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Deep Creek Bridge

Austin Berry
Boise State University

Hanna Irving
Boise State University

Luke Spath
Boise State University

Cait Williams
Boise State University

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Abstract

Deep Creek Bridge is located in Latah County, Idaho along US Highway 95. The bridge was built in 1938. An inspection completed in 2016 determined the damage on the bridge was too great for repair and marked it necessary for replacement. Currently, the foundations are exposed and the hydraulic performance needs improvement. The joints are severely damaged, reinforcing bars are exposed and rusting, and large deep cracks are seen throughout the bridge. The bridge will not last another 10 years with the increase in traffic flows.

To maintain traffic flow during construction, a 4.6-mile detour takes traffic north through a rural road and down to Highway 6 which will connect people to US 95. The span of the bridge will be increased. An integral abutment with discrete piles will be used in conjunction with rip rap to prevent further scour from happening and the bridge secured. The girders and handrails of the bridge are made from steel while the decking will be concrete. High-water level and the 100-year floodplain were used to determine the height of the bridge. Deep creek does fall under categorical exclusion, therefore, neither an environmental impact statement nor an environmental assessment is required.

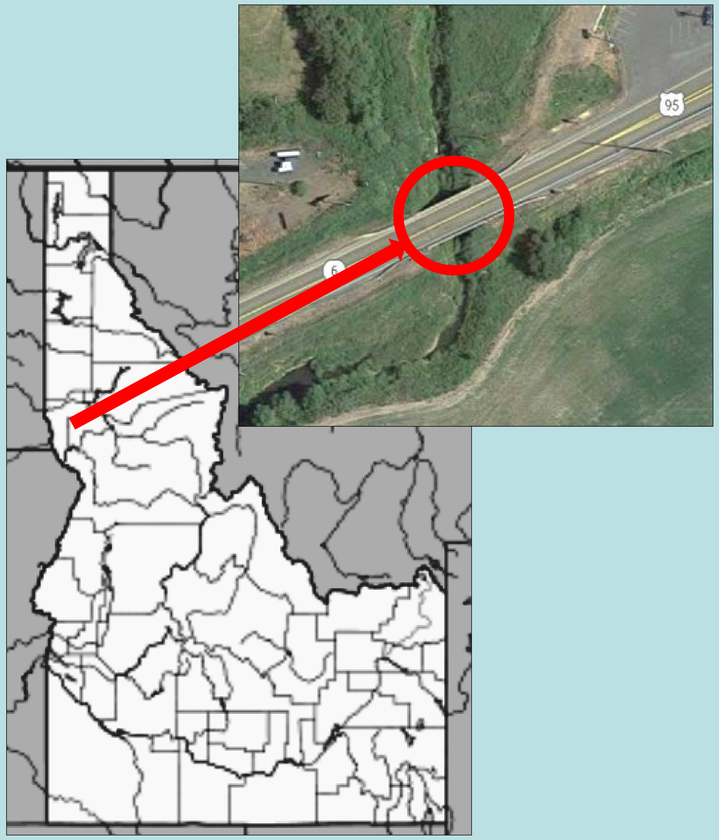
Deep Creek Bridge Redesign

BOISE STATE UNIVERSITY

The Dropout Engineers: **Austin Berry, Hanna Irving, Luke Spath, Cait Williams**

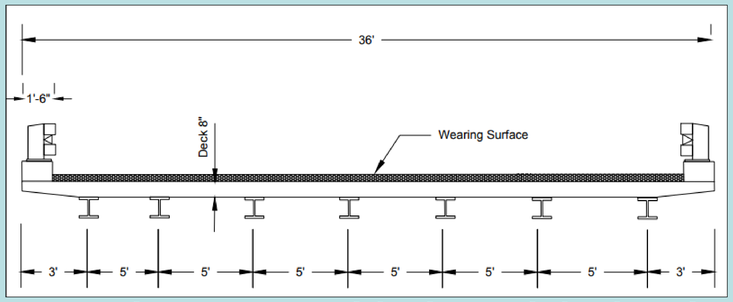
Faculty Sponsors: Dr. B. Chittoori, Dr. R. Hamilton, Dr. M. Khanal, Dr. Y. Lu, Dr. S. Miller, Dr. D. Mishra, Dr. M. Sadegh

PROJECT OVERVIEW

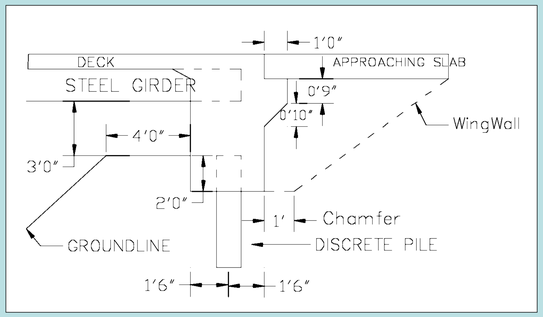


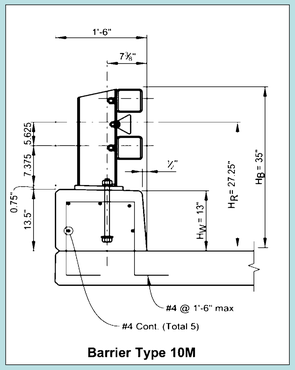
Deep Creek Bridge was built in 1939 and is located in Latah County along US Highway 95 just outside of Potlatch, Idaho. Idaho Transportation Department, in 2015, marked the bridge for reconstruction due to significant scour along the foundations, exposed and rusting steel reinforcement, and subpar safety ratings. The bridge is required to be a single span and traffic flow will be maintained. The main design areas are the foundation design, bridge design, pavement design, traffic management plan, and environmental permitting.

STRUCTURAL



A single span integral bridge with bank pad abutments will be used for the new design. For this design, the use of a concrete deck will be implemented along with a barrier type 10m steel railing. The deck will be supported by seven steel girders (W 36x160). The wearing surface of the deck will be made with an epoxy overlay. An epoxy overlay is generally less expensive and will require little maintenance.





Barrier Type 10M

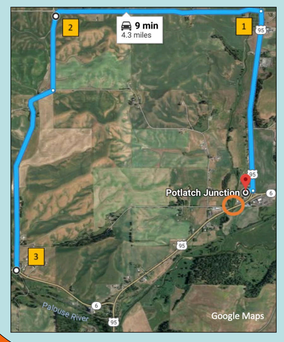
GEOTECHNICAL

Due to poor soils conditions existing until a depth of 47 feet and potential for scour, a deep foundation was selected as the most optimal foundation type. Driven steel piles as per ASTM A252 G3 with a diameter of 24 in. and a wall thickness of 0.5 in. were selected. Four of piles are selected to be driven to a depth of 25 ft. to achieve a bearing capacity of 2257 kips/pile.

ENVIRONMENTAL

A stormwater pollution prevention plan (SWPPP) was designed to distribute runoff into existing roadway ditches on either side of the bridge. During the construction of the bridge straw waddles and black sediment control tarps will be used to minimize pollution into the creek.

TRAFFIC MANAGEMENT



Traffic will be routed north along US - 95 and along a frontage road and connect back to Idaho Highway 6. This will prevent any interference with the railroad and limit costs for the detour.