



## 2016 – Wrights Corners Bridge

### Description

#### Meta Fields

**Abc Construction Equipment :** Conventional

**Miscellaneous Prefabricated :** CIP reinforced concrete closure joints, prefabricated railing, polyester polymer concrete overlay

**Prefabricated Bridge Elements :** MDcBs (Modular concrete-Decked steel Beam) - Folded Steel Plate Girder System (FSPGS)

**Project Delivery :** Public-Private Partnership (P3)

**Longitude :** -78.4942093

**Latitude :** 41.9248047

**Nbi # :** 53529

**State Id # :** 4.21E+13

**Construction Equipment :** Conventional

**Total Bridge Length Ft :** 49

**Max Span Length Ft :** 45

**Beam Material :** Steel

**Spans :** One-span

**Location :** Rural

**Owner :** State

**State :** PA

**Year Abc Built :** 2016

**Funding Source :** Other

**Contacts :** **Owner:** Thomas P. Macioce, P.E. Chief Bridge Engineer Pennsylvania Department of Transportation [tmacioce@pa.gov](mailto:tmacioce@pa.gov) 717-346-9904 **Folded Steel Plate Girder Supplier:** Thomas Stockhausen President CDR Bridge Systems LLC [Thomas.Stockhausen@cdrmaguire.com](mailto:Thomas.Stockhausen@cdrmaguire.com) 412-235-9480 **Contractor:** Mike Heiple, P.E. Project Manager - Central Walsh Granite Joint Venture [mheiple@walshgroup.com](mailto:mheiple@walshgroup.com) 717-773-1538 **Submitter:** Thomas Stockhausen President CDR Bridge Systems LLC [thomas.stockhausen@cdrmaguire.com](mailto:thomas.stockhausen@cdrmaguire.com) 412-559-4025

**High Performance Material :** Hot-dip galvanized steel girders for corrosion protection; 4-ksi accelerated concrete closure pours; ¾-inch polyester polymer concrete overlay

**Stakeholder Feedback :** During planning, collaboration between CDR, HDR, and Walsh/Granite JV resulted in the addition of forming tabs for the concrete end diaphragm. Threaded concrete inserts were included on the bottom of the deck panels to facilitate forming for the longitudinal closure pours.

Alterations to future abutment reinforcing were noted to facilitate installation of the exterior girder elements. The change reduced installation time from 3 hours on this bridge to 2 ½ hours on the next installation.

**Construction Method :** The existing bridge was demolished and abutments constructed by the contractor. Concurrently, the Folded Steel Plate Girder modular decked beam elements were fabricated offsite. The modular decked beams were then delivered by truck to the construction site on the day required by the [on site] contractor, who installed the four elements in three hours. Following installation, the contractor made three longitudinal closure pours and the concrete end diaphragm closure pour. Approach roadway paving completed the project. The maximum allowable bridge closure was 35 days due to detour length. Using the Folded Steel Plate Girder modular decked beam elements, the actual closure was 30 days. The contractor had estimated a closure of 75 days using conventional construction methods. The contractor received no incentive for the early delivery; however, a \$4100/day liquidated damages provision was in place and avoided by the early completion.

During the project, weekly production conference calls were held, and detailed fabrication/delivery status reports were provided.

**Replacement Or New Bridge :** The replacement bridge has two 12-ft-wide traffic lanes and two 4-ft-wide shoulders. The cross-section consists of four 2-ft-deep Folded Steel Plate Girder modular decked beam elements spaced at 9.5-ft with a 7.5-inch-thick 4,000 psi precast reinforced concrete deck. Decks of the two outside elements were precast complete with railing. Integral abutments were used.

**Existing Bridge Description :** The existing single-span steel I-beam bridge was 33-ft long and 31-ft wide with spread footing on soil. It had two 12-ft-wide traffic lanes and two 2-ft-wide shoulders. Built in 1941, the bridge was deteriorated and required replacement.

**Traffic Management :** Extended use of 14-mile detour

**Average Daily Traffic At Time Of Construction :** 331

**Dimensions :** 49-ft-long and 34.5-ft-wide single-span MDcBs (Folded Steel Plate Girder System - FSPGS) bridge; 0° skew

**Primary Drivers :** Reduced traffic impacts - from detour; reduced onsite construction time

**Impact Category :** Tier 4 (within 1 month)

**Mobility Impact Time :** Actual closure was 30 days, compared to the contractor's estimate of 75 days using conventional construction.

**Project Location :** State Route 1015 over North Branch Cole Creek near State Route 46 near the city of Bradford

**Project Summary :** The project was the first "commercial" use of the Folded Steel Plate Girder System (FSPGS), an ABC prefabricated superstructure element. The superstructure for this 49-ft bridge was erected in 3 hours. The project was one of the bridges being replaced by a P3 under the PA Rapid Bridge Replacement Project. It was one of many bridges with 35-day-max closures due to detour length. This bridge was replaced in 30 days. A second FSPGS bridge was constructed two weeks after this and five others are to be built in 2017.