



METRO CUBE

ADDING A NEW DIMENSION

A Mumbai Metro Rail Corporation Newsletter

Volume no.2



MD SPEAKS

The Corporation has taken another big step towards implementation of the Colaba-Bandra-SEEPZ Metro-3 project as the civil works contracts were awarded for the entire 33.5 km. divided into 7 contract packages. The bid process for selection of contractors taken up in October 2014 as per JICA's procurement process has concluded with selection of the 5 consortia of companies for 7 packages.

Timely completion of civil works can only be ensured when the land required is made available. It gives me great pleasure to communicate that more than 90% government land has been handed over or is in the process of transfer. As far as the private land is concerned, acquisition through negotiation is in progress. The contractors have begun barricading construction sites and actual construction with necessary approval.

Traffic diversion is an area of concern and will be handled sensitively. The traffic consultants appointed by the contractors will study traffic loads, available capacities and will prepare an effective diversion plan that will be meticulously managed.

The contractors are holding a series of consultations with the traffic police. Large number of traffic marshals will also be deployed to assist the traffic police. On completion the project has immense benefits for generations to come. However, this calls for bearing little inconvenience by current generation. We at MMRC are confident that the citizens of Mumbai will cooperate in making the dream of Mumbai Metro a reality.

Ms. Ashwini Bhide (IAS)
Managing Director
MMRCL

Metro Get Set Go...

The preamble to the construction of the 33.5-km long Colaba-Bandra-SEEPZ Metro-3 corridor is over with Mumbai Metro Rail Corporation (MMRC) awarding civil contracts worth over Rs.18,000/- crore. The contracts have been bagged by major domestic construction companies in joint venture with international firms. Pre-qualification process for the systems contracts for rolling stock, traction & electrical systems, signaling, tunnel ventilation & environmental control, power supply & substations and lifts & escalators have been initiated. Final bids will be invited from the short-listed companies. The project would require a total of 78.67 Ha of land, of which 75.22 Ha is government land and 3.45 Ha is private land. 80% of this land is required temporarily for 4 to 5 years and will be reinstated appropriately. The state government has already handed over 64 ha land to MMRC and the rest of the land is to be received from MCGM for which the process is in progress.



Geotechnical profiling for Metro-3

Rehabilitation and Resettlement process of project affected families has begun with 148 families from Bandra-Kurla Complex station been shifted to Kurla West, the process of shifting police employees to buildings in Chakala is in progress. The MMRC conducted computerized lottery system to ensure transparency in the allotments. The affected families were given letters of allotment with barcode, their scanned photograph and digital signatures. In all 2000 affected families will be rehabilitated. This will exclude PAP's from Girguam and Kalbadevi, where plans for in-situ rehabilitation have been submitted to State Government for its concurrence. The numbers would reduce substantially due to optimization of station designs.

The Tunnel Boring Machines (TBMs) will work about 17-20 m below the ground and station work will also be carried out simultaneously. Utilities like water supply, sewage, solid water disposal, communication, and power cables are not likely to be affected by TBM work as they will be either diverted or supported with ducts within station box area.

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Supreme Court Eases The Process Of Metro Rail Project Implementation

Various State governments, that intend to implement Metro Rail Corridors and or Dedicated Freight Corridors, had a sigh of relief as the Supreme Court recently ruled that these corridors do not require environment clearances from the Ministry of Environment and Forest (MoEF). The division bench of Chief Justice T.C.Thakur and Justice A.M.Khanwilkar opined while hearing pleas filed by Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) against the order passed by the National Green Tribunal that all such projects require environment clearances. The Supreme Court also agreed with Attorney General Mukul Rohatgi who argued that Metro Rail Corridors and Dedicated Freight Corridors help reducing pollution and reduce dependence on cars and trucks for travel and transportation of goods.

Hence, forcing environment clearances for such environment friendly projects would tantamount to waste of time. Rohatgi further argued that polluting industries should be asked to get environment clearances and not those which help in reducing pollution. The Supreme Court, in turn, stayed the order passed by the National Green Tribunal making environment clearances a must for Metro and Dedicated Freight Corridors.

This order of Supreme Court would help new metro projects or expansion of the existing ones that are currently being implemented in several cities including Delhi, Lucknow, Mumbai, Ahmedabad, Kolkata, Nagpur, Chennai, Bengaluru, Hyderabad etc.

Metro Get Set Go...

Traffic diversion in the work zones of 26 stations and the TBM work area will be planned scientifically by addressing peak period traffic requirements and providing additional traffic marshal to assist the traffic police. At critical locations no parking restrictions will be imposed. The office of Joint Commissioner of Police (Traffic) is actively working on the schedule proposal by civil contractors.

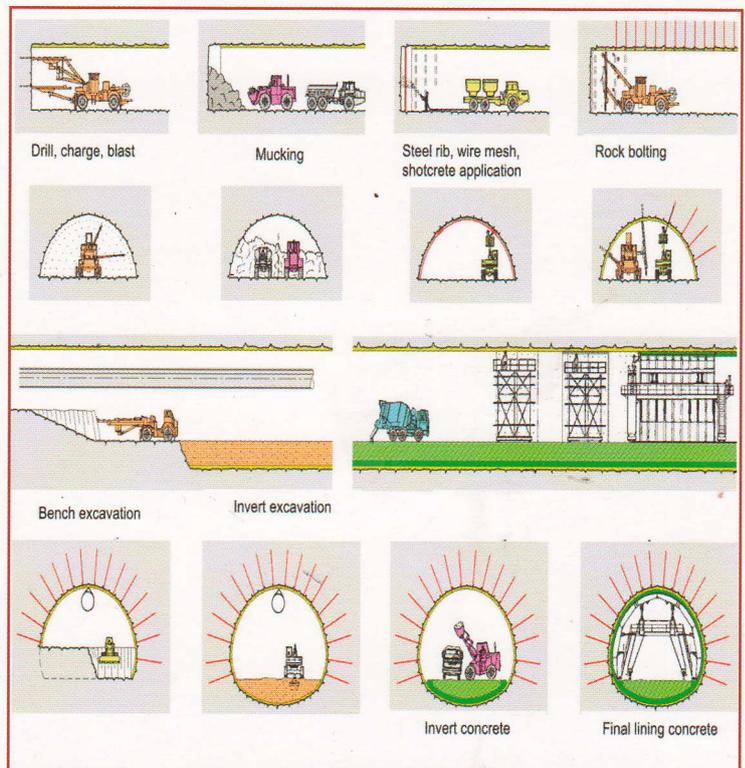
The city will start experiencing the impact of simultaneous construction activities and will take time to settle. During this period citizens are requested to co-operate by actively participating in the stake holder's consultation and making positive suggestions.

Pathbreaker

The Mumbai Metro Rail Corporation (MMRC) is using the New Austrian Tunneling Method (NATM) to carry out tunneling on Hutatma Chowk, Kalbadevi, Girgaon, Grant Road, Shitladevi Temple, Santacruz and Marol Naka stations. NATM is a conventional mode of tunnel excavation and is also known as sequential excavation method. It was first used by Mr. Rabcewicz in 1962 in Austria.

The fundamental difference between this new method of tunnelling, as opposed to earlier methods, comes from the economic advantages made available by taking advantage of the inherent geological strength available in the surrounding rock mass to stabilize the tunnel.

NATM technology involves tunneling through mechanical excavation or controlled blasting. In this method, initially the earth is excavated and a primary lining of concrete, steel/ lattice girders, wire mesh and rock bolts are applied for stabilization of soil as per geological strata. M-25 spray concrete is being used in the process. Later, a final concrete lining using M-40 grade of concrete will be done which is 400 mm in depth. Every movement of the surface during excavation is measured using sophisticated instruments such as inclinometer, extensometer, load cell etc.



NATM Work Process

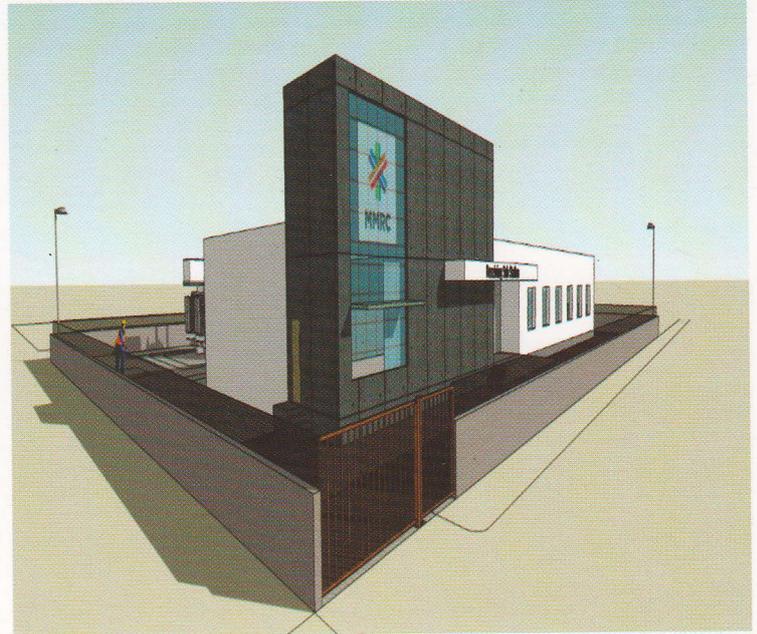
The NATM integrates the principles of the behavior of rock masses under load and monitoring the performance of underground construction during construction. It is an economical technique. The NATM has often been referred to as a "design as you go" approach, by providing an optimized support, based on monitored ground conditions. It is not a set of specific excavation and support techniques.

Stations on Mumbai Metro-3 will meet the strictest criteria for sustainable design. Being underground the stations will combine advanced technology with building practices that respect our local heritage and cultural traditions.

Metro-3 is a highly complex project, since Mumbai is a densely populated metropolis. The construction methods used for building tunnels and stations are chosen considering the lowest impact to the surrounding area and the fastest construction time.

Power To Metro

Unlike commercial/industrial sector, requirement of traction power supply for rail/ Metro Rail Transit System (MRTS) has its typical uniqueness. Traction supply has basic features of dynamically fluctuating load (varying with the movement of trains), reliability of supply & system's robustness to contain voltage unbalances. Mumbai Metro Rail Corporation (MMRC) spans over length of around 34 km covering 27 stations and a Car depot /Control Centre. It has been planned to avail EHV power supply at 110 kV voltage level from DISCOM at three different locations distributed along the length of alignment. Receiving Substations (RSS) consisting of Traction Substations (TSS) and Auxiliary Main Substations (AMS) will be located at these three locations namely Science museum, Dharavi & Aarey. The system is being designed for ultimate ridership of 72000 phpd with exigency features. In the inception year in 2020, total power requirement of MMRC will be around 90 MVA.

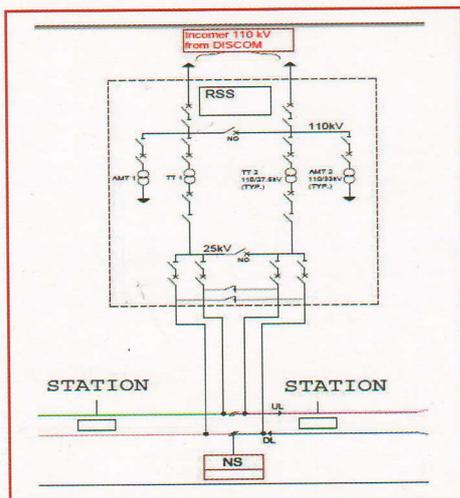


A Concept 3D model of MMRC's Green Building RSS

To describe the supply scheme, the RSS feeds power to the Rigid OCS system in tunnel at 25 kV, 50 Hz, single phase AC, through Traction Substations (TSS). Each RSS also feeds power for station lighting/air-conditioning /signalling/tunnel ventilation/other general loads through an Auxiliary Main Substation(AMS) via a robust double 33 kV cable network and Auxiliary Substations (ASS) which are located at each underground / Grade station. The power thus received at ASS is further distributed to the auxiliary loads of the stations through L V distribution system.

Following key items of Energy saving and Environmental friendly features are planned for RSSs

1. Captive power generation through Off Grid Roof Mounted Solar Panel
2. Use of Smart lighting with sensors and LED Lighting
3. Smart air-conditioning of Control room.
4. Conserving water through Rain Water Harvesting
5. Developing green patches & landscaping by Architectural design
6. Secured Access Entry



Simplified Scheme of Receiving Substation (RSS)

Special Green Features of MMRC's Substations: Each RSS will be constructed in a compact area of 2200 Sq.m by using GIS technology. Use of new GIS system gives space saving of around 60 % viz a viz conventional system. Apart from this, MMRC envisages to construct its Receiving Substations on Green Building Concept.

Employee Contribution

वर्किंग वीमेन पर कवी के कलम से

मिट्टी के शहजादों को लौह परी चाहिए
देखने सुनने में मदभरी चाहिए,
घर बाहर के कामों में कड़ी चाहिए,
मिट्टी के शहजादों को लौह परी चाहिए

एक ही पल में वो बचपने को छोड़ के,
हर जरूरत का खयाल हर एक की रखे,
वक्त पड़े तो माँ ,बहन,देवी भी हो सके,
उम्र में हो छोटी पर 'बड़ी' चाहिए,
मिट्टी के शहजादों को लौह परी चाहिए

घर के कोने-कोने को संभाल कर रखे,
बाहर के कामों में भी वो कमाल कर सके,
मुसीबतों में हो सके तो ढाल बन सके,
हर एक चुनौतियों में वो खरी चाहिए,
मिट्टी के शहजादों को लौह परी चाहिए

फाइव स्टार जैसा खाना बना सके
घर का इंटीरियर भी चटकियों में सजा सके
उसपे ये भी है कि वो पैसे बचा सके,
चाँदनी में धूप सुनहरी चाहिए,
मिट्टी के शहजादों को लौह परी चाहिए

लुक्स में हो स्मार्ट ऐजुकेशन भी हाई हो,
नौकरी करे और मोटी कमाई हो,
घर में आके काम में जुटी सी बाई हो,
उस पे मुस्कुराती हर घड़ी चाहिए,
मिट्टी के शहजादों को लौह परी चाहिए

श्री एस के गुप्ता
निदेशक (प्रकल्प)
एम एम आर सी

Metro Rail Goes Beyond 'Colaba' After 86 Years!

Colaba - the name comes from Kolabhat, a word in the language of Kolis, the indigenous inhabitants of the islands, before the arrival of Portuguese. Colaba lying on Mumbai's southernmost tip is compact, walkable and lined with cafes, restaurants, boutiques and bars. Shopping in Colaba caters to every budget, style and taste. Dotted with an undeniable British order about it and the ultimate reminder of the Raj is the Gateway of India built to commemorate the 1911 royal visit of King George V. The southern tip is occupied by Western Naval Command, and in its midst lies the Tata Institute of Fundamental Research, one of India's premium scientific institutions. The Sassoon Dock built in 1875 is Mumbai's first commercial wet dock and is the wholesale fish market catering to smaller fish markets. In a stark contrast to this is Cuffe Parade one of Mumbai's most expensive residential & commercial areas including The World Trade Centre and Hotel Taj:



It is ironic that Colaba is not connected by rail network despite being important place and commuters have to get off at Chhatrapati Shivaji Terminus or Churchgate to take a taxi or a bus to reach Colaba. The BEST headquarter is located in Colaba. The erstwhile Bombay, Baroda and Central India Railway (BB&CI) Railway established the Colaba Terminus, the first suburban railway in India between Virar and Colaba way back in 1867. However, the Churchgate-Colaba section was closed in 1930 for rail operation. Mumbai Metro Rail Corporation (MMRC) takes pride in mentioning that Colaba-Bandra-SEEPZ Metro-3 corridor would restore 'Colaba' back on the rail map after a gap of 86 long years. The Corridor will link Colaba to other parts of the city with interchange points facilitating connectivity between Suburban Rails, Best Depots, Metro-1 and Monorail. In addition, Metro-3 will connect Colaba to domestic as well as international airports.

News @ MMRC

MMRC Issues Letter Of Acceptance & Signs Contract Agreement With Civil Contractors



High Power Committee Meeting To Review Progress Achieved

A high power committee, chaired by Chief Secretary of State Mr. Swadheen Kshatriya, was attended by senior officials of MMRC and a thorough presentation on the project status was made by Ms. Ashwini Bhide, MD, MMRC. A short film on the project was also showcased to the committee. The Chief Secretary appreciated the efforts that are being taken by The Managing Director and her team to put the project on fast track.

MMRC And Civil Contractors Debate For Best TBM



The tunnels are key to the fully underground Colaba-Bandra-SEEPZ Metro-3 corridor which necessitated a workshop on Tunnel Boring Machines (TBM) which platform was used by all the five contractors to make very detailed and concentrated presentation. The presentations were based on their initial investigation of geotechnical profiling, water table mapping, soil quality, building condition surveys. These are the parameters for contractors to decide which TBMs to be used for which area. The contractors also reviewed the challenges they faced while constructing other metros and the steps taken to preempt the same for the Metro-3 corridor. The manufacturers of TBMs also attended the workshop where they interacted and provided detailed information on various types of TBMs and resolved queries from the contractors.

For More Information on MMRCL Website - www.mmrc.com
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Overwhelming response to pre - qualification bid for Tunnel Ventilation & Station Air Conditioning

The Mumbai Metro Rail Corporation received overwhelming response from reputed companies for Tunnel Ventilation and Station Air Conditioning including environment control system which followed JICA norms. The entire work shall be divided into 3 contract packages. The companies that submitted the bids were M/s. ETA Engineering Pvt. Ltd., M/s. Bluestar & C Doctor consortium, M/s. Voltas & STEC Ltd, M/s. Sterling & Wilson Pvt. Ltd & GYT consortium and M/s. Isolux Inglenieria SA.

The bid evaluation is expected to be completed in 60 days which will be followed by tender submission by short listed firms.

Homes To 363 Project Effected Families From Mahim



Mumbai Metro Rail Corporation (MMRC) completed the allotment of tenements by a computerized lottery system for the 363 families from Naya Nagar, Mahim. Out of 363 affected people, 330 are residential, 19 are commercial, 13 are residential-cum-commercial and 1 other. The 330 residential and 13 residential-cum-commercial units have been shifted to Kurla Premier area in Kurla (West) and the 19 commercial units have been shifted to Gautam Nagar in Govandi. The Naya Nagar Land will be used for TBM launching shaft.

MMRC has developed a internet based Rehabilitation and Resettlement (R&R) portal through which online lottery was conducted and tenements were allocated. The portal also provides SMS service to keep the PAPs informed of the allocation – making sure the PAPs aren't required to run from pillar to post. The Corporation will carry out entire resettlement and rehabilitation related work through the portal. The project involves resettling 2,807 units of which 1,866 are residential, 795 are commercial, 39 are residential-cum-commercial and 107 are others.