June 21

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A Semi-annual insight into the Civil Engineering World

CIVILONEWS

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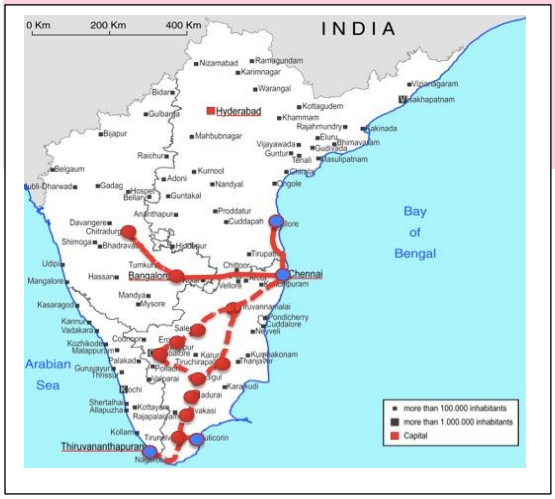


Pile Integrity Testing

Low Strain Impact Integrity Testing is a non-destructive pile testing method for integrity assessments of augered cast-in-place piles, drilled shafts or driven concrete or timber piles. If major defects exist, test results may be interpreted to estimate their magnitude and location. Test results may also be used to estimate pile length.

The Low Strain Test, also known as Pile Integrity Test (PIT), encompasses the Pulse Echo Method and the Transient Response Method. Tests by either method are normally performed after foundation installation and curing, and require minimal pile preparation. Because of their simplicity, speed of execution and relatively low cost, these integrity tests may be performed on 100% of the piles on a given a job site. In some cases piles in existing foundations can be tested.

The engineer hits the top of the foundation with a handheld hammer. The impact of the hammer generates a compressive stress wave in the pile or shaft, and an accelerometer placed on top monitors the motion associated with this wave. The stress wave propagates down the pile shaft and is reflected when it encounters either the toe or a non-uniformity of the shaft. These reflections cause a change in the acceleration signal measured on the pile top, which is picked up and processed by the Pile Integrity Tester (PIT) equipment and interpreted by an experienced engineer.
Depending on job conditions and requirements, the test by the Pulse Echo Method (using a non-instrumented handheld hammer) or by the Transient Response Method (an instrumented hammer is used).

Industrial Corridors

The proposal was made by Department for Promotion of Industry & Internal Trade (DPIIT). The project includes construction of various trunk infrastructure components for Krishnapatnam Industrial rea in Andhra Pradesh at an estimated cost of Rs. 2,139 Cr and Tumakuru Industrial area in Karnataka at an estimated cost of Rs. 1,702 Cr. Both the projects are part of Chennai Bengaluru Industrial Corridor (CBIC) and will form the backbone of multi modal connectivity infrastructure. The projects are expected to generate more than 1.85 Lakh direct and indirect job opportunities.
The cause of the explosion was later revealed to be the result of negligence and mismanagement by the Lebanese government. The ammonium nitrate had been stored in a warehouse at the port since 2014, and despite repeated warnings about the danger of storing such a large amount of explosive material in a densely populated area, no action was taken.

The Cabinet Committee on Economic Affairs chaired by Prime Minister Shri Narendra Modi has approved proposals of Department of Promotion of Industry & Internal Trade (DPIIT) for construction of various trunk infrastructure components for:

a. Krishnapatnam Industrial Area in Andhra Pradesh with an estimated cost of the project of Rs. 2,139.44 crore;
b. Tumakuru Industrial Area in Karnataka with an estimated cost of Rs. 1,701.81 crore;
c. Multi Modal Logistics Hub (MMLH) and Multi Modal Transport Hub (MMTH) at Greater Noida in Uttar Pradesh with an estimated cost of Rs. 3,883.80 crore.

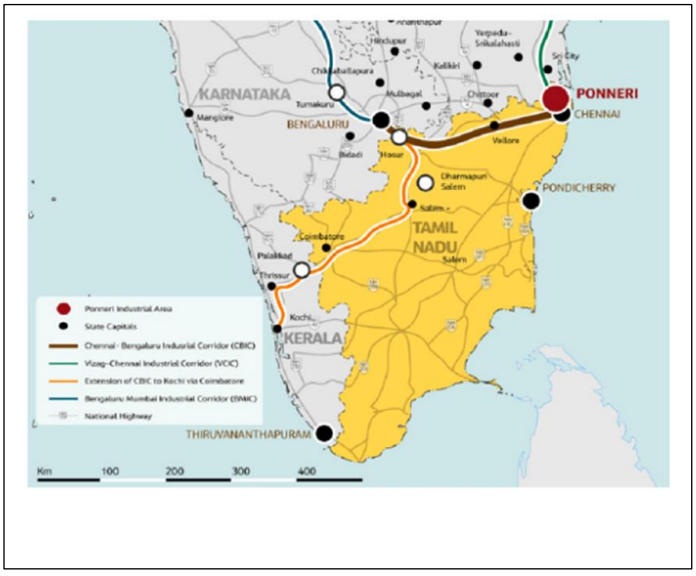
Envisioned on the backbone of major transportation corridors like Eastern & Western Dedicated Freight Corridors, Expressways and National Highways, proximity to ports, airports, etc., the objective of Industrial Corridor Programme is the creation of greenfield industrial cities with sustainable, 'plug n play', ICT enabled utilities to facilitate the manufacturing investments into the country by providing quality, reliable, sustainable and resilient infrastructure to industries. The developed land parcels in these cities will be ready for immediate allotment for attracting investments into manufacturing and positioning India as a strong player in the Global Value Chain. The Industrial Corridor Programme thrives to attain the objective of creation of an "*Atmanirbhar Bharat*" to drive the growth of industries and create greater avenues for investments across the country.

These projects have been planned on the backbone of multi modal connectivity infrastructure. Krishnapatnam Industrial Area in Andhra Pradesh and Tumakuru Industrial Area in Karnataka under Chennai Bengaluru Industrial Corridor (CBIC) have been approved to kick start the development in Chennai Bengaluru Industrial Corridor Project. These greenfield industrial cities will be self-sustained with world-class infrastructure, road and rail connectivity for freight movement to and from ports and logistic hubs along with reliable power and quality social infrastructure.

Multi Modal Logistics Hub (MMLH) & Multi Modal Transport Hub (MMTH) Projects at Greater Noida, U.P. are in close proximity to Eastern peripheral expressway, NH91, Noida- Greater Noida Expressway, Yamuna Expressway, Eastern & Western Dedicated Freight Corridors. Logistics Hub project will be developed as a world-class facility that will provide efficient storage/transitioning of goods to/from the Dedicated Freight Corridors (DFC) and offer a one-stop destination to freight companies and customers. The facility will not only provide standard container handling activities but also provide various value-added services to reduce logistics cost with improved efficiency of operations.

Multi Modal Transport Hub (MMTH) project located near the already existing Indian Railways station of Boraki will act as a transport hub with provisioning of Rail, Road and MRTS accessibility for the passengers in a seamless manner. MMTH will have space for Inter State Bus Terminal (ISBT), Local Bus Terminal (LBT), Metro, commercial, retail & hotel space and green open spaces. The project will provide world-class passenger movement facilities for the growing population of the catchment zone catering to upcoming developments in U.P. sub-region of the NCR and thus, decongest Delhi. The employment generation estimated is about 1,00,000 persons by 2040 for both these projects and will have a positive impact on the growth opportunities in the surrounding area.

These projects will generate ample employment opportunities through industrialisation. For Krishnapatnam node, estimated employment projection on completion of the first phase of development is likely to be around 98,000 persons of which about 58,000 persons are likely to be employed at the site. For Tumakuru node, employment of about 88,500 persons is estimated, out of which 17,700 persons will be from service industries such as retail, offices and other commercial opportunities in the initial development phase.



High Speed Rail Corridor

NHSRCL adopts aerial LiDAR Survey technique to conduct the ground survey for Delhi-Varanasi High Speed Rail Corridor.

National High Speed Rail Corporation Limited will be adopting Light Detection and Ranging Survey (LiDAR) technique using Laser enabled equipment mounted on a Helicopter for conducting ground survey for the preparation of Detailed Project Report for the proposed Delhi-Varanasi HSR corridor.

The alignment or ground survey is a crucial activity for any linear infrastructure project as the survey provides accurate details of areas around the alignment. This technique uses a combination of Laser data, GPS data, flight parameters and actual photographs to give accurate survey data. Based on the findings of the survey, designing of the vertical & horizontal alignment, structures, location of the stations and depots, Land requirement for the corridor, identification of project affected plots/structures, Right of Way etc are decided.

The aerial LiDAR survey technique, for the first time for any railway project in India, was adopted for the Mumbai- Ahmedabad High Speed Rail Corridor primarily because of its high accuracy. The ground survey using aerial LiDAR for MAHSR alignment was done only in 12 weeks against the 10-12 months if had been done through traditional survey methods.

Keeping in mind, the magnitude of the project and adhering to the timelines to submit the Detailed Project Report of DVHSR corridor, the ground survey using aerial LiDAR technique has already started. Reference points on the ground have already been marked and data collection through equipment mounted on a Helicopter will commence from 13th December 2020 (depending of the weather conditions) in a phased manner. The requisite permissions from the Ministry of Defence for flying the Helicopter have been received and the inspection of the aircraft and equipment are underway.

The proposed Delhi-Varanasi HSR alignment covers mixed terrains including densely populated urban and rural areas, Highways, Roads, Ghats, Rivers, Green fields etc, which makes this activity more challenging.

NHSRCL has been entrusted with the work for preparing Detailed Project Report for the Delhi-Varanasi HSR Corridor by the Ministry of Railways. The tentative length of the corridor is about 800 km, the alignment and stations will be decided in consultation with the government.

High Speed Rail work gathers momentum. With the start of LiDAR (Aerial Ground) Survey today, High Speed Rail work gathered momentum for Delhi - Varanasi High Speed Rail Corridor.

The LiDAR survey for Delhi-Varanasi High Speed Rail Corridor started today from Greater NOIDA where a Helicopter fitted with state of art Aerial LiDAR and Imagery sensors took the first flight and captured the data related to ground survey.

National High Speed Rail Corporation Limited is adopting Light Detection and Ranging Survey (LiDAR) technology which provides all the ground details and data in 3-4 months wherein this process normally takes 10-12 months.

The ground survey is a crucial activity for any linear infrastructure project as the survey provides accurate details of areas around the alignment. This technique uses a combination of Laser data, GPS data, flight parameters and actual photographs to give accurate survey data.

During the Aerial LiDAR survey, 300 mtrs (150 mtrs on either side) of area around the proposed alignment is being captured for the survey purpose. After the collection of data, Three Dimensional (3D) Topographical map of 50 mtrs corridor on either side of the proposed alignment on a scale of 1:2500 will be available for designing of the vertical & horizontal alignment, structures, location of the stations and depots, Land requirement for the corridor, identification of project affected plots/structures, Right of Way etc

As per the nine (9) standard benchmarks set by the Survey of India in this field, 86 master control points and 350 secondary control points have been established and these coordinates are being used for flying the aircraft on Delhi-Varanasi HSR corridor alignment.

To provide clear pictures of the structures, trees and other minute ground details,60 megapixel cameras are being used for the LiDAR survey.

NHSRCL has been entrusted to prepare the Detailed Project Reports for seven (7) High Speed Rail Corridors and LiDAR survey technique will be used for ground survey in all the corridors.

Additional details:

Detailed project report for Delhi Varanasi High Speed Rail Corridor has been submitted to Ministry of Railways on 29th October 2020. The proposed plan for DVHSR Corridor will connect the National Capital Territory (NCT) of Delhi with major cities like Mathura, Agra, Etawah, Lucknow, Raebareli, Prayagraj, Bhadohi, Varanasi and Ayodhya. The main corridor from Delhi to Varanasi (Approx. 800 km) will also be connected to Ayodhya. The High Speed Rail (HSR) route will also connect the upcoming international airport at Jewar in Gautam Buddha Nagar District of Uttar Pradesh.

World Bank Signs $500 Million Project to Develop Green, Resilient and Safe Highways in India

The Government of India and the World Bank today signed a $500 million project to build safe and green national highway corridors in the states of Rajasthan, Himachal Pradesh, Uttar Pradesh and Andhra Pradesh. The project will also enhance the capacity of the Ministry of Road Transport and Highways (MoRTH) in mainstreaming safety and green technologies.

The Green National Highways Corridors Project will support MoRTH construct 783 km of highways in various geographies by integrating safe and green technology designs such as local and marginal materials, industrial byproducts, and other bioengineering solutions. The project will help reduce GHG emissions in the construction and maintenance of highways.

Dr C S Mohapatra, Additional Secretary, Department of Economic Affairs, Ministry of Finance stated that the Government of India is committed to environmentally sustainable development in its infrastructure projects. This project will set new standards in the construction of safe motorable roads. The selected stretches in the states of Uttar Pradesh, Andhra Pradesh, Rajasthan and Himachal Pradesh will also help improve connectivity and promote economic development.

The agreement was signed by Dr Mohapatra on behalf of the Government of India and Ms SumilaGulyani, Acting Country Director, India on behalf of the World Bank.

The ultimate objective of transport infrastructure is to provide seamless connectivity and reduce logistics costs. The Government of India has launched many investment programs in road sector infrastructure to strengthen and improve logistics performance. This project will also support analytics to map the freight volume and movement pattern on the National Highway network, identify constraints, and provide innovative logistics solutions.

Historically, the transport sector in India has offered limited employment opportunities for women. The project will support the ministry with an in-depth analysis of gender-related issues in the transport sector along with help in creating jobs for women by training women-led micro enterprises and women collectives to implement green technologies in the highway corridors.

“Connectivity for economic growth and connectivity for sustainable development are two important aspects of a country’s development trajectory. This operation brings these two priorities together in support of India’s growth strategy,” said Mr Junaid Ahmad, World Bank Country Director in India. “This project will provide efficient transportation for road users in the four states, connect people with markets and services, promote efficient use of construction materials and water to reduce the depletion of scarce natural resources, and help lower GHG emissions,” he added.

The National Highways of India carry about 40 percent of road traffic. However, several sections of these highways have inadequate capacity, weak drainage structures and black spots prone to accidents. The project will strengthen and widen existing structures; construct new pavements, drainage facilities and bypasses; improve junctions; and introduce road safety features. It is imperative that the infrastructure investments are climate resilient. To this effect disaster risk assessment of about 5,000 km of the National Highway network will also be undertaken under the project along with support to ministry for mainstreaming climate resilience aspects in project design and implementation.

The $500 million loan from the International Bank for Reconstruction and Development (IBRD), has a maturity of 18.5 years including a grace period of five years.