2009 â?? Black Cat Road Bridge

Description

Meta Fields

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Project Summary : Interior pier precast cap and columns
Project Location : Black Cat Road over Interstate 84 at Milepost 41.0 near the city of Meridian in the Boise metropolitan area
Mobility Impact Time :

- ABC: 4 months
- Conventional: 10 months

Impact Category : Tier 6 (longer but reduced by months/years)
Dimensions : 196-ft-long and 53.67-ft-wide two-span prestressed modified bulb tee beam bridge (97 ft â?? 97 ft); 8.33Âº skew
Average Daily Traffic At Time Of Construction : 74000
Traffic Management : 6 additional months of traffic impacts
Existing Bridge Description : The existing five-span prestressed concrete stringer bridge was 226 ft long and 28.67 ft wide with spread footing substructure. It had two 12-ft-wide traffic lanes with no shoulders. Built in 1963, the bridge was deteriorated and required replacement to accommodate the widening of I-84. Columns on the existing bridge were too close together to allow construction of additional I-84 lanes.
Replacement Or New Bridge : The replacement bridge has two 12-ft-wide traffic lanes, two 6.5-ft-wide shoulders, and two 7.5-ft-wide raised sidewalks. The cross-section consists of six 5-ft-deep pretensioned modified bulb tee beams spaced at 9.25 ft with an 8-inch-thick cast-in-place reinforced concrete deck. The cast-in-place abutments and precast pier cap and columns are founded on concrete-filled steel shell piles.
Construction Method : The pretensioned bulb tee beams and precast reinforced concrete cap and two columns were fabricated in a precast plant and shipped to the bridge site. The precast cap was fabricated with mechanical couplers embedded flush with the bottom surface for embedment of column reinforcement The precast columns were fabricated with column reinforcement extending from each end for connection to precast cap and cast-in-place footing. Traffic was detoured. Concurrent with precast fabrication, the contractor demolished the bridge in two overnight closures of I-84 from 10 pm to 7 am. The mechanically stabilized earth (MSE) walls were constructed. Steel shell piling was driven at abutments and interior pier, and filled with concrete. Abutments were constructed conventionally. Footings were cast at interior pier to encapsulate piles; mechanical couplers were embedded flush with the top surface of the footings to connect reinforcement extending from the bottom surfaces of the columns. The precast columns were erected and mechanical couplers were grouted. The precast cap was erected onto the precast columns, and the mechanical couplers were grouted. The superstructure was constructed conventionally with outside pedestrian fence railing. A deck overlay was not applied. The bridge was opened to traffic. This project includes both the Black Cat Road Bridge and the Robinson Boulevard Bridge replacements to accommodate the widening of I-84. The bridge was closed four months, compared to 10 months that would have been required for conventional substructure construction. The contract included an incentive/disincentive of $20,000 per calendar day for either early or late opening. The incentive/disincentive was based on the available 120 calendar days and could not exceed $400,000.
Stakeholder Feedback : Where appropriate, ITD intends to continue to use precast caps and columns, while modifying them as needed to gain maximum effectiveness.
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Costs : The engineerâ??s estimate for the project was $9.47 million for both Black Cat and Robinson bridges. The low bid was $8.50 million for both structures. There were four bidders. The cost per square foot of bridge was $260 compared to $217 for conventional construction in this region in 2009. In May 2006, the Idaho legislature authorized the sale of $200 million in Grant Anticipation Revenue Vehicle (GARVEE) bonds to finance the first phase of the GARVEE Transportation Program. This project uses some of that funding.
Funding Source : Federal and State

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