

STATE	FOREST	PROJECT NO.	PROJECT NAME	SHEET	TOTAL SHEETS
CA	Tahoe				

ESTIMATED BRIDGE QUANTITIES

ITEM NO	DESCRIPTION	QUANTITY
15101	Mobilization	Lump Sum
20102	Clearing and Grubbing	Lump Sum
* 20304	Removal of Structures and Obstructions	Lump Sum
** 55706	Treated Structural Timber and Lumber	Lump Sum
** 55706	Untreated Structural Timber and Lumber (Rail)	Lump Sum
57302	Helical Pile, In Place	4 Each

* Pay Item 20304 consists of removing the remnants of the existing trail bridge and disposing off of Forest Service land.

** Payment for Items 55706 includes cost for all hardware and galvanized materials.

HYDROLOGY AND HYDRAULICS

Mannings coefficient n = 0.090
Drainage area = 0.8 sq. mi. below dam
Stream slope = 0.6 %
Precipitation, P = 76 in. per year
 Q_{100} = 66 cfs El. 5999.0 V = 2 fps
(Assumes Lower Sardine Lake and Sand Pond attenuates the basin 900 cfs Q_{100} flow.)

GENERAL NOTES:

SPECIFICATIONS: DESIGN: AASHTO LRFD Bridge Design Specifications, 9th edition, 2020, and the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges. Comply with FSH 7709.56b, Chapter 80 Trail Bridges.
CONSTRUCTION: Standard Specifications For Construction of Roads and Bridges on Federal Highway Projects (FP-24), with Forest Service Supplemental Specifications.

DESIGN LOADS: Concrete = 150 PCF; Timber = 50 PCF; Pedestrian Live Load = 90 PSF; Earth pressure equivalent to a fluid weighing 36 PCF. Snow Load = 330 PSF (unfactored). Snow load and Pedestrian Live Load are not combined. Equestrian Live Load = 1,000 pound single hoof load over a deck plank square area measuring 4 inches on a side. Wind load = 58 psf (100 mph). Seismic CSM = 0.84g.

TIMBER: Deck planks, 6x6 posts, sills, and curbs shall be Douglas Fir-Larch, No. 1, S4S. Run Planks and end planks shall be Douglas Fir-Larch No. 2 or better, rough. Girders shall be glued laminated Douglas-Fir, combination symbol 24F-V4 DF/DF. Rails shall be solid sawn California Redwood, No. 1, S4S. Maximum moisture content for timber shall be 19%. Maximum moisture content for glued laminated members shall be 16%. All timber except rails and run planks shall be pressure treated with copper naphthenate in heavy oil, in accordance with AASHTO M133; AWPA and AWPA U1-09, Use Category UC4B. Treated materials shall follow the post treatment requirements summarized in "Best Management Practices for the Use of Treated Wood in Aquatic Environments" (WWPI 1196), to ensure all surfaces are free of excess preservative, and chemicals are adequately fixated in the wood. All wood members shall be cut and drilled before treatment. When miscellaneous field drilled holes and cuts are required because of mis-alignment, they must be approved by the Engineer. All field drilled holes and cuts shall be treated with two applications of copper naphthenate 2% solution. Lead holes are required for all bolts and screws. Driving of lag bolts and screws will not be permitted. Glued Laminated stringers shall be fabricated with a 1000' Radius).

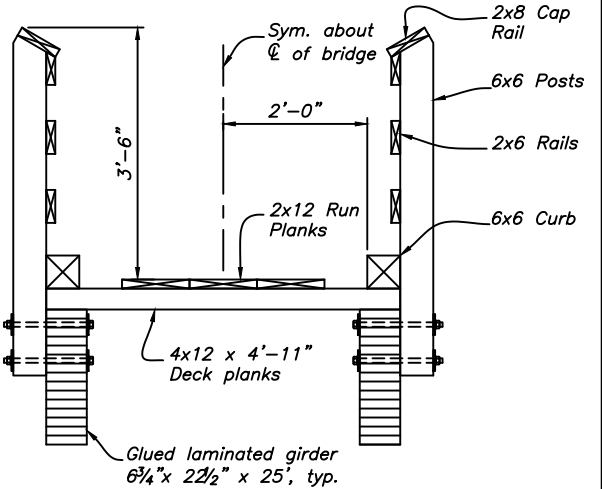
MISCELLANEOUS STEEL: All plates and shapes shall conform to AASHTO M270 (ASTM A709) Grade 36. Bolts shall conform to ASTM A 307. Anchor bolts shall conform to ASTM F1554, Grade 36. All steel shall be hot dipped galvanized per AASHTO 232 (ASTM A153) after fabrication. Stainless steel plates, shapes, and bolts may be used in lieu of hot dipped galvanized steel. Stainless steel bolts shall conform to ASTM A193. Stainless steel plates shall conform to ASTM A480.

HELICAL PILES: Design, furnish, and install helical piles and accessories. Design the pile shaft for an unbraced length of 6'. See Drawing R-1763-03 for design loads and soil boring data. Submit design, calculations and shop drawings for helical piles to the Contracting Officer for approval.

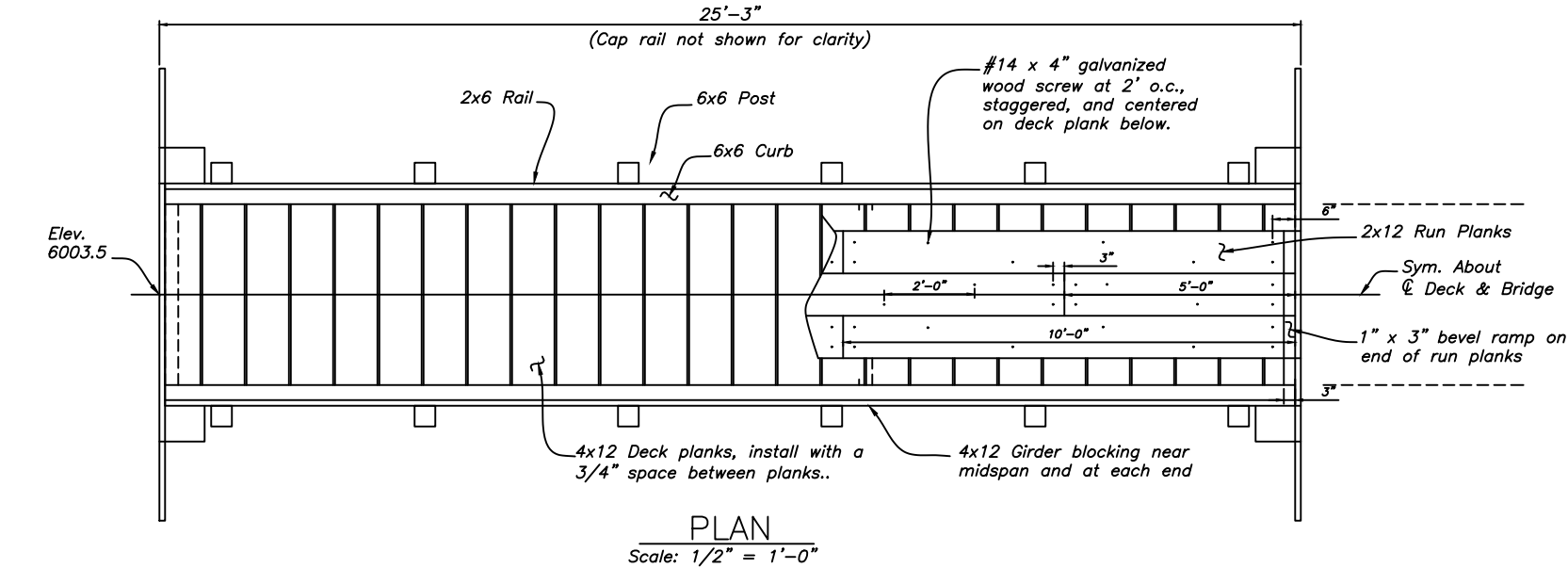
ELASTOMERIC BEARING: Bearing pads shall have a Durometer Hardness of 60. Design method A, grade 3.

CONSTRUCTION NOTES: Abutment fill shall not be placed until superstructure has been placed. Fill shall be brought up to grade equally at both abutments.

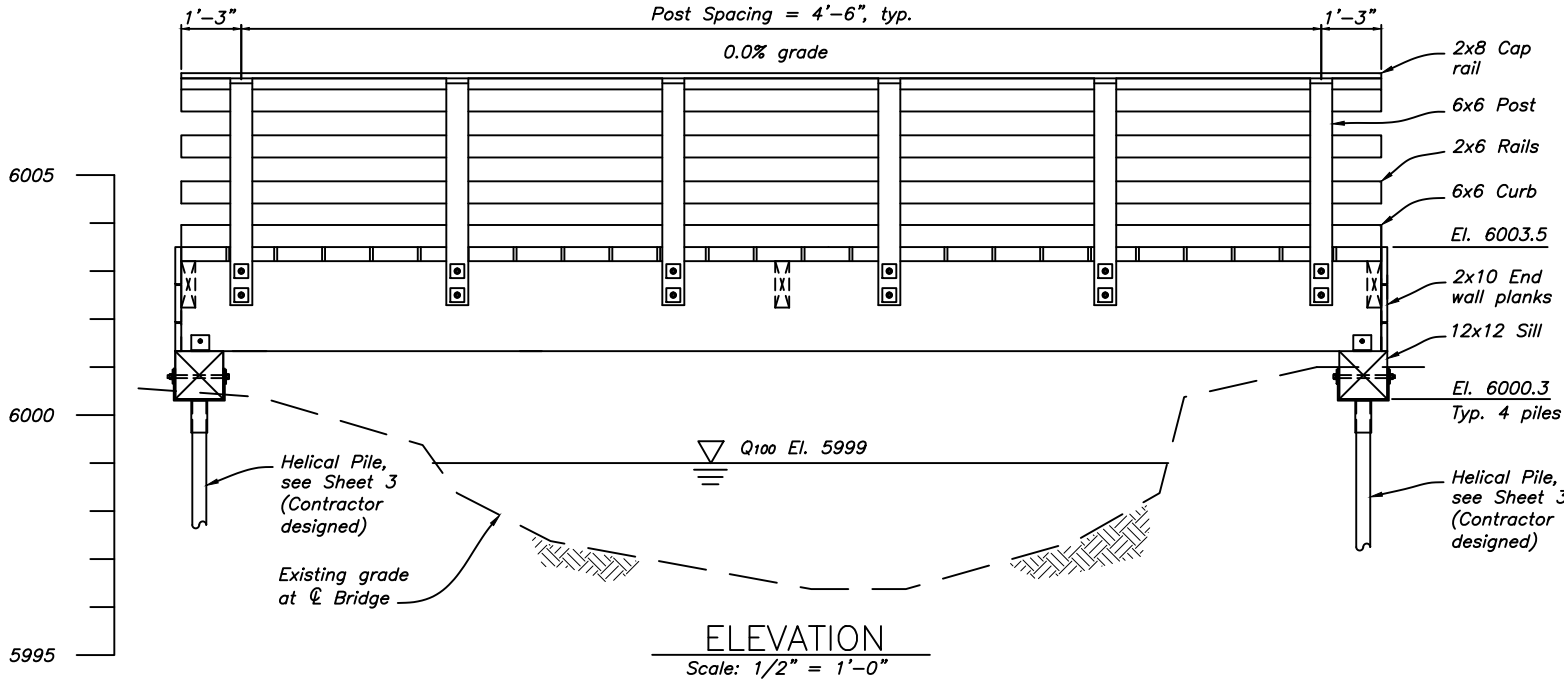
FABRICATION: Submit shop drawings for all bridge components. Show all dimensions and fabrication details for all cut or bored timber. Submit final as-built drawings to the Regional Bridge Engineer.



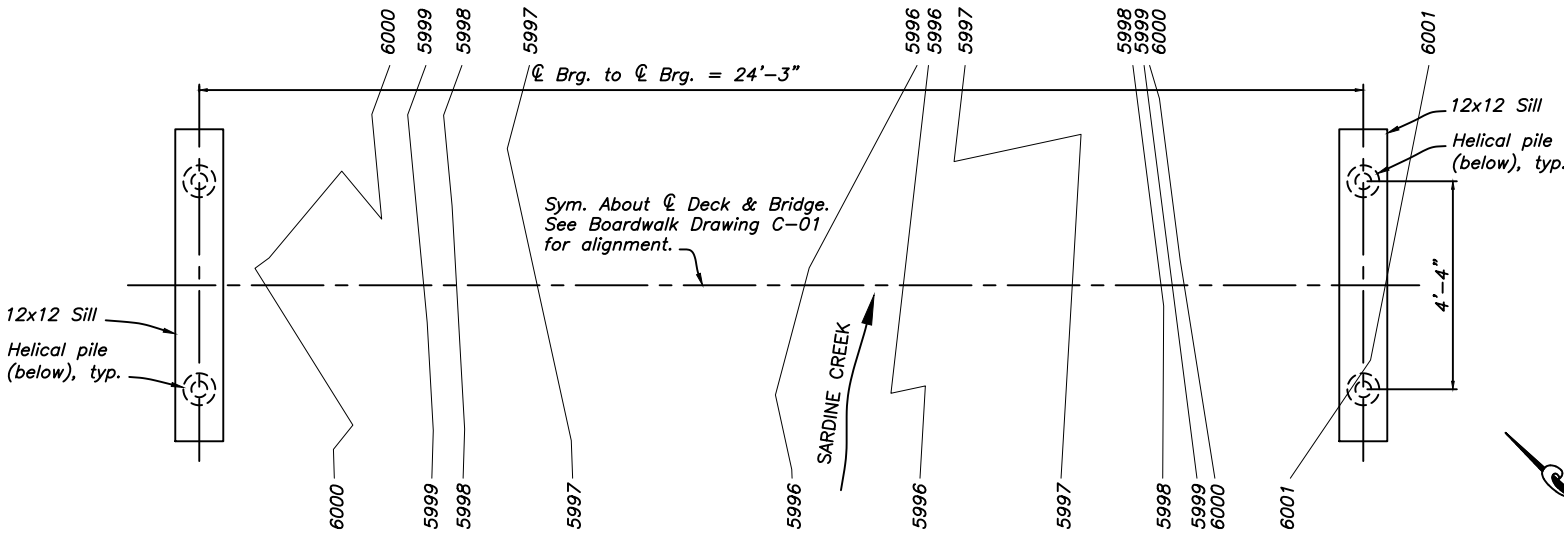
TYPICAL SECTION
Scale: 3/4" = 1'-0"



PLAN
Scale: 1/2" = 1'-0"



ELEVATION
Scale: 1/2" = 1'-0"

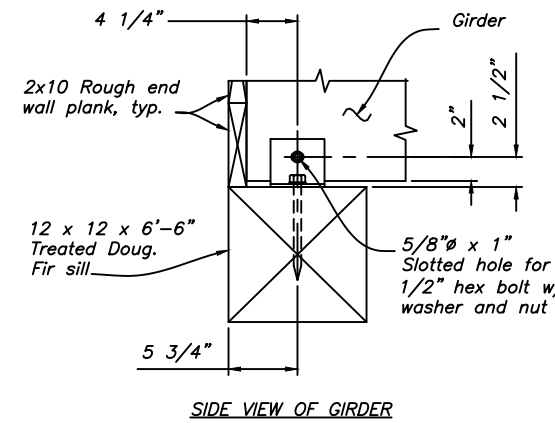
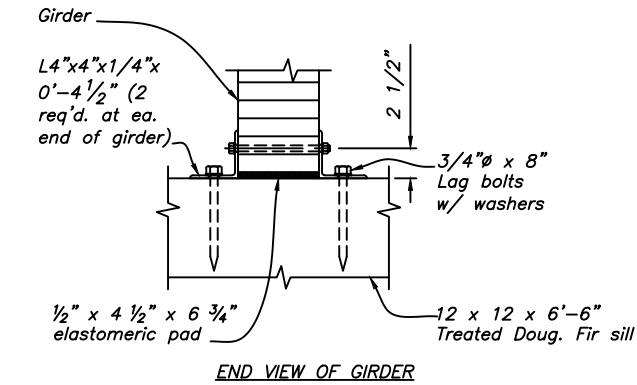


FOUNDATION PLAN
Scale: 1/2" = 1'-0"

DESIGNED <u>C. Shields</u> DATE <u>05/20/26</u>	U. S. DEPARTMENT OF AGRICULTURE FOREST SERVICE REGION FIVE	
DRAWN <u>C. Shields</u> DATE <u>05/20/26</u>	SARDINE CREEK TRAIL BRIDGE	
CHECKED <u>Mark Sodaro</u> DATE <u>05/28/26</u>	FOR SAND POND BOARDWALK	
RECOMMENDED: _____ DATE _____	PLAN AND ELEVATION	
STAFF ENGINEER TRANSPORTATION STRUCTURES APPROVED: _____ DATE _____	SCALE: <u>As Noted</u> BRIDGE SHEET <u>1</u> OF <u>3</u>	
REGIONAL ENGINEER _____	DRAWING NUMBER R-1763-01	
REVISION MARK AND DATE	DISREGARD PRINTS BEARING EARLIER DATES	

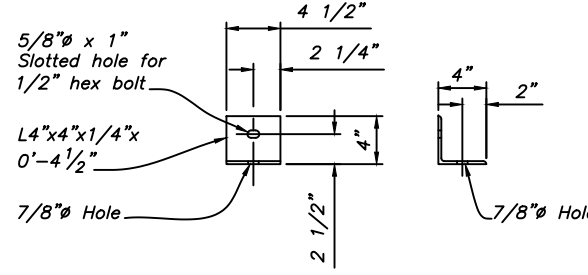
Latitude 39.6182, Longitude -120.6183

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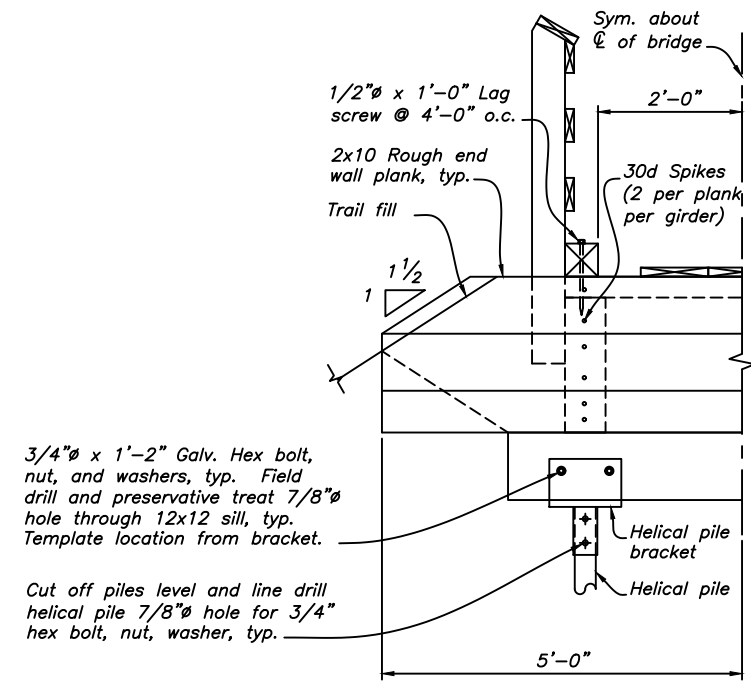
GIRDER TO TIMBER SILL CONNECTION DETAIL

Scale: 1 1/2" = 1'-0"



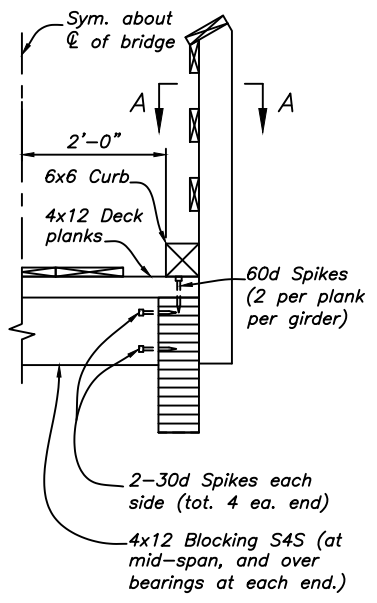
GIRDER BRACKET

Scale: 1 1/2" = 1'-0"



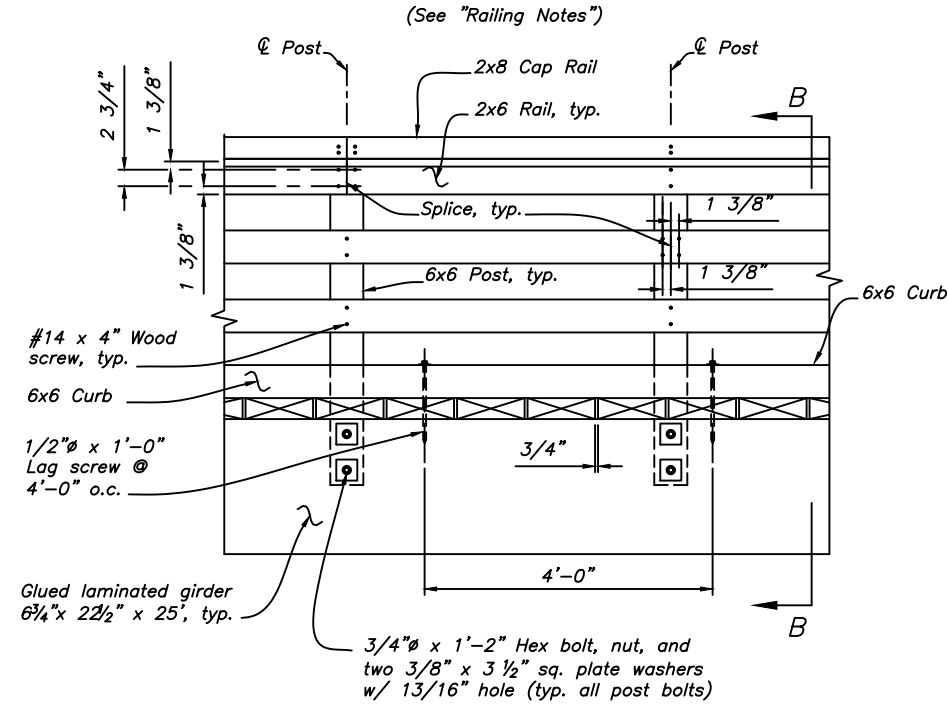
HALF SECTION AT ABUTMENT

Scale: 3/4" = 1'-0"



HALF SECTION AT MIDSPAN

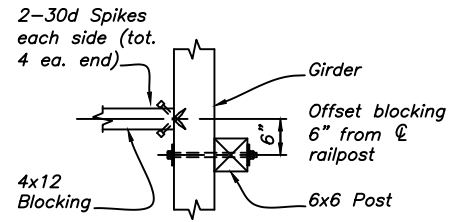
Scale: 3/4" = 1'-0"



BRIDGE RAILING ELEVATION

Scale: 3/4" = 1'-0"

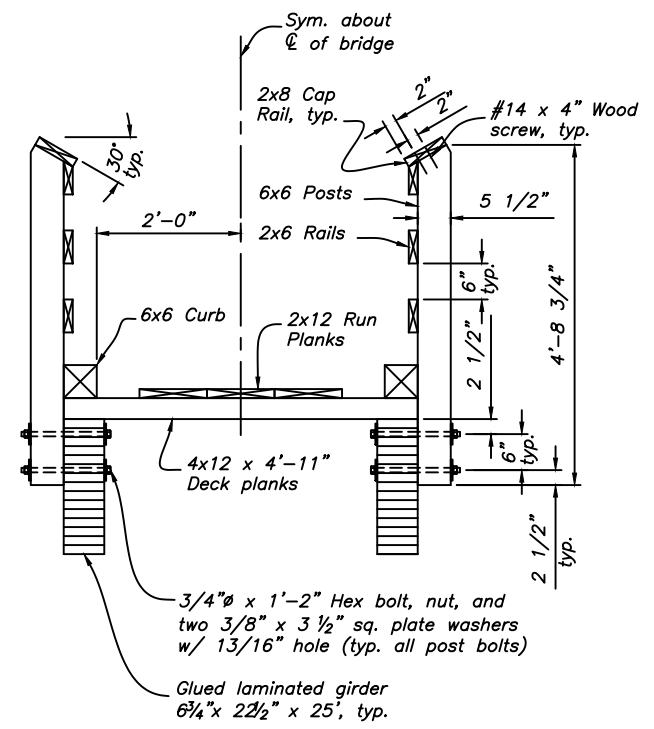
- RAILING NOTES:
1. Posts shall be vertical
 2. Rails shall be parallel to grade and continuous over 2 or more posts.
 3. Only two rail splices per post, staggered every other rail, and every other post.
 4. Posts shall fit tightly against girders.



Note: Deck, Curb and Railing not shown.

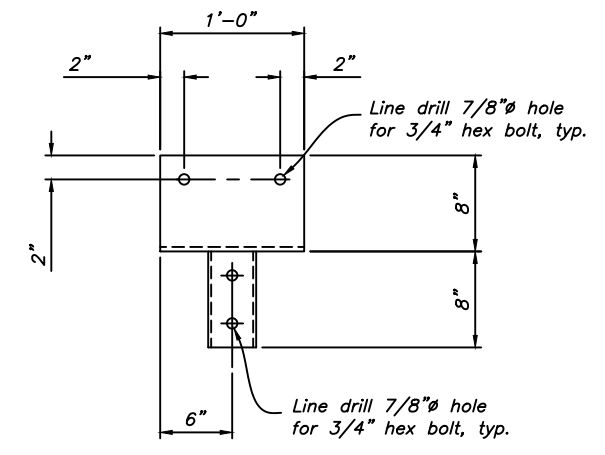
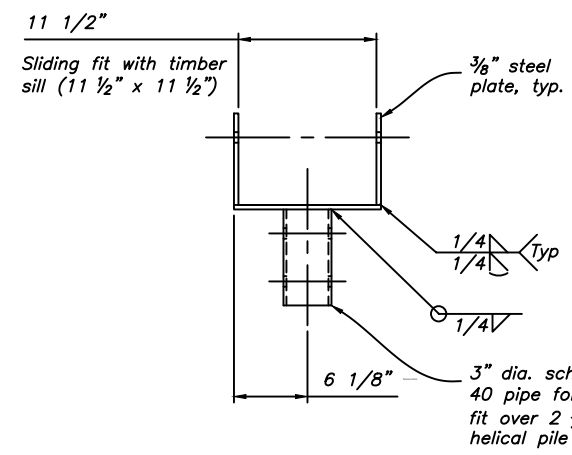
SECTION A-A

Scale: 3/4" = 1'-0"



SECTION B-B

Scale: 3/4" = 1'-0"



Note: Hot dip galvanize weldment after fabrication is complete

HELICAL PILE BRACKET

Scale: 1 1/2" = 1'-0"

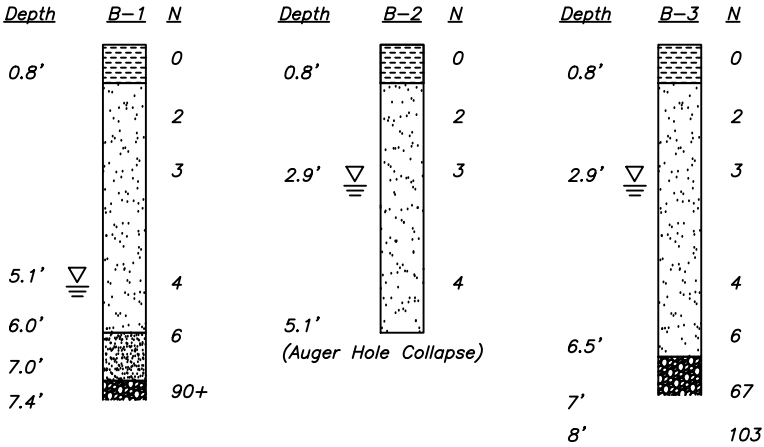
DESIGNED <u>C. Shields</u> DATE <u>05/20/26</u>	U. S. DEPARTMENT OF AGRICULTURE FOREST SERVICE REGION FIVE	
DRAWN <u>C. Shields</u> DATE <u>05/20/26</u>	SARDINE CREEK TRAIL BRIDGE	
CHECKED <u>Mark Sodaro</u> DATE <u>05/28/26</u>	FOR SAND POND BOARDWALK	
RECOMMENDED:	ABUTMENT AND RAILING DETAILS	
STAFF ENGINEER TRANSPORTATION STRUCTURES	SCALE: As Noted	
APPROVED:	BRIDGE SHEET <u>2</u> OF <u>3</u>	
REGIONAL ENGINEER	DRAWING NUMBER	
DISREGARD PRINTS BEARING EARLIER DATES	R-1763-02	
REVISION MARK AND DATE		

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BORING LEGEND

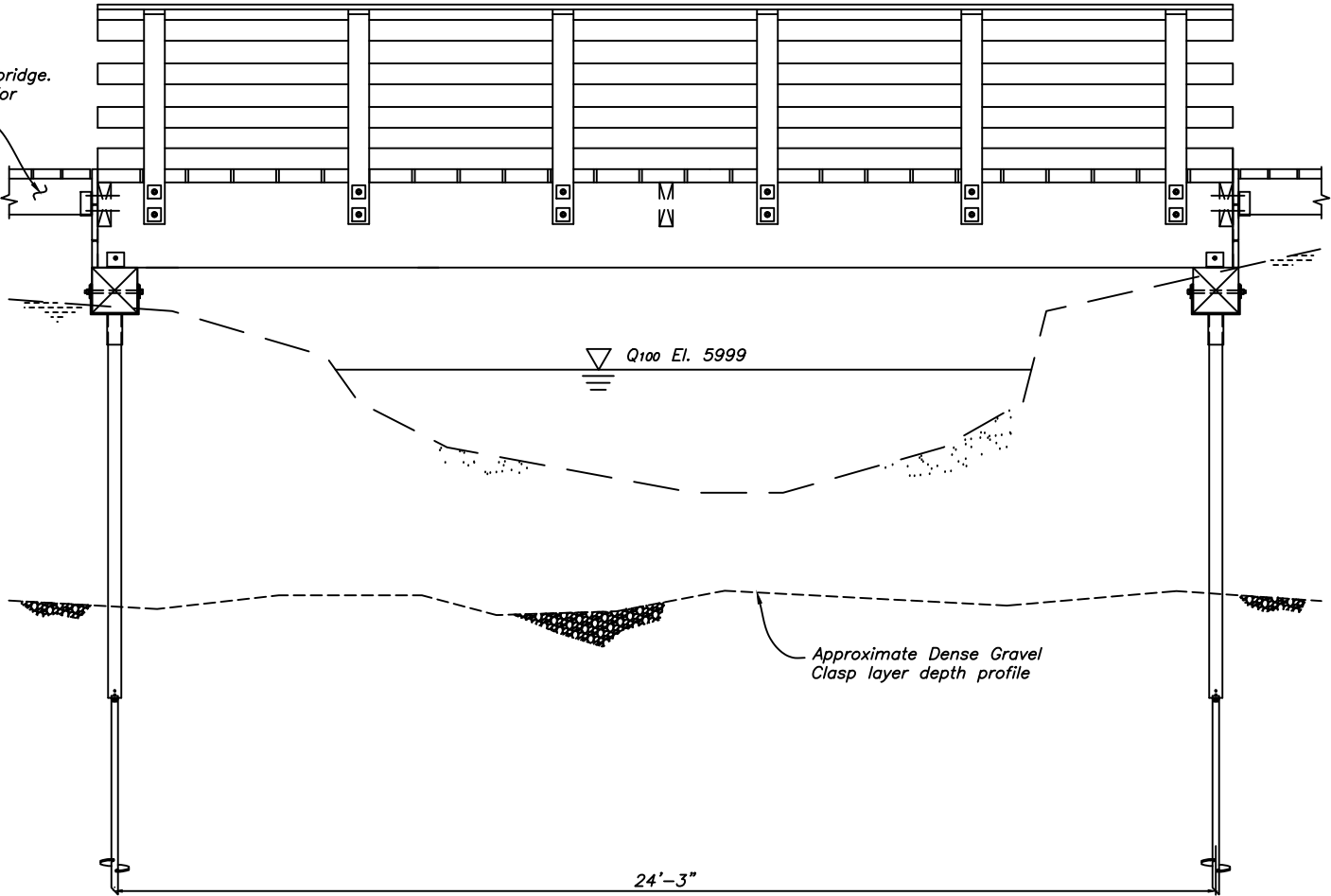
- Organics
- Fine Sand
- Medium Sand
- Dense Gravel Clasp
- N

Dynamic Cone Penetration Test
Resistance, Blows per Foot
(15 lb weight dropped 20")

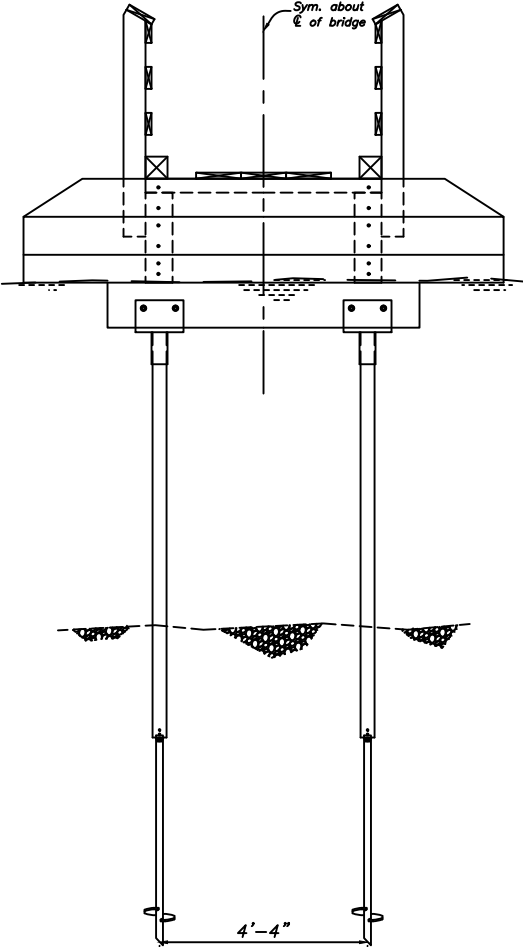


BORING LOG
Scale: 1/2" = 1'-0"

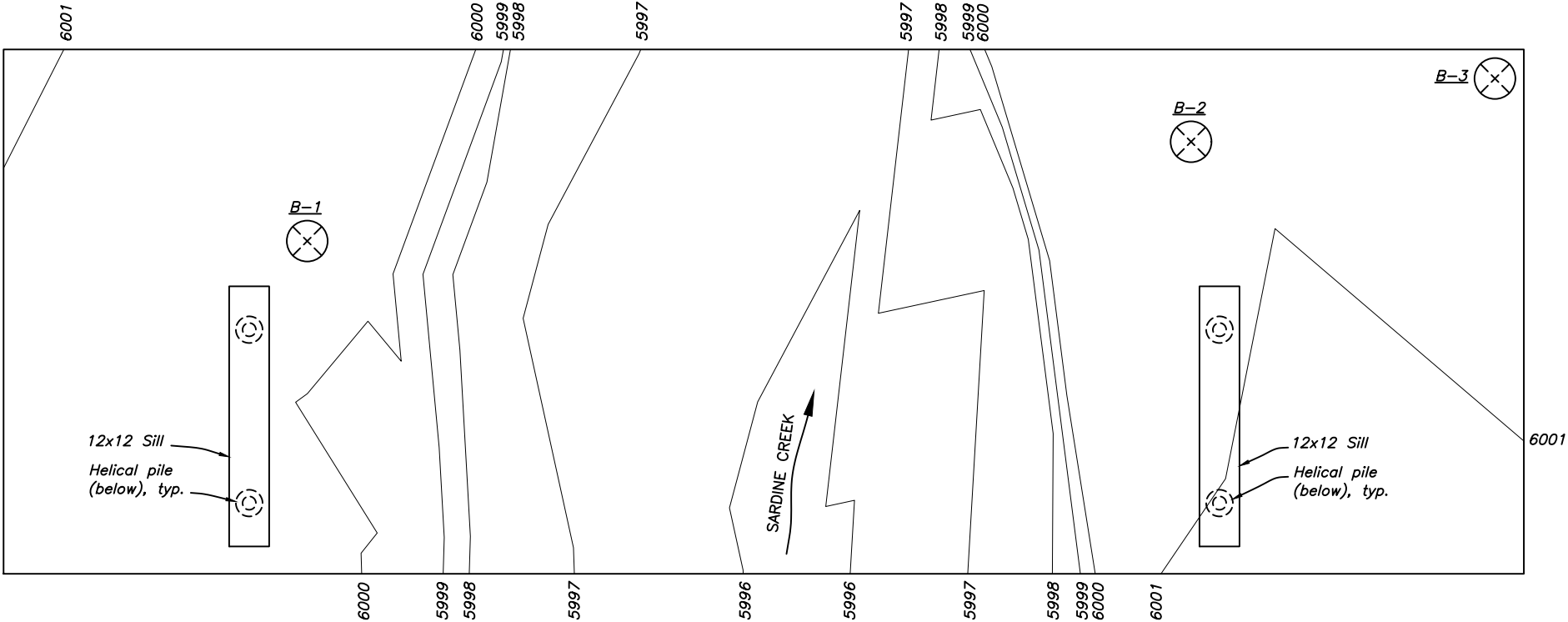
Boardwalk each end of bridge.
See Boardwalk Drawing for
connection details.



ELEVATION
Scale: 1/2" = 1'-0"



END ELEVATION
Scale: 1/2" = 1'-0"



BORING PLAN
Scale: 1/2" = 1'-0"

UNFACTORED REACTIONS AT HELICAL PILE TOP (Kips)						
Dead Load (DL)	Ped. Load (PL)	Snow Load (SL)	Seismic		Wind	
			Vert.	Lat.	Vert.	Lat.
1.6	2.3	10.2	±4.2	±3.0	1.7 (dn) 2.9 (up)	±1.6

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CHECKED <u>Mark Sodaro</u> DATE <u>05/28/26</u>		
RECOMMENDED: _____ DATE _____	SARDINE CREEK TRAIL BRIDGE FOR SAND POND BOARDWALK	
STAFF ENGINEER TRANSPORTATION STRUCTURES APPROVED: _____ DATE _____		
REGIONAL ENGINEER _____ DATE _____	HELICAL PILE DESIGN INFO	
DISREGARD PRINTS BEARING EARLIER DATES	SCALE: <u>As Noted</u>	BRIDGE SHEET <u>3</u> OF <u>3</u>
REVISION MARK AND DATE		DRAWING NUMBER R-1763-03