



Acrow Steel Structure Used to Support a Failing Concrete Bridge on Oahu's North Shore

Deteriorating piers necessitated emergency repairs on one of the island's busiest highways

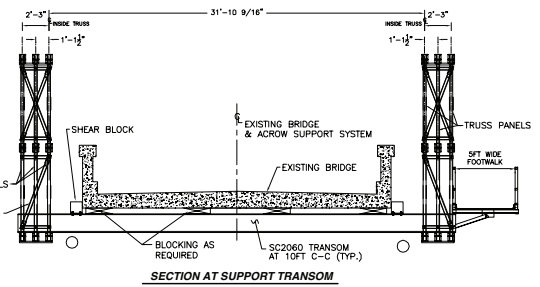
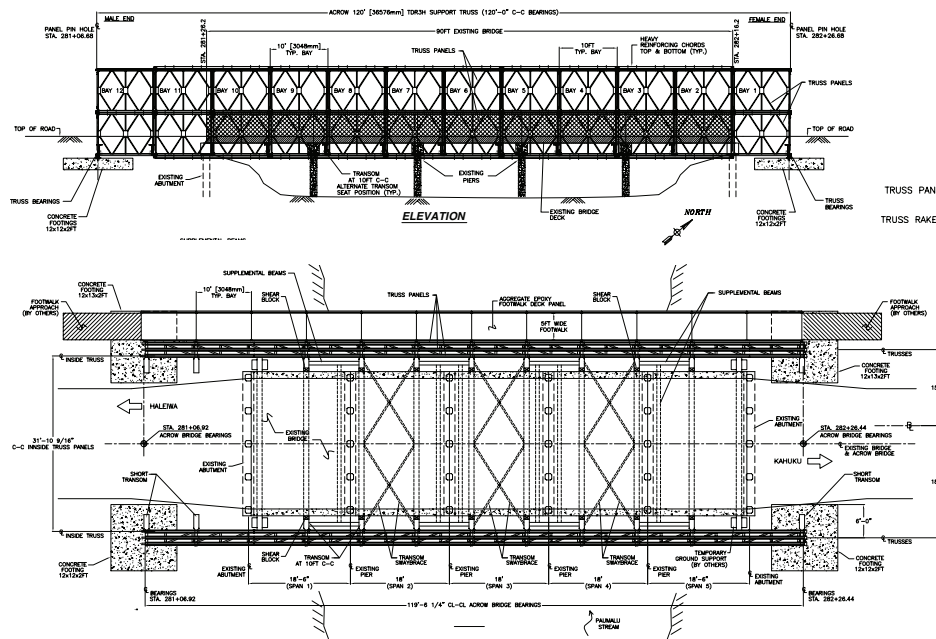
When a state inspection found serious deterioration in the piers of the 87-year old Paumalu Stream Bridge, a plan for expedited repairs was undertaken to avoid further structural damage. The bridge is situated on Kamehameha Highway, one of the busiest roads on Oahu's north shore. A bridge replacement was estimated to require a full closure of the route for up to two years, so an innovative solution from Acrow was chosen.

The temporary structure was a standard Acrow bridge with special floor beams and steel underneath that wrapped around the existing bridge to provide the support needed to allow continued traffic flow during the rehabilitation.

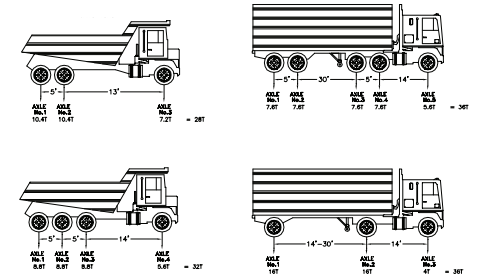
Using innovative installation techniques, Acrow's structure was successfully assembled with a truss line on each side of the old bridge and rolled into position. The support beams were then installed underneath, along with the special support members for the old bridge.

The project posed many challenges, from detail engineering to fit up to the existing bridge, to complicated installation of the structure while live traffic was still traveling the busy highway.

With Acrow's solution in place, Hawaii Department of Transportation employees were able to safely work on the construction and installation of collars for the original piers.



DIAGRAMS OF PERMISSIBLE LIVE LOADS - AASHTO HS20 WITH TOWS



NOTE:
PERMIT VEHICLES ARE NOT TO USE BRIDGE UNLESS WRITTEN APPROVAL FROM ACROW HAS BEEN OBTAINED. THE BRIDGE SHALL HAVE AT EACH END BEING PROTECTED UNDIMENSIONALLY THE PERMISSIBLE LIVE LOADS SHOWN ABOVE. IT SHOULD ALSO INDICATE THAT PERMIT VEHICLES ARE NOT ALLOWED.

Specifications

Bridge length:

120' (36.58m)

Roadway width:

30' (9.15m)

Deck surface:

No deck was used, as the Acrow structure provides support underneath the old bridge on Acrow floor beams and support steel around each pier cap.

Bridge erection method:

The structure was assembled with a truss line on each side of the old bridge

and rolled into position. Support beams were then installed underneath, along with specialized support members, and the old bridge was then secured with blocking to the Acrow frame structure.

Design load:

HS-20, plus all of the old concrete bridge dead load

Standard Acrow bridge finish:

- All major components galvanized to AASHTO M111-ASTM A123
- All bolts are hot-dip galvanized
- All pins are electrogalvanized

Standard Acrow bridge specification:

- (A) Panel chords, diagonals, verticals, reinforcing chords, rakers to AASHTO M223 GD 65
- (B) Raker braces, transoms, top chord braces, swaybraces, transom braces, diagonal chord braces, decking to AASHTO M223 GD 50
- (C) Panel pins to ASTM A 193 GD B7
- (D) Bolts to AASHTO M164M - A325