

METRO CUBE



ADDING NEW DIMENSIONS

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MD SPEAKS

Ms. Ashwini Bhide, IAS

For a project like Metro -3, assessments of environmental impact is the most critical and mandatory step to initiate the project. The Environmental Impact Assessment was carried out in the year 2012 as per JICA guidelines with an emphasis on identification of environmental impacts on city-wide ecology including the water bodies, mangroves, urban forests, natural habitats for birds, flora and fauna, special breeding places etc. The decision of going underground itself was a significant step towards achieving environmental sustainability. Further, we carried out a detailed inventory of impacted trees due to stations, depot and ancillary structures to acquire and clear land for construction.

As per the tree survey conducted in 2016, 4255 trees at station locations were to be cut, out of which 1090 trees were retained by MMRC successfully with design optimization and revised planning.

A recent study shows 10% annual increase (300veh/day) in the private vehicles in Mumbai. With commissioning of Metro -3, there will be a reduction of about 6.6 lac vehicle trips per day, 2.94 lac litres/day in fuel consumption and CO2 emission at the rate of 6800 tonnes/day in year 2021.

Undoubtedly, green benefits of the project in a larger and longer perspectives are much more than the immediate environmental costs. An environment friendly public transit for Mumbai is the need of the hour which can contribute to significant saving in travel time, cost and fuel consumption with an enhanced quality of life, added effectivity at work places and homes.

I want to assure our readers and people of Mumbai that MMRC is sensitive to the environmental issues and we have taken all possible care to minimize the environmental impact.

MMRC intends to do re-plantation and transplantation of trees in a scientific way with a choice of native trees like Neem, Vad, Peepal, Tamarind etc. trying to achieve an ecological balance, duly protect the habitat for birds and further improve and protect biodiversity.



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KNOW YOUR STATION

Hutatma Chowk



Metro 3 will soon connect the heritage precinct of Flora Fountain with enhanced accessibility to the business centres, cultural destinations and public spaces.

Hutatma Chowk station is located in the busy financial district of South Mumbai, surrounded by heritage precinct of Flora Fountain. The fountain sits at the exact location where the Church Gate of the St. Thomas Cathedral once stood, along the Hornby Road of the Old Fort before its demolition in 1862. In order to serve the growing city and its aspirations the Hornby Road was widened into a broad avenue with commercial plots on its western side built in Neo Classical and Gothic Revival styles. The Hornby Road (Dadabhai Naoroji Road) links Churchgate, Flora Fountain, bazaar areas, the Victoria Terminus and the precincts are now part of the heritage and legacy of colonial architecture. The monument of Flora Fountain built in 1864 is a combination of architecture, water and sculpture depicting the Roman goddess of flowers, *Flora*. Hutatma Chowk derives its present name from an incident in 1960 when a peaceful demonstration by the Samyukta Maharashtra Samiti was fired upon by the police resulting in 105 deaths. The shooting proved to be a major impetus for the creation of Maharashtra on 1st of May, 1960.



INITIATIVE FOR SUSTAINABLE URBAN TRANSPORT

All major cities in the World, starting with London and Paris in the late 19th century, and coming into a climax of record metro construction projects spreading in India and other Asian countries in recent years, have as a major component of their transportation policies, to build or to expand metro networks. Governments, City Development Authorities, and international organizations such as the World Bank, the Asian Development Bank, the European Union, etc., have recognized that the overall benefits - environmental, social and economic, outweigh the temporal impacts that metro construction might bring to a city. A strong public reaction is received due to such temporal impacts however, it is important to see the broader vision and benefits to the city as a whole. The 10th Report of the Planning Commission, under Chapter 6.2 states: Rail based public transport, such as Metro systems are considered as part of basic amenities of civic life.

Traffic congestion, the resulting air pollution, and the longer travel hours are inevitable to Mumbai life. Indeed, the operation of Metro Line 3 will bring a significant improvement in people's mobility and in reduction of traffic loads. During construction, traffic diversion plans will be functional in the areas of all Metro work sites which will provide safe footpaths for pedestrians, access to emergency services as ambulance and fire brigade even during the construction.

MMRC has committed to incorporate a process of management and monitoring of all activities during the construction and operation phase of the project. The Environmental Management and Monitoring Plans delineate mitigation measures to minimize adverse impacts of noise, vibration, and air and water pollution. All contractors are obliged by their contract terms, to strictly comply with the environmental regulations of Government of India and Government of Maharashtra, as well as with International Guidelines and Standards. MMRC and their General Consultant MAPLE will check and audit these compliances throughout the construction period.

The timely commissioning of Mumbai Metro Line 3 will have positive impacts on mobility, quality of life and larger overall environmental benefits for this city with an efficient and clean transport system.



An everyday traffic congestion on D.N Road

Metro-3 transforms mobility scenario of Mumbai with a choice of sustainable public transport

MMRC's Green Initiatives

It is MMRC's policy to preserve as many trees as it is feasible, to transplant a large percentage of trees and overall, increase the green cover of the city by compensatory plantation of 3 trees planted for each tree that will be cut. Tree cutting will be carried on permission of MCGM garden authority. The transplantation sites are located in consultation with MCGM. New trees that will be planted through professional agencies, will be at least 10 feet high and of native variety.



*Dr Alexandros Bousoulengas
Environmental Expert, MAPLE*

Baseline Monitoring

Preconstruction baseline monitoring of air quality, and of noise levels has been conducted at several locations along the Metro -3 alignment. The Baseline results indicate that existing noise levels at all locations exceed the limits prescribed for residential areas as per Central Pollution Control Board Standards. Mitigation measures will be applied during construction so that noise levels will not exceed greatly the Baseline levels. Monitoring will be carried out to verify the effectiveness of mitigation measures.



TREE CUTTING

Concerns and Opportunities

Efficient public interface is the key to success for large infrastructure projects. Cutting of trees which are integral part of urban landscape of Mumbai is as sensitive to us as it is to people of Mumbai. We received several questions and reactions to tree cutting as the work is about to begin. This can be an immediate concern for people, however, a one needs to focus on the larger benefits. Here is our response to some representative concerns raised by people, on their issue at heart.

Why Construct a Metro at the cost of Environment? Trees are of great value to the city and will last another 100 years.

A rail based mass rapid transit system in a place like Mumbai where 75% population uses public transport is a big step to protect environmental losses in future. The current suburban rail system is already saturated and is insufficient to cater to the needs of growing population. In this scenario Metro -3 will become the second lifeline of Mumbai with enhanced productivity, increased family time and overall quality of socio-cultural environment. The project serves a larger public interest, environmental benefits and contributes to sustainable development in its own way. We fully understand citizens' concerns regarding green cover and we are committed to demonstrate our sensitivity through compensatory plantation in a professional manner.

What about the value of human lives? Shouldn't they be part of the equation?

Close to 70 lakh people travel daily in inhuman conditions in suburban trains in Mumbai; on an average 7 to 8 people die every day falling on track by overcrowding. It is Government's responsibility to provide better public transport and they are rendering it.

Majority of people using the trains will not be able to afford the Metro.

That is a misconception. Mumbai shows a consistent 5%-7% increase in private vehicles every year which leads to increase in travel cost, pollution, overall fuel consumption and the carbon footprint. Metro 3 connects six business centres which are not connected today by rail network. A huge number of car users will shift to this metro. We expect 15% to 20% reduction in suburban train commuters. Fair structure for the Metro will be affordable and definitely cheaper than other available modes of transport.

How do you justify cutting 5000 trees just for a Metro?

5000 trees are for a huge project worth Rs. 23,000 Cr, which will be implemented over 4 years and will serve the city for next 100 to 150 years. In a congested city like Mumbai trees need to be cut for various types of development including real estate development. However tree cutting for public transport project is justified since environmental benefits are larger than temporary loss on account of tree cutting. Mitigation measures like compensatory plantation and transplantation help substantially in reducing the losses due to tree cutting. Conflict of saving trees over construction of public transit infrastructure for a metropolis needs to be resolved with an informed decision to achieve a larger goal.

One can't build an eco-system in a day! All the trees being cut are minimum 30-40 years old and more. How is MMRC going to compensate for that? We have seen what has happened to the trees meant for JVLR and monorail plantation compensation. They are nowhere in sight!

Plantation done by MMRDA for other transport projects was not successful is a myth. MMRC is highly committed to carry out tree transplantation and re-plantation in the most professional manner involving local citizens groups, participatory organizations, NGOs and environmental experts.

MMRC, after completion of the project, will also plant trees in the vicinity where trees were cut. Plantation of grown up trees ensures the retention of green cover in a faster way.

MCGM Tree authority has given permission for tree cutting through a legal process. Wherever land is being made available in the local vicinity we will be planting and transplanting trees there.



PLATFORM SCREEN DOORS

Platform Screen Doors are used as barriers between the passenger waiting area and platform edge. These framed glass doors are used in many metro systems to prevent risk of passengers falling off from the platform to the tracks.

PSDs are either installed as a floor-to-ceiling barricade or just tall enough to prevent crossing over to the track.

Benefits:

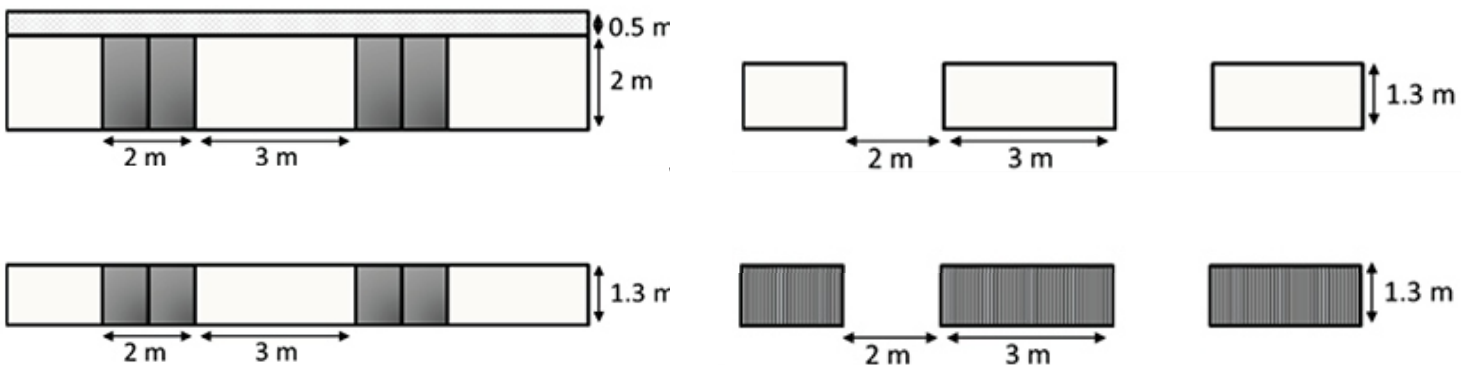
- Prevents accidental fall off the platform onto the track
- Prevent or reduce the pressure caused by the piston effect of train
- Improve ventilation and air conditioning within the station
- Helps in smooth boarding and alighting of passengers
- Helps improve the sound quality of announcements
- Restricts the access to the tracks and tunnels
- Increases energy efficiency & energy saving by reducing Environment Control System (ECS) load

Door Types

Although the terms are often used interchangeably, Platform Screen Doors are full height, total barriers between the station floor and ceiling and Platform Edge Doors are half height.



Two types of doors : Platform Screen Door and Platform Edge Door



Modules of the types of typical PSDs with their dimensions

The doors and the lower walls of the PSDs are of tempered glass and the upper walls of the PSDs are of sheet metal.

Source: Research article by Yoshiharu Soeta and Yong Hee Kim, *Effects of Platform Screen Doors on Sound Fields in Underground Stations*

Working Principle:

When a train is correctly stopped along the platform, the Signalling System sends opening and closing orders to PSD Control panel (PSC) kept in PSD room.

One Door Control Unit, controls and monitors each PSD according to opening and closing signals received from the PSD control cabinet. Obstacle detection devices are also used for stopping the closure of the PSDs, to prevent passenger injury.

Platform screen doors in Indian Metro Projects:

PSDs are used in underground Delhi Airport Metro Line 7 & 8 and Chennai.

Adoption of driverless system of operation for Mumbai Metro Line 3 Project, mandates provision for Platform Screen Doors (PSD) both for underground as well as at-grade sections to ensure the safety of passengers.

Cost benefits of PSD

It helps in increasing energy efficiency & Energy Saving by reducing Environment Control System (ECS) load. This can result in up to 40% energy savings for environmental control systems.



WORKSHOP ON NATM

Workshop on New Austrian Tunnel Method (NATM tunnelling) was conducted on 31st January 2017 at MCA in Bandra Kurla Complex (BKC). The workshop focused on variety of tunnelling and excavation methods for Metro 3, that is being designed and constructed as a complete underground metro with 27 stations with NATM technology.

More than 150 participants joined in for the workshop representing MMRC, civil works contractors, designers, suppliers and manufacturers including staff from the General Consultant.

The objective of the workshop was to achieve a better understanding on how to implement the use of NATM for excavation works at stations, tunnels, cross passages and the cross overs for the trains. Special focus throughout presentation was on minimizing construction risks and to improve overall safety and quality for the MML-3 project. Furthermore, the workshop aimed at networking and knowledge sharing among participants.

MMRC and Gc experts at NATM workshop



The NATM construction method is executed by drill & blast techniques using explosives or by mechanical methods as hydraulic hammer or road header machines. The selection of preferred method depends on a variety of parameters i.e. geology, tunnel geometry, structural support and design. The construction method requires implementation of a very efficient risk management system to handle mitigation measures avoiding any major incidents and accidents during excavation. Three presentations had focus on monitoring and survey of existing building settlements, vibration, noise, dust, air pollution including strengthening and protection of existing heritage buildings. It was concluded that, experienced geotechnical engineers, designers and contractors will be needed on site during the whole construction phase to take care of all NATM works for a successful completion.



TUNNELING CONFERENCE

The Tunneling Asia 2017 International Conference was organized by Tunneling Association of India, Central Board of Irrigation and Power in association with MMRC, DMRC and Indian Concrete Institute under the aegis of International Tunneling and Underground Space Association on 9th-10th February 2017 in Mumbai.

Ms. Ashwini Bhide, MD, MMRC addressed that "urban tunneling in the areas like Mumbai is full of challenges. It is necessary to learn from those who have already dealt with such challenges and this conference is great opportunity to learn. MMRC will embark upon huge tunneling activity in upcoming year". Mr. S. K. Gupta, Director (Projects), MMRC deliberated on station construction methodology, NATM activities, geology and various challenges in Metro-3 project.

MMRC conferred upon Emerging Company in Tunneling Arena award by TAI. Ms. Ashwini Bhide accepted the award at the hands of Mr. Mangu Singh MD, DMRC on the occasion.



A workshop on "Tunnel Design and construction: Issues and Challenges" was organized on 7-8th February 2017 where about 300 professionals from agencies like Metro, hydro-power, highway, railways, and other consultants, academicians and contractors participated.



INTERVIEW WITH GOD

Me: God, You are looking sad today...!! What happened?

God: You are true, My son. I am sad.... Because people actually do not want Me to be with them all the time. They prefer that I should remain confined to the temples/churches/mosques etc. They forget where I actually do reside.

Me: But where do you reside?

God: People want Me to remain away from them except in morning & evening times. Probably....so that I cannot see their wrong doings during the day.....!!

Me: Couldn't understand? Any definite address of yours?

God: One certain place where I always reside is people's "HEART" provided it is plain & pure like that of newly born child with no dust accumulation of worldly impressions.

Me: Why do people build temple / church / mosque etc. when you live in their hearts?

God: They want to spend few minutes remembering Me in morning (& sometimes in evening) ... that too not actually remembering ... but only begging favors and protection from fears.

Me: Thereafter ?

God: Thereafter they think as if they have got the permit to commit any offence throughout the day ... to be compensated by so-called prayer next day morning (as if I feel more happy if I get donation)?

Me: OK. But God-if someone sincerely desires to see You, how can he do that?

God: You can't 'SEE' Me but can always 'FEEL' Me & My presence. Love Me as you love your kids (& not in plastic manner) you can certainly feel Me !!

Me: What pains you about 'human being' in today's world?

God: I love people but people don't love Me. They only 'WORSHIP' Me ... that too in temple etc. & thereafter forget Me. My situation is like that of old parents who love their kids always..... but kids (after growing up /getting married) rarely reciprocate& parents keep waiting & waiting.... This pains Me as I can't stop loving people and keep helplessly watching them.

Me: Why people fight over religion?

God: They don't understand 'SPIRITUALITY'; they understand only "RELIGION". In fact Spirituality starts where Religion ends...!! Spirituality is 'one' , Religions are 'many'.

Me: Ok God-see you for the time being..!

God: Let's see when you come again to see Me but My doors are always open for anyone & everyone... & all the time. Remember it!!

R.K.Sharma, IRSEE
Executive Director/Elect,
Mumbai Metro Rail Corporation



PROJECT UPDATES

MML3 All (7) Packages Status Summary		
No.	Description	Status as of Feb 2017
1	Secant Pile (Retaining Structure for all Packages Stations) Scope - 20,800 Nos	396 Nos
2	Major equipment deployed on site	
	Secant Boring Pile Rig	15 Nos
	Soil Investigation Machine	40 Nos
	Batching Plant	3 Nos
	Excavator	12 Nos
	Trucks	11Nos
	Mobile crane	5 Nos
	Generator	38 Nos
	Gantry	1Nos
	Boiler (Steam Curing)	Nil
3	Manpower on site (weekly average) - Technical Site Staff +Skilled + Unskilled Labours	1714 Nos



Secant Piling in CST



Secant Piling at Vidyanaigari Station



Piling at Cuffe Parade



MMRC SIGNS MOU WITH TATA Power Supply To Metro-3 Project

MMRC has signed the MoU with Tata Power Ltd for availing the dedicated HT power supply for Metro-3 project. Executive Director (electrical), Mr. R. K. Sharma on behalf of MMRC and Mr. Ashok Sethi, Executive Director of Tata Powers signed MoU.

Power supply is a crucial component in Underground Metro. Reliable and robust power supply is very important for uninterrupted service of metro.

MMRC will require 110 kV power from Sept 2019 for traction load of 8 coach metro and various other applications including tunnel ventilation and environment control system, firefighting, Air conditioning, Platform Screen door, Signal and Telecommunication, lifts and escalators and car depot.

MMRC has planned its Receiving Sub Stations at Science Museum, Dharavi and Aarey for ensuring uninterrupted power supply for metro service. Power demand of MMRC for year 2019-20 will be 90 mV. The demand of power will be increased with increase in the ridership. Tata power will avail the power to MMRC with tariff of Rs.5.82 per unit for year 2019.

Ms. Ashwini Bhide, MD, MMRC, Mr. S. K. Gupta, Director (Projects), Mr. A. A. Bhatt, Director (Systems), Mr. R. Ramana, Executive Director (Planning) and senior officers of MMRC were present on the occasion.



ED, (Elect), Mr. R. K. Sharma and ED, Tata Power Co. Ltd, Mr. Ashok Sethi signing the MoU. in the presence of Md, MMRC Ms. Ashwini Bhide and other senior officials of MMRC.

KALAGHODA FESTIVAL Metro-3 Model Installation

A model of Metro-3, conceptualised by Mumbai Underground - a group supporting Metro-3 project was displayed at Kalaghoda Festival held during 5th to 12th February at Kalaghoda, to make the Mumbaikars aware of their underground Metro.

The impressive model of metro-3 surrounded by information panels became the popular selfie point at Kalaghoda.



PRE-BID MEETING Traction and Power Supply

Pre-qualification process for Package 11A and 11B for traction and power supply was completed recently duly complying with JICA norms of international bidding process and MMRC received encouraging response from prospective bidders.

Package 11A - The pre-bid meeting was attended by bidders namely Consortium of ALSTOM TRANSPORT INDIA LIMITED and ALSTOM TRANSPORT S.A., Cobra Instalaciones y Servicios, S.A, & T-FURRER+FREY CONSORTIUM and Consortium of Siemens Ltd., India and Siemens AG, Germany.

Package 11B - The pre-bid meeting was attended by bidders namely TATA Projects Ltd, Larsen & Toubro Limited, Isolux Ingenieria S.A. and Consortium of Siemens Ltd., India and Siemens AG, Germany.

The pre-bid meeting was organized to clarify the issues on the bid documents to facilitate the bidders for applying correctly in a competitive bidding process.

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