2012 – Rock County Road 55 Bridge over Railroad

Description

Meta Fields
Specifications 0 Spec File : 1844
Abc Construction Equipment : conventional
Miscellaneous Prefabricated : asphalt overlay w/o membrane
Prefabricated Bridge Elements : adjacent box beams, GRS abutments
Project Delivery : design-bid-build
Longitude : -96.133255
Latitude : 43.6478043
Nbi # : 67564
State Id # : 67564
Construction Equipment : Conventional
Total Bridge Length Ft : 82.5
Max Span Length Ft : 82.5
Beam Material : Concrete
Spans : One-span
Location : Rural
Owner : Rock County
State : MN
Year Abc Built : 2012
Foundations & Walls : GRS IBS [Geosynthetic Reinforced Soil Integrated Bridge System]
Contract Plans : 1
Incentive Program : $350,000 IBRD Program
Funding Source : Federal and State
Costs : The engineer's estimate for the project was $ 616,969. The low bid was $834,769. There were 2 bidders. The cost per square foot of bridge was $230 compared to $120 for conventional construction in this region during the same time period.
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Stakeholder Feedback : We would not envision using GRS abutments again for such a tall abutment (? 20-ft exposed height) which generates an excessively large foot print of geosynthetic reinforcement, and reduces the cost saving feature of GRS. The hollow

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core CMU facing is vulnerable to construction damage, stress concentrations, etc. In the future, we would opt to use wet cast solid concrete blocks for both better freeze-thaw protection and to better distribute possible stress concentrations, etc.

Construction Method : The GRS technology used in this project consists of three main components: the reinforced soil foundation, the abutment, and the integrated approach. Alternating layers of compacted granular fill and geosynthetic reinforcement provide support for the bridge. The closely spaced reinforcement and granular soil create a composite material that is capable of carrying bridge loads with predictable performance. The bridge abutment went up quickly. Three to five layers of the abutment were completed each day, about 220 to 360 square feet. Wing walls meet the abutment at an angle, so 45-degree CMU were specified to help speed construction.

Replacement Or New Bridge : The new bridge consists of 82-ft-long single-span prestressed concrete side-by-side boxes utilizing Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) technology. The bridge has a roadway width of 30 ft with two 11-ft wide traffic lanes and two 4-ft-wide shoulders. The cross-section consists of eight 2.75-ft-deep adjacent box beams with a 2- to 5.75-inch-thick bituminous overlay. The adjacent box beams are post-tensioned transversely through the deck. The GRS abutments were founded on glacial till. The total height of the abutments from top of reinforced soil foundation to bridge low member is 22 ft. The front facing of the GRS abutment is gravity stacked 8-inch concrete blocks. The lower layers, where contact with water is anticipated, are constructed with solid concrete blocks to prevent water from accumulating and freezing.

Existing Bridge Description : No bridge previously existed at this RR crossing.

Average Daily Traffic At Time Of Construction : 135

Dimensions : 82.5-ft-long and 33-ft-wide one-span prestressed concrete side-by-side box beams, 0º skew

Primary Drivers : reduced onsite construction time; minimized environmental impacts

Impact Category : Tier 5 (within 3 months)

Mobility Impact Time : 60 days for ABC vs. same time for conventional construction

Project Location :

0.1 Miles South of JCT. C.S.A.H. 4 on C.R. 55 over Minnesota southern railway in Magnola Township of Rock County

Project Summary :

GRS IBS [Geosynthetic Reinforced Soil Integrated Bridge System]

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