Bridge Information

Name: Ross Booth Memorial Bridge aka Winfield Toll Bridge

The bridge was renamed in honor of Ross Booth in June of 2006. Mr. Booth worked as a carpenter on the Winfield Toll Bridge and also helped with the construction of many bridges located in the western section of I-64. It was on one of those bridges that Mr. Booth was injured thus ending his career as a carpenter.

Location and Description of Setting: The project area is located in Putnam County, West Virginia between the towns of Winfield and Red House. The bridge is located on WV 34 (F), located 0.31 mile north of the junction with WV 817 (T) and WV 62 and Walters Street, spanning the Kanawha River. The superstructure replacement of the Winfield Overpass Bridge was also included with the rehabilitation of the Ross Booth Memorial Bridge.

Description of Bridge: The Ross Booth Memorial Bridge (40A035) was built in 1955 by the John F. Beasley Construction Company. The Vincennes Company fabricated the steel and Harrington and Cortelyou, Inc. was contracted to design the bridge. Originally the structure opened as a toll bridge. Entrance ramps to the toll bridge were utilized until the Winfield Overpass Bridge was open to traffic in 1958.

The Ross Booth Memorial Bridge consists of a three-span cantilever through-truss (KSTT) flanked to the south by four 76'-0" long continuous composite wide flange beam spans (CSWB) with the majority of Span Five being a new composite plate girder span (CSPG) 77'-5" long which is spliced to the continuous wide flange beams on the forward side of Pier Four. These plate girders are also coped up at their north end and run continuous over Pier Five and are framed (bolted to) the floorbeam at panel point one of the through-truss span. The north end of the truss is flanked by two new composite continuous plate girder spans (CSPG) 58'-2" and 33'-9" in length. The cantilever through-truss consists of two anchor spans each 245'-0" in length and the main span 462'-0" in length between pier centerlines. The main span is comprised of two 128'-4" cantilever arms and a 205'-4" suspended span. Truss members are made up of built-up or rolled steel sections. All truss connections are riveted except for the hangers and false chord members, which are pinned, with the exception of any new retro-fitted areas which are bolted. The truss floor system consists of four longitudinal steel stringers that frame into transverse steel floorbeams at each lower panel point of the truss except at panel points L0 and L38 where the four new plate girders of Spans Five and Nine run continuous over Piers Five and Eight and framed (bolted to) the floorbeams at panel points One and Thirty-seven of the through-truss span.

The structure is supported by reinforced concrete stub abutments and reinforced concrete rigid frame piers. The abutments and approach span piers are founded on steel piling, while the piers supporting the truss spans are founded on shale and gray sandstone. The approach span piers are
double column open type frame piers, while the truss span piers have partial height concrete web walls.

Adjusted elevations for the seats and caps, along with the original elevations for the footings and pile tips were taken from the plans are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Seat/Cap</th>
<th>Footing</th>
<th>Pile Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment One</td>
<td>597.21</td>
<td>593.40</td>
<td>526.00</td>
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<tr>
<td>Pier One</td>
<td>600.18</td>
<td>568.00</td>
<td>527.00</td>
</tr>
<tr>
<td>Pier Two</td>
<td>603.51</td>
<td>568.00</td>
<td>526.00</td>
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<td>Pier Three</td>
<td>606.89</td>
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<tr>
<td>Pier Eight</td>
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<tr>
<td>Pier Nine</td>
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<tr>
<td>Abutment Two</td>
<td>612.72</td>
<td>608.86</td>
<td>554.00</td>
</tr>
</tbody>
</table>

Superstructure dimensions include:

- Overall length: 1,433'-6"
- Span No. 1: 76'-0" No. 2: 76'-0"
  No. 3: 76'-0" No. 4: 76'-0"
  No. 5: 77'-5" No. 6: 245'-0"
  No. 7: 462'-0" No. 8: 245'-0"
  No. 9: 56'-2" No. 10: 33'-9"
- Roadway: 28'-0"
- Horizontal Clearance: 28'-0" (Max. Hor. Clearance 28'-7")
- Vertical Clearance: 14'-0" (Perm. Vert. Clearance) 13'-9"
- Under Clearance: 15'-8" (WV 62)
- Deck: 8" Reinforced Concrete/35'-3" Wide
- Wearing Surface: Conc. Deck Surface (laterally grooved & milled)

The original structure connections are rivet connected while all retrofitted connections are bolted. The fracture critical pin and hanger assemblies at panel points 15 and 23 were retrofitted with a redundant hanger system.

A 5'-2 1/2" wide concrete sidewalk exists along the downstream side bordered by a rectangular parapet with aluminum handrail, while an F-Style parapet with aluminum handrail borders the upstream side of the bridge roadway.

**Maintenance History:** In the 1980's the navigation lighting system was replaced. In 1991, a latex modified concrete overlay was placed on the original bridge deck. In 1997 and 1998, several deteriorated steel cross beams were replaced at Panel Points L10, L15, and L28. Also during this time period several deteriorated steel stringer webs were plated at Panel Points L10 and L28.
The Winfield Overpass Bridge was opened to traffic in 1958 by unknown contractor and in 2010 the superstructure was replaced. The two lane structure over WV 817 (formerly US 35) is a three span (44', 82', & 44') continuous steel structure with four longitudinal steel beams for an overall length of 174'2" from centerline to centerline of the abutment bearings.

Rehabilitation Project Information

**Date/Cost for Rehabilitation or Maintenance Activity:** The Ross Booth Memorial Bridge underwent a major rehabilitation in 2010 at the cost of approximately $15,220,500.00 which included the superstructure replacement of the Winfield Overpass Bridge and some additional road widening on WV 817 (formerly US 35).

**Bridge Designer:** The Ross Booth Memorial Bridge was rehabilitated with design plans by URS Consulting Engineers using LRFD design criteria. All construction work was done by Orders Construction Company of St. Albans, West Virginia. The new superstructure for the Winfield Overpass Bridge was also constructed by Orders Construction Company.

**Rehabilitation Project:** The Ross Booth Memorial Bridge project consisted of the following rehabilitation items:

- Replaced selected stringers (longitudinal floor system)
- Replaced selected floor beams (transverse floor system beams)
- Replaced selected bearings
- Deck replacement
- Cleaning and painting of the existing truss to resemble the original paint color
- Sidewalk was added with new pedestrian railing
- Installed a redundant hanger system for the suspended middle span of the bridge
- Deck replacement
- Substructure work on the abutments and piers

*For full rehabilitation work see attached scope of work details.

**Bridge Owner/Client:** West Virginia Department of Transportation

**Source for Additional Information:** West Virginia Department of Transportation (WVDOT)

Attention: Sondra Mullins
Capitol Complex Building 5
Room 450
Charleston, West Virginia 25305
Email: Sondra.L.Mullins@wv.gov
Phone: 1-304-558-9487
Additional Information

Significant Issues: The Ross Booth Memorial Bridge is inspected on a yearly basis and in 2008 was listed in fair condition. Due to the cost, location of the bridge and high traffic volumes the bridge was recommended for rehabilitation. Several public meetings were held in order to receive public input on a full closure of the bridge for a shorter project time frame versus a partial closing and extending the project time to two construction seasons. Additional meetings were also held with emergency personnel and city officials. It was decided to close the bridge and finish the project as quickly as possible. An incentive was written into the construction contract if the project was finished early; Orders Construction Company finished the project a month ahead of schedule. The newly renovated Ross Booth Memorial Bridge opened on August 13, 2010.

Section 106 Finding:

The Section 106 process was initiated in May 2008 for the rehabilitation of the Ross Booth Memorial Bridge and the superstructure replacement of the Winfield Overpass Bridge. The West Virginia State Historic Preservation Office (WVSHPO) concurred with the WVDOT recommendation that the two bridge structures were eligible for the National Register of Historic Places. Additional information was requested about the type of railing that would be used for the project. Railing design options were submitted to the SHPO for comment. Upon viewing the final railing design the SHPO determined that this undertaking would be an adverse effect to the historic structures. The WVDOT contacted FHWA about rehabilitation of the bridge and due to the adverse effect a draft MOA was developed in March 2009. In April 2009 the FHWA notified the Advisory Council on Historic Preservation that the proposed rehabilitation of the Winfield Toll Bridge and the Winfield Overpass Bridge would have an adverse effect to these historic structures. The Advisory Council on Historic Preservation decided not to participate in the project. The Memorandum of Agreement (MOA) was sent to WVSHPO in March 2009. Included in the MOA were stipulations that the WVSHPO review the plans and railing details for the project, including documenting the bridge prior to rehabilitation. The MOA was signed by the SHPO on May 11, 2009, the WVDOT on May 12, 2009, and FHWA on May 15, 2009. All stipulations of the MOA were concurred on June 12, 2009 by the WVSHPO.
Bridge Photographs

Bridge railings-before and after

The Ross Booth Memorial Bridge aka Winfield Toll Bridge- December 2008. Photographed by Jacqueline Giles/WVDOH.
The Winfield Overpass Bridge in December 2008. Photographed by Jacqueline Giles/WVDOH.

The Winfield Overpass Bridge in December 2010. Photographed by Traci Cummings/WVDOH.
The Ross Booth Memorial Bridge aka Winfield Toll Bridge- December 2010 after rehabilitation. Photographed by Sondra Mullins/WVDOH.
WINFIELD (TOLL) BRIDGE NO. 1364
OVER KANAWHA RIVER
WINFIELD, PUTNAM COUNTY, WEST VIRGINIA