



CONSTRUCTION OPPORTUNITIES

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SPECIAL FOCUS-ROAD CONSTRUCTION EQUIPMENT-CASE STUDY



Barrier breakers

Afcons Infrastructure Ltd has completed a hill-road project in record-breaking time, setting benchmarks for excellence, by installing a Road Header machine in conjunction with a Drum Cutter for the first time in India

Expansion and development of efficient road network is one of the pre-requisites of a country's economic progress. Roads are a preferred mode of transport in India and as per current statistics, highways carry 60 per cent of freight and 80 per cent of the passenger traffic. The traffic on national highways is estimated to grow by 8-10 per cent per annum in the coming years. For several decades, NH1-A has served as a vital link between the nation's frontiers and its coasts. This road also enables mobilisation of soldiers and strategic resources and plays a vital role in securing our country.

Expansion and re-alignment of the section was a part of the Phase-II National Highways Development Programme (NHDP) entrusted to the National Highway Authority of India (NHAI) by the Central Government. Afcons Infrastructure Ltd played a key role in reincarnating NH1-A and creating a record for the fastest completion of a hill-road project. The project which has led to ease in transportation in the Jammu -Udhampur stretch is an ideal example reflecting the benefits of utilising effective construction equipment.

Afcons terms the project as a 'Project of Structures' - wherein the highway had 76 bridges/viaducts and underpasses, 223 culverts, 10 km of retaining wall, 27 km of breast wall, four twin-tube tunnels and much more. However, the infrastructure major credits its record-breaking success

to its qualitative workforce, precision and effective utilisation of apt construction equipment and technologies.

"The project demonstrated the very theme of operational excellence that Afcons has developed as a key differentiator vis-a-vis its competitors," says K Subrahmanian, VC and MD, Afcons.

THE PROJECT

The project started in 2011 with a mere 35 per cent of land being available. The 64-km stretch had to be closely monitored and over 8,000 workers were deployed to finish the job before time. To avoid project delays, the activities were divided into two sections - Jammu headed by Arun Kumar Mishra and Udhampur headed by Ananta Kumar.

However, construction on the hilly terrain posed numerous hurdles, owing to the Himalayan varied rock strata. The situation hence required construction of long sections of retaining walls to support and protect the road from debris and rocks. "It was necessary for us to adopt several techniques instead of going for a conventional RCC retaining wall. So, we went for RCC retaining wall, gabion wall and RE walls," said Ananta Kumar.

The other crucial concerns which were considered during project execution were the blind curves, passenger safety and passage of road through wildlife areas. Also, blasting was not allowed during construction in the project. Excavation had to be done using

rock breakers, eccentric rippers, by strictly adhering to the environmental safety norms.

TECHNO AID

To surmount the geological challenge, Afcons adopted several advanced construction methods. Among the many innovations, it implemented a novel technique of tunnel construction where an integrated water-proofing arrangement was used. Further, the RCC lining which involved use of gantry, was replaced with SFRS and lattice girder, which made construction of the tunnels independent of gantry an easy execution.

A key attraction and noteworthy mode of execution were the utilisation of road header machine and drum cutter inside the tunnels.

A road header machine was especially introduced for the first time in conjunction with a drum cutter inside the tunnels. Both machines combined seamlessly to cut through the rock with scissor-like precision.

Furthermore, the water-proofing system consisted of integrated mode where the water-proofing agent was directly mixed with Steel Fibre Reinforced Shotcrete (SFRS). In between the initial layer of SFRS and final layer of SFRS, a spray-based bonding agent was applied which not only provided the second level of water-proofing but also acted as a bonding agent for SFRS. ♦