



2010 – Biltmore Avenue Bridge

Description

Meta Fields

Other Related Url 0 Other Related Link : <http://www.youtube.com/watch?v=TICSxcbaOI>

Specifications 0 Spec File : 2488

Abc Construction Equipment : Conventional

Miscellaneous Prefabricated : CIP reinforced concrete closure joints

Prefabricated Bridge Elements : MDcBs (Modular decked beams)

Contracting : ∅ Full lane closure

Project Delivery : ∅ Design-Bid-Build

Longitude : -82.5441971

Latitude : 35.5687218

Nbi # : BRSTP-0081(1)

State Id # : B-2515

Construction Equipment : Conventional

Total Bridge Length Ft : 135

Max Span Length Ft : 135

Beam Material : Steel

Spans : One-span

Location : Urban

Owner : State

State : NC

Year Abc Built : 2010

Foundations & Walls : ∅ Micropiles

Other Related Url : 1

Contract Plans : 1

Incentive Program : IBRD (Innovative Bridge Research and Deployment Program): \$110,000

Funding Source : Federal and State

Costs : The engineer's estimate for the project was \$ 3.03 million. The low bid was \$ 2.10 million (\$ 931,000 = 31% lower than engineer's estimate). There were four bidders. The cost per square foot of bridge was \$136 compared to \$135 for conventional construction in this region in 2010.

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High Performance Material : Partial replacement of cement with fly ash or ground granulated blast

furnace slag in deck concrete

Construction Method : The contractor constructed the superstructure units at an adjacent staging area. The girders were supported at bearing locations with required superelevation, and allowed to deflect under self-weight prior to installing the intermediate diaphragms to ensure fit. The girders were then shored to prevent deflection during deck casting. Each deck unit was cast with blockouts in the corners to facilitate placement of the end diaphragms between units. Shoring was removed after the deck concrete attained compressive strength. Foundations were constructed of micropiles, with demonstration micropiles required prior to construction to ensure capacity would be achieved. The abutments were constructed using cast-in-place concrete and the bridge seat elevations verified before placement of the bearing assemblies. The superstructure units were erected, and the intermediate diaphragms were tightened. The classic concrete bridge railing and sidewalks were constructed. The closure joints were then cast, followed by grinding of the deck and approach slab for rideability. Attendance at a pre-bid conference was mandatory to bid on the project. The contractor was required to construct, maintain, and afterwards remove a temporary pedestrian bridge for use during construction. From January 2 until April 30, the road was closed for construction. Traffic was maintained with an off-site detour approximately one mile in length through city streets. Prior to January 2, nightly road closures were allowed if needed. Liquidated damages were \$2000 per calendar day for interim and final completion. If all traffic lanes were not open Monday through Sunday from 6 am to 9 pm during the first construction phase, liquidated damages ranged from \$1000 per hour to \$500 per 15 minutes. All work was completed on schedule and no liquidated damages were incurred by the contractor. No incentives were offered for early completion.

Replacement Or New Bridge : The longer and wider four-lane replacement bridge has two traffic lanes in each direction and two 7-ft-wide sidewalks. The superstructure consists of six modular units. Each 11.25-ft-wide unit has two 4-ft-deep Grade 50W plate girders spaced at 6.13 ft, and a composite concrete deck that is 10.5 inches thick over the girders and 8.0 inches thick between girders. The units are connected with 12-inch-wide longitudinal cast-in-place concrete closure joints.

Existing Bridge Description : The existing four-lane reinforced concrete girder bridge with cast-in-place concrete deck consisted of three 41-ft spans. It was 123-ft long with a clear roadway width of 40 ft. Built in 1935, it was structurally deficient, functionally obsolete, and required replacement.

Traffic Management : Traffic management alternative, if constructed conventionally: required construction of temporary detour bridge

Average Daily Traffic At Time Of Construction : 34890

Dimensions : 135-ft-long and 72.5-ft wide single-span modular decked beam bridge

Primary Drivers : • Minimized environmental impacts • Reduced traffic impacts, reduced pedestrian impacts, minimized economic impact to local businesses • Reduced onsite construction time • Improved site constructability

Impact Category : Tier 6 (longer but reduced by months/years)

Mobility Impact Time : ABC: 4-month road closure with an off-site detour; Conventional: 24 months with adjacent temporary detour bridge

Project Location :

On Biltmore Avenue (NC 81, an urban minor arterial) over the Swannanoa River in Biltmore Village in Buncombe County