

Temporary Multi-Span Panel Bridge

The Acrow 700XS multi-span panel bridge owned by the New Hampshire DOT, provides a temporary crossing over the Connecticut River on US Route 4 eliminating a long detour while a new bridge is designed and constructed to replace the deteriorating historic bridge built in 1936.



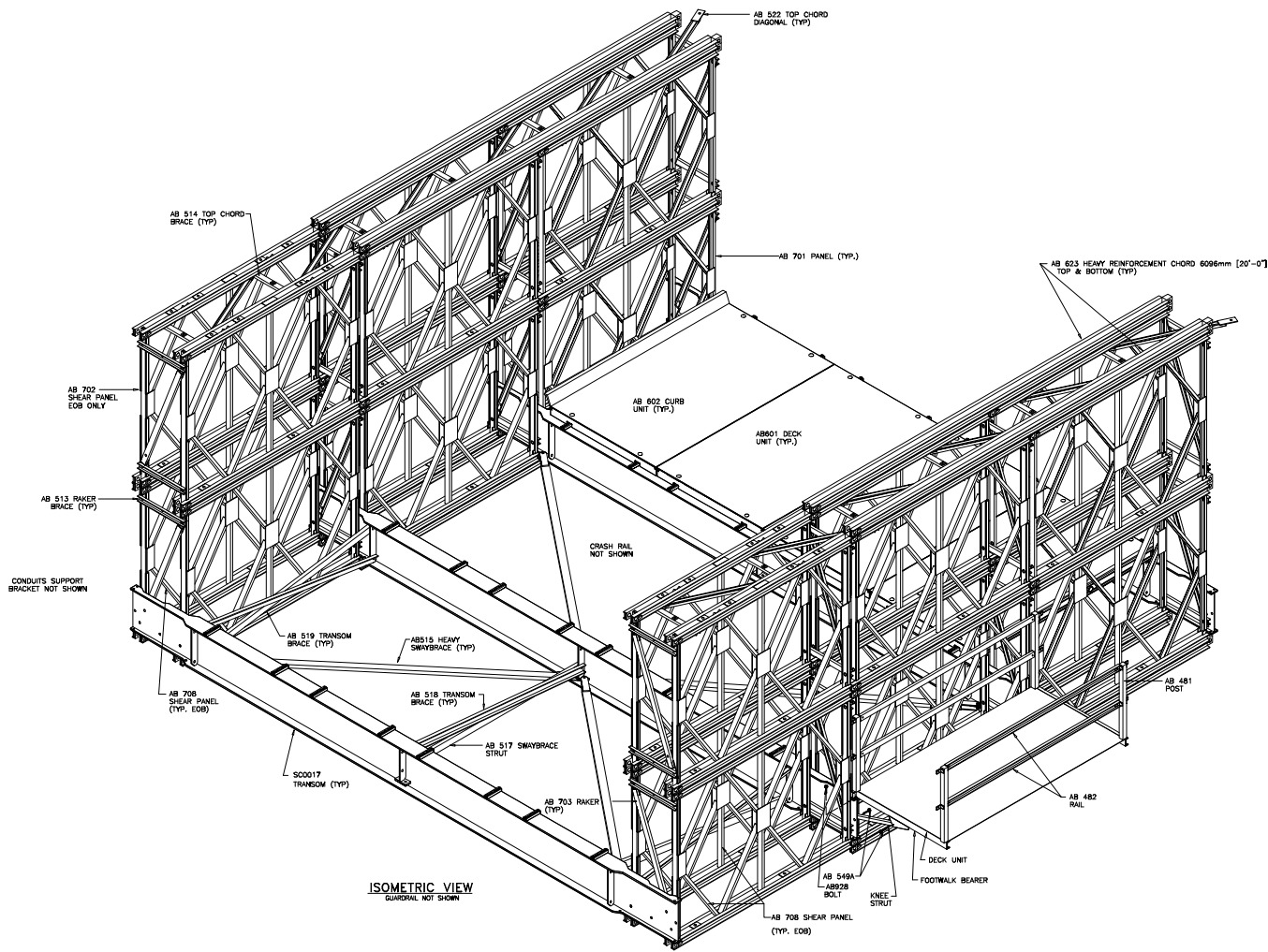
The historic 1936 vintage bridge over the Connecticut River on US Route 4 between Lebanon, NH and Hartford, VT was posted to carry a maximum load of 10 tons, after inspection by the State of NH revealed serious deterioration. The 10 ton posting prevented fully loaded trucks from using the bridge. To minimize transportation impact to the area, replacement of the bridge had to be accelerated. The New Hampshire Department of Transportation (NHDOT) issued a competitive contract to install a temporary panel bridge. The project was awarded to CPM Constructors of Maine who bought an Acrow 700XS multi-span panel bridge to be installed for a period of five to seven years while a new bridge was designed and constructed to replace the existing bridge. The Acrow bridge became the property of the NHDOT.

The original bridge was built in 1936 connecting Lebanon, NH and Hartford, VT. It was 392 feet (119.5M) in length and comprised of three spans. It had two high pratt truss spans, one span was 143 feet 6 inches (43.7M) and a second high pratt truss span was 148 feet 9 inches (45.3M). The third 88 foot (26.8M) long span was a low warren truss. While this 1936 vintage bridge was eligible for the National Register of Historic Places as it represented an intact example of the early 20th century multi-span, riveted truss

transitioning from built-up to rolled steel, it's rehabilitation was deemed too costly. The state opted to erect a temporary multi-span panel bridge that would be used for five to seven years while a new bridge was designed and constructed.

The main reason for specifying a panel bridge was founded in the history of the NHDOT's utilization of state owned Acrow 300 Series bridging. The state purchased their 300 Series bridging in the 1980's and has successfully utilized their inventory for planned detours and emergency response. The US Route 4 bridge gave the state the opportunity to purchase the newer Acrow 700XS series which is a more versatile version of the panel bridge that can meet today's heavy loads, longer span requirements and required guide rail standards.

The designs were finalized, contract documents were published and the project was advertised for bidding. CPM Constructors of Freeport Maine was the low bidder for the construction of a 450 foot (137.2M) long, temporary Acrow detour bridge which included a 5 foot (1.5M) sidewalk cantilevered off of one side of the bridge and with 550 feet (167.6M) of detour approach construction at a price of \$2.7 million.



Specifications

Bridge length:

Acrow supplied 450 linear feet (137.2M) of bridging that was comprised of three spans. The span arrangement was 170 feet (51.8M) -170 feet (51.8M) and 110 feet (33.5M).

Bridge width:

The Acrow bridge has a 24 foot (9.3M) clear travel way between the guide rails.

Guide rails:

A test level 4 guide rail system was supplied by Acrow for the bridge

Deck surface:

Contract documents required a crowned asphalt overlay

Sidewalk:

The bridge was supplied with a 5 foot (1.5M) wide sidewalk cantilevered off of one side of the bridge.

Bridge erection:

Full cantilevered launch

Live load:

The bridge was designed in accordance with AASHTO LRFD bridge design specifications second edition to:

- HL93 vehicular
- Pedestrian live load = 85psf
- 10 K snow plow vehicles on footwalk
- Utility load = 50plf

Bridge design:

- (A) Panel chords, diagonals 7 verticals, panel reinforcing chords, Rakers to AASHTO M223 GD 65
- (B) Decking, raker brace, transom, top chord brace, swaybrace, transom brace, diagonal chord brace to AASHTO GD 50
- (C) Panel pins to ASTM A 193 GD b7
- (D) Bolts to AASHTO M164M – A325

Bridge finish:

- All major components galvanized to AASHTO M111 – ASTM A 123
- All bolts are hot dipped galvanized
- All pins are electro galvanized