2022 â?? Jacoby Creek Bridge

Description

Meta Fields

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Project Summary : Lateral Slide: Single-span precast/prestressed concrete box girders (9 cells) supporting a cast-in-place reinforced concrete deck on reinforced concrete seat abutments with monolithic wingwalls (16 feet @A1, 17.75 ft @ A2) on driven Cast-in-Steel-Shell (CISS) concrete piles.
Project Location : Southbound Highway 101 between the cities of Eureka and Arcata in northwestern California
Mobility Impact Time :

- ABC: 1 day

Impact Category : Tier 1 (within 1 day)
Dimensions : 43-ft-width, 73-ft-long single-span concrete adjacent box beam bridge; 12Â° skew
Average Daily Traffic At Time Of Construction : 18000
Traffic Management : extended use of 9-mile detour
Existing Bridge Description : The original southbound bridge was constructed in the 1920s as a two-lane highway in both directions and widened in 1955. It was a three-span structure with pier supports within the creek channel.
Replacement Or New Bridge : The new 73-ft-long, 43-ft-wide single-span bridge has two 12-ft-wide traffic lanes and is four feet wider than the previous bridge. The superstructure consists of nine 4-ft-wide post-tensioned concrete hollow box girders (adjacent box beams) connected transversely with post-tensioned rods and gap keyways filled with non-shrink grout, with deck constructed of cast-in-place polymer-fiber-reinforced concrete to limit the shrinkage to 0.032%. The bridge is supported on new cast-in-place concrete abutments with twelve 36-inch-diameter cast-in-steel shell (CISS) concrete piles along the banks of the creek. The bridge was raised two feet higher than the previous bridge in anticipation of future sea-level rise issues.
Construction Method : There were three seasons of construction due to environmental constraints. The contract required construction to coincide with (1) a time when the tidal flow of the creek was low, and (2) a Friday night from 8 p.m. until 6 a.m. No construction activity was allowed from October 16 to May 31. In the first season (June 1, 2020 to October 30, 2020), the CISS piles were driven and abutments constructed in their temporary location in the highway median adjacent to the existing bridge. The use of vibratory hammers, oscillators, or rotators to install the piles was not allowed. The precast girders were erected and the deck was cast. Traffic was then detoured to this temporary alignment. In the second season of construction (2021), the existing Jacoby Creek (Left) Bridge (Br. No. 04-0023L) was deconstructed and removed in segments. CISS piles and abutments were constructed in the permanent location. In the third season (2022), the bridge substructure was completed and the new superstructure span was slid from the highway median to the Southbound 101 alignment on October 5, 2022 using a jack-and-slide (lateral slide) method.
Stakeholder Feedback : Some of the lessons learned were:

1. Always double check dimensions in the special provisions to ensure they match those shown on the plans.
2. Consider allowing more lenience to the amount of time required between a trial move and a final move based on jobsite constraints including, but not limited to, tidal flows, traffic closure restrictions, etc.
3. Post-tensioning ducts can be compromised during the longitudinal keyway grouting between individual box girders. You should ensure that couplers are grout tight before placing longitudinal keyway grout.

High Performance Material :

- polymer-fiber-reinforced concrete in deck for shrinkage resistance

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