



2007 – OR 47 Bridge over Dairy Creek Overflow

Description

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Abc Construction Equipment : Conventional

Miscellaneous Prefabricated : Grouted key closure joints; Asphalt overlay w/o membrane

Prefabricated Bridge Elements : Adjacent box beams; Steel pile caps

Contracting : Full lane closure

Project Delivery : In-house forces

Decision Making Tools : State process

Longitude : -100

Latitude : 45.6341019

Nbi # : 20316

State Id # : 20316

Construction Equipment : Conventional

Total Bridge Length Ft : 45

Max Span Length Ft : 45

Beam Material : Concrete

Spans : One-span

Location : Rural

Owner : State

State : OR

Year Abc Built : 2007

Other Related Url : 1

Contract Plans : 2

Funding Source : State Only

Costs : The engineer's estimate for the project was \$ 507,000. The total actual cost for the in-house design and construction by State maintenance forces was \$480,000. ABC techniques saved an estimated \$147,000 over conventional construction.

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Stakeholder Feedback : Successful bridge replacement was accomplished in two weeks. The 14-day bridge closure allowed the owner to save \$120,000 by omitting the traffic control signal cost that would have been required for conventional staged construction over a four-month period. Coordination with

other disciplines saved more time and money; for example, the permitting process were streamlined to address adding some fill to a wetland for the approach transition guardrail; and use of existing beams salvaged from another project in Region 5. Use of steel bent caps and field welding in lieu of cast-in-place concrete reduced much of the delay time.

Construction Method : Steel piles were driven under a separate contract as part of the advance work prior to the bridge replacement. Traffic was detoured and the existing bridge was demolished. At each abutment the piles were exposed, cut to grade, and capped with a galvanized steel pile cap. A crane was used to erect the caps and beams. The cap was bolted to a steel plate welded to each pile. The beams were erected onto elastomeric bearing pads, and their ends were bolted to the caps. The shear keys between beams were grouted. The 7/8-inch-diameter galvanized tie rods were threaded through the beams at ends and third points and stressed using the turn-of-the-nut method. The tie rod galvanized ducts were ungrouted. The bridge was paved with an asphalt overlay without the use of a waterproofing membrane. Construction Schedule: Day 1-2 " Bridge removal and excavation" Day 3 " Finish removal of bridge and wood piles" Day 4-5 " Cutting piles to correct elevation" Day 6 " Finish setting caps" Day 7 " Off on Sunday" Day 8-9 " Setting slabs and grout keyways" Day 10 " Backfill, roadway grading, and paving preparation" Day 11-12 " Begin paving, shoulder material, and site cleanup" Day 13 " Finish guardrail and pavement markings" Day 14 " Finish cleanup and open road All construction work except the pile foundation was done by in-house bridge maintenance forces.

Replacement Or New Bridge : The replacement bridge has two 12-ft-wide traffic lanes and two 7.75-ft-wide shoulders. The bridge consists of ten 4-ft-wide 1.75-ft-deep adjacent pretensioned concrete box beams with three circular voids per beam. The beams were salvaged from another project and are supported by steel caps on steel piles.

Existing Bridge Description : The existing two-span timber stringer bridge was 38 ft long (19 ft - 19 ft) and 35 ft wide with timber pile bent substructure. It had two 13-ft-wide traffic lanes, two 3.5-ft-wide sidewalks, and no shoulders. Built in 1936, the bridge suffered severe decay, was structurally deficient and functionally obsolete, and required replacement.

Traffic Management : Traffic management alternative, if constructed conventionally: extended use of 3.75-mile detour

Average Daily Traffic At Time Of Construction : 4000

Dimensions : 45-ft-long and 40-ft-wide single-span prestressed adjacent box beam bridge

Primary Drivers : reduced traffic impacts; reduced onsite construction time; improved work-zone safety; improved site constructability; minimized environmental impacts; reduced life-cycle cost

Impact Category : Tier 3 (within 2 weeks)

Mobility Impact Time : ABC: 14 days ; Conventional: four months

Project Location :

Oregon Route 47 (Nehalem Highway 102) at Milepost 81.94 over Dairy Creek Overflow in Washington County between the town of Banks and Highway 26