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2017 AWARDS FOR ENGINEERING EXCELLENCE

Award of Excellence Atal Setu (Basohli Bridge)



Consultant

McElhanney Consulting Services Ltd.

Client

IRCON/SP Singla Joint Venture

Owner

Border Roads Organization,
Ministry of Defense, India

Category

Transportation & Bridges

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In 2001, the Border Roads Organization was able to develop the 592 metre Atal Setu, a bridge connection to join the isolated village of Basohli to three nearby states. As the first cable-stayed bridge procured under a design-build scheme in India, the bridge would provide an alternative route to National Highway 1A, reducing travel time between Punjab and Kashmir by 4 hours.

High seismic activity and wind conditions of 140 kilometers per hour posed unique challenges. Steep rocky banks and large fluctuations in the river levels made erection of main span segments from below very difficult. With short side spans compared to the main span, the imbalanced superstructure created significant uplift forces at the abutment. To eliminate this, a combination of lightweight composite steel in the main span, counterbalanced with concrete side spans, cast-in-place on a temporary support structure were used. The main span was progressively cantilevered over the river, with the steel segments delivered from above and hoisted by a custom gantry. Diamond-shaped towers addressed seismic and aerodynamic issues, modified to improve constructability. Because this solution addressed wind stability, simple plate girders, which are easier to fabricate and erect than closed box girders, could be used.

The bridge was opened to traffic in December 2015 after only 4 years of construction – less than half the time to construct previous cable-stayed bridges of similar scale in India.