

# Acrow Bridge Provides Pilgrims Safe Passage in Flood-Ravaged Area in the Himalaya

A major cloudburst in 2013 and a second flood in 2015 created an impasse to remote temple



In June 2013, a multi-day rainstorm centered on the north Indian State of Uttarakhand caused devastating floods and landslides. Government figures cited more than 5,700 people dead or missing, with more than 100,000 airlifted to safety. The floods caused extensive property damage, including the destruction of an existing bridge at Sonprayag, an extremely important part of the route taken each year by hundreds of thousands of Hindu pilgrims from all over the world on the trek to the Kedarnath Temple, 3,500 meters above sea level.

Because the damage to the structure occurred during the middle of the pilgrimage season, a quick but ultimately temporary bridge was soon erected at the site of the destroyed crossing, but was washed away on two occasions by floods, most recently in June 2015.

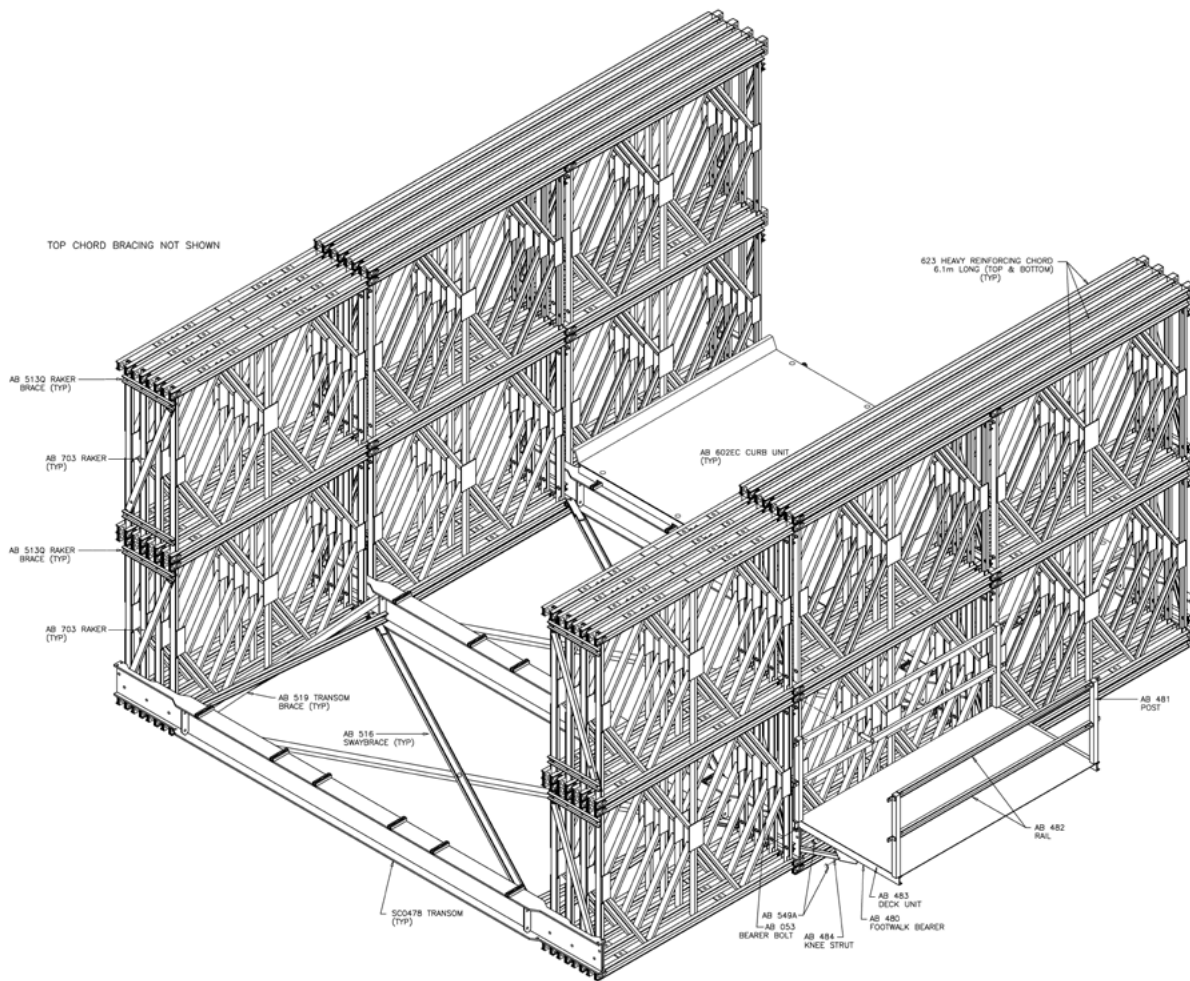
The Acrow structure was selected by the Uttarakhand Disaster Recovery Project team along with the Indian infrastructure and project consultancy company Intercontinental Consultants and Technocrats Pvt. Ltd. (ICT) with funding provided by the World Bank. The 60 meter clear span bridge, which sits 2,600 meters above sea level, was customized with modular components to address local conditions. Unlike previous crossings, the new structure can take two lanes of traffic, allowing far more capacity for pilgrims and local residents alike.

In a remote location like this, building an Acrow modular steel bridge on site is often the best option, since constructing a conventional bridge of a long length in-situ is most likely not feasible due to

challenging topography. It would also take more than 3 years to build, while an Acrow steel span of any length can be erected with minimal construction machinery and using unskilled labor, with construction time counted in days.

Remote areas such as this often have substandard road conditions. This can make it difficult to transport heavy highway construction equipment or materials to the project site and do not allow safe maneuverability of the heavy weight of a prefabricated concrete structure or the length of a steel beam structure. In contrast, the modular Acrow components used for the Sonprayag bridge were shipped in standard ocean containers and then delivered by highly compact and maneuverable 6.5 meter long trucks. The components were delivered over three weeks early and the structure was completed in an incredible 45 days.

For over 60 years, all over the world, Acrow has created and restored transportation lifelines under extreme circumstances. They have replaced bridges lost to natural catastrophes and man-made calamities and provided safe and secure crossings for the general public, commerce and emergency vehicles.



## Specifications

### Bridge length:

Acrow supplied 200 linear feet (60.96M) of bridging to build one clear span.

### Bridge width:

The Acrow bridge is 18 feet (5.5M) to support two lanes of traffic and pedestrians.

### Live Load:

India Class 70R loading;  
pedestrian load=5 kN/m<sup>2</sup>

### Deck surface:

Asphalt overlay provided by Acrow Bridge.

### Bridge finish:

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

### Bridge erection:

Rolling/launching method to temporary stone and steel pier of 12 meters

### Bridge design:

- (A) Panel chords, diagonals & verticals, raker & reinforcing chords to AASHTO M223 GD 65
- (B) Decking, raker brace, transom, transom brace swaybridge, top chord brace, diagonal brace to AASHTO M223 GD 50
- (C) Panel pins to ASTM A193 GD B7
- (D) Bolts to AASHTO M164M – A325