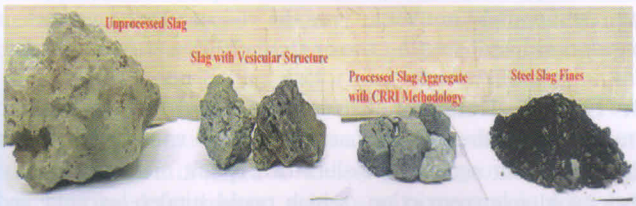
Bituminous Steel Slag Road
Building Sustainable Roads

CSIR-Central Road Research Institute (CSIR-CRRI) based in New Delhi undertook a major R&D project funded by the Ministry of Steel and four major industries, utilising the steel slag, a byproduct of the steel manufacturing process for road construction. Steel slag produced at the time of separation of the molten steel from impurities in steel-making furnaces occurs as a molten liquid melts and solidifies on cooling. The steel slag for road development by CRRI is made of processed steel slag aggregates.

India ranks second in the world in steel production and generates 19 million tonnes of steel slag in the form of solid waste from various steel plants. By the end of 2030, the steel slag generation is predicted to reach around 60 million tonnes. Hence, its utilisation for road construction is a well-thought solution that contributes to the trending waste-to-wealth initiative. The majority of steel slag after the recovery of metal lands in the waste dump or a landfill, calling for a sustainable, eco-friendly solution.



Conversion of unprocessed steel slag into processed steel slag through customised steel slag valorisation technology

Surat, Gujarat, became the first city in the country to have a one-of-a-kind, one-kilometre long, six-lane bituminous steel slag road. It connects National Highway (NH)-6 to Hazira port. The road was inaugurated on 15 June 2022. The joint venture project was between CSIR-CRRI, the Union Ministry of Steel, GoI, the Government Think Tank NITI AAYOG' and a steel company in the country. Steel slag has been used in all the layers of the road, substituting for hundred per cent of the natural aggregates. The construction incorporated one crore ninety lakh tonnes of waste from the steel plant. The new road is 30-32 per cent less thick compared to conventional concrete roads. The steel slag road material is dense and hard and is capable of withstanding wither and tear. Additionally, compared to conventional roads made out of concrete, it can withstand more pressure and load. About one lakh tonnes of processed steel slag aggregates were developed.

Six-lane bituminous steel slag road at Surat (Gujarat)

The second road where the Border Roads Organisation (BRO) utilised solid waste material from steel plants for constructing a long-lasting, heavy-duty road along the India-China border area at Arunachal Pradesh. The new steel slag road was one kilometre long and was constructed by BRO under the technical guidance of CSIR-CRRI. About 1200 metric tonnes of processed steel slag aggregates were delivered via railway and road, first from Jamshedpur to Itanagar and then from Itanagar to the project site.

BRO constructed steel slag road at Arunachal Pradesh over a one-kilometre stretch