



## MD's Corner

Dear Colleagues,

Recently Nagpur Metro and Pune Metro teams celebrated their 5th and 3rd Foundation Day respectively. Looking back, I draw immense satisfaction from the fact that in such a short span, in a time-bound manner, both the teams have done incredible job. Nagpur team completed 25 km (i.e. two-third of the entire project length) of metro line construction in record 50 months at the rate of 1 km every two months, while the Pune Metro created its milestone by reaching to trial run stage in record 30 months.

These are no mean achievements. But we have no time to rest on our Laurels. We have vowed to complete the Nagpur Metro Project in its entirety by December 2020 so that the services on the entire length can commence in early 2021. Likewise, we stand committed to making 2020 as the "Year of Metro Rail" for the citizens of Pune - Pimpri Chinchwad.

These are humongous responsibilities. But together we can. And we will. The onset of the monsoon season (when the work slows down a bit) is barely three months away. We must resolutely ensure that we take the best out of the busy work season of the next three months and are in readiness to progress even in the monsoon season. In the next three months, we must complete all the stations of Reach 1 (Orange Line) and Reach 3 (Aqua Line) at Nagpur while we must open the priority section of Pune Metro. These are the immediate tasks before us, and the way the entire team has performed so far, these are eminently achievable targets.

March also is momentous for team Maha-Metro for a singularly important reason - 8th March 2020 is the International Women's Day. And I take the opportunity to welcome Ms. Sujatha Jayaraj (Director Finance Chennai Metro Rail Corporation) as a new director on the board of Maha-Metro.

Also, I am happy to mention that both at Nagpur and Pune, Maha-Metro family celebrated the International Women's Day with the enthusiastic participation of all. I heartily congratulate all-female team members including spouses of Maha-Metro, on the eve of the auspicious occasion of the International Women's Day. Maha-Metro could not have reached where it stands today, without you all.

Wish you all a happy and a colorful holi!



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# SPECIAL FEATURE



## Pune Underground Metro Construction

A special feature of the construction of 33 km long two-line Metro Rail at Pune is its underground section. The 5 km stretch of Pune Metro that passes through the densest corridors of the city is underground as it was simply not possible to construct elevated metro in the area. This underground stretch is decidedly the most challenging part of the 16.56 Corridor-I (PCMC-Swargate) of Pune Metro rail project as it traverses through the most densely populated areas like Kasba Peth, Budhwar Peth and Mandai in the old city area.

## Challenges Galore

Apart from the construction of metro rail in the most congested areas, the underground section faced immense challenges, particularly in the realm of land-acquisition. But Maha-Metro team has been able to address these intractable challenges with the help and cooperation of dwellers, through adequate compensation and resettlement and with the help of government authorities.

## JV of Tata Projects India & Gulermak, Turkey - Contracting Partner

The work of construction of the underground section has been awarded to the joint venture of Tata Project Limited and the Turkish company Gulermak. The underground section has two packages and the JV has bagged contractual rights of both the packages at the combined value of Rs 2,283 crore with Package I of 2.5 km worth Rs 1,127 crore and Package II of 2.5 km worth Rs 1,156 crore.

## Stations Construction

Out of five stations, two are being constructed using innovative New Austrian Tunneling Method (NATM), also known as the Sequential Excavation Method (SEM) or Sprayed Concrete Lining method (SCL). Balance three stations are being constructed using conventional cut and cover method. The underground section is likely to be completed and put on a commercial operation in 2022.

# SPECIAL FEATURE

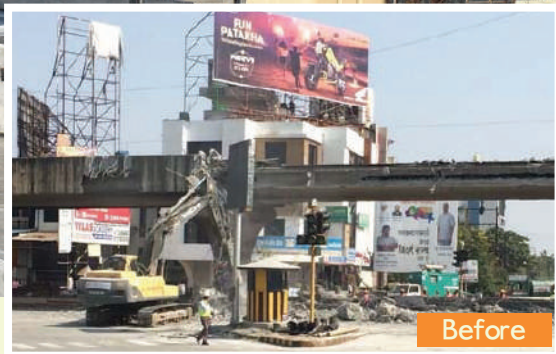
## Digging Deeper with Giant Tunnel Boring Machines



The twin tunnels are being constructed using three numbers of Tunnel Boring Machines (TBM) sourced from TERRATEC. These TBMs are of 6.61m diameter Earth Pressure Balance tunnel boring machines will have robust mixed-face dome-style cutter head designed to work effectively in the compact Basalt that is expected on these contracts at pressures of up to 4 bars, as the TBMs progress deeper they will install 14,00 mm wide by 275 mm thick pre-cast concrete lining rings inside the tunnel. These giant Tunnel Boring Machines will be eventually digging at an approximate depth of between 65-feet to 100-feet below the surface.

The TBM is of the length of about 279-feet, including back-up gantry. While their cutter head does the boring and machine moves ahead - they have multiple hands that simultaneously place C-shaped concrete sections throughout the tunnel. Two TBMs are already in operation and they have completed 1 km tunnelling from the Agricultural College side. The third TBM too has arrived on the site and is ready to roll on. Earlier Maha-Metro had planned to employ four TBMs on the work, but by innovatively re-engineering they have eliminated the need for the fourth TBM and in the process have also saved nearly Rs. 100 Crore.





Before

## Nagpur Metro Iconic Challenge - Creative Destruction of Chatrapati Flyover

Some innovations call for 'creative destruction.' One such situation arose during Nagpur Metro Construction. It was the demolition of the 15 year old overbridge, a lifeline of Nagpur.

This flyover was a part and parcel of Nagpurians' way of life. It eased moving towards the Airport, avoiding the traffic snarls below. Over the years citizens had developed a deep emotional bond with the huge inanimate structure of steel, cement and sand.

The flyover had to be removed to make way for the metro viaduct from Airport to Sitabuldi on Wardha Road.

When it was decided to demolish the flyover, the bigger challenge for Maha-Metro officials was not to pull the structure down but to innovatively convince citizens why such an action was needed, in the very first place. Truth is, demolishing the structure was rather easy but Maha-Metro decided to do it with the full consent and cooperation of citizens.

Maha-Metro innovatively secured involvement, concurrence and active participation of citizens to the demolition process. These included erection of information kiosk near Chatrapati Chowk for dissemination of correct and timely information, print and visual media, exhibition showing details of stations and flyover paintings with a model of double decker replacing it, erection of a wall at the site where citizens pledged support to "Maazi Metro - more than 7000 people did pledge the support, a Selfie competition and a video at site showing the film of Nagpur Metro and that of flyover demolition.

No work of creative destruction is normally done with such all-round support of citizens. This excruciatingly difficult demolition work was completed squarely in ten days against the Maha-Metro's internal target of 30 days.

A word on the type of structure that the flyover was located at Chhatrapati Square on National Highway 44, it was 450 m long with the North ramp of length 185 m and South ramp of length 165 m.

It consisted of 2500 cubic meters concrete structure and 14000 cubic meters of earth filling requiring dismantling of the structure carefully and disposing the debris properly to locations far away from the city.

Heavy equipment like rock breakers, diamond wire saw, jaw crushers and diamond floor saw were used for the demolition. Naturally, a key challenge was the traffic diversion for the routes in and around the square where bridge was located and team Maha-Metro worked seamlessly in tandem with the stakeholders like Traffic department, Fire department, NMC, PWD, police department and other departments for successful diversion of the traffic and shifting of all utilities along the flyover and for ensuring overall safety of the commuters.

A major challenge was taming the huge pollution arising from the dust and noise arising during demolition. The dust pollution was mitigated by using jet sprayers, foggers and sprinklers to avoid the formation of dust clouds. The noise was controlled by planning major activity of crushing the structures during the day and removing debris in the night ensuring least disturbance. The debris was cleared using heavy tippers in such a manner that they avoided the peak traffic and obviated traffic jams due to movement. Crushers were installed at the disposal site so that the concrete debris was broken down into fine particles to use them for recycling. The old flyover at Chhatrapati Nagar is now itched in the memory of Nagpurians but it has surely paved the way for construction of a brand new 3.5 km long, double-decker structure of which citizens will be proud of.

# MAHA METRO UPDATES

## Nagpur Metro celebrated the 5th foundation day on 18th February

The function held at the newly constructed headquarters of Maha-Metro at Nagpur witnessed wholehearted participation by one and all. In his keynote address, Dr. Brijesh Dixit, Managing Director lauded the team of Maha-Metro, General Consultants and Contractors for completing 25 km route (two-third of the total project length) in a record time of fifty months. He recalled how Nagpur Metro had commenced its journey from a single room at "Ravi Bhawan", then no one could have visualized that within five years citizens of Nagpur will have a world-class metro. He also exhorted the team to give its best, to complete the project in entirety by end of 2020.



## German Delegation Visits Nagpur Metro

In February, Nagpur metro welcomed a special nine-member delegation from Karlsruhe, Germany. The delegation was headed by Dr. Frank, The City Mayor took a ride on the metro systems from Sitabuldi interchange station to Airport Metro Station and back. The Mayor appreciated the view the metro offers through its large lookout window. He urged citizens to embrace metro rail in a big way to address the critical issues related to Climate Change. He praised all for planning, execution and timely completion of Nagpur Metro with special focus on making it the Greenest Metro.



## Nagpur Metro Receives the 19th Train Set

Nagpur Metro received the 19th train set from its metro coach supplier CRRC, Dalian China. With the arrival of the 19th trainset, Nagpur metro is fast inching towards having its full quota of 23 trains as envisaged on the project.

Once the 19th rake is put into operational services after mandatory checks, the metro rail services will be bolstered further easing the transportation woes of citizens.



# MAHA METRO UPDATES

## Metro Stations Getting Ready to Welcome Citizens at Pune - Pimpri Chinchwad

The work for priority section of Reach I between Sant Tukaram Station and Phugewadi section has entered the last lap with fast-paced completion of the two stations. Next month will witness the completion of Reach I priority section in all respect. It is worth noting that Pune Metro began its maiden test run in the first week of January.



## Construction Begins For Four Layer Transport System

In February, after getting last of the permissions (from Central Railway) construction of the unique four layered transport system began at Nagpur. This is country's first and only four-layered system has first layer as the surface road, while the second layer shall be the railway line, third layer for road and the top-most fourth layer will be metro rail. This unique system is the most challenging, complicated and complex part of Nagpur metro construction.

## Pune Metro Samvaad at Forbes Marshal

Pune Metro team conducted Samwad at Forbes Marshall Company, Kasarwadi. This Samwad was specifically designed for the kids of "Study Centre", the ones who could not get education on their own. Mr. Nitin Joshi, Jt. G M - Public Relations explained the plan and progress of the Pune Metro project and answered the queries of the children followed by an interesting quiz. Students of this Study Centre were drawn from 5th to 10th standard who study in the corporation school run by Forbes Marshall and NGO YOJAK. These institutions implement different activities apart from imparting free education to the children and much more.



## Social Media Engagement

### Citizens Love Maha Metro!

Social media engagement of Pune & Nagpur Metro far exceeds its other counterparts in the country. Pure testimony of 'Maazi Metro'



### NAGPUR METRO

Average acquisition of FB followers per month **9,522**

**5,42,797**

**8,436**

**3,83,000**

**9,089**



### PUNE METRO

Average acquisition of FB followers per month **14,147**

**5,23,441**

**8,836**

**7,85,000**

**17,200**