

महा मेट्रो

maha-metro CONNECT

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Anil Kumar, Executing Director, Nagpur

Hemant Sonawane, GM-PR, Pune

DESIGN

visionVIBES, Delhi

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MAHA-METRO CONNECT invites contributions from the Maha-Metro family for forthcoming issues. First three entries to be featured will receive a special consideration from the MD.

MD's Corner

Dear Reader,

It gives me immense pleasure to introduce MAHA-METRO CONNECT, the Monthly Bulletin of Maha-Metro (Maharashtra Metro Rail Corporation Limited). It comes a little late in the day because, Maha-Metro team since day zero has been perpetually in motion in crafting the big dream of Making Metro Rail at Nagpur and Pune and making the dream come true with laser focus attention and deep-rooted passion. We at Maha-Metro have a rare distinction (exceptions being DMRC in India and MTRC, Hong Kong in the world elsewhere), of having been given the responsibility to simultaneously plan and construct multi-city multi-location metro rail systems. Nagpur and Pune Metro together, both being developed by us, accounts for nearly 10% of total metro rail construction being carried out in the country. This responsibility will turn more humungous soon with likely addition of Metro Neo at Nashik, likely sanction of Thane Metro and eventual sanction of phase II of Nagpur and Pune Metro Rail.



Our dream journey took first baby-steps on 21st August 2014 with the sanction of two-line 38.2 km Nagpur Metro Rail Project and laying of its foundation stone by the Prime Minister on the same day. On 24th December 2016, the dream got bigger by laying of the foundation stone of two-line 33.645 km metro rail project at Pune by the Prime Minister. As we look back today, we can and we must derive satisfaction from the fact that despite challenges galore, the commercial operation of 13.5 km long section Orange Line at Nagpur (Khapri to Sitabuldi interchange station) was inaugurated by Prime Minister on 7th March, 2019 and in September 2019 another stretch of 11 km of Nagpur Aqua Line (Lokmanya Nagar to Sitabuldi interchange station) was certified fit for commercial operations by Commissioner Metro Rail Safety (CMRS), thereby making 24.5 km or "two third of the total project length", operational or certified to be operational in record time.

In true sense, 2019 was the year when Maha-Metro gave the gift of safe, secured, comfortable, convenient, affordable, inclusive and sustainable "Maazi Metro" to citizens of Nagpur. Likewise, 2020 is going to usher in an era at Pune, where Pune-kars will have their tryst with Metro Rail. The Pune Metro project is chugging along fast, to open the 12 km priority section in early 2020.

Maha-Metro is accredited and acclaimed for many innovations in project management. MAHA-METRO CONNECT is going to be Maha-Metro's medium to connect monthly with all internal and external stakeholders to apprise of all key developments.

On behalf of team Maha-Metro, I wish readers a very happy reading experience.

Dr. Brijesh Dixit

Journey so far...

NAGPUR METRO A Dream Comes True

Nagpur Metro Rail Project was sanctioned on 21st August, 2014 and its foundation stone laid by Prime Minister Shri Narendra Modi on the same day. The project comprises of two corridors (North-South & East-West, named Orange Line and Aqua Line respectively) with 38.2 km length, 38 stations and 2 coach maintenance depots.

The 13.5 km section of Orange Line (Khapri to Sitabuldi interchange station) was inaugurated by Prime Minister on 7th March, 2019. With the opening of 11 km of Aqua Line (Lokmanya Nagar to Sitabuldi interchange station) in September 2019, the operational network increases to 24.5 km thus "two-third of the total project length".

From 1st June, 2015, when the actual physical construction commenced, the project has created many benchmarks including reaching fastest to trial run in 27 months; opening of 13.5km of Orange Line in 44 months; certification for commercial operation of 11 km Aqua Line thus making two-third of line fit for operation in record 50 months. Nagpur Metro is also credited with being the "greenest metro" (with 65% of total energy needs met by solar power, 100% water recycling, 100% rain-water harvesting, bi-digesters at all stations). More than 50% revenue is expected to come from non fare-box revenue. Nagpur Metro, innovatively, amicably and with co-operation of the state government, local bodies and landowners acquired 100% land in record time.

So far the project has achieved 82.5% overall progress. The final two sections of Aqua and Orange Lines are scheduled to get ready by mid and end 2020 respectively. This is noteworthy given the extraordinary challenges faced through busy north-south railway lines at two locations with long spans near Nagpur station and the lines traversing through the most congested parts of the city.

PUNE METRO A Dream Coming True

Tryst of metro in Pune has not come any sooner in the day. Way back in 2001, M/s RITES in a report commissioned by Pune Municipal Corporation first mooted an MRTS network. The action on the report did not commence any time soon and in between the city looked at various other options like Sky Bus, tramways and BRT.

The journey of Pune Metro Rail in true sense began in 2008 with DMRC being called upon to prepare the project DPR. The project was approved by the state government in 2010 and central government in 2013. Despite approvals, the project could not start due to intense stakeholder scrutiny.

The issues and roadblocks were finally cleared only with the recommendations of a committee set up by Chief Minister of Maharashtra. Thereafter the Project DPR was updated in 2015, and the final sanction to the project was accorded in December 2016.

Punekars have patiently waited for two decades to get a rail-based fast, comfortable, safe, secured, inclusive environment-friendly and sustainable metro rail to end their commuting woes. Maha-Metro is committed to precisely give what the city needs and deserves. The opening of priority sector in next few months is just a beginning.

The project has total length of 33.645 km, out of which 28.345 km is elevated and remaining 5.3 km is underground. Not to be content on its laurels Maha-Metro team is fully geared to complete the entire elevated section by end of the year 2021 and full project by 2022.

Introducing Metro Neo



Maha-Metro participated in the 12th Urban Mobility India Conference and Expo in Lucknow from 15-17 November 2019. It presented the draft standard specifications of 'Metro Neo.' The standard specifications were made by a committee set up by Ministry of Housing and Urban Affairs, chaired by Dr. Brijesh Dixit. Metro Neo was appreciated as a low cost, effective, energy efficient solution for the urban transport needs of 2/3 tier cities to meet the urban transportation needs up to 15,000 PHPDT. Metro Neo originally conceived for Nashik is becoming a trend setter for 2/3 tier cities.

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Pune Metro Highlights



Arrival of First TBM for Pune Metro Rail Project



The underground section of 5.3 km section from Range Hill to Swargate will be constructed using Tunnel Boring Machines (TBM). The TBM has been manufactured by Terratec, China.

November witnessed the arrival of first TBM at Mumbai and the machine is on its way to Pune. The tunnel construction work using this TBM (part of four TBMs to be used) shall commence shortly.

New Aluminum Coaches for Pune Metro : Kick-off Meeting with Titagarh Wagons Limited



An Indian multinational Titagarh Limited has been awarded the contract for manufacturing and supplying 102 ultra-modern, light, low maintenance aluminium bodied, futuristic metro coaches. For the first time ever, such metro coaches will be manufactured in the country, as part of Make in India.

A kick-off meeting, chaired by Dr. Brijesh Dixit, was held on 31st Oct - 1st Nov at Pune with top management of Maha-Metro, Titagarh Wagon Ltd and Titagarh Firema, the latter will be manufacturing coaches first in Italy and then in India.

The subjects discussed were wide ranging including design and quality plan, production set-up, technology transfer, manufacturing in India and strategy for delivering on time, with quality.

Independent Safety Assessor Meet

Maha-Metro has appointed France based globally reputed agency M/s Bureau Veritas as Independent Safety Assessor (ISA) for independent safety assessment of various systems of the project at all stages. On 18th Nov 2019, kick-off meeting was held with ISA and other project stake holders. Interface & Coordination requirements were outlined during the meeting.

On Fast Track to Open Priority Section

The project team is moving fast with laser focused attention to make early 2020 the year of operationalization of 12 km of priority section of Pune Metro. After fast progress in construction of viaduct, more than 6.5 km of track has been laid and traction work too has made brisk progress. Soon the way Pune-kars move will get transformed with arrival of metro rail in the city.

Quality Control Week Celebrated with Enthusiasm

Quality on time is the hall mark of Maha-Metro in every aspect of the project. The annual Quality Control Week was celebrated with fervour in November to re-dedicate every employee to the quality in every aspect of their work at all times.

Appointment of 3 New Directors



ATUL GADGIL
Director (Project)

B Tech and M Tech in Civil from IIT Delhi

Has worked with Delhi and Jaipur Metro.

Previously ED in charge of the underground section at Pune



VINOD KUMAR AGARWAL
Director (Transport and Maintenance)

An officer with the Indian Rail Signal and Telecom Service

Previously ED S&T at Nagpur



RAMNATH SUBRAMANIAM
Director (Strategic Planning)

Management from XLRI, Jamshedpur Has worked with institutions like Goldman Sachs.

Previously ED Strategic Planning at Pune

Nagpur Metro Highlights



Annual appraisal by financing agencies



Financing Agencies of Maha-Metro, KfW-Germany and AFD-France carried out their joint annual appraisal mission of Maha-Metro. The funding agencies had meetings at Nagpur on 11-12th November and Pune on 13th November.

JP Nagar station becomes operational

Jaiprakash Nagar station on Orange Line became the latest station to be opened for commercial operation on 20th November 2019 after certification from Commissioner of Metro Rail Safety.

Bapu Kuti of Sewagram comes to Nagpur



Maha-Metro constructed a replica of 'Bapu Kuti in Sewagram' at Airport Metro Station in the memory of Mahatma Gandhi who gave the message of peace and non-violence. The replica depicts, Bapu spinning Khadi on a charkha and is turning into a big attraction.

Nod to run trains at 80kmph

The Railway Board gave permission to Maha-Metro to operate trains with a speed of 80 kmph on select stretches at Nagpur. The Research Design and Standards Organization (RDSO) had submitted a proposal to that effect to the Board. The Board cleared the proposal on 13th November 2019.

4 layer transport structure soon



National Highways Authority of India (NHAI) has given a nod to Nagpur Metro's proposal for constructing a 4-layer transport structure on Kamptee Road on 6th November 2019.

Vendor Development Programme

Chamber of Small Industries Association (COSIA) had organised 'Vendor Development Programme' on 9th November at VIA Hall, Udyog Bhavan. A presentation was given on various subjects by contractors and Metro officials.

Important Functionaries Visit Nagpur Metro

A 3-member team of Commissioner of Metro Rail Safety (CMRS) visited and inspected the Jaiprakash Nagar Station along with other metro stations and rolling stock facilities. The CMRS was on a two-day visit on 14-15 November 2019.

Principal Secretary to Govt. for Municipal Administration and Urban Development, Govt. of Telangana, HW Mayor, Greater Hyderabad Municipal Corporation along with various other officials, visited Nagpur Metro for an engineering study tour regarding Road Bridge cum Metro Corridor on 19th November 2019.



Maha-Metro trains to run at a speed of 80 kmph on select sections in Nagpur

SPECIAL FEATURE

Environment Sustenance Maha-Metro Way : Tree Transplantation

Maha-Metro is constructing the biggest metro rail system in country outside Delhi and Mumbai. But saving the green cover of Pune and Nagpur, with “zero tolerance” in tree cutting for the project is what differentiates Maha Metro with its other peers in the country. **The USP of the corporation in this regard, has been its unique Tree Transplantation Technique.**

Tree transplantation in Maha-Metro began in real earnest in its Nagpur Project but it took a quantum jump in Pune, where it was introduced from day zero. So far more than 1,700 trees have been saved by this technique of transplantation in Pune and Nagpur!

And it is just the beginning.

To put it simply, tree transplantation is the act of digging up, moving the tree from its original location and re-planting it to another location. At the face value what looks simple is an extremely delicate process best exemplified by the process of surgery where it is of paramount importance that the patient is diligently prepared to sustain not only the trauma of the surgery but is also kept healthy enough to survive the compulsory period of recuperation and problems if any that come during the process.

Tree transplantation by Maha-Metro is being carried out by adopting the arboriculture procedure. This technology and scientific method never been used by any of the Center and State Governments in India. It starts with canopy pruning, cutting very few branches of the tree. This is followed by root pruning, which ensures the reduction of roots without giving any shocks to it. The third step is root ball making whereas fourth procedure is root ball lifting and transit in which high engineering machineries and equipment are involved in making the safe and comfortable transit of the tree to the new location.

Equally important to the process is the Planting Hole at the re-plantation site which is dug and prepared much before the tree is to be transplanted there. By keeping the site ready in advance Maha-Metro invariably has ensured that no damage happens to the transplanted tree due to drying out.

Post-transplantation Maha-Metro has ensured adequate monitoring and maintenance of the trees. The track record of Maha-Metro in saving the transplanted trees has been credible so far.

The process of transportation of every single tree transplantation has often been a logistical challenge which has required taking elaborate safety precaution for all the possible hazards.

Maha-Metro has not reinvented tree-transplantation but by making it integral to the project has taken it to an unprecedented level in the country. And this is just one of its main innovations to ensure that the environmentally sustainable metro rail systems it creates are equally sensitive to environmental needs even during construction.



INNOVATION CORNER

Virtual Reality becomes a Reality in Maha-Metro Projects

MAHA-METRO TECHNOLOGICAL ADVANCEMENT TO HANDLE INFRASTRUCTURE PROJECTS USING 5D BIM & ERP



After successfully implementing 5D Building Information Modeling (BIM) for its project, Maha-Metro is now exploring 6D BIM or 6D Building Information Modeling mechanism for its project. 6D BIM, a term widely used in the infrastructure industry, refers to the intelligent linking of individual 3D components or assemblies with all aspects of project life-cycle management information.

As per Detail Project Report (DPR) of Maha-Metro Nagpur, overall O&M Expenses for 25-year period is around Rs. 14,491 crores. **Use of 6D BIM is expected to save a whopping Rs. 1,450 crores for Maha Metro over a period of 25 years!**

A typical lifecycle of metro project is for 50 years which includes 4 to 5 years on design and construction, and 40 to 45 years on operations and maintenance. When considering the whole life of metro, 80% of the total costs are involved in operations phase. Considering this point, Maha-Metro has started working during construction phase itself to capture all assets on digital platform to reap benefits during O&M phase.

Nagpur Metro is the first project in the country to implement the 5D BIM Project visualization. It is also the first to extend the resources to achieve another milestone of 6D BIM. With 6D BIM Maha-Metro, Nagpur has created a digital twin with an asset management

system. This way the organization has reduced the information loss which happens at project handover time.

Traditionally the complete handover between the project team and O&M team gets very little time. With this excellent approach, Maha-Metro has done a seamless handover on the digital platform. Final deliverables are 3D as-built models rather than the drawings, based on which the O&M team is able to plan the maintenance strategy and philosophy in advance.

To maintain the asset information, Maha-Metro has developed Asset Tag, where 3D component information has been linked such as product details, operation and maintenance manuals, product specifications etc. The same Asset Tag is being used for identifying the assets and to perform maintenance activities. Total number of assets are estimated around 5,00,000 covering Rolling Stock, MEP, Signaling, Telecom, OHE, Power Supply, Viaduct, Stations etc.

The transformative power of building information modeling is such that 10-17% savings are expected by implementing BIM in operations phase. Many infrastructure projects across the globe are using BIM, but only some of them are utilizing the full benefits of BIM. However, BIM has major benefits in operation phase. We are fortunate to be one of the projects where BIM is utilized for whole project life cycle.

visionvibes@gmail.com

SOCIAL MEDIA ENGAGEMENT

Citizens Love Maha Metro!

Social Media Engagement of Pune and Nagpur Metro far exceeds its other counterparts in the country. Pure testimony to Maazi Metro!

