

Inside India's Longest Road Tunnel

Like a giant T-Rex, the Finnish machine with a 15-metre extendable arm - cables dangling from it - raises its head and swings sideways. It then hisses a cement spray-mix onto the inner walls of the Chenani-Nashri tunnel that's being dug in the heart of the majestic Pir Panjal range in Jammu and Kashmir. The machine is guided by a boxed remote control device, suspended from a belt, which the operator wears around his neck. The device resembles a video game remote-control with a joystick and numerous buttons, but this is no child's play.

The tunnel, along with the Qazigund-Banihal tunnel located 100 km ahead, will bring the Kashmir Valley and its people closer to mainland India. The two tunnels, being built at a cost of nearly `45,000 million, will halve the travel time between Jammu and Srinagar from the present 10 hours and reduce the mountainous journey by 46 km. Though the project, which includes building two tunnels and four-laning of National Highway 1A that connects Jammu to Srinagar, began several years ago, it has gathered pace only now.

The making of the tunnel

On a Wednesday afternoon, at the south end of the two-lane Chenani-Nashri tunnel, the man who operates the spray machine is surrounded by dozens of other workers wearing the mandatory safety helmets, gum boots and bright orange overalls lined with glowing florescent patches. Most of them come from the neighbouring districts of Udhampur and Ramban, says Janak Singh Rathore, project director of the Chenani-Nashri Tunnelway Limited (CNTL). CNTL is a special purpose vehicle set up by IL & FS Transportation Network Limited (ITNL), the concessionaire for the tunnel.

Nearly 500 metres inside the tunnel, workers are preparing for another round of blasting. A single blasting adds 2-3 metres to the tunnel length, depending on the rock formation. The tunnel is illuminated on both sides by a series of bulbs, apart from floodlights mounted atop the machinery deployed inside. The tunnel has an escape route on one side, with cross passages every 300 metres for those trapped inside in case of an emergency. Once ready, this nine-km-long tunnel connecting Chenani town to Nashri village, located at a distance of about 90 km from Jammu city, will be the longest road tunnel in the country. The 2.5 km long Jawahar tunnel was the last road tunnel built in the region nearly 55 years ago.

The equipment and consultants for the two tunneling projects have come from all over the world. At Chenani-Nashri, the project site has been secured by deploying personnel from the G4S security agency and gating it at two different points on the approach road. The temperature inside the tunnel is lower by two degrees in summer but breathing can get difficult after a while.

CNTL, officials say they regulate the fresh air supply inside the tunnel. “After a blast, we pump fresh air inside to force out the fumes,” says Vijender Singh, Project Director for the same project, National Highways Authority of India (NHAI). The work is underway in full swing, carried out 24x7, in two shifts of 12 hours each, to meet the 2016 deadline.

“*Rozgaar mil raha hai* (I have got a job here),” says 38-year-old Shahabuddin, an electrician at the site. Shahabuddin, who belongs to Bihar, earns nearly `18,000 a month, saving enough to send back home as the company takes care of lodging and food. He finds the work here more demanding than the 10 hours shift he was used to in Delhi, where he worked on the Metro construction project.

“Sometimes I find it difficult to breathe inside the tunnel. Dust is as problem,” he says, “With rising costs, it is difficult to manage expenses. It is only in construction-related jobs that one gets paid so much,” he says. Nearly 800 workers are employed at the Chenani-Nashri tunnel and 500 at the Qazigund-Banihal tunnel where construction is underway at both end of the tunnels.

It wasn’t easy to decide the spots for these tunnels to be built. “The location was proposed on the basis of environmental, geo-technical and economic studies,” says Rathore, the CNTL Project Director.

On the Qazigund-Banihal tunnel project, the concessionaire, Navyuga Engineering Company Limited, has roped in SMEC India, an Australian engineering and development company, as independent consultants. Project developers say once the tunnels are complete, they will give a boost to the food processing industry here. “The tunnels will facilitate the movement of perishable commodities and reduce wastage,” says P Satyanarayan, Project Director for the Qazigund-Banihal tunnel.

Work on this tunnel is slower and has lagged behind Chenani-Nashri. SMEC’s Project Manager for underground works, Malcolm Rankin, attributes this to a multitude of factors. “Every bit of logistics must be organised, spares can be a problem, equipment lying idle can be a problem.”

Road blocks

At both the tunneling sites, the developers are facing labour issues even though Qazigund-Banihal developers attempt to downplay the situation. Though NHAI officials say over 80 percent of those employed are from neighbouring areas, the developers insist that tunneling projects require specialised skills and therefore it may not always be possible to hire locals. They cite instances when, allegedly at the behest of some local politicians or authorities, workers created trouble at the site and work came to a standstill.

Between September and December 2011, work was disrupted for at least 17 days at the Chenani-Nashri tunnel. The developer says the reason varied from workers demanding tea break allowances to labour camp food, removal of undisciplined staff and manhandling of store staff by workers. At the Qazigund-Banihal site office, the notice board warns workers of disciplinary action if they indulge in malpractices.

News & Views

Thirty-year-old Mohammed Arshad Malik, local head of Centre of Indian Trade Unions (CITU), from Chenani town, alleges that locals have been replaced with outsiders at the site. “We have been dragged outside. The company has brought outsiders and deployed heavy security to keep us out,” he says.

Outside the gate of the project site, 50 to 60 workers in uniform come together, claiming that the company did not pay them tunnel and medical allowances. Malik says the company has promised that it will now hire 40 locals in their security division. “If they don’t comply, we will go on a strike,” he says, and soon the men around him break into slogans.

As SMEC’s project manager for underground works, Rankin says an hour lost to disruption costs the developer `0.5 million. “Work conditions here are starkly different from those in Delhi or Mumbai. In Jammu and Kashmir, it is difficult to assemble a team.”

Labour issues are not the only challenges that developers face. While the land required for the two tunnels have been acquired, it is for the road widening project - converting them into four-lane highways - that problems have raised their head, delaying the project delivery. The total project - two tunnels and four-laning of the existing NH1A - requires 900 hectares of land.

“Acquiring land is the biggest issue. Almost 80-90 percent of the land is available, but in patches. We have to slow down the work as compensation distribution is slow,” says NHAI Project Director M.K. Jain. NHAI has deposited `5,400 million with the state government, and another `3,000million will be deposited soon, he says. The land in Jammu and Kashmir is acquired by the state under its Land Acquisition Act. The Act has a provision whereby the seller can go and ask for revision of rates, and if adjudicated in his favour, then the buyer has to pay the higher compensation. “There are several such cases pending before the courts and those have delayed the process,” says Jain.

Building roads in hilly areas is at least three times more expensive than in plains. It costs `250-300 million to build a kilometer of road in hilly areas, whereas it costs `100 million a km in plains. “The difference is due to bridges and retaining walls that have to be built in hilly areas,” says Jain.

At Qazigund-Banihal, some of the workers say they have given up their land for this project. “We had almond, cherry, apple and apricot trees on this land,” says Mohammed Yusuf, a worker at the tunnel site. He admits they received compensation at the rate of `0.65 million a canal, but for him it is job that’s important. “It’s with great difficulty that I got a job here,” he says, “These projects help us only if they continue for at least 7-8 years. Else, we will be jobless again.”

Construction work slows down considerably during winters when snowfall blocks the approach roads. “We have a 24x7 work schedule but even then, productivity is lower than expected,” says a project engineer.

Before the engineers decide to bore further down the tunnel, they have to monitor various parameters like rock behavior, minimum support required and allow for 'deformation in tunnel to take place before they put a final lining. "The approach adopted is, build as you go," says Rathore.

According to NHAI, which is undertaking these highway building projects in the region on Public-Private Partnership, the project will reduce the physical distance between Srinagar and Jammu by almost 46 km. It means that commuters will be able to avoid the snow-capped and landslide-prone areas of Patnitop, the winter resort destination that lies between Jammu and Srinagar.

The Chenani-Nashri tunnel will also skip the Nagroda bypass which truckers find difficult to negotiate due to its sharp and steep bends. Vehicles can also skip a treacherous part of the highway, called 'Khooni Nala' (bloody path) by locals. This particular road stretch is surrounded by shooting stones, which claimed 10 lives in the months of January-February. Besides, the two tunnels will convert the 286 km NH 1A stretch into an all-weather, four-lane road from the present two lanes.

Apart from NHAI's projects, upcoming rail projects will connect the Valley to Jammu. In fact, the 11-km-long Qazigund rail tunnel is being built in the vicinity of the road tunnel. However, people in the Valley believe the project's significance lies in its political implications - it will bring the Valley closer to mainland India.

Source: Indian Express, 8.4.2012

Zojila Tunnel will Open Road to Ladakh even in Winter

In an effort to counter the increasing threat from China, the Centre has finally decided to build two tunnels on the avalanche-prone Zojila Pass at a cost of about ` 66,000 million for year-long connectivity of the Ladakh region, which remains cut off for road traffic for about five months.

The construction of the tunnels is part of India's plan to build 558 roads with a total length of 27,986 kilometre by 2030 along the India-China border. Work is in progress on five roads in eastern Ladakh, bordering Tibet and Aksai Chin.

The decision to construct the 6 km long Gagengar-Sonamarg tunnel was taken at a meeting convened by Union roads and transport minister CP Joshi in New Delhi on March 28. According to the Border Roads Organisation (BRO), the estimated cost of this tunnel is about ` 21,000 million.

Work on the basis of the feasibility report of the 12 km long Baltal-Menamarg tunnel, costing about ` 45,000 million, is also expected to start soon.

People of the Ladakh region, especially Kargil, had been demanding the construction of these tunnels for the past 30 years as this 18 km stretch is avalanche prone and snow bound.

Source: Hindustan Times, 7.5.2012

The World's Largest Underground Powerhouse in China

The world largest underground powerhouse at Baihetan hydropower station, Jingshajiang River, China will be excavated soon in the rock masses composed of tuff, interlayer shear weakness zones, and basalt with columnar-shaped joints. The measured maximum in situ stress is about 30MPa. The underground powerhouse covers both sides of the river in the downstream direction and is composed of a main powerhouse, a transformer chamber and three surge shafts on each river bank, the dimensions of which are about 438m x 34/31m x 86.7m, 368m x 21m x 39.5m, and about 50m x 100m, respectively. The total Installed generating capacity of the hydropower station is 16000MW, consisted of 16 generating sets of 1000MW.

Source: Xia-Ting Feng

ISRM President

ISRM News Letter, No. 1, June 2012

Cultivate a Culture of Giving, says Gates, Premji

Forty-five of India's richest were engaged for four hours in an intense discussion with Bill Gates, Azim Premji and Ratan Tata not only on philanthropy but also on the critical question of "How do you figure out how much you and the next generation need," before deciding to give away your wealth for charitable causes.

Bill Gates, who has pledged \$26 billion to the Bill & Melinda Gates Foundation, told the audience "keep it for the need," and give the rest away. He said, "you should not leave behind for your next generation more than what they require. Historically, such a thing has proven to be not good and therefore it is important to give things for charity." He also said it is 'important for all those who have succeeded in life to do philanthropy.' The co-hosts emphasized the need for partnering, teaming up to help improve quality of education, water, healthcare and sanitation in the country.

The event kicked off with the three co-hosts talking about the culture of giving and asking the billionaires and millionaires present to cultivate the habit.

Source: The Times of India, 4.6.2012

The Little Details

- A mountain is composed of tiny grains of earth. The ocean is made up of tiny drops of water. Even so, life is but an endless series of little details, actions, speeches and thoughts. And the consequences whether good or bad of even the least of them, are far-reaching. – *Swami Sivananda*
- A man was examining the construction of a cathedral. He asked a stonemason what he was doing chipping the stones, and the mason replied, "I am making stones." He asked a stone carver what he was doing. "I am carving a gargoyle," he said. And so it went, each person said in detail what they were doing. Finally, he came to an old woman who was sweeping the ground. She said, "I am helping build a

cathedral.”...Most of the time each person is immersed in the details of one special part of the whole and does not think of how what they are doing relates to the larger picture. – *A parable*

Source: The Times of India

Rising and How

Mumbai tops the chart of skyscrapers and highrises

Project	City	Height	Floor	Year
India Tower	Mumbai	720 m (2362 ft)	125	2016
World One	Mumbai	442 m (1450 ft)	117	2014
Oasis Tower 1	Mumbai	372 m (1220 ft)	85	2016
Orchid Crown T2	Mumbai	337 m (1106 ft)	75	2011
Orchid Crown T1	Mumbai	337 m (1106 ft)	75	2011
L’wala Minerva	Mumbai	305 m (1001 ft)	82	2014
Orchid Hts T1	Mumbai	300 m (984 ft)	80	2013
Orchid Hts T2	Mumbai	300 m (984 ft)	80	2013
I’bulls Sky Forest	Mumbai	276 m (906 ft)	80	2012
I’bulls Sky Suites	Mumbai	291 m (955 ft)	75	2012

Source: Hindustan Times, 25.3.2012

Top 10 Remittance Receiving Countries in 2011 (*Remittance in \$ billion*)

India:	64
China:	62
Mexico:	24
Philippines:	23
Egypt:	14
Pakistan:	12
Bangladesh:	11
Nigeria:	11
Vietnam:	9
Lebanon:	8

Source: Hindustan Times, 30.4.2012