



MMRC

ADDING NEW DIMENSIONS

METRO CUBE

A MUMBAI METRO RAIL CORPORATION NEWSLETTER



Mr. Katsuo Matsumoto, Chief Representative of JICA India & Mr. Yoshiki Ehara, representative of JICA visited Metro-3 site

MD Speaks

Ms. Ashwini Bhide, IAS

This year the Mumbai region seems to be blessed with good monsoon. Notwithstanding the disruptive rainy spells of Mumbai, team Metro-3 is putting its best foot forward. Award of Rolling Stock tender is the pinnacle of activities of this year. Alstom Transport India together with Alstom Transport S.A France made the successful bid for 31 trains of 8 cars equipped with driverless technology, smart temperature & display control, safety features like CCTVs & help points. The trains will be manufactured in India under Make in India Policy. These trains will operate on 25 kV AC traction and would be enabled with energy efficient with regenerative braking system. As regards remaining systems works, bid process of Electrical and Mechanical works of depot received good response from 5 reputed firms/JVs.

The cumulative tunneling by the 8 operating TBMs has crossed 6.00 km landmark. This would not have been possible without the support and cooperation of Mumbaikars; especially the residents in vicinity of construction sites. In the meantime, 9th TBM in sequence; Krishna-3, of Package 4 commenced its initial drive at Siddhivinayak launching shaft that was attended by Shri D. K. Sharma, GM, Central Railway.

Besides the tunneling, construction of underground stations is continuing in full swing. Base slab of Sahar Road and BKC underground stations comprising of 1250 m³ and 1050 m³ respectively have been completed successfully as planned. While these are only beginning of many more such works, uninterrupted execution of these works in monsoon period has given a good encouragement to the Team Metro-3; MMRC, GC and Contractors.

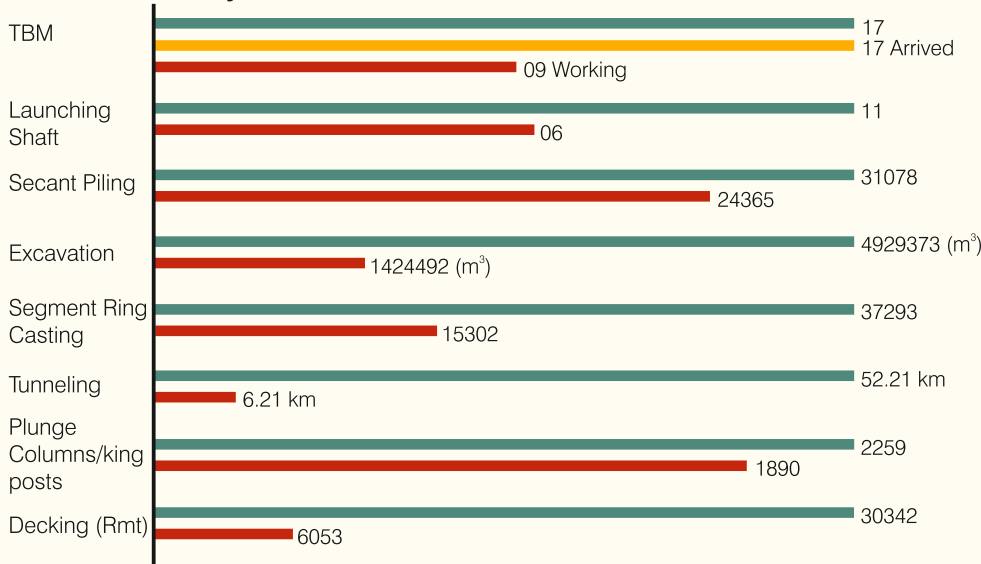
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Project Progress Update

As on 28th July, 2018



Four TBMs have been lowered at their respective launching shafts and are getting assembled for tunneling.

Legend
█ Planned
█ Completed

Tidal Influence and Floods: Mumbai

This article is in continuation with the article on Monsoon Special series, in June 2018, Volume 21.

There is a myth among the public that high tides occur on full moon days and therefore the floods in coastal areas are likely to take place around full moon days. One needs to understand following realities about Mumbai to understand occurrence of floods here: -

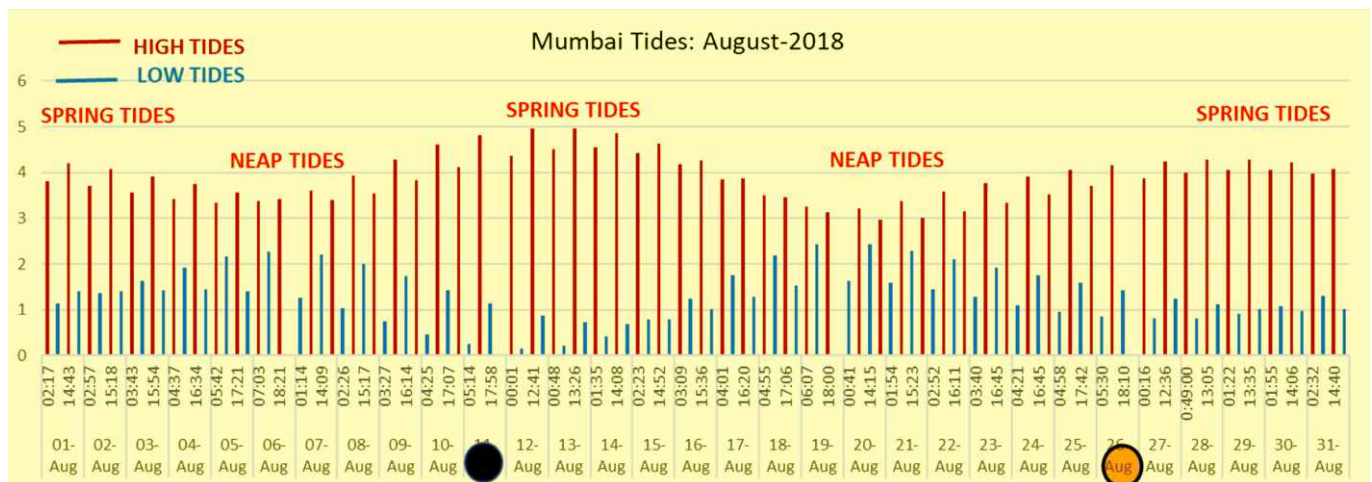
- Mumbai can experience floods on any day if the precipitation on any day (24 hrs) is more than 200 mm irrespective of the tidal conditions.
- The highest tides in Mumbai do not occur on Full or New Moon days but a day or one and half day after it i.e. up to 2 days after new and full moons.
- Tide levels are higher around new moon than full moon days.

Observation: -

- There could be floods in Mumbai from 19th to 21st August - 2018 even if there is moderate precipitation during this period.

Measurement of Tides: -

The tides are not measured from any one reference point all along the coastline. The reference point for measuring the tides is known as the 'Chart Datum' popularly called as 'CD'. It is a point on the coastline of a region below which the sea water level seldom goes down. The CD of Mumbai is at the observatory set up by Mumbai Port at Gateway of India (Apollo Bandar).



Tidal Graph: August-2018

What Lies Beneath The Earth

We talked about the alignment of Construction Package-03 in our June 2018 issue. Moving forward, this month we cover alignment of Package-04, which starts with north end of Worli Station and ends at south end of Dharavi Station. This package includes Three Stations; Siddhivinayak Metro, Dadar Metro and Sitaladevi Metro Stations.

The alignment crosses the Western Railway tracks near Mahim Railway Station. The predominant rock type found in this stretch is Basalt, Breccia and subsidiary Tuff. Basalt is harder and stronger variety of rock and the Breccia is weaker than Basalt.

Stations in this Contract Package are constructed by Cut-and-Cover as well NATM Method of Construction. Siddhivinayak and Dadar Metro Stations are constructed by Cut-and-Cover method, whereas the Sitaladevi Metro Station is constructed by NATM method of construction.

The challenges while working in this area:-

- 1 Rocky Strata:** It is variable and different type of rock e.g. Basalt and Breccia are encountered. Any weak rock layer shall be identified during construction and necessary precautionary measures to be taken as necessary.
- 2 Strength of Rock:** Strength of rock varies in similar grade of rock at different locations.
- 3 Ground Water:** Earth-retaining system should be water tight in upper soil and highly fractured rock mass layers.
- 4 Upper Soil and Completely Weathered Rock Mass:** During the station construction, the top soil and weathered rock will be supported by secant piles (earth retaining system), which will be constructed before start of the excavation.
- 5 Tunnel Boring Machine (TBM):** Tunneling in this stretch will be executed by Dual Mode TBM as the variations in the strata with the rock weathering grades. The TBM will operate in closed mode by Earth Pressure Balancing Technology in weak rock stretches.
- 6 Tunneling Below Existing Structures:** TBM has to negotiate locations below existing high-rise buildings and roads.
- 7 Railway Tracks:** The alignment crosses the Western Railway tracks near Mahim Railway Station. The tunneling below the running tracks is challenging.

MD Speaks

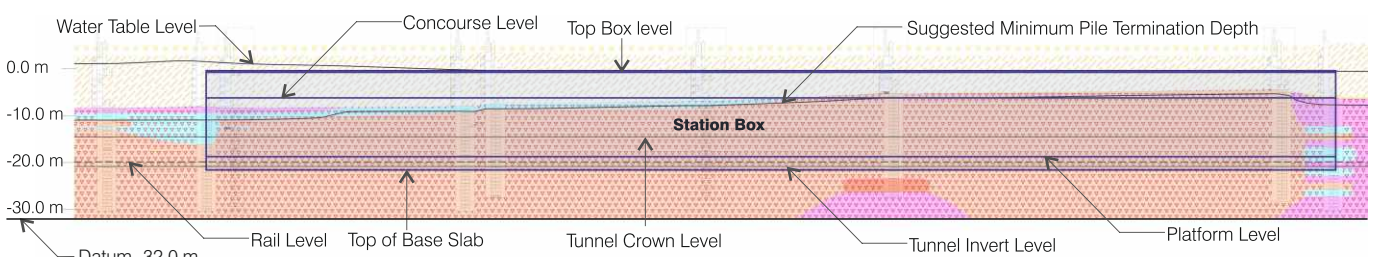
Continued from page 1

While private Land acquisition is progressing consistently, MMRC got possession of 4 buildings in Girgaon. MCGM has given permission for demolition of these buildings after ascertaining the transit accommodation of MHADA certified tenants. The acquisition of remaining private lands, buildings therein and the tenants are being handled systematically and are expected to be completed in 2 months period.

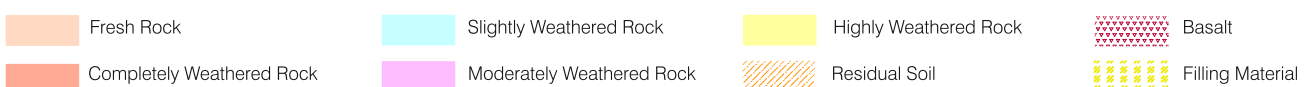
RFP for Non Fare Box revenue study invited in June were received during this month. 4 major firms have submitted their proposals for this consultancy. Evaluation and award of this consultancy will help MMRC in assessing and exploring the alternative revenue opportunities.

Mr. Katsuo Matsumoto, Chief Representative of JICA India & Mr. Yoshiki Ehara, representative of JICA were in Mumbai to acquaint with the project. Team MMRC welcome the new JICA India Chief that was followed by a quick review of the project and site visit to Vidyanagri Launch Shaft.

We are happy to mention that JICA loan 2nd Tranche amounting to ₹100 Bn (₹5747 Cr.) has been effectuated during this month and we can draw funds for ongoing civil works and systems contracts awarded.



Sitaladevi Station Profile Cross Section



Know Your Station - Santacruz Metro Station



St. Anthony's Church / Vakola Church



Dinkar Patel Garden



Grand Hyatt



V. N. Desai Hospital



Kalpataru Inspire



Map source : <http://www.loginmumbai.org/map.html>

The Metro connectivity to Santacruz is undoubtedly an additional transit infrastructure to these thriving neighbourhood, institutions and local business destinations. Integration of the Metro Station with the Suburban Station can help seamless modal transfers to extend further connectivity to Western Suburbs.

Santacruz Metro Station is primarily surrounded by sub urban residential localities of Ville Parle, Juhu, Khar and Kurla. Western Railway Line bisects the area in two parts, Santacruz East and Santacruz West. The area has an advantage of the proximity to the Domestic Terminal (T1) of Mumbai Airport. The proposed Santacruz Metro Station is located underneath the service road along Western Express Highway at the junction of Nehru Road and WEH. Santacruz Station on Western Railway is located at around 0.7 km from the Metro Station. Important landmarks in the vicinity are Hotel Grand Hyatt, University of Mumbai (Kalina), Kalpataru Synergy, St. Anthony's Church, Vakola Police Station, VN Desai Hospital etc.

Santacruz(East) consists of gaathan areas of, Agripada, Kalina and Vakola along with plotted developments of Santacruz(East) consists of Maratha Colony and Prabhat Colony. A large chunk of land owned by Airport Authority of India, which consists of the Mumbai Airport and Air India Colony extends from Vakola to Kurla West.

The air port at Santacruz has a historic reference as it was set up by the British in 1930, as a Royal Air Force airfield. During the World War II, the nearby Juhu Aerodrome, could not cope with the fighters, bombers and other large transport planes of the Air Force, that required longer and stronger runways. The Santacruz Airfield covered an area of about 600 ha with three runways and was extensively used during the World War. After the end of the War, the airport was handed over to the Director General of Civil Aviation for Civil operations and now continues civilian operations, now known as Chhatrapati Shivaji International Airport.

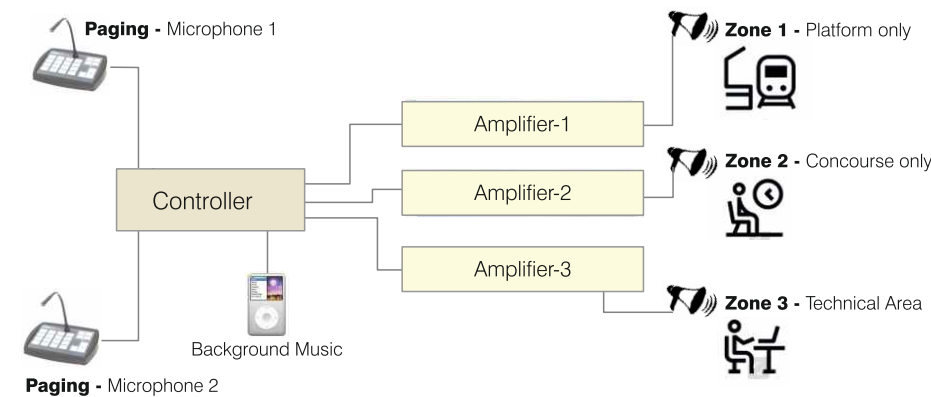
The military base at Kalina set up by the British is located within one km of the proposed Metro Station. The eastern part of the station is a multi-religion – multi culture community with people speaking different languages, customs and lifestyles till living in harmony with each other. Western part of Santacruz is predominantly planned residential colonies with markets near the railway station. This side bordered by Khar, Bandra, Juhu and Vile Parle is strikingly more affluent than the eastern part of the suburb.

Public Address System

Public Address System will allow the passengers to get information about the status of Metro-3 transport services through announcements at stations. It will announce train schedules, real time information of services, normal and emergency messages etc. in different languages (namely, Marathi, Hindi and English). The proposed Public Address System is IP based and will allow controllers (in Operation Control Centre, Backup Control Centre and Station Control Room) to make need based live-microphone and pre-recorded voice announcements selectively, for the passengers in public areas of stations as well as staff in stations and depot area.

Public Address System (PAS) Operation and Key features:

- PAS equipment is installed in the Telecommunication Equipment Room of each station which is in turn connected to the Equipment room of Centralized Control Rooms (at OCC and BCC) through fiber optics system. PAS is also integrated to Radio and Telephone sub-systems for emergency communications.
- PAS receives real time information of trains from Signalling and Train Control System that can be announced through speakers, such that announcements can be heard adequately in the station premises.



PAS announcements are also co-ordinated automatically with Public Information Display System (PIDS) at stations.

Normally speakers of PASs are divided into various zones at stations as under:

1. Platforms only
2. Concourse only
3. Technical area (staff area, equipment rooms, plant rooms and corridor)

Controller can choose any combination of zones such as individual zone or group of zones or all zones for announcements, which could be automatic pre-recorded station announcements related to train operations or any other urgent announcements to guide passengers in special situations like disruption in train operation due to various reasons.

In case of emergency, announcement can be made through hand held portable radio sets or telephones also but with the permission of authorized person.

Alstom Bags Contract for Metro-3 Coaches

MMRC awarded contract to supply trains for Metro-3 to the consortium of Alstom Transport India Ltd. and Alstom Transport S A France, 31 trains of 8 coaches each will be manufactured in India under Make In India Policy.



Being energy efficient with regenerative braking, these trains will have 75% motorization & LED lights. Metro-3 trains will operate on 25 kV AC traction and will carry 2350 passengers each. Metro-3 trains will be equipped with driverless technology, smart temperature & display control and will have safety features like CCTVs and help points to provide efficient, safe and comfortable commuting.

Expert Speaks

Stress and the City



Our author for 'Expert Speaks' section for this month is an eminent psychiatrist, Dr. Rajendra Barve. He shares his knowledge and expertise on mental wellness for public benefit through the programs conducted by his organization The Mindful Life. Rajendra has been working for people with distress - coaching and counselling them as a psychiatrist for past three and half decades, making a difference to his clients' lives. He has written several books in Marathi, to demystify and de-stigmatize the process of seeking psychological help and assistance.

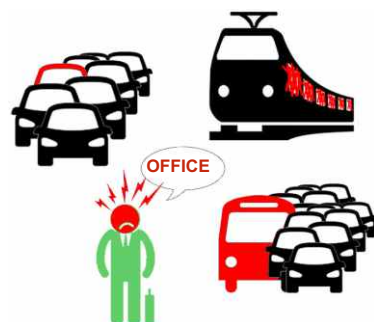
He has presented his expert analysis of social issues on regional and national television channels. In this article, he talks a case on how daily commuting builds high stress levels within the citizen in Metro cities like Mumbai and its impacts on peoples wel being. In the following article which will be published in next issue, he talks about simple techniques to deal with such stress.

"To think about retirement at 32 is ridiculous, particularly when I am doing so well in my job. But here I am thinking about what reason I should give to avoid attending office. Frankly doctor, this commuting every day to office is taking life out of me" the nattily dressed young executive said to me.

In my experience, he is a part of the increasing number of men, women, young and old who come to me, speak of their exhaustion of travelling within the city to go where they want. While bereavement, divorce and moving houses are usually the most stressful moments in people's lives but getting stuck in a traffic jam is the biggest cause of everyday stress, according to findings by a national public health survey. When asked what do they think causes work-life imbalance, 15% men with families identified the irritation and suppressed anger caused during travelling at peak hours which is frequently displaced to other family members especially children. Working mothers too felt drained from their ability to love their children after commuting back and forth for work everyday.

The negative health effects of overcrowded public transport and road traffic are well-documented. Travelling by railways or other public transport has been a major health hazard for the last few decades in all metropolitan cites especially Mumbai. Not only does this increase risk to exposure of carcinogenic pollutants but also takes a toll on mental health as commuters often feel helpless which affects self-worth and peace of mind. For public transport employees such as bus drivers, the negative effects are manifold and stress-related physical and mental disorders are common. Imagine yourself in your vehicle or perhaps even walking down a crowded street in traffic hours. As you crawl through the thick of automobiles and people, you can feel heart rate picking up, your breathing intensifying and your blood pressure shooting up. Drivers are irritably honking, peeping out of the windows and glaring at other vehicles, shouting and using profanities. At times, this road rage boils over into fisticuffs between commuters.

At this point let us take a pause and understand what exactly goes wrong inside our bodies and minds. The classical definition of stress is failure to cope with any change in the environment either internal or external. The human body has an efficacious mechanism to cope with change that occurs internally as well as the surroundings. This is better known as the typical Stress Response. The stress response is our body's attempt to cope with the change. The human stress response consists of sudden release of stress hormones viz. adrenaline and steroid into the blood stream as directed by a small gland in the brain called pituitary gland. It receives messages form the sensory organs about the change such as, unexpected sound of foot steps when you are walking on a street on a dark night. The release of hormones is instantaneous at electronic speed!



Health Issues:

-  **Increases Heart Rate**
-  **Raises Blood Sugar**
-  **Work - Life Imbalance**
-  **Increase Blood Pressure**
-  **Mental Health Problems**

The hormones provide the body to take immediate action to deal with the change. This is better known as the Flight or Fight Response. With the release of stress hormones, our body readies herself to take action by facing the change directly and overcome it or take flight that means simply move away if the change is difficult to handle.

This whole process is coded in our DNA. The natural stress response increases heart rate, blood pressure and even raises blood sugar to some extent. This readies the body for action. The mind too is put on alert for action. This wonderful mechanism is one of the secret's of human endurance from the beginning of time.

There are some evidence-based tips which can help you stay calmer will be discussed in next volume.



Media Glimpses

IAS officer Ashwini Bhide has shattered many a glass ceiling with her intellect and confidence
Turning obstacles into opportunities



मुंबई मेट्रो-३ प्रकल्पामध्ये ५ किमीचे भुयारीकरण पूर्ण

१५ टोलन बॉयिंग मशीन दाखल; आठ वर्षे कार्यान्वित



MMRC TO PLANT 20K TREES IN SGNP DURING MONSOON



सजय गांधी उद्यान : मेट्रोच्या कामावेळी केलेल्या वृक्षतोडीची होणार भरपाई

मेट्रो-३ डब्यांचे काम फ्रेंच कंपनीला

२४८ युनिट भारतातच तयार होणार



'Our work has to continue in monsoon, we have to ensure there is no flooding'

मेट्रो लावणार २०,९०० झाडे

round Colaba-Bandra-SEEPZ tunnel Boring Machines (TBMs) JENITA CHACKO, Mumbai Metro 3 issues and challenges being 'underground Metro'.

MMRCL gets excellent response to bid for Metro 3 depot

MUMBAI: Mumbai Metro Rail Corporation Limited (MMRCL) has received excellent response to bid for procurement of the state-of-the-art Depot (Electrical & Mechanical system for Mumbai Metro Line 3 corridor. Commenting on this occasion, Managing Director MMRC, Ashwini Bhide said, "We are pleased with the response...

सीएसटी ते ग्रॅण्ट रोड ५ किमीचे भुयार तयार



मुंबई, दि. १० (प्रतिनिधी) - कुलाबा-वडि-सेज या मेट्रो-३ प्रकल्पाने तयार होणाऱ्या भुयारी प्रकल्पामध्ये सध्या सीएसटी ते ग्रॅण्ट रोड या ५ किमीच्या भुयारी तयार करण्याचे काम पूर्ण झाले आहे. सीएसटी ते वडि येथे खणवणारे मेट्रो ट्यूबिंग हा यूपीसी मार्ग तयार झाल्याचे मुंबई मेट्रो कॉर्पोरेशनचे (एमएमआरसी) संचालक, राहणार मेट्रोच्या कामांनी वेग घेतलेले आहे. टोपीयण सध्या राहणार...

या झाडांची कणार लागवड

● या प्रकल्पामध्ये आसपासची वृक्षतोड करून, त्यांची जागा भरण्यासाठी २०,९०० झाडांची लागवड करण्यात येईल. यासाठी सजय गांधी उद्यान, एमएमआरसीच्या अखत्यारीत असलेल्या वृक्षतोड करून घेतले जाईल. यासाठी सजय गांधी उद्यान, एमएमआरसीच्या अखत्यारीत असलेल्या वृक्षतोड करून घेतले जाईल.

मेट्रो-३चे डबे भारत बनणार

मुंबई मेट्रो-३च्या डब्यांचे काम फ्रेंच कंपनीला देण्यात आले आहे. २४८ युनिट भारतातच तयार होणार. यासाठी सजय गांधी उद्यान, एमएमआरसीच्या अखत्यारीत असलेल्या वृक्षतोड करून घेतले जाईल.

Alstom bags contract for Metro 3 rolling stock

Mumbai Metro Rail Corporation Limited awarded the contract to procure rolling stock for the 33-km-long Metro 3 project to the consortium of Alstom Transport India Ltd and Alstom Transport S.A. France. The company will provide 248 coaches, 31 train sets of eight cars each, and design, manufacture, supply, install, test and commissioning.

मेट्रो ३ डब्यांची निर्मिती भारतातच



मुंबई, मुंबई मेट्रो-३च्या डब्यांची निर्मिती भारतातच होणार आहे. २४८ युनिट भारतातच तयार होणार.

Colaba-Seepz Metro: 5km of tunnel work completed



मुंबई मेट्रो-३च्या कोलाबा-सेज मेट्रो-३ प्रकल्पामध्ये ५ किमीच्या ट्यूबिंग काम पूर्ण झाले आहे.

MMRC SIGNS MOU TO PLANT 20,900 TREES

MMRC has signed an MoU to plant 20,900 trees in the Sanjay Gandhi National Park (SGNP) during the monsoon season to offset the carbon footprint of the Metro 3 project.

MMRC assures no flooding along Metro 3

The MMRC has assured that the new three-pronged approach will ensure there is no waterlogging in this stretch.

FLOODING SPOTS ALONG METRO ROUTE

● Bhi Nager Junction (M7) - 34 corridor
● Anand East Depot (Sat Metro 7 corridor)

STATUS OF DESILING

70% Complete

DAHSAR

COLABA

GOREGAON

Indian envoys visit Mumbai Metro site

MUMBAI: Mumbai Metro Rail Corporation on Thursday organised a site visit for Indian Ambassadors and Missioners to the Colaba-Seepz Metro site.

मॉनसून में भी मेट्रो निर्माण को रफ्तार

मुंबई मेट्रो-३च्या निर्माण कामात मोनसून काळातही रफ्तार राखण्यासाठी एमएमआरसीच्या संचालक, राहणार मेट्रोच्या कामांनी वेग घेतलेले आहे. टोपीयण सध्या राहणार...

The Biggest Infra Project Gathers Steam

We make conscious efforts to engage with people for sharing information on the project

Environmental Benefits

Carbon Footprint	1,000,000 tCO2e
Water Consumption	10,000,000 m3
Land Use	100,000 m2

MMRC Control Room

Contact us @ +91 9136805065 to report monsoon related grievances pertaining to Metro-3 construction work.

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