRETE INTERIOR SPAN (PER STD. DWG. 502000 SHT. 1-4)	510-0472	
4	EA.	END HANDRAIL ASSEMBLY CEH FOR CONCRETE SPAN (PER STD. DWG. 502000 SHT. 1-4)	513-3020	
34	EA.	GRATING SUPPORT GS-9 (PER NOTES, SHEET NO. 4 AND DETAIL, SHEET NO. 13)	120893-6	
2	EA.	WELDFORGED TYPE W/B STEEL GRATING, (1 3/4" x 3/16" SERRATED BARS), 9 11/16" WIDE x 33'-10" LONG (GALVANIZED)	120893-7	
6	EA.	WELDFORGED TYPE W/B STEEL GRATING, (1 3/4" x 3/16" SERRATED BARS), 9 11/16" WIDE x 29'-10" LONG (GALVANIZED)	120893-8	
18	EA.	DECK PLATE CDP1, GALVANIZED (PER STD. DWG. 502000 SHT. 1-4)	510-0590	
18	EA.	DECK PLATE CDP2, GALVANIZED (PER STD. DWG. 502000 SHT. 1-4)	510-0591	
36	EA.	DECK PLATE CDP3, GALVANIZED (PER STD. DWG. 502000 SHT. 1-4)	510-0592	
8	EA.	PL3/8x24x 10'-0" (ASTM A36, PLAIN)	510-7650	
1	LOT	BENT #2 THRU #7 SKIRTING SCHEDULE (PER SCHEDULE, SHEET NO. 11)	120893-9	
148	EA.	1/2"x28"x 6'-4" PREMOLDED EXPANSION JOINT FILLER PER ASTM D1751	511-8213	
56	EA.	3/8"x7"x 0'-7" ELASTOMERIC BEARING PAD	510-3635	
8	EA.	3/8"x7"x 1'-2" ELASTOMERIC BEARING PAD	510-3637	
1	QT.	ZRC COLD GALVANIZING COMPOUND OR APPROVED ALTERNATE	513-3960	
1	EA.	BRIDGE MARKER AND NO TRESPASSING SIGNS, MOUNTING POST AND MOUNTING HARDWARE (PER STD. DWG. 0502, 0507, 0538 AND 0599)	P00-2616	
1	LOT	TEMPORARY BALLAST RETAINER MATERIAL		CONSTRUCTOR
300	TON	RIPRAP, CLASS II (PER NOTES, SHEET NO. 4)	562-3430	
56	TON	WELL-GRADED 1 1/2" MINUS CRUSHED ROCK (PER STD. DWG. 530000 SHT. B1-B4)		
1	LOT	4000 PSI NON-SHRINK GROUT (FOR DOWELS AND RISER BLOCK)		
1	LOT	4000 PSI GROUT (FOR GROUTED RIPRAP REPAIR)		
1	LOT	4000 PSI CONCRETE FOR PILE AUGER HOLES		
1	LOT	PL-400 CONSTRUCTION ADHESIVE FOR BEARING PADS (PER STD. DWG. 530000 SHT. A1-A5)		

EST. WT. OF STEEL PIPE PILING = 562,845 LB.
EST. WT. OF STEEL SHEET PILING = 38,800 LB.
EST. WT. OF BENT SKIRTING = 43,215 LB.
EST. WT. OF STEEL GRATING = 2,490 LB.
EST. WT. OF MISCELLANEOUS STEEL (NOT INCL. BOLTS) = 15,030 LB.
EST. WT. OF DOWELS = 525 LB.

BULK MATERIAL QUANTITIES ARE ESTIMATED.

NOTE:
CONSTRUCTOR DESIGNATES MANAGER BRIDGE CONSTRUCTION IF CONSTRUCTION BY UPRR AND CONTRACTOR IF CONSTRUCTION BY CONTRACTOR.

NO.	DATE	REVISIONS
	/ /	
3	5/17/18	CHANGED COMPACTION NOTES
2	4/17/18	ADDED WELL COMPACTED FILL NOTE
1	2/26/18	20" DIA. PIPE PILE AND BENT SKIRTING

Damian Wallner 2/28/17

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY:

DATE: DECEMBER 06, 2016

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: GENERAL NOTES AND BILL OF MATERIAL

PROJECT ID: 97193
WORK ORDER: 35715
DESIGN BY: MJH
CHECKED BY: KAS
DRAWN BY: JEJ
CHECKED BY: TMS
SCALE: NONE

UP ENGINEER: UP-DGW OLSSON-TMS

LATITUDE: 40.05149° N
LONGITUDE: 122.14980° W

SHEET NO. 4 of 16

C E NUMBER 120893

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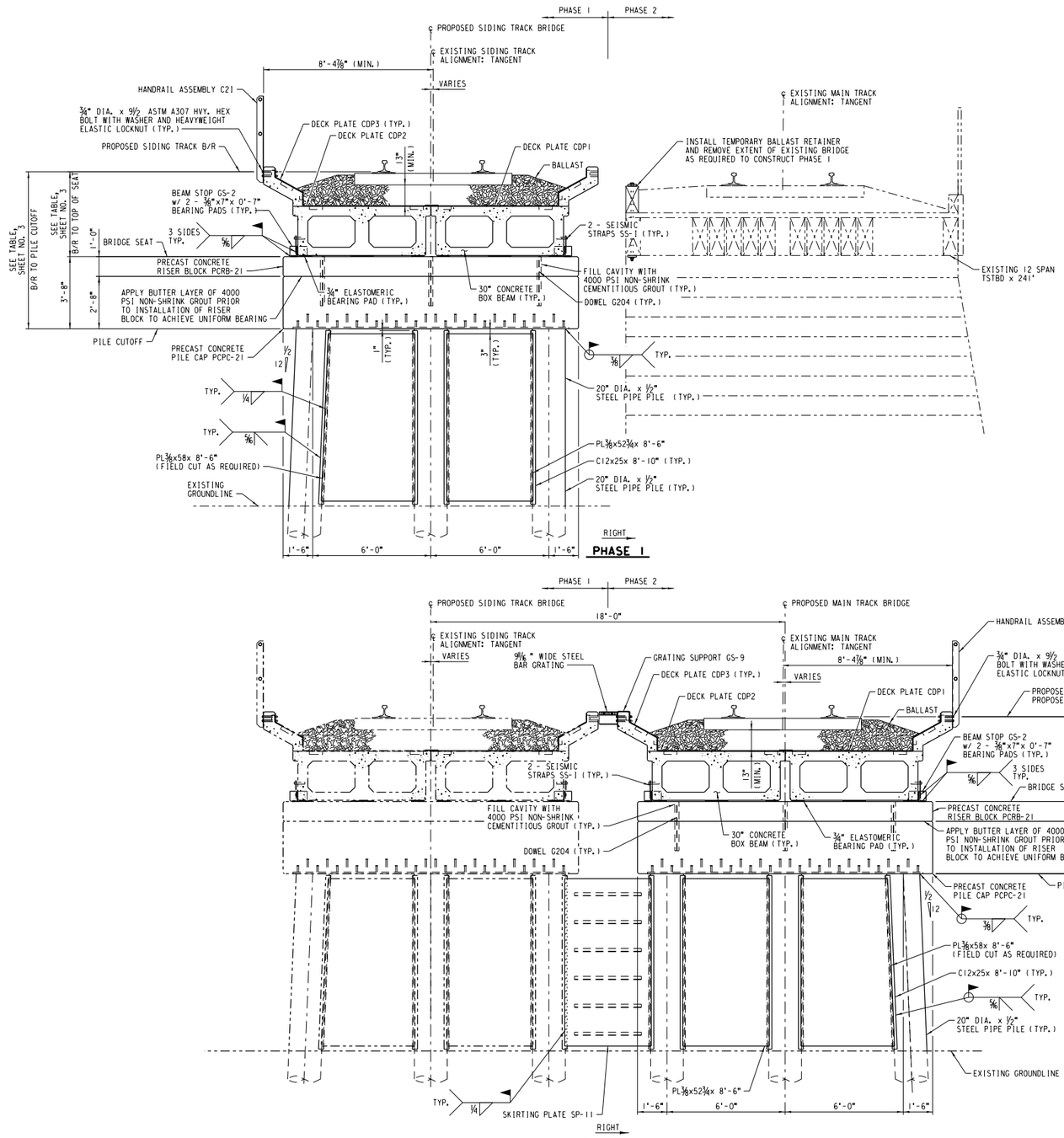

SECTION A

SCALE: ⅜"=1'-0"

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	20" DIA. PIPE PILE AND BENT SKIRTING

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49, 1.4 MILES SOUTH OF GERBER, CA — VALLEY SUB.

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING I2 SPAN TSTBD x 241'

DWG. TITLE: PHASING SECTIONS (1 OF 2)

Damian Wallner 2/28/17

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

PROJECT ID:	97193	UP ENGINEER: UP-DGM OLSSON-TMS	LATITUDE: 40.05149° N
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CHECKED BY:	TMS	5 of 16	120893
SCALE:	AS SHOWN		

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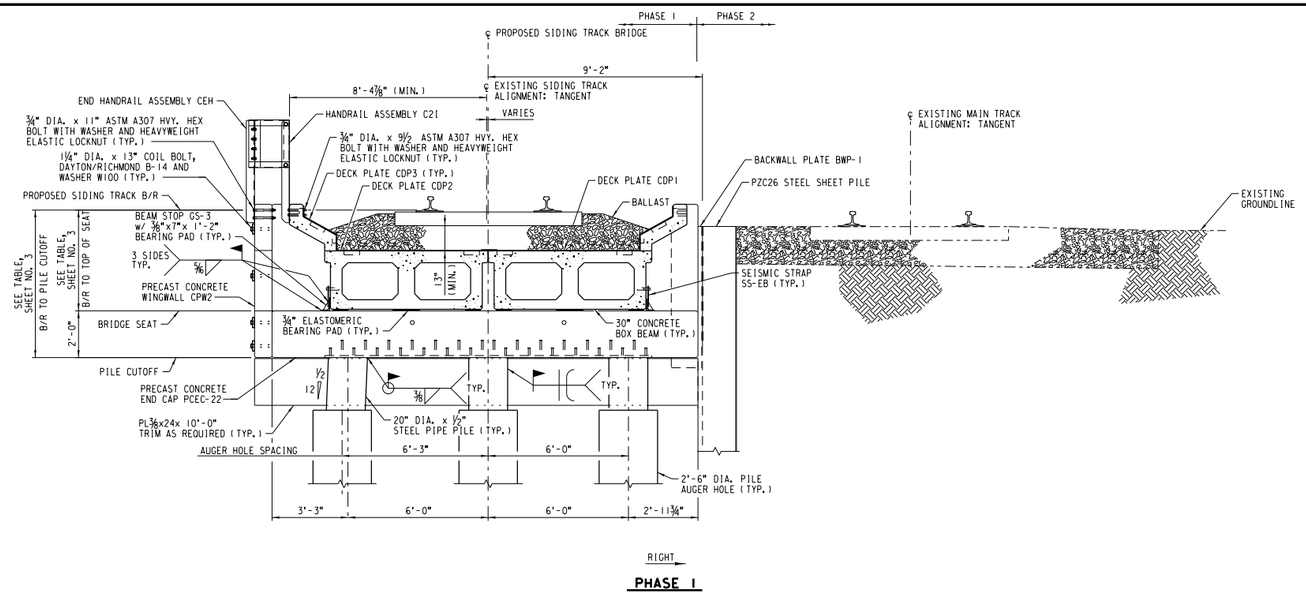
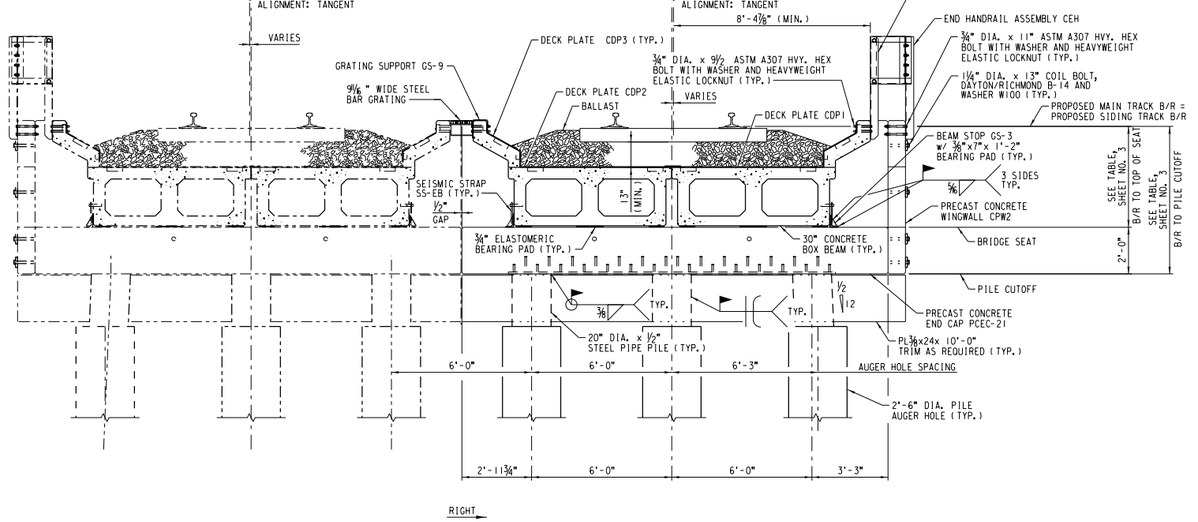


PHASE 1



PHASE 2

⚠ SECTION B 2 6
SCALE: ⅜"=1'-0"

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	20" DIA. PIPE PILE

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: PHASING SECTIONS (2 OF 2)

PROJECT ID: 97193	UP ENGINEER: UP-DGW OLSSON-TMS	LATITUDE: 40.05149° N
WORK ORDER: 35715		LONGITUDE: 122.14980° W
DESIGN BY: MJH		
CHECKED BY: KAS		
DRAWN BY: JEJ	SHEET NO.	C E NUMBER
CHECKED BY: TMS	6 of 16	120893
SCALE: AS SHOWN		

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INCHES 1 2 3 4 5 6 7 8 9 10 11 12

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PRECAST CONCRETE NOTES

CONCRETE

1. All concrete materials, placement and workmanship shall be in accordance with Part 1, Chapter 8 of the current AREMA Manual for Railway Engineering.
2. Minimum compressive strength at 28 days shall be 4000 psi.
3. Exposed surfaces shall be formed in a manner which will produce a smooth and uniform appearance without rubbing or plastering. Exposed edges of 90 degrees or less are to be chamfered ¾" x ¾". Top surface to have a smooth finish, free of all float or trowel marks.
4. Concrete shall be proportioned such that the water - cement ratio (by weight) does not exceed 0.45. Concrete must contain a minimum of 6½ sacks of cement per cubic yard of concrete.
5. Cement shall be either Type I, Type II or Type III Portland Cement in accordance with ASTM C150 specifications.
6. Aggregates shall be graded in accordance with ASTM C33 specifications. Course aggregate shall be size no. 67. Fine aggregate shall be natural sand.
7. Air content shall be between 5% and 7% (by volume).
8. Admixtures shall not be used without approval by Engineer.
9. Curing shall be accomplished by wet curing or the application of a Type 2 membrane.
10. The Fabricator shall stencil the Fabricator's name, date of fabrication, bridge number and piece mark at location shown on drawings.
11. Production procedures for the manufacture of precast members shall be in accordance with the AREMA Manual for Railway Engineering and the Precast Concrete Institute's Manual MNL 116 for Quality Control.
12. Dimensional tolerances governing the manufacture of precast members shall conform to Division VI, Section 6.4 of the Precast Concrete Institute's Manual MNL 116 for Quality Control for the appropriate shape. Tolerance for location of lifting devices shall be +/- ½".
13. The Fabricator will be responsible for loading and properly securing all precast concrete members for shipment. All concrete components shall be made available for inspection by the Railroad at the Fabricator's plant prior to shipment, at the Railroad's discretion.

REINFORCING STEEL

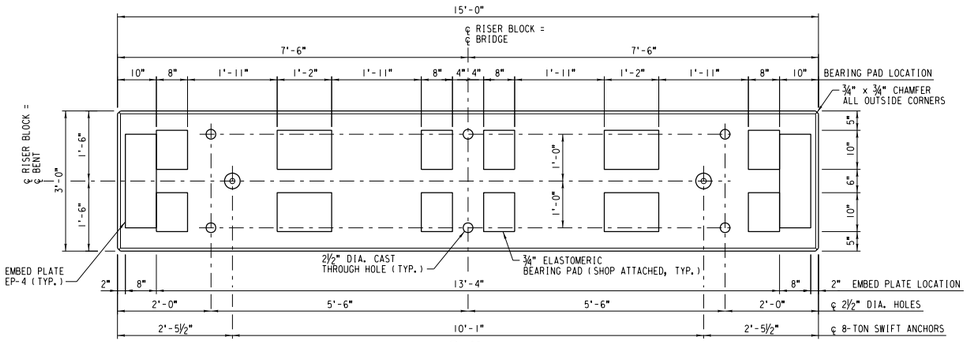
1. Reinforcing steel shall be deformed, new billet bars per current ASTM A615 Specifications and meet Grade 60 requirements.
2. Fabrication of reinforcing steel shall be per Chapter 7 of the CRSI Manual of Standard Practice. Dimensions of bending details are out to out of bar.
3. Reinforcing steel shall be blocked and tied to proper location and securely wired against displacement. Tie wires shall be installed at every other bar intersection so that at least 50% of the intersections are tied. Tack welding of reinforcing is prohibited. Minimum concrete cover on reinforcing not otherwise noted shall meet the AREMA Manual for Railway Engineering requirements.

EMBEDDED STEEL

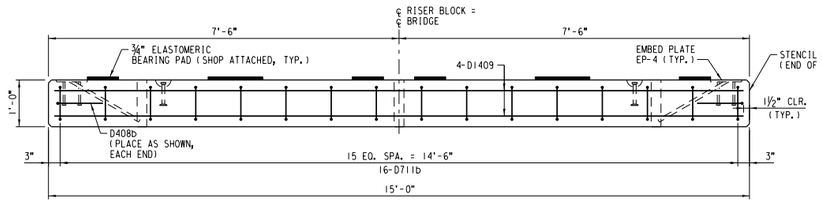
1. Steel plates and angles shall conform to ASTM A36 or ASTM A709-Grade 36 Specifications.
2. Studs shall be C1015, C1017 or C1020 cold drawn steel conforming to ASTM A108 Specifications.
3. Deformed bar anchors shall conform to ASTM A1064 Specifications.
4. Where galvanizing is not indicated, material shall be plain.

LIFTING ANCHORS

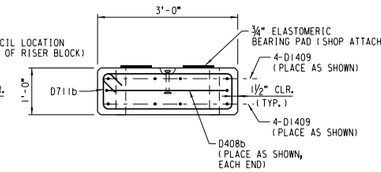
1. Swift lift anchors shall be Dayton Superior P-52 anchors or approved alternate with a safe working load sufficient for the weight of the precast element including form removal. The safe working load shall provide a minimum safety factor of 4.



PLAN



ELEVATION



SECTION
EMBED PLATE EP-4 NOT SHOWN FOR CLARITY

PRECAST CONCRETE RISER BLOCK PCRB-21

SCALE: ¾"=1'-0"

MATERIAL SCHEDULE
(QUANTITY PER RISER BLOCK PCRB-21)

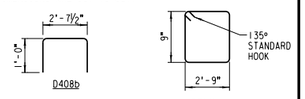
REQ'D.	UNIT	DESCRIPTION
1.7	CU. YD.	4000 PSI CONCRETE (PER NOTES, SHEET NO. 7)
1	LOT	REINFORCING STEEL (PER SCHEDULE, SHEET NO. 7)
2	EA.	EMBED PLATE EP-4 (PER NOTES, SHEET NO. 7 AND DETAILS, SHEET NO. 13)
2	EA.	8-TON SWIFT LIFT ANCHOR
8	EA.	¾"x8"x 0'-10" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)
4	EA.	¾"x10"x 1'-2" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)

REINFORCING SCHEDULE

TOTAL	MARK	SIZE	LENGTH	SHAPE
2	D408b	#5	4'-8"	⊓
16	D711b	#5	7'-11"	□
8	D1409	#5	14'-9"	—

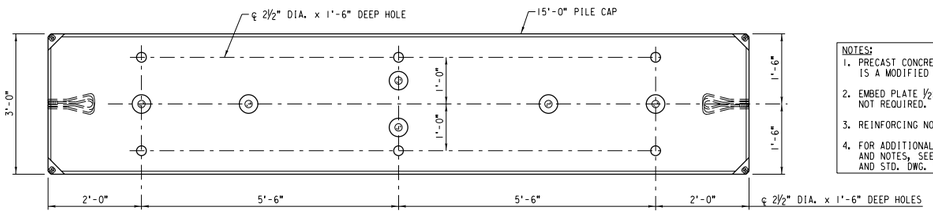
EST. WT. OF REINFORCING STEEL = 265 LB.

BENDING DIAGRAM
(DIMENSIONS ARE OUT TO OUT)



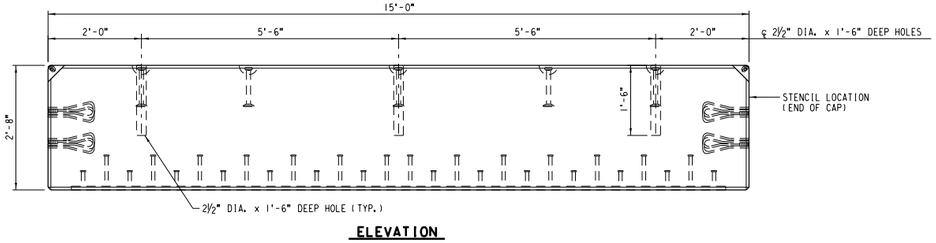
BAR DESIGNATIONS CONSIST OF BAR SIZE & LENGTH FOLLOWED BY THE LETTER "D" IF BENT. BAR SIZES ARE REPRESENTED BY THE LETTERS A THROUGH L CORRESPONDING TO BAR SIZE #2 THROUGH #18. BAR LENGTHS ARE GIVEN IN FEET AND INCHES; THE LAST TWO DIGITS ARE INCHES.

FABRICATION NOTES:
1. COVER OR FILL CAST HOLES TO PREVENT MOISTURE OR DEBRIS FROM ENTERING DURING STORAGE AND SHIPMENT.
2. SWIFT LIFT ANCHORS SHALL BE DAYTON RICHMOND P-52SL ANCHORS OR APPROVED ALTERNATE, WITH A MINIMUM SAFE WORKING LOAD OF 12,200 LB. PER ANCHOR WITH 1'-6" EDGE DISTANCE. THE SAFE WORKING LOAD SHALL PROVIDE A MINIMUM SAFETY FACTOR OF 4.

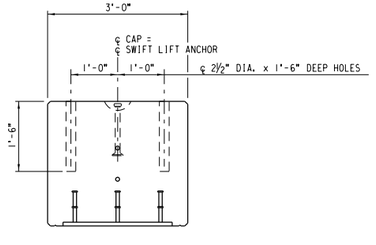


NOTES:
1. PRECAST CONCRETE PILE CAP PCPC-21 IS A MODIFIED STANDARD 15'-0" PILE CAP.
2. EMBED PLATE ½x8 x 2'-0" AND BEARING PADS NOT REQUIRED.
3. REINFORCING NOT SHOWN FOR CLARITY.
4. FOR ADDITIONAL FABRICATION DETAILS AND NOTES, SEE STD. DWG. 501000 SHT. C1, C2 AND STD. DWG. 531800 SHT. 8.

PLAN



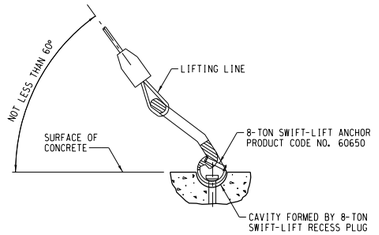
ELEVATION



SECTION

PRECAST CONCRETE PILE CAP PCPC-21

SCALE: ¾"=1'-0"



NOTE:
8-TON SWIFT-LIFT RECESS PLUGS, ANCHORS AND LIFTING EYES ARE AVAILABLE FROM DAYTON SUPERIOR CORP., 1125 BYERS ROAD MIAMISBURG, OHIO 45342, TELEPHONE (937) 866-0711. THE MATERIALS FOR THIS LIFTING SYSTEM ARE NOT INCLUDED IN THE BILL OF MATERIAL BUT ARE TO BE ORDERED AS REQUIRED.

SWIFT LIFT LIFTING DETAIL

SCALE: NONE

NOTES:
1. FOR EMBEDDED STEEL DETAILS, SEE SHEET NO. 13.
2. ADJUST REINFORCING AS REQUIRED TO MISS EMBED PLATES AND CAST HOLES.

EST. WT. OF PRECAST CONCRETE

PILE CAP PCPC-21 = 19,700 LB. EA. (9.9 TON)
RISER BLOCK PCRB-21 = 6,900 LB. EA. (3.5 TON)

NO.	DATE	REVISIONS
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Damian Wallner 2/28/17

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB, 1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: PRECAST CONCRETE RISER BLOCK PCRB-21 & PRECAST CONCRETE PILE CAP PCPC-21 DETAILS

PROJECT ID: 97193	UP ENGINEER: UP-DGM OLSSON-TMS	LATITUDE: 40.05149° N	
WORK ORDER: 35715		LONGITUDE: 122.14980° W	
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO. 7 of 16	C E NUMBER 120893
CHECKED BY: TMS			
SCALE: AS SHOWN			

FILE NAME: \\sa.aecomnet.com\ppw\corr\hou\Projects\620161101\250105-15224\Design\Reinstallation_BNSF\Lib\ENG\PCB_Riser.dgn

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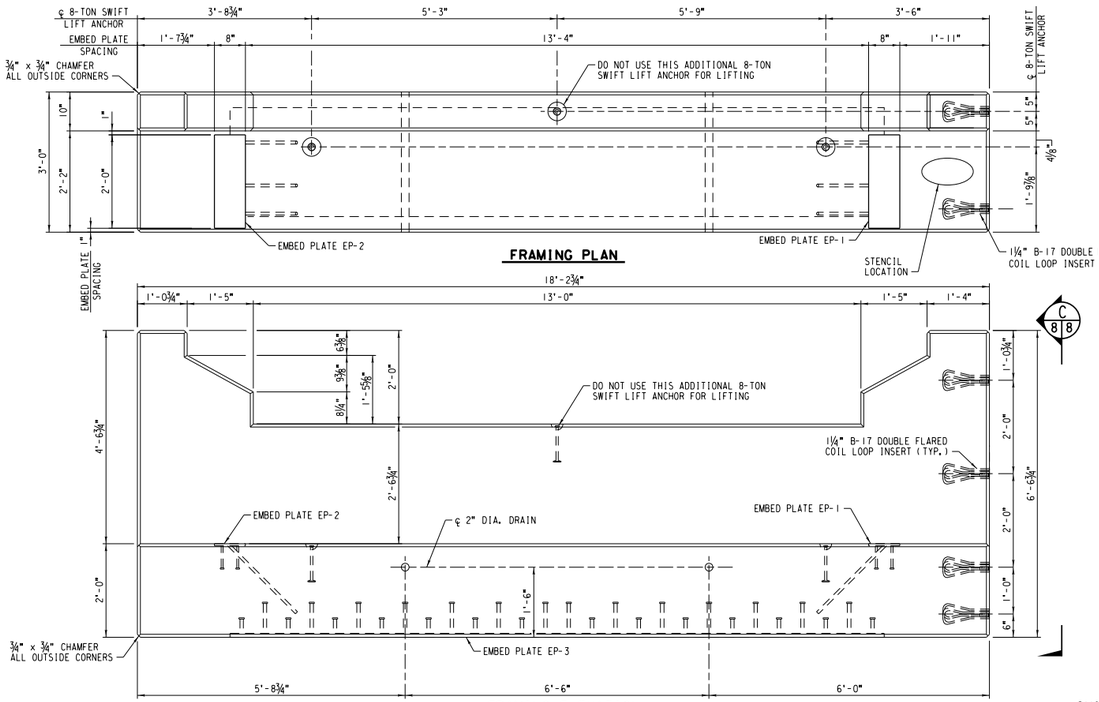
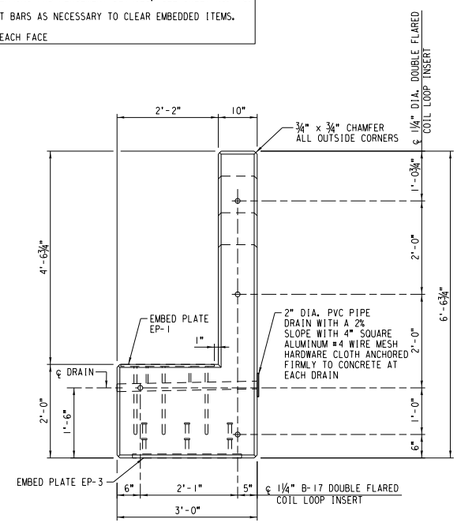
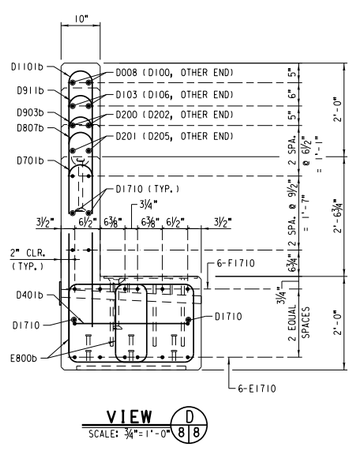
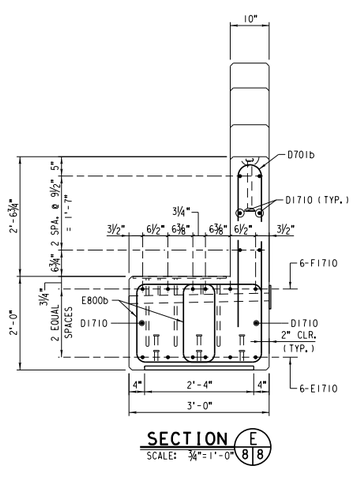


NOTES:
1. FOR PRECAST CONCRETE NOTES, SEE SHEET NO. 7.
2. FOR BEARING PAD PLACEMENT DETAILS, SEE SHEET NO. 10.
3. ADJUST BARS AS NECESSARY TO CLEAR EMBEDDED ITEMS.
4. EF = EACH FACE







MATERIAL SCHEDULE
(QUANTITY PER END CAP PCEC-21)

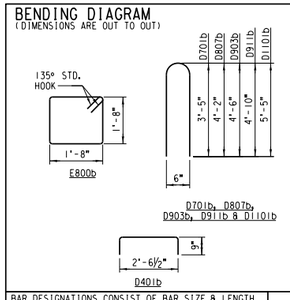
REQ'D.	UNIT	DESCRIPTION
5.8	CU. YD.	4000 PSI CONCRETE (PER NOTES, SHEET NO. 7)
1	LOT	REINFORCING STEEL (PER NOTES, SHEET NO. 7 AND SCHEDULE, SHEET NO. 8)
1	EA.	EMBED PLATE EP-1 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
1	EA.	EMBED PLATE EP-2 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
1	EA.	EMBED PLATE EP-3 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
7	LIN. FT.	2" DIA. PVC PIPE, SCHEDULE 40
2	EA.	4" SQUARE ALUMINUM WIRE #4 MESH HARDWARE CLOTH
4	EA.	1¼" B-17 DOUBLE FLARED COIL LOOP INSERT
3	EA.	8-TON SWIFT LIFT ANCHOR
4	EA.	¾"x8"x 0'-10" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)
2	EA.	¾"x10"x 1'-2" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)

REINFORCING SCHEDULE

REQ'D.	MARK	SIZE	LENGTH	SHAPE
2	D008	#5	0'-8"	
2	D100	#5	1'-0"	
2	D103	#5	1'-3"	
2	D106	#5	1'-6"	
2	D200	#5	2'-0"	
2	D201	#5	2'-1"	
2	D202	#5	2'-2"	
4	D205	#5	2'-5"	
2	D209	#5	2'-9"	
2	D401b	#5	4'-1"	
26	D701b	#5	7'-1"	
2	D807b	#5	8'-7"	
2	D903b	#5	9'-3"	
2	D911b	#5	9'-11"	
4	D1101b	#5	11'-1"	
8	D1710	#5	17'-10"	
72	E800b	#6	8'-0"	
6	E1710	#6	17'-10"	
6	F1710	#7	17'-10"	

EST. WT. OF REINFORCING STEEL = 1,740 LB.

BENDING DIAGRAM
(DIMENSIONS ARE OUT TO OUT)



BAR DESIGNATIONS CONSIST OF BAR SIZE & LENGTH FOLLOWED BY THE LETTER "b" IF BENT. BAR SIZES ARE REPRESENTED BY THE LETTERS A THROUGH L CORRESPONDING TO BAR SIZE #2 THROUGH #18. BAR LENGTHS ARE GIVEN IN FEET AND INCHES; THE LAST TWO DIGITS ARE INCHES.

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EST. WT. OF PRECAST CONCRETE
END CAP PCEC-21 = 24,100 LB. EA. (12.1 TON)

Damian Wallner 2/28/17
APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES
BY: T. M Sh
DATE: DECEMBER 06, 2016

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49, 1.4 MILES SOUTH OF GERBER, CA — VALLEY SUB.

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: PRECAST CONCRETE END CAP PCEC-21 DETAILS

PROJECT ID: 97193	UP ENGINEER: UP- DGW OLSSON- TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W	
WORK ORDER: 35715			
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO. 8 of 16	C E NUMBER 120893
CHECKED BY: TMS			
SCALE: AS SHOWN			

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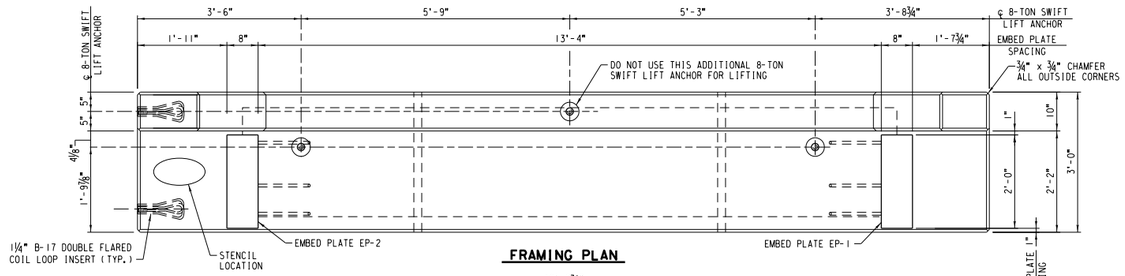
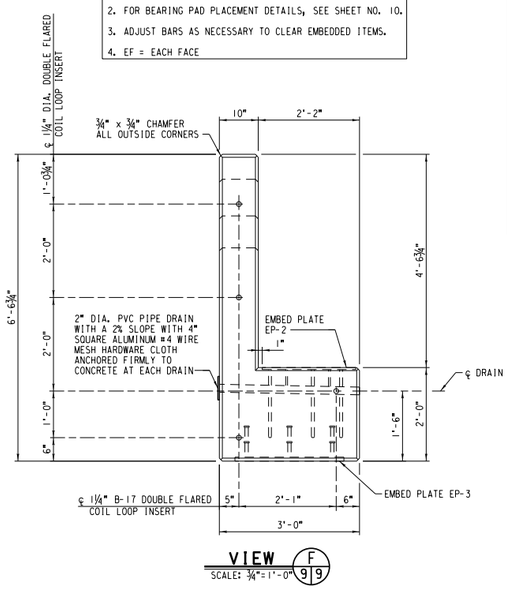
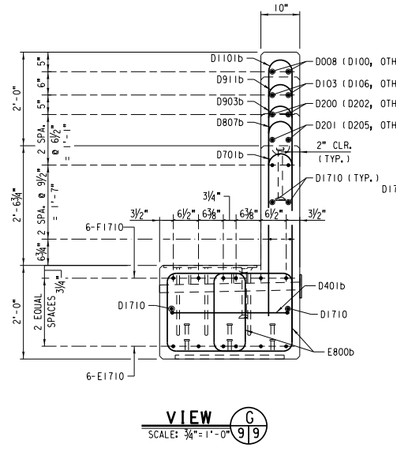


PRECAST CONCRETE END CAP PCEC-22
SCALE: ¾"=1'-0"

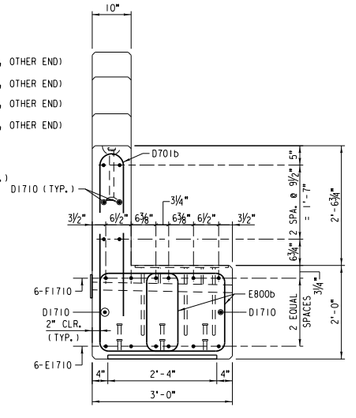
NOTES:
1. FOR PRECAST CONCRETE NOTES, SEE SHEET NO. 7.
2. FOR BEARING PAD PLACEMENT DETAILS, SEE SHEET NO. 10.
3. ADJUST BARS AS NECESSARY TO CLEAR EMBEDDED ITEMS.
4. EF = EACH FACE



VIEW F 9 9
SCALE: ¾"=1'-0"



VIEW G 9 9
SCALE: ¾"=1'-0"



SECTION H 9 9
SCALE: ¾"=1'-0"

MATERIAL SCHEDULE
(QUANTITY PER END CAP PCEC-22)

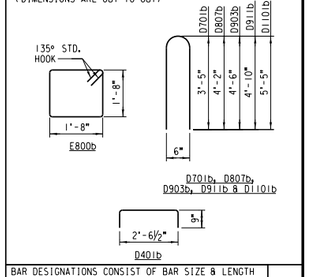
REQ'D.	UNIT	DESCRIPTION
5.8	CU. YD.	4000 PSI CONCRETE (PER NOTES, SHEET NO. 7)
1	LOT	REINFORCING STEEL (PER NOTES, SHEET NO. 7 AND SCHEDULE, SHEET NO. 9)
1	EA.	EMBED PLATE EP-1 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
1	EA.	EMBED PLATE EP-2 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
1	EA.	EMBED PLATE EP-3 (PER NOTES, SHEET NO. 7 AND DETAIL, SHEET NO. 13)
7	LIN. FT.	2" DIA. PVC PIPE, SCHEDULE 40
2	EA.	4" SQUARE ALUMINUM WIRE #4 MESH HARDWARE CLOTH
4	EA.	1¼" B-17 DOUBLE FLARED COIL LOOP INSERT
3	EA.	8-TON SWIFT LIFT ANCHOR
4	EA.	¾"x8"x 0'-10" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)
2	EA.	¾"x10"x 1'-2" RANDOM ORIENTED FIBER BEARING PAD (PER NOTES, SHEET NO. 10)

REINFORCING SCHEDULE

REQ'D.	MARK	SIZE	LENGTH	SHAPE
2	D008	#5	0'-8"	——
2	D100	#5	1'-0"	——
2	D103	#5	1'-3"	——
2	D106	#5	1'-6"	——
2	D200	#5	2'-0"	——
2	D201	#5	2'-1"	——
2	D202	#5	2'-2"	——
4	D205	#5	2'-5"	——
2	D209	#5	2'-9"	——
2	D401b	#5	4'-1"	⊓
26	D701b	#5	7'-1"	⊃
2	D807b	#5	8'-7"	⊃
2	D903b	#5	9'-3"	⊃
2	D911b	#5	9'-11"	⊃
4	D1101b	#5	11'-1"	⊃
8	D1710	#5	17'-10"	——
72	E800b	#6	8'-0"	□
6	E1710	#6	17'-10"	——
6	F1710	#7	17'-10"	——

EST. WT. OF REINFORCING STEEL = 1,740 LB.

BENDING DIAGRAM
(DIMENSIONS ARE OUT TO OUT)



BAR DESIGNATIONS CONSIST OF BAR SIZE & LENGTH FOLLOWED BY THE LETTER "b" IF BENT. BAR SIZES ARE REPRESENTED BY THE LETTERS A THROUGH L CORRESPONDING TO BAR SIZE #2 THROUGH #18. BAR LENGTHS ARE GIVEN IN FEET AND INCHES; THE LAST TWO DIGITS ARE INCHES.

NO.	DATE	REVISIONS
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OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49, 1.4 MILES SOUTH OF GERBER, CA — VALLEY SUB.

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: PRECAST CONCRETE END CAP PCEC-22 DETAILS

PROJECT ID: 97193	UP ENGINEER: UP-DCW OLSSON-TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W	
WORK ORDER: 35715			
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO. 9 of 16	C E NUMBER 120893
CHECKED BY: TMS			
SCALE: AS SHOWN			

EST. WT. OF PRECAST CONCRETE
END CAP PCEC-22 = 24,100 LB. EA. (12.1 TON)

Damian Wallner 2/28/17
APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES
BY: T. M. Sh
DATE: DECEMBER 06, 2016

FILE NAME: \\au.ad.comom.com\Engineering\Projects\2016\015\120893\15122400\Design\Mainmodels_BASE\mED134_bna.dgn

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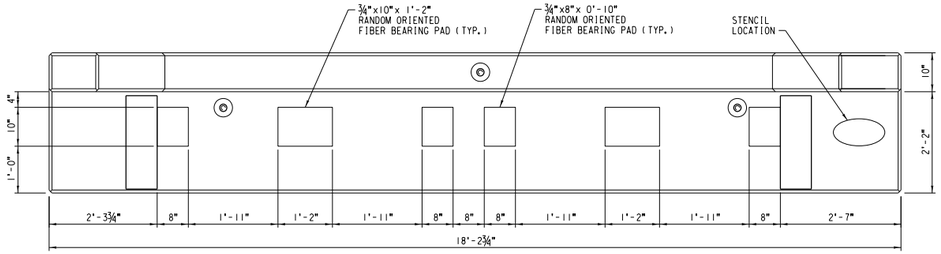
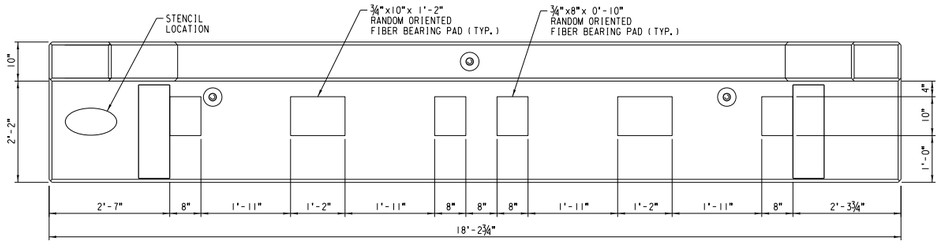


BEARING PAD PLACEMENT PLAN

SCALE: ¾"=1'-0"

PRECAST CONCRETE END CAP PCEC-21



BEARING PAD PLACEMENT PLAN

SCALE: ¾"=1'-0"

PRECAST CONCRETE END CAP PCEC-22

BEARING PAD SPECIFICATIONS

1. Bearing pads shall be Random Oriented Fiber elastomeric material comprised of high-quality ozone-resistant virgin elastomer and synthetic fibers. Pads shall conform to the following minimum material properties:

Hardness (Shore A, ASTM D2240)	80 ± 5
Tensile Strength, psi (ASTM D412, Die C)	1000 ± 100
Ultimate Elongation, minimum %	40
Heat Aging (ASTM D573, 70 Hrs. @ noted temperature):	
Durometer, 212 °F, maximum point change	± 10
Tensile Strength, 158 °F, maximum % change	± 25
Ultimate Elongation, 212 °F, maximum % change	± 25
Compression, minimum ultimate strength, psi	8000
Apparent Shear Modulus (GA), psi, based on tests conducted at 70 °F to 80 °F under uniform compressive stresses of 500, 1000, and 1500 psi and at applied horizontal shear plus slip strain of 50%. GA is constant in all directions parallel to the bearing plane.	230 ± 30

2. Bearing pads shall be Voss Engineering, Inc., "Fiberlast" expansion bearing pads or approved equal.
3. Cutting of the pads shall be done so that the edges have no tears or other jagged areas.
4. Permissible tolerances of the pad shall be as stated in Section 5.12.6.b, Chapter 15 of the 2014 AREMA Manual.
5. Fasten the bearing pads to the cap by using the following procedure: clean pads according to manufacturer's recommendations; prime contact surface and glue to cap with Sikadur 31 Hi-Mod Gel (1:1 mix ratio) or approved equal.

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: T. M. Sh

DATE: DECEMBER 06, 2016

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
	/ /	

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION:
BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY:
8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE:
BEARING PAD PLACEMENT DETAILS

PROJECT ID: 97193	UP ENGINEER: UP- DGW OLSSON- TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W	
WORK ORDER: 35715			
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO. 10 of 16	C E NUMBER 120893
CHECKED BY: TMS			
SCALE: AS SHOWN			

FILE NAME: \\au.ad.jacobs.com\dfs\projects\2016\35715\300\01-1522AX-Design\Mainmodels_BAE\mEF134S_bra.dgn

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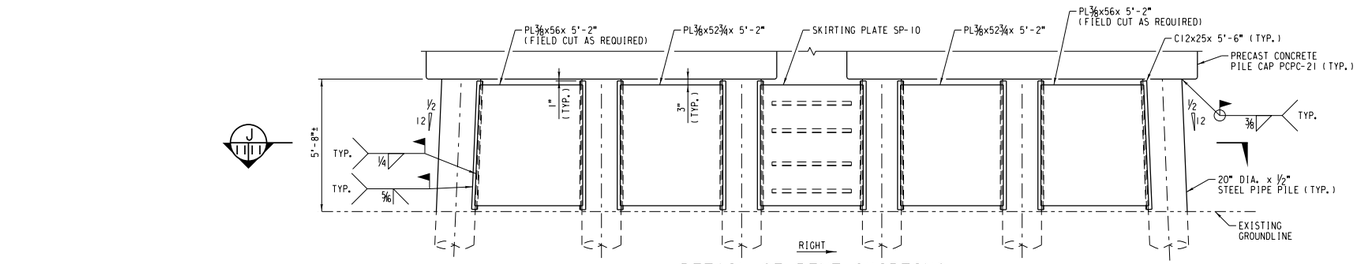
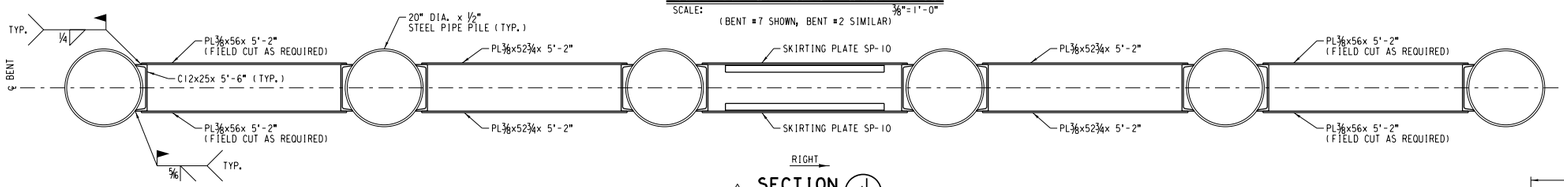


DETAIL OF BENT SKIRTING

SCALE: ⅜"=1'-0"

(BENT #7 SHOWN, BENT #2 SIMILAR)

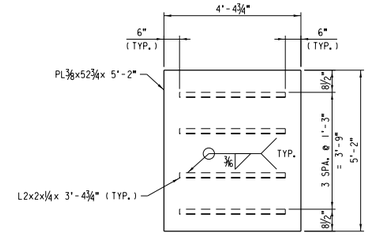


⚠ SECTION J

SCALE: ¾"=1'-0"

⚠ BENT #2 THRU #7 SKIRTING MATERIAL SCHEDULE		
REQ'D.	UNIT	DESCRIPTION
4	EA.	SKIRTING PLATE SP-10 (PER NOTES, SHEET NO. 4 AND DETAIL, SHEET NO. 11)
8	EA.	SKIRTING PLATE SP-11 (PER NOTES, SHEET NO. 4 AND DETAIL, SHEET NO. 11)
8	EA.	PL⅜x52¾x 5'-2" (ASTM A36, PLAIN)
8	EA.	PL⅜x56x 5'-2" (ASTM A36, PLAIN)
16	EA.	PL⅜x52¾x 8'-6" (ASTM A36, PLAIN)
16	EA.	PL⅜x58x 8'-6" (ASTM A36, PLAIN)
20	EA.	C12x25x 5'-6" (ASTM A36, PLAIN)
40	EA.	C12x25x 8'-10" (ASTM A36, PLAIN)

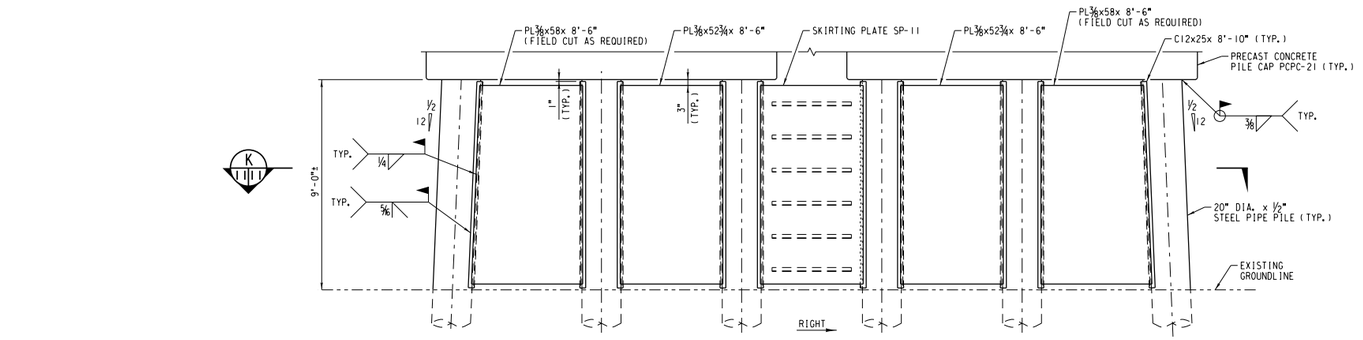
EST. WT. OF BENT SKIRTING = 43,215 LB.



⚠ SKIRTING PLATE SP-10

SCALE: ½"=1'-0"

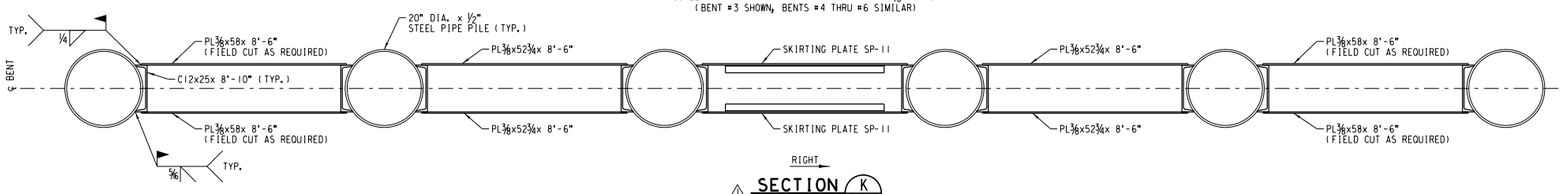
EST. WT. = 392 LB. EA.



DETAIL OF BENT SKIRTING

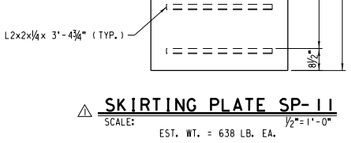
SCALE: ⅜"=1'-0"

(BENT #3 SHOWN, BENTS #4 THRU #6 SIMILAR)



⚠ SECTION K

SCALE: ¾"=1'-0"



⚠ SKIRTING PLATE SP-11

SCALE: ½"=1'-0"

EST. WT. = 638 LB. EA.

⚠ NOTES:

1. FOR MISCELLANEOUS STEEL NOTES, SEE SHEET NO. 4.
2. SKIRTING PLATES TO BE FIELD MODIFIED AS REQUIRED BASED ON ACTUAL FIELD CONDITIONS.
3. SUPERSTRUCTURE NOT SHOWN FOR CLARITY.

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	20" DIA. PIPE PILE AND BENT SKIRTING

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION:
BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY:
8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE:
BENT SKIRTING DETAILS

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: T. M Sup

DATE: DECEMBER 06, 2016

PROJECT ID: 97193	UP ENGINEER: UP-DGM OLSSON-TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W	
WORK ORDER: 35715			
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO.	C E NUMBER
CHECKED BY: TMS		11 of 16	120893
SCALE: AS SHOWN			

FILE NAME: \\sac.olssonnetworking.com\files-sac1\projects\2016\035715\2000\05-ISSUE\Design\Microstation_RAIL\MET348_Bnch.dgn

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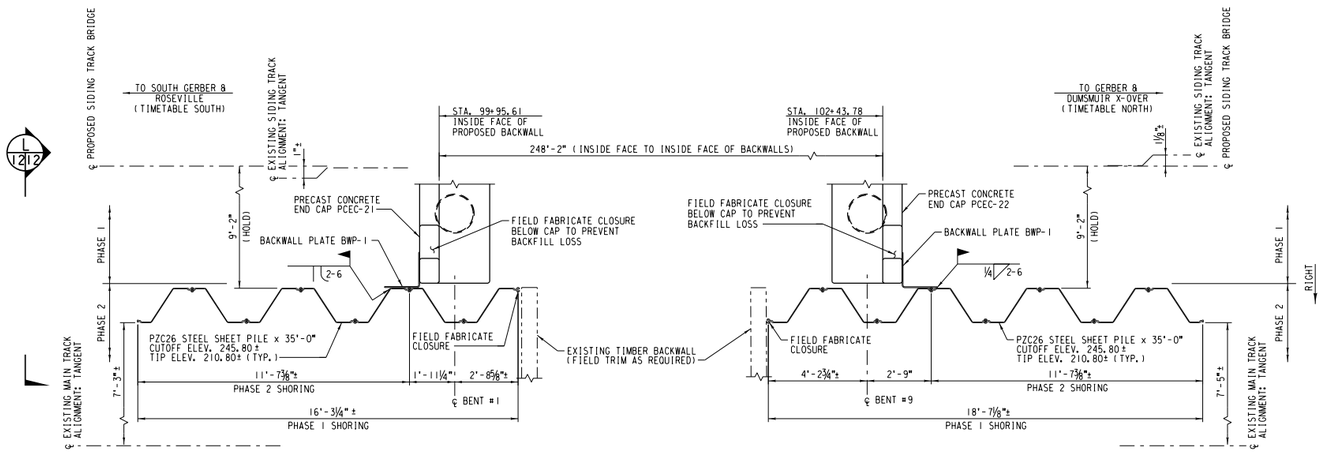
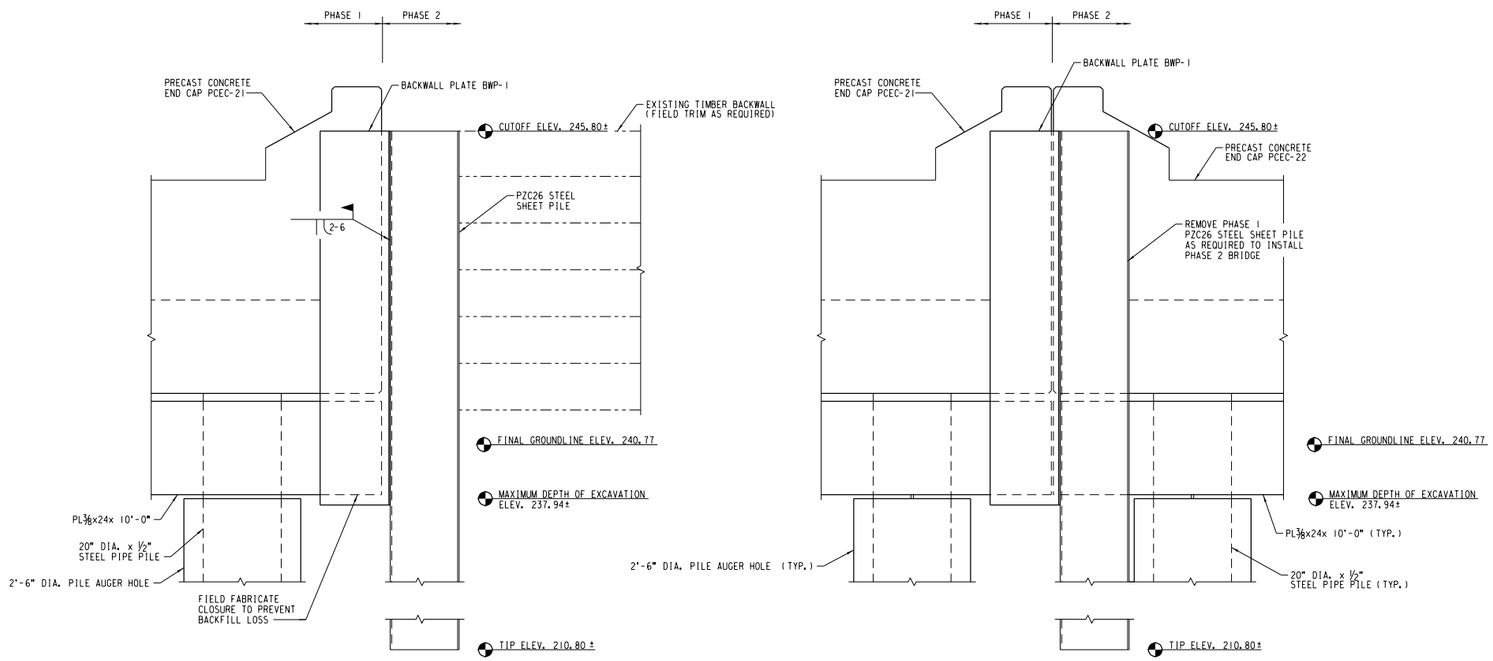


⚠ SHORING INSTALLATION DETAIL

SCALE: ⅜"=1'-0"



PHASE 1 **PHASE 2**

⚠ VIEW

SCALE: ¾"=1'-0" (L 12|12)

NOTE:
BENT #1 SHOWN, BENT #9 SIMILAR.

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: [signature]

DATE: DECEMBER 06, 2016

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	20" DIA. PIPE PILE

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: TEMPORARY SHORING DETAILS

PROJECT ID: 97193	UP ENGINEER: UP- DGM OLSSON- TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W	
WORK ORDER: 35715			
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO.	C E NUMBER
CHECKED BY: TMS			
SCALE: AS SHOWN		12 of 16	120893

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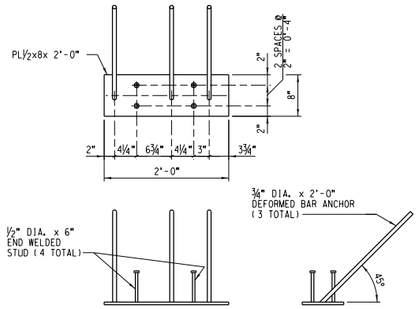
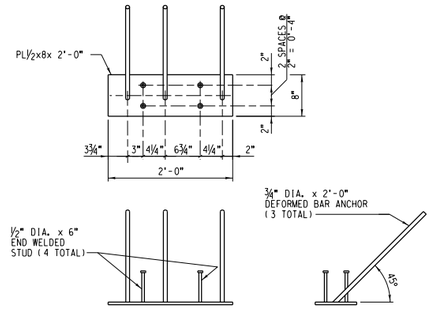


EMBED PLATE EP-1

SCALE: 1"=1'-0"

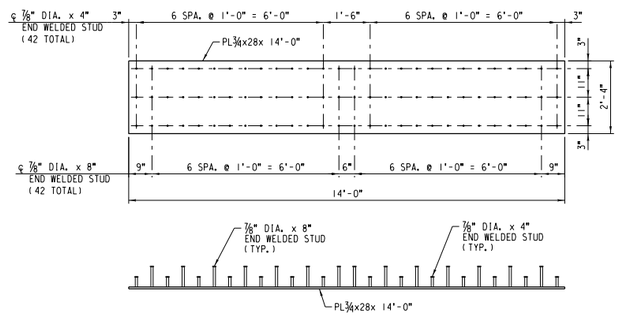
EST. WT. = 37.8 LB. EA.



EMBED PLATE EP-2

SCALE: 1"=1'-0"

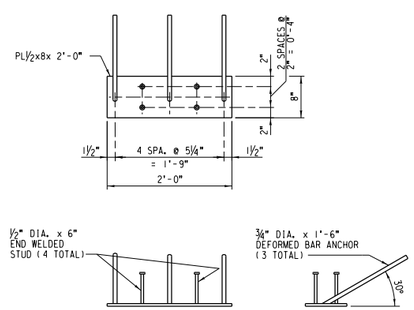
EST. WT. = 37.8 LB. EA.



EMBED PLATE EP-3

SCALE: ½"=1'-0"

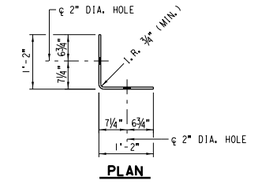
EST. WT. = 1,087 LB. EA.



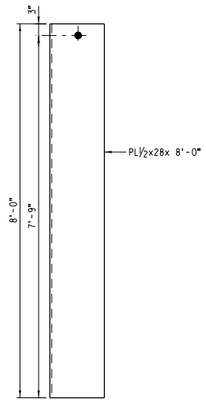
EMBED PLATE EP-4

SCALE: 1"=1'-0"

EST. WT. = 35.5 LB. EA.



PLAN

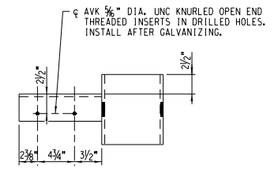


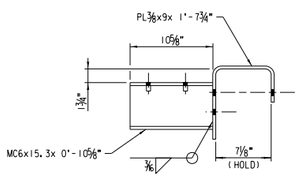
ELEVATION

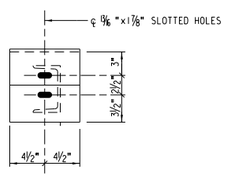
BACKWALL PLATE BWP-1

SCALE: ¾"=1'-0"

EST. WT. = 382 LB. EA.







GRATING SUPPORT GS-9

SCALE: 1½"=1'-0"

EST. WT. = 32.5 LB. EA.
GALVANIZE AFTER FABRICATION

SHIP WITH:
3-⅜" DIA. x 9½" ASTM A307 GRADE A HVY. HEX BOLT w/HVY. HEX ELASTIC LOCKNUT (MIL-DTL-32258) & FLAT CIRCULAR WASHER (ASTM F436), GALVANIZED.
2-JKG INDUSTRIES TYPE F-9 SADDLE CLIPS
2-⅝" DIA. x 2½" HEX HEAD BOLTS w/ LOCKWASHERS, GALVANIZED

NOTES:
1. FOR MISCELLANEOUS STEEL NOTES, SEE SHEET NO. 4.
2. FOR PRECAST CONCRETE NOTES, SEE SHEET NO. 7.

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	UPDATED TO CURRENT DETAILING

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 — VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: MISCELLANEOUS STEEL DETAILS

PROJECT ID: 97193	UP ENGINEER: UP-DGM OLSSON-TMS	LATITUDE: 40.05149° N	
WORK ORDER: 35715		LONGITUDE: 122.14980° W	
DESIGN BY: MJH			
CHECKED BY: KAS			
DRAWN BY: JEJ		SHEET NO.	C E NUMBER
CHECKED BY: TMS			
SCALE: AS SHOWN		13 of 16	120893

FILE NAME: I:\oa.ad.oz\corona\dgn\corp\files\ref\templates\2018\150\120893\04-STR\CADD\dgn\Miscellaneous_BWP&GS.dgn

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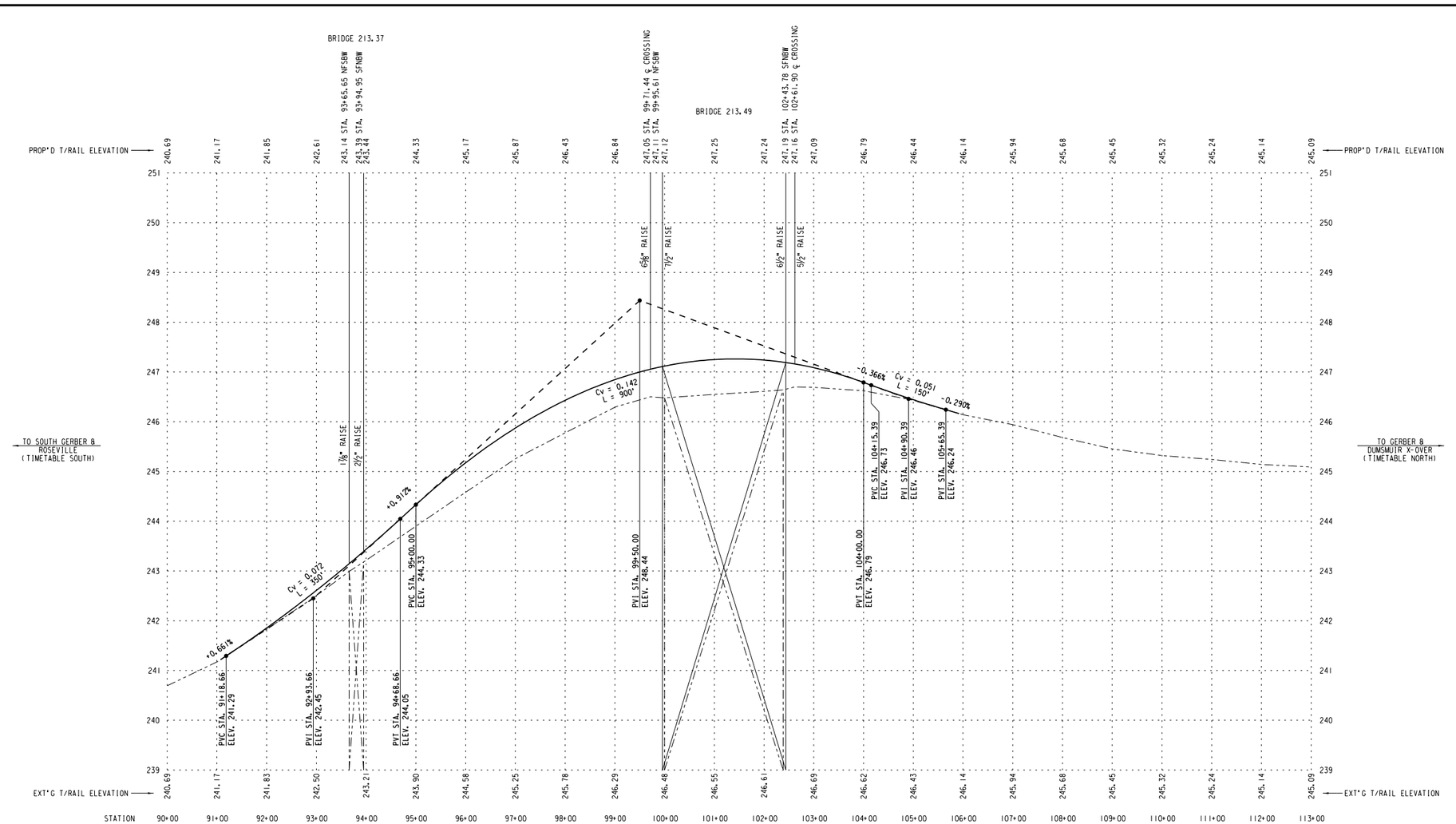

MAIN TRACK TOP OF RAIL PROFILE

SCALE: 1"=100' HORIZ. 1"=1' VERT.

Damian Wallner 2/28/17

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
	/ /	

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS) REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: MAIN TRACK TOP OF RAIL PROFILE

PROJECT ID: 97193	UP ENGINEER: UP- DGM OLSSON- TMS	LATITUDE: 40.05149° N LONGITUDE: 122.14980° W
WORK ORDER: 35715		
DESIGN BY: MJH		
CHECKED BY: KAS		
DRAWN BY: JEJ	SHEET NO. 14 of 16	C E NUMBER 120893
CHECKED BY: TMS		
SCALE: AS SHOWN		

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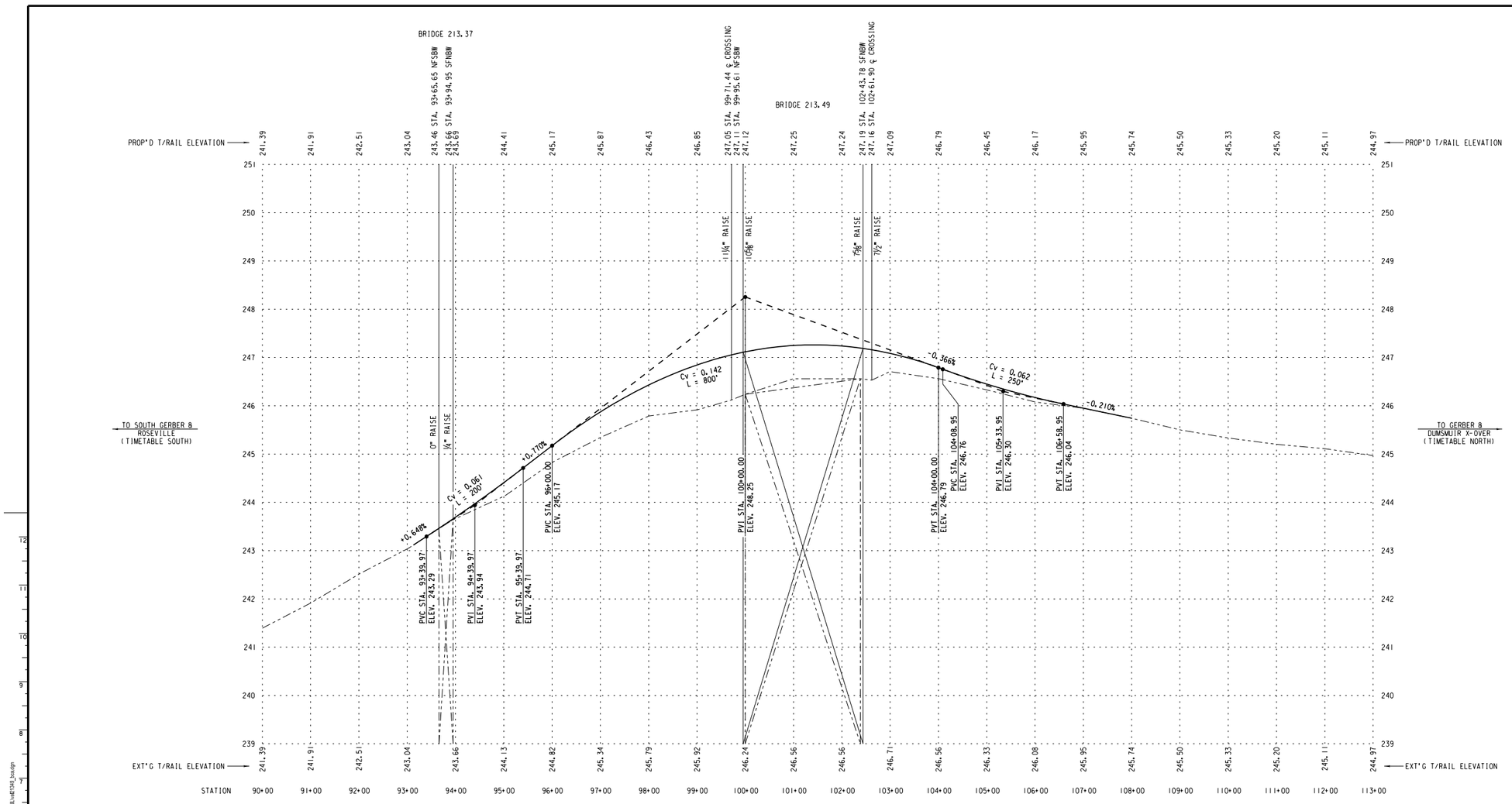

SIDING TRACK TOP OF RAIL PROFILE

SCALE: 1"=100' HORIZ.
1"=1' VERT.

NO.	DATE	REVISIONS
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	/ /	

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 — VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG. TITLE: SIDING TRACK TOP OF RAIL PROFILE

Damian Wallner 2/28/17

APPROVED FOR
UNION PACIFIC RAILROAD CO.
BY
OLSSON ASSOCIATES

BY: _____

DATE: DECEMBER 06, 2016

PROJECT ID: 97193	UP ENGINEER: UP-DGM OLSSON-TMS	LATITUDE: 40.05149° N
WORK ORDER: 35715		LONGITUDE: 122.14980° W
DESIGN BY: MJH		
CHECKED BY: KAS		
DRAWN BY: JEJ	SHEET NO. 15 of 16	C E NUMBER 120893
CHECKED BY: TMS		
SCALE: AS SHOWN		

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LOG OF BORING B-1 (FIG. B-2, Sheet 1 of 2)

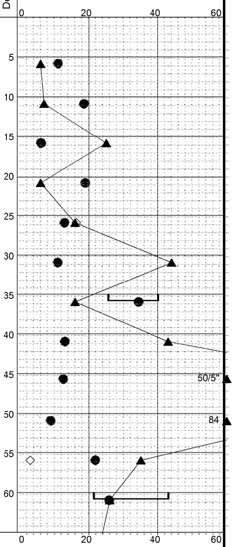
Total Depth: 101.5 ft. Latitude: Drilling Method: Hollow Stem Auger Hole Diam.: 8 in.
Top Elevation: ~ 241 ft. Longitude: Drilling Company: Cascade Drilling Rod Diam.: NWJ
Vert. Datum: WGS84 Station: Drill Rig Equipment: CME 95 Hammer Type: Automatic
Horiz. Datum: Offset: Other Comments:

SOIL DESCRIPTION — *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*

Elevation, ft.	Soil Description	Depth, ft.
	Red-yellow, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist; fine to coarse, rounded gravel; fine to coarse, rounded sand. (Artificial Fill)	
236.0	Loose, yellow-brown, *Sandy Silt (SM)*; dry to moist; fine sand.	5.0
228.0	Medium dense, yellow-brown to olive, *Well-Graded Gravel with Silt and Sand (GW-GM)*; moist, fine to coarse, subrounded gravel; fine to coarse, rounded to subrounded sand. (Alluvium)	13.0
220.7	Loose, yellow-brown to olive, *Clayey Sand (SC)*; moist; fine to medium, subrounded sand; seams of silty sand.	20.3
218.0	Medium dense, yellow-brown, *Silty Sand (SM)*; moist; fine to medium, subrounded sand.	23.0
213.0	Dense, red-yellow, *Clayey Sand (SC)*; moist; fine to coarse, rounded to subrounded gravel; fine to coarse, rounded to subrounded sand.	28.0
208.0	Very stiff, red-yellow to yellow, *Silt with Sand (ML)*; moist; fine sands; low plasticity fines.	33.0
203.0	Dense, yellow-brown, *Well-Graded Sand with Silt (SW-SM)*; wet; fine gravel; fine to coarse sand.	38.0
198.0	Very dense, yellow-brown, *Well-Graded Gravel with Silt and Sand (GW-GM)*; wet; fine to coarse, rounded to subrounded gravel; fine to coarse, rounded to subrounded sand.	43.0
188.0	Dense, yellow-brown to brown, *Poorly Graded Sand with Gravel (SP)*; wet; fine to medium gravel; fine to coarse, rounded to subrounded sand.	53.0
183.0	Very stiff, yellow-brown, *Lean Clay (CL)*; moist.	58.0

Samples: 1–12. Ground Water: During Drilling ▽

PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches



CONTINUED NEXT SHEET

LEGEND
* Sample Not Recovered
2.0" O.D. Split Spoon Sample
▽ Ground Water Level ATD
Plastic Limit — Natural Water Content — Liquid Limit
◇ % Fines (<0.075mm)
● % Water Content

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured from existing site features and should be considered approximate.

Valley Sub. MP 213.49 Bridge Replacement
Union Pacific Railroad
Tehama County, California

LOG OF BORING B-1
September 2017 51-1-10264-001
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants
FIG. B-2 Sheet 1 of 2
REV 3

Typ: LKN Rev: RAL Log: RAL
MASTER_LOG_E_MC 51-10264.GPJ SHAN_WIL.GDT 8/17/17

LOG OF BORING B-2 (FIG. B-3, Sheet 1 of 2)

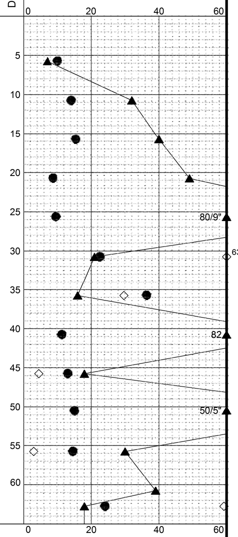
Total Depth: 121.5 ft. Latitude: Drilling Method: HSA and Mud Rotary Hole Diam.: 8 in.
Top Elevation: ~ 243 ft. Longitude: Drilling Company: Cascade Drilling Rod Diam.: NWJ
Vert. Datum: WGS84 Station: Drill Rig Equipment: CME 95 Hammer Type: Automatic
Horiz. Datum: Offset: Other Comments:

SOIL DESCRIPTION — *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*

Elevation, ft.	Soil Description	Depth, ft.
	Loose, yellow-brown, *Silty Sand (SM)*; moist; fine to coarse, rounded to subrounded sand. (Artificial Fill)	
235.0	Hard, yellow-brown, *Fat Clay (CH)*; moist; fine sand.	8.0
225.0	Dense to very dense, yellow-brown, *Clayey Sand (SC)*; moist; fine gravel; coarse, rounded to subgrounded sand. (Alluvium)	18.0
220.0	Very dense, red-yellow to yellow-brown, *Well-Graded Sand with Clay and Gravel (SW-SC)*; moist; coarse, rounded to subrounded gravel; medium to coarse, subrounded to subangular sand.	23.0
215.0	Very stiff, red-yellow to yellow-brown, *Sandy Lean Clay (CL)*; moist; fine to coarse gravel; fine to medium sand.	28.0
210.0	Medium dense, red-yellow, *Silty Sand (SM)*; moist; fine to medium, sub-angular sand.	33.0
205.0	Very dense, gray to yellow-brown, *Poorly Graded Gravel (GP)*; moist; coarse, rounded to subgrounded gravel; fine to coarse sand; low plasticity fines.	38.0
200.0	Medium dense, yellow-brown, *Well-Graded Sand (SW)*; wet; fine, rounded gravel; medium to coarse, rounded sand.	43.0
195.0	Very dense, gray to yellow-brown, *Poorly Graded Gravel (GP)*; wet, coarse, rounded to subrounded gravel.	48.0
190.0	Medium dense to dense, yellow-brown, *Well-Graded Gravel with Sand (GW)*; wet; fine to coarse gravel; medium to coarse sand. Blow counts for sample S-12, taken at 60-feet, are unreliable due to heave.	53.0
181.0	Very stiff, red-yellow, *Sandy Silt (ML)*; moist; fine sand.	62.0
179.0		64.0

Samples: 1–13 (12*). Ground Water: During Drilling ▽

PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches



CONTINUED NEXT SHEET

LEGEND
* Sample Not Recovered
2.0" O.D. Split Spoon Sample
▽ Ground Water Level ATD
◇ % Fines (<0.075mm)
● % Water Content

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
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Valley Sub. MP 213.49 Bridge Replacement
Union Pacific Railroad
Tehama County, California

LOG OF BORING B-2
September 2017 51-1-10264-001
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants
FIG. B-3 Sheet 1 of 2
REV 3

Typ: LKN Rev: RAL Log: RAL
MASTER_LOG_E_MC 51-10264.GPJ SHAN_WIL.GDT 8/17/17

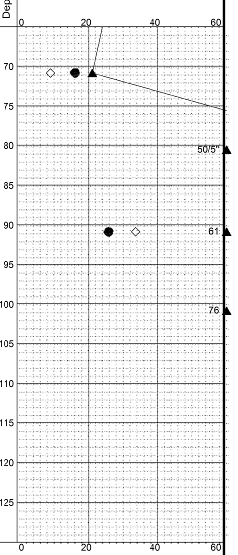
LOG OF BORING B-1 (FIG. B-2, Sheet 2 of 2)

Total Depth: 101.5 ft. Latitude: Drilling Method: Hollow Stem Auger Hole Diam.: 8 in.
Top Elevation: ~ 241 ft. Longitude: Drilling Company: Cascade Drilling Rod Diam.: NWJ
Vert. Datum: WGS84 Station: Drill Rig Equipment: CME 95 Hammer Type: Automatic
Horiz. Datum: Offset: Other Comments:

Elevation, ft.	Soil Description	Depth, ft.
176.0	Medium dense, yellow-brown, *Well-Graded Sand with Clay (SW-SC)*; wet; fine to coarse, rounded to subrounded sand.	65.0
166.0	Very dense, red-yellow, *Silty Sand (SM)*; wet; fine to coarse sand.	75.0
139.5	BOTTOM OF BORING COMPLETED 8/3/2017	101.5

Samples: 13–16.

PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND
* Sample Not Recovered
2.0" O.D. Split Spoon Sample
▽ Ground Water Level ATD
Plastic Limit — Natural Water Content — Liquid Limit
◇ % Fines (<0.075mm)
● % Water Content

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
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Valley Sub. MP 213.49 Bridge Replacement
Union Pacific Railroad
Tehama County, California

LOG OF BORING B-1
September 2017 51-1-10264-001
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants
FIG. B-2 Sheet 2 of 2
REV 3

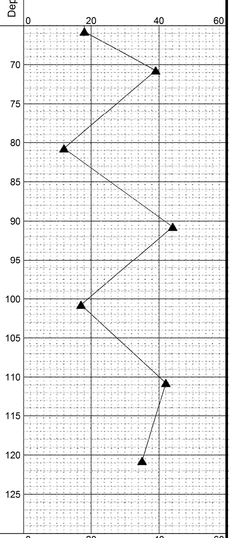
LOG OF BORING B-2 (FIG. B-3, Sheet 2 of 2)

Total Depth: 121.5 ft. Latitude: Drilling Method: HSA and Mud Rotary Hole Diam.: 8 in.
Top Elevation: ~ 243 ft. Longitude: Drilling Company: Cascade Drilling Rod Diam.: NWJ
Vert. Datum: WGS84 Station: Drill Rig Equipment: CME 95 Hammer Type: Automatic
Horiz. Datum: Offset: Other Comments:

Elevation, ft.	Soil Description	Depth, ft.
	Very stiff to hard, yellow-brown, *Lean Clay (CL)*; moist; fine sand.	
157.0	Dense, yellow-brown to red-yellow, *Silty Sand (SM)*; moist; fine to medium, subrounded sand.	86.0
147.0	Very stiff, yellow-brown to red-yellow, *Lean Clay with Sand (CL)*; moist; fine to medium sand.	96.0
137.0	Dense, red-yellow, *Clayey Sand (SC)*; moist; fine to medium sand.	106.0
127.0	Hard, red-yellow, *Lean Clay (CL)*; moist; fine sand.	116.0
121.5	BOTTOM OF BORING COMPLETED 8/2/2017	121.5

Samples: 14–20.

PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND
* Sample Not Recovered
2.0" O.D. Split Spoon Sample
▽ Ground Water Level ATD
◇ % Fines (<0.075mm)
● % Water Content

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
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Valley Sub. MP 213.49 Bridge Replacement
Union Pacific Railroad
Tehama County, California

LOG OF BORING B-2
September 2017 51-1-10264-001
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants
FIG. B-3 Sheet 2 of 2
REV 3

NOTES:
1. SUBSURFACE INFORMATION IS PROVIDED FOR INFORMATION ONLY FROM SHANNON & WILSON, INC. REPORT TITLED "SUBSURFACE EXPLORATION & RECOMMENDATIONS FORM", DATED 08/29/17. A COMPLETE COPY OF THE REPORT MAY BE OBTAINED FROM THE OFFICE OF AVP ENGINEERING DESIGN UPON REQUEST.
2. BORING B-1: STA. 99+42.00
37.00' LEFT OF EXISTING MAIN TRACK CENTERLINE
ELEV. 241.00

BORING B-2: STA. 102+62.00
38.00' RIGHT OF EXISTING MAIN TRACK CENTERLINE
ELEV. 243.00

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
1	2/26/18	ADDED BORING LOGS

OLSSON ASSOCIATES
UNION PACIFIC RAILROAD
Office of AVP Engineering Design

LOCATION: BRIDGE 213.49 VALLEY SUB.
1.4 MILES SOUTH OF GERBER, CA

FACILITY: 8 SPAN PCB x 248' (2 TRACKS)
REPLACING 12 SPAN TSTBD x 241'

DWG TITLE: BORING LOGS

PROJECT ID: 97193
WORK ORDER: 35715
DESIGN BY:
CHECKED BY:
DRAWN BY: SNP
CHECKED BY:
SCALE: NONE
UP ENGINEER: UP-DGW OLSSON-TMS
LATITUDE: 40.05149° N
LONGITUDE: 122.14980° W
SHEET NO. 16 of 16
C E NUMBER 120893

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