

PROJECT DESCRIPTION

Project No. 0159-0193 involves the rehabilitation Bridge No. 00642, carrying Route 15/U.S. 5 over Route 99 (Silas Deane Highway) and Bridge No. 00811, carrying Route 15/U.S. 5 over Hartford Avenue & Providence & Worcester Railroad in Wethersfield.

Bridge No. 00642

Bridge No. 00642 supports Route 15 and U.S. 5 over Route 99 (Silas Deane Highway) in the town of Wethersfield, approximately 0.3 miles south of the Wethersfield/Hartford town line. The existing bridge, originally constructed in 1942 and rehabilitated in 1986, consists of a two-span steel multi-girder superstructure supported by reinforced concrete abutments and a reinforced concrete pier founded on spread footings. The existing bridge has a maximum span length of 69 feet and the total bridge length is 145 feet. The out-to-out deck width of the bridge is 83 feet – 10 inches, while the curb-to-curb width over the structure is 80 feet. The southbound travel direction over the bridge consists of two travel lanes and a left and right shoulder and a southbound off-ramp exists 50 feet east of the bridge. The northbound travel direction over the bridge consists of two travel lanes, a left and a right shoulder. The southbound and northbound travel directions are separated by a 2-foot-wide concrete median barrier. The AADT of Route 15 and U.S. 5 over the bridge is 37,200 vehicles per day. The AADT of Route 99 (Silas Deane Highway) is 15,700 vehicles per day.

The purpose and need of this project is to address the structural deficiencies of the steel superstructure supported by reinforced concrete abutments which are in fair condition (Rating = 5). The existing elastomeric expansion bearings at the abutments have surface rust on the sole plates with the bearing pads exhibiting curling and bulging. Random bearing pads have gaps up to 14" wide by 6" long between pad and sole plate, as well as overhang which results in minor loss of bearing support. The existing curved sole plate fixed bearings exhibit rust between the sole and masonry plate, as well as areas of section loss. The steel girders exhibit areas of painted over section losses and welded repair plates at random locations. Top flanges have painted over pitting losses and isolated recurring rust, while the bottom flanges have section losses in critical areas. The steel diaphragms exhibit rust at random locations with pack rust between the diaphragms and connection plates, with open bolt holes at random end diaphragms.

The proposed rehabilitation consists of metalizing and performing steel repairs at the beam ends, replacing the bearings, and constructing a link slab over the pier. The existing bituminous concrete wearing surface over the bridge will be milled and the deck repaired by performing full depth and partial depth deck patch, new waterproofing membrane will be applied, and new overlay will be installed. Additionally, the beam end repairs will include full height UHPC beam end repairs in accordance with CTDOT guidance documents. Repairs of the concrete substructure will be included.

Bridge No. 00811

Bridge No. 00811 supports Route 15 and U.S. 5 over the Providence & Worcester Railroad (P&W R.R.) and Hartford Avenue in the town of Wethersfield, approximately 0.20 miles south of the Wethersfield/Hartford town line. The existing bridge, originally constructed in 1942 and widened in 1990, consists of a three-span continuous steel rigid frame structure that supports a 9-inch-thick reinforced concrete deck. The existing steel rigid frame is supported by individual steel frame legs and column pedestals, founded on spread footings, and is aligned at a skew angle of approximately 9 degrees with respect to the existing roadway. There are two reinforced concrete abutments with wingwalls, founded on spread footings, at either end of the bridge. Beyond each abutment along the south side of the bridge, there are two additional spans composed of a cast-in-place reinforced concrete beam and column system founded on piles, which were constructed as part of the 1990 bridge widening to accommodate the northbound on-ramp and acceleration lane.

The existing bridge has a total structure length of 308 feet and has a maximum span length of 100 feet. The out-to-out deck width of the bridge varies from approximately 93 feet 8 inches to approximately 99 feet 7 inches, while the curb-to-curb width over the structure varies from approximately 87 feet 10 inches to approximately 93 feet 9 inches. The southbound travel direction over the bridge consists of two travel lanes and a left and right shoulder, and the northbound travel direction over the bridge consists of two travel lanes, an acceleration lane as part of the northbound on-ramp, and a left and right shoulder. The southbound and

northbound travel directions are separated by a 2-foot-wide concrete median barrier, which widens to 6 feet beyond the east abutment. The AADT of Route 15 and U.S. 5 over the bridge is 47,500 vehicles per day. The AADT of Hartford Avenue is 1,200 vehicles per day.

The purpose and need of this project is to address the structural deficiencies of the existing steel rigid frame which is in poor condition (Rating = 4). The existing steel rigid frame exhibits areas of light to heavy rust and varying degrees of section loss. The bottom flange angles and cover plates of the steel rigid frame girders have documented areas of section loss across all three spans up to 25% in critical locations. The existing bridge substructure and deck are in overall satisfactory condition (Rating = 6) with random cracking and areas with spalling and honeycombing.

The proposed rehabilitation consists of repairing the existing steel rigid frame as required by installing repair plates at the deteriorated sections of the webs only and replacing rivets with severe section loss with high strength bolts. Performing this repair to deteriorated flanges requires a significant number of rivets to be removed and replaced and is not included as part of the scope. Additionally, all steel bridge components will be cleaned and metalized. The existing bituminous concrete wearing surface over the bridge will be milled and the deck repaired by performing full depth and partial depth deck patch, new waterproofing membrane will be applied, and new overlay will be installed. The deck ends at each abutment will be reconstructed and lengthened over the backwall. New reinforced concrete approach slabs will be installed at each approach to the bridge. The existing abutment backwall will be modified to accept the new deck end and approach slab. New asphaltic plug expansion joints will be installed at both abutments. Repairs of the concrete substructure will be included. The ground surface adjacent to Abutment 1 will be regraded away from the abutment to stop any water from ponding.

To maintain traffic at the site, construction will be performed in three stages.

- Stage 1: Route 15/U.S. 5 Southbound traffic will be reduced to one lane to perform the proposed work on the northernmost portion of the structures. The southbound off-ramp will be closed for the duration of Stage 1.
- Stage 2: Route 15/U.S. 5 in both the northbound and southbound directions will be reduced to perform the proposed work on the middle portion of the structures.
- Stage 3: Route 15/U.S. 5 Northbound traffic will be reduced to one lane to perform the proposed work on the southernmost portion of the structures. The northbound on-ramp and off-ramp will be closed for the duration of Stage 3.

Traffic control on Route 99 (Silas Deane Highway) is anticipated to include temporary shoulder closures, lane shifts and off-peak lane closures.

There are four (4) anticipated detours.

- Hartford Avenue will be detoured for the entirety of construction. The detour route will use Jordan Lane and Route 99 (Silas Deane Highway).
- Route 15/U.S. 5 southbound off-ramp will be detoured for the duration of Stage 1 using Route 175 and Route 99.
- Route 15/U.S. 5 northbound on-ramp will be detoured for the duration of Stage 3 using Route 99, Wethersfield Avenue, Route 530 (Airport Road), and Brainard Road.
- Route 15/U.S. 5 northbound off-ramp will be detoured for the duration of Stage 3 using I-91, Route 3 and Route 99.

Railroad and Utilities

Bridge No. 00811 carries Route 15/U.S. 5 over P&W Railroad the proposed rehabilitation work within the existing railroad clearance envelope or requiring access across/within the railroad right-of-way is to be coordinated with the railroad.

Aerial and underground utilities exist within the project limits, however, impacts to the utilities are not anticipated.

Bridge No. 00642: The underground utilities include the Metropolitan District Connecticut (MDC) water main below and Connecticut Natural Gas (CNG) gas main below Span 1.

Bridge No. 00811; the underground utilities include an MDC sanitary force main below span 1. Eversource electrical conduits, MDC Sanitary and water mains and CNG gas main below span 3. Aerial utilities include Eversource Energy, Frontier Communications and CoxCom are supported by poles owner by Eversource Energy and terminate on a pole south of the bridge. CoxCom facilities continue past the pole and are supported by the bridge superstructure.

Additional aerial utilities, including Eversource Energy Electric Transmission lines run parallel to the railroad and cross Route 15/U.S. 5 near the west abutment of Bridge No. 00811.

CTDOT Incident Management System (IMS) Conduits are supported by the subject bridges and a separate project is planned to add additional conduits in the project area. Impacts to the existing and proposed conduits are not anticipated.

There are no anticipated Right-of-Way impacts.

The following environmental permit is anticipated to be required:

- CTDEEP Stormwater Discharge Permit

Project Cost & Construction

The Opinion of Probable Construction Cost (OPCC) for the project is \$23,000,000.

Construction is anticipated to begin Spring 2028.