Construction of Rohtang tunnel, one of the world's most challenging motorable projects at 3,000 metres above sea level and which will provide an all-season connectivity to the landlocked Lahaul Valley from here in Himachal Pradesh, may be completed by 2020.

The most ambitious and expensive undertaking of its kind, the excavation of the 8.8-km long horseshoe shaped tunnel under the 3,978 metres Rohtang Pass in the Himalayas was completed last October. Now civil engineering work is on.

However, a geological surprise in the form of a rivulet that sprung up in 2012 during the tunnel digging is posing a challenge. Its torrential inflow is emerging into the tunnel.

"As per the current pace of work, most likely we will complete all civil engineering work by December 2019," an engineer involved in the tunnel construction said.

He said electrical and ventilation works were also in progress simultaneously. "In all probabilities, the tunnel will be made operational by May-June 2020."

The project is being built by the Border Roads Organisation (BRO), a wing of the Defence Ministry, in collaboration with Afcons, a joint venture with Strabag AG.

The Rs 1,495-crore tunnel's foundation stone was laid by United Progressive Alliance (UPA) chairperson Sonia Gandhi on June 28, 2010 in the picturesque Solang Valley near here.

Official sources said the tunnel had missed its February 2015 deadline owing to tough geographical conditions in the Himalayas along with harsh climatic conditions, besides a limited working season of six months in the tunnel's north portal.

Even the project is going to miss its second deadline 2019, admitted the engineer.

The tunnel, whose both ends can be accessed after negotiating 20 landslide and snow avalanche zones, is located at altitudes ranging above 3,000 metres and lies beneath the snow covered Rohtang Pass, whose 70 per cent of the top remains under snow even during summer.

But the delay of almost five years will face a cost overrun of Rs 20-25 billion.

Taming the glacial-fed Seri rivulet is still a challenge for the engineers.

It's a tributary of the Beas river and the tunnel alignment is crossing beneath the rivulet.

"Earlier, we were encountering the Seri rivulet's impact in 562 metre area. Now, we have managed to reduce its impact to just 30 metres. Very soon we will manage to control its entire flow and seepage inside the tunnel," said another engineer.

Situated in the Pir Panjal ranges, the Rohtang Pass highway tunnel will provide ample room for two-way traffic and is designed to cater to a maximum vehicular speed of 80 km per hour.

Upon completion, it will also be a boon for the cold deserts of Lahaul Valley, where over

20,000 people remain cut off from the rest of the country in winter owing to the closure of the Rohtang Pass.

Besides reducing road distance by approximately 46 km and saving travel time of five hours between Manali and Keylong, headquarters of Lahaul-Spiti, the tunnel has the capacity to ply 3,000 vehicles per day under any weather condition.

The completion of the Rohtang tunnel is a key element in the Defence Ministry's attempts to make the entire 475 km-long Manali-Keylong-Leh highway, used by the armed forces to reach forward areas in Ladakh bordering China and Pakistan, motorable round the year, said officials.

The strategic importance of the Manali-Leh link was realised by the Indian government almost a decade ago when Pakistan tried to cut off the Srinagar-Leh road during the Kargil conflict, in a bid to restrict road access to Ladakh.

Currently, the movement of armed forces to the forward areas in Ladakh from Manali side, which doesn't fall in the firing range of Pakistan forces, is feasible only from June to mid-December.