# BOMBAY DYEING

**Date: 20/12/2014**

**To,**
The Director
(IA - III Division)
Ministry of Environment and Forests
Indira Paryavaran Bhavan, Jor Bagh Road,
New Delhi - 110 003, India

सी. आर. अनुभाग द्वारा प्राप्त /
Received by CR Section
पर्यावरण,वन एवम् जलवायु परिवर्तन मंत्रा
Ministry of Environment, Forests & Clima
भारत सरकार/Govt. of India
इंदिरा पर्यावरण भवन,/Indira Paryavaran B
जोरबाग रोड,नई दिल्ली/Jorbagh Road
New Delhi-110003
22/12/14

**Subject** : Resubmission of EIA Report & Form 1 & 1A along with Enclosures for "Island City Centre" at plot bearing C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G.D. Ambekar Marg, Wadala, Mumbai , Maharashtra.

**Reference** : Our project listed as Item No. 3.16 in the 142nd meeting. of EAC for Infrastructure Development, Coastal Regulation Zone, Building/Construction and Miscellaneous Projects.
[F.No.21-115/2014-IA.III]

Respected Sir,

With reference to above mentioned subject, I would like to inform you that the undersigned, Mr S Pochendar, am the Authorised Signatory of the Bombay Dyeing & Mfg Co Ltd.

Further, I am also the Contact Person for The Bombay Dyeing & Mfg Co Ltd. Accordingly, point 15 of Form1 submitted by us on 14/10/2014 would stand amended and should be read accordingly.

Hence, we are submitting herewith the EIA Report, Form 1 & 1A with necessary enclosures again for your reference and record.

We request you to acknowledge the same.

Thanking You,

Best regards,

For **The Bombay Dyeing & Mfg. Co. Ltd.**

**Authorized Signatory**
**Encl:** As above

# FORM –1 & 1 A

**(Revision 1)**

# "Island City Centre"

**At**

C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) of Dadar Naigaon division at G. D. Ambekar Marg, Wadala, Mumbai 400 001

**By**

## M/s. The Bombay Dyeing & Mfg. Co. Ltd.

Neville House, J. N. Heredia Marg, Ballard Estate, Mumbai 400 001

**APPENDIX - I**
**(See paragraph - 6)**
**FORM 1**

## (I) Basic Information

<table>
<tr><th>Sr. No.</th><th>Item</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of the project/s</td><td>“Island City Centre”<br>C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G. D. Ambekar Marg, Wadala, Mumbai State: Maharashtra.</td></tr>
<tr><td>2.</td><td>S. No. in the schedule</td><td>8 (B1)</td></tr>
<tr><td>3.</td><td>Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled</td><td>Total plot area: 1,83,663.18 sq. mt.<br>Net plot area: 1,13,728.95 sq. mt.<br>Built up area as per FSI (Including Fungible FSI): 1,66,766.85 sq. mt.<br>Total construction built up area: 3,53,818.99 sq. mt.<br>Building details are as follows:
<table>
<tr><th>Sr. No.</th><th>Building Configuration</th><th>Description</th></tr>
<tr><td>A</td><td colspan="2">Completed Building (As per EC received in the year 2006)</td></tr>
<tr><td>1</td><td>1 Bldg with 2 wings:<br>Wing A: Stilt + 41 floors<br>Wing B:<br>3 Basements + 2 Parking floors</td><td>Flats: 161 Nos.</td></tr>
<tr><td>B</td><td colspan="2">Proposal for Amendment (EC received in the year 2011 & Corrigendum in the year 2013)</td></tr>
<tr><td>1</td><td colspan="2">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Building A:<br>Basement + Stilt + 22 floors<br>Building B:<br>Basement + Stilt + 19 floors</td><td>Flats: 296 nos.<br>Flats Nos.: 352 Nos.</td></tr>
<tr><td>2</td><td colspan="2">Sale</td></tr>
<tr><td>2.1</td><td>ONE ISLAND CITY CENTRE[ICC] (Formally known as Tower A):<br>3 Basements + Ground + podium + 1st to 53rd floors.</td><td>Flats:193 Nos.</td></tr>
<tr><td>2.2</td><td>TWO ISLAND CITY CENTRE [ICC](Formally known as Tower B):<br>3 Basements + Ground + Podium + 1st To 60th floors.</td><td>Flats: 325 Nos.</td></tr>
</table></td></tr>
<tr><td>4.</td><td>New/Expansion/Modernization</td><td>Expansion</td></tr>
<tr><td>5.</td><td>Existing Capacity/ Area etc.</td><td>The project has received prior Environmental clearances<br>From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006<br>From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013<br>It is referred as an Enclosure 1.<br>As there are certain amendments, reapplication for revised EC has been made. Total Constructed area (FSI + Non FSI) till date: 77586.68 Sq. mt.</td></tr>
<tr><td>6.</td><td>Category of project i.e.’ A’ or ‘B’</td><td>8 (B1)</td></tr>
<tr><td>7.</td><td>Does it attract the general condition? If yes, please specify.</td><td>Not Applicable</td></tr>
<tr><td>8.</td><td>Does it attract the specific condition? If yes, please specify.</td><td>Not Applicable</td></tr>
<tr><td rowspan="5">9.</td><td>Location</td><td>Dadar, Naigaon Division</td></tr>
<tr><td>Plot/Survey/Khasra No.</td><td>C.S. No. 223, 1/983, 1/128 (pt) & 120 (pt)</td></tr>
<tr><td>Village</td><td>Wadala</td></tr>
<tr><td>Tehsil</td><td>Mumbai</td></tr>
<tr><td>District</td><td>Mumbai</td></tr>
</table>

| | | |
|---|---|---|
| | State | Maharashtra |
| 10. | Nearest railway station<br>Nearest airport | Wadala railway station: 1.70 Km (Road distance)<br>Mumbai Chhatrapati Shivaji International Airport: 17.00 Km (Road distance) |
| 11. | Nearest Town, city, District headquarters along with distance in kms. | Dadar |
| 12. | Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal address with telephone nos. to be given) | Municipal Corporation of Greater Mumbai (M.C.G.M.) |
| 13. | Name of the applicant | **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** |
| 14. | Registered Address | C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G. D. Ambekar Marg, Wadala, Mumbai, State: Maharashtra. |
| 15. | Address for correspondence | C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) 128 Dadar Naigaum division at G. D. Ambekar Marg, Wadala, Mumbai, State: Maharashtra. |
| | Name | Mr. Pochendar |
| | Designation (Owner/Partner/CEO) | CEO |
| | Address | C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G. D. Ambekar Marg, Wadala, Mumbai, State: Maharashtra. |
| | Pin Code | 400 025 |
| | E-mail | pochendar@bombayrealty.in |
| | Telephone No. | 022 - 6101 2345 |
| | Fax No. | 022 - 6619 2001 |
| 16. | Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo-sheet. | Not Applicable |
| 17. | Interlinked Projects | No |
| 18. | Whether separate application of interlinked project has been submitted? | Not Applicable |
| 19. | If yes, date of submission | Not applicable |
| 20. | If no, reason | Not applicable |
| 21. | Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given.<br>(a) The Forest (Conservation) Act, 1980?<br>(b) The Wildlife (Protection) Act, 1972?<br>(c) The C.R.Z Notification, 1991? | Not applicable |
| 22. | Whether there is any Government Order/Policy relevant/ relating to the site? | **---** |
| 23. | Forest land involved (hectares) | Not applicable |
| 24. | Whether there is any litigation pending against the project and/or land in which the project is propose to be set up?<br>(a) Name of the Court<br><br>(b) Case No.<br>(c) Order /directions of the Court, if any and its relevance with the proposed project. | <br><br><br>High court of Judicature at Bombay Ordinary Original Civil Jurisdiction<br>Case No. 2368 of 2013<br>Sarva Shramik Sanghatana (Konkan Vibhag) – respondents Brihanmumbai Municipal Corporation for Greater Mumbai & others |

**(II) Activity**

**1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities /rates, wherever possible) with source of information data |
|---|---|---|---|
| 1.1 | Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan) | Yes | The project site has mill workers chawls and residences. Chawl will be demolished and site will be developed into residential development.<br><br>The project has already received Environmental Clearances on From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006<br>From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013<br>Copy of the same is attached as **Enclosure 1** |
| 1.2 | Clearance of existing land, vegetation and building? | Yes | The project site has mill workers chawls which will be demolished |
| 1.3 | Creation of new land uses? | Yes | Previously on the site there was closed down textile mill and residence of mill workers. As the earlier EC is obtained the site is now being developed as residential development. |
| 1.4 | Pre-construction investigation e.g. bore houses, soil testing? | Yes | Geotechnical Investigation has been carried out. It is referred as an **Enclosure 2.** |
| 1.5 | Construction works? | Yes | Residential development. |
| 1.6 | Demolition works? | Yes | Demolition debris generated shall be partly recycled and partly shall be disposed to the authorized sites with permission from M.C.G.M. |
| 1.7 | Temporary sites used for construction works or housing of construction workers? | No | -- |
| 1.8 | Above ground building, structures or earthworks including linear structures, cut and fill or excavations | Yes | The excavated material generated shall be partly recycled and partly shall be disposed to the authorized sites with permission from M.C.G.M. |
| 1.9 | Underground works including mining or Tunneling? | No | Construction of Basements for proposed building. |
| 1.10 | Reclamation works? | No. | **---** |
| 1.11 | Dredging? | No. | **---** |
| 1.12 | Offshore structures? | No. | **---** |
| 1.13 | Production and manufacturing processes? | No. | **---** |
| 1.14 | Facilities for storage of goods or materials? | Yes | Temporary storage facilities to store the construction raw material. |
| 1.15 | Facilities for treatment or disposal of solid waste or liquid effluents? | Yes | • Sewage Treatment Plant (STP) for treatment of sewage of proposed and existing buildings. Treated sewage will be used for flushing and within the premises. Excess treated sewage shall be temporary used for further construction in project site. There after shall be disposed to sewer line.<br>• Segregation of non biodegradable and |

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities /rates, wherever possible) with source of information data |
|---|---|---|---|
| | | | biodegradable garbage on site.<br>• Biodegradable garbage: Treatment in Organic Waste Converter (OWC).<br>• Non- biodegradable garbage: Handed over to M.C.G.M.<br>• STP Sludge (Dry sludge): Used as manure within the premises for plants. |
| 1.16 | Facilities for long term housing of operational workers? | No | --- |
| 1.17 | New road, rail, or sea traffic during construction or operation? | No | --- |
| 1.18 | New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc? | No | --- |
| 1.19 | Closure or diversion of existing transport routes or infrastructure leading to changes in traffic Movements? | No | --- |
| 1.20 | New or diverted transmission lines or pipelines? | No | --- |
| 1.21 | Impoundment, damming, culverting, realignment or other change to the hydrology of watercourses or aquifers? | No | --- |
| 1.22 | Stream crossings? | No | --- |
| 1.23 | Abstraction or transfers of water from ground or surface waters? | No | --- |
| 1.24 | Changes in water bodies or the land surface affecting drainage or run-off? | Yes | By considering the runoff prior to development and runoff after development there is some increment in runoff of storm water.<br>**Incremental Runoff =0.39 $m^3$/sec** |
| 1.25 | Transport of personnel or materials for construction, operation or decommissioning? | Yes | Transport of construction materials |
| 1.26 | Long-term dismantling or decommissioning or restoration works? | No | --- |
| 1.27 | Ongoing activity during decommissioning which could have an impact on the environment? | No | --- |
| 1.28 | Influx of people to an area in either temporarily or permanently? | Yes | There will be influx of ~2590 Persons. (Sale occupancy only) |
| 1.29 | Introduction of alien species? | No | --- |
| 1.30 | Loss of native species or genetic diversity? | No | --- |
| 1.31 | Any other actions? | No | --- |

**2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

| Sr. No. | Information/checklist confirmation | Yes / No | Details there of (with approximate quantities /rates, wherever possible) with source of information data |
|---|---|---|---|
| 2.1 | Land especially undeveloped or | No | The project site has mill workers chawls and residences. Now site will be developed into residential development. |

<table>
<tr><th>Sr. No.</th><th>Information/checklist confirmation</th><th>Yes / No</th><th>Details there of (with approximate quantities /rates, wherever possible) with source of information data</th></tr>
<tr><td></td><td>agricultural land (ha)</td><td></td><td></td></tr>
<tr><td>2.2</td><td>Water (expected source & competing users) unit : KLD</td><td>Yes</td><td>During Construction Phase -<br>For Workers : M.C.G.M..: 32 KLD<br>For Construction : From Tanker : 30-40 KLD<br>(Depending upon the activity).<br><br>During Operational Phase – During Non Monsoon Season
<table>
<tr><th>Use</th><th>Quantity KLD</th><th>Source</th></tr>
<tr><td>Domestic</td><td>596</td><td>M.C.G.M.</td></tr>
<tr><td>Flushing</td><td>298</td><td>STP treated sewage</td></tr>
<tr><td>Gardening</td><td>187</td><td>STP treated sewage</td></tr>
<tr><td>Swimming pool</td><td>28</td><td>Tanker water of potable quality</td></tr>
</table>
All quantities are in KLD<br>Total water requirement = 1109<br>Treated sewage available for recycling = 699<br>After recycling treated sewage for<br>• Flushing: 298<br>• Gardening: 187<br>Net water requirement = 624<br>• For Domestic: From M.C.G.M. = 596<br>• For swimming pool makeup: From Tanker water of potable quality = 28<br>Reduction in water Demand = 43.73%<br><br>During Operational Phase - During Monsoon Season
<table>
<tr><th>Use</th><th>Quantity KLD</th><th>Source</th></tr>
<tr><td>Domestic</td><td>596</td><td>M.C.G.M./RWH</td></tr>
<tr><td>Flushing</td><td>298</td><td>STP treated sewage</td></tr>
<tr><td>Swimming pool</td><td>28</td><td>Tanker water of potable quality</td></tr>
</table>
All quantities are in KLD<br>Total water requirement = 922<br>Treated sewage available for recycling = 699<br>After recycling treated sewage for flushing (298)<br>From RWH = 149<br>Net water requirement = 475<br>• For Domestic: From M.C.G.M. = 447<br>• For swimming pool makeup: From Tanker water of potable quality = 28<br>Reduction in water Demand = 48.5 %</td></tr>
<tr><td>2.3</td><td>Minerals (MT)</td><td>No</td><td>---</td></tr>
<tr><td>2.4</td><td>Construction material – stone, aggregates, and / soil (expected source – MT)</td><td>Yes</td><td>Quantity : As per requirement<br>Stone aggregates demand will be met from the clay/soil generated after excavation and from open market<br>Sources: The material required for construction activities shall be procured from company’s authorized / approved vendors only. The vendor’s performance will be monitored periodically. In case of urgency or non-availability of materials from authorized/approved vendors, it will be procured from the open market.</td></tr>
<tr><td>2.5</td><td>Forests and timber (source – MT)</td><td>Yes</td><td>Timber will be required for doors. Timber will be sourced from local suppliers.</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Information/checklist confirmation</th><th>Yes / No</th><th>Details there of (with approximate quantities /rates, wherever possible) with source of information data</th></tr>
<tr><td>2.6</td><td>Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)</td><td>Yes</td><td>During Operational Phase –<br>Source: From TATA power<br><table><tr><th>Sr. No.</th><th>Description</th><th>Existing</th><th>Rehabilitation</th><th>One ICC</th><th>Two ICC</th><th>Total</th></tr><tr><td>1.</td><td>Connected load (KW)</td><td>4275</td><td>3971</td><td>9002</td><td>12904</td><td>30152</td></tr><tr><td>2.</td><td>Maximum demand (KW)</td><td>2875</td><td>2606</td><td>4024</td><td>5587</td><td>15092</td></tr></table><table><tr><th>User</th><th>Capacity of DG sets<br>(In case of power failure only)</th></tr><tr><td>Existing</td><td>1 DG set of 1010 kVA</td></tr><tr><td>Rehabilitation - A</td><td>1 DG set of 500 kVA</td></tr><tr><td>Rehabilitation - B</td><td>1 DG set of 500 kVA</td></tr><tr><td>One ICC</td><td>1 DG set of 1010 kVA &<br>1 DG set of 625 kVA</td></tr><tr><td>Two ICC</td><td>1 DG set of 1010 kVA &<br>1 DG set of 625 kVA</td></tr></table></td></tr>
<tr><td>2.7</td><td>Any other natural resources (use appropriate standard units)</td><td>Yes</td><td>• Solar powered lightings for landscape and common areas<br>• Solar powered water heating</td></tr>
</table>

**3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| 3.1 | Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies) | No | **---** |
| 3.2 | Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases) | No | **---** |
| 3.3 | Affect the welfare of people e.g. by changing living conditions? | No | **---** |
| 3.4 | Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc., | No | **---** |
| 3.5 | Any other causes | No | **---** |

**4. Production of solid wastes during construction or operation or decommissioning (MT/month):**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities / rates, wherever possible) with source of information data |
|---|---|---|---|
| 4.1 | Spoil, overburden or mine wastes | No | **---** |

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities / rates, wherever possible) with source of information data |
|---|---|---|---|
| 4.2 | Municipal waste (domestic and or commercial wastes) | Yes | The total quantities of solid waste that will be generated in the project are 2986 Kg /day. Out of which<br>• Non biodegradable - 896 Kg /day<br>• Biodegradable garbage - 2090 Kg /day<br>• Segregation of non biodegradable and biodegradable garbage on site.<br>• Biodegradable garbage: Treatment in Organic Waste Converter (OWC).<br>• Non- biodegradable garbage:<br>Recyclable waste : To recyclers<br>Non recyclable waste: To M.C.G.M.<br>STP Sludge (Dry sludge): Used as manure within the premises for gardening |
| 4.3 | Hazardous wastes (as per Hazardous waste Management Rules) | Yes | Waste oil shall be stored at separate location duly marked and will be sold to the CPCB authorized recyclers. |
| 4.4 | Other industrial process wastes | No | **---** |
| 4.5 | Surplus product | No | **---** |
| 4.6 | Sewage sludge or other sludge from effluent treatment. | Yes | Dried sludge from STP will be used as manure for the plants. |
| 4.7 | Construction or demolition wastes. | Yes | Excavated material and construction waste from earth shall be partly used for backfilling and partly disposed to the authorized landfill site with permission from M.C.G.M. |
| 4.8 | Redundant machinery or equipment. | No | --- |
| 4.9 | Contaminated soils or other materials. | No | --- |
| 4.10 | Agriculture wastes. | No | --- |
| 4.11 | Other solid wastes. | No | --- |

**5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr):**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| 5.1 | Emissions from combustion of fossil fuels from stationary or mobile sources | Yes | CPCB approved D.G. Sets will be used during power failure. |
| 5.2 | Emissions from production processes | No | --- |
| 5.3 | Emissions from materials handling including storage or transport | Yes | Fugitive dust emission due to handling and loading-unloading activities is envisaged during construction. Frequent water sprinkling will be done to minimize the fugitive emissions. |
| 5.4 | Emissions from construction activities including plant and equipment | Yes / Marginal | The project may cause rise in dust levels during construction phase. Precautions would be taken to reduce dust generation during construction phase:<br>Water sprinkling will be done at regular intervals to reduce control of dust generation. |
| 5.5 | Dust or odours from handling of materials including construction materials, sewage and waste | Yes | Dust generation will be controlled as described above.<br>Proper ventilation will be provided around STP |
| 5.6 | Emissions from incineration of waste | No | --- |
| 5.7 | Emissions from burning of | No | --- |

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| | waste in open air (e.g. slash materials, construction debris) | | |
| 5.8 | Emissions from any other sources | No | --- |

**6. Generation of Noise and Vibration, and Emissions of Light and Heat:**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data. |
|---|---|---|---|
| 6.1 | From operation of equipment e.g. engines, ventilation plant, crushers. | Yes but negligible | For control of noise following measures shall be adopted:<br>• Properly maintained equipment with mufflers will be used.<br>• High noise generating construction activities would be carried out only during day time.<br>• Workers working near high noise construction machinery would be supplied with ear muffs/ear plugs.<br>• Provision of barricades, trees of various species shall be planted. |
| 6.2 | From industrial or similar processes. | No | --- |
| 6.3 | From construction or demolition. | Yes | Noise Pollution Control :<br>Noise pollution will be due to operation of machinery as well as transportation vehicles. This may cause nuisance to the nearby area. Following precautions shall be taken to control noise pollution :<br>• High noise generating construction activities would be carried out only during day time.<br>• Installation, use and maintenance of mufflers on equipment.<br>• Workers working near high noise construction machinery would be supplied with ear muffs/ear plugs.<br>• Provision of barricades, trees of various species shall be planted. |
| 6.4 | From blasting or piling. | No | --- |
| 6.5 | From construction or operational traffic. | Yes | **During Construction phase:**<br>There will be transport of materials for construction work. Precautions will be taken to reduce the impact of the vehicular movement such as vehicular trips will not be at peak traffic hours.<br><br>**Operation Phase :**<br>• Provision of proper parking arrangement, traffic management plan for smooth flow of a vehicle helps to abate noise pollution due to vehicular traffic.<br>• Around 934 Nos. of trees shall be planted in proposed development that shall act as natural noise buffer |
| 6.6 | From lighting or cooling systems. | No | --- |
| 6.7 | From any other sources. | Yes | During power failure to mitigate the noise of D.G. sets while in operation D.G. sets will be enclosed in acoustic enclosures. |

**7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea :**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| 7.1 | From handling, storage, use or spillage of hazardous materials. | No | Hazardous Waste management plan is given in Form 1A**.** |
| 7.2 | From discharge of sewage or other effluents to water or the land (expected mode and place of discharge). | No | The treated sewage will be reused for flushing and gardening within the premises. Excess treated sewage shall be temporary used for further construction in project site. There after shall be disposed to sewer line. |
| 7.3 | By deposition of pollutants emitted to air into the land or into water. | No | Dust will be generated during construction phase from earthworks and movement of vehicles. Appropriate fugitive dust control measures, including water sprinkling of exposed areas and dust covers for trucks, will be provided to minimize any impacts.<br>DG exhaust will be discharged at stipulated height by providing adequate stack height to the DG sets. |
| 7.4 | From any other sources. | No | --- |
| 7.5 | Is there a risk of long term build up of pollutants in the environment from these sources? | No | --- |

**8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment :**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| 8.1 | From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances | No | --- |
| 8.2 | From any other causes. | No | --- |
| 8.3 | Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, and cloudburst)? | Yes | Landslides are not expected in the area.<br>Management plan for flood is as follows<br>**Floods :**<br>• Storm water system would be checked at regular interval for its proper functioning.<br>• Mapping the areas within or leading in or out of the building that may be water logged due to the flood<br>• The areas will be marked after completion of the project (as final ground levels etc. will be available after completion)<br>• Drain pumps shall be installed to avoid basement flooding<br><br>**Post-flood Mitigation Measures:**<br>- Rescue and evacuation<br>- Relief, Rehabilitation and Reconstruction<br><br>**Earthquake :**<br>➢ Contacting emergencies rescue centres and explain the emergencies to them.<br>➢ Determining and co-coordinating emergency response actions for a particular floor or portion of a floor;<br>➢ Ensuring that all occupants, including those with disabilities, are completely out of unsafe areas;<br>➢ Keeping evacuated or relocated persons at the safe |

| | | | |
|---|---|---|---|
| | | | refuge area until building management or the fire department authorizes them to return to their workstations.<br>Disaster Management Plan is referred to as an **Enclosure 2.** |

**9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.**

| Sr. No. | Information/Checklist confirmation | Yes / No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data |
|---|---|---|---|
| 9.1 | Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:<br>• Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)<br>• housing development<br>• extractive industries<br>• supply industries<br>• other | No<br><br><br><br><br>Yes | Supporting infrastructure is already in existence<br><br><br><br><br>The project is residential development. |
| 9.2 | Lead to after-use of the site, which could have an impact on the environment | No | --- |
| 9.3 | Set a precedent for later developments | Yes | Will create job opportunity in construction phase. |
| 9.4 | Have cumulative effects due to proximity to other existing or planned projects with similar effects | Yes | Impacts on water availability, storm water drainage, availability of electricity, traffic congestion etc. |

**(III) Environmental Sensitivity**

| Sr. No. | Areas | Name/ Identity | Aerial distance (within 15 km.) from Proposed project location boundary |
|---|---|---|---|
| 1 | Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value | Maharashtra nature Park<br>Jijamata Udyan<br>Sanjay Gandhi National Park<br>Aarey Colony | Within 4.40 km<br>Within 3.35 km<br>Within 14.70 km<br>Within 13.70 km |
| 2 | Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests | Mahim Bay<br>Mahim Creek<br>Mahul Creek<br>Arabian sea | Within 2.30 km<br>Within 4.00 km<br>Within 3.40 km<br>Within 3.50 km |
| 3 | Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration | Maharashtra nature Park<br>Jijamata Udyan<br>Sanjay Gandhi National Park<br>Aarey Colony | Within 4.40 km<br>Within 3.35 km<br>Within 14.70 km<br>Within 13.70 km |
| 4 | Inland ,coastal, marine or underground waters | Mahim Bay<br>Chandivali Lake<br>Powai Lake | Within 2.30 km<br>Within 12.50 km<br>Within 13.20 km |

| | | | |
|---|---|---|---|
| | | Mithi River | Within 5.20 km |
| 5 | State, National boundaries | None | -- |
| 6 | Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas | Western express highway<br>Eastern express highway | Approx.: 4.45 km<br>Approx.: 0.60km |
| 7 | Defence installations | No | -- |
| 8 | Densely populated or built-up area | Mumbai Metropolitan City. | -- |
| 9 | Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)* | Mumbai Metropolitan City. | -- |
| 10 | Areas containing important, high quality or scarce resources *(Ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)* | No | -- |
| 11 | Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)* | No | -- |
| 12 | Areas susceptible to natural hazard which could cause the project to present environmental problems (*Earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*) | No | -- |

**(IV) Proposed Terms of Reference for EIA studies:**

The EIA Report is prepared based on the model Terms of References (TOR) given in Environmental Impact Assessment Guidance Manual for building construction, townships and area development projects by Ministry of Environment & Forests (MOEF) and the project specific TOR given by SEAC-2 Maharashtra in November, 2012.

BOMBAY DYEING

"I hereby give undertaking that the data and information given in the application and enclosures aretrue to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost."

Date: 13.10.2014

Place: Mumbai

**For BOMBAY DYEING & MFG. CO.LTD.**

**Signature of the applicant**
**With Name and Full Address**
**(Project proponent/s Authorised Signatory)**

**APPENDIX II**
**(See paragraph 6)**
**FORM-1 A (only for construction projects listed under item 8 of the Schedule)**

**CHECK LIST OF ENVIRONMENTAL IMPACTS**
[Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring program.]

| 1 | LAND ENVIRONMENT [Attach panoramic view of the project site and the vicinity] |
|---|---|
| 1.1 | **Will the existing land use get significantly altered from the project that is not consistent with the surroundings? (Proposed land use must conform to the approved Master Plan / Development Plan of the area. Change of land use if any and the statutory approval from the competent authority to be submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) The site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.** |
| | **Land Use Pattern:**<br>The project site under reference is located at plot bearing C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G. D. Ambekar Marg, Wadala, Mumbai, State: Maharashtra. The nearest Railway Station is Dadar.<br><br>**Site History:**<br>• The project site has chawls and residences for mill workers. Presently 648 households of mill workers are residing at the site. Chawl will be demolished and the tenants will be accommodated temporarily on rental basis in the vicinity.<br>• This project has received prior Environment Clearance (EC), details are as follows:<br>From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006<br>From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013<br>• As there are certain amendments, reapplication for revised EC has been made to State Environment Expert Appraisal Committee - 2 (SEAC - 2), Maharashtra on dated 04.10.14. For the finalization of the draft TOR presentation has been done to SEAC 2, Maharashtra in the 5th meeting dated 16th November 2012.<br>• Total constructed area (FSI+ Non FSI) till date: 77586.68 Sq. mt.<br><br>**Agriculture / Livestock:**<br>There is no agricultural activity in the vicinity of the proposed area.<br><br>Please refer the enclosed maps showing the following:<br>i. Google image<br>ii. Contour plan<br>iii. Layout Plan |
| 1.2 | **List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.** |
| | **I. PROJECT DETAILS:**<br><br>**A. Name & Location: " ISLAND CITY CENTRE (ICC) "**<br><br>The site is situated at C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G.D. Ambekar Marg, Wadala, Mumbai. |

**B. Proposed Building Details:**

**Table No.1:Proposed Building details**

| S. N. | Building configuration | Flats |
|---|---|---|
| **A** | **Completed Building** (As per EC received in the year 2006) | |
| 1 | 1 Building with 2 wings<br>**Wing A:** Stilt + 41 floors<br>**Wing B:** 3 Basements + 2 Parking floors | Flats: 161 Nos. |
| **B** | **Proposal for Amendment** (EC received in the year 2011 & Corrigendum in the year 2013) | |
| **1** | **Rehabilitation** | |
| 1.1 | **Building A:** Basement + Stilt + 22 floors<br>**Building B:** Basement + Stilt + 19 floors | Flats: 296 nos.<br>Flats Nos.: 352 nos. |
| 2 | **Sale** | |
| 2.1 | **ONE ISLAND CITY CENTRE[ICC]**<br>**(Formally known as Tower A):**<br>3 Basements + Ground + podium + 1st to 53rd floors. | Flats: 193 Nos. |
| 2.2 | **TWO ISLAND CITY CENTRE [ICC]**<br>**(Formally known as Tower B):**<br>3 Basements + Ground + Podium + 1st To 60th floors. | Flats: 325 Nos. |

**C. Area Statement:**

**Table No.2: Area Statement**

| Sr. No. | Description | | Total Area (Sq. Mt.) |
|---|---|---|---|
| 1. | Total Plot Area | | 1,83,663.18 |
| 2. | Deductions | | 69,934.23 |
| 3. | Net Plot Area | | 1,13,728.95 |
| 4. | Ground coverage area (18.15 %) | | 20,636.88 |
| 5. | R G area | On Ground | 13,008.13 |
| | | On Podium | 19,145.68 |
| 6. | Built up area as per FSI (Including Fungible FSI) | | 1,66,766.85 |
| 7. | Total Construction Built – up area (FSI + NON FSI ) | | 3,53,818.99 |

**D. Parking Statement:**

**Table No.3: Parking Statement**

| Sr. No. | Phases | Parking Numbers (4W) | | Parking Area in Sq.mt. |
|---|---|---|---|---|
| | | Parking requirement | Parking provision | |
| **A** | **Existing** | **403** | **461** | **14332** |
| **B** | **Proposed** | | | |
| **1** | **Rehabilitation** | | | |
| 1.1 | Rehab - A | 55 | 56 | 1669.48 |
| 1.2 | Rehab - B | 47 | 48 | 800.63 |
| **2** | **Sale** | | | |
| 2.1 | One ICC | 518 | 540 | 45833.52 |
| 2.2 | Two ICC | 813 | 835 | |
| | **Total** | **1836** | **1940** | **62635.63** |

**E. Occupancy load:**

**Table No.4: Occupancy Load**

| Sr. No | Details | No. of Flats/rooms | Criteria for Occupancy | Occupancy (Nos.) |
|---|---|---|---|---|
| **A** | **Completed Building** | | | |
| 1 | Existing | 161 | 5 persons / flat | 805 |
| | | | **Total** | **805** |
| **B** | **Proposal for Amendment** | | | |
| 1 | Rehabilitation | 648 | 5 person / flat | 3240 |
| 2 | Sale | | | |
| 2.1 | One Island City Centre [ICC] (Formally known as Tower A) | 193 | 5 person / flat | 965 |
| 2.2 | Two Island City Centre [ICC] (Formally known as Tower B) | 325 | 5 person / flat | 1625 |
| | | | **Total** | **5830** |
| | | | **Grand Total** | **6635** |

**Reference**: National Building Code (NBC) -2005 – Part 4, Page 27, Occupant Load

**F. Water requirement for the project:**

**1. During Construction Phase:**

- For workers.: 32 KLD ( From M.C.G.M)
- For construction activity: 30 - 40 KLD. ( From Tankers)

**2. During Operational Phase:**

- **Water Consumption: (Domestic and flushing requirement)**

**Table No.5: Water requirement (Domestic and flushing requirement)**

| Sr. No | Components | Occupancy | Criteria for Water Requirement lit/person/day | | Total Water Requirement (KLD) | | |
|---|---|---|---|---|---|---|---|
| | | | Domestic | Flushing | Domestic | Flushing | Total |
| **A** | **Completed Building** | | | | | | |
| 1. | Existing | 805 | 90 | 45 | 72 | 36 | 108 |
| | | | | **Total** | **72** | **36** | **108** |
| **B** | **Proposal for Amendment** | | | | | | |
| 1 | Rehabilitation | 3240 | 90 | 45 | 291 | 146 | 437 |
| 2 | Sale | | | | | | |
| 2.1 | One ICC | 965 | 90 | 45 | 87 | 43 | 130 |
| 2.1 | Two ICC | 1625 | 90 | 45 | 146 | 73 | 219 |
| | | | | **Total** | **524** | **262** | **786** |
| | | | | **Grand Total** | **596** | **298** | **894** |

**Reference:** National Building Code (NBC) -2005 – Part 9, Page 19, Water Requirement

The amount of water demand is calculated based on the occupancy of the building and the per capita consumption as given in MOEF Manual on norms and standards for EC of large construction projects i.e. Total quantity of water used (LPCD) = Occupancy x Quantity (LPCD)

Then Total quantity of water used for Domestic and Flushing in KLD is calculated.

- **Total water requirement for the project and source:**

**Table No.6: Total water requirement for the project and source**

| Sr. No. | Description | Quantity of water required (KLD) | Source of water supply |
|---|---|---|---|
| **1**. | **Construction phase** | | |
| a. | For Workers | 32 | M.C.G.M. |
| b. | For Construction | 30-40 (Depending upon the construction activity) | Tankers |
| **2.** | **Operation phase** | | |
| | | | |
| a. | Domestic | 596 | M.C.G.M. |
| b. | Flushing | 298 | Treated sewage from STP |
| c. | Gardening | 187 | Treated sewage from STP |
| d. | Swimming Pool | 28 | Tanker water of potable quality |

*Water requirement for gardening purpose is considered as 7 liters per square meter of gardening area on ground and 5 liters per square meter on podium.

Total quantity of water used (LPCD) =Gardening Area (Sq. Mt.) x Quantity (Lit /Sq. Mt.)
Then Total quantity of water for gardening in KLD is calculated.

**G. Sewage Generation**

**Table No.7: Sewage Generation**

| Sr. No | Description | Quantity of Sewage generated ( KLD ) | Treatment/ Disposal |
|---|---|---|---|
| 1. | Construction Phase | 31 | The sewage generated will be disposed to existing municipal sewer line. |
| 2. | Operation Phase | 775 | Treatment in STP and reuse of treated sewage (available for recycling – 699 KLD) for flushing – 298 KLD and gardening – 187 KLD. Excess treated sewage shall be disposed to sewer line. |

**Reference:** Manual on norms and standards for EC of large construction projects MoEF

**H. Solid Wastes:**

**During Construction Phase:**

**Table No.8: Solid Wastes During Construction Phase**

| No. of workers | Criteria for Solid Waste Generation | | | Solid Waste Generation Kg /day | | |
|---|---|---|---|---|---|---|
| | Total (Kg/Person/day) | Non-Biodegradable | Biodegradable | Non-Biodegradable | Biodegradable | Total |
| 500 | 0.1 | 80% | 20% | 40 | 10 | 50 |

The solid waste generation due to workers dwelling on the site will be segregated and will be disposed suitably.

**During Operation Phase:**

**Table No.9: Solid Wastes During Operation Phase**

| Sr. No | Phases | Occupancy | Criteria for Solid Waste Generation | | | Solid Waste Generation (Kg/day) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Total Kg/ Person/day | Non - biodegradable | Biodegradable | Dry | Wet | Total |
| **A** | **Existing** | **805** | **0.45** | **30%** | **70%** | **109** | **254** | **363** |
| **B** | **Proposed** | | | | | | | |
| **1** | **Rehabilitation** | | | | | | | |
| 1.1 | Rehabilitation - A | 1760 | 0.45 | 30% | 70% | 238 | 554 | 792 |
| 1.2 | Rehabilitation - B | 1480 | 0.45 | 30% | 70% | 200 | 466 | 666 |
| **2** | **Sale** | | | | | | | |
| 2.1 | One ICC | 965 | 0.45 | 30% | 70% | 130 | 304 | 434 |
| 2.2 | Two ICC | 1625 | 0.45 | 30% | 70% | 219 | 512 | 731 |
| | | | | **GRAND TOTAL** | | **896** | **2090** | **2986** |

**Considerations for solid waste generation:**

- **For Residential** : 70 % wet garbage and 30 % dry garbage out of total 0.45 Kg/person /day

The total quantities of solid waste that will be generated in the project will be 2986 kg/day. Out of which 896

kg/day will be non-biodegradable and 2090 kg/day will be biodegradable.

- Segregation of non biodegradable and biodegradable garbage on site.
- Bio degradable garbage: Treatment in OWC (Organic Waste Convertor)
- Non- biodegradable garbage: Segregated into recyclable and non-recyclable waste.
  Recyclable waste: Handed over to recyclers and
  Non-recyclable waste: Handed over to M.C.G.M.
- STP Sludge (Dry sludge): Used as manure within the premises for plants.

**I. Power requirement:**
**During Construction Phase -**
Local Authority : 100 KW
D.G. Sets: as per requirement

**During Operational Phase -**
Source: From TATA Power

**Table No.10: Power Requirement of the project**

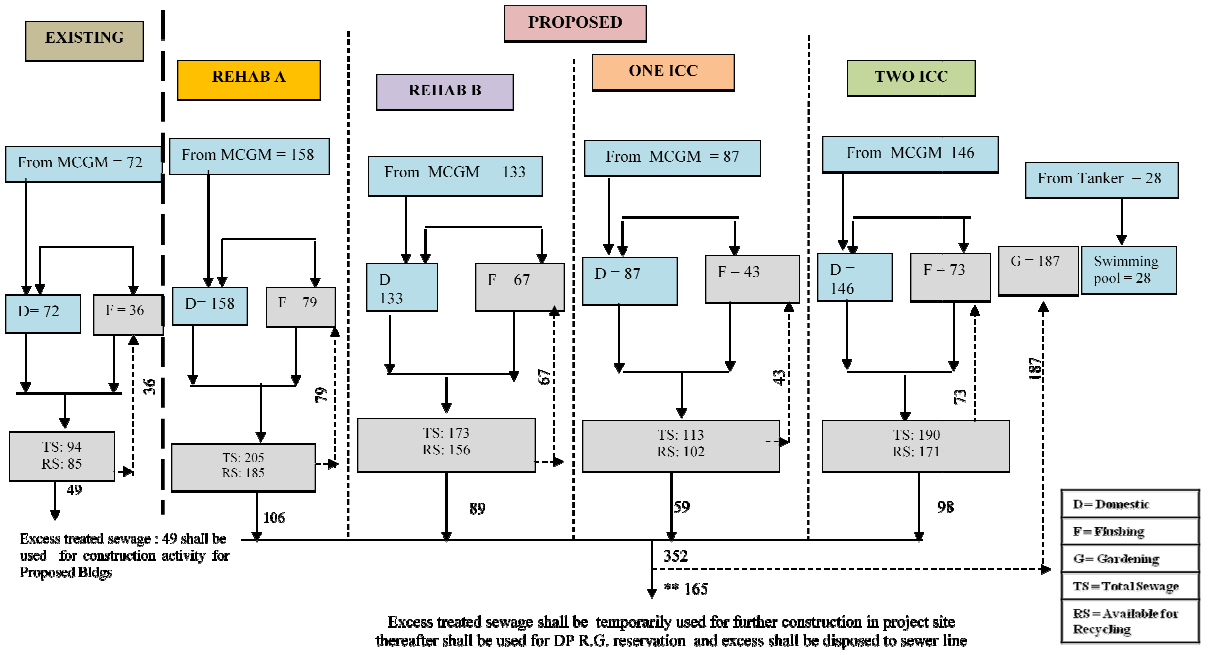
| Sr. No. | Description | Existing Building | Proposed | | | Total |
|---|---|---|---|---|---|---|
| | | | Rehabilitation | Sale | | |
| | | | | One ICC | Two ICC | |
| 1. | Connected load (KW) | 4275 | 3971 | 9002 | 12904 | **30152** |
| 2. | Maximum demand(KW) | 2875 | 2606 | 4024 | 5587 | **15092** |
| 3. | D.G sets (In case of power failure) | 1 DG set of 1010 kVA | 1 DG set of 500 kVA & 1 DG set of 500 kVA | 1 DG set of 1010 kVA & 1 DG set of 625 kVA | 1 DG set of 1010 kVA & 1 DG set of 625 kVA | |

| | |
|---|---|
| 1.3 | **What are the likely impacts of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing land use, disturbance to the local ecology).** |
| | Project site will be developed into a Residential development. Hence, there shall have some impacts on water, air environment, power requirement but it shall be mitigated by providing proper pollution control facilities like STP. Also for water conservation, rain water harvesting shall be done. Power consumption shall be reduced by using energy saving practices. Impact on air quality shall be reduced by plantation of trees on green cover area. This project will generate employment during construction phase and there by shall have positive impact on socio economy. |
| 1.4 | **Will there be any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity etc. may be given).** |
| | As per the Seismic Zoning Map of India, region falls under Zone- III. Stability Certificate, as per prevalent IS Code will be obtained for these buildings from registered Consulting Structural Engineer considering the seismic forces and wind forces etc. |
| 1.5 | **Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)** |
| | The proposal will not involve alteration of natural drainage systems. |
| 1.6 | **What are the quantities of earthwork involved in the construction activity-cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc)** |
| | The excavated material and construction waste generated shall be partly recycled on site and shall be partly |

| | |
|---|---|
| | disposed to authorized site through authorized contractors with permission from M.C.G.M. |
| 1.7 | **Give details regarding water supply, waste handling etc during the construction period.** |
| | Water Requirement during Construction Phase:<br>From tankers (For Construction): 30-40 KLD. (Depending upon the construction activity).<br>From M.C.G.M. (For Workers): 32 KLD.<br>The sewage generated approximately 31 KLD will be disposed to sewer line. |
| 1.8 | **Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)** |
| | No. |
| 1.9 | **Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)** |
| | **Solid Waste Generation during Construction Phase:**<br>Construction waste shall be partly reused on site and shall be partly disposed to authorized site through authorized contractors with permission from<br>Biodegradable garbage = 10 kg/day<br>Non-biodegradable garbage = 40 kg/day<br>Total = 50 kg/day<br>This waste shall be segregated and shall be handed over to M.C.G.M. |
| **2** | **WATER ENVIRONMENT** |
| 2.1 | **Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement be met? State the sources & quantities and furnish a water balance statement.**<br>**Water Requirement & Source:**<br><br>**<u>During Construction Phase –</u>**<br>For Workers : M.C.G.M. : 32 KLD<br>For Construction : From Tankers : 30-40 KLD<br><br>**<u>During Operational Phase</u>**<br>**Table No.11: Total Water Requirement & Source** |

| Use | Quantity (KLD) | Source |
|---|---|---|
| Domestic | 596 | M.C.G.M. |
| Flushing | 298 | Treated STP treated sewage |
| Gardening | 187 | Treated STP treated sewage |
| Swimming Pool | 28 | Tanker water of potable quality |

## WATER BALANCE PER DAY BASIS DURING NON MONSOON




**All Quantities are in KLD**

**Please Note:** We have considered 80 % sewage of total of domestic and flushing requirement.

*We have considered 10 % less availability of sewage for recycling considering losses of sewage in evaporation and sludge formation

**After commissioning of STP the excess treated sewage shall be used for DP R.G. reservation and for further construction activities

Total water requirement = 1109

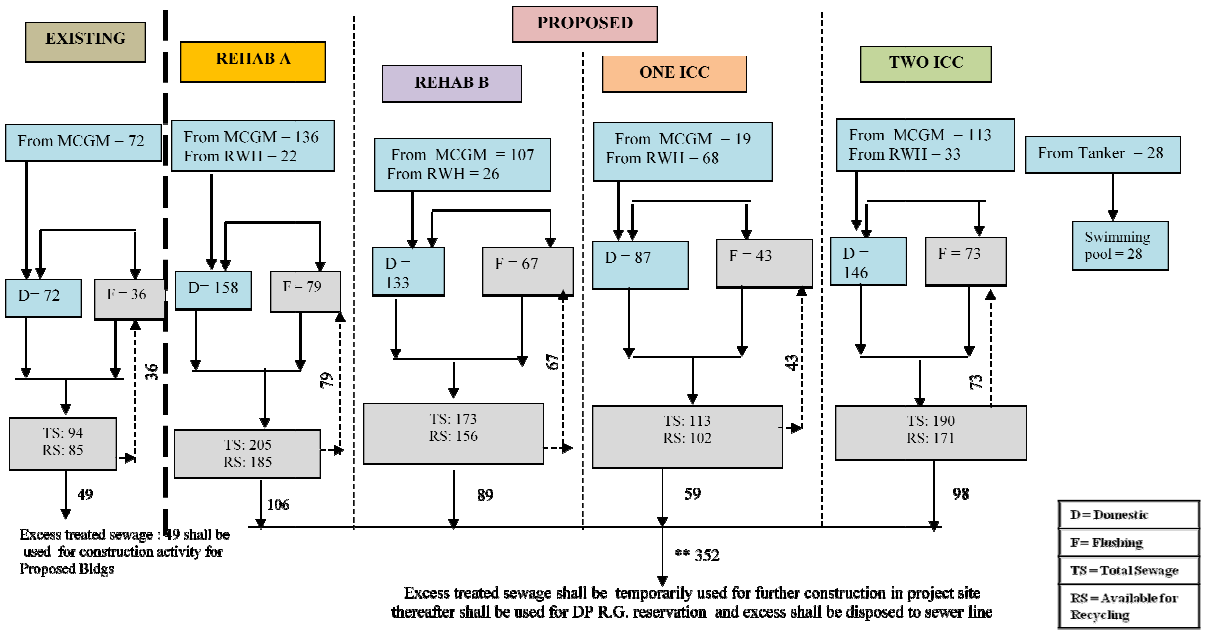
Recycling of treated sewage for

- flushing (298)
- gardening (187)

Hence Net water requirement = 624 (From MCGM = 596, From Tanker of potable quality = 28)

Reduction in Net water demand = 43.73 %

## WATER BALANCE PER DAY BASIS FOR MONSOON




**All Quantities are in KLD**

**Please Note:** We have considered 80 % sewage of total of domestic and flushing requirement.

*We have considered 10 % less availability of sewage for recycling considering losses of sewage in evaporation and sludge formation

**After commissioning of STP the excess treated sewage shall be used for DP R.G. reservation and for further construction activities

Total water requirement = 922

Recycling of treated sewage for flushing (298)

RWH = 149

Hence Net water requirement = 475 (From MCGM = 447 & from tanker of potable quality = 28)

Reduction in Net water demand = 48.5%

| | |
|---|---|
| 2.2 | **What is the capacity (dependable flow or yield) of the proposed source of Water?** |
| | Domestic Water Supply from M.C.G.M. During monsoon season rain water harvested in tank will also be used for domestic purpose. |
| 2.3 | **What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)** |
| | Drinking water quality of Class A as per Indian Standard: 10500, 2004 from M.C.G.M. |
| 2.4 | **How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)** |
| | All secondary requirements like flushing (298 KLD) and gardening (187 KLD) would be fulfilled by treated sewage 699 KLD from STP. Excess treated sewage i.e. during non monsoon (625 KLD) and during monsoon (794 KLD) shall be disposed off to the sewer line. |
| 2.5 | **Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)** |
| | M.C.G.M. has common water supply. |
| 2.6 | **What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)** |

Sewage generation from Existing and Proposed buildings and capacity of STPs for its treatment are as follows:

| S. N. | Details | Sewage (KLD) | STP Capacity (KL) |
|---|---|---|---|
| **A** | **Existing** | 94 | 103 |
| **B** | **Proposed** | | |
| **1** | **Rehabilitation** | | |
| 1.1 | Rehabilitation- A | 205 | 225 |
| 1.2 | Rehabilitation - B | 173 | 190 |
| **2** | **Sale** | | |
| 2.1 | One ICC | 113 | 125 |
| 2.2 | Two ICC | 190 | 210 |

Treated sewage used for Flushing (298 KLD) and Gardening (187 KLD)

**UNTREATED AND TREATED SEWAGE QUALITY:**

**Table No.12: Untreated & Treated Sewage Quality**

| SR. NO. | DETAILS | VALUES | | UNITS |
|---|---|---|---|---|
| | | UNTREATED | TREATED | |
| **1.** | pH | 7.0 – 8.0 | 6.5 – 7.5 | |
| **2.** | Total Suspended solids | 250 | ≤ 10 | mg/lit |
| **3.** | Chemical Oxygen Demand | 400 | ≤ 30 | mg/lit |
| **4.** | BOD, 5 day, 20 °C | 250 | ≤ 10 | mg/lit |
| **5.** | Oil & grease | 50 | <5 | mg/lit |

| | |
|---|---|
| 2.7 | **Give details of the water requirements met from water harvesting? Furnish details of the facilities created.** |
| | Rain water from terrace area will be collected in Rain water harvesting tanks as follows: |

| S. N. | Details | RWH Tank Capacity |
|---|---|---|
| | **Proposed** | |
| **1** | **Rehabilitation** | |

| | | | |
|---|---|---|---|
| 1.1 | Rehabilitation - A | 1 tank of total capacity 49 KL | |
| 1.2 | Rehabilitation - B | 1 tank of total capacity 54 KL | |
| **2** | **Sale** | | |
| 2.1 | One ICC | 1 tank of total capacity 144 KL | |
| 2.2 | Two ICC | 1 tank of total capacity 72 KL | |

2.8 **What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long term basis? Would it aggravate the problems of flooding or water logging in any way?**

**Total runoff for total Site & catchment area is as follows:**

| **Details** | **Capacity($m^3$/sec)** |
|---|---|
| Total run off before development | 1.94 |
| Run off after development from plot | 2.33 |
| Carrying Capacity of Internal Storm water drains | 3.47 |
| Carrying Capacity of External Storm Water Drain | 4.57 |

Storm water drainage system of adequate capacity shall be laid down considering runoff from the plot as well as from catchment area outside plot

**Management plan for Flood is as follows :**

- Storm water drain shall be cleaned at regular interval.
- Mapping the areas within or leading in or out of the building that will be water logged, flooded or isolated due to the flood. The areas will be marked after completion of the project (as final ground levels etc. will be available after completion).
- The vulnerability of the basements should be mapped.
- Dewatering pumps shall be installed at vulnerable locations.

2.9 **What are the impacts of the proposal on the ground water? (Will there be tapping of ground water; give the details of ground water table, recharging capacity, and approvals obtained from competent authority, if any)**

The ground water table at the project site is between 6.5 to 9.5 mt which is high hence no ground water recharging is proposed.

2.10 **What precautions/measures are taken to prevent the run-off from construction activities polluting land & aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts).**

The runoff from the site during construction phase would be very negligible.
Prevention under :

i) Use of wet jute cloth covering the walls and soaking the same with minimum quantity of water to avoid dripping. This will also help in conserving water
ii) By collecting the running water in an impervious pit and using the same again for curing purpose

2.11 **How is the storm water from within the site managed?(State the provisions made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)**.

Internal storm water drains will be constructed strictly in accordance to the governing authority regulations.
**Peak runoff after development = 2.33 $m^3$/sec**
Internal SWD is designed considering peak runoff after development

2.12 **Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)**

- During construction phase, temporary toilets with connection to septic tank shall be used. Hence there will not be unsanitary conditions around the project site.
- Regular segregation and disposal of solid waste generated by these workers shall be as per M.C.G.M. practices.
- First aid and medical facilities will be provided to all the concerned people working on the site.
- Proper housekeeping will be maintained throughout the premises.
- Regular pest control on site.

2.13 **What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal).**

**Design Basis of Treatment plant - MBBR (Moving Bed Bio Reactor)**

**Table No.13: Untreated & Treated Sewage Quality**

| SR. NO. | DETAILS | VALUES | | UNITS |
|---|---|---|---|---|
| | | UNTREATED | TREATED | |
| 1. | pH | 7.0 – 8.0 | 6.5 – 7.5 | -- |
| 2. | Total Suspended solids | 250 | ≤ 10 | mg/lit |
| 3. | Chemical Oxygen Demand | 400 | ≤ 30 | mg/lit |
| 4. | Biochemical Oxygen Demand, 3 day, 27 °C | 250 | ≤ 10 | mg/lit |
| 5. | Oil & grease | 50 | <5 | mg/lit |

**Design Basis of Treatment plant – MBBR (Moving Bed Bio Reactor)**

The treatment will include the following unit / equipment;

- **Screen chamber**
- **Oil & Grease Trap**
- **Collection tank**
- **Raw Sewage Transfer pumps**

All the sewage generated will gravitate through **Bar Screen**. The Bar screen will take care of any floatable matter, which will be manually scraped out and collected in drums. Bar screen will comprise of SS plate type screen for removing floatable matter. From the bar screen it will then pass on to the **Oil & Grease Trap** for removal of free floating oil. The oil will be scrapped and collected in drums to be disposed as per statutory norms. The sewage will be collected in **Collection tank.** Uniform mixing is achieved by providing aeration grid (air sparging) in the collection tank. After completion of mixing, the sewage will be pumped at a uniform rate by sewage transfer pumps to Biological Treatment.

**Biological treatment (secondary treatment):**

This will include the following;

- **MBBR Bioreactor**
- **Secondary Clarifier**
- **Sludge Dewatering System-(Filter press)**

The process will be of activated sludge extended aeration biological process of Moving Bed Bio Reactor (MBBR) type. The MBBR process will be an aerobic system having two biological growth process- attached growth and suspended growth. The pretreated sewage will be pumped into MBBR where support media will provide more surface area for Biological growth. Oxygen will be added for biological growth through tubular diffusers.

The effluent will be uniformly pumped to **MBBR Reactor** to biologically degrade the organic matter. The oxygen required for the bacterial growth will be supplied through **Diffuser systems.** The system envisages better oxygen transfer because of fine bubbles and increased contact with the sewage.

The overflow from **MBBR Reactor** will gravitate to the **Secondary clarifier.** The arrested sludge will be pumped back to the Aeration tank to maintain the bacterial concentration in the tank and excess sludge will be will be sent to the **Sludge collection pit** and dewatered using a **Filter press**. The filtrate will be taken to the Raw Sewage Collection Tank. The dried sludge can be used as manure for gardening.

**Tertiary Treatment:**

The treatment will include the following unit / equipment;

- **Filter feed tank**
- **Pressure Sand Filter**
- **Activated Carbon Filter**
- **UV system**

The clear supernatant from the Secondary clarifier will be collected in a **Filter feed tank** this tank will be provided with level switch for unmanned operations. The treated sewage will be pumped to **Pressure Sand Filter followed by Activated Carbon Filter.** After ACF treated sewage will be passed through **UV filtration** for disinfection. After UV filtration treated sewage will be collected in **Treated Water Tank.** Treated sewage from Treated Water Tank can be used for irrigation or flushing.

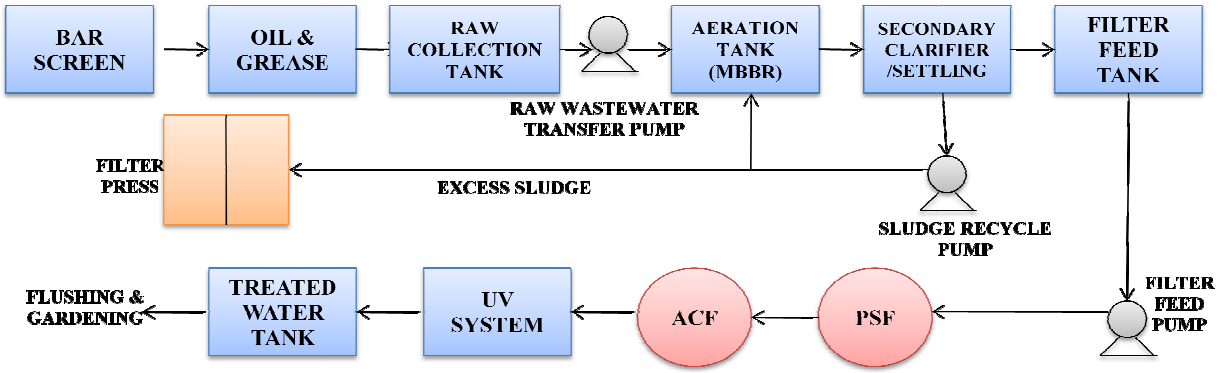



**Figure: STP Process Diagram ( MBBR Process)**

| | |
|---|---|
| 2.14 | **Give details of dual plumbing system if treated waste used is used for flushing of toilets or any other use.** |
| | Recycling of treated sewage for flushing and gardening.<br>Color coding for dual plumbing system shall be done as per standard practices. |
| **3** | **VEGETATION** |
| 3.1 | **Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with its unique features, if any)** |
| | No. |
| 3.2 | **Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project).** |

| | Already done | To be done | Total |
|---|---|---|---|
| Cut | 139 | 5 | 144 |
| Transplant | 84 | 4 | 88 |
| Retain | 412 | 0 | 412 |

| | |
|---|---|
| 3.3 | **What are the measures proposed to be taken to minimize the likely impacts on important site** |

| | |
|---|---|
| | **features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale)** |
| | Plantation of around 934 nos. of trees on ground of various varieties out of which 350 nos. of trees has been already planted. |
| **4** | **FAUNA** |
| 4.1 | **Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.** |
| | No |
| 4.2 | **Any direct or indirect impacts on the avifauna of the area? Provide details.** |
| | No |
| 4.3 | **Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna.** |
| | Not applicable. |
| **5** | **AIR ENVIRONMENT** |
| 5.1 | **Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)** |

One season baseline data for ambient air parameters namely $PM_{10}$ , $PM_{2.5}$, Oxides of Sulphur, Oxides of Nitrogen, CO at project site and in an area extending 500 meters radius from the boundary of project site has been monitored.

**AVERAGE AMBIENT AIR QUALITY AT THE PROJECT SITE**
**Period: November 2012 to January 2013**
**Table No.14: Average Ambient Air Quality at the Project Site**

| Station Code | AAQM Station | $PM_{2.5}$ (24 hr) ($\mu g/m^3$) | $PM_{10}$ (24hr.) ($\mu g/m^3$) | $SO_2$ (24hr.) ($\mu g/m^3$) | NOx (24hr) ($\mu g/m^3$) | CO (1 hr) ($mg/m^3$) |
|---|---|---|---|---|---|---|
| | | Average | Average | Average | Average | Average |
| AQ1 | Project site | 50 | 77 | 15 | 22 | 1.63 |
| AQ2 | Near Kirti Night College, Wadala | 72 | 49 | 16 | 20 | 0.98 |
| AQ3 | Near Lokseva Sangh Mumbai School, Wadala | 48 | 76 | 18 | 27 | 1.94 |
| AQ4 | Near Dr. Ambedkar College, Wadala | 53 | 75 | 20 | 28 | 1.73 |
| AQ5 | Near MBPT Quarters, Wadala | 46 | 72 | 12 | 20 | 1.51 |

**All the monitoring stations have been considered as residential zones. After tabular and graphical representation of Ambient Air quality it can be observed that:**

- The average values of $PM_{2.5}$ ranged in between 46 $\mu g/m^3$ to 72 $\mu g/m^3$ and $PM_{10}$ ranged in between 49 $\mu g/m^3$ to 77 $\mu g/m^3$.
- The average values of $SO_2$ was in between 12 $\mu g/m^3$ to 20 $\mu g/m^3$, $NO_x$ was in between 20 $\mu g/m^3$ to 28 $\mu g/m^3$ and CO ranged in between 0.98 $mg/m^3$ and 1.94 $mg/m^3$.
- All the parameters were found to be within the desired limits specified by CPCB except value of $PM_{2.5}$ near Kirti Night College, Wadala (AQ2) which is exceeding permissible limits due to vehicular movement in nearby roads.
- Graphical comparison with baseline data of January-March 2010 shows decrease in value of $PM_{10}$ but values of $SO_2$ and NOx show increase in value.

| | |
|---|---|
| 5.2 | **What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.** |

**Sources of Air pollution During Construction phase :**

- Increased level of dust and other air pollutants due to demolition, site clearances, building construction and other related activities
- Emissions from vehicles carrying the construction materials
- Emissions from DG sets
- Open burning of solid wastes can cause air pollution

**Mitigation Measures:**

- Water sprinkling on site for dust suppression
- Use of covering sheets shall be done for trucks carrying construction material to prevent air borne dust
- All material storages shall be adequately covered to avoid dust / particulate emissions
- Use of CPCB approved DG sets
- Proper maintenance of DG sets
- Adequate parking provision and proper traffic arrangement for smooth traffic flow
- Vehicles having valid pollution under control certificate shall be allowed to ply on site
- Open burning of solid waste shall be prohibited
- Regular health checkup of the worker
- Provision of masks to workers

**Sources of Air pollution During Operational phase :**

- Vehicular emissions
- Emissions from DG sets

**Mitigation Measures:**

- Adequate parking provision and proper traffic management for smooth traffic flow
- Stack height of DG sets shall be as per norms of Central Pollution Control Board (CPCB) to allow effective dispersion of pollutants
- Proper maintenance of DG sets shall be done
- Plantation of around 934 Nos. of trees of various varieties on ground out of which 350 nos. of trees has been already planted

Climatological data is obtained from India Meteorological Department (IMD) station for one full year. Micro meteorological data consisting of wind speed, wind direction, temperature, humidity, rainfall (peak and average daily rainfall) and wind rose patterns have been reported in EIA.

5.3 **Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.**

| Sr. No. | Phases | Parking Numbers (4W) | | Parking Area in Sq.mt. |
|---|---|---|---|---|
| | | Parking requirement | Parking provision | |
| **A** | **Existing** | **403** | **461** | **14332** |
| **B** | **Proposed** | | | |
| **1** | **Rehabilitation** | | | |
| 1.1 | Rehab - A | 55 | 56 | 1669.48 |
| 1.2 | Rehab - B | 47 | 48 | 800.63 |
| **2** | **Sale** | | | |
| 2.1 | One ICC | 518 | 540 | 45833.52 |
| 2.2 | Two ICC | 813 | 835 | |
| | **Total** | **1836** | **1940** | **62635.63** |

| | |
|---|---|
| | Detailed traffic study has been incorporated in EIA report |
| 5.4 | **Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.** |
| | • The project proponents have proposed to provide adequate well organized captive and public parking arrangement<br>• This project would have separate entry /exit points for residential & shops<br>• Proper internal road designed to avoiding traffic |
| 5.5 | **Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.** |
| | **Sources of Noise pollution During Construction phase :**<br>• Noise due to demolition/construction activities<br>• Impact due to transportation activities<br>• Nuisance to nearby areas due to noise polluting work at night<br>• Noise generated due to DG sets<br><br>**Mitigation Measures:**<br>• During demolition/construction activities the noise will be monitoring to ascertain the noise levels are within limit<br>• All precautions for noise abatement shall be taken during the construction activities<br>• High noise construction activity there will be provision of ear plugs for construction labour and staff<br>• No noise polluting work in night shifts<br>• Provision of barricades along the periphery of the site<br>• Acoustic enclosure for DG sets<br><br>**Sources of Noise pollution During Operational phase :**<br>• Impact of noise due to vehicular traffic<br>• Noise generated due to DG sets<br>• Noise generated due to railway line abutting to the plot<br><br>**Mitigation Measures:**<br>• Provision of proper parking arrangement, traffic management plan for smooth flow of a vehicle helps to abate noise pollution due to vehicular traffic<br>• Plantation of around 934 Nos. of trees of various varieties on ground out of which 350 nos. of trees has been already planted that shall act as natural noise buffer<br>• Maintain acoustic enclosure for DG sets |
| 5.6 | **What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.** |
| | D.G. Sets will be operated only in case of power failures during operational phase. The Pollutants like SPM, $SO_2$ that may arise from emissions from D.G. Sets will be discharged through vent of proper height.<br>D.G. sets are with inbuilt acoustic enclosures to reduce the noise of D.G. sets while in operation. Plantation of trees would act as noise barrier and will reduce the noise level.<br>Noise modeling details are reported in EIA |
| **6** | **AESTHETICS** |
| 6.1 | **Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?** |
| | No. |
| 6.2 | **Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?** |

| | |
|---|---|
| | All precautions will be taken to mitigate the impact due to water, air and noise pollution during construction and operation phase. Environmental Management plan is prepared and shall be implemented along with Environmental Monitoring Programme. |
| 6.3 | **Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.** |
| | No. |
| 6.4 | **Are there any anthropological or archaeological sites or artifacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.** |
| | No such site in the vicinity. |
| **7** | **SOCIO-ECONOMIC ASPECTS:** |
| 7.1 | **Will the proposal result in any changes to the demographic structure of local population? Provide the details.** |
| | There will be influx of about ~2590 people (Sale occupancy only). |
| 7.2 | **Give details of the existing social infrastructure around the proposed project.** |
| | As Mumbai is a cosmopolitan city we found the people of different religion and cast. Main languages spoken in the district are Marathi, Hindi, and Gujarati. Civil structures, School, Colleges, Hospitals, Recreation facilities, Markets, etc. are available in the area to a reasonable degree. |
| 7.3 | **Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?** |
| | No |
| **8** | **BUILDING MATERIALS** |
| 8.1 | **May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)** |
| | The conservation material & resources strategy will be achieved through the following:<br>▪ Reducing and Reusing of Waste<br>▪ Using recycled material in construction<br>▪ Use of Regional Material in construction |
| 8.2 | **Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?** |
| | Measures taken to minimize the impacts during transport and handling of materials during construction phase are as follows:<br>• Major portion of the excavation shall be done by mechanical means and shall be disposed using dumpers during the off peak hours<br>• Excavation area, access road to excavation area and site dumping area will be marked on drawing.<br>• All these areas will be barricaded with necessary safety sign boards and sufficient illumination.<br>• The useful excavated material will be stacked at approved area within site. The area will be safely secured<br>• The surplus or discarded excavated material will be taken out of construction site and will be dumped as per the approved guidelines of the local authorities.<br>• The outgoing vehicles will be checked for proper covering and cleaning of tyres.<br>• Washing bay & silt trap will be provided. |
| 8.3 | **Are recycled materials used in roads and structures? State the extent of savings achieved?** |
| | • Fly Ash will be used in Concrete (12-15 %)<br>• Pozzolana Cement containing upto 20% fly ash will be used for plaster, masonary, flooring.<br>• BBC water proofing will be done with old bricks.<br>• Use of single glazed glass for windows<br>• Thermal insulation in roofs.<br>• Low VOC (volatile organic compound) paints will be used. |

| | |
|---|---|
| | • Energy efficient materials and systems will be utilized. |
| 8.4 | **Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.** |
| | • Segregation of non biodegradable and biodegradable garbage on site<br>• Bio degradable garbage: Composting in OWC (Organic Waste Convertors)<br>• Non- biodegradable garbage: Segregated into recyclable and non-recyclable waste<br>o Recyclable waste: Handed over to recyclers &<br>o Non-recyclable waste: Handed over to Local Authority<br>• STP Sludge (Dry sludge): Used as manure within the premises for plants |
| **9** | **ENERGY CONSERVATION** |
| 9.1 | **Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?** |

**Power Requirement**
**During Construction Phase –**
TATA power : 100 KW
D.G. Sets: as per requirement

**During Operational Phase -**
Source: From TATA power
**Table No.18: Power Requirement**

| Sr. No. | Description | Existing | Rehabilitation | One ICC | Two ICC | Total |
|---|---|---|---|---|---|---|
| 1. | Connected load (KW) | 4275 | 3971 | 9002 | 12904 | 30152 |
| 2. | Maximum demand (KW) | 2875 | 2606 | 4024 | 5587 | 15092 |
| 3. | Capacity of DG sets (In case of power failure only) | 1 DG set of 1010 kVA | • 1 DG set of 500 kVA<br>• 1 DG set of 500 kVA | • 1 DG set of 1010 kVA &<br>• 1 DG set of 625 kVA | • 1 DG set of 1010 kVA &<br>• 1 DG set of 625 kVA | |

**Following Energy conservation measures are proposed for Energy Saving:**

- Energy efficient fluorescent tube lights & CFL lamps which give approx. 30% more light output for the same watts consumed and therefore require less nos. of fixtures and corresponding lower point wiring costs. The life of T5 tubes are 2.5 to 3 times time conventional tubes and hence the cost of replacement is quite less and hence rate of disposal of tubes reduced drastically.
- All fluorescent light fixtures will be specified to incorporate electronic ballast with THD less than 5% which have less watt-loss compared to electromagnetic ballast and result in superior operating power factor. Electronic chokes also improve the life of the fluorescent lamps.
- Bus bars in all distribution panels are specified as copper bus-bars to reduce losses and improve reliability.
- Copper conductor cables will be specified for sizes up to 16 sq.mm, this will reduce losses and improve reliability.
- All cables will be de-rated to avoid heating during use. This also indirectly reduces losses and improves reliability.
- Variable frequency drives will be incorporated on motor feeders which will save considerable energy.
- Occupancy Presence sensors & day-light sensors will be provided where ever feasible.

<table>
<tr><td></td><td>
<ul>
<li>General lighting shall be through energy efficient fluorescent lamps and illumination levels shall be generally in line with National Building Code.</li>
<li>10% of common area / staircases / basement parking corridor lights shall be designated as emergency lights and shall be connected to individual inverters for uninterrupted illumination.</li>
<li>All vertical fenestration will have Double Glazing Glass Panel with SHGC as per ECBC.</li>
<li>All the external walls will be 225mm brick plastered on both sides and no additional insulation is envisaged.</li>
<li>All WCs shall have dual flush cistern rather than single flush type & flush valve combination which will reduce consumption of water significantly.</li>
<li>All common area low flow plumbing fixture shall be installed to conserve the water. For the residents, guide lines shall be given to use the efficient plumbing fixtures to conserve the water.</li>
<li>The water supply to the tower is by gravity with booster pumps for the floors which are at close proximity.</li>
<li>Solar powered lightings for landscape and common areas</li>
<li>Solar powered water heating</li>
</ul>
</td></tr>
<tr><td>9.2</td><td>What type of, and capacity of, power back-up to you plan to provide?</td></tr>
<tr><td></td><td>D.G. Set for emergency backup during power failure are as follows:
<table>
<tr><th>S. N.</th><th>Details</th><th>Capacity of DG sets</th></tr>
<tr><td>A</td><td>Existing</td><td>1 DG set of 1010 kVA</td></tr>
<tr><td>B</td><td>Proposed</td><td></td></tr>
<tr><td>1</td><td>Rehabilitation</td><td></td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>2</td><td>Sale</td><td></td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
</table>
</td></tr>
<tr><td>9.3</td><td>What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?</td></tr>
<tr><td></td><td>Glass shall be used only for windows.</td></tr>
<tr><td>9.4</td><td>What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.</td></tr>
<tr><td></td><td>
<ul>
<li>Roof assembly- U factor to be max 0.261w/m² °C</li>
<li>Opaque walls - Max U factor to be 0.440w/m² °C</li>
<li>Vertical fenestration-Max U factor to be 3.30w/m² °C</li>
</ul>
</td></tr>
<tr><td>9.5</td><td>Does the layout of streets & buildings maximize the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.</td></tr>
<tr><td></td><td>
<ul>
<li>Solar powered lightings for landscape and common areas</li>
<li>Solar powered water heating</li>
</ul>
</td></tr>
<tr><td>9.6</td><td>Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?</td></tr>
<tr><td></td><td>
<ul>
<li>Roof assembly- U factor to be max 0.261w/m² °C</li>
<li>Opaque walls - Max U factor to be 0.440w/m² °C</li>
<li>Vertical fenestration-Max U factor to be 3.30w/m² °C</li>
</ul>
</td></tr>
<tr><td>9.7</td><td>Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-</td></tr>
</table>

| | |
|---|---|
| | **conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.** |
| | **Following Energy conservation measures are proposed for Energy Saving:**<br>• Energy efficient fluorescent tube lights & CFL lamps which give approx. 30% more light output for the same watts consumed and therefore require less nos. of fixtures and corresponding lower point wiring costs. The life of T5 tubes are 2.5 to 3 times time conventional tubes and hence the cost of replacement is quite less and hence rate of disposal of tubes reduced drastically.<br>• All fluorescent light fixtures will be specified to incorporate electronic ballast with THD less than 5% which have less watt-loss compared to electromagnetic ballast and result in superior operating power factor. Electronic chokes also improve the life of the fluorescent lamps.<br>• Bus bars in all distribution panels are specified as copper bus-bars to reduce losses and improve reliability.<br>• Copper conductor cables will be specified for sizes up to 16 sq.mm, this will reduce losses and improve reliability.<br>• All cables will be de-rated to avoid heating during use. This also indirectly reduces losses and improves reliability.<br>• Variable frequency drives will be incorporated on motor feeders which will save considerable energy.<br>• Occupancy Presence sensors & day-light sensors will be provided where ever feasible.<br>• General lighting shall be through energy efficient fluorescent lamps and illumination levels shall be generally in line with National Building Code.<br>• 10% of common area / staircases / basement parking corridor lights shall be designated as emergency lights and shall be connected to individual inverters for uninterrupted illumination.<br>• All vertical fenestration will have Double Glazing Glass Panel with SHGC as per ECBC.<br>• All the external walls will be 225mm brick plastered on both sides and no additional insulation is envisaged.<br>• All WCs shall have dual flush cistern rather than single flush type & flush valve combination which will reduce consumption of water significantly.<br>• All common area low flow plumbing fixture shall be installed to conserve the water. For the residents, guide lines shall be given to use the efficient plumbing fixtures to conserve the water.<br>• The water supply to the tower is by gravity with booster pumps for the floors which are at close proximity.<br>• Solar powered lightings for landscape and common areas<br>• Solar powered water heating |
| 9.8 | **What are the likely effects of the building activity in altering the micro-climates? Provide a self assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?** |
| | It will not alter the microclimate. The construction will not cause inversion. |
| 9.9 | **What are the thermal characteristics of the building envelope? (a) roof; (b) external walls; and (c) fenestration? Give details of the material used and the U-values or the R values of the individual components.** |
| | • Roof assembly- U factor to be max 0.261w/m² °C<br>• Opaque walls - Max U factor to be 0.440w/m² °C<br>• Vertical fenestration-Max U factor to be 3.30w/m² °C |
| 9.10 | **What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.** |

**FIRE FIGHTING MEASURES:**

The fire fighting system has been designed considering the following codes, manual and guidelines as described below:

- The fire fighting system has been designed considering the following codes, manual and guidelines as described below:
  - National Building Code of India (NBC);
  - As per requirement of fire officer/local fire approving authorities; and
  - As per Indian Standard Code for Fire Protection (IS Codes given in NBC, 2005).
- There will be adequate location of fire hydrant with Hose Reel proposed to be installed in all blocks.
- Underground fire water storage tank of adequate capacity.
- Proper Fire Escape routes.
- Portable fire extinguishers of IS specification.
- Fire safety equipments like fire blankets, fire alarm bells.
- Provision of Fire escape masks.
- Adequate number of fire lifts with independent electric supply.
- Alternate source of power supply / D.G sets.
- Refuge areas as per CFO Norms.
- Provision of Signages.

| | |
|---|---|
| 9.11 | **If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.** |
| | Glass shall be used only for windows. |
| 9.12 | **What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.** |
| | It has not been studied. |
| 9.13 | **To what extent the non-conventional energy technologies are utilized in the overall energy consumption? Provide details of the renewable energy technologies used.** |
| | • Solar powered lightings for landscape and common areas<br>• Solar powered water heating |
| **10** | **Environment Management Plan** |

The Environment Management Plan would consist of all mitigation measures for each activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.

**ENVIRONMENTAL IMPACT AND MANAGEMENT PLAN FOR THE PROJECT**

**EMP for Construction Phase**

| Sr. no. | Environmental Component | Activity | Impacts | Precautionary measures |
|---|---|---|---|---|
| 1 | Ambient Air Quality & Noise level | • Site Clearance<br>• Excavation<br>• Construction of Structures<br>• Heavy vehicle traffic<br>• Use of DG Set<br>• Open burning of waste | • Increased level of dust & other air pollutants<br>• Increased Noise level. | **For controlling air pollution :**<br>• Water Sprinkling<br>• Cover on trucks<br>• Use of RMC instead of preparing concrete at site<br>• Vehicles with valid PUC<br>• **DG sets:** CPCB approved low sulphur fuel. |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | **For controlling noise pollution :**<br>• Barricades along the periphery of the site.<br>• Ear Plugs for Labourers<br>• D.G. sets CPCB approved<br>• No noisy work in night shifts.<br>• Using electrically operated construction equipment. |
| | 2 | Water | • Use of fresh water for Construction activity / labours<br>• Wastewater Generation<br>• Disposal of site<br>• Run off into SWD<br>• Water logging | • Stress on the water supply in the vicinity<br>• Sedimentation<br>• Pollution of nearby water courses.<br>• Unhygienic condition for surrounding residents. | • Use of tanker water for construction. No burden on municipal supply<br>• Provision of temporary toilets for labour.<br>• Precaution to avoid water logging during construction |
| | 3 | Soil | • Preconstruction and excavation debris<br>• Storage of construction material / chemicals<br>• Transportation of hazardous material<br>• Residual paints Solvents/bituminous material etc. operation / maintenance Generation of garbage by labour | • Loss of good fertile soil<br>• Soil erosion, Soil contamination due to mixing of construction material/ accidental spillage of chemicals /oils | • Proper and Separate storage of construction material<br>• Storage of all petroleum products on impervious layers viz. concrete.<br>• Transportation, storage and handling, disposal of HW as per their guidelines and handing it over to authorized agencies.<br>• Use of electrically operated machinery.<br>• Segregation of waste at Source |
| | | Even after taking precautions if soil is found to be contaminated, it shall be removed and disposed off to authorized site. | | | |
| | 4 | Ecology | • Site clearance, Construction of structures, cutting of trees | • Disturbing natural flora and fauna<br>• Loss of vegetation from chemical spills from vehicles | • Plantation of local tree species on the Periphery of site<br>• Plantation of trees will start in mid of construction phase.<br>• Regulation of vehicular trips and speed and proper maintenance of machinery. |

| | | | | |
|---|---|---|---|---|
| 5 | Safety & Hygienic Measures | Construction work Labor | • Positive impact : Employment generation<br>• Safety and hygiene at site may be affected during construction | • Adequate drinking water, toilet and bathing facilities.<br>• Regular analysis of drinking water.<br>• Personal protective and safety equipment will be provided.<br>• First aid facility.<br>• Regular health check up<br>• Regular pest control at site.<br>• Educational and awareness programme for safety measures. |

**EMP for Operation Phase**

| Sr. no. | Environmental Component | Activity | Impacts | Precautionary measures |
|---|---|---|---|---|
| 1 | Ambient Air Quality & Noise level | • Increased vehicular trips,<br>• Use of DG sets | • Traffic congestion<br>• Air pollution<br>• Increase in noise level | • Adequate Parking provision; well organized traffic management plan for Smooth flow of vehicles.<br>• Regular PUC check-up for vehicles.<br>• DG sets: As per CPCB norms, Proper Maintenance, Use of Low sulphur fuel.<br>• Acoustic Enclosures for DG sets<br>• Plantation of tress will reduce air pollution and also act as noise buffer. |
| 2 | Water | • Increased Demand of natural water,<br>• Generation of waste water<br>• Increased paved structure | • Stress on existing water supply,<br>• Pollution of water bodies<br>• Increased run off from site. | • Use of water saving practices<br>• Adoption of dual flush system<br>• Rain water harvesting<br>• Plantation of less water consuming trees.<br>• STP is planned and treated sewage will be used for secondary requirements like flushing and gardening. |
| 3 | Land | • Solid waste generation,<br>• Transportation of hazardous material<br>• Increased paved structure | • Improper disposal of waste,<br>• accidental spillage of hazardous chemicals leads to soil | • Waste minimization recovery and reuse<br>• Segregation at source for all solid waste streams<br>• Treatment of biodegradable garbage by Organic waste converter and its use as manure<br>• Use of dried STP sludge as |

| | | | | |
|---|---|---|---|---|
| | | | contamination<br>• Increased run off from site. | manure<br>• Transportation, storage and handling, disposal of HW as per their guidelines and handling it over to authorized agencies.<br>• Strom water drainage of adequate capacity. |
| | Even after taking precautions if soil is found to be contaminated, it shall be removed and disposed off to authorized site | | | |
| 4 | Ecology | Introduction of new tree species | • Disturbing natural flora and fauna<br>• Increased exposure to anthropogenic activities. | • Plantation of local tree species. |
| 5 | Safety & Hygienic Measures | Influx of people | • Stress on all utilities, risk and danger due to natural and manmade disaster<br>• Positive impact: Employment generation | • Emergency preparedness plan and Disaster management plan will be Prepared and explained with the help of local NGO's and surrounding people and authority. |

Note: Environmental monitoring plan will be prepared based on Environmental management Plan. All environmental parameters will be studied as and when required and based on analysis result mitigation measures will be implemented.

**Hazardous Waste Management Plan:**

**Construction Phase:**

Environmental Management Plan for Hazardous Waste Generation

| Sr. No. | Source of Hazardous Waste Generation | Mitigation Measures |
|---|---|---|
| 1 | Leakages and spillage oil or fuel | * Contaminated soil if any shall be disposed off to Authorized Disposal Site.<br>* Bituminous materials /any other chemicals shall not be allowed to leach into the soil. |
| 2 | Residual Paints/Solvents | --do-- |

Other hazardous wastes, if any, shall also be handled in the similar way through authorized dealers only.

**Operational Phase**

| Sr. No. | Source of Hazardous Waste Generation | Mitigation Measures | Disposal |
|---|---|---|---|
| 1. | Waste Oil from D.G Sets | -- | Waste oil will be handed over to authorized recyclers. |


G. D. AMBEKAR MARG.
ROAD NO. 26
6 M WIDE SERVICE ROAD
BASEMENT LINE
12 M WIDE ROAD
PROPOSED BLDG. 04
(ONE ICC)
B1 to B3 + GROUND
+PODIUM TOP+
1ST TO 53RD FLOOR
HT - 197.60 MT.
213.72 M. AMSL
208.97 M. AGL.
CLUBHOUSE
01
CLUBHOUSE
02
PROP.RG.NO. - 03
(ON PODIUM TOP)
PROP.RG.NO. - 01
EXISTING
BUILDING
SMRT 1
SMRT PLOT
BOUNDARY
PROP.RG.NO. - 02 AREA
PROP.RG.
PROPOSED BLDG. 02
(TWO ICC)
B1 to B3 + GROUND
+PODIUM TOP+
1ST TO 60TH FLOOR
HT - 223.20 MT.
237.49 M. AMSL
232.74 M. AGL.
PROP.RG.NO. - 08
PROP.RG.NO. - 04
PROP.RG.NO. - 05
PHYSICAL R.G.
SCAL
PLOT
PROP.RG.NO. - 06
Basement Line for ICC
ADDITIONAL 10% PHYSICAL
R.G. ON GROUND
12.0 M. WIDE INTERNAL ROAD
PROP.RG.NO. - 07
on PODIUM
ADDITIONAL AREA
EARMARKED AS PER WRIT
PETITION
HANDOVER AREA
MCGM RG
HANDOVER AREA
MHADA
SHOP
ENTRY
REHAB –B
PROP.RG.NO. - 09
PROPOSED REHAB
BLDG. B
B1+ STILT FL.+1ST TO 19TH FL
HEIGHT - 58.10 MT.
PHYSICAL R.G ON GROUND
PROP.RG.NO. - 10
PLOT -E
AMENITY PLOT
PROPOSED
REHAB
BLDG. A
part B1+ STILT FL.+1ST
TO 22nd FLOOR
HEIGHT - 67.75 MT.
PLOT -D
5% AMENITY AREA
ON OWNER'S SHARE
RECEIVING
STATION
VITTHAL MANDIR ROAD
EXIT
REHAB–B
ENTRY
REHAB–A
EXIT
REHAB–A
GROUND FLOOR PLAN

# ENVIRONMENTAL IMPACT ASSESSMENT

**(Revision 1)**

**FOR**

# "ISLAND CITY CENTRE"

**AT**

**C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) of Dadar (East), Naigaon division at G. D. Ambekar Marg, Wadala, Mumbai, Maharashtra**

**By**

## M/s. The Bombay Dyeing & Mfg. Co. Ltd.

**Report Prepared By**


## ULTRA-TECH

**Environmental Consultancy & Laboratory**

**(An ISO 9001-2008 Company, Accredited by NABET , Lab : Gazetted by MOEF, GoI )**

**Thane (West) – 400601**

**Phone: (022) 25342776 / 25380198**

**Fax: (022) 25429650**


**Period: November 2012 to October 2014**

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## LIST OF PLATES



## LIST OF ENCLOSURES

**QUESTIONNAIRE FOR THE ENVIRONMENTAL IMPACT ASSESSMENT OF NEW CONSTRUCTION PROJECTS**

## I. BACKGROUND INFORMATION OF THE PROPOSED PROJECT

| | |
|---|---|
| State clearly the objective of the project: | This Project is proposed by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** The site will be developed as a residential development.<br>This project has received prior Environmental Clearance (EC) details are as follows:<br>**From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006**<br>**From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013**<br>But now reapplied for amendment in EC. |
| Location of the project (attach map to a suitable scale) : | Town/Tehsil: Wadala<br>District: Mumbai<br>State: Maharashtra<br>Latitude : 18°55'6.587"N to 19°6'6.023"N<br>Longitude: 72°45'26.937"E to 72°56'30.665"E<br>Location map of the project site with 10 Km radius around the plot boundary (1: 1000 scale) is given in *Chapter 2 of the Report enclosed.* |
| Names & distances from the nearest : | Eastern Express highway: 0.65 km (Road distance)<br>Railway Station: Wadala Railway station: 1.70 km (Road distance)<br>Airport: Chhatrapati Shivaji Terminus Air port : 17.00 km (Road distance) |
| Name of the agency proposing the new construction project: | **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** |
| Name of the Chief Executive & Postal address:<br>Contact particulars (Tel/Fax/e-mail): | **M/s. The Bombay Dyeing & Mfg. Co. Ltd.**<br>Mr. Yogesh Prabhu - Head Regulatory<br>C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G.D. Ambekar Marg, Wadala, Mumbai, State: Maharashtra.<br>Tel. Nos. : 022 - 61012345<br>Fax Nos.: 022 - 66192001<br>E- mail : Yogesh.Prabhu@bombayrealty.in |
| Type of project: Housing project/Industrial Estate or others: | Residential development |
| Estimated cost of the project:<br>Land cost<br>Estimated construction cost<br>Cost of the Plant & machinery | Total cost: Rs.1978.34 Crores |

## II. SITUATION WITHIN 10 KM RADIUS FROM PROJECT SITE

| | |
|---|---|
| General topography | The plot has gradually sloping ground. *The details are referred in Chapter 3 of the Report enclosed.* |
| Specify general features of land | *The land use details for 15 Km radius around the project site are referred in Chapter 3 sec 3.1.2 of the Report enclosed.*<br>*The land for 2 Km radius around the project site is referred in Chapter 3 of the Report enclosed.* |
| Tree cover-prominent species<br>Fauna-wildlife/domesticated<br>Avifauna | **Project site :**<br>**Flora**: The floristic survey reveals that the project site possesses abundance of plants viz, *Mangifera indica*, *Ficus racemosa, Ficus religiosa* etc.<br><br>**Fauna** : Butterflies like common grass yellow, common Indian crow, common wanderer and small grass yellow were found, while common birds like pigeon, black kites, house sparrow, Indian myna and house crow were dominant. Among mammals, common dog, domestic buffalo and squirrel were observed.<br><br>**Area between project site and 500 m:**<br>**Flora:** Based on field survey and land use map, 5 locations were selected for vegetation studies. The dominant trees are *Tamarindus indica, Peltophorum pterocarpum, Swietenia mahagoni*, *Albizia saman, Delonix regia,* followed by *Terminalia catappa, Azadirachta indica, Ficus bengalensis, Ficus recemosa, Lantana camara, Casuarina equisitifolia* etc.<br><br>**Fauna :**<br>The survey revealed that there were 3 species of common mammals in the study area, while no wild mammal was observed in this area. Two species of reptiles and 2 species of amphibian were recorded. 11 species of birds were noticed during the survey. 9 species of butterflies, dominated by *Eurema brigitta, Danaus chrysippus, Pareronia valeria* and *Euploea core* were observed. Three species of dragonflies and two species of damselflies were recorded<br><br>**Area between 500 m and 15 km**:<br>The area covers Sanjay Gandhi National Park within a 15 Km radius from the project boundary.<br><br>**Wetland ecology:** Birds like white-throated kingfisher, spot-billed duck, purple swamphens, bronze-winged and pheasant- tailed jacanas, ashyprinias, brahminy kite, cormorants, lesser whistling ducks, purple and Indian |

| | |
|---|---|
| | pond herons, great egrets, woolly-necked stork (winter visitor) & whiskered terns are common in these areas. The fishes available in the lakes are: catla (*Catla catla*), mahseer (*Tor khudree* ), calabose (*Labeo calbasu*), mrigal (*Cirrhinus mrigala*), gouramy (*Ophronemus gouramy*), rohu (*Labeo rohita*), silver carp (*Hypophthalmichthys molitrix*), megalop (*Megalopa* sp), common carp (*Cyprinus carpio* ), tilapia (*Tilapia mossambica*), cat fish (*Clarias batrachus*) and other minor varieties. *The details are referred in Chapter 3 of the Report enclosed.* |
| Soil characteristics | The predominant soil cover in Mumbai city is sandy, whereas in the suburban district, the soil cover is alluvial and loamy. Soil sampling was done to further establish the baseline characteristics.<br>On site subsurface layers:<br>Layer I - Fill layer: Sand & non plastic fines<br>Layer II - Sandy Clay: Brown clay<br>Layer–III - Sand: Completely weathered rock<br><br>Soil sampling was done to further establish the baseline characteristics.<br>*The details are referred in Chapter 3 of the Report enclosed.* |
| Natural drainage pattern | Plot has gradually slopping ground with 3 m level difference from Northeast to Southwest corners of the plot land |
| Flood prone areas | Majority of the study area for this project falls under F/South Ward of MCGM. The following places are low – lying areas prone to flooding in monsoon:<br>Dadasaheb Phalke Road, Dr. B. A road, Hindmata, St. Xavier Street, Dabaram Lad Marg - Sardar Hotel, Zakaria Bunder Road 1,2,3, R.A.Kidwai Road., Sewri Cross road No. 7, J.B.Road F/S office.,Mahadeo.Palav. Marg, near Railway Bridge, Godrej Co - Gas company lane |
| Geological features including seismic zone | Greater Bombay is a small archipelago scattered along the west coast of India. The three major islands, Bombay, Trombay and Salsette are separated by tidal flats and creeks. *The details of geographical features are referred in Chapter 3 of the Report enclosed.*<br><br>As per the Seismic Zoning Map of India, study region falls under Seismic Zone-III. The structural design shall be as per prevalent IS Code is obtained for these buildings from registered Consulting Structural Engineer considering the seismic forces and wind forces etc. |
| Existing landuse (area &percentages) map (to include agricultural & non-agricultural uses, commercial, industrial dense/open forests, | The land use for the radius of 2 Km & 15 Km has been studied on the basis of satellite image analysis. Landuse pattern of the study area shows 5 landuse classes. |

| | |
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| fallow land, human settlements,<br>water bodies, transport systems etc.) | Details of Landuse of study area *are referred in section 3.1.2 of Chapter 3 of the Report enclosed.* |
| Predominant activities – residential, institutional, commercial etc. | The site is in Residential zone as per DP remarks. Majority of the land surrounding the site is mixed type i.e. residential and commercial. |
| Special features : (such as tourist spots, monuments/archaeological sites, hospitals, schools, institutions, religious places, heritage areas and places of other interests) | There are various tourist, religious, schools, institutions and historical places within 10 Km area. *The details are referred in Chapter 3 of the Report enclosed.* |
| Specific environmental problems, if any<br>(Such as water and air pollution, land spoliation by natural & manmade factors, endemic diseases, traffic congestion spots in the vicinity of project site, loss of tree cover, open spaces etc.) | *The details are referred in Chapter 3 of the Report enclosed.* |
| Ground level concentrations (major parameters) SPM/RSPM, $SO_2$, $NO_x$, HC, Noise | Environmental Impact Assessment Report has been prepared based on baseline collected during November 2012 to January 2013.<br>RSPM, $SO_2$, $NO_x$ are well within prescribed limit. Noise levels at all locations are exceeding the specified limit of CPCB.<br>*The details are referred in section 3.3 and section3.4 of Chapter 3 of the Report enclosed.* |
| Furnish wind rose diagram | Wind rose diagrams are enclosed *Sub-section 3.3.1 of Chapter 3 of the Report enclosed.* |
| General meteorological data(wind direction, speed, rainfall, temperature<br>Details if any of heat islands, inversions, venturi effect. Impacts on the conceptualization of the proposal | Meteorological data representing the summer season of Mumbai have been collected from the IMD for the year 2012 and 2013. *The details are referred in Sub-section 3.3.1 of Chapter 3 of the Report enclosed.* |
| Human Resources<br>i. Population of study area (10 km radius), | *The details are referred in Sub-section 3.6.1 of chapter 3 of the Report enclosed.* |
| ii. Decadal growth rate, settlement pattern and growth, | *The details are referred in Sub- section 3.6.2 of chapter 3 of the Report enclosed.* |
| iii. Socio-economic conditions | Study area is a developed city area having all modern amenities. Civil structures, School, Colleges, Hospitals, Recreation facilities, Markets, etc. are available in the area. |
| iv. Health: Endemic diseases, Mortality, Epidemics. | No epidemic health problems are reported due to waste water/ air/ soil. |
| Environmental assessment and suitability of the proposed development (specifically identifying the limits) | Environmental Impact assessment for this project has been done by using Delphi Technique. With the methodical working of sensitivity index and weight-ages, the total scope |

| | |
|---|---|
| | of pollution potential has come to 413.9, the site fits into "LOW" Pollution Potential.<br><br>*The details are referred in section 4.2 of Chapter 4 of the Report enclosed.* |

## III. PROMINENT FEATURES WITHIN ABOUT 100 METRES RADIUS FROM THE SITE BOUNDARY (LOCAL AND IMMEDIATE VICINITY)

| | |
|---|---|
| General description<br>(contours at 1m intervals) | Land has gradually slopping ground |
| Natural resources<br>i. Water:<br>a. ground water table, rate of recharge present restrictions on withdrawal, available yield, quality of water (physical, chemical, biological) | Three ground water sampling locations have been observed. |
| b. Surface water location, source and yield, present use (for agriculture, human consumption, industry, etc.) | No surface water sources were observed within 100 meters radius from the site boundary. Primary data was collected within radius of 10 km of the project site for major surface water locations.<br>*The details are referred in section 3.2 of Chapter 3 of the EIA Report enclosed* |
| ii. Ambient air quality levels (standard parameters including noise) | RSPM, $SO_2$, $NO_x$ & CO is well within prescribed limit of CPCB.<br>*The details are referred in section 3.3 of Chapter 3 of the Report enclosed.* |
| iii. Minerals: type, location, quantum (estimated) | Not Applicable. |
| iv. Energy: consumption pattern for hydrocarbons, gas, electricity and any other non-conventional energy source | *The details are referred in Sub-section 4.2.5 of Chapter 2 of the Report enclosed.* |
| Details of new construction Plot coverage, height, FSI (permissible/proposed) | This study is limited to project site. Details of project proposal and area statement are given in *section 2.5.1 of* Chapter 2 *of the Report enclosed*. |
| Details of public utilities required for the project during: (may be indicated separately for construction & operation phases)<br>i. Water supply:<br>a. Source of water supply and quantities to be drawn. | *The details are referred in chapter 2 of the Report enclosed.*<br><br>Fresh Water Supply : 624 KLD<br>i.e. 596 KLD from MCGM (Domestic) and 28 KLD From tanker water of potable quality (Swimming pool)<br><br>Secondary requirements<br>Flushing = 298 KLD |

<table>
<tr><td></td><td>Gardening = 187 KLD &<br>Excess treated sewage from existing building used for construction activity of proposed buildings<br>The details are referred in Section 2.6 of Chapter 2 of the Report enclosed.</td></tr>
<tr><td>b. Type of treatment, if any.</td><td>No</td></tr>
<tr><td>c. Continuous/Intermittent supply</td><td>Continuous supply from M.C.G.M.</td></tr>
<tr><td>ii. Sewage, Collection, Treatment & Disposal<br>a. Mode of collection of domestic effluent<br>- Surface drains<br>- Underground<br>- System and capacity</td><td>Sewage shall be collected through pipe networks to Sewage Treatment Plants.</td></tr>
<tr><td>b. Mode of treatment<br>- Septic tank and filters (capacity)<br>- Biological treatment capacity & other details</td><td>Construction phase: Disposal to sewer line of M.C.G.M.<br>Operation phase: 6 Nos. of STPs
<table>
<tr><th>Sr. No.</th><th>Details</th><th>STP Capacity (KL)</th></tr>
<tr><td>A</td><td>Existing</td><td>103</td></tr>
<tr><td>B</td><td>Proposed</td><td></td></tr>
<tr><td>1</td><td>Rehabilitation</td><td></td></tr>
<tr><td>1.1</td><td>Rehabilitation – A</td><td>225</td></tr>
<tr><td>1.2</td><td>Rehabilitation – B</td><td>190</td></tr>
<tr><td>2</td><td>Sale</td><td></td></tr>
<tr><td>2.1</td><td>One ICC</td><td>125</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>210</td></tr>
</table></td></tr>
<tr><td>c. Mode of disposal<br>- Soak pits / Disposal to local sewer/ water bodies (specify)<br>- Use for cultivation</td><td>Treated sewage from buildings shall be reused for secondary requirements like gardening, flushing & the excess treated sewage shall be used temporary used for further construction in project site (till estimated time 4.5 years) thereafter shall be used for nearby gardens.</td></tr>
<tr><td>iii. Solid Wastes:<br>- estimated quantity of each types of solid waste:<br>- Mode of collection and disposal:<br>- Recycling to be instituted, if any:</td><td>The total quantities of solid waste that will be generated in the project: 896 kg/day will be non-biodegradable and 2090 kg/day will be biodegradable.<br>There will be provision for storage, collection and segregation of biodegradable, non-biodegradable waste, E-waste within the premises. Biodegradable waste will be treated by Organic Waste Converter. Recycling of recyclable non-biodegradable garbage and only non recyclable portion shall be handed over to MCGM to reduce the load on dumping grounds.</td></tr>
</table>

<table>
<tr><td></td><td>Dried sludge from STP will be used as manure.</td></tr>
<tr><td>iv. Power System:<br>- Sources of power and supply capacity<br>- Distribution System<br><br>- Alternate supply for essential services<br>- DG Set: Type of fuel used and capacity</td><td>For construction phase:<br>From TATA power<br>D.G. Sets: As per Requirements<br><br>For operation phase:<br>Source: TATA power
<table>
<tr><th>Details</th><th>Total Power requirement (KW)</th></tr>
<tr><td>Connected load</td><td>30152</td></tr>
<tr><td>Maximum demand</td><td>15092</td></tr>
<tr><td>D.G sets (In case of power failure)</td><td>
<table>
<tr><th>Sr. No.</th><th>Details</th><th>Capacity of DG sets</th></tr>
<tr><td>A</td><td>Existing</td><td>1 DG set of 1010 kVA</td></tr>
<tr><td>B</td><td>Proposed</td><td></td></tr>
<tr><td>1</td><td>Rehabilitation</td><td></td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>2</td><td>Sale</td><td></td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 DG set of 1010 kVA & 1 DG set of 625 kVA</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 DG set of 1010 kVA & 1 DG set of 625 kVA</td></tr>
</table>
</td></tr>
</table>
Fuel : Diesel</td></tr>
<tr><td>Impact of the new development on the surrounding areas<br>i. Traffic management at peak hours<br><br><br><br><br><br><br><br><br><br><br>ii. Provision of service roads<br>iii. Buffer zone planned, if so, details<br>iv. Activities likely to come up in the surrounding areas from the project during construction & operation phases.</td><td>During construction phase there will be transport of construction materials. Precautions will be taken to reduce the impact of the vehicular movement by restricting movement in non-peak hours<br>An overall trip distribution was developed for the site after a review of the existing travel patterns in the area. The volume of traffic generated / attracted will have a defined pattern of distribution both for entry and exit.<br>Detailed traffic survey has been done & report is enclosed as Enclosure 8.<br>--<br>Sufficient buffer to nalla has been provided<br>The Proponent will continue regular environmental awareness programs to bring forth the benefits of development in terms of improvement in quality of</td></tr>
</table>

| | |
|---|---|
| v. Agencies and the measures proposed to regulate unplanned developments like slums, shops, etc. | life<br>The Project Area is under Administrative control of MCGM. Any work development to be done here has to have the express approval of the MCGM. As such no unauthorized or unplanned development can take place. |
| State briefly impacts predicted on the quality and quantity of natural resources from the proposed new development:<br>- Air quality<br>- Vegetation<br>- Animal/Aquatic life<br>Surface/ Ground Water | Environmental Impact assessment for this project was done by using Delphi Technique.<br>*The details are referred in Chapter 4 of the Report enclosed.* |
| State briefly impacts predicted on the quality and quantity of manmade features from the proposed new development:<br>- Transport Linkages:<br>a. Road<br>b. Rail<br>c. Water<br>d. Air<br>e. Others<br>- Heritage areas/ecologically sensitive areas | The project site is located in a developed area with well developed infrastructural facilities and there will be no major impact on the existing infrastructure and amenities.<br>*The details are referred in Chapter 4 of the Report enclosed.*<br>Traffic survey assessment is done and the Report is enclosed vide Enclosure 8. |
| Landscaping /Tree Plantation<br>i. Numbers and types of trees to be planted inside & outside the plot:<br>a. Parks and gardens<br>b. Along roads and pedestrian movement<br>c. In public areas'<br><br>ii. Other special features of proposed landscape design<br>iii. Likely impacts from proposed landscaping | Around 934 nos. of new evergreen trees shall be planted.<br><br>*The details are referred in Chapter 4 of the Report enclosed.*<br><br>Landscape plan is enclosed as Enclosure 4<br><br>--<br><br>-- |
| Any other relevant information of environmental significance-such as disabled-friendly design, flyash utilization, Greening of supply chain, heat islands/inversions/venturi effects, Timber-free construction, Green rating, energy efficiency for lighting & ventilation, Intelligent building, life cycle costs, measurable design impacts on human health, indoor environment related to occupational health etc. | Various energy saving measures shall ensure for saving energy.<br>Details of energy conservation measures are given in Chapter 4 *of the Report enclosed.* |

# CHAPTER: 1

# INTRODUCTION

## 1.0 PURPOSE OF THE REPORT:

The proposed project site is located at G. D. Ambekar Marg, Wadala, Mumbai,: Maharashtra. Earlier there was Spinning & Weaving Mill on the project site. The site is within the limits of Municipal Corporation Greater Mumbai. The region has mixed land use pattern comprising of residential and commercial development. This project has received prior Environment Clearance (EC), details are as follows:

**From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006**
**From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013**

As there are certain amendments, reapplication for revised EC has been made to State Environment Expert Appraisal Committee - 2 (SEAC - 2), Maharashtra on dated 04.10.14. For the finalization of the draft TOR presentation has been done to SEAC 2, Maharashtra in the 5th meeting dated 16th November 2012.

The EIA Report addresses the environmental impacts of the project and proposes the mitigation measures for the same. The EIA Report is prepared based on the model Terms of References (TOR) given in Environmental Impact Assessment Guidance Manual for building construction, townships and area development projects by Ministry of Environment & Forests (MOEF) and the project specific TOR given by SEAC-2 Maharashtra in November, 2012.

## 1.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT:

The site is located at C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) of Dadar (East), Naigaon division at G. D. Ambekar Marg, Wadala, Mumbai, Maharashtra. The project will be developed by **M/s. THE BOMBAY DYEING & MFG. CO. LTD.**

| | |
|---|---|
| **Type of Project** | **Residential development** |
| **Name of Project** | **"ISLAND CITY CENTRE (ICC)"** |
| **Name, contact number & address of Proponent** | **M/s. The Bombay Dyeing & Mfg. Co. Ltd.**<br>**Mr. Pochendar - CEO**<br>C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G.D. Ambekar Marg, Wadala, Mumbai,<br>State: Maharashtra.<br>**Tel. Nos. :** 022 - 61012345<br>**Fax Nos.:** 022 - 66192001<br>**E- mail :** pochendar@bombayrealty.in |
| **Name, contact number & address of Consultant** | **Environmental Consultant:**<br>**M/s. Ultra-Tech Environmental Consultancy & Laboratory**<br>**(An ISO 9001-2008 Company, Accredited by NABET, Lab : Gazetted by MOEF, GoI )**<br>Unit No. 206, 224, 225, Jai Commercial Complex, Eastern Express Highway, Opp. Cadbury Factory, Khopat,<br>Thane (W) – 400601<br>Tel.: 91-22-25342776, 25380198, 25331438.<br>Fax : 91-22-25429650 |

| | |
|---|---|
| | Email : deepa@ultratech.in, shekhartamhane@ultratech.in<br>Website : www.ultratech.in |
| **Location of the project** | C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) of Dadar (East), Naigaon division at G.D. Ambekar Marg, Wadala |
| **Total Plot Area** | 1,83,663.18 sq. mt. |
| **Deduction** | 69,934.23 sq. mt. |
| **Net Plot Area** | 1,13,728.95 sq. mt. |
| **Total Construction Built up Area** | 3,53,818.99 sq. mt. |
| **Litigation Details** | ➢ High court of Judicature at Bombay Ordinary Original Civil Jurisdiction<br>➢ Case No. 2368 of 2013<br>➢ Sarva Shramik Sanghatana (Konkan Vibhag) – respondents Brihanmumbai Municipal Corporation for Greater Mumbai & others |

## 1.2 APPLICABLE ENVIRONMENTAL REGULATIONS:

With respect to prevention and control of environmental pollution, the following Acts and Rules of Ministry of Environment and Forest, Government of India govern the proposed mixed use development project:

- Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988
- Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987
- Environment (Protection) Act, 1986 amended in 1991 and Environment (Protection) rules, 1986 as amended
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008 as amended
- E-waste Management and Handling Rules, 2011
- The Noise Pollution (Regulation and Control) Rules, 2000 as amended
- EIA Notification dated 14.09.2006 as amended

## 1.3 OBJECTIVE & SCOPE OF EIA STUDY:

EIA integrates the environmental concerns in the developmental activities so that it can enable the integration of environmental concerns and mitigation measures in project development. EIA can often prevent future liabilities or expensive alterations in project design.

The study included detailed characterization of existing status of environment in an area of 15 km radius around project site

In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, air quality, water quality, soil quality, noise level, ecology and socio-economic environment are studied /monitored. Environmental baseline monitoring has been carried out during November 2012 to January 2013 and used to identify potential significant impacts.

The scope of the study broadly includes:-

- To describe the project and associated works together with the requirements for carrying out the proposed development

- To establish the baseline environmental and social scenario of the project site and its surroundings
- To identify and describe the elements of the community and environment likely to be affected by the project
- To identify, predict and evaluate environmental and social impacts during the construction and operation phase of the project
- To study the existing traffic load, predict the increment in traffic due the project and to suggest the management plan for the same
- Conservation of resources
- To design and specify the monitoring and audit requirements necessary to ensure the implementation and the effectiveness of the mitigation measures adopted
- To evaluate proposed pollution control measures and delineate environmental management plan (EMP) outlining additional control measures to be adopted for mitigation of adverse impacts
- To delineate post-project environmental quality monitoring programme to be pursued by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.,** Mumbai

## 1.4 STRUCTURE OF EIA REPORT

EIA report contains baseline data, project description, assessment of impacts, preparation of environmental management plan & disaster management plan. The report is organized in following ten chapters:

- **Chapter 1 : Introduction**

  This chapter describes objectives and methodology for EIA.

- **Chapter 2 : Project Description**

  This chapter gives a brief description of the location, approachability, amenities, layout and utilities of the proposed project. This chapter also gives outline of status of completion of construction activities as this is an expansion project

- **Chapter 3 : Description of The Environment**

  This chapter presents details of the baseline environmental status of existing land use of study area, water environment, air environment, biological environment and socio-economic environment etc.

  - **Natural Environment:** The Topography, Geology, Rainfall, Climate, Temperature, Humidity, Winds, Soil, Land-use, Water bodies, Flora, Fauna
  - **Manmade Environment:** Human settlement, Housing, Habitation, Public Health, Employment & Wages, Occupation, Industries, Transport System, Heritage, Literacy, Demography, etc
  - Monitoring results of various facets of Environment in Study area

  This is an expansion project, EIA studies were done. Comparison of current baseline data with the environmental settings reported in previous EIA has been done and the changes in the environmental quality are highlighted.

- **Chapter 4 : Anticipated Impact And Mitigation Measures**

  This chapter discusses the possible sources of pollution and environmental impacts due to the project during construction and operation phases and suggests the mitigation measures.

- **Chapter 5 : Environmental Monitoring Programme**

  This chapter discusses the details about the environmental monitoring programme during construction and operation phases.

- **Chapter 6 : Additional Studies**

  This chapter covers Rehabilitation Action Plan, Risk Assessment Studies for the construction and operation phase, the safety precautions that have to be taken during construction phase and the Disaster Management Plan and Emergency Preparedness Plan Onsite and Offsite.

- **Chapter 7 : Project Benefits**

  This chapter presents the benefits from the proposed project.

- **Chapter 8 : Environmental Management Plan**

  This chapter deals with the Environmental Management Plan (EMP) for the proposed Project and indicates measures proposed to minimize the likely impacts on the environment during construction and operation phases and budgetary allocation for the same.

- **Chapter 9 : Summary And Conclusions**

  This chapter gives the Executive Summary of the EIA report.

- **Chapter 10 : Disclosure Of Consultants**

  This chapter deals with the details of consultants engaged and the National Accreditation Board for Education and Training (NABET) accreditation details of Environmental Consultants.

# CHAPTER: 2

# PROJECT DESCRIPTION

## 2.0 PREAMBLE:

The site is located in Dadar (East), Naigaon division at G. D. Ambekar Marg, Wadala, Mumbai and comes under the jurisdiction of Municipal Corporation of Greater Mumbai. The site will be developed as a residential development by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.**

## 2.1 SITE LOCATION & SURROUNDING DETAILS: (TOR Point No. 1)

### 2.1.1 Location of the Project:

The proposed project site is located at Dadar (East), Naigaon division at Latitude 18°55'6.587"N to 19°6'6.023"N and longitude 72°45'26.937"E to 72°56'30.665"E. Total area of the plot is 1,83,663.18 Sq mt.

The site is surrounded by the following:

- East: Open ground (Agri Maidan)
- West: Road (G. D. Ambekar Marg)
- North: Road No. 26 (MMG Sangrahalaya Marg)
- South: Residential

The nearest railway station is Wadala on Harbour Railway line of Mumbai.

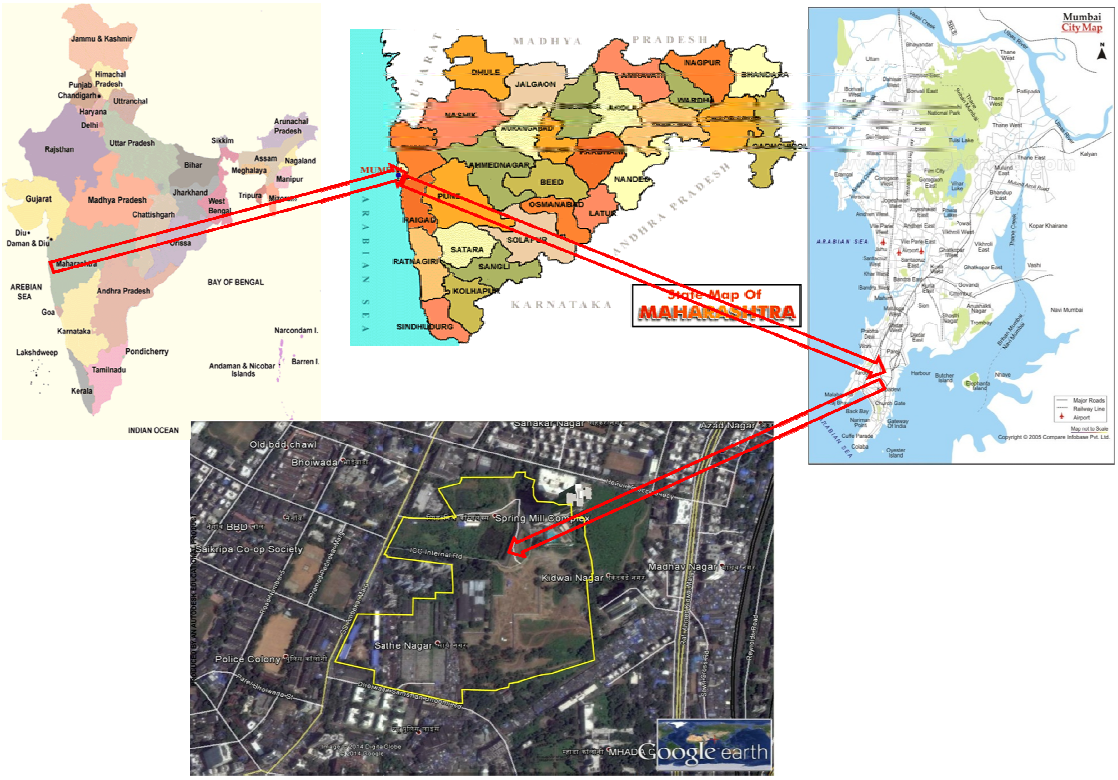



**Fig. 2.1: Project Location**

| Amenities | Name | Distance (Km) Approx (Road distances) |
|---|---|---|
| Fire Station | Dadar Naigaon Fire Station | 0.64 |
| Police station | Bhoiwada Police Station | 0.40 |

### 2.1.2 Social Infrastructure:

**Table 2.2: Social Infrastructure**

| Infrastructure | Names |
|---|---|
| **Schools** | Bengali Education Society School, A. E. S. High School, Amulakh Amichand School, Auxilium Convent High School, Bansidhar Agarwal School, C. G. E. E. S. High School, Dadar Parsee Youths Assembly High School, Dnyaneshwar Vidyalaya, Don Bosco High School, J. B. Vachha High School, Knowledge center (Mumbai School), Korba Mithagar Municipal School, N. K. E. S. High School, Nadkarni Park Municipal School, Nirmal Vidyalaya School, Ganesh Nagar, S. I. W. S. School, Sitaram Prakash High School, St. Joseph's High School |
| **Colleges** | A. E. S. Junior College of Science & Commerce, Dr. Ambedkar college of Commerce & Economics, Kala Saadhna (Classical Dance Music Academy) G. N. Khalsa College, Mumbai College of science and commerce, Mumbai Institute of Management and Research, S. I. W. S. School College, The Institute of Chemical Technology (formerly UDCT), Vidyalankar Campus (Engineering (UG & PG), Science and Management Colleges), Veermata Jijabai Technological Institute (V.J.T.I.) |
| **Hospitals** | Ackworth Leprosy Hospital, Aditya Eye hospital, BPT Hospital, Mumbai Port Trust Hospital, Shobha Maternity Hospital |

### 2.1.3 Historical, religious and tourist centers:

The details of historical/religious or tourist places are given below:

**Table 2.3: Name of historical/religious or tourist places in Study area**

| Name | Type | Location | Arial distance |
|---|---|---|---|
| Elephanta Caves | Historical Monuments | Gharapuri | 9.48 km |
| Sion Fort | Historical Buildings | Sion | 4.55 km |
| Haji Ali | Religious Mosque | Mahalaxmi | 5.19 km |
| Mahalaxmi Temple | Religious Temple | Mahalaxmi | 5.52 km |
| Jijamata Udyan | Tourist Place | Bycalla | 3.44 km |

### 2.1.4 Land Utilization:

Previously on the site there was closed down textile mill and residence of mill workers. As the earlier EC is obtained the site is now being developed as residential development where one residential building is already constructed & occupied.

## 2.2 PROJECT IMPLEMENTATION SCHEDULE:

### 2.2.1 Site clearance strategy: (TOR Point No. 1 (1)-a)

- The project site has chawls and residences for mill workers. Presently 648 households of mill workers are residing at the site

- Chawl will be demolished and the tenants will be accommodated temporarily on rental basis in the vicinity. The details of demolition debris and its management plan are given in Chapter No.4 Sec.4.2.3.2
- The construction work for proposed portion has been reckoned in a single phase and shall be completed within approximately 4.5 years. With the completion of these buildings all the existing tenements will be relocated in their premises.

### 2.2.2 Development Strategy, phasing of the project: (TOR Point No. 2)

- The construction work for proposed portion has been reckoned in a single phase
- Status of construction is as follows:

| Bldg no. | Completed level |
|---|---|
| **Existing Building** | |
| 1 Bldg with 2 wings | Constructed & Occupied |
| **Proposed Buildings** | |
| **Rehabilitation** | |
| Rehabilitation Building A | Not started |
| Rehabilitation Building B | Not started |
| **Sale Buildings** | |
| 1 ICC (Formally known as Tower A) | Excavation done (No construction done) |
| 2 ICC (Formally known as Tower B) | Excavation done (No construction done) |

Total constructed area (FSI+ Non FSI) till date: 77586.68 Sq. mt.

- The construction period for proposed project is approximately 4.5 years.

## 2.3 RESOURCE REQUIREMENT:

### 2.3.1 Construction Materials, Equipments and Machinery: (TOR Point No. 39)

a. Fly Ash will be used in Concrete (12-15 %)
b. Pozzolana Cement containing upto 20% fly ash will be used for plaster, masonry, flooring
c. ACC aerated autoclaved blocks will be used
d. BBC water proofing will be done with old bricks.
e. High performance reflective glass will be used for glazing / building envelope wherever proposed.
f. Thermal insulation in roofs
g. Low VOC (volatile organic compound) paints will be used.
h. Energy efficient materials and systems will be utilized.
i. The list of equipments and machinery required for the construction is given in following Table 2.4

**Table 2.4: Details of Major Equipment and Machinery**

| No. | Equipment / Machinery | Quantity |
|---|---|---|
| 1. | Batching plant | 1 |
| 2. | Wheel Loader | 1 |
| 3. | Transit mixer | 4 |
| 4. | Tower cranes | 2 |
| 5. | Passenger cum Material Hoist | 4 |
| 6. | Excavator | 1 |
| 7 | De-Watering Pumps | 4 |
| 8 | Welder Rectifier | 2 |
| 9 | Bar Shearing & Bar Bending | 4 |
| 10 | Plate Compactor | 4 |
| 11 | Gas cutting set | 3 |
| 12 | Grinder | 4 |

| No. | Equipment / Machinery | Quantity |
|---|---|---|
| 13 | Drill machine | 4 |
| 14 | Curing pumps | 8 |
| 15 | Vibrators | 16 |
| 16 | Diesel generator set | 2 |
| 17 | Concrete cube testing machine | 1 |
| 18 | Concrete pumps | 2 |
| 19 | Compressor | 2 |

### 2.3.2 MANPOWER REQUIREMENT:

- Proposed project requires manpower during construction phase & operation phase thereby creating job opportunities. Local skilled and unskilled laborers will have an opportunity for employment directly or indirectly. The number of workers envisaged are 100 residential and 400 non residential on an average
- Additional employment for the poor strata of society by way of helpers, cleaners, drivers and security guard etc. during operation phase.

## 2.4 INFRASTRUCTURE AND FACILITIES / UTILITIES: DURING CONSTRUCTION PHASE: (TOR Point 2)

**Table 2.5: Infrastructure and facilities / utilities during construction phase**

| Component | Details |
|---|---|
| Electrical Supply | From TATA power |
| Backup during power failure for emergency services | As per requirement |
| Water Supply & Storage | Fresh water supply (for workers): M.C.G.M.<br>For construction : Water tankers<br>Adequate water storage tanks |
| Facilities for workers | Drinking water facility and toilet bathing facilities<br>Health checkup facilities<br>Personal protective and safety equipments |
| Site Sanitation Measures | For sewage disposal: Connection to Sewer line of M.C.G.M.<br>For storm water : Proper management of channelization of water to avoid water logging at site<br>Regular pest control at site |

### 2.4.1 Water Requirement During Construction Phase:

i. For Workers: 32 KLD. (From MCGM)
ii. For Construction: 30 - 40 KLD (Depending upon the construction activity- Excess treated Sewage/From water tankers)

*Note: For fulfilling the construction water requirement proponents are planning to use the excess treated sewage from existing building. This will help to reduce the fresh water demand for construction activity.

### 2.4.2 Sewage Generation, Collection, Treatment and Disposal During Construction Phase:

i. Quantity of Sewage generated (KLD): 31
ii. Treatment/ Disposal: The sewage generated will be disposed to existing sewer line.

### 2.4.3 Solid Waste Generation During Construction Phase: (TOR Point No. 18)

The wastes generation during construction phase shall be disposed in environmental friendly manner with due care and precautions and after getting all the NOCs from concerned department of M.C.G.M. The excavation and construction waste quantities and its management is explained in detail in chapter 4 section 4.2.3.2

i. **Municipal solid waste:** The generation of municipal solid waste from workers dwelling on site is as follows.

**Table 2.6: Solid Waste Generation during Construction Phase**

| Solid Waste Generation Kg/day | | |
|---|---|---|
| **Non-biodegradable** | **Biodegradable** | **Total** |
| 40 | 10 | 50 |

These wastes shall be segregated into biodegradable and non biodegradable and shall be handed over to MCGM.

ii. **Hazardous wastes:** There will be separate storage for Hazardous wastes and its disposal shall be done to authorized common hazardous waste disposal site respectively for further treatment and disposal

iii. **E waste:** E-waste generated during construction phase shall be stored at distinct location within project site and subsequently E-waste shall be handed over to authorized recyclers

### 2.4.4 Energy Requirement During Construction Phase: (TOR Point No. 22 & 24)

i. Source: From TATA power
ii. DG Sets: As per requirement

## 2.5 DETAILS ABOUT THE PROJECT DURING OPERATION PHASE:

### 2.5.1 Area statement:

The area statement explaining the total plot area, net plot area available for development after deduction, the covered areas due to construction, green areas is as per Table 2.7. In this table the built up area as per Floor Space Index (FSI) and the construction built up area which include FSI and non FSI area is also explained.

**Table 2.7: Area Statement**

| No. | Description | | Total Area (Sq. Mt.) |
|---|---|---|---|
| 1. | Total Plot Area | | 1,83,663.18 |
| 2. | Deductions | | 69,934.23 |
| 3. | Net Plot Area | | 1,13,728.95 |
| 4. | Ground coverage area (18.15 %) | | 20,636.88 |
| 5. | R G area | On Ground | 13,008.13 |
| | | On Podium | 19,145.68 |
| 6. | Built up area as per FSI (Including Fungible FSI) | | 1,66,766.85 |
| 7. | Total Construction Built – up area (FSI + NON FSI ) | | 3,53,818.99 |

Layout plan is enclosed as Enclosure 2. **(TOR Point No. 2 (2)-a, (2)-b)**

### 2.5.2 Buildings Details :

The establishments planned for the building is detailed as follows:

**Table 2.8: Building Details and Occupancy**

| S.N. | Building configuration | Flats | Occupancy |
|---|---|---|---|
| **A** | **Completed Building (As per EC received in the year 2006)** | | |
| **1** | **1 Bldg with 2 wings:**<br>**Wing A:** Stilt + 41 floors<br>**Wing B:** 3 Basements + 2 Parking floors | Flats nos.: 161 Nos. | 805 |
| **B** | **Proposal for Amendment (EC received in the year 2011 & Corrigendum in the year 2013)** | | |
| **1** | **Rehabilitation** | | |
| 1.1 | **Building A:** Basement + Stilt + 22 floors<br>**Building B:** Basement + Stilt + 19 floors | Flats: 296 nos.<br>Flats Nos.: 352 Nos. | 1480<br>1760 |
| **2** | **Sale** | | |
| 2.1 | **ONE ISLAND CITY CENTRE[ICC]**<br>**(Formally known as Tower A):**<br>3 Basements + Ground + podium + 1st to 53rd floors. | Flats: 193 Nos. | 965 |
| 2.2 | **TWO ISLAND CITY CENTRE [ICC]**<br>**(Formally known as Tower B):**<br>3 Basements + Ground + Podium + 1st To 60th floors. | Flats: 325 Nos. | 1625 |
| **Total** | | | **6635** |

**Reference**: National Building Code (NBC) -2005 – Part 4, Page 27, Occupant Load

### 2.5.3 Parking Statement:

**Table 2.9: Parking Statement:**

| Sr. No. | Details | Parking Numbers (4W) | | Parking Area in Sq.mt. |
|---|---|---|---|---|
| | | Parking requirement | Parking provision | |
| **A** | **Existing** | **403** | **461** | **14332** |
| **B** | **Proposed** | | | |
| 1 | **Rehabilitation** | | | |
| 1.1 | Rehab - A | 55 | 56 | 1669.48 |
| 1.2 | Rehab - B | 47 | 48 | 800.63 |
| **2** | **Sale** | | | |
| 2.2 | One ICC | 518 | 540 | 45833.52 |
| 2.2 | Two ICC | 813 | 835 | |
| | **Total** | **1836** | **1940** | **62635.63** |

## 2.6 INFRASTRUCTURE AND FACILITIES / UTILITIES : DURING OPERATION PHASE (TOR Point No. 2)

**Table 2.10: Details about utilities & environmental liabilities**

| Component | Details |
|---|---|
| Onsite Parking Facility | Parking Provision as per requirement of M.C.G.M. |

<table>
<tr><th>Component</th><th>Details</th></tr>
<tr><td>Electrical Supply</td><td>From TATA power<br>Details of Electrical load is given in Table 2.12</td></tr>
<tr><td>Backup during power failure for emergency services</td><td>D. G. Sets :
<table>
<tr><td>A</td><td>Existing Bldg</td><td>1 DG set of 1010 kVA</td></tr>
<tr><td>B</td><td colspan="2">Proposed</td></tr>
<tr><td>1</td><td colspan="2">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>2</td><td colspan="2">Sale</td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 DG sets of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
</table></td></tr>
<tr><td>Water Supply & Storage</td><td>Fresh Water Supply (for domestic): M.C.G.M.<br>Secondary requirements (flushing & gardening): STP treated sewage<br>Details of water requirement is given in Table 2.11<br>Adequate storage tanks UG and OH
<table>
<tr><th rowspan="2">S. N.</th><th rowspan="2">Details</th><th colspan="2">UG tank (KL)</th><th colspan="2">OH tank (KL)</th></tr>
<tr><th>Domestic</th><th>Flushing</th><th>Domestic</th><th>Flushing</th></tr>
<tr><td>A</td><td>Existing</td><td>80</td><td>40</td><td>40</td><td>20</td></tr>
<tr><td>B</td><td colspan="5">Proposed</td></tr>
<tr><td>1</td><td colspan="5">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>158</td><td>79</td><td>79</td><td>40</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>133</td><td>67</td><td>67</td><td>33</td></tr>
<tr><td>2</td><td colspan="5">Sale</td></tr>
<tr><td>2.1</td><td>One ICC</td><td>87</td><td>43</td><td>43</td><td>22</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>146</td><td>73</td><td>73</td><td>37</td></tr>
<tr><td></td><td>Total</td><td>525</td><td>262</td><td>262</td><td>131</td></tr>
</table></td></tr>
<tr><td>Rain water harvesting System</td><td>
<table>
<tr><th>S. N.</th><th>Details</th><th>RWH Tank Capacity</th></tr>
<tr><td colspan="3">Proposed</td></tr>
<tr><td>1</td><td colspan="2">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>1 tank of total capacity 49 KL</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>1 tank of total capacity 54 KL</td></tr>
<tr><td>2</td><td colspan="2">Sale</td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 tank of total capacity 144 KL</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 tank of total capacity 72 KL</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Component</th><th>Details</th></tr>
<tr><td>Sewage Treatment</td><td>
<table>
<tr><th>S. N.</th><th>Details</th><th>Sewage (KLD)</th><th>STP Capacity (KL)</th></tr>
<tr><td>A</td><td>Existing</td><td>94</td><td>103</td></tr>
<tr><td>B</td><td>Proposed</td><td></td><td></td></tr>
<tr><td>1</td><td>Rehabilitation</td><td></td><td></td></tr>
<tr><td>1.1</td><td>Rehabilitation- A</td><td>205</td><td>225</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>173</td><td>190</td></tr>
<tr><td>2</td><td>Sale</td><td></td><td></td></tr>
<tr><td>2.1</td><td>One ICC</td><td>113</td><td>125</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>190</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>Storm Water Drainage</td><td>Adequately designed SWD network within the site to cater the runoff, which shall be connected to municipal drain which has adequate carrying capacity<br>Details of storm water drainage is given in Table 2.14</td></tr>
<tr><td>Solid Waste segregation, storages and Treatment Facilities</td><td>Segregation and storages facilities for all solid waste streams<br>Biodegradable garbage shall be treated in Organic waste converter<br>Recycling of recyclable non-biodegradable garbage<br>Non recyclable garbage shall be handed to M.C.G.M.<br>Details of solid waste generation is given in Table 2.16</td></tr>
<tr><td>Facilities for workers watchmen, gardeners, sweepers, drivers, etc.</td><td>Provision of drinking water facility & toilets<br>Cabins for watchmen</td></tr>
</table>

### 2.6.1 Water Requirement for the Project: (TOR Point No. 13)

Total water requirement for the project and sources are given in Table 2.11:

**Table 2.11: Total water requirement for the project and source during operation phase**

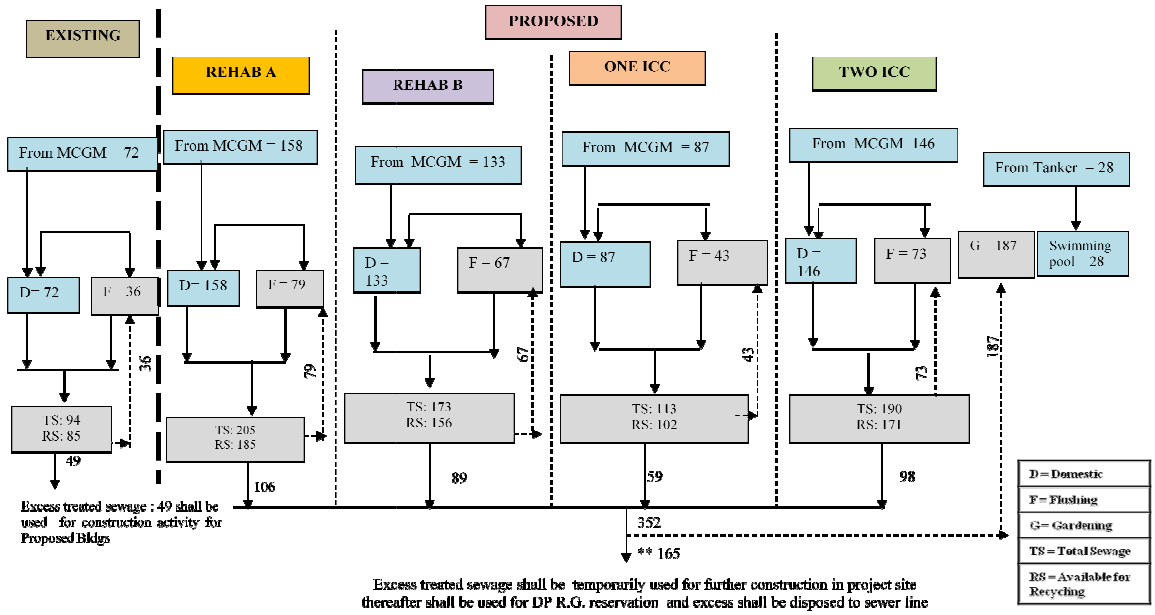
| Sr. No. | Description | Quantity of water required (KLD) | | | | Source of water supply |
|---|---|---|---|---|---|---|
| | | Existing Bldg | Proposed | | | |
| | | | Rehabilitation | One ICC | Two ICC | |
| 1 | Domestic | 72 | 291 | 87 | 146 | MCGM |
| 2 | Flushing | 36 | 146 | 43 | 73 | Treated sewage from STP |
| 3 | Gardening | 187 | | | | Treated sewage from STP |
| 4 | Swimming Pool | 28 | | | | Tanker water of potable quality |

**Reference:** This is in agreement National Building Code (NBC) -2005 – Part 9, Page 19, *Water Requirement*

**Considerations for water requirement:**
**Residential:** 90 Liter/Person/day for domestic and 45 Liter/Person/day for flushing

The water balance per day basis during monsoon and non monsoon period is explained as follows:

## WATER BALANCE PER DAY BASIS DURING NON-MONSOON (TOR Point No. 13)

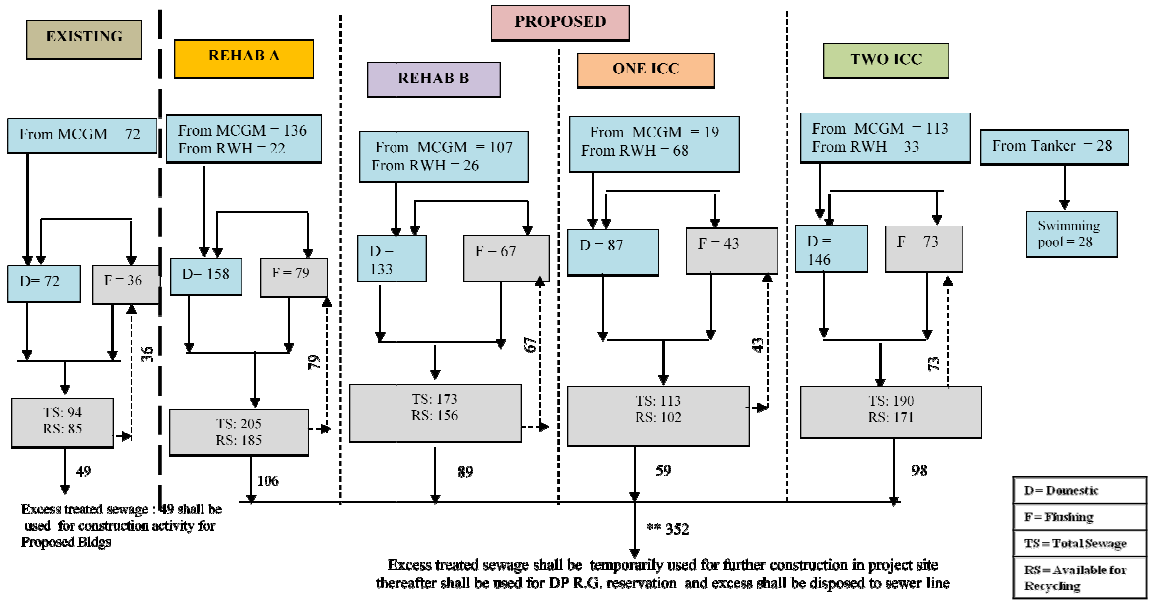



**All Quantities are in KLD**

Total water requirement = 1109
Recycling of treated sewage for flushing (298) & gardening (187)
Hence Net water requirement = 624 (From MCGM = 596, From Tanker of potable quality = 28)
Reduction in Net water demand = 43.73 %

Please Note:
We have considered 80 % sewage of total of domestic and flushing requirement.
*We have considered 10 % less availability of sewage for recycling considering losses of sewage in evaporation and sludge formation
**After commissioning of STP the excess treated sewage shall be used for DP R.G. reservation and for further construction activities

**WATER BALANCE PER DAY BASIS DURING -MONSOON**




**All Quantities are in KLD**
Total water requirement = 922
Recycling of treated sewage for flushing (298)
RWH = 149
Hence Net water requirement = 475 (From MCGM = 447 & from tanker of potable quality = 28)
Reduction in Net water demand = 48.5%

Please Note:
We have considered 80 % sewage of total of domestic and flushing requirement.
*We have considered 10 % less availability of sewage for recycling considering losses of sewage in evaporation and sludge formation
**After commissioning of STP the excess treated sewage shall be used for DP R.G. reservation and for further construction activities

### 2.6.2 Energy Requirement During Operation Phase: (TOR Point No. 22)

Source: From TATA Power
The power requirement for the project is estimated as following:

**Table 2.12: Power Requirement of the Project**

| Sr. No. | Description | Existing Building | Proposed | | | Total |
|---|---|---|---|---|---|---|
| | | | Rehabilitation | Sale | | |
| | | | | One ICC | Two ICC | |
| 1. | Connected load (KW) | 4275 | 3971 | 9002 | 12904 | **30152** |
| 2. | Maximum demand(KW) | 2875 | 2606 | 4024 | 5587 | **15092** |

### 2.6.3 Power backup: (TOR Point No. 24)

The emergency backup power requirement will be met through DG sets, details of which are as follows:

**Table 2.13: Capacity of DG sets**

| S. N. | Details | Capacity of DG sets |
|---|---|---|
| **A** | **Existing** | 1 DG set of 1010 kVA |
| **B** | **Proposed** | |
| **1** | **Rehabilitation** | |
| 1.1 | Rehabilitation - A | 1 DG set of 500 kVA |
| 1.2 | Rehabilitation - B | 1 DG set of 500 kVA |
| **2** | **Sale** | |
| 2.1 | One ICC | 1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA |
| 2.2 | Two ICC | 1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA |

The Diesel generators sets will be provided with stacks as per CPCB norms. Layout showing location for DG sets is enclosed as an **Enclosure 6**

## 2.7 WASTE GENERATION DURING OPERATION PHASE:

This section deals with generation of waste or discharges from the project like storm water, sewage, solid wastes etc.

### 2.7.1 Runoff from site and Storm water Drainage During Operation Phase:

**Table 2.14: Runoff for total Site and Carrying capacity of storm water drains:**

| Details | Capacity($m^3$/sec) |
|---|---|
| Total run off before development | 1.94 |
| Total run off after development from plot | 2.33 |
| Carrying Capacity of Internal Storm Water Drain | 3.47 |
| Carrying Capacity of External Storm Water Drain | 4.57 |

Storm water drainage system of adequate capacity shall be laid down and proper maintenance shall be done. These drains shall have silt and oil and grease traps to avoid pollution of water in drains outside the plot. The layout for storm water drainage is attached **as Enclosure 5.**

### 2.7.2 Sewage Generation During Operation Phase:

**Table 2.15: Sewage Generation:**

| Sr. No. | Details | Quantity of Sewage generated (KLD) |
|---|---|---|
| **A** | **Existing** | 94 |
| **B** | **Proposed** | |
| **1** | **Rehabilitation** | |
| 1.1 | Rehabilitation - A | 205 |
| 1.2 | Rehabilitation - B | 173 |
| **2** | **Sale** | |
| 2.1 | One ICC | 113 |
| 2.2 | Two ICC | 190 |
| | **Total** | **775** |

**Reference**: Manual on norms and standards for EC of large construction projects MoEF

### 2.7.3 Solid Waste Generation During Operation Phase: (TOR Point No. 18)

There are various types of waste that will be generated during operation phase of this project and that are explained as follows.

**a. Municipal Solid Waste:**

Details of generation of municipal solid waste are as follows:

**Table 2.16: Solid Waste Generation during Operation Phase**

| Sr. No. | Details | Occupancy | Solid Waste Generation (Kg/day) | | |
|---|---|---|---|---|---|
| | | | Non-biodegradable | Biodegradable | Total |
| **A** | **Existing** | 805 | 109 | 254 | 363 |
| **B** | **Proposed** | | | | |
| **1** | **Rehabilitation** | | | | |
| 1.1 | Rehabilitation- A | 1760 | 238 | 554 | 792 |
| 1.2 | Rehabilitation - B | 1480 | 200 | 466 | 666 |
| **2** | **Sale** | | | | |
| 2.1 | One ICC | 965 | 130 | 304 | 434 |
| 2.2 | Two ICC | 1625 | 219 | 512 | 731 |
| | **Total** | **6635** | **896** | **2090** | **2986** |

**Considerations for solid waste generation:**

- **For Residential:**
  30% dry garbage and 70% wet garbage out of total 0.45 Kg/person/day as per MCGM norm

**b. Household Hazardous Waste:**

- **Leftovers or empty containers of:** Furniture and shoe polish, paints, insect repellent, fungicides, herbicides, rodent killers, weed killers, air freshener, general cleaning agents, disinfectants, and hair color or hair dyes, etc
- Fluorescent light tubes, used inverter batteries, used car batteries, chlorine bleach, Medicines out of expiry dates etc
- There will be separate storage for Hazardous wastes and its disposal shall be done to authorized CHWTSDF sites

# CHAPTER 3

# DESCRIPTION OF THE ENVIRONEMENT

## 3.0 INTRODUCTION

Determination of baseline conditions of the environment is essential for evaluation of environmental impacts of the proposed development on the existing conditions. It is necessary to ascertain existing environmental quality of the project site and environmentally significant factors that could preclude project development. This chapter will provide information on existing environmental scenario of existing land use of study area, air environment, biological environment and socio-economic environment. There are no major sources of water pollution and air emissions at the project site.

- **Scope of Baseline Studies**

  This chapter can be broadly divided into three sections providing overview of:
  - Natural Environment: The Topography, Geology, Rainfall, Climate, Temperature, Humidity, Winds, Soil, Land-use, Water bodies, Flora, Fauna.
  - Manmade Environment: Human settlement, Housing, Habitation, Public Health, Employment & Wages, Occupation, Industries, Transport System, Heritage, Literacy, Demography, etc.
  - Monitoring results of various facets of Environment in Study area.

- **Study Area**

As per guidelines of Ministry of Environment & Forests (MoEF) for Environmental Impact Assessment (EIA), pertaining to Construction projects, total study area is restricted up to 15 km radius from the project site. Environmentally sensitive locations for the area from 500 m up to 15 km radial distance from project site have been identified and represented below. Out of 15 km study area, primary data need to be collected from the area up to 500 m radius and remaining area, up to 15 km; will be represented by secondary data. But since this is a building construction project no impacts are envisaged on environmental parameters in the area beyond 500 m radius from project boundary, hence secondary data has not been incorporated.

**The status of study area for environmental sensitive places is as follows: (TOR Point No. 07)**

**Table 3.1: Status of study area for environmental sensitive places within 15 km**

| Environmental Sensitive Places | Locations | Aerial distance (in km) from Plot boundary |
|---|---|---|
| National Park/Wildlife Sanctuary | Sanjay Gandhi National Park<br>Aarey Colony | 14.70<br>13.70 |
| Tiger Reserve/Elephant Reserve/ Turtle Nesting Ground | Nil | NA |
| Core Zone of Biosphere Reserve | Nil | NA |
| Nature Park/Dense Tree Covers | Maharashtra Nature Park<br>Jijamata Udyan | 4.40<br>3.35 |
| Habitat for migratory birds | Mahim Bay<br>Mahim Creek<br>Mahul Creek | 2.30<br>4.00<br>3.40 |
| Lakes/Reservoir/Dams | Mahim Bay<br>Chandivali Lake<br>Powai Lake | 2.30<br>12.50<br>13.20 |
| Streams/Rivers | Mithi River | 5.20 |
| Creek/Sea | Arabian Sea<br>Mahim Creek | 3.50<br>4.00 |
| Mangroves | Carter Road Mangroves | 6.45 |

| Environmental Sensitive Places | Locations | Aerial distance (in km) from Plot boundary |
|---|---|---|
| | Sewri Mangroves<br>Mahul Mangroves | 2.00<br>3.61 |
| Mountains/Hills | Nil | NA |
| Notified Archaeological Sites | Bandra Fort<br>Worli Fort<br>Sion Fort<br>Elephanta Caves | 4.70<br>3.80<br>4.20<br>10.00 |
| Any other Archaeological site | Nil | NA |

- **Methodology**

The methodology for conducting the baseline environmental survey considered is as per EIA Guidance Manual-Building, Construction, Township and Area Development projects by MoEF.

Baseline information with respect to air quality, noise level and soil quality in the study area were collected by conducting primary sampling / field studies during November 2012 to January 2013. Baseline status of Land, Biological and Socio-economical environment are also studied by an accredited expert.

**Table 3.2: Environmental Attributes**

| Sr. no. | Attributes | Baseline Data | |
|---|---|---|---|
| | | **Project Site to 500 m radius** | **500 m radius to 15 km radius from Project Site** |
| **1** | **Air Environment** | | |
| i | Ambient air quality | **Sampling Locations:** Total 5 locations including Project site | -- |
| ii | Noise Level | **Sampling Locations:** Project site and 4 locations around 100 m from the boundary of project site | -- |
| iii | Meteorological Data | -- | **Source:** Meteorological Department (IMD), Mumbai (2012 and 2013) |
| **2** | **Water Environment** | | |
| i | Surface water | No source of surface water was observed within the project site boundary and within 500 m radius from project site. | Water bodies in the study area between 500 m to 15 km radius from project boundary are mentioned in Table 3.1. Since this is a building construction project no impacts are envisaged on water bodies in the area beyond 500 m radius from project boundary, hence secondary data has not been incorporated. |
| ii | Ground water | No ground water source was found in the project site. | -- |
| **3** | **Land Environment** | | |
| i | Land use | GIS Study | |
| ii | Soil analysis | **Sampling Location:** Project site | -- |
| iii | Solid waste generation | Project site | |
| **4** | **Socio – Economic Environment** | Project site | For Demographic details of Mumbai<br>**Source :** 'Census of India' 2011 |

| Sr. no. | Attributes | Baseline Data | |
|---|---|---|---|
| | | **Project Site to 500 m radius** | **500 m radius to 15 km radius from Project Site** |
| | | | For Demographic details of F-South Ward of MCGM, Mumbai **Source:** Official website of MCGM (as per 'Census of India' -2001) Bombay District Gazetteer |
| **5** | **Biological Environment** | Primary data collected **Period :** November 2012 | The data pertaining to flora and fauna have been collected based on discussion with concerned forest department officials, local people and NGOs. |
| **6** | **Traffic study** | Traffic survey was carried out for Traffic density / pattern (Survey done by M/s. Systra MVA Consulting (India) Pvt. Ltd. conducted in January 2014) | |

## 3.1 EXISTING LAND USE OF STUDY AREA

### 3.1.1 Site Topography and Geographical Location of site: (TOR Point No.(10)-a)

The plot has gradually slopping ground with 3 m level difference from northeast to southwest corners of the plot land. The Contour map of the project site and surrounding area is attached in Enclosure 3 of this report. **(TOR Point No. (10)- a & 11)**

Latitude : 18°55'6.587"N to 19°6'6.023"N
Longitude : 72°45'26.937"E to 72°56'30.665"E
Tehsil : Wadala
District : Mumbai
State : Maharashtra

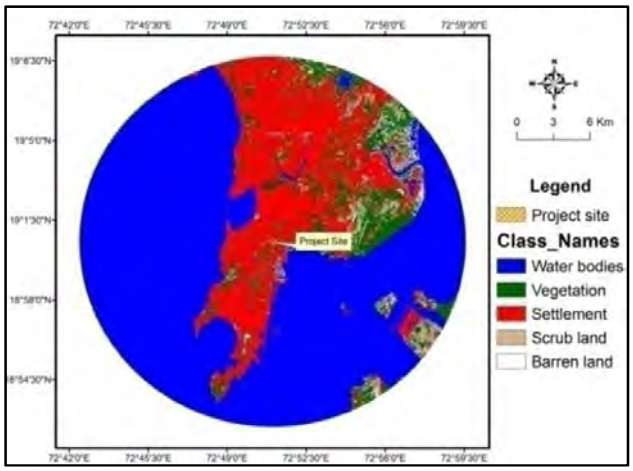



**Fig. 3.1: Satellite image of 15 km radius around project site.**

**Land use/ Land cover Classes Details: (TOR Point No. 6 & (8) - a)**
Five different land use/ land cover classes were identified in total area of 15 km radius around project site.

**Data:**

Satellite Data: RESOURCESAT-2 LISS- III cloud free data has been used for Land use / land cover analysis.

Satellite Sensor - RESOURCESAT-2 LISS- III
Resolution - 23.5 m

Path and Row - Path 94, Row 59
Date of Pass - 3 Jan 2014

The area under each land use/land cover class has been calculated in Table below.

**Table 3.3: Land use/Land cover Statistics of the Study Area (TOR Point No. (8) - a)**
**(Within 15 km radius from the project site)**

| Sr. No. | Land use/land cover | Area (Ha) | % Area |
|---|---|---|---|
| 1 | Settlement | 15807.8 | 22.32 |
| 2 | Water body | 45482.75 | 64.22 |
| 3 | Vegetation | 6539.04 | 9.23 |
| 4 | Scrub land | 1831.97 | 2.59 |
| 5 | Barren land | 1156.55 | 1.63 |
| | **Total** | **70818.11** | **100.00** |

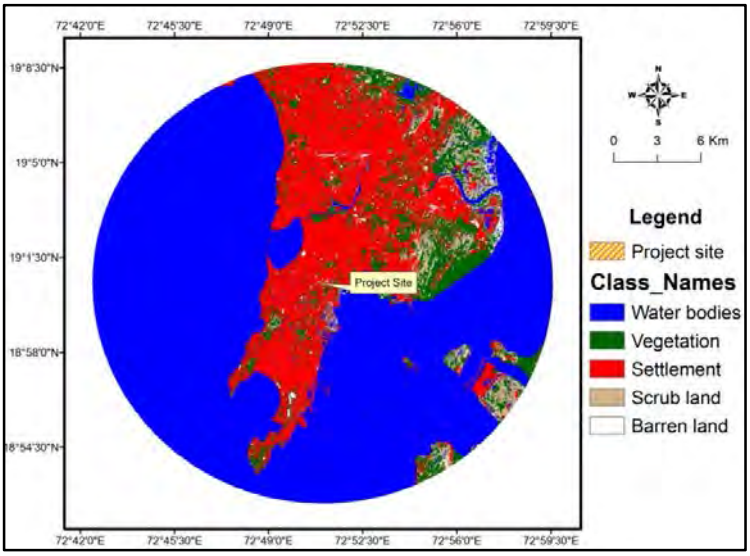



**Fig. 3.2.: Land use/land cover of 15 km radius area around project site.**

Details of land use around 2 km and 500 km radius of the project site were also examined. The images are given in Fig. 3.3 and Fig 3.4. The Land use/ Land Cover Statistics of 2 km and 500 km radius around project site are explained in Table: 3.4 and Table: 3.5.

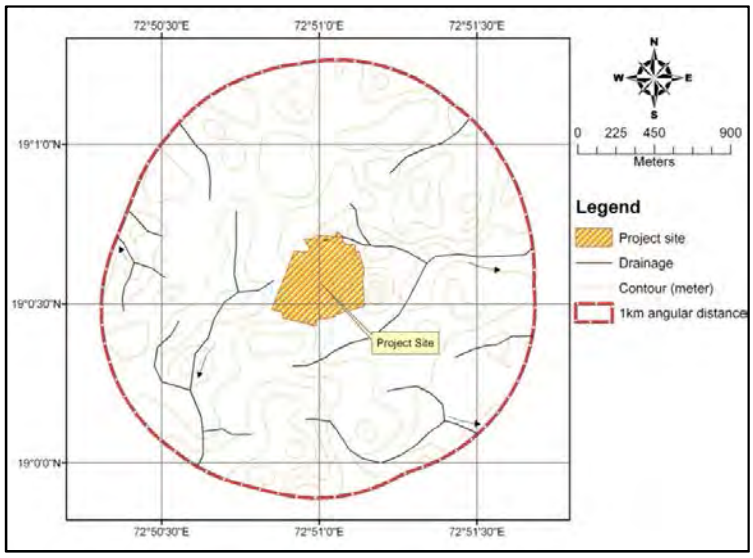



**Fig. 3.6: Drainage map of 1 km radius area around Project site**

### 3.1.3 Seismicity

Mumbai sits on a seismically active zone owing to the presence of 23 fault lines in the vicinity. The area is classified as a Seismic Zone III region which means an earthquake of up to magnitude 6.5 on the Richter-scale may be expected.

### 3.1.4 Land Environment

The impact of any developmental activities on land environment generally depends on the type/ category of the project. For example, field development required land acquisition / procurement, site reading / construction and operation. In such case the impact on land environment would be in the form of permanent change in the land use pattern as well as direct or indirect impacts on surrounding land due to pollution discharged in the form of gases, fugitive emission, liquid and solid waste disposal subsequently urbanization as an indirect impact and type of raw material to be used. The infrastructure projects require a lot of developmental activities related to the building up of township or other residential, commercial structures to enhance the living of people through economic development. The status of land environment has been assessed through reconnaissance in the project area, characterization of soil through field studies, land use/ land cover and cropping pattern corresponding to the project area.

**a. Reconnaissance**

The 15 km area around project site covers water bodies and settlement. No agricultural activities were noted within the study area.

The climate of the study area is humid due to vicinity of the coastal, characterized by monsoon, hot summer and mild winter. The annual average rainfall is 2000 -2500 mm. The bulk of precipitation received from the south-west monsoon from June to September. The mean annual temperature of the area is 27-28$^{o}$C. The mean summer and winter soil temperatures are 38$^{O}$C and 18$^{O}$C respectively with marginal difference of 2$^{o}$C confirming coastal region of soil taxonomy. The summer commences in early February with increase in day temperature.

**b. Natural Vegetation**

The natural vegetation of the study area is mostly dry deciduous mixed type. The thin and scanty vegetation mostly shrub type is observed an undulating up land. Further details of natural vegetation are given in section 3.4 below.

**c. Physiography**
The study area and project site area is almost flat with little topographic undulation.

**d. Relief**
The overall relief is gentle and North-Westerly.

e. **Drainage**
Mithi River is the main river, 5.2 km north-west of the project site the surface drainage shows dendritic drainage pattern and moderately slow.

**f. Geology**
The area is occupied by archean quartzites deccan trap and alluvium. The major part of the study area is covered by thick soil cover formed on predment and associated deposited of the river bank.

The Deccan traps or basal are the basic igneous rocks which come out through long narrow fissures as lava and spread as nearly horizontal sheets on continental scale. The Deccan trap occurring in the watershed is part of this vast basaltic province. The bulk of the rock is composed of piagiociase feldspar and provixeness. The Archean quartizes are silicious rocks containing minor feldspars and other oxides.

**g. Hydrogeology**
Drainage map and hydrogeological details are given in section 3.1.2 above.

**3.1.4.1 Baseline Status**

Baseline data was collected to assess landuse / land cover of the study area (15 km radius) and project site.

**a. Land use pattern (15 km radius)**
The description of the area falling within 15 km radial distance from the project site is depicted in **Table 3.3** above from which it is seen that majority portion is water bodies i.e. Arabian Sea and then is the settlement, being developed area of Mumbai. The site and surrounding area has mixed landuse parts of residential and commercial use.

**b. Soil Characteristics (TOR Point No. (10) - c)**
Soil may be defined as a thin layer of earth's crust which serves as a natural medium for the growth of plants. It is the unconsolidated mineral matter that has been subjected to, and influenced by genetic and environmental factors – parent materials, climate, organisms and topography all acting over a period of time. Soil differs from the parent materials in the morphological, physical, chemical and biological properties. Also, soils differ among themselves in some or all the properties depending on the difference in the generic and environmental factors. Thus some soils are red, some are black, some are deep and some are shallow, some are coarse-textured and some are fine – textured. It serves in varying degree as a reservoir of nutrients and water for crops, provides mechanical anchorage and favorable filth. The components of soils are mineral materials, organic matter, water and air, the proportions of which vary and which together form a system for plant growth, hence there is a need to study the soils in perspective manner.

One soil sample was collected from the project site. Representative soil sample from depth (0-15 cm) was collected for estimation of the physico- chemical characteristics of soil water samples. Standard methods were followed for the analysis of soil samples as given in Table 3.6.

**Table 3.6: Methodology of soil sample monitoring**

| Parameters | Analytical equipment | Standard Method | Methodology | Sensitivity / Detection limit | Units | Remarks |
|---|---|---|---|---|---|---|

| Parameters | Analytical equipment | Standard Method | Methodology | Sensitivity / Detection limit | Units | Remarks |
|---|---|---|---|---|---|---|
| Colour | -- | -- | Visual Observation | -- | -- | -- |
| pH | pH meter | IS : 2720 (Part 26) - 1987 | pH-metry | 0.1 | -- | 1:2 Soil extract |
| Electrical Conductivity | Electrical conductivity meter | IS 14767 - 2001 | Conductometry | 0.01 | mS/cm | |
| Moisture content | i)Oven ii)Weighing balance | IS : 2720 (Part 2) - 1973 | Gravimetric method | 0.1 | % | Analysis as per Standard Methods specified |
| Organic matter | i)Oven ii)Weighing balance iii) Volumetric apparatus | IS : 2720 (Part 22) - 1972 | Titrimetric method | 0.1 | % | |
| **Dissolved analytes in Soil/Sediment/Sludge** | i)Oven ii)Mechanical Shaker iii)Weighing balance iv)Volumetric apparatus | 1:10 water extract for dissolved analytes | | | | |
| Calcium as Ca | Volumetric apparatus | APHA, 22nd Ed, 2012, 3500-Ca B | EDTA Titrimetric | 10 | mg/kg | 10% Water Extract to be made and analysed as per Standard Methods specified. |
| Magnesium as Mg | Volumetric apparatus | APHA, 22nd Ed, 2012, 3500-Mg B | By Calculation | 10 | mg/kg | |
| Sodium as Na | Flame photometer | APHA, 22nd Ed, 2012, 3500-K B | Flame Photometry | 10 | mg/kg | |
| Potassium as K | Flame photometer | APHA, 22nd Ed, 2012, 3500-Na B | Flame Photometry | 10 | mg/kg | |
| Phosphates as $PO_4^{---}$ | UV Visible Spectrophotometer | APHA, 22nd Ed, 2012, 4500-P-D | Stannous Chloride method | 1 | mg/kg | |
| Sulphates as $SO_4^{--}$ | UV Visible Spectrophotometer | APHA, 22nd Ed, 2012, 4500-$SO_4^{--}$ E | Turbidimetric method | 10 | mg/kg | |
| Chlorides as $Cl^-$ | Volumetric apparatus | APHA, 22nd Ed, 2012, 4500-$Cl^-$ B | Argentometric method | 5 | mg/kg | |

| Parameters | Analytical equipment | Standard Method | Methodology | Sensitivity / Detection limit | Units | Remarks |
|---|---|---|---|---|---|---|
| **Metals in Soil/Sediment/Sludge** | i) Oven<br>ii) Weighing balance<br>iii) Hot plate<br>iv) Volumetric apparatus | USEPA SW846 7000 | 1:100 acid extract and measurement of digested sample on AAS | | | |
| Copper as Cu | Atomic Absorption Spectrophotometer | USEPA SW846 7210 | Flame Atomic Absorption Spectrophotometry | 2 | mg/kg | 1% acid digested sample used for metal analysis. Analysis has been carried out as per USEPA SW 846 methods. |
| Total Chromium as Cr | | USEPA SW846 7190 | | 5 | mg/kg | |
| Cobalt as Co | | USEPA SW846 7200 | | 5 | mg/kg | |
| Cadmium as Cd | | USEPA SW846 7130 | | 0.5 | mg/kg | |
| Zinc as Zn | | USEPA SW846 7950 | | 0.5 | mg/kg | |
| Lead as Pb | | USEPA SW846 7420 | | 10 | mg/kg | |
| Nickel as Ni | | USEPA SW846 7520 | | 4 | mg/kg | |
| Iron as Fe | | USEPA SW846 7380 | | 3 | mg/kg | |

**c. Chemical Properties of Soil**

The collected soil sample was analysed for various chemical parameters. The parameters selected were pH, electrical conductivity, soluble anions and cations, nutrients and organic carbon content. These results are presented in Table 3.6.

pH is an important parameter which indicates the alkaline and acidic nature of soil. It regulates the nutrient availability and greatly attacks the microbial population as well as solubility of metal ions. The pH of the soil in the project site is slightly alkaline in reaction having pH of 7.3.

The EC for the soil sample is 0.32 mS/cm. Most of the important cations and anions present in soluble salts in the soil are Calcium, Magnesium, Sodium, Potassium, Chloride and Sulphate. It was observed that the concentration of Calcium and Magnesium is 80 mg/kg and 24.3 mg/kg respectively. Sodium and Potassium concentrations are 30 mg/kg and 10 mg/kg respectively. Sulphate and Chloride values are 61 mg/kg and 48.9 mg/kg respectively. The chemical analysis of soil extract (1:1) is presented in Table 3.7.

**Table 3.7: Chemical Properties of Soil**

| Sr. No. | Parameter | Result of analysis | Unit |
|---|---|---|---|
| 1 | Colour | Brown | -- |
| 2 | pH | 7.3 | -- |
| 3 | Electrical Conductivity | 0.32 | mS/cm |

| Sr. No. | Parameter | Result of analysis | Unit |
|---|---|---|---|
| 4 | Moisture Content | 2.5 | % |
| 5 | Organic Matter | 04 | % |
| 6 | Chlorides as $Cl^-$ | 48.9 | mg/kg |
| 7 | Sulphates as $SO_4^{-2}$ | 61 | mg/kg |
| 8 | Phosphate as $PO_4^{-3}$ | 6.7 | mg/kg |
| 9 | Calcium as Ca | 80 | mg/kg |
| 10 | Magnesium as Mg | 24.3 | mg/kg |
| 11 | Sodium as Na | 30 | mg/kg |
| 12 | Sodium Adsorption Ratio (SAR) | 0.82 | - |
| 13 | Potassium as K | 10 | mg/kg |

BDL: Below Detectable Limit

**Soil Extraction:**

**Water Extract**

10g soil sample was taken in 100 ml distilled water, mixed well and the sample was stirred with the help of mechanical shaker for 6 hrs. Then it was filtered and made up to 250 ml by distilled water.

**Acid Extract:**

10g soil sample was taken in 50 ml double distilled water; 5ml of Aqua-regia was added and it was digested. Then it was filtered and made up to 100 ml with distilled water**.**

**d. Nutrient Status of Soil**

Organic matter present in the soil influences the soil's physical and chemical properties. Organic matter commonly accounts as one third or more of the cation exchange capacity of surface soils. It is also responsible for stability of the soil aggregates. Organic matter was found to be 4% as mentioned in Table 3.6 above.

**e. Heavy Metal Content in the Soil**

The heavy metals occur in the solution as cations are adsorbed by the negatively charged soil particles. They are held strongly as complex on the surface of clay Alumino Silicates hydrated oxide and humus. In general, adsorption increases with pH, heavy metals pollution is serious because it can persist for many decades. The heavy metals also create problems in the nutrient utilization in plant and also marked reduction in chlorophyll content.

**Average concentration of heavy metals in Soil:**

| Heavy Metals | Concentration (Mg/kg) |
|---|---|
| Chromium (Cr) | 5-1500 |
| Zinc (Zn) | 10-300 |
| Lead (Pb) | 2-300 |
| Nickel (Ni) | 2-1000 |
| Cadmium (Cd) | 0.01-24 |
| Cobalt (Co) | 0-8 |
| Manganese (Mn) | 850-1000 |
| Iron (Fe) | 0-38000 |
| Arsenic (As) | 0.1 – 8.5 |

Soil samples was also analyzed for heavy metals such as Chromium, Zinc, Lead, Nickel, Cadmium, Cobalt, Manganese, Iron and Copper and their concentrations are presented in Table 3.7. The presence of heavy metals at proper pH enhances the microbial activity in soil. It is observed that levels of heavy metals like Iron, Manganese and Cadmium are found to be high in soil of project site whereas other heavy metals are in the normal range. The high level of Iron and Manganese might be due to mineralization of Iron and Manganese in the strata due to weathering effect.

**Table 3.8: Heavy Metals in Soil**

| Sr. No. | Parameter | Result of analysis | Unit |
|---|---|---|---|
| 1. | Iron as Fe | 48865 | mg/kg |
| 2. | Copper as Cu | 75.5 | mg/kg |
| 3. | Manganese as Mn | 2030 | mg/kg |
| 4. | Chromium as Cr | 50 | mg/kg |
| 5. | Cobalt as Co | 32 | mg/kg |
| 6. | Cadmium as Cd | 2.2 | mg/kg |
| 7. | Zinc as Zn | 180 | mg/kg |
| 8. | Lead as Pb | 110 | mg/kg |
| 9. | Nickel as Ni | 39 | mg/kg |

### 3.1.5 Soil Erosion: (TOR Point No. 10-d)

The following precautions shall be taken for preventing soil erosion-

- On open unpaved areas carefully planned landscaping and tree plantation shall be done
- Excavation required during construction phase shall not be undertaken during monsoon season and the excavated soil shall be removed from the site before commencement of monsoon season
- There shall be traps on storm water drains to avoid any siltation and sedimentation of the external drain outside the plot

## 3.2 WATER ENVIRONMENT

Water is essential for all life forms and quality of water affects humans, plants and animals. During environmental monitoring of the project site and impact area both surface water and ground water sources were identified. This section documents the baseline scenario of the water environment in the study area.

### 3.2.1 Surface water: (TOR Point No.8-c)

No source of surface water was observed within the project site boundary and within 500 m radius from project site. The surface water bodies found within study area are tabulated in **Table 3.9**.

**Table 3.9: Proximity to Surface Water bodies**

| Surface Water body | Aerial Distance in km from Plot Boundary |
|---|---|
| Mahim Bay | 2.30 |
| Mahim Creek | 4.00 |
| Mahul Creek | 3.40 |
| Mithi River | 5.20 |
| Arabian Sea | 3.50 |
| Chandivali Lake | 12.50 |
| Powai Lake | 13.20 |

All the above mentioned water bodies are located in the area between 500 m periphery of the project boundary to 15 km. Since this is a building construction project no impacts are envisaged on water bodies in the area beyond 500 m radius from project boundary, hence secondary data has not been incorporated.

### 3.2.2 Ground Water: (TOR Point No. 8-b)

Ground water sampling was not done as no source of ground water was found within the project site boundary.

## 3.3 AIR ENVIRONMENT : (TOR Point No.: 8-d)

### 3.3.1 Climate

The climate of Mumbai is characterized by an oppressive summer, dampness in the atmosphere nearly throughout the year, and heavy South-West monsoon rainfall. The cold season from December to February is followed by the summer season from March to June. The period from June to about the end of September constitutes the South-West monsoon season, and October and November form the post-monsoon season.

### 3.3.2 Rainfall (TOR Point No. 10-b)

The records of Mumbai for the average annual rainfall are 2000 -2500 mm. About 94 per cent of the annual rainfall in Mumbai is received during the south-west monsoon months of June to September. July is the rainiest month when about one-third of the annual rainfall is received. Some rainfall mostly as thundershowers is also received during the month of May and the post-monsoon months.

### 3.3.3 Cloud Cover

During the South-West monsoon months the skies are generally heavily clouded or overcast. Cloudiness decreases after the withdrawal of the South-West monsoon towards the end of September. During the period December to March clear or lightly clouded skies prevail generally. Later cloudiness increases with the progress of the season.
Source: http://cultural.maharashtra.gov.in/english/gazetteer/greater_bombay/general.html#3

### 3.3.4 Meteorology

Meteorological data for the year 2012 and year 2013 has been collected from Indian Meteorological Department (IMD), Mumbai. The parameters for which data have been collected are:

- Wind speed
- Wind direction
- Temperature
- Relative humidity

**Metrological Data of one full year, 2012**
Average/ maximum and minimum meteorological data for period January to December 2012 is represented in Table 3.10.

**Table 3.10: Meteorological data**

| Study period | Temp (°C) | | Predominant Wind direction | Wind speed (m/s) | | Relative Humidity(%) | |
|---|---|---|---|---|---|---|---|
| | Max. | Min | | Max | Min | Max | Min. |
| January 2012 | 34.3 | 10.4 | NW | 14 | 0 | 98 | 13 |
| February 2012 | 38.7 | 11.6 | NNW | 17 | 0 | 90 | *10 |
| March 2012 | 38.5 | 13.3 | NNW | 22 | 0 | 93 | 13 |
| April 2012 | 36 | 22.7 | NW | 18 | 0 | 91 | 28 |
| May 2012 | 34.7 | 24.6 | W | 18 | 0 | 87 | 54 |
| June 2012 | 34.5 | 23.3 | SW | 28 | 0 | 95 | 53 |
| July 2012 | 31.7 | 24.7 | SWW | 22 | 0 | 98 | 69 |
| August 2012 | 31.5 | 24.5 | SW | 20 | 0 | 97 | 64 |
| September 2012 | 34.8 | 23.6 | SW | 22 | 0 | 98 | 38 |
| October 2012 | 36 | 21 | NE | 18 | 0 | 95 | 17 |
| November 2012 | 35 | 16 | NW | 14 | 0 | 96 | 14 |
| December 2012 | 36 | 15 | NNW | 16 | 0 | 92 | 15 |

| Study period | Temp (°C) | | Predominant Wind direction | Wind speed (km/h) | | Relative Humidity (%) | |
|---|---|---|---|---|---|---|---|
| | Max. | Min | | Max | Min | Max | Min. |
| January | 34.8 | 11.7 | North West | 18 | 0 | 96 | 11 |
| February | 36.5 | 14.7 | North | 26 | 0 | 93 | 16 |
| March | 41 | 18.7 | North West | 26 | 0 | 92 | 16 |
| April | 37.1 | 19.7 | North West | 22 | 0 | 92 | 25 |
| May | 34.4 | 25.6 | West | 22 | 0 | 95 | 35 |
| June | 33.9 | 24.8 | South West | 26 | 0 | 98 | 54 |
| July | 31.7 | 24 | West | 26 | 0 | 100 | 68 |
| August | 31.3 | 24.4 | West | 26 | 0 | 93 | 49 |
| September | 32.4 | 22.8 | West | 26 | 0 | 100 | 60 |
| October | 36.8 | 21.2 | West | 22 | 0 | 96 | 36 |
| November | 37 | 18.2 | North West | 12 | 0 | 91 | 23 |
| December | 35.2 | 15 | North West | 12 | 0 | 94 | 15 |

Source: Meteorological data for the year 2013 has been collected from Indian Meteorological Department (IMD), Mumbai.

The prevailing wind direction at site is shown through following wind roses prepared for each month throughout the year 2013 is as follows:

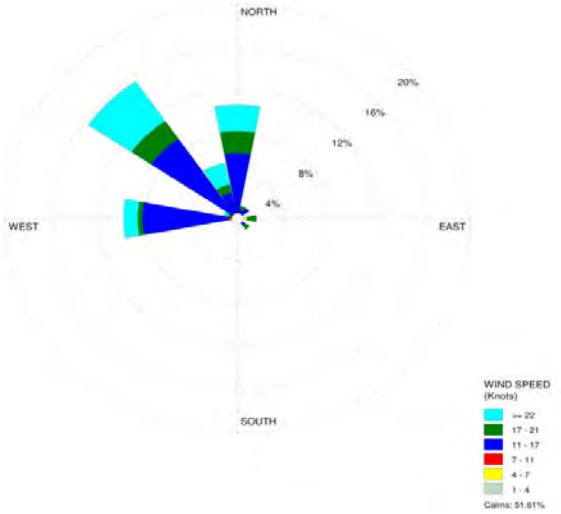



**Fig.3.19: Windrose diagram for January 2013**

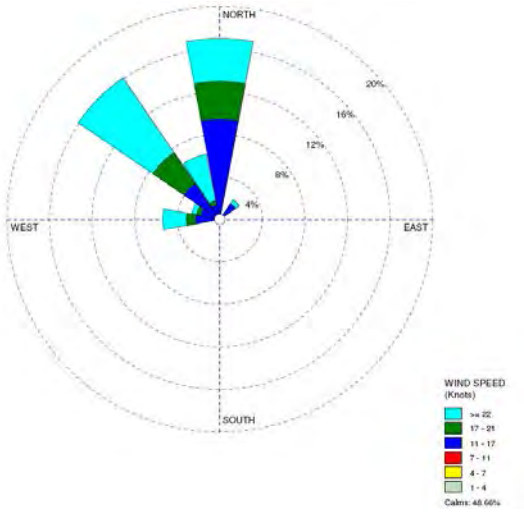



**Fig.3.20: Windrose diagram for February 2013**

Map showing the locations of ambient air quality monitoring is given below.

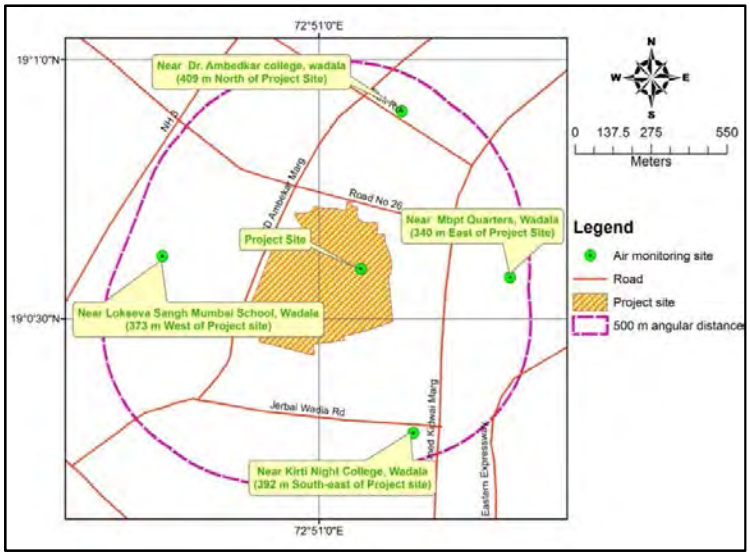



**Fig. 3.31: Air monitoring site map of 500 m radius area around project site (TOR Point No. 31)**

- **Sampling Frequency**

The frequency of monitoring was 24 hrs twice a week at each station spread over the season except for CO which was 1 hr twice a month.

- **Parameters Monitored and Methods Used**

The parameters monitored were Respirable Suspended Particulate Matter (RSPM), Sulphur Dioxide ($SO_2$), Nitrogen Oxides (NOx) and CO. The detailed monitoring methodology for ambient air is given in **Table 3.13.**

**Table 3.13: Methodology of Ambient Air Monitoring**

| Sampling Parameters | Sampling Frequency | Sample collection | | Sample Analysis | | Methodology |
|---|---|---|---|---|---|---|
| | | Sampling equipment | Sensitivity/ Detection Limit | Analytical Equipment | Sensitivity/ Detection Limit | |
| RSPM ($PM_{10}$, $PM_{2.5}$), $SO_2$, NOx | 24 hrs twice a week at each station | RSPM ($PM_{10}$), Respirable Dust Sampler | 10 µg/$m^3$ | RSPM ($PM_{10}$), Monopan Balance | 0.0001 mg | Gravimetric (HVS) IS : 5182 (Part 23) : 2006 (through Cyclonic flow Technique) |
| | | RSPM ($PM_{2.5}$), Fine Dust Sampler | 2.5 µg/$m^3$ | Monopan Balance | 0.0001 g | Gravimetric Method – NAAQS Monitoring & Analysis Guidelines Volume 1 By CPCB |
| | | $SO_2$: Rotameter for measurement of air flow | 05 µg/$m^3$ | $SO_2$: Spectrophoto meter | - | IS : 5182 (Part 2) : 2001 |

| Sampling Parameters | Sampling Frequency | Sample collection | | Sample Analysis | | Methodology |
|---|---|---|---|---|---|---|
| | | Sampling equipment | Sensitivity/ Detection Limit | Analytical Equipment | Sensitivity/ Detection Limit | |
| | | $NO_x$: Rotameter for measurement of air flow | 05 µg/m$^3$ | $NO_x$: Spectrophoto meter | - | IS : 5182 (Part 6) : 2006 |
| CO | 1hrs twice a month at each station | Gas Bladder | -- | NDIR Spectroscopy | < 0.05 ppm | IS : 5182 (Part 10) : 1999 Non Dispersive Infra Red (NDIR) Spectroscopy |

- **Results of Ambient Air Monitoring**

Results of Ambient Air monitoring are given in Table 3.14.

**Table 3.14: Average Ambient Air Quality around the Project Site**
**Period: November 2012 to January 2013 (TOR Point No. (8)- d and 31)**

| Station Code | AAQM Station | PM $_{2.5}$ (24 hr) (µg/m$^3$) | $PM_{10}$ (24hr.) (µg/m$^3$) | $SO_2$ (24hr.) (µg/m$^3$) | NOx (24hr) (µg/m$^3$) | CO (1 hr) (mg/m$^3$) |
|---|---|---|---|---|---|---|
| | | Average | Average | Average | Average | Average |
| AQ1 | Project site | 50 | 77 | 15 | 22 | 1.63 |
| AQ2 | Near Kirti Night College, Wadala | 72 | 49 | 16 | 20 | 0.98 |
| AQ3 | Near Lokseva Sangh Mumbai School, Wadala | 48 | 76 | 18 | 27 | 1.94 |
| AQ4 | Near Dr. Ambedkar College, Wadala | 53 | 75 | 20 | 28 | 1.73 |
| AQ5 | Near MBPT Quarters, Wadala | 46 | 72 | 12 | 20 | 1.51 |

**Table 3.15: Permissible Ambient Air Quality Standards**

| Pollutants | $PM_{2.5}$ (24hr.) (µg/m$^3$) | PM $_{10}$ (24hr.) (µg/m$^3$) | $SO_2$ (24hr.) (µg/m$^3$) | NOx (24hr) (µg/m$^3$) | CO( 1 Hr ) (mg/m$^3$) |
|---|---|---|---|---|---|
| **Residential, Industrial, rural area & other area** | 60 | 100 | 80 | 80 | 04 |
| **Sensitive** | 60 | 100 | 80 | 80 | 04 |

The permissible standards are as per National Ambient Air Quality Standard (NAAQS) issued by Central Pollution Control Board (CPCB) is B-29016/20/90/PCI-I dated November 18, 2009.

- **Presentation of Ambient Air Quality analysis results:**

The Ambient Air Quality Monitoring (AAQM) stations at project site (AQ1) and near MBPT Quarters, Wadala (AQ5) have been considered as residential zones. AAQM stations near Kirti Night College, Wadala (AQ2), near Lokseva Sangh Mumbai School, Wadala (AQ3) and near Dr. Ambedkar College, Wadala (AQ4) have been considered as sensitive zones. After tabular and graphical representation of Ambient Air quality it can be observed that:

- The average values of $PM_{2.5}$ ranged in between 46 µg/m$^3$ to 72 µg/m$^3$ and $PM_{10}$ ranged in between 49 µg/m$^3$ to 77 µg/m$^3$.
- The average values of $SO_2$ was in between 12 µg/m$^3$ to 20 µg/m$^3$, $NO_x$ was in between 20 µg/m$^3$ to 28 µg/m$^3$ and CO ranged in between 0.98 mg/m$^3$ and 1.94 mg/m$^3$.

- All the parameters were found to be within the desired limits specified by CPCB except value of $PM_{2.5}$ near Kirti Night College, Wadala (AQ2) which is exceeding permissible limits due to vehicular movement in nearby roads.
- Graphical comparison with baseline data of January-March 2010 shows decrease in value of $PM_{10}$ but values of $SO_2$ and NOx show increase in value.

The concentrations of all ambient air quality parameters as measured in November 2012 to January 2013 are within the limits prescribed by CPCB except value of $PM_{2.5}$ recorded near Kirti Night College, Wadala (AQ2) which shows higher value than CPCB standard.

Graphical representation of comparison of Ambient Air Quality status of the project site is as below:

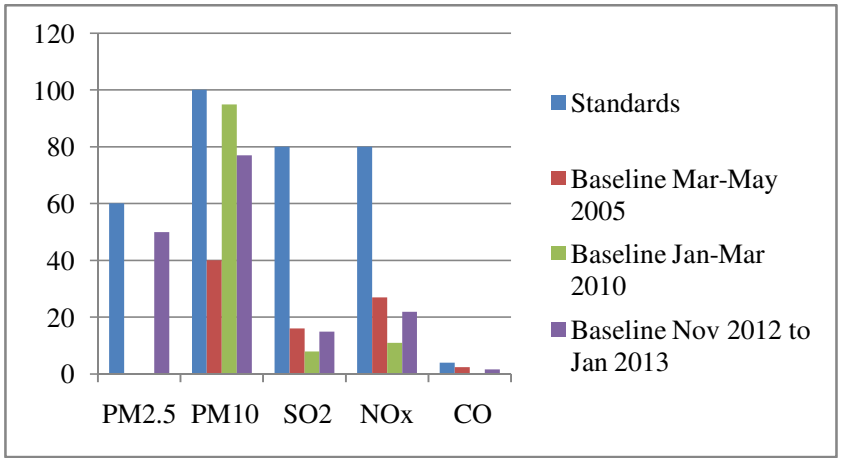



**Fig. 3.32: Graphical representation of comparison of Ambient Air Quality data**

EIA studies including baseline data collection was not carried out during March to May 2005 by Ultra-Teach team. As compared to baseline results of January to March 2010 and November 2012 to January 2013 shows decrease in value of $PM_{10}$ and there is an increase in values of $SO_2$ and $NO_X$.

- **Calibration of RSPM**

All RSPM samplers used for sampling purpose have been calibrated by its manufacturer Envirotech India Limited.

### 3.3.6 NOISE ENVIRONMENT: (TOR Point No. (8) f )

Noise can affect human health and behavior. Construction equipment and road traffic are the major sources of noise. Baseline noise data of the project area and the neighborhood habitat areas was ascertained to establish existing conditions of ambient noise in the project site.

- **Monitoring Methodology of Noise Level**

Methodology for monitoring of noise levels is given in **Table 3.16.**

**Table 3.16: Monitoring Methodology of Noise (TOR Point No. 33 and 34)**

| Environmental Component | Sampling location | Sampling Parameter | Sampling Frequency | Sampling equipment |
|---|---|---|---|---|
| Ambient Noise levels | 5 locations | Decibels – dB (A) | Hourly reading for 24 hours at each location | Noise Level Meter |

- **Noise Level Results**

Noise readings were taken at different locations 100 m around the project site. The readings are presented vide Table 3.17.

**Table 3.17: Noise level readings 100 m around the project site (TOR Point No. (8) f)**

| Station Code | Category of Area/Zone | Zone | Distance from Project Site | Equivalent Noise levels in Leq | |
|---|---|---|---|---|---|
| | | | | Day | Night |
| N1 | Project Site | Residential | -- | 62 | 50 |
| N2 | Near Agari Ground, Wadala | Residential | 54 m | 58 | 49 |
| N3 | Near T.B. Hospital, Sewari, Wadala | Silence | 65 m | 64 | 49 |
| N4 | Near Naigaon Police Parade Ground, (Police Head Quarters) | Residential | 62 m | 62 | 47 |
| N5 | Near Wadala Udyog Bhawan | Commercial | 75 m | 69 | 50 |

Map showing the locations of noise level monitoring 100 m around project site is given in Fig 3.32.

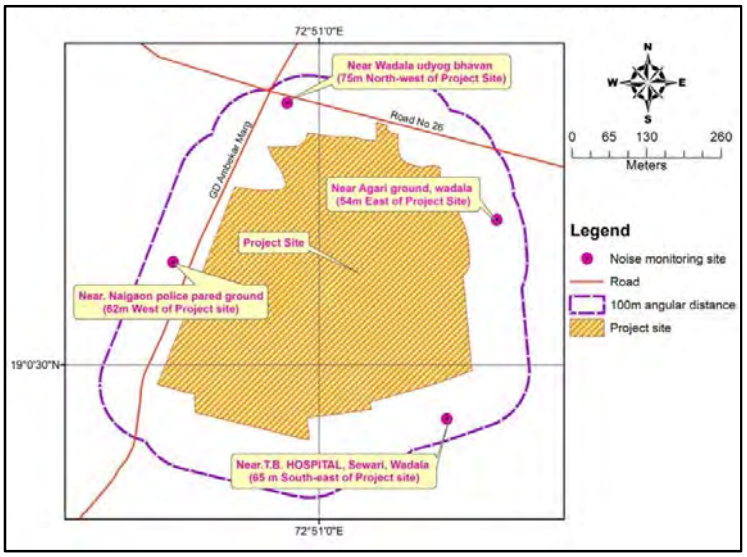



**Fig. 3.33: Noise monitoring site map 100 m around the project site (TOR Point No. 34)**

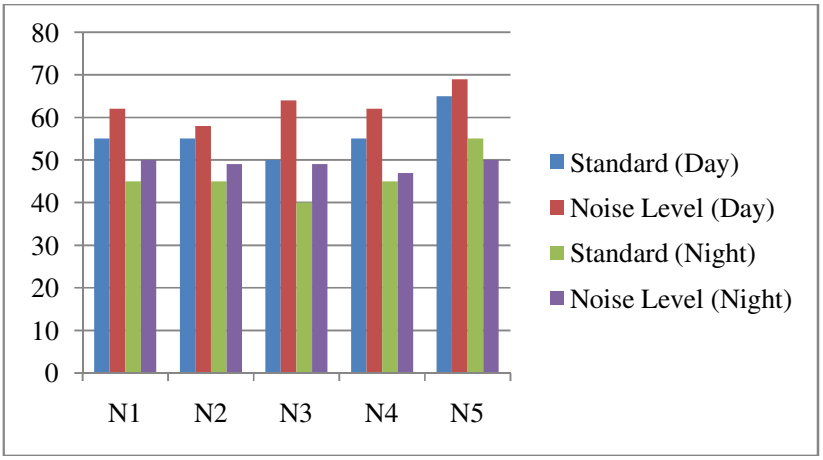



**Fig. 3.34: Graphical representation of noise quality data 100 m around project site**

**Table 3.18: Ambient Noise Levels Standards Specified By CPCB**

| Category of Area | Limits in dB (A) Leq | |
|---|---|---|
| | Day Time 6 am – 9 pm | Night Time 9 pm – 6 am |
| **Industrial Area** | 75 | 70 |
| **Commercial Area** | 65 | 55 |
| **Residential Area** | 55 | 45 |
| **Silence Zone** | 50 | 40 |

- **Presentation of Ambient Noise Quality results:**

Ambient noise quality monitoring stations at project site (N1), near Agari Ground, Wadala (N2) and near Naigaon Police Parade Ground, (Police Head Quarters) (N4) have been considered as residential zones. Station near T.B. Hospital, Sewari, Wadala (N3) has been considered as silence zone and near Wadala Udyog Bhawan (N5) has been considered as a commercial zone.

Comparison of the ambient noise levels with the standards specified by CPCB reveals that the noise level, day time and night time readings of all stations are exceeding CPCB standards owing to vehicular movement in nearby roads. Night time noise level readings at monitoring station near Wadala Udyog Bhawan (N5) is complying with above specified CPCB limits. The Principal Rules of Noise Pollution were published in the Gazette of India, vide S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.

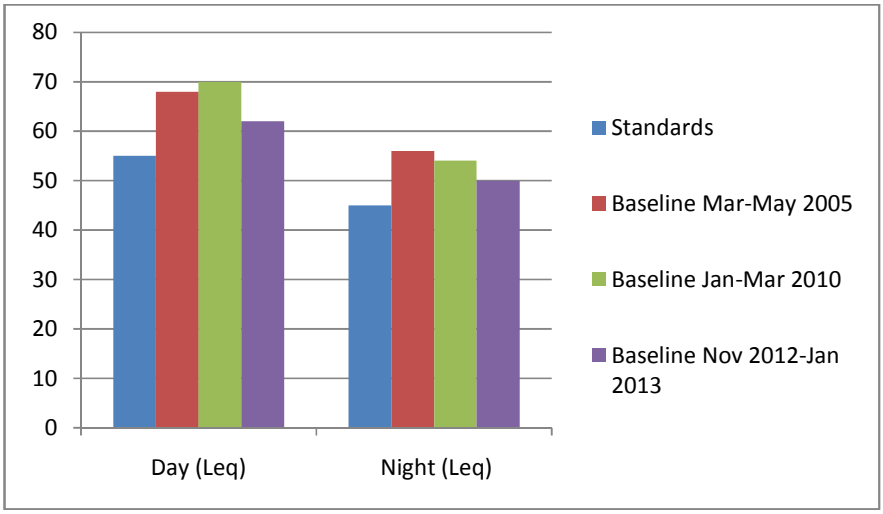



**Fig.3.35: Graphical representation of Comparison of average values of noise quality data.**

As mentioned earlier EIA studies including baseline data collection was not carried out during March to May 2005 by Ultra-Teach team.

Comparison of the ambient noise levels at the project site between January to March 2010 and November 2012 to January 2013 show decrease both at day time and night time readings. Still the readings exceeded the notified CPCB standards.

## 3.4 BIOLOGICAL ENVIRONMENT:

### 3.4.1 Preamble:

Study of biological environment is one of the most important aspects for Environmental Impact Assessment. In view of the need for conservation of environmental quality and biodiversity, study of biological environment is one of the most important aspects for Environmental Impact Assessment. Ecological systems show complex inter-relationships between biotic and abiotic components

including dependence, competition and mutualism. Biotic components comprises of both plant and animal communities, which interact not only within and between them but also with the abiotic components viz. physical and chemical components of the environment. Generally, biological communities are the indicators of climatic and edaphic factors. The biological environment includes mainly terrestrial ecosystem and aquatic ecosystem.

**Habitat Assessment:** The term "habitat" has been used in broad sense for the general land cover and physiognomy for a particular species. The information on prevailing baseline in the proposed project site is important because project activities might lead to loss of the ecological resources, if existing. The information will further enable to evaluate the feasibility and efficacy of the mitigation options that are being proposed by environmentalist and conservationist to incorporate conservation concerns in mitigating the impacts of developmental project.

### 3.4.2 Objectives of Ecological Studies

The present study was undertaken with the following objectives:

- To assess the nature and distribution of vegetation in and around the project site
- To assess the distribution of animal life spectra, including avifauna and butterflies, available in this area
- To ascertain whether the proposed project will have any adverse impact on the ecology in and around project areas, and suggest mitigation measures, if needed

### 3.4.3 Study Area

As per guidelines of MoEF for Environmental Impact Assessment, pertaining to Construction projects, total study area is restricted up to 15 km radius from the project site, of which primary data need to be collected from the area up to 500 m radius and remaining area, up to 14.5 km, will be represented by secondary data. The data up to 500 m radius were generated with reference to topography, land use, vegetation pattern, animals etc. All observations were undertaken in November 2012 at select sampling locations (**Figs. 3.36 & 3.37**). The climatic conditions in the study area are severe with moderately hot and humid climate and moderate rainfall. Terrestrial vegetation primarily consists of trees and shrubs.

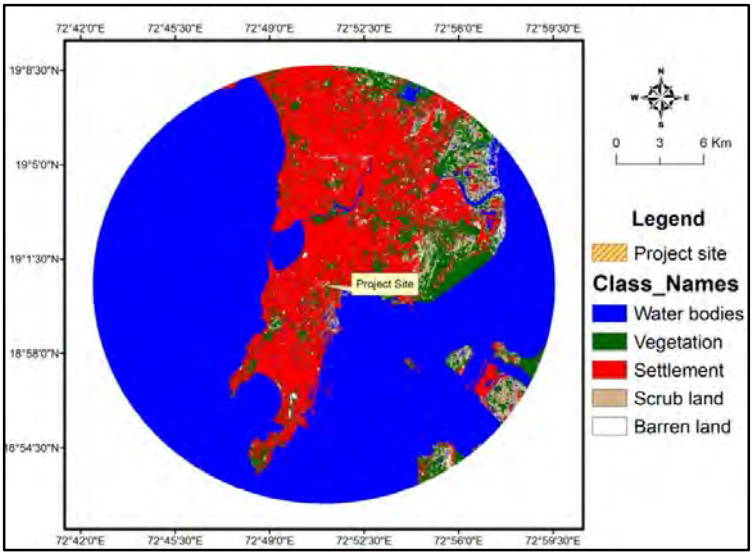



**Fig. 3.36: Landuse / landcover map of 15 km periphery around the plot boundary**

### 3.4.4 Biodiversity (TOR Point No. 8-e & 21)

### 3.4.4.1 Project site

**Flora:**

Presently in the project site some species like *Mangifera indica*, *Ficus racemosa, Ficus religiosa* etc. were found.

**Fauna:**

In project site some species of butterflies like common grass yellow, common Indian crow, common wanderer and small grass yellow were found, while common birds like pigeon, black kites, house sparrow, Indian myna and house crow were dominant. Among mammals, common dog, domestic buffalo and squirrel were observed. A comparative account of the types of birds available in project site and surrounding areas, and their preference of foods has been delineated in following section 3.4.4.2.

### 3.4.4.2 Area between project site and 500 m surroundings

**A) Terrestrial Ecology:**

**Methodology***:* A field survey was undertaken during November 2012 to enumerate the trees in the proposed site and general types of vegetations in between proposed site and 500 m surroundings.

**a) Flora**

It was clearly observed that the area is very congested and fully developed. Five locations (patch) (A-E), including project site, were selected for detailed survey **(Plate 3.1)**. The patches measuring 500 sq. m were considered for field survey. The dominant trees are *Tamarindus indica, Peltophorum pterocarpum, Swietenia mahagoni*, *Albizia saman, Delonix regia,* followed by *Terminalia catappa, Azadirachta indica, Ficus bengalensis, Ficus recemosa, Lantana camara, Casuarina equisitifolia* etc. **(Table 3.19).**

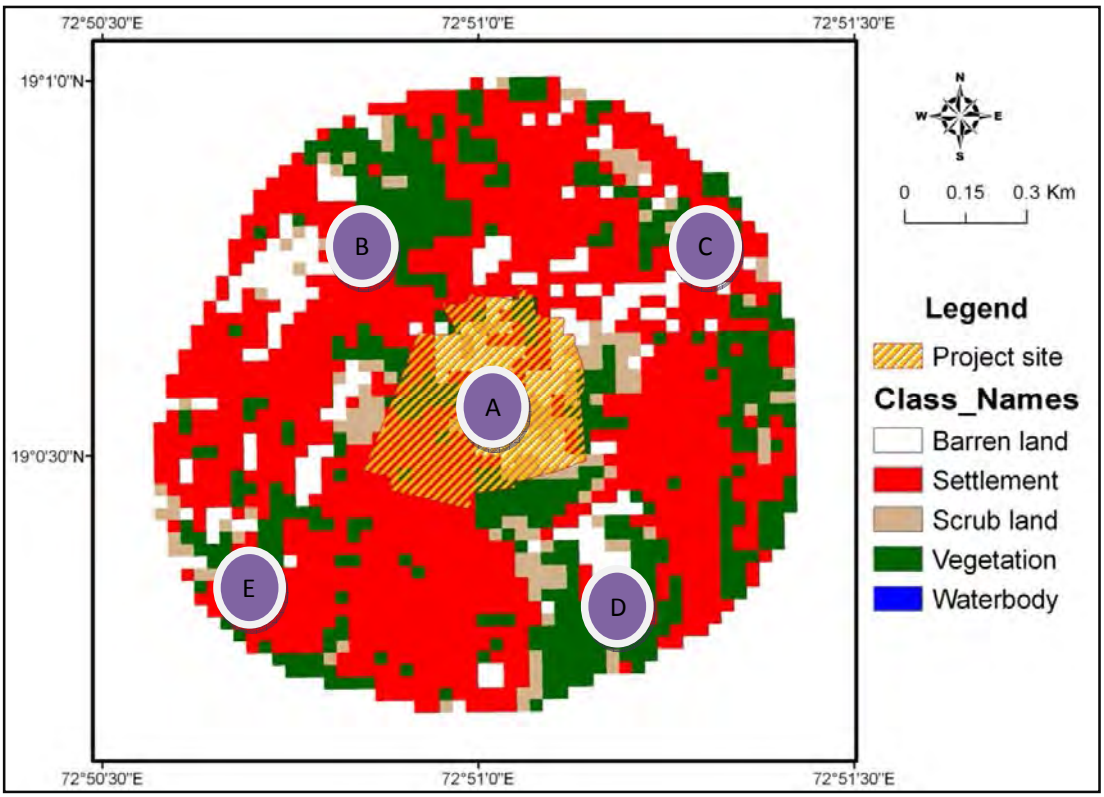



**Fig.3.37: Locations of field survey within 500 m periphery of project site: vegetation and avifauna (A-E)**

**Table 3.19: Trees and shrubs in green patches within 500 m surroundings from the project site**

| Sr. No | Scientific Names | Areas | | | | |
|---|---|---|---|---|---|---|
| | | Project site (A) | Dadar BEST Workshop (B) | Mumbai Port Trust Colony (C) | Sewri T.B Hospital (D) | Haffkine Institute Compound (E) |
| **Trees** | | | | | | |
| 1 | *Delonix regia* | + | + | + | + | + |
| 2 | *Albizia saman* | + | + | + | - | + |
| 3 | *Terminalia catappa* | + | + | + | + | + |
| 4 | *Azadirachta indica* | + | + | + | - | + |
| 5 | *Ficus benghalensis* | + | + | + | + | + |
| 6 | *Ficus religiosa* | + | - | - | + | + |
| 7 | *Peltophoum pterocarpum* | + | + | + | + | + |
| 8 | *Syzygium cumini* | + | + | + | - | + |
| 9 | *Bombax ceiba* | + | + | - | + | + |
| 10 | *Ployanthia longifolia* | + | + | + | + | + |
| 11 | *Thespesia populnea* | + | + | + | + | + |
| 12 | *Cocos nucifera* | + | + | + | + | + |
| 13 | *Swietenia mahagoni* | + | + | + | + | + |
| 14 | *Artocarpus heterophyllus* | + | - | + | - | + |
| 15 | *Ficus racemosa* | + | + | + | + | + |
| 16 | *Malacra capitata* | + | + | + | + | + |
| 17 | *Bauhinia purpurea* | - | + | - | + | - |
| 18 | *Tamarindus indica* | + | + | + | + | + |
| 19 | *Acacia auriculiformis* | - | + | + | + | + |
| 20 | *Eucalyptus* | + | - | + | - | + |
| 21 | *Lagerstroemia speciosa* | + | + | + | - | - |
| 22 | *Casuarina equisitifolia* | + | - | + | - | + |
| **Shrubs** | | | | | | |
| 1 | *Ricinus communis* | - | + | - | + | - |
| 2 | *Calliandra emarginata* | + | + | + | + | + |
| 3 | *Bougainvillea glabra* | - | + | + | + | + |
| 4 | *Lantana camara* | - | + | - | + | - |
| 5 | *Microcos paniculata* | + | + | + | + | + |
| 6 | *Alamanda cathartica* | - | + | + | + | + |
| 7 | *Caesalpinia pulcherrima* | | | | | |
| 8 | *Argemone mexicana* | | | | | |
| 9 | *Jasminum sp.* | - | + | - | + | - |
| 10 | *Plumeria alba* | + | + | + | + | + |
| 11 | *Ervatamia divaricata* | - | + | + | + | + |

| Sr. No. | Common Name | Scientific Name | Conservation status as per Wildlife (Protection) Act (1972) |
|---|---|---|---|
| 8 | Dark pierrot | *Tarucus ananda* | Not enlisted |
| 9 | *Small grass yellow | *Eurema brigitta* | Not enlisted |
| **Dragonflies and Damselflies** | | | |
| 1 | *Tricoloured marsh hawk | *Orthetrum luzonicum* | Not enlisted |
| 2 | Ditch jewel | *Brachythemis contaminata* | |
| 3 | *Yellow bush dart | *Copera marginipes* | Not enlisted |
| 4 | *Golden dartlet | *Ischnura aurora* | Not enlisted |
| 5 | Senegal golden dartlet | *Ischnura senegalensis* | Not enlisted |
| **Mammals** | | | |
| 1 | *Common dog | *Canis lupus familiaris* | Not enlisted |
| 2 | *Squirrel | *Funambulus palmarum* | Sch-IV |
| 3 | *Domestic buffalo | *Bubalus bubalis* | Not enlisted |

**Source: Primary data generation by Ultratech team**
***Observed also in site 1 (Project site)**

- **Observation**

**i. Vertebrates:**

The domestic animals in the study area mostly comprised of dog and cow. The survey revealed that 3 species of common mammals were recorded, while no wild mammal was observed in this area. Availability of fauna in the vicinity of the site is presented in **Table 3.21**. None of these animals are endangered (Schedule I) as per Wildlife (Protection) Act 1972.

**ii. Invertebrates**

**Butterflies**

Study area comprises of 9 species of butterflies, dominated by *Eurema brigitta, Danaus chrysippus, Pareronia valeria* and *Euploea core*. Butterfly diversity and community composition are dependent on plants, as their caterpillars are highly specific to host plants, on which they feed and metamorphose into the adults. Fairly good butterfly diversity in this area is conspicuous due to presence of wide varieties of flowering trees. Therefore, richness of host plant diversity contributes to butterfly diversity. None of these is endangered (Schedule I) as per Wildlife (Protection) Act 1972.

**Dragonflies and Damselflies**

Three species of dragonflies and two species of damselflies were recorded. Species like *Copera marginipes, Diplocodes trivialis* and *Orthetrum luzonicum* are commonly seen throughout the project area **(Plate 3.5)** while damselfly *Ischnura aurora* was common in the periphery of the project site.

**iii. Avifauna**

Avifauna is an important part of the ecosystem playing the various roles as scavengers, pollinators, predators of insect pest etc.They are also the bio-indicators of different status of environment like urbanization, industrialization and human disturbance. Birds were studied by direct observation with the help of ‘‘Olympus 10 x 50 DPS I’’ binocular and were identified by adopting available literature (Grimmett *et al.* 1998). Field observations at different locations were carried out during November 2012.

- **Observation**

A total of 11 bird species dominated by Indian myna, house crow, house sparrow, blue rock pigeon, Indian black drongo etc. (**Table 3.21**) were recorded. None of these birds are endangered (Sch I) as per Wildlife (Protection) Act 1972.

**Table 3.21: Availability of avifauna within the 500m during November 2012**

| Sr. No. | Common name | Scientific name | Conservation status as per Wildlife (Protection) Act 1972 |
|---|---|---|---|
| 1 | *Black kite | *Milvus migrans* | Not enlisted |
| 2 | *Blue rock pigeon | *Columba livia* | Sch – IV |
| 3 | Common swallow | *Hirunds rustica* | Sch – IV |
| 4 | *House crow | *Corvus splendens* | Sch – V |
| 5 | *House sparrow | *Passer domesticus* | Sch – IV |
| 6 | *Indian black drongo | *Dicrurus adsimilis* | Sch – IV |
| 7 | Indian cuckoo | *Cuculus micropterus* | Sch – IV |
| 8 | *Indian myna | *Acridotheres tristis* | Sch – IV |
| 9 | Magpie robin | *Copsychus saularis* | Sch – IV |
| 10 | Indian robin | *Saxicoloides fulicata* | Sch – IV |
| 11 | *Small green bee eater | *Merops orientalis* | Sch – IV |

***Observed also in site 1 (Project site)**

**B) Aquatic**

The surroundings of the project site are primarily covered only by land without scrub, plantation, settlement, land with scrub and vegetation. No water body was recorded within 500m surroundings of project site.

### 3.4.4.3 Area between 500 m and 15 km

**Methodology:** The data pertaining to flora and fauna have been collected based on discussions with concerned forest department officials, local people, published literature, NGOs etc. and supported by physical verifications, wherever feasible. The collated data have been delineated hereunder.

Maharashtra Nature Park (MNP), Sanjay Gandhi National Park and Jijamata Udyan are located within 15 Km periphery of the study area. A sizable portion is covered by Mahim Bay, Powai Lake, Chandiwali Lake, Mahul Creek, Mithi River and sea. Along the creek there are mudflats and mangrove forests.

**A) Maharashtra Nature Park (MNP):**

Different types of flora and fauna available in MNP are mentioned below.

**a) Flora:**

There are totally 14000 plants of some 300 verities, including at least 150 kinds of woody trees and a wealth of herbs and shrubs. Planted in several phases over the years, these have not just created a patch of urban green belt but a veritable forest of life.

**Trees:** *Bauhinia purpurea, Acacia nilotica, Acacia catechu, Adansonia digitata, Aegle marmelos, Alstonia scholaris, Albizia lebbeck, Annacardium squamosa, Anthocephalus Cadamba, Achras sapota, Artocarpus heterophyllus, Barringtonia racemosa, mornida tictoria,, Bombax ceiba, cassaia fistula, Delonix regia, Casurina equisetifolia, citrus reticulata, citrus acida, citrus medica, commiphora mukul, courouptia guianensis, Cordia dichotomata, Crateva magna, Cassia siamea, DAlbergia sissoo, Dalbergia latifolia, Butea monosperma, Dillenia indica, Erythrina indica, /emblica officinalis, Syzygium cumini, Eucalyptus species, Ficus bengalensis, Ficus elastic, Ficus glomereta, Ficus religiosa, Garcinia indica, Gmelina arborea, Hollarhena antidysrntrica, Oroxylum indicum, Lagerstomia lanceolata, Madhuca longifolia, Mallotus philippensis, Mangifwra indica, Mitragyna*

*parviflora, Mesua ferrea, Polyanthia longifolia, Mimusops elengi, Michelia champaca, Saraca asoca, Moringa oleifera, Nyctanthes arbor-tristis, Melia azedarach, Inga dulcis, Lagerstoemia flos-reginae, Peltophorum roxburghii, Samanea saman, Plumeria rubra, Pongamia pinnata, Prosopis cineraria, Psidium guajava, Punica granatum, Putranjiva roxburghii, Santalum album, Sapindus emarginatus, Sterculia urens, Swierenia macrophylla, Syzyguim aromaticum, Strychnos nux-vomica, Tectona grandis, Terminalia Bellerica, Terminalia catappa, Terminalia arjuna, Terminalia chebula, Thespesia populnea, Trema orientalis, Zizyphus mauritiana.*

**Medicinal plants:** *Asparagus racemosus, plumbago zeylanica, Adhatoda vasica, tinospora cordifolia, rauwolfia serpentine.*

**Bamboos**: *Dendrocalamus strictus, Bambusa vulgaris, Arundinaria wightiana, bambusa bambos, bambusa ventricosa, Areca catechu, Cocos nucifera, palmyra borassus flabbellifer, caryota urens, phonexi species, livinstona chinensis, Roystonea eagans.*

**b) Fauna:**

**Mammals**
Species of bats, common mongoose, stripped squirrels, flying fox etc.

**Avifauna**
Little cormorant, pond heron, grey heron, blacked crowned night heron, cattle egret, great egret, little egret, western reef egret, black winged stilt, black headed gull, brown headed gull, little tern, gull billed tern, common sandpiper, green sandpiper, wood sandpiper, common redshank, temminck's stints, little ringed plover, kentish plover, lesser sand plover, red wattled lapwing, black-tailed lapwing, coot, Indian moorhen, white-breasted water hen, common kingfisher, white throated kingfisher, clamorous reed warbler, Eurasian marsh harrier, brahminy kite, wire-tailed swallow, yellow wagtail, grey wagtail , white wagtail, coppersmith barbet, brown headed barbet, house crow, large billed crow**,** rufous treepie, oriental magpie robin, Indian robin, white throated fantail, asian paradise flycatcher, red-throated flycatcher, black naped monarch, black drongo, golden oriole, red vented bulbul, red-whiskered bulbul, blue rock pigeon, spotted dove, yellow footed green pigeon, laughing dove, jungle bush quail, asian koel, common hawk cuckoo, pied cuckoo, greater coucal, common iora, purple rumped sunbird, purple sunbird, pale- billed flowerpecker, red munia, scaly-breasted munia and black headed munia, common tailorbird, grey breasted prinia, plain prinia, ashy prinia, greenish warbler, blyth's reed warbler, hoopoe, nightjar, spotted owlet, barn owl, shikra, black kite, white –rumped vulture, greater spotted eagle, steppe eagle, common kestrel, common myna, asian pied starling, grey- headed starling, rosy starling, house sparrow, house swift, asian palm swift, ring necked parakeet, alexandrine parakeet, plum-headed parakeet, mahratta woodpecker, eurasian wryneck, long tailed shrike, little green bee eater, Indian roller, Indian pitta, barn swallow etc.

**Reptiles**

**Snakes-** Common cobra, rat snake, russell's viper, saw-scaled viper, green vine snake, checkered keelback, striped keelback, banded racer, blind snake, dog faced water snake, glossy marsh snake etc.

**Other reptiles-** Chameleon, garden lizard, common skink, forest calotes, bark gecko, brook's gecko, northern house gecko, Starred tortoise, Indian pod terrapin, peninsular mud turtle etc.

**Insects**
**Butterflies:** Blue tiger, common tiger, plain tiger, common crow etc.

**B) Sanjay Gandhi National Park (SGNP) and Aarey colony:**
SGNP, also known as Borivali National Park is within the study area and is nestled in the hill ranges at a distance of approximate 14.70 km from the project site. The park lies on the northern fringes of suburban Mumbai, India. Located in the hill ranges around Borivali, the sprawling SGNP, covering an area of 154 sq km, is a perfect getaway for nature lovers and

wildlife enthusiasts from the rush and tumble of urban Mumbai. It is one of Asia's most visited National Parks with 2 million annual visitors. The park is also claimed to be the largest park in the world, located within city limits. It is said to be the lungs of the city, as it purifies much of the air pollution of the city. The endangered, threatened or scheduled species have been dealt in separate section.

**a) Forest types**

According to the revised classification of forest types of India by Champion & Seth, the forests of Sanjay Gandhi National Park division represent the following forest types.

- **B/C1 Southern moist teak bearing forests**
- **3 B/C2 Southern moist mixed deciduous forests**
- **B/TS1 Mangrove scrubs**
- **8 A/C2 Western sub-tropical hill forests**

**a.1) B/C1 Moist teak bearing forests**

The moist teak bearing forests occur in 3-5% of the area. These forests exist where the soil condition is relatively better. Density of the crop is generally above 0.4 and it goes upto 0.7. The forests are mostly concentrated in Yeur and Ghodbander roads. Earlier Nagla block had vast area under teak forest but teak has been almost wiped by illicit cutting from this area.

Important tree species of this forest type include *Tectona grandis* (Teak), *Garuga pinnata* (Kakad), *Lannes grandis* (Shemat), *Schleichera oleosa* (Koshimb), *Mimusops hexandra* (Ranjan), *Mangifera indica* (Amba), *Adina cordifolia* (Hed), *Pterocarpus marsupium* (Bija), *Bombax malabaricum* (Sawar) and *Syzygium cumini* (Jambul).

Important shrubs include *Carissa carandus* (Karvand), *Helicteres isora* (Murudsheng), *Adhatoda vasica (*Adulsa), and *Thespesia lampas* (Ranbhendi). The climbers are *Abrus precatorius* (Gunj), *Climatis triloba* (Ranjai), *Zizyphus rugosa* (Toria), etc. Bamboo species found in the forests are *Dendrocalamus strictus* (Manvel), *Bambusa arundinacea* (Katas) while important grass species are *Cynodon dactylon* (Harali), *Dicanthium anulatum* (Ranbangdi), *Coix gigantea* (Ranjondhala), *Eragrostis* spp. (Darbha) and *Panicum glabrum* (Varai).

**a.2) 3 B/C2 Southern moist mixed deciduous forests**

The Southern moist mixed deciduous forests are profusely found in the area. Teak is occasionally found in low proportions. The density varies from 0.4 to 0.7. Clumps of manvel bamboo *(Dendrocalamus strictus)* and katas bamboo (*Bambusa arundinacea*) are found in the area. This forest type covers major part of the division. The soil is deep, loamy, and generally rich in humus content. The semi evergreen species found in this forest type are mango, lokhandi, shendri, koshimb and ashok, though ashok is mostly localized along the nalla courses in Kanheri, Chena and Krishnagiri Upvan forests.

**a.3) B/TS1 Mangrove scrubs**

The coastal line of Maharashtra is about 720 km (NIO, GOA 1998) and numerous river mouths, creeks, small bays, headlands, cliffs etc. indent it. Bassein creek is one of the 37 stations that were surveyed by NIO for the floral and faunal diversity. Bassein creek is the longest creek with 41-km. length. However, only 23% area i.e. approximately 2000 ha has mangrove coverage (NIO 1998). This creek passes through Sanjay Gandhi National Park. The extent of mangrove forests included within the boundaries of this area is not precisely known. *Avicennia marina* is dominating the vegetation and has stunted growth. *Bruguiers gymnorhiza* and *Lumnizera racemosa* have almost vanished from the estuaries of Bassein creek. The dominant marine algae found in Bassein creeks are *Entromorpha clathrata* and C*laloglossa lepureurii.*

**a.4) 8 A/C2 Western sub-tropical hill forests**

These are supposed to be few of the remnant patches of natural forests of higher elevations that occur on low lying hills (Bio-diversity of the Western Ghats, 1997).The western sub tropical hill forests are found in very small patches at high altitude. Density is around 0.6. It is semi-evergreen type of forest

with many evergreen species present in the crop. The Bamboo is typically absent. Besides climbers, orchids and ferns, the floristic include *Mangifera indica* (Mango), *Pongamia pinnata* (Karanj), *Gardenia indicia* (Kokomo), *Syzygium cuminii* (Jambul), *Calophyllum inophyllum* (Undi), *Sideroxylon tomentosum* (Kate-Kumbal), *Ixora* (Lokhandi), *Murraya paniculata* (Pandari) etc. *Garcinia* is located on the highest peak in Kanheri forests.

**b) Fauna**

**b.1) Mammals**

Mammals like *Suncus murinus, Rousettus leschenaultia, Taphozous soccolaimus, Rhinolophus rouxi, Viverricula indica, Lepus nigricollis, Funambulus palmarum* etc. have been recorded in the national park. Some rare and endangered species were found in Sanjay Gandhi National Park, which has been dealt separately.

**b.2) Avifauna**

The avifauna of this area is an attractive wildlife feature. Well over 250 bird species, both resident and migrant, belonging to 18 different orders and 47 families have been recorded here. The period between December and February is ideal for bird watching. Migratory ducks, such as, common teal (*Anas crecca*) and the red crested pochard (*Rhodonessa rufina*) are seen in small numbers in Vihar and Tulsi lakes. Mangrove swamps attract a variety of plovers, sandpipers, gulls and terns. Rose-ringed parakeet (*Psittacula krameri)* and the blossom headed parakeet (*Psittacula roseate)* are common and breed within the park. Lorikeet is seen in winter. Black capped kingfisher (*Halcyon pileata*) is known to breed near the Kanheri caves during the rainy season. The white-breasted kingfisher and the small blue kingfisher are common.

**b.3) Reptiles**

The reptiles of the park are covered under three orders and fourteen families. In the park there are 38 species of reptiles, of which 3 species of tortoise and 11 species of lizards are common.

**b.4) Amphibia**

The Kanheri caves, with its perennial pools of water, have a variety of frogs and toads. Besides the common ones, such as the tree frogs, the bullfrog and common toad, the Jerdon's narrow-mouthed frog (*Ramanella montana*) has been recorded in this area. In the cisterns, within the rocks in Kanheri, a few interesting species of frogs including the six-toed frog and the skipper frog have been recorded.

Also, Forest of Elephanta Island and Veer Jijamata Udyan (Zoo) are located within the 15 Km radius of the study area. It has a number of evergreen trees with some botanically important species, such as *Amherstria nobilis*, *Colvillia racemoss*, *Adansonia digitata*, *Browhea coccinea*, *Lagerstroemia rosea*, *Malalenca lencodendron*, *Cassia* sps. etc. The Udyan possesses around l, 800 trees belonging to about 150 species. The garden has a rich nursery. The Zoo in the park occupies an area of about eight ha and it contains over 1,200 specimens of mammals, birds, reptiles, etc. In the snake park there are two hundred snakes in natural environments. The animals kept in the Zoo include lions, tigers, bears, panthers, besides different types of monkeys, deer, elephants, etc.

**(Source: Greater Bombay Gazetteer).**

**Wetland**

***Fresh water ecosystems***

The area is surrounded by various lakes as referred above. Birds like white-throated kingfisher, spot-billed duck, purple swamphens,bronze-winged and pheasant- tailed jacanas, ashyprinias, brahminy kite, cormorants, lesser whistling ducks, purple and Indian pond herons, great egrets, woolly-necked stork (winter visitor) & whiskered terns are common in these areas. The fishes available in the lakes are: catla (*Catla catla*), mahseer (*Tor khudree* ), calabose (*Labeo calbasu*), mrigal (*Cirrhinus mrigala*), gouramy (*Ophronemus gouramy*), rohu (*Labeo rohita*),silver carp (*Hypophthalmichthys molitrix*), megalop (*Megalopa* sp), common carp (*Cyprinus carpio* ),tilapia (*Tilapia mossambica*), cat fish (*Clarias batrachus*) and other minor varieties.

***Mangroves***

Mahim creek area, located at a distance of about 4 km from the project site, covers fodder crop field, barren land. In this area abundance of mangrove species viz, *Avicennia marina* and *Acanthus*

*illicifolius* (**Plate 3.2**) are dominant. Other species in the tidal influenced area are *Typha angustata*, *Salvadora persica*, *Excoecaria agallocha* and *Thespesia populnea*.

***Avicennia marina***

***Acanthus illicifolius***

**Plate 3.2: Mangrove species in Mahim creek region**

**Associated fauna**

**Annelids:** Among the marine annelids, two species of Earthworms (*Lumbricina*) are commonly found in the mangroves sediments in intertidal zone of the creek.

**Molluscs:** The molluscs are represented from the orders gastropoda, bivalvia and pulmonata. The common species are *Telescopium telescopium, Nerita crepidularia, Potamides cingulatus, Thais carinifera, Melampus sinocaporensis, M. fasciatus, Littorina intermediate, Ellobium auris-jude, Anadara granosa, Dosinia prostate, Angulus sinuate, Crossosterus* sp., *Cuspidaris* sp., *Onchedium* sp., *Simperula maculate* etc., of which *Potamides cingulatus* is abundant during monsoon season.

**Crustaceans:** Mangroves also help breeding of prawns, lobsters, shrimps and crabs. Crustaceans, found in this region, are barnacles *Balanus sp*., crabs, prawns, and shrimps, of which crabs are most dominant. Five species of crabs, *viz.* swimming crabs (*Scylla serrata, Varuna litterata*), fiddler crab (*Uca rosea, U.vocans*) and *Sesarma* sp. are most common.

**Insects:** A rich insect fauna comprising of butterfly, lacewings, moths, mealy bugs, flies, wasps, beetles, grasshoppers and dragonflies are recorded in this area. A total 28 species of butterflies from five families were also observed in this area. Tailed jay (*Graphium agamemnon*), plain tiger (*Danaus chrysippus*), common emigrant (*Catopsilia pomona*), psyche (*Leptosia nina*), small salmon arab (*Colotis amata*), common grass yellow (*Eurema hecabe*), grey pansy (*Junonia atlites*) and common castor (*Ariadne merione*) were sighted in mangroves. Evening brown (*Melanitis sp*.) was also observed here during winter season only.

**Fishes:** In the mangroves and adjacent water bodies, there are records of common fish species like India tarpon (*Megalops* sp.), guppy (*Lebistes poecila*), catfish (*Clarias* sp.), tilapia (*Oreochromis mossambicus*), mullet (*Mugil cephalus*), mudskippers (*Boleopthalmus bodderti, B. dussumieri*), and eel (*Anguilla* sp.), of which mudskippers are most comm.

**3.4.4.4 Threatened Species:**

Threatened species are those found only in small numbers or those very near to extinction in the country. India has a list of threatened species at the all India level, as published by the Botanical Survey of India, entitled 'Red Data Book' and Wildlife (Protection) Act 1972, from MoEF, Govt. of India.

The threatened **vegetations** available in SGNP are two species of white orchids (*Platanthera* sp. and *Habernaria* sp) at the highest peak in the month of September.

The threatened **animals** in SGNP are enlisted under various Schedules of Wildlife (Protection) Act 1972. While species like Indian peafowl (*Pavo cristatus*), osprey or fish-eating eagle (*Pandion haliaetus*), white-bellied sea eagle (*Haliaeetus leucogaster*), hawks, large falcons and *Haliaeetus leucogaster* are included in Schedule I, *Halcyon pileata, Anas crecca* and *Psittacula roseate* are included in Schedule IV of Wildlife (Protection) Act 1972. Among the reptiles found in the national park, *Crocodylus palustris, Varanus* sp. and *Python molurus* are included in Schedule I, while species like *Ptyas mucosus, Naja naja, Vipera russelli* and *Natrix piscatar* are included in Schedule II of Wildlife (Protection) Act 1972.

## 3.5 SOCIO ECONOMIC ENVIRONMENT: (TOR Point No. 8-g,9 & 9-a)

This section discusses the baseline scenario of the socio-economic environment in the study area and anticipated impacts of the proposed project on the socio-economic environment. The issues under focus in this topic are demographic pattern, economic activity, education and literacy profile, etc. The assessment attempts to predict and evaluate the future impacts of project upon people, their physical and psychological health and well being, their economic status, cultural heritage, lifestyle and other value system.

### 3.5.1 Growth of Mumbai and Settlement Pattern

Mumbai is one of the largest mega cities in the world in terms of population and is currently ranked 4th after Tokyo, Mexico City and New York. The city is the financial capital of India with a large commercial and trading base. It plays host to a number of industries, multinational companies and important financial institutions. With a per capita income thrice that of the national average, Mumbai makes huge contribution to the total tax revenues of the country. The city is also an important international sea port and strategic from defence perspective.

The population of Mumbai is marked by its social heterogeneity cutting across racial, religious, regional and linguistic lines. Each community initially had its niche in the occupational structure. The various religious and caste communities remained largely encapsulated and, in spite of being juxtaposed in Mumbai's cosmopolitan setting, continued to maintain lifestyles, which differed relatively little from those practiced in their respective regions of origin.

The population of Greater Mumbai has increased more than twelve times in the last century. Until 1950, most of the growth remained within the Island City but this significantly reduced after 1971 due to congestion. After independence, with the influx of refugees, both the eastern and western suburbs started growing rapidly. Since 1981, the suburban district of Mumbai has become the largest district in the State of Maharashtra in terms of population.

### 3.5.2 Demography

As per Census of India, population of Mumbai in 2011 is 12,478,447; of which male and female are 6,736,815 and 5,741,632 respectively, of which Mumbai city has population of 3,085,411 and Mumbai Suburban has population of 9,356,962. In a city already bursting at the seams and hemmed in on three sides by the Arabian sea, the population density of Mumbai city and Mumbai Suburban grew to 19,652 and 20,979 persons per square km, respectively, over the past decade — perhaps making it one of the densest districts in the country.

The growth rate of population for Greater Mumbai in the last decade was 4.73%. However, there was a negative growth of -7.57 percent in the Mumbai city population as compared to population of 2001 and there was change of 8.29 percent in the Mumbai suburban district population as compared to population as per 2001.

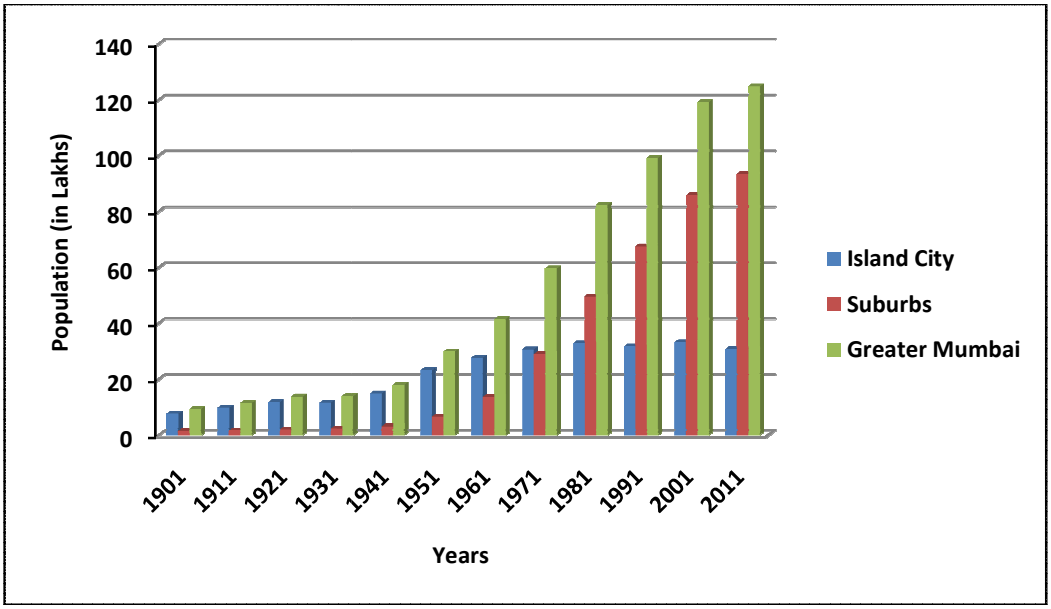



**Fig 3.38: Population of Greater Mumbai**

**Table 3.22: Population Growth in Greater Mumbai**

| Years | 1951-61 | 1961-71 | 1971-81 | 1981-91 | 1991-01 | 2001-11 |
|---|---|---|---|---|---|---|
| **Island City** | 19.02 | 10.77 | 6.99 | -3.35 | 5.14 | -5.75 |
| **Suburbs** | 107.41 | 110.14 | 70.97 | 36.15 | 27.99 | 8.01 |
| **Greater Mumbai** | 32.4 | 35.9 | 32.0 | 18.5 | 18.1 | 4.7 |

Source: Mumbai Human Development Report, 2009 & Census of India, 2011.

The sex ratio was 838 (females per 1,000 males) in the Mumbai city, 857 in the Mumbai suburban, and 848 as a whole in Greater Mumbai, all numbers lower than the national average of 914 females per 1,000 males. The low sex ratio is partly because of the large majority of Mumbai's population are migrants from other states of India. The low sex ratio is due to a large number of male migrants who come to the city to work.

### 3.5.3 Literacy

As per 2011 census, total literates in Greater Mumbai are 10,237,586 of which 5,727,774 are males while 4,509,812 are females. Average literacy rate of Greater Mumbai is 90.28% of which male and female literacy was 93.32% and 86.70%. Average literacy rate of Mumbai City in 2011 was 89.21% and male and female literacy was 91.48% and 86.45% respectively. Average literacy rate of Mumbai Suburban in 2011 was 89.91% and male and female literacy was 92.92% and 86.37% respectively.

### 3.5.4 Education Facilities

Mumbai is a major centre of learning and education. Schools in Mumbai are either run by the state government or by private, sometimes religious and social organisations. Mumbai municipality runs more than 1,000 primary and secondary schools for the city's children. Instruction is provided in the student's mother tongue (mainly Marathi, Hindi, Urdu, and English) though Marathi is a compulsory subject in all municipal schools. Education is free up to certain grades although parents pay for text books and school uniforms.

Inadequate resources and declining standards in public institutions result in parents sending their children to the city's private schools. Private schools in Mumbai typically use English as the medium of instruction and are affiliated with either ICSE, and CBSE or the Maharashtra State Board. Mumbai is also hub to its various research institutions in the field of science and humanities. Mumbai is also home to several premier research institutions like the Tata Institute of Fundamental Research (TIFR) and the Bhabha Atomic Research Centre (BARC).

### 3.5.5 Health Care Facilities

Mumbai has well established public and private health care services. The services range from the super speciality, tertiary-level care hospitals to the general practitioners. The various government organisations, such as ports, railways and defence, have their own health care services for their employees. For the general population, the Municipal Corporation of Greater Mumbai (MCGM) provides major facilities in the public sector along with the State Government.

The Public Health Department of the MCGM runs four major hospitals, 16 peripheral hospitals, five specialised hospitals, 168 dispensaries, 176 health posts, and 28 maternity homes with a staff of over 17,000 employees. The Corporation also runs three medical colleges. Of the total 40,000+ hospital beds in the city, the MCGM-run hospitals have about 11,900 beds. As many as 10 million patients are treated annually in the OPDs in the MCGM hospitals.

Mumbai does boast of traditionally reputed and well known private and specialty hospitals run by trusts and foundations such as Bombay Hospital, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Dr. L H Hiranandani Hospital, P. D. Hinduja National Hospital & Medical Research Centre, Lilavati Hospital & Research Centre, Jaslok Hospital, Breach Candy Hospital.

## 3.6 BASELINE SOCIO-ECONOMIC STATUS OF THE STUDY AREA:

On-site observations were made about the existing conditions with respect to land use, infrastructure resource base, human habitation etc. The information relating to social parameters such as demographic details, basic amenities was collected from secondary sources such as MCGM web site, Census of India 2011 etc. Besides, a keen personal observation of the team about the existing conditions of the project area was a part of social assessment.

Secondary data on all the aforesaid social parameters were assessed and information provided by proponent has been used in identifying, predicting and evaluating the likely impacts due to the proposed project activity. The Proper precautionary measure has been delineated to mitigate adverse socio-economic impacts.

### 3.6.1 Demographic Features and Infrastructure Resource Base in the Proposed Project Area:

- The proposed project site falls under F South ward of Municipal Corporation of Greater Mumbai (MCGM) and in the Mumbai city district.
- Total area of F South ward is 14 sq. km.
- Total population of the F South ward is 359,980 (2011) with density of 25,713 persons per sq.km which is higher than the population density of Mumbai city i.e. 19,652 persons per sq.km.
- Sex ratio of F South ward is 928 females per thousand males (2011), which is very high than the ratio in 2001 i.e. 831 females per thousand males.
- MCGM water supply through pipeline is the source of potable water in the study area.
- The project site has a good education and medical facilities in and around area.
- All the houses have regular power supply facility from Tata Power.
- Study areas under focus have good communication and transport facility.

### 3.6.2 Observations Made During Site Visit:

- During site visit, it was observed that there were about 400 non residential workers at the site.
- Labourers were provided all the safety gears, such as helmet, rubber shoes etc.
- Provision of drinking water for labourers had been made.
- Facility of temporary toilets is provided to labours for sanitation purpose.

- A single room separately for dispensary has been provided at the site with first aid kit and full time male nurse. Emergency cases are referred to nearby hospitals.
- Safety boards and signs were displayed at appropriate locations within the site.

**Plate3.3: Safety Implemented at Project site**

### 3.6.3 Socio-Economic Survey

- **Objective**

The objective of conducting consultation was to obtain detailed information about prevailing socio-economic conditions of the study area and awareness, opinion and reaction of the inhabitants about the proposed redevelopment project.

- **Methodology**

There are mill workers residing on the project site, who will be affected by the project. Discussions were conducted by study team with the help of Project proponent with the mill worker community. During consultations issues related to new housing, livelihood, basic amenities and post project scenario etc. were discussed.

Assessment of existing socio-economic conditions vis-à-vis correlating it with the developmental activities would form the basis for predicting and evaluating the likely impacts due to the project on existing social and economic status and also delineation of social management plan for smooth initiation and functioning of the project.

**The salient observations recorded during the group discussion:**

**Mill Workers:**

- The project site has mill workers chawls and residences.
- About 648 households of mill workers are residing at the site.
- The mill workers would be getting a house of 300 sq ft with attached bathroom and drinking water facility.
- The residents would be getting bigger and better houses under the redevelopment scheme.
- More than 90% of the residents have agreed to the redevelopment project.
- Till the completion of project, the residents would be staying at their current location.


**Plate3:4: Discussions with Mill Workers**

### 3.7 SOLID WASTE:

To evaluate the present data on solid waste generation in the surrounding area i.e. F ward of MCGM, Mumbai, secondary data available on the website of MCGM in ward wise details is reported as follows:

Garbage generation: 512 MT per day
Silt debris generation: 15 MT per day

Source: http://www.mcgm.gov.in/irj/portal/anonymous/qlwardfs

Disposal and waste management by MCGM:
Total three transfer stations at Mahalaxmi, Kurla and Versova all over Mumbai support intermediate transfer of waste from the surrounding areas up to the dumping grounds.

### 3.8 TRAFFIC PATTERN AND DENSITY (TOR Point No. 26)

The proposed development has residential and rehabilitation buildings. The project is located in Dadar towards eastern side of Dadar Railway Station. The location is surrounded by G. D. Ambekar Marg towards the West, Naigaon Cross Road towards the North, Rafi Ahmed Kidwai Marg towards the East and Vitthal Mandir Marg towards South. G. D. Ambekar Marg runs parallel to the Rafi Ahmed Kidwai Marg and connects Matunga and Bhoiwada. The plot is located on G. D. Ambekar Marg, 1 kilometer away from the Mane Master Chowk with access from G. D. Ambekar Marg adjoining the property.

The area is well served by public transport (both bus and sub-urban Railway). The site is located around 1 km from Dadar Railway Station and 1.5 km from Wadala Railway Station and 0.5 km from Wadala Bus Depot. Naigaon Monorail station is just adjacent to the proposed development on the G.D. Ambekar Marg.

A Traffic Movement Count survey was done on a week day on Mane Master Chowk and Sarfare Chowk. The Volume count survey was counted from 09:00 to 24:00 hours to capture both morning and evening peak at both locations on 9$^{th}$ January 2014.

The total peak hour traffic generated from the residential development is 975 PCUs. Based on the traffic forecast, by 2018 (the expected operational year of the development) G. D. Ambekar Marg will operate with a level of service C during morning and evening peak hour. The future traffic includes both background traffic and the generated traffic from the development. The traffic from the slum and SMRT building is already captured in the background traffic. It is assumed that out of the total traffic generated from the proposed development, 50% of traffic will use G. D. Ambekar Marg and will

move towards North direction and 50% of traffic towards South direction.

An overall trip distribution was developed for the site after a review of the existing travel patterns in the area. The volume of traffic generated / attracted will have a defined pattern of distribution both for entry and exit. Locations of the residential zones, major roadways and highways that will serve the development have been considered to arrive at trip distribution. The generated traffic from the proposed development can easily be served by the adjoining roads and the Naigaon Monorail Station and therefore we do not envisage any adverse impact on the traffic.

Detailed Traffic report is enclosed as Enclosure 8.

As per the approved layout rehabilitation area of chawls are abutting 30 mt. wide G. D. Ambekar Road. For MHADA and MCGM, as per the D. C. R. provisions, 12m. wide road is provided. (TOR Point No. 2).

# CHAPTER 4

# ANTICIPATED IMPACT AND MITIGATION MEASURES

## 4.0 INTRODUCTION:

This chapter describes the anticipated environmental impacts on the surrounding area / environment due to the implementation of project. The major objectives of describing the anticipated impacts and mitigation measures are:

- To identify pollution sources - characteristics, quantification and prediction during construction and operation phase
- To suggest suitable avoidance / mitigation methods for each of the impacts due to project activity

The impacts have been assessed for the project assuming that the pollution due to the existing activities has already been covered under baseline environmental monitoring and continue to remain the same during the operation phase. The project would create impact on the environment in two distinct phases.

- During the Construction phase which may be regarded as temporary or short term
- During the Operation phase

## 4.1 PREDICTION OF IMPACTS & MITIGATION MEASURES:

The activities that take place during construction phase and operation phase of the project and the potential impacts on the environment, their prediction, significance and mitigation are as follows.

### 4.1.1 LAND ENVIRONMENT:

**During Construction Phase:**

- **Anticipated Impacts -**

- The waste generated during demolition, excavation and construction material (which are detailed out in section 4.2.3.4 of this chapter).
- Improper disposal of the demolition debris, excavated earth and waste generated during construction may cause irreversible negative impacts on land environment
- Storage of construction material/chemicals if not done at designate place can cause nuisance and hazards
- Accidental spillage of Hazardous chemicals/oil may lead to soil contamination
- Improper segregation and disposal of the solid waste by workers dwelling on site during construction phase may cause negative impacts on land environment

- **Mitigation Measures -**

- Designated storage of debris, construction material and waste
- Waste Management Plan during excavation was formulated in which reuse of the possible debris onsite or offsite is envisaged. (Waste management Plan is given in Table 4.5 of chapter 4)
- The solid waste generation due to workers dwelling on the site will be segregated and will be handed over to MCGM for further treatment and disposal.
- Bituminous materials /any other chemicals shall not be allowed to leach into the soil

- Waste oil generated from D. G. sets will be handed over to authorized recyclers approved by CPCB.
- Hazardous waste shall be handed over to authorized common hazardous waste disposal site for further treatment and disposal.

**During Operation Phase:**

- **Anticipated Impacts -**

- Various types of solid wastes, if disposed improperly, can have a negative impact on land environment
- Accidental spillage of hazardous chemicals/ oil from vehicles leads to soil contamination

- **Mitigation Measures -**

- Waste minimization recovery and reuse
- Segregation at source for all solid waste streams
- Recycling of recyclable non-biodegradable garbage and only non recyclable portion shall be handed over to MCGM to reduce the load on dumping grounds
- Treatment of biodegradable garbage by organic waste converter and its use as manure
- Use of dried STP sludge as manure
- All the occupants shall be informed that they should dispose their E-waste or household hazardous waste to the designated common storage so that these will not be mixed with municipal solid waste and can be disposed as per norms

This being a construction project apart from impacts on the site, no adverse impact on the land environment and soil in the surrounding area is anticipated.

### 4.1.2 WATER ENVIRONMENT (WATER RESOURCES AND QUALITY):

**During Construction Phase:**

- **Anticipated Impacts -**

- Increased water demand during construction phase for site preparation, water spraying for dust suppression, for construction activities, curing, domestic and other water requirements for labour and staff onsite
- Waste water disposal by construction labour and staff can lead to pollution of nearby water courses if not disposed properly
- Sedimentation of outside drains
- Water logging creates unsanitary conditions and mosquito breeding at site

- **Mitigation Measures –**

- Wastage of water used for construction curing shall be avoided
- For fulfilling the construction water requirement the excess treated sewage from existing building will be reused. This will help to reduce the fresh water demand for construction activity
- The sewage generated from construction workers and staff etc will be discharged into sewer line
- Sedimentation of outside drains shall be avoided by using screens and silt traps
- Proper management of channelization of water to avoid water logging at site

**During Operation Phase:**

- **Anticipated Impacts –**

- Increased fresh water demand from local authorities
- Waste water generated can lead to pollution of nearby water courses if not disposed properly
- Sedimentation and pollution of outside storm water drains

- **Mitigation Measures –**

- Use of water saving practices like dual flush cisterns, low loss plumbing fixtures and flow control devices
- Treatment of waste water into Sewage Treatment Plants and its reuse for secondary requirements like flushing and gardening and for construction activity as well
- After commissioning of STP of existing building, the excess treated sewage from existing building shall be used for construction purpose thereby reducing the fresh water usage
- Rain water collection from terraces and its reuse thereby reducing the fresh water demand from MCGM in monsoon season
- Provision of Storm water drainage system with adequate capacity. These drains shall have silt and oil and grease traps to avoid pollution of water in drains outside the plot
- Proper maintenance of storm water drainage, provision of oil and silt traps to avoid pollution of external drain

### 4.1.3 AIR ENVIRONMENT:

**During Construction Phase:**

- **Anticipated Impacts –**

- Increased level of dust and other air pollutants due to demolition, site clearances, building construction and other related activities
- Emissions from vehicles carrying the construction materials
- Emissions from DG sets
- Open burning of solid wastes can cause air pollution

- **Mitigation Measures-**

- Water sprinkling on site for dust suppression
- Use of covering sheets shall be done for trucks carrying construction material to prevent air borne dust
- All material storages shall be adequately covered to avoid dust / particulate emissions
- Use of CPCB approved DG sets
- Proper maintenance of DG sets
- Adequate parking provision and proper traffic arrangement for smooth traffic flow
- Vehicles having valid pollution under control certificate shall be allowed to ply on site
- Open burning of solid waste shall be prohibited
- Regular health checkup of the worker
- Provision of masks to workers

**During Operation Phase:**

- **Anticipated Impacts –**

- Vehicular emissions
- Emissions from DG sets

- **Mitigation Measures –**

- Adequate parking provision and proper traffic management for smooth traffic flow
- Stack height of DG sets shall be as per norms of Central Pollution Control Board (CPCB) to allow effective dispersion of pollutants
- Proper maintenance of DG sets shall be done
- Plantation of around 934 Nos. of trees of various varieties on ground out of which 350 nos. of trees has been already planted

### 4.1.4 NOISE ENVIRONMENT: (TOR Point No. 33 & 35)

**During Construction Phase:**

- **Anticipated Impacts –**

- Noise due to demolition/construction activities
- Impact due to transportation activities
- Nuisance to nearby areas due to noise polluting work at night
- Noise generated due to DG sets

- **Mitigation Measures –**

- During demolition/construction activities the noise will be monitoring to ascertain the noise levels are within limit
- All precautions for noise abatement shall be taken during the construction activities
- High noise construction activity there will be provision of ear plugs for construction labour and staff
- No noise polluting work in night shifts
- Provision of barricades along the periphery of the site
- Acoustic enclosure for DG sets

**During Operation Phase:**

- **Anticipated Impacts –**

- Impact of noise due to vehicular traffic
- Noise generated due to DG sets
- Noise generated due to railway line abutting to the plot

- **Mitigation Measures –**

- Provision of proper parking arrangement, traffic management plan for smooth flow of a vehicle helps to abate noise pollution due to vehicular traffic
- Plantation of around 934 Nos. of trees of various varieties on ground out of which 350 nos. of trees has been already planted that shall act as natural noise buffer
- Maintain acoustic enclosure for DG sets

#### 4.1.4.1 Noise Modeling Studies: (TOR Point No. 32)

Noise Modeling means predictive analysis of how much would be the noise levels at different distances from the project site, depending upon the predicted maximum noise levels at the project site. (Due to DG Sets, other machineries, etc.)

**Table 4.1: Noise Modeling Results**

| Long Duration Noise Sources | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sr. No. | Noise generating areas | Noise level at source (dBA) | Anticipated Noise level (dBA) | | | | | |
| | | | | Location 1: Nr. Agari Ground, Wadala | Location 2: Nr. T.B. Hospital, Wadala | Location 3: Naigaon Police Ground | Location 4: Nr. Wadala udyog | 100 |
| | | (at 1 meter dist) | Distance from project site (m) | 54.3 | 66.4 | 62.1 | 75 | 100 |
| 1 | DG Set (Multiple) | 95 | | 60.3 | 58.6 | 59.1 | 57.5 | 55.0 |
| 2 | Batching plant | 100 | | 65.3 | 63.6 | 64.1 | 62.5 | 60.0 |
| 3 | Compressors (2 Nos.) | 95 | | 60.3 | 58.6 | 59.1 | 57.5 | 55.0 |
| | Cumulative Noise Levels | | | 67.4 | 65.7 | 66.3 | 64.6 | 62.1 |
| | Attenuation due to Green belt and acoustic enclosure | | | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| | Existing Noise Levels (day-time) | | | 58.0 | 63.8 | 62.5 | 69.0 | 55.0 |
| | Cumulative Noise Levels(Day) | | | 58.4 | 63.9 | 62.6 | 69.0 | 55.2 |

- **Results of Noise modeling studies:**

This being a construction project, majority of the machinery involved is going to be present at the project site only during the construction phase. Hence most of the sources of noise are going to be only temporarily present at the project site. Following are the machinery involved.

**Construction Phase:**

- Batching Plant – (Total 1 No,) - 100 dB
- Tower Cranes (2 Nos) – <80 dB
- Transit Mixers– (4 Nos) – 85 dB Each
- Compressors (2 Nos)– 95 dB Each
- Concrete Pump (2 Nos) – 90 dB Each
- Excavators (1 No.) – 90 dB

**Operation Phase: DG Sets:**

Existing: 1 DG sets of 1010 kVA each
Rehabilitation – A: 1 DG set of 500 kVA
Rehabilitation – B: 1 DG set of 500 kVA
One ICC: 1 DG sets of 1010 kVA each & 1 DG set of 625 kVA
Two ICC: 1 DG sets of 1010 kVA each & 1 DG set of 625 kVA

Out of the above listed machinery, the Compressors, Batching Plant and the DG sets were considered for the predictive noise modeling analysis. Noise monitoring was done at 4 locations surrounding the project site and following Sound Pressure Levels were noted (Leq day)

Location 1 : Nr. Agari Ground, Wadala – 54.2 meters: 58 dB
Location 2 : Nr. TB Hospital, wadala – 66.4 meters: 63.8 dB
Location 3 : Naigaon Police Parade Ground – 62.2 Meters: 62.5 dB
Location 4 : wdala Udyog Bhavan – 75 meters: 69 dB

From the above baseline Noise Levels, it can be noted that the existing Sound Pressure Levels are well above the allowable CPCB levels. This is due to the location being very densely populated urban area with heavy traffic present throughout the day.

The only major permanent sources of noise are the DG Sets. There are total 7 Nos of DG set proposed for this project site. The 2 Proposed DG Sets of 500 KVA for Rehabilitation buildings A & B are below the 1000 KVA limit of CPCB norms below which all DG sets have to comply to <75 dBA of Sound Pressure Levels at 75% of the full load condition. There are 2 DG sets of 625 KVA for which the noise levels are likely to exceed 90 dBA. These sources of noise are already considered in the noise modeling study and the impact on the noise environment is already considered in this study for which the mitigations will be suggested. For all the DG Sets above 1000 KVA, Acoustical Enclosures with 30+ dB Transmission Los Rating are suggested.

There is one batching plant going to be present at the project site during the construction phase. Although the batching plants are temporary sources of noise, the batching plant contains several different sources, the collective noise level of which may rise to 100 dB. Following are the several different sources present in a batching plant.

a) Truck and front end loader engine noise
b) Hydraulic pumps
c) Conveyor belts
d) Air valves
e) Filters
f) Alarms
g) Compressors
h) Swinging, scrapping and loading devices

**Mitigations:**

- ✓ The contractor should carefully choose the above equipment in order to meet with the CPCB Norms.
- ✓ Hydraulic pumps and compressors should be covered with Acoustical Enclosures with 20 dB Transmission Loss Rating in order to reduce the noise.
- ✓ Valves should be covered with Removable Acoustical Blankets.
- ✓ The contractor should choose controlled operating hours for noisy activities such as delivery, loading unloading etc.

From the Noise Modelling study, we can see that approximately 0.4 dB of increase was predicted Near Agari Ground. The increase predicted at Location 2, 3 and 4 is 0.1 dB, 0.1 dB and 0 dB respectively. At Location 4, Near Wadala Udyog bhavan, no increase is predicted because the background noise / baseline noise level itself is very high, measured at 69 dB which is 14 dB above the allowable CPCB levels for residential zones. The predicted increase at Location 2 and 3 is 0.1 dB because the noise level measured for baseline data is significantly high. At 55 dB of allowable CPCB levels, 0.5~0.7 dB of increase would be observed. To control this increase, It is recommended to install Noise Reflective corrugated Roof sheets around the boundary of the Project site at least up to the height of 5 meters from the Ground. These reflective noise barriers have a transmission loss rating of approximately 3~5 dB, which is the required noise reduction in the near field of the project site.

An assumed reading was taken at 100 meters distance with Noise Level assumed as 55 dB which is the allowable noise level as per the CPCB recommendations. At this noise monitoring location, 0.2 dB was the predicted increase in noise level due to the sources of noise at the project site. This is a negligible increase considering that the lowest noticeable increase in noise level for a human ear is 0.5 dB.

There are 2 compressors going to be present at the project site. Reciprocating or Screw type compressors have noise levels well above 95 dBA if they are not covered with acoustical canopy. The compressors should be covered with 20 dB Transmission Loss Rating Acoustical Enclosures or such compressors should be chosen which come with its own acoustical canopy.

This analysis is done assuming that the Noise level of the mentioned sources is going to be 85 dB at the Boundary of the project site, where as in actual, the machinery will be installed well within the boundary of the Plot, and other sound sources e.g. Ventilation system etc. are going to be installed inside the constructed building, because of which there will additional attenuation and hence the SPL measured at the boundary of the project because of the machinery involved in this project is going to be much lower than what is considered in this report. This Analysis is done for the absolute worst case scenario for the Noise Environment.

**Conclusion:**

- Maximum increase in Sound Pressure level would be of approximately 0.1 to 0.4 dB for distances up to 100 meters from the project site, during the Construction phase.
- Beyond a distance of 150 meters from the project site, there will not be any increase in the Sound Pressure Levels.
- Mitigations Measures as listed below should be implemented for avoiding any potential impact on the Noise Environment.

**Mitigation Measures:**

| Sr. No. | Machinery/Equipment Description | Predicted SPL at 1 meter distance | Mitigations Required |
|---|---|---|---|
| 1. | Excavator / Earth moving Machinery / Wheel Loader/Dumpers /other vehicles | 95 dB | This project site has only 1 Wheel loader, 2 Dumpers and 1 Excavator machine during the construction phase. The sound pressure level of an excavator measured at 1 meter distance can be up to 85 dB. This is an unavoidable source of noise which cannot be attenuated by any means. However, this source has been already considered in the Noise Modeling study, and its impact will not make any significant difference on the Noise Environment.<br>For the people working in the near field of these equipments, 85 dBA is a perfectly safe noise level for continuous noise dose of up to 8 hours. |
| 2. | DG Sets (7 Nos.) | <85 dB | Diesel Generator Sets are supposed to have Sound Pressure Levels of lesser than 75 dBA when measured at 1 meter distance. However, these DG sets are not going to be kept close to one another.<br>All DG Sets that are below 1000 KVA, the canopy that comes with the DG set itself is sufficient to bring down the SPL within allowable limits.<br>For 1600 KVA DG Sets, Acoustical Enclosures with 30+ dB Transmission Loss |

| Sr. No. | Machinery/Equipment Description | Predicted SPL at 1 meter distance | Mitigations Required |
|---|---|---|---|
| | | | Ratings are recommended. |
| 3. | Tower Crain / Material Hoist | 85~90 dB | The lifting mechanism of the Tower Crane or the builders hoist usually has very low noise levels of less than 75 dBA. However they are usually powered by Diesel Engines in order to make them portable, and hence the noise of the diesel engine itself can exceed 90 dBA. Therefore following mitigation should be implemented: Acoustical Canopy for the Diesel Engine running the portable hoists/cranes to be installed with TL Rating of 30 dB. |
| 4. | Concrete Pumps | 90 dB | Concrete pump, usually driven by diesel engine makes noise over 90 dB. Acoustical Enclosure with 20+ dB Transmission Loss Rating is highly recommended for this source of noise.<br>In case the concrete pump is electrically driven, then SPL would be lower. If it is less than 85 dB, no acoustical mitigations are required for this source in that case. |
| 5. | Compressors (2 Nos) | 95~100 dBA | Compressors can have noise level of up to 100 dBA due to the nature of the operation. Acoustical Enclosures with 20+ dB Transmission Loss are recommended for the compressors. |
| 6. | De-Watering Pumps | <85 dBA if Electric motor Driven.<br>95 dBA if Engine Driven | De-watering Pumps, if electric motors driven create noise levels of up to 85 dBA in which case no mitigations are necessary for this noise source. However, if the De-watering pumps are engine driven, then the noise level may rise above 90 dB as well, in which case acoustical enclosure with 15 dB Transmission loss rating is recommended for the engine-pump assembly. |
| 7. | Additional Mitigations / Cares to take | N/A | • Sound Reflective barriers to be installed at the boundary of the project site.<br>• All people working in the vicinity of the Equipment/Machinery with Sound Pressure Levels higher than 95 dB should wear protective ear plugs to avoid permanent hearing damage. |

### 4.1.5 BIOLOGICAL ENVIRONMENT: (TOR Point No. 21)

- **Anticipated Impact-**

- During construction phase there is possibility of dust pollution, which is likely to affect plant physiology in the form of closing of stomata etc. in areas surrounding the site

- Dusts may lead to partial clogging of respiratory tracts in insects and other fauna in nearby areas
- Since this project is away from forest area, so additional plantation within the site will enhance biodiversity and aesthetical status of the area
- Since there are no wild animals within the project site, no adverse impact is envisaged

➢ **Mitigation Measures-**

- Periphery plantation of fast growing trees is recommended to act as air and noise pollution barrier during construction as well as operation phase
- Around 934 nos. of new trees with good foliages are recommended for proposed development
- Sprinkling of water and fine spray from nozzles at regular interval to suppress the dust
- Use of covering sheets to prevent dust dispersion from the vehicles used for carrying construction materials at site
- Use of covering sheets for covering construction materials stored at site
- Vehicles having pollution under control certificate should be allowed to play in the site
- Since animals are not sedentary, they will move to nearby areas

**Details for varieties of tree plantation are given in Section 4.2.5 of Chapter 4.**
**Landscape plan is enclosed as Enclosure 4.**

### 4.1.6 SOCIO-ECONOMIC ENVIRONMENT:

The impact of the project would depend upon the nature and size of the project, greater the size of the project the setting up of any kind project would undoubtedly include significant impact on socio-economic and cultural life of the people in the project area. These impacts will be largely positive associated with some adverse effects as well. Here, an attempt is made to visualize and discuss such tentative impacts likely to be induced by the project.

➢ **Positive Impacts**

- The proposed scheme is good because instead of resettlement of mill workers to another location it is better to upgrade their tenements by providing them with bigger and better housing facility.
- The proposed scheme will provide new, bigger and better housing structures with appropriate amenities, adequate sanitation facilities as well as fire fighting and safety measures to the mill workers.
- There would be growth in indirect jobs and business opportunities to the local and nearby people such as contractors, transporters and raw material suppliers etc. due to the proposed development in the area.
- Demands of community services would create additional employment for the poor strata of society by way of security guard, driver, maid/servant, sweeper, gardener etc.
- Approach and internal road network, as well as local markets, daily need shops would experience positive impact due to the proposed project.
- Improvement in safety, security and fire-fighting facility.
- The project envisages bringing various other communities to the area and thereby enabling rapid enhancement of an urban environment.

➢ **Negative Impacts**

- Due to the proposed project activity, influx of population may increase during the construction phase. This may lead to strain on infrastructure facilities in the area as well as increase in

population at local level. However, this impact is only for the short duration and temporary in nature.

- During construction phase, increase level of dust and other air pollutants may lead to respiratory diseases.
- Vehicular traffic and construction activities may create noise pollution.
- Proposed development may have a significant impact on the community's ability to accommodate new residents and adapt to changes in the social environment for existing surrounding residents.
- Due to the proposed project, economic status of existing residents will certainly improve but at the same time their traditional way of living will also get affected.

➢ **Mitigating Measures**

In order to mitigate the adverse impacts likely to arise in the surrounding area due to proposed project activity, it is necessary to formulate an effective mitigation plan. The suggestions are as follows:

**Before Commencing and During Initial Phase:**

- Communication with the local community should be institutionalized and done on a regular basis. The forum could provide opportunities to discuss local critical issues and prepare progammes of mutual benefits.
- Information regarding the proposed development plan, community programmes etc. should be communicated to the local community.

**During Construction Phase:**

- Project proponent should take appropriate steps to keep environment clean and healthy during construction phase
- Provision of adequate drinking water, toilet and bathing facilities should be made available on project site
- Water shall be sprinkle/spread to suppress dust during construction phase to control air pollution and thereby avoid adverse health impact
- Proper living condition with appropriate facilities for residential labours should be provided
- Training and awareness programme should be carried out so that the workers understand the importance of occupational health & safety.

**During Operation Phase:**

- The colony management collectively will need a pool of watchmen, gardeners, sweepers, plumbers, fitters, STP operators, lift operators and solid waste collectors. Preference should be given to local people for all this.
- The treated sewage and the compost prepared from the organic solid waste are useful for the gardening.

## 4.2 ENVIRONMENTAL LIABILITIES:

Waste management like treatment, recycle or disposal and adequacy and technical capabilities of the systems designed for the same are always priceless for making the project environmentally sustainable by avoiding any negative impacts on city infrastructure and on the aesthetics and health and hygiene of project site and surrounding areas

Following environmental liabilities shall be undertaken for this project:

### 4.2.1 WATER SAVING PRACTICES

The details of Water saving practices are as follows:

- **Dual Flush Cisterns:**
  - Dual flushing cisterns have been developed to reduce the wastage of water by excess use in the low or high level cistern. It is achieved by cutting the vacuum seal at the fixed water level in the flushing cistern
  - Dual flush cistern have two flush settings, one for normal operation to flush solids 6 lit per flush and a second reduced amount for liquids as 3 lit per flush, thus saving considerable amount of water
- Water efficient landscaping
- Use of water saving practices like low loss plumbing fixtures and flow control devices
  - **Showers/Faucets:** 2.5 gallons per minute (9.5 liters per minute, lpm)
  - **Water Closets:** 1.6 gallons per flush (6.1 liters per flush, lpf)
  - **Urinals:** 1.0 gallons per flush (3.8 liters per flush, lpf)
- Rain water collection from terraces: 4 nos. of tanks of total capacity 319 KL
  Layout showing RWH scheme is attached as **Enclosure 5.**

### 4.2.2 Wastewater Management During Operation Phase: (TOR Point No. 17)

Total sewage generation from the proposed development will be 775 KLD. This sewage will be treated in separate Sewage Treatment Plants (STP's) of adequate capacity. Treated sewage generated will be reused for secondary requirements like gardening (187 KLD) and flushing (298 KLD). After commissioning of STP the excess treated sewage shall be used for DP R.G. reservation and for further construction activities.

While proposing location for STPs care is taken that it is not proposed near any underground domestic water storage tanks. The capacity and technology used for treatment of sewage is given in Table 4.2. The STP locations are indicated on the layout plan attached as **Enclosure 6** of this report.

**Table 4.2: Capacity of Sewage Treatment Plants**

| Sr. No. | Details | Sewage quantity (KLD) | STP Capacity (KL) | Technology |
|---|---|---|---|---|
| **A** | **Existing** | **94** | **103** | MBBR Technology |
| **B** | **Proposed** | | | |
| **1** | **Rehabilitation** | | | |
| 1.1 | Rehabilitation - A | 205 | 225 | |
| 1.2 | Rehabilitation- B | 173 | 190 | |
| **2** | **Sale** | | | |
| 2.1 | One ICC | 113 | 125 | |
| 2.2 | Two ICC | 190 | 210 | |

The generated sewage will be collected by gravity through pipe network to STP. Basis characteristics of untreated and treated sewage are as follows:

**Table 4.3: Untreated & Treated Sewage Quality**

| SR. NO. | DETAILS | VALUES | | UNITS |
|---|---|---|---|---|
| | | UNTREATED | TREATED | |
| 1. | pH | 7.0 – 8.0 | 6.5 – 7.5 | -- |

| SR. NO. | DETAILS | VALUES | | UNITS |
|---|---|---|---|---|
| | | UNTREATED | TREATED | |
| 2. | Total Suspended solids | 250 | ≤ 10 | mg/lit |
| 3. | Chemical Oxygen Demand | 400 | ≤ 30 | mg/lit |
| 4. | BOD, 3days, $27^0$C | 250 | ≤ 10 | mg/lit |
| 5. | Oil & Grease | 50 | <5 | mg/lit |

**4.2.2.1 Design Basis of Treatment plant – MBBR (Moving Bed Bio Reactor)**

- **Preliminary Treatment:**

**Technical Description of MBBR:**

The treatment will include the following unit / equipment;

- **Screen chamber**
- **Oil and Grease Trap**
- **Collection tank**
- **Raw Sewage Transfer pumps**

**S**ewage generated will be gravitated through **Bar Screen**. The Bar screen will take care of any floatable matter, which will be manually scraped out and collected in drums. Bar screen comprises of SS plate type screen for removing floatable matter. From the bar screen it will then pass on to the **Oil & Grease Trap** for removal of free floating oil. The oil will be scrapped and collected in drums and shall be disposed as per statutory norms. The sewage will be collected in **Collection tank.** Uniform mixing shall be achieved by providing aeration grid (air sparging) in the collection tank. After completion of mixing, the sewage will be pumped at a uniform rate by sewage transfer pumps to Biological Treatment.

**Biological treatment (secondary treatment):**

This includes the following:

- **MBBR Bioreactor**
- **Secondary Settling Tank**
- **Sludge Dewatering System - (Filter press)**

The process is of activated sludge aeration biological process of Moving Bed Bio Reactor (MBBR) type. The MBBR process will be an aerobic system having two biological growth process- attached growth and suspended growth. The pretreated sewage will be pumped into MBBR where support media will provide more surface area for Biological growth. Oxygen is added for biological growth through diffusers.

The sewage will be uniformly pumped to **MBBR Reactor** to biologically degrade the organic matter. The oxygen required for the bacterial growth will be supplied through **Diffuser systems.** The system envisages better oxygen transfer because of fine bubbles and increased contact with the sewage. The overflow from **MBBR Reactor** will be gravitated to the **Secondary settling tank.** The arrested sludge will be pumped back to the Aeration tank to maintain the bacterial concentration in the tank and excess sludge will be sent to the **Sludge holding tank** and dewatered using **Filter press**. The filtrate will be taken to the Raw Sewage Collection Tank.

The dried sludge can be used as manure for gardening.

**Tertiary Treatment:**

The treatment includes the following units / equipment;

- ❖ **Filter feed tank**
- ❖ **Pressure Sand Filter**
- ❖ **Activated Carbon Filter**
- ❖ **UV system**

The clear supernatant from the Secondary settling tank will be collected in a **Filter feed tank** this tank will be provided with level switch for unmanned operations. The treated sewage will be pumped to **Pressure Sand Filter followed by Activated Carbon Filter.** After ACF treated sewage will be passed through **UV filtration** for disinfection. After UV filtration treated sewage will be collected in **Treated Water Tank.** Treated sewage from Treated Water Tank can be used for irrigation and flushing.

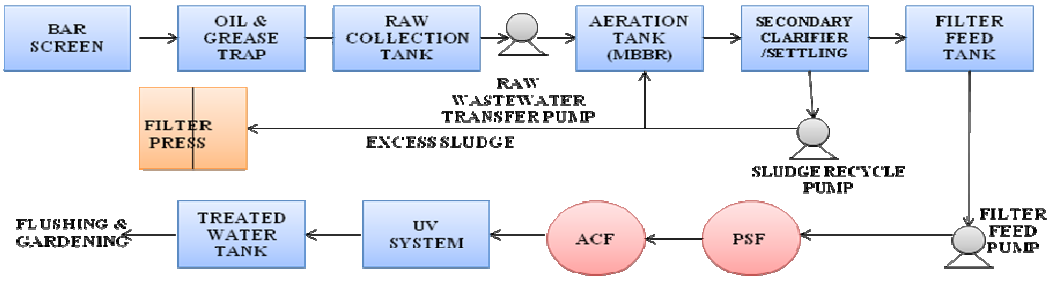



**Fig. 4.1: STP Process Diagram (MBBR process)**

### 4.2.3 SOLID WASTE MANAGEMENT: (TOR Point No. 18)

#### 4.2.3.1 During Pre-Construction Phase:

➢ **Anticipated Impacts -**

- As this being residential development were one residential building is already constructed and occupied and the construction activities are in progress for the rehabilitation building with 2 wings (A & B) and 2 sale buildings (1 ICC & 2 ICC), the impact due to demolition of existing structures and management of the debris generated is a big task and this is the major impact identified in this project.
- Impact on environment due to improper disposal of construction waste other than Hazardous waste
- Nuisance created in & around site due to improper handling and disposal of construction debris and solid waste.

➢ **Mitigation Measures –**

- Debris quantification and segregation of demolition waste shall be done on site
- Reuse of the possible debris onsite. e. g. bricks, steel, wood which are generated from demolition of existing structure shall be reused during construction work.
- Recycling of the debris generated from demolition of existing structure through scrap dealers e.g. steel, metal, wood, doors, windows, plumbing fixtures, etc.
- Disposal of non usable or non recyclable debris shall be done as per the norms and to the designated dumping areas with prior permissions of local authorities.
- Designated and covered storage for demolition debris, construction material and waste
- Segregation at source for all solid waste streams

- Construction waste minimization and reuse (details are explained in Table 4.5)
- Disposal of excavation soil to authorized land fill site as per directions and prior approvals of local authorities
- During construction municipal waste shall be segregated into biodegradable and non biodegradable and shall be handed over to MCGM
- Separate storage for E waste and its disposal to authorized recyclers
- Separate storage for Hazardous wastes and its disposal to authorized CHWTSDF sites

#### 4.2.3.2 Debris Management Plan: (TOR Point No. 1 – b, c & d)

The demolition activities shall be conducted by personnel using appropriate health and safety procedures in accordance with the regulatory requirements. Proper management of debris by reusing/recycling will be done prior to its disposal to reduce the burden on municipal landfill sites.

The details for management of debris is given in Table 4.4

**Table 4.4: Debris Management Plan – During Construction Phase**

| No. | Item | Reuse/Recycle/ Disposal (Quantity and Details ) |
|---|---|---|
| **Already Done** | | |
| 1 | Concrete Debris | 1622 cu. mt disposed to designated dumping area for refilling as intimated by the Competent authority |
| 2 | Steel | 304 mt recycled through authorized scrap dealer |
| 3 | Plaster debris | 1420 cu.mt disposed to designated dumping area for refilling as intimated by the Competent authority |
| 4 | Bricks Debris | 6083 cu.mt disposed to designated dumping area for refilling as intimated by the Competent authority |
| 5 | Flooring Tiles And Flooring | 1014 cu. mt disposed to designated dumping area for refilling as intimated by the Competent authority |
| 6 | Wood | 237 cu. mt recycled through authorized scrap dealer |
| 7 | Pavers | 109 cu. mt disposed to designated dumping area for refilling as intimated by the Competent authority |
| 8 | Salvaged building components | Recycled through authorized scrap dealer |
| 9 | Asbestos sheets | 637 sq mt disposed to CHWTSDF at Taloja |
| **To Be Done** | | |
| 1 | Concrete Debris | 2358 cu.mt shall be disposed to authorized landfill sites |
| 2 | Steel | 445 mt shall be recycled through authorized scrap dealer |
| 3 | Plaster debris | 2063 cu.mt shall be disposed to authorized landfill sites |
| 4 | Bricks Debris | 8842 cu.mt shall be disposed to authorized landfill sites |
| 5 | Flooring Tiles And Flooring | 16702 cu.mt shall be disposed to authorized landfill sites |
| 6 | Wood | 3898 cu.mt shall be recycled through authorized scrap dealer |
| 7 | Roof Tiles | 159 cu.mt shall be recycled through authorized scrap dealer |
| 8 | Pavers | 1800 cu.mt shall be disposed to authorized landfill sites |
| 9 | Salvaged building components | Shall be recycled through authorized scrap dealer |
| 10 | Asbestos | 44 sq mt shall be disposed to CHWTSDF at Taloja |
| 11 | GI sheets | 882 sq mt shall be recycled through authorized scrap dealer |

**4.2.3.3 During Construction Phase:**

- **Anticipated Impacts -**

- Impact on environment due to improper disposal of construction waste, municipal solid waste by construction workers and staff, Hazardous waste, E waste etc.
- Nuisance created in & around site due to improper handling and disposal of excavated matter.
- Improper storage of construction material leading to pollution of land, water, air.

- **Mitigation Measures –**

- Designated and covered storage for waste
- Construction waste minimization and reuse
- Disposal of excavation soil to authorized land fill site or to the low lying (where it is needed for filling), as per directions and prior approvals of local authorities
- During construction municipal waste shall be segregated into biodegradable and non biodegradable and shall be handed over to MCGM
- Separate storage for Hazardous wastes and its disposal to authorized CHWTSDF sites
- Disposal of non usable or non recyclable excavation debris shall be done as per the norms and to the designated dumping areas with prior permissions of local authorities.
- Preparation of Construction Waste Management plan and its positive implementation.

- **Expected hazardous waste during construction phase :**
  - Fuel and Heating oil's and other volatile/flammable liquids such as coolants, grease, etc
  - Centering oil, formwork oil
  - Tar and Tar products (bitumen, felt, water proofing compounds etc.)
  - Chemicals, admixtures, sealants, adhesives solvents etc.
  - Empty containers of Paints and primers
  - Empty containers of pesticides, wood preservatives
  - Tarpaulin
  - Product packaging (cement bags, cartons, containers, plastic covers etc.)
  - Plastics, Acrylics, Silica, PVC
  - Fluorescent Lamps Intact and Crushed, Incandescent Lamps.
  - Mercury Containing Lamps and Tubes, Mercury Containing Devices – Mercury switches, relays, regulators, thermostats, thermometers, manometers etc.
  - All types of Batteries
  - Electronic Ballasts, PCBs, Transformers, capacitors, switchgear, Lead Cable, Oil filled /gel filled cables

- **Management of Hazardous waste:**
  - The dustbins for these wastes shall be made of durable materials like metal or even masonry as the project's construction span is 4.5 years.
  - Isolated, covered and raised storage for hazardous wastes
  - Installation of fire extinguisher shall be done near storage of hazardous wastes
  - The hazardous waste shall not be stored over a long period and shall be disposed within time as per regulations and with to authorize CHWTSDF sites as per regulations.

#### 4.2.3.4 Construction Waste Management Plan (TOR Point No. 3)

**Waste generation during construction phase**

**Excavation Earth Details:**

| Quantity | Reuse/Recycle/ Disposal (Quantity and Details |
|---|---|
| **Already done** | |
| 174900 Cum | • 15000 Cum is reused for backfilling and leveling on site<br>• 159900 Cum disposed to designated dumping area for refilling as intimated by the competent authority |
| **To Be Done** | |
| 34586 Cum | • 34586 Cum shall be reused for backfilling and leveling on site. |

**Excavation Waste Movement Plan:**

- Excavation area, access road to excavation area and site dumping area will be marked on drawing.
- All these areas will be barricaded with necessary safety sign boards and sufficient illumination.
- The useful excavated material will be stacked at approved area within site. The area will be safely secured
- The surplus or discarded excavated material will be taken out of construction site and will be dumped as per the approved guidelines of the local authorities.
- The outgoing vehicles will be checked for proper covering and cleaning of tyres.
- Washing bay & silt trap will be provided.

#### 4.2.3.5 During Operation Phase:

➢ **Anticipated Impacts & Mitigation Measures -**

There are various types of wastes during operation phase their type and management are detailed out as under.

- **Municipal Solid Waste Management:**

The quantification of municipal solid waste is given in sec. 3.7 of Chapter 3 of this report. During operation phase there will be provision for segregation and collection of biodegradable & non-biodegradable waste within the premises. Biodegradable waste (Wet garbage) will be treated in Organic Waste Converter. Details of organic waste converter machine are given below. The non-biodegradable waste (Dry garbage) will be segregated further into recyclable and non-recyclable waste. Recyclable waste shall be handed over to recyclers and non-recyclable waste shall be handed over to M.C.G.M. dried sludge from STP will be used as manure.

- **Area requirement for Solid Waste Management:**

**Table 4.5: Area requirement for SWM:**

| Component | Existing | | Proposed | | | |
|---|---|---|---|---|---|---|
| | | | Rehabilitation | | Sale | |
| | Garbage | | Garbage | | Garbage | |
| | Dry | Wet | Dry | Wet | Dry | Wet |
| Bulk density of Garbage | 0.269 | 0.58 | 0.269 | 0.58 | 0.269 | 0.58 |
| Total Garbage Generated (kg/day) | 109 | 254 | 437 | 1021 | 350 | 816 |
| Mass (Ton) | 0.11 | 0.25 | 0.44 | 1.02 | 0.35 | 0.82 |

| Component | | Existing | | Proposed | | | |
|---|---|---|---|---|---|---|---|
| | | | | Rehabilitation | | Sale | |
| | | Garbage | | Garbage | | Garbage | |
| | | Dry | Wet | Dry | Wet | Dry | Wet |
| Density | | 0.269 | 0.58 | 0.269 | 0.58 | 0.269 | 0.58 |
| Volume ($m^3$) | | 0.4 | 0.4 | 1.6 | 1.8 | 1.3 | 1.4 |
| Height of Bag Considered(mt.) | | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Area required ($m^2$) | 1 day capacity | 0.34 | 0.36 | 1.35 | 1.47 | 1.08 | 1.17 |
| | 2 day capacity | 0.7 | 0.7 | 2.7 | 2.9 | 2.2 | 2.3 |
| 40% area for processing | | 0.3 | 0.3 | 1.1 | 1.2 | 0.9 | 0.9 |
| Total Area required | | 0.9 | 1.0 | 3.8 | 4.1 | 3.0 | 3.3 |
| Area required for garbage collection (Sq. mt.) | | 2.0 | | 7.9 | | 6.3 | |
| Area required for garbage segregation (Sq.mt.) | | 2.0 | | 7.9 | | 6.3 | |
| **Area requirement for OWC machine and curing space (Sq.mt.)** | | **56** | | **84** | | **65** | |

- **Details of Organic Waste Converter (OWC):**

| Particulars | Details |
|---|---|
| Machine Capacity | 125 Kg/batch |
| Machine Nos. | 3 nos. |
| Total area provided for SWM | 245 Sq. mt |
| Working Hours | 8 Hr |
| End product | Manure |

**Disposal of Household Hazardous waste**

There will be common storage facility for Hazardous wastes and its disposal shall be done to authorized CHWTSDF sites as per regulations.

### 4.2.4 ENERGY CONSERVATION: (TOR Point No. 22, 23)

**Energy saving by non-conventional method:**

- Energy efficient fluorescent tube lights & CFL lamps which give approx. 30% more light output for the same watts consumed and therefore require less nos. of fixtures and corresponding lower point wiring costs. The life of T5 tubes are 2.5 to 3 times time conventional tubes and hence the cost of replacement is quite less and hence rate of disposal of tubes reduced drastically.
- All fluorescent light fixtures will be specified to incorporate electronic ballast with THD less than 5% which have less watt-loss compared to electromagnetic ballast and result in superior operating power factor. Electronic chokes also improve the life of the fluorescent lamps.
- Bus bars in all distribution panels are specified as copper bus-bars to reduce losses and improve reliability.
- Copper conductor cables will be specified for sizes up to16 sq.mm; this will reduce losses and improve reliability.
- All cables will be de-rated to avoid heating during use. This also indirectly reduces losses and improves reliability.
- Variable frequency drives will be incorporated on motor feeders which will save considerable energy.
- Occupancy Presence sensors & day-light sensors will be provided where ever feasible.
- General lighting shall be through energy efficient fluorescent lamps and illumination levels shall be generally in line with National Building Code.
- 10% of common area / staircases / basement parking corridor lights shall be designated as emergency lights and shall be connected to individual inverters for uninterrupted illumination.
- All vertical fenestration will have Double Glazing Glass Panel with SHGC as per ECBC.
- All the external walls will be 225mm brick plastered on both sides and no additional insulation is envisaged.
- All WCs shall have dual flush cistern rather than single flush type & flush valve combination which will reduce consumption of water significantly.
- All common area low flow plumbing fixture shall be installed to conserve the water. For the residents, guide lines shall be given to use the efficient plumbing fixtures to conserve the water.
- The water supply to the tower is by gravity with booster pumps for the floors which are at close proximity.
- Solar powered lightings for landscape and common areas
- Solar powered water heating

#### 4.2.4.1 Energy Saving Statement: (TOR Point No. 22)

Energy saving statement is given as follows.

**Table 4.6 (a): Energy Saving Statement for ICC ONE**

| | Description | AVG.KWH/DAY | AVG.KWH/YRS |
|---|---|---|---|
| | **ICC ONE** | 32124 | 11725272 |
| **REDUCTION IN CONSUMPTION BY USING ENERGY SAVING MEASURE** | | | |
| 1 | By Using CFL / T5 Lamps | Overall Saving can be 37% | |
| 2 | By Using LED Light in Lift lobby | Overall Saving can be 50% | |
| 3 | By Using electronic ballast | Overall Saving can be 25% | |
| 4 | By Using VFD and high efficient pump | Overall Saving can be 30- 20% | |
| 5 | By Using Solar lighting for External Light | Overall Saving can be 100% | |
| 6 | By Using Solar for Hot Water Generation | Overall Saving can be 100% | |

| ANNUAL SAVING | | | | | |
|---|---|---|---|---|---|
| | | **Per day unit consumption** | **Saving Percentage** | **Per day Unit Consumption with saving** | **Saving in Unit** |
| A | Total Saving Due to CFL Lamp for Common and Residential Area | 2344 | 37 | 1477 | 867 |
| B | Total Saving Due to LED Light for Lift Lobby | 2344 | 50 | 1172 | 1172 |
| C | Total Saving Due to Electronic Ballast for common and Residential Area | 4688 | 25 | 3516 | 1172 |
| D | Total Saving Due to VFD & Efficient Pump | 7107 | 30 | 4985 | 2550 |
| E | Total Saving Due to Solar Lighting | 640 | 1 | 640 | 0 |
| F | Total Saving Due to Solar Hot Water Generation | 378 | 100 | 378 | 0 |
| | **Average KWH/Day saving** | | | | **5762** |
| | **Average KWH/Annual saving** | | | | **2103013** |
| | **TOTAL ANNUAL SAVING** | | | | **2103013** |

**Table 4.6 (b): Energy Saving Statement for ICC TWO**

| | **Description** | **AVG.KWH/DAY** | **AVG.KWH/YRS** |
|---|---|---|---|
| | **ICC TWO** | 40893 | 14925799 |
| **REDUCTION IN CONSUMPTION BY USING ENERGY SAVING MEASURE** | | | |
| 1 | By Using CFL / T5 Lamps | Overall Saving can be 37% | |
| 2 | By Using LED Light in Lift lobby | Overall Saving can be 50% | |
| 3 | By Using electronic ballast | Overall Saving can be 25% | |
| 4 | By Using VFD and high efficient pump | Overall Saving can be 30- 20% | |
| 5 | By Using Solar lighting for External Light | Overall Saving can be 100% | |
| 6 | By Using Solar for Hot Water Generation | Overall Saving can be 100% | |

| ANNUAL SAVING | | | | | |
|---|---|---|---|---|---|
| | | **Per day unit consumption** | **Saving Percentage** | **Per day Unit Consumption with saving** | **Saving in Unit** |
| A | Total Saving Due to CFL Lamp for Common and Residential Area | 2216 | 37 | 1396 | 820 |
| B | Total Saving Due to LED Light for Lift Lobby | 2216 | 50 | 1108 | 1108 |
| C | Total Saving Due to Electronic Ballast for common and Residential Area | 4432 | 25 | 3324 | 1108 |
| D | Total Saving Due to VFD & Efficient Pump | 6743 | 30 | 4733 | 2374 |
| E | Total Saving Due to Solar Lighting | 800 | 1 | 800 | 0 |
| F | Total Saving Due to Solar Hot Water Generation | 512 | 100 | 512 | 0 |
| | **Average KWH/Day saving** | | | | **5410** |
| | **Average KWH/Annual saving** | | | | **1974475** |
| | **TOTAL ANNUAL SAVING** | | | | **1974475** |

**Table 4.6 (c): Energy Saving Statement for Rehabilitation-A**

| | **Description** | **AVG.KWH/DAY** | **AVG.KWH/YRS** |
|---|---|---|---|
| | **Rehabilitation A** | 9935 | 3626435 |
| **REDUCTION IN CONSUMPTION BY USING ENERGY SAVING MEASURE** | | | |
| 1 | By Using CFL / T5 Lamps | Overall Saving can be 37% | |
| 2 | By Using LED Light in Lift lobby | Overall Saving can be 50% | |
| 3 | By Using electronic ballast | Overall Saving can be 25% | |
| 4 | By Using VFD and high efficient pump | Overall Saving can be 30- 20% | |
| 5 | By Using Solar lighting for External Light | Overall Saving can be 100% | |
| 6 | By Using Solar for Hot Water Generation | Overall Saving can be 100% | |

| ANNUAL SAVING | | | | | |
|---|---|---|---|---|---|
| | | **Per day unit consumption** | **Saving Percentage** | **Per day Unit Consumption with saving** | **Saving in Unit** |
| A | Total Saving Due to CFL Lamp for Common and Residential Area | 208 | 37 | 131 | 77 |

| | | | | | |
|---|---|---|---|---|---|
| B | Total Saving Due to LED Light for Lift Lobby | 208 | 50 | 104 | 104 |
| C | Total Saving Due to Electronic Ballast for common and Residential Area | 416 | 25 | 312 | 104 |
| D | Total Saving Due to VFD & Efficient Pump | 538 | 30 | 381 | 157 |
| E | Total Saving Due to Solar Lighting | 60 | 1 | 60 | 0 |
| F | Total Saving Due to Solar Hot Water Generation | 419 | 100 | 419 | 0 |
| | **Average KWH/Day saving** | | | | **442** |
| | **Average KWH/Annual saving** | | | | **161206** |
| | **TOTAL ANNUAL SAVING** | | | | **161206** |

**Table 4.6 (d): Energy Saving Statement for Rehabilitation-B**

| | **Description** | **AVG.KWH/DAY** | **AVG.KWH/YRS** |
|---|---|---|---|
| | **Rehabilitation B** | 8749 | 3193516 |
| **REDUCTION IN CONSUMPTION BY USING ENERGY SAVING MEASURE** | | | |
| 1 | By Using CFL / T5 Lamps | Overall Saving can be 37% | |
| 2 | By Using LED Light in Lift lobby | Overall Saving can be 50% | |
| 3 | By Using electronic ballast | Overall Saving can be 25% | |
| 4 | By Using VFD and high efficient pump | Overall Saving can be 30- 20% | |
| 5 | By Using Solar lighting for External Light | Overall Saving can be 100% | |
| 6 | By Using Solar for Hot Water Generation | Overall Saving can be 100% | |

**ANNUAL SAVING**

| | | **Per day unit consumption** | **Saving Percentage** | **Per day Unit Consumption with saving** | **Saving in Unit** |
|---|---|---|---|---|---|
| A | Total Saving Due to CFL Lamp for Common and Residential Area | 208 | 37 | 131 | 77 |
| B | Total Saving Due to LED Light for Lift Lobby | 208 | 50 | 104 | 104 |
| C | Total Saving Due to Electronic Ballast for common and Residential Area | 416 | 25 | 312 | 104 |
| D | Total Saving Due to VFD & Efficient Pump | 538 | 30 | 381 | 157 |
| E | Total Saving Due to Solar Lighting | 60 | 1 | 60 | 0 |
| F | Total Saving Due to Solar Hot Water Generation | 419 | 100 | 419 | 0 |
| | **Average KWH/Day saving** | | | | **442** |
| | **Average KWH/Annual saving** | | | | **161206** |
| | **TOTAL ANNUAL SAVING** | | | | **161206** |

### 4.2.5 Green Belt Development: (TOR Point No. 36, 37&38)

About 13,008.13 sq. mt of area will be maintained as greenbelt at ground and on podium 19,145.68 sq. mt will be provided. Plantation of around 934 nos. of trees on ground of various varieties out of which 350 nos. of trees has been already planted. The details are given in Table 4.8

**Table 4.7: Proposed Plant Species for Plantations**

| Sr. No. | Common Name | Botanical Name |
|---|---|---|
| 1 | Shirish | *Albizia lebbeck* |
| 2 | Neem | *Azadiracta indica* |
| 3 | Sita ashok | *Saraca asoka* |
| 4 | Kadamb | *Neolamarckia cadamba* |
| 5 | Fish Tail Palm | *Caryota urens* |
| 6 | Son Chaffa | *Michelia champaca* |
| 7 | Maharukh | *Ailanthus excelsa* |
| 8 | Nandruk | *Ficus retusa* |
| 9 | Saptparni | *Alstonia scholaris* |
| 10 | Karanj | *Pongamia pinnata* |

Landscape plan is enclosed as **Enclosure 4.** (TOR Point No. 2 (2)-c)

### 4.2.6 Topsoil preservation:

Top soil will be stockpiled and preserved for using it in onsite landscape areas. As the project is in a developed area top soil is available only from the existing gardens.

### 4.2.7 Indoor Air Environment:

Indoor Air Quality is the nature of air that affects the health and well being of the building occupants. Indoor air pollution comprises a mixture of contaminants penetrating from outdoors and those generated indoors. In the last several years, the amount of scientific evidence has indicated that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities.

There are many sources of indoor air pollution in homes. These sources of indoor air pollution include building materials, wet or damp carpet, cabinetry or furniture made of certain pressed wood products; household cleaning products, central cooling systems, humidification devices, paints, resins, wood preservatives, fertilizers, pesticides and outdoor sources such as pollution. Additionally, polluted outdoor air due to heavy vehicular traffic on the adjacent roads would add to the increasing pollution levels from the outside.

In this project Indoor Air Pollution shall be mitigated through natural ventilation of the regularly occupied living spaces (Kitchens, Bedrooms, Living and dining spaces). Building Flush out has been proposed for the project before occupancy as a measure to reduce the indoor air quality problems resulting from construction to prevent comfort and well being of building occupants. Interior finishing materials with low Volatile Organic Compounds (VOC) will be used for the project.

- **Ventilation for Car Parking and smoke extraction fans:**

As defined in the National Building Code of India, mechanical ventilation for car parking shall be designed to permit 10 ACPH for normal ventilation and 30 ACPH in case of fire or distress call. The system shall comprise of ducted ventilation system. The system shall consist of axial fans along with duct. The outside air shall be drawn through from entry / exit ramp & from the shaft which provide down to floor level and dispensed into the parking space through wire mesh for this area for basement.

Following standards shall be adopted for smoke ventilation of the specific areas:

| | | |
|---|---|---|
| Toilet (Public) | : | 15 ACPH |
| DG Room | : | 30 ACPH |
| STP Room | : | 30 ACPH |
| Plumbing Plant Room | : | 30 ACPH |
| Transformer Room | : | 30 ACPH |
| LT Panel Room | : | 20-25 ACPH |
| Basement Car Parking | : | 10 ACPH (Normal Mode) Exhaust<br>20 ACPH Additional (Fire Mode) Exhaust<br>Total 30 ACPH (Fire Mode) Exhaust |

## 4.3 DETAILS OF IMPACT ON EXISTING INFRASTRUCTURE DUE THE PROJECT :

Detailed examination of the project and project site have been made with reference to impact on infrastructure covering water supply, carrying capacities of storm water drainage, sewers, electrical load etc.

### 4.3.1 Details of the project with reference to water supply: (TOR Point No. 4-a)

The requirement of fresh water will be fulfilled from M.C.G.M. All other secondary requirements like flushing and gardening are getting fulfilled by treated waste water from STPs. Hence the overall reduction in total water demand shall be 43.73%.

### 4.3.2 Details of Project with reference to Storm Water Drainage : (TOR Point No. 4-b, 11 and 12)

**Table 4.8: Carrying capacity of storm water drains (TOR Point No. 5 and 11)**

| Details | Capacity($m^3$/sec) |
|---|---|
| Total run off before development | 1.94 |
| Total run off after development from plot | 2.33 |
| Carrying Capacity of Internal Storm water drains | 3.47 |
| Carrying Capacity of External Storm water drain | 4.57 |

Hence the carrying capacity of external drain is sufficient to take the runoff and there will be no flooding on and around project site.

### 4.3.3 Details of the project with reference to sewerage: (TOR Point No. 4-c & e )

As on date there is no individual effort to reuse of treated sewage for flushing and gardening, etc. The implementation of Building-wise Sewerage Treatment plants will result in reduced flow in the city sewers. As far as this project is concerned there will be reduced sewerage flow from current flow even with new population.

### 4.3.4 Details of the project with reference to Electrical Supply: (TOR Point No. 4-d)

The power demand for proposed development is 15092 KW with the use of various energy conservation and non conventional energy (solar) around 18% for ICC One, 13% for ICC Two, 4% for Rehabilitation A and 5% for Rehabilitation B of energy shall be saved. The details are given in sec 4.2.4.1

## 4.4 IMPACT ASSESSMENT BY INTEGRATION:

Impact identification for this project was done by using Delphi Technique.

### 4.4.1 Technique:

For sitting of an activity, **"Delphi Technique"** is advised by MoEF. The Government of India has recommended this technique in the book on Sitting of Hazardous Waste Disposal Areas, prepared by NEERI, Nagpur and published by the Ministry of Environment and Forest (MoEF) in 1991. The same is proposed to be used with due improvisation, mutatis mutandis, covering other media of environment.

a. (i) The Delphi Technique considers the following 34 attributes and
Four weightages i.e.:
7 attributes, receptor related
10 attributes, pathway related
8 attributes, pollutant related
9 attributes, waste management related.

(ii) The modified Technique used here considers 23 attributes and
Four weightages i.e.:

7 attributes, receptor related
5 attributes, pathway related
5 attributes, water pollution & waste management related
4 attributes, air pollution and waste management related
2 attributes, solid waste management related.

b. Four types of marks for each attribute like 0 to 0.25, 0.25 to 0.5, 0.5 to 0.75 and 0.75 to 1.0 depending on facts of situations, chemical properties of pollutants and quantification are considered. These marks are known as Sensitivity Index (SI).

c. Combined consideration of (1) and (2) together gives attribute-wise weight-ages. These are the negative marks out of 1000 and ranking of candidate sites is based on comparison of these marks.

Finding the sensitivity index (SI) shall be first task and is done in the table below.

### 4.4.2 Marks Allocation and Ranking:

Site selection depends on site evaluation. Site evaluation will depend on consideration of sensitivities of various attributes and the weight-ages attachable to each. Finding the sensitivity index (SI) shall be first task and is done in the table given below.

The attribute measurements or values or description are known as the team has traversed the area. The sensitivity index is awarded based on attribute properties in above table. The attribute wise score is arrived at by multiplying the sensitivity index and the weight-age of each attribute and is given in Table 4.10

**Table 4.9: Sensitivity Index and the Weight-Age of Each Attribute**

| **Attribute** | **Sensitivity Index** | | | |
|---|---|---|---|---|
| | **0.0 - 0.25** | **0.25 - 0.5** | **0.5 - 0.75** | **0.75 - 1.0** |
| Receptor Related | | | | |
| Population within 500 meters | 0 to 100 | 100 to 250 | 250 to 1000 | > 1000 |
| Distance to nearest drinking water well | > 5000 m | 2500 to 5000 m | 1000 to 2500 m | < 1000 m |
| Use of site by nearby residents | No used | Occasional | Moderate | Regular |
| Distance to nearest off site building | > 3000 m | 1500 to 3000 m | 500 to 1500 m | < 500 m |
| Presence of major transportation routes | Airport | Internal road | Highway | Rail |
| Land use/ Zoning | Completely remote (Zoning not applicable) | Agricultural | Commercial or industrial | Residential |
| Critical environments | Not a critical environmental element | Pristine natural areas | Wetlands, flood plains, & preserved areas | Major habitat or endangered or threatened species |
| Pathway Related | | | | |
| Distance to nearest surface water | > 8000 m | 1500 to 8000 m | 500 to 1500 m | < 500 m |

| Attribute | Sensitivity Index | | | |
|---|---|---|---|---|
| | **0.0 - 0.25** | **0.25 - 0.5** | **0.5 - 0.75** | **0.75 - 1.0** |
| Ground water depth | > 30 m | 15 to 30 m | 5 to 15 m | < 5 m |
| Type of contamination | No Contamination | Soil Contamination only | Biota contamination | Air, Water or food contamination |
| Precipitation effectiveness index | Semi arid | Semi humid | Humid | Wet |
| Susceptibility to erosion & run-off problem | 0 - 0.25 not susceptible | 0.25 - 0.50 Potential | 0.50 - 0.75 Moderate | 0.75 - 1 Severe |
| Waste Related | | | | |
| Water | | | | |
| BOD generation level | < 250 mg/l | 250- 500 mg/l | 500- 1000 mg/l | Above 1000 mg/l |
| Treatability COD-BOD | < 2.5 | 2.5 – 3.5 | 3.5 - 5 | Above 5 |
| Treatment | Tertiary | Secondary | Primary | No |
| Disposal | Land assured & crop perennial | Land seasonal | Stream up to 5km | Riparian |
| pH | 6 - 8 | 5- 6 or 8 - 9 | 3 - 5 or 9- 11 | <3 or >11 |
| Air | | | | |
| Industrial mix Fuel | Electricity | Oil | Bagasse | Coal |
| Control equipment | All including ESP or wet scrubber | Bag filter | Cyclone, Fly ash arrestor | None though required |
| Stacks heights | As per Act | 30 | < 30 | None though required |
| Noise at boundary | upto 55 dB(A) | 55 to 70 dB(A) | 70 to 85 dB(A) | Above 85 dB(A) |
| Solid Waste | | | | |
| Industrial mix (waste type) | None | Non-hazardous | Hazardous & Non-hazardous | Hazardous |
| Treatment - • Non hazardous | Recycle/sale | Secured landfill | Low landfill | None though required |
| • Hazardous | Recycle/ Incinerator | Secured landfill | Sanitary landfill | None though required |

**Table 4.10: Ranking for Project Site**

| Attribute | Attribute Measurement | Sensitivity Index | Weight-age | Attribute Score |
|---|---|---|---|---|
| Receptor Related | | | | |
| Population within 500 meters | > 1000 | 0.75 | 80 | 71 |
| Distance to nearest drinking water well, m | < 1000 m | 0.75 | 60 | 30.2 |
| Use of site by nearby residents | Regular | 0.75 | 50 | 39.3 |
| Distance to nearest off site building | < 500m | 0.75 | 40 | 32 |

| Attribute | Attribute Measurement | Sensitivity Index | Weight-age | Attribute Score |
|---|---|---|---|---|
| Land use/ Zoning | Residential/ Commercial | 0.75 | 30 | 24 |
| Presence of transportation routes | Road | 0.25 | 30 | 6.8 |
| Critical environments | No | 0.00 | 30 | 0 |
| Sub total | | 4.00 | 320 | 203.3 |
| Pathway Related | | | | |
| Distance to nearest surface water | < 5 | 0.75 | 55 | 15.1 |
| Depth of ground water | < 5 | 0.75 | 45 | 34.4 |
| Type of contamination | No contamination | 0 | 45 | 0 |
| Precipitation effectiveness index | Humid | 0.5 | 25 | 12.7 |
| Susceptibility to erosion and runoff problems | Not susceptible | 0.25 | 25 | 5.4 |
| Sub total | | 1.75 | 195 | 67.6 |
| Waste related | | | | |
| BOD, mg/l | <250 | 0.25 | 40 | 10 |
| PH | 7.00 | 0.25 | 20 | 5 |
| Treatability (COD:BOD) | About 2.5 | 0.40 | 40 | 16 |
| Treatment | Tertiary | 0.20 | 50 | 10 |
| Disposals | Secured | 0.25 | 50 | 12.5 |
| Air | | | | |
| Industrial mix (Fuel) | Electricity | 0.25 | 70 | 17.6 |
| Control equipment | Scrubber | 0.25 | 50 | 12.2 |
| Stacks | As per Act | 0.25 | 50 | 7.1 |
| Noise at boundary | 55-70 | 0.50 | 30 | 18 |
| Solid Waste | | | | |
| Waste Type | Non Hazardous | 0.5 | 45 | 22.6 |
| Facilities | Recycle/sale | 0.25 | 40 | 12 |
| Sub total | | 3.35 | 485 | 143 |
| **Total** | | | | 413.9 |

**Ranking**

From the above considerations we have to place our present Project site at appropriate level as per following slabs.

Score 750 to 1000 = Pollution Potential Very High
Score 600 to 750 = Pollution Potential High

Score 450 to 600 = Pollution Potential Moderate
Score 300 to 450 = Pollution Potential Low
**Score below 300 = Pollution Potential Very Low**

**Yard-Stick for Ranking**

Since with the methodical working of sensitivity index and weight-ages, the total scope of pollution potential has come to **413.9,** the site fits into **"LOW"** Pollution Potential.

# CHAPTER 5

# ENVIRONMENTAL MONITORING PROGRAMME

## 5.0 MONITORING PROGRAM: (TOR Point No. (41) – a & b)

A monitoring program has been detailed out in which the frequencies of measurement, the planned location of measurement and detailed budgets are listed.

The environmental monitoring program includes following:

- Ambient air quality
- Monitoring of exhausts from DG sets
- Noise level monitoring
- Water quality monitoring
- Waste water Analysis

The MoEF approved laboratory is appointed for the environmental monitoring during construction and operation phases. There will be one record section for recording all the sampling frequencies and analysis reports.

➢ **During Construction Phase:**

- **Air & Noise Monitoring**

The ambient air quality for the parameters RSPM, $SO_2$ and NOx shall be monitored quarterly. During construction phase, the major air pollutant of prime concern is RSPM as impacts of other emissions such as $SO_2$, NOx & CO will not be significant because the nature of sources is such that the emissions are distributed spatially and as well as temporal. Dust emissions from construction activities shall require comprehensive mitigation measures as explained in detail in the EIA report.

The noise level shall be checked during construction activities. The noise level shall be recorded by the project proponents themselves and record shall be kept for daily readings. The location shall be selected in the area where there are chances of high noise levels. The noise emitted from heavy duty construction equipment during construction period being high shall require occupational preventive measures and temporary noise barriers for noise attenuation.

- **Water Analysis**

The water supplied by MCGM generally is of good quality but still to ascertain its quality as a precaution it shall be checked quarterly for physicochemical and bacteriological parameters.

➢ **During Operation Phase:**

- **Air & Noise Monitoring**

The ambient air quality for the parameters RSPM, $SO_2$, NOx and Noise levels shall be monitored quarterly as per guidelines at five different locations within the project site to ascertain that they are within the prescribed limits. There will be provision of 7 nos. DG sets for emergency requirement during power failure. The emissions from these DG sets are only limited while they are in operation. In this area the chances of power failure are very remote. Still the emissions of DG sets shall be monitored as per guidelines quarterly by taking test run of DG sets.

During operational period to control emissions from DG sets, stack heights of DG sets shall be as per CPCB guidelines. With regards to concern from vehicular emissions, the exhaust emissions due to rise in peak hour traffic will be mitigated by adopting traffic management measures and permitting vehicles having valid PUC. As this is being an expansion project the ambient air quality is being regularly monitored on site and the results are found to be within limits of CPCB standards.

During operational period the major noise pollution source will be DG sets and surrounding traffic activity. In order to prevent adverse noise exposure to the occupants, optimal mix of mitigation measures such as low noise generation units, acoustic enclosures, and plantation of trees as noise barriers all around the project boundary has been planned. Noise modeling studies have been done for the prediction of impacts.

- **Water & Wastewater Analysis**

The water supplied by MCGM generally is of good quality but still to ascertain its quality as a precaution it shall be checked quarterly for physicochemical and bacteriological parameters. Water conservation shall be done with the help of collecting rain water and using it for domestic purpose and thereby minimizing requirement of fresh water from MCGM. 4 nos. of rainwater collection tank are proposed and the water collected from terraces shall be collected in that and shall be used for domestic purpose after treatment. This treated water shall be tested daily during rainy season for physicochemical and bacteriological parameters to ascertain its quality for domestic use.

Treatment of waste water in Sewage Treatment Plants and its reuse for secondary requirements like flushing and gardening is committed in this project thereby avoiding water pollution. Total 5 STPs are proposed.

Storm water drainage shall be adequately designed to take the runoff. These drains shall have silt and oil and grease traps to avoid pollution of water in drains outside the plot. Proper maintenance of storm water drainage shall be done to avoid choking of drains and flooding on site.

## 5.1 ENVIRONMENTAL MONITORING PLAN WITH BUDGETARY ALLOCATION:

During construction and operation phase the environmental monitoring is done regularly as per the statutory conditions as explained in section 5.1

The budgetary allocation for environmental monitoring plan for construction and operation phase of the project is as explained in Table 5.2.

**Table 5.1: Environmental Monitoring Plan with Costing During Construction Phase:**

| S.N. | Item | Parameters | Frequency | Location | Total (Rs) |
|---|---|---|---|---|---|
| 1. | Ambient Air Quality | $PM_{(2.5)}$, $PM_{(10)}$, $SO_2$ & $NO_X$ | Quarterly | At major construction area (5 locations ) | 2,70,000 |
| 2. | Noise Level | Equivalent Noise Level dB(A) | Daily | At major construction area (5 locations ) | |
| 3. | Water Analysis | Physical, Chemical and Bacteriological Parameters | Quarterly | Municipal Supply | 81,000 |
| 4. | EMP for Batching plant | Ambient Air Quality | Quarterly | -- | 2,08,000 |
| | | Noise Level | Daily | | |

| S.N. | Item | Parameters | Frequency | Location | Total (Rs) |
|---|---|---|---|---|---|
| | | Exhaust from DG Set | Quarterly | | |
| | | | | **Total** | **5,59,000** |

The budgetary allocation for operation phase of the project is given in Table 5.2.

**Table 5.2: Environmental Monitoring Plan with Costing (Per Annum) During Operation Phase**
**(TOR Point No. 34)**

| Sr. No. | Item | Parameters | Location | Frequency | Costing (Rs /annum) |
|---|---|---|---|---|---|
| | | | | **By MOEF approved external lab** | |
| 1. | Ambient Air Quality | $PM_{(2.5)}$, $PM_{(10)}$, $SO_2$ & $NO_x$ | Total 5 locations | Quarterly | 60,000 |
| 2. | Noise Level | Equivalent Noise level | Total 5 locations | Daily | |
| 3. | Exhaust from DG Set | SPM, $SO_2$ | Stacks of DG sets (Total nos. 7) | Quarterly | 42,000 |
| 4 | Water Analysis (for rain water) | Physical, Chemical and Bacteriological Parameters | Rain water stored in tank (After treatment) | Daily During rainy season | 5,40,000 |
| 5 | Sewage Analysis | pH, BOD, COD, TSS, TDS, O & G | STP (Total nos. of 5 STPs) | Daily | 36,50,000 |
| 6 | OWC manure | Physical and Chemical parameters | OWC machine (Total 6 Nos.) | Quarterly | 60,000 |
| | **Grand Total** | | | | **43,52,000** |

# CHAPTER 6

# ADDITIONAL STUDIES

## 6.0 INTRODUCTION:

This chapter covers Risk Assessment Studies for the construction and operation phase, the safety precautions that have to be taken during construction phase and the Disaster Management Plan and Emergency Preparedness Plan Onsite and Offsite. Apart from these, Rehabilitation Action Plan and Natural Resource Conservation plan are also included in this chapter.

## 6.1 RISK ASSESSMENT: (TOR Point No. 40)

| **STEP 1: DEFINE THE PROJECTS/TASKS** |
|---|
| ***Project Proponents :*** **"M/s. The Bombay Dyeing & Mfg. Co. Ltd"** of Naigaon division, Dadar (East), State: Maharashtra. |
| **STEP2: IDENTIFY THE HAZARDS** |

***a) Are you using (Tick Boxes)***

[ √ ] plant/equipment
[ √ ] portable electrical equipment
[√] pressure vessels/boilers
[√] hazardous substances
[ √ ] scaffolding
[ √ ] ladders
[ √ ] lifts/hoists/cranes/dogging/rigging/load shifting machinery

***b) Does the project/task involve (Tick boxes)***

[ √ ] using tools/equipment with moving part(s)
[ √ ] using tools/equipment that vibrate
[ x ] working with x-rays ,or lasers
[ √ ] electrical wiring
[√ ] asbestos removal
[ √ ] welding
[√ ] hazardous waste
[√ ] excavation / trenches ( >1.5m)
[ √ ] working around electrical installations
[√ ] working near traffic
[ √ ] working at a height (>3m)
[ √ ] working in isolation.
[ √ ] working in a confined space
[ √ ] manual handling
[ √ ] repetitive or awkward movements
[ √] lifting or moving awkward or heavy objects
[√ demolition work

***c) Is there (Tick boxes)***

[ √ ] noise
[√ ] dust/fumes/vapours/gases
[√] extreme températures
[√] risk of fire/explosion
[ √ ] slippery surfaces/trip hazards
[ x ] poor ventilation/air quality
[ x ] a poorly designed work area for the project/task

***During Construction Phase:***

**STEP 3: ASSESS THE RISK**

| | Air Pollution | Water Pollution | Noise Pollution | Soil Pollution | Occupational Hazard |
|---|---|---|---|---|---|
| **A. Material Handling:** | | | | | |
| **Cement** | +M | - | - | +M | +M |
| **Steel** | - | - | + | - | +M |
| **Sand** | - | - | - | - | - |
| **Stone** | - | - | - | - | +L |
| **Wood** | - | - | -- | - | - |
| **Glass** | - | - | - | - | +M |
| **Hardware** | - | - | - | - | - |
| **Colour** | - | +H | - | +M | - |
| **B. Construction Machinery** | | | | | |
| **Rotary Driller** | +L | - | +L | - | +L |
| **Mixers** | +M | - | +M | +L | +M |
| **Excavator** | +L | - | +L | - | +H |
| **Material Lift** | - | - | +L | - | +H |

***Risk Factor:***

**+ : Positive**
**- : Negative**
**L : Low**
**M : Medium**
**H : High**

**STEP 4: CONTROL THE RISK**

For any projects/tasks that present a high or extreme risk, a Safe Work Method Statement must be completed.

***a) Note how you will control the risk following the priorities listed to the right. This may include controls like redesigning the workplace, using guards or barriers, ventilation, using lifting equipment or personal safety equipment.***

1. Eliminate the hazard
2. Keep the hazard and people apart
3. Change work methods
4. Use personal protection

***b) Note any specific risk assessments required for high-risk hazards. Check whether any hazards noted in step 2 require further assessment or action***

[√] hazardous substance risk assessment [ √ ] confined spaces risk assessment
[√ ] test and tag electrical equipment [ √ ] sound level test

*c) Note Permits/Licences/Registration required*

[√] Demolition work
[√ ] Electrical wiring
[√ ] Pressure vessels
**[ x ]** Friable asbestos removal
**[ x ]** Ionising radiation sources
[ √ ] registers for chemicals, Personal protective Equipment, training, ladders, lifting gear

*d) Note certificates of competency/licenses for operators*

[ √ ] Scaffolding
[ √ ] Rigging
[ √ ] Load shifting machinery operation
[ x ] Pesticide application
[ √ ] Crane operation
[ √ ] Hoist operation

*e) Note emergency systems required*

[ √ ] first aid kit
[ √ ] extended first aid kit
**[ x ]** emergency stop button
[ √ ] additional emergency procedures
[ √ ] Fire control
**[ x ]** remote communication mechanism
**[ x ]** others

**f)** ***Quantitative Risk Assessment Formula used Matrix calculations***

$$R_i^k = \frac{\sum_{j=1}^{n} r_{ij}^k}{n} = \frac{1}{n}\sum_{j=1}^{n} \alpha_{ij}\beta_{ij}^k$$

Where k Ri = significance index score for risk i on project objective k. The three-point scales for a (highly likely, likely and less likely) and b (high level of impact, medium level of impact and low level of impact) need to be converted into numerical scales. These risk are quantify as "high" or "highly" takes a value of 1, "medium" takes a value of 0.5, and "less" or "low" takes a value of 0.1.

The matrix presented in below shows the calculation of the risk significance index.

| **a\b** | **High level of impact (1.0)** | **Medium level of impact (0.5)** | **Low level of impact (0.1)** |
|---|---|---|---|
| Highly likely (1.0) | 1.00 | 0.50 | 0.10 |
| Likely (0.5) | 0.50 | 0.25 | 0.05 |
| Less likely (0.1) | 0.10 | 0.05 | 0.01 |

During the study of this project only Top 10 ranked risks as per their significance in relation to project objectives Environment related risks and Safety related risks are considered with Significance Index scores.

**Table 6.1: Safety related risks**

| **Sr. No** | **Top 10 ranked risks related Safety /Occupational Health** | **Significance Index scores** |
|---|---|---|
| 1. | Tight project schedule | 0.20 |
| 2. | Low management competency of subcontractors | 0.05 |
| 3. | Unsuitable construction program planning | 0.05 |
| 4. | Variations of construction programs | 0.05 |
| 5. | General safety accident occurrence | 0.30 |
| 6. | High performance or quality expectations | 0.20 |

| Sr. No | Top 10 ranked risks related Safety /Occupational Health | Significance Index scores |
|---|---|---|
| 7. | Design variations | 0.05 |
| 8. | Lack of coordination between project participants | 0.01 |
| 9. | Excessive approval procedures in administrative Government departments | 0.01 |
| 10. | Unavailability of sufficient amount of skilled labour | 0.01 |

**Table 6.2: Environmental risk**

| Sr. No | Top 10 ranked risks work related Environmental Risks | Significance Index scores |
|---|---|---|
| 1. | Tight project schedule over night work-stress | 0.01 |
| 2. | Variations of construction programs | 0.01 |
| 3. | Unavailability of sufficient professionals and managers | 0.01 |
| 4. | Excessive approval procedures in administrative government departments---shortcuts leads to damage | 0.01 |
| 5. | Variations by the client | 0.01 |
| 6. | Inadequate or insufficient site information (soil test and survey report) | 0.01 |
| 7. | Low management competency of subcontractors<br>Poor House keeping | 0.01 |
| 8. | High performance or quality expectations | 0.30 |
| 9. | Inadequate program scheduling | 0.01 |
| 10. | Serious Noise pollution caused by construction | 0.05 |

### 6.1.1 Identified Hazard operations during Excavation, Construction and maintenance of buildings:

Physical injury to workmen, falling from height, high Noise level, electrical shocks, inhalation of dust, muscular skeleton dieses due to wrong work posture. These are listed out in detail as follows:

**Table 6.3: Risk and remedial measures**

| Sr. No | Operations | Risk | Remedial Measures |
|---|---|---|---|
| 1. | Tower Crane | Injury,<br>Fatal accident,<br>Contact with high voltage live wires | Certified by Competent person,<br>Operated by trained personal,<br>Preventive maintenance,<br>Use work permit system,<br>Use of PPA/PPE Safe Operating Procedures (SOP) |
| 2. | Batching Plant | Reportable Accident<br>Ice plant,<br>Ammonia leakages | Certified by Competent person,<br>Operated by trained personal,<br>Preventive maintenance,<br>Use work permit system,<br>Use of PPA/PPE |
| 3. | Construction/material Hoists | Personal injury<br>Accidents | Only approved hoist to be used by trained employees with safe area demarcation ,<br>Use of PPA/PPE |

| Sr. No | Operations | Risk | Remedial Measures |
|---|---|---|---|
| 4. | Passenger lift | Fatal /major Accident | Certified/approved passenger lift to be used by trained employees,<br>With safe area demarcation,<br>Use of PPA/PPE |
| 5. | Portable electrical equipment | Burn/fatal | To be checked before use by Approved Electrical safety official/Use of PPA/PPE |
| 6. | Pressure vessels | Pressure air Rupture | Compressors,<br>For Jack Hammer,<br>AHU (Air conditioning )Ice Plant,<br>Inspection of Safety valve, proper rubber fittings, Vibration to be avoided<br>Use of PPE/PPA, Training |
| 7. | Hazardous substances | Fire, explosion<br>Toxic release<br>Unhygienic Dust | Storage of Bulk Fuel. Paints, Plastic Plywood Combustible, Store as per HAZMST Rules. PPE/PPA<br>Training |
| 8. | Scaffolding | Fall from Height<br>Fatal accident | Introduction of Working on Height permit system, PPE/ PPA/ safety belt /Training |
| 9. | Ladders | Accident,<br>Injury | Proper selection, Inspection, PPE/PPA, Training |
| 10. | Lifts | Accidental,<br>Injury<br><br>Even Fetal | Inspection by competent person,<br>Safe work instruction,<br>Correct Use, Training,<br>Testing before use for SWL,<br>Use of PPE/PPA |
| 11. | Hoists | Accidental,<br>Injury | Inspection by competent person, Safe work instruction, Correct Use, Training,<br>Testing before use for SWL Use of PPE/PPA, Fencing |
| 12. | Material handling cranes | Accidental,<br>Injury<br>Even Fetal | Inspection by competent person,<br>Ergonomic training,<br>Use of PPE/PPA, Safety Guards |
| 13. | Dogging | Accidental,<br>Injury | Inspection by competent person |
| 14. | Rigging | Accidental,<br>Injury | Inspection by competent person,<br>Ergonomic training,<br>Use of PPE/PPA, Safety Guards |
| 15. | Using tools/equipment with moving part(s) | Nipping,<br>Injury to Hand ,<br>Electrical Shocks<br>Leg Injury | Proper selection of Hand tool,<br>Periodic Inspection,<br>Use of proper hand glove,<br>PPE/PPA, Training,<br>Safety guard in case of Grinder |
| 16. | • Using tools/equipment that vibrate<br>• Electrical wiring | • Vibration hazard<br>• Electrical shocks<br>• Asbestosis | Inspection by competent person,<br>Ergonomic training,<br>Use of PPE/PPA,<br>Safety Guards |

| Sr. No | Operations | Risk | Remedial Measures |
|---|---|---|---|
| | • Asbestos removal<br>• Welding | • Eye, Body Burns Toxic gases inhalation | |
| 17. | Working around electrical installations/working near traffic / working at a height (>3m) / Working in isolation. Working in a confined space/ demolition work | Electrical shocks, Injury, Fatal accident, Hazard of toxic, Gases inhalation | Work by Authorized trained person, Indian electrical safety rules to be fallowed, Work permit system, Work environment in confined space, Use of PPE/PPA |
| 18. | Work environment<br>1. Noise<br>2. Dust/fumes/vapours/gases<br>3. Extreme températures<br>4. Slippery surfaces/ trip hazards<br>5. Poor ventilation/ air quality<br>6. A poorly designed work area for the project/ task | Accidental Injury, Occupational Hazards, Rashes, Burn , Skin deceases | Enclose noise source, Lubrication, Min time exposure, Use of PPE/PPA, Good Housekeeping, Illumination survey, Trainings |

**a. Batching plant safety during construction:**

**Incident: <u>Release of Cement cause accidental exposure to workmen</u>**

**Remedial measures:**

- Have emergency procedures in place to deal with unexpected release of cement dust. These procedures should allow for workers to contain a release without exposing them to undue risk during the containment or cleaning up afterwards
- If possible, locate control rooms a safe distance from any areas where loading, storage, conveying and mixing of cement dust and other concrete additives occur to prevent engulfment if cement dust is discharged
- Use self-closing flow control valves (e.g. spring loaded) that revert to the closed position if there is a fault in the actuation system
- If possible, incorporate manual activation or override controls that can be operated at ground level to valves controlling the flow of cement dust
- Where there is a risk of a bursting 'sock', encase the sock within an additional reinforced connection between the silo and the hopper. This will provide containment if the sock fails

**In addition to the above, duty holders and workers should consider the following practices when working with or near cement or other potentially hazardous dusts**:

- Have protective clothing available and wear masks where there is a risk of inhaling dust
- Clean the workplace regularly by vacuuming or wet sweeping
- Wear disposable or washable work clothes and shower if facilities are available

- Vacuum dust from work clothes and change into clean clothing before leaving the work site
- To avoid ingesting cement dust, do not eat, drink, smoke or apply cosmetics in areas where dust is present
- Wash hands and face outside of dusty areas before performing these activities
- Participate in training, exposure monitoring and health screening and surveillance programs to monitor any adverse health effects caused by cement or other potentially hazardous dusts

**b. Safety Inspection Checklist For Concrete Batching Plant:**

- Work platforms protected by adequate hand rails (minimum Adequate guarding for incoming gear box at ball bearing turn table. For silos attachment, safe distance of 50 cm should be maintained within the unit slewing radius to adjacent machinery)
- Proper Housekeeping practices should be followed at the work area
- Scraper bucket rope lock should not get drawn into the rope feeding station
- Obstructed scrapper bucket is not pulled off with retraction rope
- Oil should be cleaned and / or adjustment of machine should not be carried out while in motion
- Impact on machine should be avoided by handling scrap bucket carefully ( free fall is avoided )
- The radial scrapper should be slewed in both directions within the limits of the bin wall
- Scrapping gear - steering in opposite direction should be avoided
- Check break adjustment For: i) Stopping the scrap bucket & ii) Preventing rope sag
- General conditions of ropes
- Scraping & hauling rope
- Suspension rope
- Scraper bucket - Check the chain for wear & usage
- Spraying operation
- Unnecessary lubricant should be removed
- Spraying is done at the end of the shift.
- Lockout procedure should be followed for repair and maintenance work. Adequate personal protective equipments are worn by the workers

## 6.2 DISASTER MANAGEMENT PLAN: (TOR point no. 40)

Disaster is a threat to Environment and Society. Disaster Management Plan (DMP) deals with the preparations to reduce the impacts of Natural and Man-made disasters. Recent rise in the incidence of disasters has alerted us regarding the need of pre-planned DMP which will aim at providing effective and timely relief during disaster through organized manner.

Emergency prevention through good design, operation, maintenance and inspection are essential to reduce the probability of occurrence and also making the occupiers aware of what to do in case of any emergency. The overall objective of a disaster management plan is to make use of the combined resources created or available at the site and/or off-site services to achieve the following:

- Prevent Disasters
- Minimize the effects of the accident on people and property;
- Initiate the rescue and medical treatment of casualties;
- Safeguard other people
- Evacuate people to safe areas with care
- Inform and collaborate with statutory local and state authorities;

- Provide credible information to news media;
- Bring the incident under control;
- Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of the emergency;
- Investigate and take steps to prevent recurrence of similar incidents.

DMP follows the Basic structure as shown in Figure 6.1

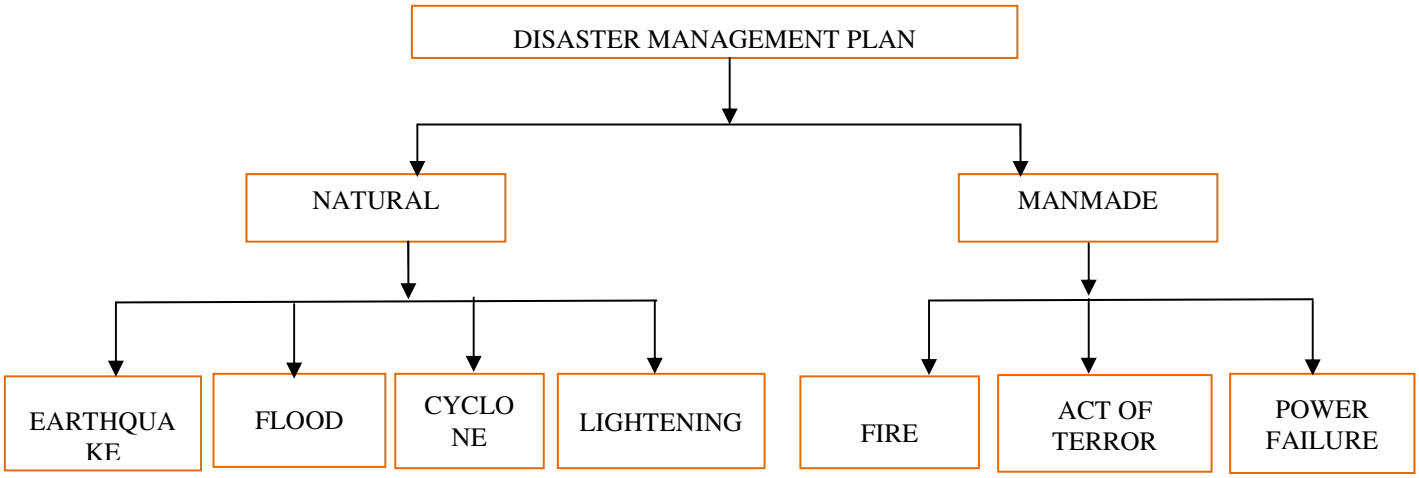



**Fig. 6.1: Basic Structure of DMP**

### 6.2.1 NATURAL DISASTER:

**A. EARTHQUAKE:**

**SEISMIC ENVIRONMENT & PRECAUTIONS**

As per the Seismic Zoning Map of India, Thane region falls under Seismic Zone-III. The structural design shall be certified as per IS code 456 - 2000 Plain & reinforced concrete – code of practice IS 1893 – 2002, criteria for earthquake resistant design of structures.

**B. FLOODS:**

Particularly in Mumbai, areas having poor drainage characteristic get flooded by accumulation of water from heavy rainfall. Following precautions would be taken by the proponent to manage flood disasters:

a. Storm water system would be checked and cleaned periodically
b. Mapping the areas within or leading in or out of the building that will be water logged, flooded or isolated due to the flood. The areas will be marked after completion of the project (as final ground levels etc. will be available after completion)
c. Vulnerability of basement should be mapped
d. Dewatering pumps shall be installed at vulnerable locations

**C. CYCLONES:**

Cyclones are caused by atmospheric disturbances around a low-pressure area distinguished by swift and often destructive air circulation. They are usually accompanied by violent storms and bad weather.

There is no history of any cyclone in this area. However in such an instance the occupants should be advised to stay in the shelter in tightly secured windows and doors. The glass of windows etc. should be covered with paper/cardboards to avoid glass breaking due to flying objects outside.

**D. LIGHTNING:**

Lightning is an atmospheric electrostatic discharge accompanied by thunder which typically occurs during thunderstorms and sometimes during volcanic eruptions or dust storms. It often leads to physical damage to the building and occupants. It can also lead to short circuits, failure of power supply and fire. Lightning arrestor systems shall be provided for highrise buildings in this project to abate the impact of lightning hazard.

### 6.2.2 MAN-MADE DISASTER:

**A. FIRE:**

Fire could take place through various means; one of them is through electrical fire. Hence, all the electrical works and material of the building would adhere to the standards. Regular maintenance and audit of the electrical systems would be carried out by external auditors.

Fire alarm would be installed. The functioning of these fire alarms would be checked periodically by security manager. A report of the same would be submitted to safety manager and M/s. The Bombay Dyeing & Mfg. Co. Ltd. for necessary action. The occupants/residents of the proposed buildings would undergo mock fire drills. These mock drills would be conducted by qualified staff (e.g. fire brigade). Fire extinguishers would be placed in every floor. All occupants/residents would be given training on how to use these fire extinguishers. Fire extinguisher equipment would be evaluated periodically to ensure that it is in working conditions by security manager. If any faulty equipment is observed then it would be repaired or replaced by Society. Proper evacuation plan would be chocked for the building. The map for the evacuation plan would be provided to all the occupants.

**Fire fighting measures:**

- The fire fighting system has been designed considering the following codes, manual and guidelines as described below:
    - National Building Code of India (NBC);
    - As per requirement of fire officer/local fire approving authorities; and
    - As per Indian Standard Code for Fire Protection (IS Codes given in NBC, 2005).
- There will be adequate location of fire hydrant with Hose Reel proposed to be installed in all blocks.
- Underground fire water storage tank of adequate capacity.
- Proper Fire Escape routes.
- Portable fire extinguishers of IS specification.
- Fire safety equipments like fire blankets, fire alarm bells.
- Provision of Fire escape masks.
- Adequate number of fire lifts with independent electric supply.
- Alternate source of power supply / D.G sets.
- Refuge areas as per CFO Norms.
- Provision of Signages.

**a. Response Sequence during Fire:**

**i. Person noticing the fire should attempt to isolate and extinguish the fire with the available equipment and Inform or arrange to inform the security regarding the**:

- Location of the fire
- Material of burning
- Extent of fire
- Callers name and number

"A proper code of communication shall be maintained wherein the caller makes sure that the message has been conveyed to the right person".

**ii. Security or the coordinators will**

- Respond to the scene of the incident
- Arrange to send the necessary firefighting equipment to the scene of the incident.
- Extinguish the fire with the available equipment
- Ensure closure of gates immediately to regulate traffic in such a way that free movement of outside assistance like fire tenders, ambulance etc is available
- Security will cordon off the area and local city fire fighting staff should be notified for further assistance
- All the occupants will need to stop their operations/ work, switch off lights, fans, machines etc. All persons should assemble to refuge or designated area for fire and hazardous situation

**iii. Reporting and Follow up System**

- All cases of fire occurrence, no matter how small, must be reported promptly to the Security for further action to avoid such incident
- Fire extinguishing equipment once used, should not be returned to its location without it is being recharged/ certified fit by the security
- All fire extinguishers after use should be laid horizontally to indicate that they have been exhausted

**b. Refuge Area :**

The Refuge Area will have the following resources available:

i. Copies of the Disaster Management Plan
ii. Layout Plan of the complex
iii. Information regarding Safety Equipment, Fire Fighting material
iv. A list of important telephone numbers like those of neighbouring police station, Fire Brigade, Hospitals etc.
v. First - Aid Kit
vi. Communication equipment - Internal and External telephones and other communication equipment
vii. Drinking water facility

In addition to many of the above measures an attempt will be made to add any site specific steps and manpower based instruction. Instruction should be in multiple languages including "Marathi and Hindi". The communication equipment will be checked periodically to ensure that they are functional.

**b. Hostage Situation:**

A hostage situation is a situation where one or more suspects are holding one or more people in confinement in a closed area and threatening their life. The main aim of the proposed building security is to safeguard the situation until a professional police force will step in to negotiate and terminate the event. The declaration of a hostage situation will be done by the Security. Hosted situation will be handled by police department.

**C. POWER FAILURE:**

Power failure is a short- or long-term loss of the electric power to an area. Failure of electrical power to a building will have a serious impact on its operations, particularly if the failure occurs during normal operating hours when the building is fully occupied.

**a. Causes Of Power Failure:**

There are many causes of power failures in an electricity network which are caused by either of the following faults:

**i.** Manmade / Technical Fault
- Faults at power stations,
- Damage to electric transmission lines, substations or other parts of the distribution system,
- Short circuit,
- Overloading of electricity mains
- Collision of person or object with utility poles or power transformers,
- Human error in operating equipment within the building or outside (such as at the utility company supplying the power), or malicious tampering

**ii.** Natural Events
Natural events include storms, floods, and earthquakes, lightning

**b. Types Of Power Failure:**

Power failures are categorized into three different phenomena, relating to the duration and effect of the failures:

i. A transient fault is a momentary (a few seconds) loss of power typically caused by a temporary fault on a power line. Power is automatically restored once the fault is cleared
ii. A brownout or sag is a drop in voltage in an electrical power supply
iii. A blackout refers to the total loss of power to an area and is the most severe form of power outage that can occur

**c. Effects Of Power Failure:**

i. Loss of visibility
ii. Safety is at risk
iii. Stoppage of elevators
iv. Computer memory loss and equipment damage
v. Stoppage of working of Fire fighting system
vi. Stoppage of working of building utilities like water pumps, Sewage treatment plants etc.
vii. Loss of comfort

**d. Mitigation plan:**

Buildings have emergency and standby power systems to provide safety and comfort to building occupants during interruptions in their normal power supply.

**i. Diesel Generators**

A diesel generator is the combination of a diesel engine with an electrical generator (to generate electric energy. Diesel generating sets are used in places without connection to the power grid or as emergency power-supply if the grid fails. The packaged combination of a diesel engine, a generator and various ancillary devices (such as base, canopy, sound attenuation, control systems, circuit breakers, jacket water heaters and starting system) is referred to as a generating set.

In case of emergency these diesel generators are backup for electric supply for the common area lighting and utilities like elevators, water pumps, fire lifts, fire pumps & Sewage Treatment plant etc.

**ii. Provision of Independent electrical circuits for critical equipments as per Norms**

Also as per specific requirement of Fire fighting department the Electric supply for Fire pumps, booster pumps, sprinkler pumps will be on independent circuit.

**iii. Uninterruptible power supply (UPS)**

Uninterruptible power supply, also uninterruptible power source, UPS or battery/flywheel backup is an electrical apparatus that provides emergency power to a load when the input power source, typically the utility mains, fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide instantaneous or near-instantaneous protection from input.

Even if DG sets are provided as power backup a UPS is typically used to protect computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause injuries, fatalities, serious business disruption or data loss.

**iv. Power Outage Tips :**

- Check to see if others are without power. If you are the only one without electricity, check your fuse box and if needed call an electrician
- Turn off appliances that were running before the outage to protect the motor
- Turn off the Television, computers, air-conditioning system, and refrigerator
- If stuck in elevator, please be patient, it only takes a few minutes to get out of the elevator once the backup system is on

### 6.2.3 OFFSITE DISASTER MANAGEMENT PLAN:

**a. Safeguard Requirements for Natural and Manmade Disasters:**

List of nearest clinics and hospitals shall be maintained for medical emergency as also any other eventuality. The table below will be ready and will be distributed to all members within the building and later for off-site plan to neighbourhood. These information need to be updated every six months before safety drills. The information thus updated should also be shared with occupants.

**Table 6.4: Emergency Situation Clinics and Hospitals**

| Sr. No. | Names and Area of specialization | Location | Distance from the project site | Phone numbers |
|---|---|---|---|---|
| 1. | Vansh Hospital | Dadar | Approx. 0.63 Km | 022 2854 6464 |

| Sr. No. | Names and Area of specialization | Location | Distance from the project site | Phone numbers |
|---|---|---|---|---|
| 2. | ESI Hospital | Dadar | Approx. 1.10 Km | 022 2886 7242 |
| 3. | Ankur Hospital | Dadar | Approx. 2.00 Km | 022 2808 6942 |
| 4. | Shatabdi Municipal Hospital | Dadar | Approx. 1.70 Km | 022 2805 1509 |
| 5. | Gift A Health Ambulance Service | Dadar | Approx. 0.48 Km | 91 9819585044 |
| 6 | Dhanwantari hospital | Dadar | Approx. 0.17 Km | 22 2430 4082 |
| 7 | Shushrusha Hospital | Dadar | Approx. 0.50 Km | 22 2444 9161 |

**Table 6.5: Emergency Situation Government Agencies and Offices**

| Sr. No. | Names and Area of response | Location | Distance | Phone numbers |
|---|---|---|---|---|
| 1. | Police (Law and Order) | Dadar | Approx. 0.75 Km | 22 2436 2515 |
| 2. | Fire Brigade | Station Officers, Shivaji Park | Approx. 0.85 Km | 22 2445 7203 |
| 3 | Railways | Station Masters of Dadar | Approx. 0.45 Km | **RPF Control Room** (022) 28051580 |
| 4. | BEST (Transport) | Assistant Traffic Superintendent of Wadala | Approx. 0.65 Km | -- |
| 5. | MSRTC | Depot Manager, Dadar | Approx. 1.05 Km | 22 2430 2667 |
| 6. | Government Hospitals | Medical Officer casualty ward, Dhanwantari hospital | Approx. 0.17 Km | 22 2430 4082 |
| 7. | MTNL | Area Manager, Dadar Exchange | Approx. 0.85 Km | 2444/6/7 |
| 8. | BEST (Power) | Station Engineer Santacruz | Approx. 10.55 Km | 91 22 2615 4284 |
| 9. | Revenue, GOM | Officer designated by Collector, Mumbai City | --- | 022-2266 2440, 2266 4232 |

**Source: Municipal Corporation of Greater Mumbai**

## b. OFF-SITE EMERGENCY COVERAGE

### i. Role of the Local Authorities:

The local authority will carry out his duty in preparing for a whole range of different emergencies within their jurisdiction area. (Ward-wise areas in case of MCGM). The responsible personnel from proposed development will coordinate with the local authorities to obtain the information to provide the basis for the plan. This liaison should ensure that the plan is continually up dated and communicated to all stake holders.

It will be the responsibility of the local authority to ensure that all those organizations, which will be involved off site in handling the emergency, know of their roles and responsibility. Sufficient staff and appropriate equipment arrangement shall be the responsibility of respective person. Rehearsals for off-site plans should be organized by the local authority.

**ii. Role of Police Department:**

Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions should include controlling bystanders, evacuating the public, identifying any serious problems, and informing all concerned.

**iii Responsibilities of DCP:**

The DCP's office will be responsible for the following field activities in co-ordination with the ward officer:

- Shifting of the injured to the hospitals on a priority and providing bandobast for crowd control at the hospital.
- Cordoning of area to restrict movement of on-lookers, vehicular and pedestrian traffic.
- Guarding of property/valuables in affected area
- Providing easy access to rescue and relief personnel/vehicles
- Ensuring proper identification , inquest procedure and Corpse disposal
- Panchanamas will be prepared as per police procedure
- Crowd control especially outside Railway stations, bus stations and schools
- Police bandobast near railway stations, bus stations and schools
- Extensive mobile patrolling
- Arrangements for transportation/shifting of stranded or affected persons through police vehicles and private vehicles.
- Law and order and control of anti-social elements
- Use of public address system to provide information to the public. Sign boards may be used to provide information and declare areas out of bounds
- Enlist support of Mohalla Committees for maintaining peace and for rumour control
- Information centre to organise sharing of information with mass media and community
- Communicate to police control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**iv Responsibilities of Divisional Police Inspector (Traffic)**

The Divisional Police Inspector (Traffic) in co-ordination with the Ward Officer will be responsible for the following field activities:

- Control and monitor traffic
- Extensive patrolling especially covering railway stations, bus stations and schools
- Diversion of traffic on alternate routes as and when necessary.
- Provide information about traffic flow along various corridors, especially heavy traffic or congested roads
- Co-ordination with BEST to ensure additional buses are deployed along desired routes
- Mobilising towing cranes and towing of stranded/breakdown or those vehicles obstructing movements
- Use of P.A system to provide information and direction to the public
- Setting up of sign-boards and display boards at strategic locations to give information regarding traffic movement
- Enlist support of RSP, NCC, NSS, NGOs and voluntary organisations for traffic management
- Provide and co-ordinate arrangements for transportation/shifting of stranded or affected persons through police vehicles and private vehicles
- Communicate to traffic control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**v. Responsibilities of Fire Brigade Station Officer, Shivaji Park and Naigaon Fire Brigade**

The Fire Brigade Station Officers in co-ordination with the Ward Officer will be responsible for the following field activities:

- Fire fighting operations in the affected area
- Rescue operations
- Transport of injured to the hospitals on a priority
- Evacuation of persons from the affected area
- Ensure safety from electrical installations or power supply at disaster site
- Clearing of roads or pathways due to uprooted trees
- Salvage operations
- Co-ordinate with BMC for rescue operations in house collapses
- Communicate to fire brigade control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**vi Responsibilities of Officer from Revenue Department**

The officer from Revenue Department in co-ordination with the Ward Officer will be responsible for the following field activities:

- Assessing the requirements for transit camps on the occurrence of disaster
- Assisting the ward officer in requisitioning vehicles and temporary shelters
- Setting up of transit camps and pandals for temporary accommodation
- Arranging for food distribution
- Arrangements for dry rations and family kits for cooking
- Arrangements for clothing
- Providing gratuitous relief
- Enlist support of NGOs and private sector for resources and manpower for transit camps
- Communicate to BMC control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**vii Responsibilities of Medical Officer (Casualty)**

The Medical Officer (Casualty) in co-ordination with the Ward Officer will be responsible for the following field activities:

- Providing emergency treatment for the seriously injured at the hospital
- Organising on-site treatment of injured with tagging and triage and transfer of injured
- Emergency supplies of medicines and first-aid
- Post-mortem and corpse disposal
- Demarcate an area in the hospital for receiving patients, tagging and triage
- If necessary, setting up poison centre within the hospital or at disaster site
- Co-ordinate with blood banks for emergency supply of blood
- Setting up an information centre at the hospital
- Communicate to BMC control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**viii Responsibilities of Railway Station Master, Dadar Railway Stations**

The Railway Station Master in co-ordination with the Ward Officer will ensure that the following field activities are undertaken:

- Crowd control through Railway Police
- Continuous updated information through public address system on the running of trains

measures being undertaken

- Information on location of temporary shelters organised by BMC for railway passengers
- Providing facilities at railway station to ward office for provision of emergency food and water to passengers
- Monitoring level of water on the railway tracks
- Co-ordinating with engineering branch staff posted at the flood prone locations at railway tracks
- Co-ordination with ward officer regarding passenger data and alternate transport

**In case of railway accidents:**

- Rescue and evacuation
- Shifting of injured to hospitals
- Co-ordination with railway hospitals, BMC hospitals and government hospitals
- Provide information on alternate travel arrangements for outstation passengers
- Communicate to Railway control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**ix Responsibilities of Assistant Traffic Superintendent, Bus Depot**

The BEST Assistant Traffic Superintendent in co-ordination with the Ward Officer will be responsible for the following field activities:

- Keep standby buses in readiness for deployment
- Co-ordination with Railway Station Master and Divisional Police Inspector (Traffic) for information regarding traffic movement and passenger data
- Co-ordinate with MSRTC for transport arrangements of stranded passengers
- Deployment of additional buses along certain routes to clear passenger traffic
- Diversion of routes if and when necessary
- Providing information to the public at bus depots regarding the cancellation, re-routing, delays of buses, temporary shelter locations of BMC and the measures being undertaken.
- Communicate to BEST control room details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**x Responsibilities of BSES Station Engineer**

The BSES station engineer in co-ordination with the Ward Officer will be responsible for the following field activities:

- Cutting off power supply if necessary
- Restoration of power supply
- Keeping emergency gangs in readiness for repair work
- Attending to calls of power breakdowns or short-circuits
- Co-coordinating with fire respective control rooms the details on the fields activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements.
- Alternative arrangements for power supply for lighting
- Illumination of affected area as well as the periphery
- Repairs to damaged power infrastructure

**xi Responsibilities of MTNL Area Manager, Shivaji Park Exchange**

The MTNL Area Manager in co-ordination with the Ward Officer will be responsible for the following field activities:

- Restoration of telephone lines
- Keeping emergency gangs in readiness for repair work
- Repairs to telecommunication infrastructure
- Communicate with Head Office the details on the field activities including deployment and reinforcements of staff and resources and communicate nature of additional requirements

**xii Role of NGOS and Voluntary Organisations:**

The non-governmental organisations and voluntary agencies play an important role in disaster management and provide a strong band of committed volunteers with experience in managing the disasters. Their strength lies in the choice of their manpower, the informality in operations and flexibility in procedures. These organisations enjoy a fair degree of autonomy and hence can respond to changing needs immediately. However, in order to maintain uniformity in operations and effective co-ordination, it is desirable that they follow the standards of services (as given in the Guidelines), information exchange and reporting so as to enable the Ward Officer to have a total picture of resource availability, disbursements and requirements. NGOs therefore will be assigned specific tasks by the Ward Officer to undertake relief work within the overall institutional framework. As and where possible, NGOs may also be able to improve the quality of delivery of services.

Specific activities in which NGOs/Private Sector can be involved during disaster management operations are:

- Search and rescue operations
- Information dissemination
- First aid
- Disposal of dead
- Damage assessment
- Management of information centre's at temporary shelters
- Mobilization and distribution of relief supplies including finances
- Manpower for community mobilization, crowd control, rumours control, traffic management
- Specialized services (psychiatric and mental health assistance)
- Management of transit camps

The following individuals from varying agencies will be associated with relief and rehabilitation activities. Most of them have the capacity to mobilise required resources and have assisted the administration in the past in managing relief and rehabilitation activities. These include:

- Shri Nilkanth V. Mod
- Shri Mahendra P. Sheth
- Shri Anil K. Parera
- Smt. Pratibha Belwalkar
- Dr. Leela Narde
- Shri Shrikant Panditrao
- Shri Nitin Prabhakar Chaubal
- Shri K. M. Chopra
- Smt. Pallavi P. Deshmukh
- Smt. Jijabai Maghade
- Smt. Sagarbai G. More
- Shri Harish Dinanath Tarkar

Depending on the intensity of the disaster and the quantum of resources required, the following city level agencies will also be approached for assistance through the BMC Control Room.

Agriculture Produce Market Committee

- Bharat Sevashram
- CARE
- CARITAS
- CASA
- Indian Red Cross
- Mahalaxmi Trust
- Nirmala Niketan School of Social Work
- Ramkrishna Mission
- Salvation Army
- SOCLEEN
- Somaiya Trust
- Swami Narayan Trust
- Tata Institute of Social Sciences
- Tata Relief Committee

As a part of general preparedness at community level, the NGOs in the ward will make the communities conscious about the type of hazard that the community faces. Thus local disaster management action plans for hot-spot areas in the context of specific vulnerability would be developed. In addition, Mohalla Committees have been operating at the community level, especially in times of emergencies like house collapses, fires, floods. Such committees have been identified at the ward level.

For areas with high concentration of industries particularly engaged in production, storage and transport of hazardous materials, Mutual Aid and Resource Groups will be set-up.

**c. Ward wise emergency preparedness plan:**

When the disaster situation is localized at ward level and can be managed locally, the ward plan will come into operation. However, a disaster situation may cover the entire city which would call for co-ordination of activities not only at the city level but also at the ward level. The response structure given in the ward plan essentially limits itself to micro-level intervention. When more than one ward are affected, BMC control room which is the co-ordinating authority, would expect the ward officers to co-ordinate the activities at the ward level with the line agencies such as Fire Brigade, Police etc. The responsibilities for all the ward level functionaries have been identified.

**Table 6.6 Key officials for ward response plan**

| **Service** | **Designation** |
|---|---|
| EOC | EOC In-charge |
| BMC | Mayor |
| BMC | Municipal Commissioner |
| BMC Control Room | In-charge Control Room |
| Ward office | 'F-South' Ward Officer |
| Police (Law and Order) | DCP |
| Police (Traffic) | Divisional Police Inspector |

| Service | Designation |
|---|---|
| Fire Brigade | Station Officers, Shivaji Park Fire Brigade |
| Railways | Station Masters of Dadar |
| BEST (Transport) | Assistant Traffic Superintendents of Dadar Depot. |
| Hospitals | Medical Officer casualty ward |
| MTNL | Area Manager, Dadar Exchange |
| BSES | Station Engineer, Dadar receiving station |
| Revenue, GOM | Officer designated by Collector, Mumbai Suburban District |

**i. Responsibilities of 'F-South' Ward Officer**

On the receipt of warning or occurrence of the disaster, the 'F-South' Ward Officer is in preparedness by undertaking the following:

Establish a Ward Control Room with the following:

- Direct telephone contact with BMC Control Room
- A supervisor of the rank of S.E. / J.E to be in-charge of control room
- Labourers from conservancy staff to be kept in readiness for undertaking any emergency work
- Required equipments such as:
    - Digging Tools
    - Choke Clearing Equipments
    - Ropes
    - Tree-Cutting Saws
    - Portable Search Lights
    - Batteries
    - Megaphones
    - Gas Cutters
    - J.C.B.
    - Poclain
    - Beam Cutters
    - Generators

The ward officer will act as Site Officer responsible for co-ordination of field activities of various line departments. The ward officer will also be responsible for providing support to line agencies so as to enable them to operate efficiently. As the Site Officer, he would be in constant touch with BMC Control Room and the field officers from

Police (Law and Order) : DCP
Police (Traffic) : Divisional Police Inspectors
Fire Brigade : Station Officers, Shivaji Park Fire Brigade
Railways : Station Masters of Dadar
BEST (Transport) : Assistant Traffic Superintendents of Dadar Depot
Hospitals : Medical Officer Casualty ward
MTNL : Area Manager, Dadar Exchange
BSES : Station Engineer, Dadar receiving station
Revenue, GOM : Officer designated by Collector, Mumbai Suburban District

The ward officer should ensure that all BMC officers on disaster duty use the official shoulder bands with BMC emblem for easy identification.

The ward officer will provide all information as given in the ward plan to the field officers of the line departments. The ward officer is directly responsible for the execution of the following tasks through BMC staff:

- Rescue Operations during House and Commercial complex Collapses in Co – Ordination with Fire Brigade in Co-Ordination with Fire Brigade.
- Ensure Transport Of Injured To Hospitals On Priority
- Transport of Dead to the Hospitals/Corpse Disposal
- Anti-Flooding Operations
- Clearing Of Debris
- Salvage Operations
- Clearing Of Uprooted Trees
- Repairs to Damaged Roads, Water Supply and Drainage

**The ward officer will provide and co-ordinate arrangements for**

- Transportation/shifting of stranded or affected persons through BMC vehicles, private vehicles and MSRTC buses
- Temporary shelters with emergency food and water
- Issue of passes and identification stickers for vehicles on relief duty
- Issue of passes and identity cards to relief personnel including the persons from NGOs setting-up of Information Centre at the site
- [Requisitioning of private transport vehicles, temporary shelters can be done through the Collect orate]

**The ward officer will ensure through the Medical Officer (Health)**

- Preventive medicine and anti-epidemic actions
- Providing special information required regarding precautions for epidemics
- Supervision of food, water supplies, sanitation and disposal of waste
- Damage assessment will be carried out as per the pro forma
- The ward officer will enlist the support of NGOs and private sector for response operations. The NGOs active in the ward along with their expected role is given in the Annexure
- The ward officer will report to BMC Control Room on the field activities including deployment and reinforcements of staff and resources and communicate additional requirements

**Conclusion**

M/s. The Bombay Dyeing & Mfg. Co. Ltd. will periodically review and update the Disaster Management Plan and will take the initiative to institutionalize the relationship between all Emergency Security and Rescue Forces (e.g. Police, Municipality, Fire Brigade, Medi-Care Centres etc.)

## 6.3 REHABILITATION ACTION PLAN:

- The project site has mill workers chawls and residences. Presently 648 households of mill workers are residing at the site
- Chawl will be demolished and the tenants will be accommodated on rental basis in the vicinity.

- The construction work for proposed portion has been reckoned in a single phase and shall be completed within approximately 4.5 years. With the completion of these buildings all the existing tenements will be relocated in their premises.

## 6.4 DEMOLITION PLAN FOR EXISTING STRUCTURES :

**M/s. The Bombay Dyeing & Mfg. Co. Ltd.** will develop the entire area as a residential development. Most of the structures are with load bearing walls with wooden members, iron grills, Doors, Mangalore tiles for roofing, etc. Following methodology shall be used for dismantling.

- The Transport vehicles deployed shall be complying with applicable laws and meeting relevant standards for fuel and emission as per National Auto Fuel Policy of India. It is further ensure that the Transport vehicles comply with all applicable traffic regulations.
- Noise Levels during demolition activities shall be restricted within the M.P.C.B's permissible norms.
- Adequate measures shall be taken to prevent any earth, sand, cement, concrete, debris or any other material to fall or be washed into the drain from any stockpile thereof.
- All waste should be stored and removed for disposal quickly.
- All waste water generated at the construction site must be properly disposed.
- There shall not be any nuisance to the adjacent residents, due to this demolition.
- The electric/water connection shall be got disconnected from the authority concerned prior to start of actual demolition work.
- Water for dust suppression purposes and Electricity for night time illumination shall be arranged.
- Clear and unobstructed approach to the project site and maintenance of the same throughout the project duration through site entrance gate(s).
- Portable toilets shall be provided by the Contractor for use by his workers only.
- Provisions of a 24/7 security guard at the entrance to the site.
- A truck loading area shall be created at the earliest opportunity within the demolition area to allow demolition materials to be removed

## 6.5 NATURAL RESOURCE CONSERVATION: (TOR Point No. 39)

Building materials choices are important in sustainable design because of the extensive network of extraction, processing and transportation steps required to process them. Activities to create building materials pollute the air and water, destroy natural habitats and deplete natural resources.
When new materials are used in buildings, it is important to consider different sources. Salvaged materials can substitute for new materials, save on material costs and perhaps add character to the building. Recycled content materials reuse waste products that would otherwise be deposited in landfills. The use of local materials supports the local economy and reduces the impacts of transportation. Use of the building materials and products that are extracted and manufactured within the region, shall be done in this project thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

The conservation material & resources strategy will be achieved through the following:

- Reducing and Reusing of Waste
- Using recycled material in construction
- Use of Regional Material in construction

# CHAPTER 7
# PROJECT BENEFITS

This chapter includes benefits accruing to the locality, neighborhood, region and nation as a whole. The foremost befits are listed as follows;

| | |
|---|---|
| **A** | **SOCIO ECONOMY** |
| 1 | The proposed scheme is good because instead of resettlement of mill workers to another location it is better to upgrade their tenements by providing them with bigger and better housing facility. |
| 2 | The proposed scheme will provide new, bigger and better housing structures with appropriate amenities, adequate sanitation facilities as well as fire fighting and safety measures to the mill workers. |
| 3 | There would be growth in indirect jobs and business opportunities to the local and nearby people such as contractors, transporters and raw material suppliers etc. due to the proposed development in the area. |
| 4 | Improvement in safety, security and fire-fighting facility |
| **B** | **TREE PLANTATION AND LANDSCAPING** |
| 1 | Landscaping shall reduce energy use by reducing heat island effect |
| 2 | Pleasing aesthetic and visual impact |
| 3 | Provide tolerance to air pollutants like RSPM, $SO_2$, $NO_x$ and CO |
| 4 | Trees act as natural noise buffers |
| **C** | **WATER SAVING AND WASTE WATER MANAGEMENT** |
| 1 | Minimizing water consumption in construction phase by utilizing treated sewage for construction purpose thereby avoiding the wastage of fresh water |
| 2 | By using various water saving practices like use of water efficient plumbing fixtures, dual flushing cisterns etc. and use of rainwater for domestic purpose bringing down the per capita water consumption compared to the present use |
| 3 | By using treated sewage for flushing, gardening within project site and excess treated sewage shall be temporary used for further construction in project site thereafter shall be used for DP R.G. reservation and excess shall be disposed to sewer line. |
| 4 | Reducing storm water runoff by collecting the rain water from terraces and reducing the load on city storm water drains. |
| **D** | **ENERGY SAVING** |
| 1 | Use of non conventional solar energy by using solar panels |
| 2 | Various energy saving measures shall ensure for saving energy |
| **E** | **SOLIDANDHAZARDOUSWASTEMANAGEMENT** |
| 1 | All necessary precautions will be taken to prevent nuisance and hazards from the solid waste, hazardous waste, E waste during construction phase and subsequently after commissioning of the project. In order to achieve this, Debris and Construction Waste Management, Municipal Solid Waste Management and Hazardous Waste Management shall be practiced |
| 2 | Waste Minimization, reuse/ recycling and treatment of biodegradable garbage and its use as manure shall ensure handover of only the non recyclable garbage to the local authorities thereby reducing the load on dumping grounds of MCGM. |
| **F** | **ENVIRONMENTAL MONITORING & ENVIRONMENTAL MANAGEMENT PLAN** |
| 1 | Environmental monitoring is being carried out regularly and shall be ensured in proposed development as well thereby ensuring the baseline quality, implementation of mitigation measures and control of environmental pollution |
| 2 | Environmental Management Plan and its judicious implementation with operation and maintenance of environmental facilities and proper budgetary allocations for the same will ensure a long term benefits to the project and surrounding areas. |

# CHAPTER 8

# ENVIRONMENTAL MANAGEMENT PLAN

## 8.0 INTRODUCTION:

Environmental Management Plan (EMP) deals with evaluation of significance of unavoidable or residual impacts following mitigation and the proposed monitoring.

## 8.1 OVER VIEW:

The Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the project and take appropriate actions to properly manage that risk. EMP also ensures the project implementation is carried out in accordance with the design by taking appropriate mitigative actions to reduce adverse environmental impacts during its life cycle. The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required. Also, the plan outlines roles and responsibility of the key personnel and contractors who are charged with the responsibility to manage the site.

## 8.2 ENVIRONMENT MANAGEMENT SYSTEMS:

The following components will be part of the EMS:

- Environmental Policy
- Objectives & Targets
- Structure and Responsibility
- Emergency Planning
- Environmental Monitoring Program
- Operation and Maintenance of Environmental Management Facilities like STP, Rain water harvesting, Solar Systems, other energy saving measures, landscape development, Solid waste management system
- Non-conformance & Corrective and Preventive Action
- Short term and long term budgetary provisions for the EMP
- Submission of six monthly report to Regional office, MoEF for compliance of conditions in Environmental Clearance

## 8.3 ENVIRONMENT MANAGEMENT PLAN: (TOR Point No. (41)- b)

### 8.3.1 LANDSCAPE & ECOLOGY MANAGEMENT:

Proper management of landscape and the ecology of the site would be vital to give a pleasing aesthetic and visual impact both for residents while at the same time minimizing negative impacts on the land and ecological environment. By employing good general landscaping practices **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** will be able to increase the ecological value of the site landscape while reducing energy use (by reducing heat island effect).

The efforts should be taken to minimize or eliminate the use of harmful pesticides, minimize the use of potable water, and decrease storm water runoff.

Through good landscaping **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** should complement natural ecosystems, preserve the inherent beauty and functionality of the site, maintain and enhance natural water flows, help building occupants appreciate nature, and educate visitors about the value of responsible landscape management.

Most of the activities that need to be managed to mitigate adverse impacts to the land and ecological environment will have to be planned and carried out during the construction phase of the project and sufficient arrangements have to be put in place to ensure that the EMPs in this section is implemented by the Contractors who will be entrusted with carrying out such activities.

The following EMPs for land environment should be implemented by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.**

**Enhancement of the area:**
The total look of the area shall be changed by carefully planned landscaping and planning of the buildings shall minimize storm water runoff, protect open spaces, ventilation and save energy by using solar energy by providing solar panels.

**Plantations & Greenbelts:**
New plantations will be done in this corridor for proper landscaping. Selecting trees, which support bird habitat, will result in increase of the bird-life in the area. Lawns, benches, Café Spaces, Planters with seat, Meditation seat and other urban design features may be installed in this zone with sufficient care – for example, lights should not be of very high intensity.

Plantations and greenbelts can play an important role not only in enhancing the landscape of the project, but also in attenuating pollution impacts. Plantations and greenbelts can be planned on ground & podium level.

Appropriate plant section for the planned plantations within site will be a key to it's sustainability in the long run – it would ensure that there is a balance in the new urban ecosystem being created and at the same time help in avoiding expensive and time- consuming problems later on. Along with the use of Native Plants, plant growth rate, size at maturity, life span, brittleness, and requirements for light, water, soil pH, plant colour, texture, scent, and seasonal characteristics should be considered in selecting plants. The following will be kept in mind while plantation planning:

- The selection and sitting of trees, shrubs, and groundcovers to provide shade and lower ambient air temperature can reduce air conditioning energy use.
- Some species can grow relatively faster and provide tolerance to air pollutants like RSPM, $SO_2$, NOx and CO.
- The use of native plants can reduce maintenance demands.
- Selection of plant materials for low water consumption can contribute significantly to an environmentally responsible landscape.

***Details for varieties of tree plantation are given in section 4.2.5 of chapter 4.***
***Landscape Plan is enclosed as Enclosure 4.***

### 8.3.2 AIR QUALITY MANAGEMENT:

The construction activity would cause emission of particulate matter that not only would adversely affect the surrounding habitation but would also have the potential to cause health impacts to the laborers. Therefore, it is recommended that **M/s. The Bombay Dyeing & Mfg. Co. Ltd**. takes up a proactive

approach on management of air emissions from various activities of the project. In this regard, it should be emphasized that a preventative approach must be adopted. The basic approach to mitigate air pollution impacts can be summarized as below:

**A. Dust Control:**

- Water shall be sprayed / sprinkled to prevent the scattering and propagation of dust in the surrounding area and within the site during construction activities. Wet jute or polythene sheets may also be used to cover the area so that the dust gets captured in it.
- Raw material storage site shall be enclosed on the three sides with plastic cover and water shall be applied at least 80% of the surface areas of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust
- All vehicles used for carrying raw materials shall be covered properly during transportation and dumping of raw materials. Also the vehicles shall be running at controlled speed so that the earth and dust does not get spread out.

**B. Emission Management:**

The following measures will be taken for the avoidance of nuisance and exhaust emission

- All equipments and machineries used during the construction period shall not violate exhaust emission (permissible limit) from its exhaust.
- The engines and exhaust system of all machineries shall be maintained so that exhaust emission do not exceed permissible limit.
- The exhaust of other equipments used for construction (e.g. generators) shall be placed at such location and height to ensure dispersal of exhaust emission.
- There shall not be burning of any waste material generated during the construction period within the site.
- The DG sets to be installed to provide power backup will adhere to the emission standards specified by Minimal National Standards (MINAS) and stack designed for DG set exhaust will fulfill the minimum stack height criteria. The emissions will be tested at regular intervals as proposed in the monitoring plan to detect exceedance, if any, and take necessary corrective action.
- Tree plantation to absorb dust and gaseous emissions and to keep the air clean.

### 8.3.3 NOISE LEVEL MANAGEMENT:

- The construction activities may affect the prevailing ambient noise levels in the area and may have an adverse impact on the surrounding habitations and also has the potential to cause health impacts to the laborers. Properly designed control systems can significantly reduce impacts of noise pollution from the machineries. The basic approach to mitigate noise emission impacts can be summarized as below:
- Noise enclosures will be built for DG sets providing sufficient insertion loss and temporary noise barriers may be constructed around high noise equipment during construction phase.
- Activities generating high noise like pile installation should not be done simultaneously and should be restricted only at day time to minimize the impact in nearby areas of the project site.
- Such vehicles and machineries will be used whose noise emissions are within the permissible limit.
- Any vehicle and machineries, which are found to emit excessive noise due to faulty silencer, broken or ill-fitting engine or other reasons, will immediately be taken out of service and be adequately serviced, repaired or replaced.
- Workers employed in high noise areas will be rotated. Earplug/ muffs, or other hearing protective wear will be provided to those working very close to the noise generating machinery.

### 8.3.4 WATER RESOURCES AND WASTEWATER MANAGEMENT:

**M/s. The Bombay Dyeing & Mfg. Co. Ltd.** is looking forward to meet its potable water needs through supply provided by MCGM. This section of the EMP will recommend a combination of good management practices and feasible treatment options to ensure judicious utilization of available water resources and reduction of any additional pollution load to the water environment that might result from the project.

**Prevention and Control of Water Pollution during Construction**

- Avoiding any excavation or earth work during monsoon season or rainy periods
- Wastewater generated will be disposed to existing sewer line.

**Storm Water Management**

Storm water drainage system with adequate capacity shall be laid down. Proper maintenance of storm water drainage shall be done.

Storm water on site will be harvested for ground water recharge, thus proper management of this resource is must to ensure that it is free of contamination. Contamination of storm water is possible from the following sources:

- Diesel and oil spills from the Diesel Power Generator
- Waste spills in the Solid/ hazardous waste storage area
- Oil spills and leaks in vehicle parking lots
- Silt from soil erosion in gardens
- Spillage of sludge from sludge drying area of sewage treatment plants.

A detailed **Rainwater Harvesting and Storm Water Management Plan** is being developed by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** considering all the available sources and would be implemented for the site.

The plan will incorporate best management practices which will include following:

- Regular inspection and cleaning of storm water drains.
- Provision of silt traps in storm water drains
- Oil filters shall be installed in all the parking areas.
- Ensuring adequate cover for all waste storage areas.
- Avoid application of inorganic pesticides and herbicides before wet season

**Minimizing Water Consumption**

Water consumption within the project will be minimized by a combination of water saving devices and other domestic water conservation measures. Furthermore, to ensure ongoing water conservation, an awareness program me will be introduced for all residents. Following section discusses the specific measures, which shall be implemented:

- Use of water efficient plumbing fixtures. Water efficient plumbing fixtures use less water with no marked reduction in quality and service.
- Provisions for leak detection and repair techniques
- Sweep with a broom and pan where possible, rather than hose down for external areas

**Wastewater Treatment**

Sewage generation from the project will be treated in full-fledged Sewage Treatment Plant of adequate capacities. Treated sewage generated will be reused for secondary requirements like gardening and flushing. After commissioning of 1$^{st}$ STPs the excess treated sewage shall be used for construction purpose. This will ensure

- Water conservation by minimizing requirement of fresh water from MCGM
- Avoiding water pollution by treatment of sewage up to tertiary level

### 8.3.5 SOCIO ECONOMIC ENVIRONMENT:

In order to mitigate the adverse impacts likely to arise in the surrounding area due to project activity, it is necessary to formulate an effective mitigation plan. The suggestions are as follows:

- Preference should be given to local people on the basis of their experience during post employment opportunities
- Provision of First aid and medical facilities available on project site for construction labourers
- Provision of mask to workers that can prevent inhalation of dust
- Water sprinkled to suppress dust during construction phase to control air pollution and thereby avoid adverse health impact
- Proper living condition with appropriate facilities for residential labors should be provided

### 8.3.6 SOLID AND HAZARDOUS WASTE MANAGEMENT:

All necessary precautions will be taken by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** to prevent nuisance and hazards from the solid waste, hazardous waste, E waste and subsequently after commissioning of the project. In order to achieve this, following measures will be taken.

- **Debris/Construction Waste Management:**
  Debris from demolition of previous structures and construction debris shall be recycled as much as possible and remaining excavated soil shall be disposed off to land filling sites or may used to fill the low lying areas after taking prior permission from MCGM or disposed off as per MCGM norms.

- **Municipal Solid Waste Management**
  During construction phase there will be segregation of garbage and the garbage shall be handed over to MCGM.
  During operation phase there will be provision for segregation and collection of biodegradable & non-biodegradable waste within the premises. Biodegradable waste will be treated in Organic Waste Converters and the non-biodegradable waste will be further segregated into recyclable and non-recyclable waste. Recyclable waste shall be handed over to recyclers and non-recyclable waste shall be handed over to M.C.G.M. Dried sludge from STP will be used as manure.

- **Hazardous Waste Management:**
  Hazardous waste (Household) generated shall be stored separately on raised platform in sealed and labeled containers and disposed off to the Common Hazardous Wastes Management sites.

### 8.3.7 ENERGY MANAGEMENT:

The energy management plans will be developed through a process whereby the various disciplines involved in design architects, mechanical engineers, electrical engineers, interior design professional, etc. will work together to come up with design solutions that maximize performance, energy conservation, and environmental benefits. The various energy saving measures are mentioned in section 4.2.4 of Chapter – 4.

### 8.3.8 HEALTH AND SAFETY MANAGEMENT:

Management of Health and Safety should be a prime concern for **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** especially during the construction phase. Adequate operational procedures and method statements should be built into the EMS so that the safety of workers on site and the surrounding population is ensured at all times.

- The workers posted on or near noisy machineries and those undertaking construction work in noisy areas should be provided with earplugs and muffs that can bring down noise exposure levels by 15 – 20 dB (A).
- Proper training and awareness programs should also be carried out so that these workers understand the importance of wearing the PPE's. Workers working in dust prone areas like material handling should be provided with mask's that can prevent inhalation of dust.
- The movement of heavy equipment within and outside the project site should be done with proper precaution to prevent any accidents on road.
- The occupational risk of the workers should be minimized by incorporating proper safety measures and procedures in the work practices. Proper signage should be installed at haul roads and the roads outside the project site where local people co-use the roads to warn them of dangers caused by such vehicles/equipments.
- The workers handling the hazardous chemicals and waste during the construction and operation phase or participating in spill cleanup should be provided with gloves and mask's that can prevent inhalation of contaminants. Proper training and awareness programs should also be carried out so that these workers understand the importance of wearing the PPE's.
- The health centre to be built in the premises of the project should have adequate emergency.

### 8.3.9 EMERGENCY MANAGEMENT:

The EMS will have a component that would focus on emergency preparedness and management. The main emergencies that may come up in the project may be because of an accidental fire.

There is also small probability of an earthquake and the protection of buildings from the same would be taken care of through the building design. Necessary IS specification in this regard should be complied with in this regard.

Fire protection systems shall be envisaged for the building premises considering the building height and necessary provisions shall be done for firefighting as per IS codes, National Building Code and as per regulations of Chief Fire Officer of MCGM's Firefighting Department.

Emergency prevention through good design, operation, maintenance and inspection are aimed in this project to reduce the probability of occurrence and consequential effect of such eventualities. The Emergency Response Plan (ERP) shall be practiced to make use of the combined resources at the site and outside services to achieve the following:-

- Localize the emergency
- Minimize effects on property and people
- Effective rescue and medical treatment
- Evacuation

### 8.3.10 BUDGETARY ALLOCATION FOR EMP:

Table 8.1 & 8.2 gives the expenditure to be incurred by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** on environmental matters during construction and operational phase.

**Table 8.1: Expenditure on Environmental Matters during Construction Phase**

| Sr. No. | Component | Description | Total Cost (Rs. In Lacs) |
|---|---|---|---|
| 1 | Air Environment | Water for Dust Suppression | 24.30 |
| | | Ambient air quality Monitoring | 2.70 |
| 2 | Water Environment | Water Tanker for construction | 38.88 |
| | | Drinking Water Analysis | 0.81 |
| 3 | Land Environment | Site Sanitation | 5.00 |
| 4 | Biological Environment | Gardening | 17.68 |
| 5 | Health & Hygiene Environment | Disinfection – Pest control | 5.40 |
| | | First aid facilities | 0.12 |
| | | Health Check up of workers | 135.00 |
| | | Personal protective equipment | 12.50 |
| 6 | EMP for batching plant | | 2.08 |
| | **Total Cost** | | **244.47** |

**Table 8. 2: Expenditure on Environmental Matters during Operation Phase**

| Sr. No. | Component | | Description | Capital cost Rs. In lacs. | Operational and Maintenance cost (Rs. in lacs/yr) |
|---|---|---|---|---|---|
| 1 | Air Environment | | Gardening | 159.16 | 28.30 |
| | | | Ambient Air quality & Noise Level | -- | 0.60 |
| | | | Exhaust from DG Set | -- | 0.42 |
| 2 | Water Environment | Waste water treatment | STP cost of (5 STP of capacity 103 KL, 225 KL, 190 KL, 125 KL & 210 KL) | 160.65 | 65.23 |
| | | Waste water monitoring | -- | -- | 36.50 |
| | | Rain Water Harvesting monitoring | RWH Tanks | 31.90 | 1.60 |
| | | | Rain Water harvesting monitoring | -- | 5.40 |
| 3 | Land Environment (Solid Waste Management) | | Cost for Treatment of biodegradable garbage in OWC | 27.00 | 8.96 |
| | | | OWC manure | -- | 0.60 |
| 4 | Energy Conservation | | Solar lights | 15.00 | 0.30 |
| | | | Solar water Heaters | 227.35 | 4.55 |
| 6 | Other maintenance cost | | Other maintenance cost (For SWM, Water tanks, DG etc.) | -- | 15.92 |
| | | | **Total Cost** | **621.06** | **168.38** |

**Quantum and generation of Corpus fund:**
Project proponent shall operate and maintain EMF for proposed development for 3 years after giving possession and shall also generate corpus fund during 3 years for O & M of Rs. 505.14 lacs (i.e. 168.38 lacs x years ).

**Responsibility for further O &M:**
Corpus fund shall be handed over to the Society. While handing over Environmental Management Facilities M.O.U. shall be made with society to accept responsibility of further O & M of EMF.

## 8.4 ORGANISATIONAL STRUCTURE & RESPONSIBILITY:

In addition to regular operational roles & responsibilities defined for the **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** team, all personnel directly or indirectly have a role to play towards effective environment management of the project. The entire project team will co-operate with government agencies and other stakeholders who may have environmental concerns with the project.

Various key personnel to be involved in environmental management of the project have been shown in a hierarchical manner in the following organogram. The organogram also shows the flow of authority and communication on various aspects related to environment management for the proposed project.

The major duties and responsibilities of **Environmental Management Cell** shall be as given below:

- To implement the environmental management plan,
- To assure regulatory compliance with all relevant rules and regulations,
- To ensure regular operation and maintenance of pollution control devices,
- To minimize environmental impacts of operations as by strict adherence to the EMP,
- To initiate environmental monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference.
- Maintain environmental related records.
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- Maintain of log of public complaints and the action taken.

## 8.5 RECORD KEEPING:

Record keeping and reporting of performance is an important management tool for ensuring sustainable operation of the proposed project. Records should be maintained for regulatory, monitoring and operational issues. Typical record keeping requirements is summarized in **Table 8.3**

**Table 8.3: Record Keeping Requirements**

| Parameter | Particulars |
|---|---|
| Air emissions | • Random checks of equipment logs/ manuals to check equipments/ vehicles are operated within specified parameters<br>• Vehicle logs to minimize vehicle trips |

| Parameter | Particulars |
|---|---|
| Noise | • Noise reading<br>• Working hour records to minimize night shift<br>• Maintenance records of vehicles to minimize noise from vehicles<br>• Site working practices records and noise reading implement good working practices<br>• Random checks of equipment logs/ manuals to check equipments operated within specified design parameters |
| Solid Waste Handling and Disposal | • Daily quantity of waste generated<br>• Daily quantity treated and recycled<br>• Daily quantity sent outside for disposal<br>• Comprehensive Waste Management Plan in place and available for inspection on-site. |
| E waste /Hazardous Wastes | • Quantity of waste generated<br>• Quantity of wastes sent out for treatment/disposal.<br>• Waste manifests as per regulations |
| Wastewater Discharge | • Daily quantity of raw and treated sewage<br>• Treated wastewater quality |
| Drainage | • Visual inspection of drainage and records thereof |
| Regulatory Licenses (Environmental) | • Environmental Permits / Consents from MPCB / High-rise clearance from Maharashtra State, /Post clearance submissions to Regional office of MoEF etc.<br>• Copy of Waste manifests as per requirement |
| Monitoring and Survey | • Records of all monitoring carried out as per the finalized monitoring protocol. |
| Accident reporting | • Date and time of the accident if any mainly during construction phase<br>• Sequence of events leading to accident<br>• Emergency measure taken<br>• Step to prevent recurrence of such events<br>• Mock drills |
| Others | • Log book of compliance<br>• Environmental, health and safety records for the employees during construction phase<br>• Vehicle maintenance and inspection records |

## 8.6 TRAINING AND CAPACITY BUILDING:

Training and human resource development is an important link to achieve sustainable operation of the facility and environmental management. For successful functioning of the project, relevant EMP's should be communicated to the following groups of people:

**Residents/occupants and Contractors*:*** All residents/occupants must be made aware of the importance of waste segregation and disposal, water and energy conservation. This awareness can be provided through leaflets and periodic society meetings. They should be informed of their responsibilities for successful operation of various environmental and energy management schemes inside the premises.

**Site Staff:** Relevant personnel at site must be trained for the following:

- Techniques for waste minimization, water conservation and energy conservation
- Collection, transport, treatment and disposal solid and hazardous/E waste
- Operation and maintenance of Sewage Treatment Plant and reclamation system
- Requirements of the Disaster Management Plan in case of an emergency.
- Applicable environmental, health and safety regulations and compliance requirements for the same.
- Functioning of the Environmental Management System including environmental monitoring, reporting and documentation needs.

# CHAPTER 9

# SUMMARY AND CONCLUSIONS

## 9.0 INTRODUCTION

The proposed project site is located at G. D. Ambekar Marg, Wadala, Mumbai, Maharashtra. Earlier there was Spinning & Weaving Mill on the project site. The site is within the limits of Municipal Corporation Greater Mumbai. The region has mixed land use pattern comprising of residential and commercial development. This project has received prior Environmental Clearance (EC), details are as follows:

**From MoEF: 21st March 2006 and Corrigendum dated 29th March 2006**
**From SEIAA, Maharashtra: 07th December, 2011 Corrigendum dated 18th February 2013**

As there are certain amendments, reapplication for revised EC has been made to State Environment Expert Appraisal Committee - 2 (SEAC - 2), Maharashtra on dated 04.10.14. For the finalization of the draft TOR presentation has been done to SEAC 2, Maharashtra in the 5th meeting dated 16th November 2012.

The EIA Report addresses the environmental impacts of the project and proposes the mitigation measures for the same. The EIA Report is prepared based on the model Terms of References (TOR) given in Environmental Impact Assessment Guidance Manual for building construction, townships and area development projects by Ministry of Environment & Forests (MOEF) and the project specific TOR given by SEAC-2 Maharashtra in November, 2012.

## 9.1 PROJECT DESCRIPTION

### i) Location and Settings:

The proposed project site is located in Dadar (East), Naigaon division at Latitude 18°55'6.587"N to 19°6'6.023"N and longitude 72°45'26.937"E to 72°56'30.665"E. Total area of the plot is approx. 1,83,663.18 Sq mt.

The site is surrounded by the following:

- East: Open ground (Agri Maidan)
- West: Road (G.D. Ambekar Marg)
- North: Road (Road No. 26 - MMG Sangrahalaya Marg)
- South: Residential

The nearest railway station is Wadala on Harbour Railway line of Mumbai.

| Bldg no. | Completed level |
|---|---|
| **Sale Buildings** | |
| 1 ICC (Formally known as Tower A) | Excavation done (No construction done) |
| 2 ICC (Formally known as Tower B) | Excavation done (No construction done) |

Total constructed area (FSI+ Non FSI) till date: 77586.68 Sq. mt.

- The construction period for proposed project is approximately 4.5 years.

**iii) Project Proposal:** The comparison of area statement is as follows:

**Table 9.1: Comparative Statement: Area Statement of the Project**

| No. | Description | Area in Sq. mt. | |
|---|---|---|---|
| | | As per EC received | Amendment in EC |
| 1 | Total Plot Area | 183663.18 | 183663.18 |
| 2 | Deductions | 55262.14 | 69934.23 |
| 3 | Net Plot Area | 128401.04 | 113728.95 |
| 4 | Ground coverage area (18.15 %) | 27155.20 | 20636.88 |
| 5 | RG area | 14171.73 | 32153.81 |
| 6 | Built up area as per FSI (Including Fungible FSI) | 196129.58 | 166766.85 |
| 7 | Total Construction Built – up area | 465273.36 | 353818.99 |

**Table 9.2: Comparative Statement: Project proposal**

| S. N. | Building configuration | |
|---|---|---|
| | As per EC received | Amendment in EC |
| **A** | **Completed Building (As per EC received in the year 2006)** | |
| **1** | **1 Bldg with 2 wings:**<br>**Wing A**: S + 41 flrs<br>**Wing B**: 3 Basements + 2 Parking flrs.<br>**Flats nos**.: 161 | **1 Bldg with 2 wings:**<br>**Wing A:** Stilt + 41 floors<br>**Wing B:** 3 Basements + 2 Parking floors<br>Flats nos.: 161 Nos. |
| **B** | **Proposal for Amendment (EC received in the year 2011 & Corrigendum in the year 2013)** | |
| **1** | **Rehabilitation** | |
| 1.1 | **Wing A & B:**<br>Basement + Stilt + 19 flrs<br>**Flats nos**.: 648 | **Building A:** Basement + Stilt + 22 floors<br>Flats: 296 nos.<br>**Building B:** Basement + Stilt + 19 floors<br>Flats Nos.: 352 Nos |
| **2** | **Sale:** | |
| 2.1 | **Tower A:**<br>2 Basements + Ground + 3 Parking flrs. + Club house + 66 flrs.<br>**Flats nos**. : 247 | **ONE ISLAND CITY CENTRE[ICC]**<br>**(Formally known as Tower A):**<br>3 Basements + Ground + podium + 1st to 53rd floors.<br>**Flats:** 193 Nos. |
| 2.2 | **Tower B: 1 bldg with 3 wings:**<br>3Basements + Gr. + 7 parking flrs. + Club house + 25 flrs. + 26 part flrs.<br>**Flats nos.:** 417<br>**Commercial:** 29594.91 Sq. mt. | **TWO ISLAND CITY CENTRE [ICC]**<br>**(Formally known as Tower B):**<br>3 Basements + Ground + Podium + 1st To 60th floors.<br>Flats: 325 Nos. |

**Parking Statement:**

**Table 9.3: Parking Statement**

| Sr. No. | Phases | Parking Numbers (4W) | | Parking Area in Sq.mt. |
|---|---|---|---|---|
| | | Parking requirement | Parking provision | |
| **A** | **Existing** | **403** | **461** | **14332** |
| **B** | **Proposed** | | | |
| **1** | **Rehabilitation** | | | |
| 1.1 | Rehab - A | 55 | 56 | 1669.48 |
| 1.2 | Rehab - B | 47 | 48 | 800.63 |
| **2** | **Sale** | | | |
| 2.1 | One ICC | 518 | 540 | 45833.52 |
| 2.2 | Two ICC | 813 | 835 | |
| | **Total** | **1836** | **1940** | **62635.63** |

The utilities such as electric supply, water supply and their sources, sewage treatment plants, rain water harvesting, solid waste management, etc. are listed in the following table.

**Table 9.4: Details About Utilities & Environmental Liabilities**

<table>
<tr><th>No.</th><th>Component</th><th>During Construction Phase</th><th>During Operation Phase</th></tr>
<tr><td rowspan="3">1</td><td>Electrical Supply</td><td>Source: TATA power</td><td>Source: TATA power<br>Maximum Demand : 15092 KW</td></tr>
<tr><td>DG sets used during power failure for emergency services</td><td>As per requirement</td><td>D. G. Sets :
<table>
<tr><td>A</td><td>Existing</td><td>1 DG set of 1010 kVA</td></tr>
<tr><td>B</td><td colspan="2">Proposed</td></tr>
<tr><td>1</td><td colspan="2">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Rehab - A</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>1.2</td><td>Rehab – B</td><td>1 DG set of 500 kVA</td></tr>
<tr><td>2</td><td colspan="2">Sale</td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 DG set of 1010 kVA each &<br>1 DG set of 625 kVA</td></tr>
</table></td></tr>
<tr><td>Energy Saving</td><td>--</td><td>Various energy saving measures shall ensure 18 % for ICC One, 13% for ICC Two, 4% for Rehabilitation A and 5 % for Rehabilitation B saving energy.</td></tr>
<tr><td>2</td><td>Water Supply & sources</td><td>For Workers: 32 KLD (From M.C.G.M.)<br>For construction: 30 - 40 KLD. (Depending on construction activity – Excess treated sewage/From water tankers)</td><td>• Fresh Water Supply: 624 KLD (For Domestic: 596 From M.C.G.M. & For Swimming pool: 28 From Tanker of potable quality)<br>• Secondary requirements (flushing & gardening): 485 KLD<br>• Approximately 48.5 % reduction in net water demand in monsoon season and 43.73 % in</td></tr>
</table>

<table>
<tr><th>No.</th><th>Component</th><th>During Construction Phase</th><th>During Operation Phase</th></tr>
<tr><td></td><td></td><td></td><td>non-monsoon season.</td></tr>
<tr><td>3</td><td>Sewage Generation, Collection, Treatment</td><td>Quantity of Sewage generated: 31 KLD<br>Treatment/Disposal: The sewage generated will be disposed to sewer line</td><td>• Sewage generation from the proposed project will be 775 KLD and will be treated in Sewage Treatment Plants.<br>• The treated sewage shall be reused for Flushing -298 KLD, Gardening -187 KLD</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Solid waste Management</td><td colspan="2">Segregation and storages facilities for all solid waste streams</td></tr>
<tr><td>• Municipal Solid waste shall be segregated and handed over to MCGM</td><td>• Municipal Solid waste: Biodegradable waste will be treated in Organic Waste Converters and the non-biodegradable waste will be further segregated into recyclable and non-recyclable waste. Recyclable waste shall be handed over to recyclers and non-recyclable waste shall be handed over to MCGM dried sludge from STP will be used as manure</td></tr>
<tr><td>5</td><td>Rain Water Harvesting system</td><td colspan="2">
<table>
<tr><th>Sr. No.</th><th>Details</th><th>RWH Tank Capacity</th></tr>
<tr><td colspan="3">Proposed</td></tr>
<tr><td>1</td><td colspan="2">Rehabilitation</td></tr>
<tr><td>1.1</td><td>Rehabilitation - A</td><td>1 tank of total capacity 49 KL</td></tr>
<tr><td>1.2</td><td>Rehabilitation - B</td><td>1 tank of total capacity 54 KL</td></tr>
<tr><td>2</td><td colspan="2">Sale</td></tr>
<tr><td>2.1</td><td>One ICC</td><td>1 tank of total capacity 144 KL</td></tr>
<tr><td>2.2</td><td>Two ICC</td><td>1 tank of total capacity 72 KL</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Storm Water Drainage</td><td colspan="2">Adequately designed SWD network within the site to cater the runoff, which shall be connected to municipal drain which has adequate carrying capacity</td></tr>
</table>

## 9.2 DESCRIPTION OF ENVIRONMENT:

### i) Environmental sensitive places in the study Area:

The study included area of 15 km radius around the project site. While for primary data collection for project site and surrounding area approximately 500 mt radius from the site is considered as per the guidelines mentioned in manual for building, construction, townships and area development projects. The status of study area for environmental sensitive places is as follows:

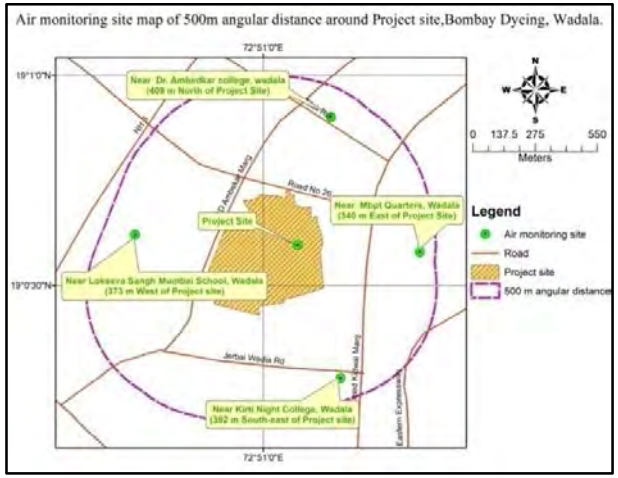
**Table 9.5: Status Of Study Area For Environmental Sensitive Places Within 15 Km**

| Environmental Sensitive Places | Locations | Aerial distance (in km) from Plot boundary |
|---|---|---|
| National Park/Wildlife Sanctuary | Sanjay Gandhi National Park<br>Aarey Colony | 14.70<br>13.70 |
| Tiger Reserve/Elephant Reserve/ Turtle Nesting Ground | Nil | NA |
| Core Zone of Biosphere Reserve | Nil | NA |
| Nature Park/Dense Tree Covers | Maharashtra Nature Park | 4.40 |

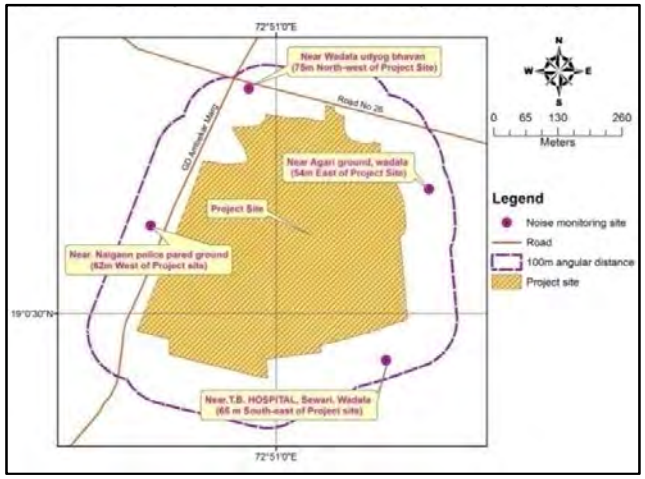
| Environmental Sensitive Places | Locations | Aerial distance (in km) from Plot boundary |
|---|---|---|
| | Jijamata Udyan | 3.35 |
| Habitat for migratory birds | Mahim Bay<br>Mahim Creek<br>Mahul Creek | 2.30<br>4.00<br>3.40 |
| Lakes/Reservoir/Dams | Mahim Bay<br>Chandivali Lake<br>Powai Lake | 2.30<br>12.50<br>13.20 |
| Streams/Rivers | Mithi River | 5.20 |
| Creek/Sea | Arabian Sea<br>Mahim Creek | 3.50<br>4.00 |
| Mangroves | Carter Road Mangroves<br>Sewri Mangroves<br>Mahul Mangroves | 6.45<br>2.00<br>3.61 |
| Mountains/Hills | Nil | NA |
| Notified Archaeological Sites | Bandra Fort<br>Worli Fort<br>Sion Fort<br>Elephanta Caves | 4.70<br>3.80<br>4.20<br>10.00 |
| Any other Archaeological site | Nil | NA |

Baseline information with respect to air quality, noise level, water quality and soil quality in the study area were collected by conducting primary sampling / field studies during November 2012 to January 2013. Baseline status of Land, Biological and Socio-economical environment are also studied by an accredited expert. The characteristics of baseline status of study area with respect to the following environmental attributes were studied.

**Table 9.6: Environmental Attributes**

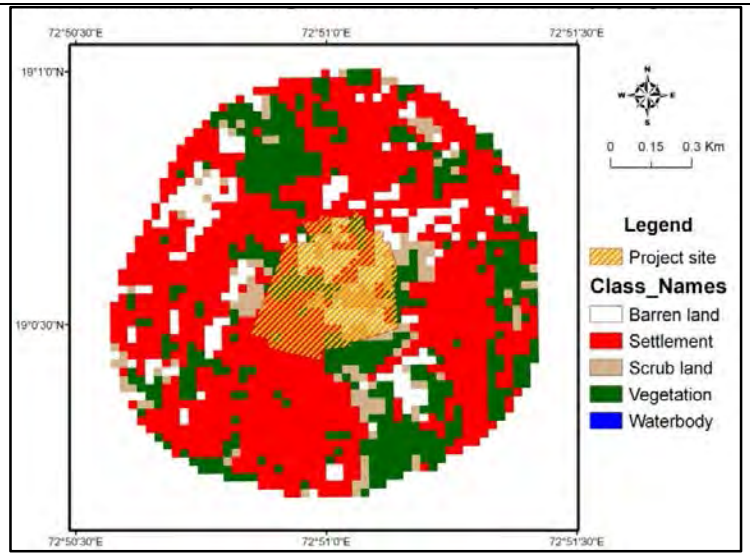
<table>
<tr><th>S. N</th><th>Attributes</th><th colspan="2">Data Collection and Source</th><th>Results/ Major findings and Interpretation of Baseline Data</th></tr>
<tr><th></th><th></th><th>Primary (Upto 500 mt from the boundary of project site)</th><th>Secondary (Upto 15 Km from the boundary of project site)</th><th></th></tr>
<tr><td>1</td><td colspan="4">Air Environment</td></tr>
<tr><td>i</td><td>Ambient air quality</td><td>Sampling Locations:<br>Total 5 locations including project site<br><br>Period:<br>November 2012 to January 2013</td><td>--</td><td>
<table>
<tr><th>Station Code</th><th>AAQM Station</th><th>PM 2.5 (24 hr) (µg/m3)</th><th>PM10 (24hr.) (µg/m3)</th><th>SO2 (24hr.) (µg/m3)</th><th>NOx (24hr) (µg/m3)</th><th>CO (1 hr) (mg/m3)</th></tr>
<tr><th></th><th></th><th>Average</th><th>Average</th><th>Average</th><th>Average</th><th>Averag</th></tr>
<tr><td>AQ1</td><td>Project site</td><td>50</td><td>77</td><td>15</td><td>22</td><td>1.63</td></tr>
<tr><td>AQ2</td><td>Near Kirti Night College, Wadala</td><td>72</td><td>49</td><td>16</td><td>20</td><td>0.98</td></tr>
<tr><td>AQ3</td><td>Near Lokseva Sangh Mumbai School, Wadala</td><td>48</td><td>76</td><td>18</td><td>27</td><td>1.94</td></tr>
<tr><td>AQ4</td><td>Near Dr. Ambedkar College, Wadala</td><td>53</td><td>75</td><td>20</td><td>28</td><td>1.73</td></tr>
<tr><td>AQ5</td><td>Near MBPT Quarters, Wadala</td><td>46</td><td>72</td><td>12</td><td>20</td><td>1.51</td></tr>
</table>


All the parameters were found to be within the desired limits specified d by CPCB
</td></tr>
</table>

<table>
<tr><th>S. N</th><th>Attributes</th><th colspan="2">Data Collection and Source</th><th>Results/ Major findings and Interpretation of Baseline Data</th></tr>
<tr><th></th><th></th><th>Primary (Upto 500 mt from the boundary of project site)</th><th>Secondary (Upto 15 Km from the boundary of project site)</th><th></th></tr>
<tr><td></td><td></td><td></td><td></td><td>except values of $PM_{2.5}$ which is exceeding permissible limits due to vehicular movement in nearby roads.</td></tr>
<tr><td>ii</td><td>Noise Level</td><td>Sampling Locations:<br>Project site and 4 locations around 100 mt. from the boundary of project site</td><td>--</td><td>
<table>
<tr><th rowspan="2">Station Code</th><th rowspan="2">Noise Monitoring Location</th><th rowspan="2">Category of Area/Zone</th><th colspan="2">Equivalent Noise levels in Leq</th></tr>
<tr><th>Day</th><th>Night</th></tr>
<tr><td>N 1</td><td>Project Site</td><td>Residential</td><td>62</td><td>50</td></tr>
<tr><td>N 2</td><td>Near Agari Ground, Wadala</td><td>Residential</td><td>58</td><td>49</td></tr>
<tr><td>N 3</td><td>Near T.B. Hospital, Sewari, Wadala</td><td>Silence</td><td>64</td><td>49</td></tr>
<tr><td>N 4</td><td>Near Naigaon Police Parade Ground, (Police Head Quarters)</td><td>Residential</td><td>62</td><td>47</td></tr>
<tr><td>N5</td><td>Near Wadala Udyog Bhawan</td><td>Commercial</td><td>69</td><td>50</td></tr>
</table>


Comparison of the ambient noise levels with the standards specified by CPCB reveals that the noise level, day time and night time readings of all stations are</td></tr>
</table>

| S. N | Attributes | Data Collection and Source | | Results/ Major findings and Interpretation of Baseline Data |
|---|---|---|---|---|
| | | **Primary (Upto 500 mt from the boundary of project site)** | **Secondary (Upto 15 Km from the boundary of project site)** | |
| | | | | exceeding CPCB standards owing to vehicular movement in nearby roads. Night time noise level readings at monitoring station near Wadala Udyog Bhawan (N5) is complying with above specified CPCB limits. |
| **iii** | **Meteorological Data** | -- | **Source:** Meteorological data from India Meteorological Department (IMD), Mumbai (2012 and 2013) | Meteorological data for one full year of Mumbai (being the nearest base station) have been collected from IMD for year 2012 & 2013. The parameters for which data have been collected are:<br>• Wind speed<br>• Wind direction<br>• Temperature<br>• Relative humidity |
| **2** | **Water Environment** | | | |
| **i** | **Surface water** | No source of surface water was observed | Mahim Bay, Mahim creek, Mahul Creek, Mithi River, Arabian Sea, Chandivali Lake, Powai Lake | Since this is a building construction project no impacts are envisaged on water bodies in the area beyond 500 m radius from project boundary, hence secondary data has not been incorporated. |
| **ii** | **Ground water** | No source of surface water was observed | | -- |
| **3** | **Land Environment** | | | |
| i | **Contour and Drainage Pattern of the site and surroundings** | Contour plan of project site & surrounding Drainage Map of 1KM radius from the project site | | Plot has gradually slopping ground with 3 m level difference from southeast to northwest corners of the plot |
| ii | **Land use** | **GIS Study** | | The part site is in residential zone as per development remarks of M.C.G.M. The land use of the study area : |

| S. N | Attributes | Data Collection and Source | | Results/ Major findings and Interpretation of Baseline Data |
|---|---|---|---|---|
| | | **Primary (Upto 500 mt from the boundary of project site)** | **Secondary (Upto 15 Km from the boundary of project site)** | |
| | | | |  <br>Five different land use/land cover classes have been identified in the area under study. Following Land without scrub: 1.57 %, Water body: 7.79 %, Built – up land: 32.25 %, Scrub land: 9.13 %, Vegetation: 49.25 %. |
| iii | **Soil analysis** | **Sampling Location:** Project site | The predominant soil cover in Mumbai city is sandy, whereas in the suburban district, the soil cover is alluvial and loamy. Two types of soils have been observed in the district viz., medium to deep black and reddish colored soil | Results of soil analysis show the soil is not polluted. |

| S. N | Attributes | Data Collection and Source | | Results/ Major findings and Interpretation of Baseline Data |
|---|---|---|---|---|
| | | **Primary (Upto 500 mt from the boundary of project site)** | **Secondary (Upto 15 Km from the boundary of project site)** | |
| **4** | **Socio – Economic Environment** | Project site | For Demographic details of Mumbai<br><br>**Source :** 'Census of India' 2011 - For Demographic details of R-S ward of MCGM, Mumbai<br><br>**Source:** Official website of MCGM ( as per 'Census of India' -2001) Bombay District Gazetteer | **Major Findings of the Socio – economic survey**<br>• The proposed project site falls under F South ward of Municipal Corporation of Greater Mumbai (MCGM) and in the Mumbai city district.<br>• Total area of F South ward is 14 sq. km.<br>• Total population of the F South ward is 359,980 (2011) with density of 25,713 persons per sq.km which is higher than the population density of Mumbai city i.e. 19,652 persons per sq.km.<br>• Sex ratio of F South ward is 928 females per thousand males (2011), which is very high than the ratio in 2001 i.e. 831 females per thousand males.<br>• MCGM water supply through pipeline is the source of potable water in the study area.<br>• The project site has a good education and medical facilities in and around area.<br>• All the houses have regular power supply facility from Tata Power.<br>• Study areas under focus have good communication and transport facility. |
| **5** | **Biological Environment** | **Period:** November 2012 | The data pertaining to flora and fauna have been collected based on discussion with concerned forest department officials, local people and NGOs. | **Project site :**<br>**Flora**: The floristic survey reveals that the project site possesses abundance of plants viz, *Mangifera indica*, *Ficus racemosa, Ficus religiosa*<br>**Fauna** : Butterflies like common grass yellow, common Indian crow, common wanderer and small grass yellow were found, while common birds like pigeon, black kites, house sparrow, Indian myna and house crow were dominant. Among mammals, common dog, domestic buffalo and squirrel were observed.<br><br>**Area between project site and 500 m :**<br>**Flora:** Based on field survey and land use map, 5 locations were selected for vegetation studies. The dominant trees are *Tamarindus indica, Peltophorum pterocarpum, Swietenia mahagoni*, *Albizia saman, Delonix regia,* followed by *Terminalia catappa, Azadirachta indica, Ficus bengalensis, Ficus recemosa, Lantana camara, Casuarina equisitifolia* etc.<br><br>**Fauna:**<br>The survey revealed that there were 3 species of common mammals in the study area, while no wild mammal was observed in this area. 11 species of birds were noticed during the survey. 9 species of butterflies, dominated by *Eurema brigitta,* |

| S. N | Attributes | Data Collection and Source | | Results/ Major findings and Interpretation of Baseline Data |
|---|---|---|---|---|
| | | **Primary (Upto 500 mt from the boundary of project site)** | **Secondary (Upto 15 Km from the boundary of project site)** | |
| | | | | *Danaus chrysippus, Pareronia valeria* and *Euploea core* were observed. Three species of dragonflies and two species of damselflies were recorded<br><br>**Area between 500 m and 15 Km**<br>The area covers Sanjay Gandhi National Park within a 15 Km radius from the project boundary.<br><br>**Wetland ecology:** Birds like white- throated kingfisher, spot-billed duck, purple swamphens, bronze winged and pheasant tailed jacanas, ashyprinias, brahminy kite, cormorants, lesser whistling ducks, purple and Indian pond herons, great egrets, woolly necked stork (winter visitor) & whiskered terns are common in these areas. The fishes available in the lakes are: catla (*Catla catla*), mahseer (*Tor khudree* ), calabose (*Labeo calbasu*), mrigal (*Cirrhinus mrigala*), gouramy (*Ophronemus gouramy*), rohu (*Labeo rohita*), silver carp (*Hypophthalmichthys molitrix*), megalop (*Megalopa* sp), common carp (*Cyprinus carpio* ), tilapia (*Tilapia mossambica*), cat fish (*Clarias batrachus*) and other minor varieties. |
| **6** | **Traffic study** | Traffic survey was carried out for Traffic density / pattern: (Survey done by M/s. Systra Consulting (India) Pvt. Ltd. conducted in January 2014) | | Proposed development peak hour traffic generated from the residential development is 975 PCUs. Based on the traffic forecast, by 2018 (the expected operational year of the development) G. D. Ambekar Marg will operate with a level of service C during morning and evening peak hour. The future traffic includes both background traffic and the generated traffic from the development. The traffic from the slum and SMRT building is already captured in the background traffic. It is assumed that out of the total traffic generated from the proposed development, 50% of traffic will use G.D. Ambekar Marg and will move towards North direction and 50% of traffic towards South direction. Hence there are no concerns of any traffic related issues on account of development of project. |

## 9.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

Impact identification for this project was done by using modified Delphi Technique. The modified Technique used considers 23 attributes and four weightages. Since with the methodical working of sensitivity index and weight-ages, the total scope of pollution potential has come to **413.9**, the project site fits into **"LOW"** Pollution Potential as per the ranking system suggested in Delphi technique. The activities that take place during construction phases and operation phase of the project and the potential impacts and mitigation measures are summarized as follows.

### i. Air Environment:

During construction phase, the major air pollutant of prime concern is RSPM as impacts of other emissions such as $SO_2$, NOx & CO will not be significant because the nature of sources is such that the emissions are distributed spatially and as well as temporal. Dust emissions from construction activities shall require comprehensive mitigation measures and best construction practices are explained in detail in the EIA report.

During operational period to control emissions from DG sets, stack heights of DG sets shall be as per CPCB guidelines. With regards to concern from vehicular emissions, the exhaust emissions due to rise in peak hour traffic will be mitigated by adopting traffic management measures and permitting vehicles having valid PUC.

As this is being an expansion project the ambient air quality is being regularly monitored on site and the results are found to be within limits of CPCB standards.

### ii. Noise Environment:

The noise emitted from heavy duty construction equipment during construction period being high shall require occupational preventive measures and temporary noise barriers for noise attenuation.
During operational period the major noise pollution source will be DG sets and surrounding traffic activity. In order to prevent adverse noise exposure to the occupants, optimal mix of mitigation measures such as low noise generation units, acoustic enclosures, and plantation of trees as noise barriers has been planned. Noise modeling studies have been done for the prediction of impacts.

Noise levels are being regularly monitored on site as part of Environmental Monitoring Plan during construction phase in this project.

### iii. Water Environment:

Treatment of waste water into Sewage Treatment Plants and its reuse for secondary requirements. Water conservation by minimizing requirement of fresh water from M.C.G.M.

- Avoiding water pollution by treatment of sewage up to tertiary level
- Provision of Storm water drainage system with adequate capacity. These drains shall have silt and oil and grease traps to avoid pollution of water in drains outside the plot.
- Proper maintenance of storm water drainage to avoid choking of drains and flooding on site.

### iv. Land Environment :

The development will not bring any change in the land use pattern. The generation of wastes during construction phase shall be disposed in environmental friendly manner with due care and precautions and after getting all the NOCs from concerned department of M.C.G.M.

**v. Biological Environment:**

The project will provide quality ambience with natural setting, well planned green belt and open spaces so that it not only enhances the quality of life of the occupants but also improve the micro-climatic conditions.
About 13,008.13 $m^2$ of area will be maintained as Green cover at ground and around 19,145.68 $m^2$ of green cover area will be provided at podium level. Plantation of trees of various varieties shall be done on ground; additionally shrubs of various varieties shall be planted on podium.

**vi. Socio-economic Environment:**

- Preference should be given to local people on the basis of their experience during post employment opportunities
- Project proponent should take appropriate steps to keep environment clean and healthy during construction phase
- There would be a growth in for the local and surrounding communities such as daily wage laborers, transporters and raw material suppliers due to construction activity.
- Provision of adequate drinking water, toilet and bathing facilities should be made available on project site for construction labors
- Water shall be sprinkle/spread to suppress dust during construction phase to control air pollution and thereby avoid adverse health impact
- Proper living condition with appropriate facilities for residential labors should be provided
- Proper Training and awareness programme should be carried out so that the workers understand the importance of wearing the personal protective equipments.

## 9.4 ENVIRONMENTAL MONITORING PROGRAMME:

During Construction and operation Phase Ambient Air Quality, Exhaust from DG Set, Noise Level, Water Analysis & Sewage Analysis shall be regularly done at the locations and frequencies specified in the statutory guidelines. Outside MOEF approved Laboratory will be appointed for the regular monitoring.
The costing for environmental monitoring during construction phase shall be Rs. 5.59 lacs and during operation phase shall be Rs. 43.52 lacs/year.

## 9.5 ADDITIONAL STUDIES:

Additional studies which are carried out are as follows:

- Risk Assessment & Disaster Management Plan
- Natural Resource Conservation
- Rehabilitation Action Plan

Risk Assessment, Identification of Hazards has been carried out for the construction and operation phase, the safety precautions that have to be taken during construction phase and the Disaster Management Plan, Rehabilitation Action Plan, Emergency Preparedness Plan Onsite and Offsite has been reported in the Chapter 6 of the EIA Report.

Emergency prevention through good design, operation, maintenance and inspection are aimed in this project to reduce the probability of occurrence and consequential effect of such eventualities. The Emergency Response Plan (ERP) shall be practiced to make use of the combined resources at the site and outside services to achieve the following:-

- Localize the emergency
- Minimize effects on property and people
- Effective rescue and medical treatment
- Evacuation

## 9.6 PROJECT BENEFITS:

| | |
|---|---|
| **A** | **SOCIO ECONOMY** |
| 1 | The proposed scheme is good because instead of resettlement of mill workers to another location it is better to upgrade their tenements by providing them with bigger and better housing facility. |
| 2 | The proposed scheme will provide new, bigger and better housing structures with appropriate amenities, adequate sanitation facilities as well as fire fighting and safety measures to the mill workers. |
| 3 | There would be growth in indirect jobs and business opportunities to the local and nearby people such as contractors, transporters and raw material suppliers etc. due to the proposed development in the area. |
| 4 | Improvement in safety, security and fire-fighting facility |
| **B** | **TREE PLANTATION AND LANDSCAPING** |
| 1 | Landscaping shall reduce energy use by reducing heat island effect |
| 2 | Pleasing aesthetic and visual impact |
| 3 | Provide tolerance to air pollutants like RSPM, $SO_2$, $NO_x$ and CO |
| 4 | Trees act as natural noise buffers |
| **C** | **WATER SAVING AND WASTE WATER MANAGEMENT** |
| 1 | Minimizing water consumption in construction phase by utilizing treated sewage for construction purpose thereby avoiding the wastage of fresh water |
| 2 | By using various water saving practices like use of water efficient plumbing fixtures, dual flushing cisterns etc. and use of rainwater for domestic purpose bringing down the per capita water consumption compared to the present use |
| 3 | By using treated sewage for flushing, gardening within project site and excess treated sewage shall be temporary used for further construction in project site thereafter shall be disposed to sewer line. |
| 4 | Reducing storm water runoff by collecting the rain water from terraces and reducing the load on city storm water drains. |
| **D** | **ENERGY SAVING** |
| 1 | Use of non conventional solar energy by using solar panels |
| 2 | Various energy saving measures shall ensure 18 % for ICC One, 13% for ICC Two, 4% for Rehabilitation A and 5 % for Rehabilitation B saving energy. |
| **E** | **SOLIDANDHAZARDOUSWASTEMANAGEMENT** |
| 1 | All necessary precautions will be taken to prevent nuisance and hazards from the solid waste, hazardous waste, E waste during construction phase and subsequently after commissioning of the project. In order to achieve this, Debris and Construction Waste Management, Municipal Solid Waste Management, Hazardous and E Waste Management shall be practiced |
| 2 | Waste Minimization, reuse/ recycling and treatment of biodegradable garbage and its use as manure shall ensure handover of only the non recyclable garbage to the local authorities thereby reducing the load on dumping grounds of MCGM. |
| **F** | **ENVIRONMENTAL MONITORING & ENVIRONMENTAL MANAGEMENT PLAN** |
| 1 | Environmental monitoring is being carried out regularly and shall be ensured in proposed development as well thereby ensuring the baseline quality, implementation of mitigation measures and control of environmental pollution |
| 2 | Environmental Management Plan and its judicious implementation with operation and maintenance of environmental facilities and proper budgetary allocations for the same will ensure a long term benefits to the project and surrounding areas. |

## 9.7 ENVIRONMENTAL MANAGEMENT PLAN:

Adequate environmental management measures will be incorporated during the entire planning, construction and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area. The EMP's that will be put into place consist of those

during construction and operating stages of the project and includes the following elements:

- Water Conservation
- Sewage Treatment and Operation and Maintenance
- Solid Waste Management
- Air Pollution Control and Management
- Noise Level Control and Management
- Storm Water Management
- Plantation and Landscaping
- Management of Social Issues, Occupational, Safety and Health issues
- Energy Conservation
- Emergency Response Plans for Emergency Scenarios
- Environmental Monitoring
- Environmental Management System

For the effective and consistent functioning of the project, an Environmental Management System (EMS) will be established at the site. The following components will be part of the EMS:

- Environmental Policy
- Objectives & Targets
- Structure and Responsibility
- Emergency Planning
- Environmental Monitoring Program
- Operation of and Maintenance of Environmental Management Facilities like STP, Rain Water Harvesting, Solar Systems, Landscape Development, Solid Waste Management System
- Non-conformance & Corrective and Preventive Action
- Short term and long term budgetary provisions for the EMP
- Submission of six monthly report to Regional office, MoEF for compliance of conditions in Environmental Clearance

**Budgetary allocation for Environment Management:**
The expenditure to be incurred by **M/s. The Bombay Dyeing & Mfg. Co. Ltd.** on environmental matters during construction and operational phase is given as follows.

**Total expenditure envisaged on Environment Management:**
**During construction phase total cost**: Approximately Rs. 244.47 lacs
**During Operation Phase total set up cost**: Rs. 621.06 lacs and Operation & Maintenance cost shall be Rs. 168.38 lacs/year

### 9.8 CSR ACTIVITY: (TOR Point No. 43)

The company is involved with various social initiatives. These activities are conducted with the help and support of the BMC. The Group has also distributed books, arranged free medical camps and blood donation drives.

### 9.9 CONCLUSION:

Based on the environmental assessment, the associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA and EMPs.

**********

# CHAPTER 10
# DISCLOSURE OF CONSULTANTS

This Form 1 & 1A and EIA report is prepared on behalf of the proponents, taking inputs from proponent's office staff, Architects, Project Management Professionals etc. by Environmental Consultants M/s Ultra-Tech Environmental Consultancy & Laboratory, Thane - Pune, who have been [provisionally] accredited by QCI-NABET vide official memorandum of MoEF dated 30th September 2011.

**ENVIRONMENTAL CONSULTANTS ORGANIZATION:**
**ULTRA-TECH ENVIRONMENTAL CONSULTANCY & LABORATORY** [Lab Gazetted by MoEF – Govt. of India] not only give environmental solutions for sustainable development, but make sure that they are economically feasible. With innovative ideas and impact mitigation measures offered, make them distinguished in environmental consulting business. The completion of tasks in record time is the key feature of Ultra-Tech. A team of more than hundred environmental brigadiers consists of engineers, experts, ecologists, hydrologists, geologists, socio-economic experts, solid waste and hazard waste experts apart from environmental media sampling and monitoring experts and management experts , strive hard to serve the clients with up to mark and best services.

Ultra-Tech offers environmental consultancy services to assist its clients to obtain environmental clearance for their large buildings, construction, CRZ, SEZ, high rise buildings, township projects and industries covering sugar and distilleries from respective authorities. Ultra-Tech is in the process of getting QCI-NABET final accreditation for its EIA organization.
Ultra-Tech also provide STP/ETP /WTP project consultancy on turn-key basis apart from Operation and Maintenance of these projects on annual contract basis. Also, having MoEF approved environmental laboratory, Ultra-Tech provide laboratory services for monitoring and analysis of various environmental media like air, water, waste water, stack, noise and meteorological data to its clients all over India and abroad.

**CREDENTIALS:**
• State of Art Environmental Laboratory & Trained Manpower, Gazetted by MoEF.
• Environmental Advisor for Municipal Corporation.
• Affiliated to Indian Green Building Council (IGBC), Hyderabad.
• Affiliated to United States Green Building Council (USGBC), US.
• Environmental Consultants for Federation of All India Textile Manufacturing Association (FAITMA)
• Environmental Consultants for All India Lead Manufacturing Association.
• NABET, Quality Council of India, Accreditation for EIA is in process.
• ISO 9001:2008, Quality Management System implemented

**HONORS:**
We are honored by the following reputed firms for our unflagging quality environmental & consultancy and monitoring services.

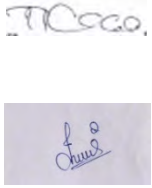
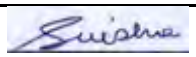
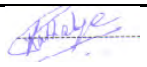
- **TECHNICAL CONSULTANT OF CRISIL, MUMBAI**
  For Common Effluent Treatment Plant issues in Gujarat, India
- **TECHNICAL CONSULTANT OF FAITMA, MUMBAI** [Fed. of All India Textile Manufacturer's Associations] For Environmental issues
- **TECHNICAL CONSULTANCY SERVICE, PUNE**
  For Environmental Quality Monitoring Services at Panvel-Karjat Rail-way Project
- **RASTRIYA CHEMICALS & FERTILIZERS , MUMBAI**
  For Ambient Air Monitoring in nearby villages

**ISO 9001:2008 CERTIFICATION:**

ULTRA-TECH is one of the leading environmental consultancy and laboratory services providing companies and is ISO 9001:2008 certified with effect from 26th March, 2011.

All it means that ULTRA-TECH is certified for offering High Quality Environmental Services aiming at customer satisfaction. Its quality policy reflects its obligation to serve their customers at the best of their skills and to go extra mile to attain and exceed the expectations of valuable customers with an additional responsibility of contributing to the drive of turning this universe into green universe. Continuous efforts to enhance the specific skills which are critical to acquire is making ULTRA-TECH to attaining Excellency in providing environmental clearances through impact assessment.

**LIST OF EIA COORDINATOR, FUNCTIONAL AREA EXPERTS & ASSOCIATES**

| S. No | Name of sector | Name of project | Name of Client | EIA Coordinator | | Functional Area Experts involved | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Name/s | Signature | FA | Name/s | Signature |
| 1 | Construction 8 (B1) | **"ISLAND CITY CENTRE"** of Dadar (East), Naigaon division at G.D. Ambedkar Marg, Wadala<br><br>Total Construction Built-up area: 3,53,818.99 Sq. Mt. | M/s. The Bombay Dyeing & Mfg. Co. Ltd. | Mrs. Deepa Tamhane Karnik |  | LU | Mr. Yomesh Rao |  |
| | | | | | | AQ | Not involved as this is a construction project for which AQ modeling was not done | -- |
| | | | | | | AP | Mr. Shekhar Tamhane | |
| | | | | | | WP | Dipti Rathod |  |
| | | | | | | EB | Dr. T. K. Ghosh<br><br>Associate: Swati Bopinwar |  |
| | | | | | | SE | Mrs. Shilpa Mishra |  |
| | | | | | | NV | Mr. Chintan Athalye |  |
| | | | | | | G & S | Not involved for this project as Geotechnical Investigation report was done and interpreted by Geo – Technical Consultants engaged by client | -- |

| S. No | Name of sector | Name of project | Name of Client | EIA Coordinator | | Functional Area Experts involved | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Name/s | Signature | FA | Name/s | Signature |
| | | | | | | HG | Basic details for the hydrology were reported by secondary data. HG expert was not involved for this project as soil report mentions about the ground water level and there is no planning for ground water withdrawal. | -- |
| | | | | | | RH | Dr. Ravindra Kode | |
| | | | | | | SHW | Ms. Deepa Tamhane Karnik & Mr. Santosh Gupta | D.A.Karnik |

**TEAM MEMBERS**

| Sr. No. | Name of Team Members | Signature |
|---|---|---|
| **1.** | Mrs. Dipti Rathod | |
| **2.** | Mrs. Sampriti Mukherjee | Sampriti Mukherjee |
| **3.** | Mr. Shekhar Kumbhar | |
| **4.** | Mr. Rahul Kolhapurkar | |
| **5.** | Ms. Smita Lad | |
| **6.** | Mr. Shrishail Adake | |

**SOURCES OF PROJECT DETAILS, PLANNING, SERVICES & UTILITIES**

| SR. NO. | DETAILS OF DATA / STUDY | DATA SOURCE / STUDY CONDUCTED AGENCY |
|---|---|---|
| 1. | Design Architect | Hafeez Contractor |
| 2. | Architect (L.S.) | JCV Spaceage Consultant |
| 3. | MEP Plan and Study | MEP Consultant |
| 4. | Structural consultant | JW Consultant LLP |
| 5. | Traffic Consultant | MVA Systra Group |

## TERMS OF REFERENCE

The project was placed before SEAC-2 (MMR) in its 5th meeting held on 16.11.2012 for finalization of Terms of References for carrying out EIA study for proposed project. The TOR specified by the Committee is as Follows:

**Project Specific Points:**

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| 1. | Submit the approvals of the competent authority regarding allocation of plot with its area and location, access to their plot etc. | -- | Layout is showing allocation of plots / FSI statement etc as per approval received from MCGM. Approval is attached as an Enclosure 9 |
| 2. | Examine increase in the width of the access road to the plots of MHADA, MCGM and rehab area for the chawls | -- | As per the approved layout rehab area of chawls are abutting 30 m. wide G. D. Ambekar Road. For MHADA and MCGM, as per the D. C. R. provisions, 12m. wide road is provided<br>MHADA & MCGM Plots are already handed over. |
| 3. | Comparative studies of the baseline data of EIAs prepared for obtaining ECs in 2006 & 2011 with the present data also give reasons for any changes | -- | Chap. 3 Fig. 3.32 and Fig. 3.35 |

**Additional points as per the TOR specified in Annexure A**

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| 1. | Examine in detail the present status of the project site. | 5 | Ch 2, Section 2.1 sub sec.2.1.1 |
| (1)-a | Site clearance strategy | 8 | Ch 2, Section 2.2 sub sec 2.2.1 |
| (1)-b | Debris quantification | 71 | Ch 4, Section 4.2.3, sub section 4.2.3.2 |
| (1)-c | Segregation of the demolition waste and quantification | 71 | |
| (1)-d | Disposal strategy in consonance with the prevailing rules. | 71 | |
| (2) | Submit development strategy, phasing of the project along with infrastructure and facilities / utilities. | 9<br><br><br><br><br>10<br><br>12 - 14 | • For development strategy, phasing of the project Ch 2, sub sec 2.2.2<br>• For Infrastructure and facilities / utilities<br>During construction phase: Table 2.4 of Ch 2, sec 2.4<br>During operation phase: Table 2.10 of Ch 2, sec 2.6 |
| (2)-a | Detailed total station map indication plot boundary | -- | Enclosure 2 of the EIA |
| (2)-b | Construction area boundary | -- | Enclosure 2 of the EIA |
| (2)-c | Green area boundary | -- | Enclosure 4 of the EIA |
| (3) | Submit excavation details, quantity of excavated material, top soil quantity and its preservation. | 73 | Ch 4, Section 4.2<br>sub section: 4.2.3.4 |
| (4) | Examine in detail the proposed site with reference to impact on infrastructure covering following points: and the disposal of | | |
| (4)-a | Water supply | 80 | Ch 4, Section 4.3.1 |
| (4)-b | Storm water drainage | 80 | Ch 4, Section 4.3.2 |

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| (4)-c | Sewerage | 80 | Ch 4, Section 4.3.3 |
| (4)-d | Power | 80 | Ch 4, Section 4.3.4 |
| (4)-e | The disposal of treated/raw wastes from the complex on land/water body and into sewerage system. | 80 | Ch 4, Section 4.3.3 |
| (5) | Examine in detail the carrying capacity of existing sewer line, drains etc. | 80 | Ch 4, Section 4.3.2 Table 4.8 |
| (6) | Examine details of land use around 2 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. | 23 | Ch 3, Section 3.1.1 |
| (7) | Study and submit details of environmentally sensitive places, rehabilitation of communities and present status of such activities. | 19 | Ch 3, Table 3.1 |
| (8) | Examine baseline environmental quality along with projected incremental load due to the project. Environmental data to be considered in relation to the community development would be: | | |
| (8)-a | Land | 22 | Ch 3, Section 3.1.1 |
| (8)-b | Ground Water | 31 | Ch 3, Section 3.2, sub Sec 3.2.2 |
| (8)-c | Surface Water | 30-31 | Ch 3, Section 3.2, sub Sec 3.2.1 |
| (8)-d | Air | 31<br><br><br><br>37-39 | Ch 3, Section 3.3,<br>For Meteorology : sub section 3.3.4<br>& For Ambient Air Quality sub section 3.3.5 , Ambient air quality monitoring location details: Table 3.12 and Table 3.14 for results |
| (8)-e | Bio-diversity | 43 | Ch 3, Section 3.4.4 |
| (8)-f | Noise due to the traffic | 40-42 | Ch 3, Sec 3.3, sub sec 3.3.6<br>Table 3.16 & 3.17 for Noise Level Readings |
| (8)-g | Socio economic and health etc. | 53 - 57 | Ch 3, sec 3.5 |
| (9) | Study the socio-economic situation of the project area and its surroundings and their impact on the project design and operation. | | For Study of the socio-economic situation of the project area and its surroundings Ch 3, sec 3.5 |
| (9)-a | Socio impact Assessment studies (SIA) shall be carried out specific to the project area. | | For SIA : Ch 3, sec 3.5 |
| (10)-a | Examine Topography | 21 | Ch 3, Sec 3.1, sub sec 3.1. |
| (10)-b | Rainfall pattern | 31 | Ch 3, Sec 3.3, sub sec 3.3.2 |
| (10)-c | Soil characteristics and | 26 | Ch 3, Sec 3.1,sub sec 3.1.4 |
| (10)-d | Soil erosion | 30 | Ch 3, Sec 3.1,sub sec 3.1.5 |
| (11) | Study the hydrological and geo-hydrological conditions of the project area including a contour plan indicating slopes and showing drainage pattern and outfall.<br>Examine in detail the carrying capacity of existing storm water drainage line. Possibility of flooding in and around the project site. | 24<br><br><br><br>80 | For Drainage Map : Ch 3, sec 3.1, sub sec 3.1.2<br>For Contour Plan :Enclosure- 3<br><br>For carrying capacity Ch 4, sec 4.3 sub sec 4.3.2 Table -4.8 |

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| (12) | Storm water drainage and outfall may be described through contour map and slopes of the project area and its surroundings. | 80 | Ch 4, Section 4.3.2 Table -4.8<br>For SWD Layout : Enclosure -5 |
| (13) | Examine the details of water requirement, use of treated waste water and prepare water balance chart. | 14 | Ch 2, sec 2.6, sub sec 2.6.1 |
| (14) | Rain water harvesting proposals should be made with due safeguards for groundwater quality, aquifer level, soil permeability, justification for suitable /appropriate rain water harvesting method and details of the selected option indicating locations on the project map. | 68 | Ch 4, sub sec 4.2.1<br>Layout showing rain water harvesting tanks is attached as Enclosure: 5 |
| (15) | Maximize recycling of water and utilization of rain water. Examine details | | |
| (16) | Examine soil characteristics and depth of ground water Table for rainwater harvesting | | |
| (17) | STP and water treatment plant should not be near each other. Indicate their locations with area details on the map. Also provide justification for the technology selected on the site and examine sustainable operation of the infrastructure. | 68 | STP and water tanks are not near each other.<br>For plan showing of STPs : Enclosure 6<br>Ch 4, sec 4.2 and sub sec 4.2.2 |
| (18) | Examine details of Solid waste generation, Type and quantity, Treatment and its disposal. | 11<br><br><br>18<br><br>70-71 | **During Construction Phase** : Ch 2, sub section 2.4.3 and<br>Chapter 4 sub section 4.2.3<br>**During Operation Phase:** Ch 2, sub section 2.7.3 and<br>Chapter 4 section 4.2.3. |
| (19) | Common facilities for waste collection Treatment, Recycling, Disposal (all effluent, emission and refuse including MSW.) | -- | For Segregation , Treatment , Recycling and Disposal of various types of solid wastes : Enclosure-6 |
| (20) | Examine the location of solid waste treatment and disposal sites | 57 | Chapter 3, sub section 3.7<br>Disposal and waste management by local authority |
| (21) | Study the existing flora and fauna of the area and the impact of the project on them. | 43<br><br>65-66 | Ch 3, sub section 3.4.4<br><br>For impact: Ch 4, sub sec 4.1.5 |
| (22) | Since the project is a building construction and area developmental activities, examine electrical load, energy conservation measures etc. and saving in energy. | 11<br><br>16<br><br>76<br><br><br>76- 78 | **During Construction Phase** : Ch 2, sub section 2.4.4 and<br>**During Operation Phase** Ch 2, sec 2.6.2<br>For energy conservation method: Ch 4, sec 4.2, sub sec 4.2.4<br><br>For saving in energy: Ch 4,Table 4.6(a), 4.6(b), 4.6(c), 4.6(d) |

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| (23) | Examine and submit details of use of solar energy and alternative source of energy to reduce the energy consumption. | 76-78 | Ch 4, sec 4.2, sub sec 4.2.4 |
| (24) | DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. Examine and submit details. | 11<br>17 | The DG sets will have inbuilt acoustic enclosure and stack height shall be as per CPCB.<br>**During Construction Phase** : Ch 2, sub section 2.4.4 and<br>**During Operation Phase** Ch 2, sec 2.6 & sub sec 2.6.3 |
| (25) | Provide for conservation of resources, energy efficiency and use of renewable sources of energy in the light of ECBC code. Application of renewable energy/alternate energy, such as solar energy, wind energy may be described with detailed analysis and exploring the possibility of such installations. | 76 | Ch 4, sec 4.2 & sub sec 4.2.4 |
| (26) | A detailed traffic and transportation study should be made for existing and projected passenger and commercial traffic as the project is a mixed development including residential and commercial development. | -- | Ch 3, sec 3.8<br>Traffic report is enclosed as Enclosure 8 |
| (27) | Examine the details of transport of materials for construction which should include source and availability. | | |
| (28) | The evaluation of impacts should be analyzed depending upon the nature (positive and negative), duration (short term and long term) reversibility, and magnitude (negligible, low, medium, high), etc. of the impacts based the objective assessments. | | |
| (29) | Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities *for* the region should be analyzed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city. | | |
| (30) | Traffic management plan including parking areas may be described. Traffic survey should be carried out on week days and week end. | | |
| (31) | Examine and submit details of Air quality monitoring as per latest National Ambient Air Quality standards as | | We have conducted AAQ monitoring at project site and 5 locations within 500 m radius from the project |

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| | notified by the Ministry on 16th November, 2009. | 38 | boundary on March to May 2013 for the parameters namely PM 2.5, PM10, SO2, NOx and CO.<br>Ch 3, sec 3.3<br>Average Ambient Air Quality around the Project Site : Table 3.14<br><br>Air monitoring site map of 500 m radius area around project site : Fig. 3.31 |
| (32) | Examine and submit the details of Noise modeling studies and mitigative measures | 61-65 | Ch 4, sec 4.1.4, sub sec 4.1.4.1 |
| (33) | Examine noise levels - present and future with noise abatement measures. | 40 - 42 | Ch 3, Sec 3.3, sub sec 3.3.6<br>For Noise Level Readings Table 3.16 & 3.17<br>Noise monitoring site map at corner of project site : Fig. 3.33<br>Ch. 4, Section 4.1.4<br>Chapter 5 section 5.1<br>Item No 2 of Table 5.2: Environmental Monitoring Plan with Costing (per annum) |
| (34) | Noise pollution has always been a major concern for developmental projects during the construction and operational phase. It is suggested that noise monitoring should be carried out at critical locations at the surrounding areas may be incorporated in environmental monitoring programme during the whole operational phase of the project. | 61<br>86-87 | |
| (35) | Natural and artificial noise barriers may be considered for critical locations. | 61 | Ch 4, sec 4.1.4 |
| (36) | A thick green belt should be planned all around the project site to mitigate noise and vibrations to the nearby settlements. The identification of species/plants should be made based on the botanical studies. | 78-79 | Ch 4, sec 4.2 sub sec 4.2.5<br><br>934 nos. of trees shall be planted in proposed development.<br><br>For Layout of tree plantation and landscape Enclosure 4 |
| (37) | Landscape plan, green belts and open spaces may be described. | | |
| (38) | Examine the details of afforestation measures indicating land and financial outlay. | | |
| (39) | Use of local building materials should be described. The provisions of fly ash notification should be kept in view. | 109<br><br>9 | For Natural Resource Conservation : Ch 6, section 6.5<br><br>For use of local building material and fly ash Ch 2, Sec 2.3 sub sec 2.3.1 |
| (40) | Risk assessment and disaster management plan should also include Fire, Earthquake, local floods, and any other natural disaster. | 88 | Ch. 6 sec 6.1and 6.2 |
| (41)-a | Environmental Management Plan should be accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. | 85- 87 | EMP is accompanied with environmental monitoring and the budget for the same.<br>For Environmental Monitoring Plan: Ch 5, sec 5.0 and 5.1 The budgetary allocation for environmental |
| (41)-b | Examine separately the details for | | |

| Sr. No. | Particular | Page No. | EIA Report reference |
|---|---|---|---|
| | construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan. | 111 - 112 | monitoring plan for construction and operation phase of the project is as explained in Table 5.1.and 5.2<br><br>For Environmental Management Plan : Ch 8 section 8.3<br><br>For the expenditure to be incurred on environmental management during construction and operational phase : Ch 8 sub section 8.3.10<br>Table 8.1 & 8.2 |
| (42) | Make assessment of any regulatory measure in view of the environmental and social impacts of the project (such as unauthorized development in and around the area) | -- | Proper plan of action by the proponent shall be implemented which useful in gaining public confidence depending on local requirement.<br>➢ The Proponent will continue regular environmental awareness programs to bring forth the benefits of development in terms of improvement in quality of life<br>➢ The Project Area is under Administrative control of MCGM. Any work development to be done here has to have the express approval of the MCGM. As such no unauthorized or unplanned development can take place. |
| (43) | Submit the details of CSR activities. Provisions shall be made for education, health and vocational training programs. | 136 | Ch 9 sub section 9.8 |

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**Government of Maharashtra**

**File No.: SEAC- 2010/CR 293/ TC2**
Environment department,
Room No. 217, 2nd floor,
Mantralaya Annexe,
Mumbai 400 032
Date: 7th December, 2011

To,
M/s The Bombay Dyeing & Mfg. Co. Ltd.
Neville House, J.N. Herdia Marg, Ballard Estate, Mumbai – 400 001
Telephone No. : 022 – 22618071/72/73/74

**Subject: "Island City Center" at GD Ambedkar Marg, Wadala, Mumbai by M/s The Bombay Dyeing & Mfg. Co. Ltd. - Environmental clearance regarding.**

Sir,

This has reference to your communication on the above mentioned subject. The proposal was considered as per the EIA Notification - 2006, by the State Level Expert Appraisal Committee, Maharashtra in its 38th & 43rd meetings and decided to recommend the project for prior environmental clearance to SEIAA. Information submitted by you has been considered by State Level Environment Impact Assessment Authority in its 40th Meeting held on 12th/13th October, 2011.

2. It is noted that the proposal is for grant of Environmental Clearance for "Island City Center" at GD Ambedkar Marg, Wadala, Mumbai by M/s The Bombay Dyeing & Mfg. Co. Ltd. SEAC considered the project under screening category is 8(b) as per EIA Notification 2006.

**Brief Information of the project is summarized as below-**

| | | |
|---|---|---|
| **Name of the Project** | : | "Island City Center" |
| **Project Proponent** | : | M/s The Bombay Dyeing & Mfg. Co. Ltd. |
| **Location of the project** | : | CS No. 223, 1/983, 1/128(pt) and 120 (pt) Dadar Nigaum division at GD Ambedkar Marg, Wadala, Mumbai |
| **Type of Project** | : | Construction project |
| **Plot Area** | : | Total plot area: 1,83,663 sq.m.<br>Net plot area: 1,28,401 sq.m. |
| **Proposed Total built up area** | : | FSI Area: 1,96,129 sq.m.<br>Total BUA: 4,65,273 sq.m. |
| **Estimated cost of the project** | : | Rs. 2,50,984 lakhs |
| **No. of Buildings** | : | **Buildings for which EC received:**<br>• One with two wings (one S+41 floors and another with 3B+2 parking floors) with 161 flats.<br>**Proposed expansion:**<br>• Rehabilitation: 2 buildings (B+G+19 floors) with 648 flats.<br>• Sale – residential: Tower A (B+G+7 parking floors + club house + 66 floors); Tower B with three wings (3B+G+7 parking floors + club house + 26 parking floors) (resulting in 76 less flats). |

| | | |
|---|---|---|
| | | • Sale – commercial – one building (G+2 floors) |
| **Total Water Requirement** | | • Fresh: 707 CMD (MCGM) + 20 CMD (Tankers)<br>• Recycled water: 504 CMD |
| **Sewage Generation** | | 979 CMD |
| **STP capacity** | | • Rehab: 1 STP of 420 $m^3$<br>• Sale: 1 STP of 160 $m^3$, 1 STP of 105 $m^3$ and 3 STP of total capacity 435 $m^3$ |
| **Rain water Harvesting** | | • 2 nos. of rainwater harvesting tank of total 450 cum capacity.<br>• 54 nos. of percolation pits are proposed. |
| **Solid waste management (for all phases)** | | • Biodegradable waste: 3515 Kg/day<br>• Non biodegradable waste: 1592 Kg/day dry<br>• STP Sludge: 147 Kg/day |
| **Disposal** | | • Biodegradable waste will be treated by Organic Waste converter.<br>• Dry waste will be handed over to authorized contractors.<br>• STP sludge will be used as manure. |
| **Green Belt Development** | | • Total green cover area: 14,171.73 sq. m.,<br>• Existing trees: 524 nos., trees to be cut: 144 nos., trees to be transplant: 88 nos., trees to be retained: 412 nos. and total nos. of new trees plantation: 477 nos. |
| **Energy Requirement** | | • Maximum demand - 22,015.8 KW<br>**Backup** –<br>• For Rehab: 1 nos. of DG sets of 910 KVA<br>• For Sale: 2 nos. of DG sets of 1000 KVA each, 3 nos. of DG sets of 910 KVA each and 1 nos. of DG sets of 1010 KVA. |
| **Traffic Management** | | • Parking area: 78,799 sq.m.<br>• Four wheelers parking: 2,644nos. |
| **Energy Conservation measures** | | • Use of CFL lamps<br>• Solar operated pole lights will be proposed to power pathway light at some strategic locations<br>• Sensor and daylight sensor are proposed |
| **Environmental Management Plan** | | Construction phase: 11.8 lakhs<br>Operation phase:<br>• Capital Cost: Rs. 310.45 Lakhs<br>• O & M Cost: Rs. 96.51 Lakhs per year<br>Project proponent shall operate and maintain EMF for 3 years after giving possession and shall also generate corpus fund during 3 years of Rs. 289.53 lakhs |

3. The proposal has been considered by SEIAA in its 40th meeting & decided to accord environmental clearance to the said project under the provisions of Environment Impact Assessment Notification, 2006 subject to implementation of the following terms and conditions:

(i) Commencement Certificate should not be issued to the project unless CFO clearance has been obtained. Local authority should ensure this while approving the plans.

(ii) This environmental clearance is only for sale building up to 70m height. Local Authority should ensure this and verify if any NOC required by project proponent while approving the plans.

(iii) The proposed height of the building requires NOC from High Rise Committee (HRC). If there is any change in the plans suggested by HRC, Project proponent should approach the Authority for amendment of EC along with CFO clearance

(iv) This environmental clearance is issued subject to land use verification. Local authority / planning authority should ensure this with request to Rules, Regulations, Notifications, Government Resolutions, Circulars, etc. issued if any. This environmental clearance issued with respect to the environmental consideration and it does not mean that State Level Impact Assessment Authority (SEIAA) approved the proposed land use.

(v) The height, Construction built up area of proposed construction shall be in accordance with the existing FSI/FAR norms of the urban local body & it should ensure the same along with survey number before approving layout plan & before according commencement certificate to proposed work. Plan approving authority should also ensure the zoning permissibility for the proposed project as per the approved development plan of the area.

(vi) "Consent for Establishment" shall be obtained from Maharashtra Pollution Control Board under Air and Water Act and a copy shall be submitted to the Environment department before start of any construction work at the site.

(vii) All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.

(viii) Project proponent shall ensure completion of STP, MSW disposal facility, green belt development prior to occupation of the buildings. No physical occupation or allotment will be given unless all above said environmental infrastructure is installed and made functional including water requirement in Para 2. Prior certification from appropriate authority shall be obtained.

(ix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche and First Aid Room etc.

(x) Adequate drinking water and sanitary facilities should be provided for construction workers at the site. Provision should be made for mobile toilets. The safe disposal of wastewater and solid wastes generated during the construction phase should be ensured.

(xi) The solid waste generated should be properly collected and segregated. dry/inert solid waste should be disposed off to the approved sites for land filling after recovering recyclable material

(xii) Wet garbage should be treated by Organic Waste Converter and treated waste (manure) should be utilized in the existing premises for gardening. And, no wet garbage will be disposed outside the premises. Local authority should ensure this.

(xiii) Arrangement shall be made that waste water and storm water do not get mixed.

(xiv) All the topsoil excavated during construction activities should be stored for use in horticulture / landscape development within the project site.

(xv) Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.

(xvi) Green Belt Development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/ Agriculture Dept.

(xvii) Disposal of muck during construction phase should not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

(xviii) Soil and ground water samples will be tested to ascertain that there is no threat to ground water quality by leaching of heavy metals and other toxic contaminants.

(xix) Construction spoils, including bituminous material and other hazardous materials must not be allowed to contaminate watercourses and the dumpsites for such material must be secured so that they should not leach into the ground water.

(xx) Any hazardous waste generated during construction phase should be disposed off as per applicable rules and norms with necessary approvals of the Maharashtra Pollution Control Board.

(xxi) The diesel generator sets to be used during construction phase should be low sulphur diesel type and should conform to Environments (Protection) Rules prescribed for air and noise emission standards.

(xxii) The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from concern authority shall be taken.

(xxiii) Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

(xxiv) Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB/MPCB.

(xxv) Fly ash should be used as building material in the construction as per the provisions of Fly Ash Notification of September 1999 and amended as on 27th August, 2003. (The above condition is applicable only if the project site is located within the 100Km of Thermal Power Stations).

(xxvi) Ready mixed concrete must be used in building construction.

(xxvii) The approval of competent authority shall be obtained for structural safety of the buildings due to any possible earthquake, adequacy of fire fighting equipments etc. as per National Building Code including measures from lighting.

(xxviii) Storm water control and its re-use as per CGWB and BIS standards for various applications.

(xxix) Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

(xxx) The ground water level and its quality should be monitored regularly in consultation with Ground Water Authority.

(xxxi) The installation of the Sewage Treatment Plant (STP) should be certified by an independent expert and a report in this regard should be submitted to the Ministry before the project is commissioned for operation. Treated effluent emanating from STP shall be recycled/refused to the maximum extent possible. Treatment of 100% gray water by decentralized treatment should be done. Discharge of unused treated affluent shall conform to the norms and standards of the Maharashtra Pollution Control Board. Necessary measures should be made to mitigate the odour problem from STP.

(xxxii) Local body should ensure that no occupation certification is issued prior to operation of STP/MSW site etc. with due permission of MPCB.

(xxxiii) Permission to draw ground water shall be obtained from the competent Authority prior to construction/operation of the project.

(xxxiv) Separation of gray and black water should be done by the use of dual plumbing line for separation of gray and black water.

(xxxv) Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.

(xxxvi) Use of glass may be reduced up to 40% to reduce the electricity consumption and load on air conditioning. If necessary, use high quality double glass with special reflective coating in windows.

(xxxvii) Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfill requirement

(xxxviii) Energy conservation measures like installation of CFLs /TFLs for the lighting the areas outside the building should be integral part of the project design and should be in place before project commissioning. Use CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid mercury contamination. Use of solar panels may be done to the extent possible like installing solar street lights, common solar water heaters system. Project proponent should install, after checking feasibility, solar plus hybrid non conventional energy source as source of energy.

(xxxix) Diesel power generating sets proposed as source of back up power for elevators and common area illumination during operation phase should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use low sulphur diesel. The location of the DG sets may be decided with in consultation with Maharashtra Pollution Control Board.

(xl) Noise should be controlled to ensure that it does not exceed the prescribed standards. During nighttime the noise levels measured at the boundary of the building shall be restricted to the permissible levels to comply with the prevalent regulations.

(xli) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.

(xlii) Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code, which is proposed to be mandatory for all air-conditioned spaces while it is aspirational for non-air-conditioned spaces by use of appropriate thermal insulation material to fulfill requirement

(xliii) The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation

(xliv) Regular supervision of the above and other measures for monitoring should be in place all through the construction phase, so as to avoid disturbance to the surroundings.

(xlv) Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.

(xlvi) Six monthly monitoring reports should be submitted to the Department and MPCB.

(xlvii) A complete set of all the documents submitted to Department should be forwarded to the MPCB

(xlviii) In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by this Department.

(xlix) A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.

(l) Separate funds shall be allocated for implementation of environmental protection measures/EMP along with item-wise breaks-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection

measures shall not be diverted for other purposes and year-wise expenditure should reported to the MPCB & this department.

(li) The project management shall advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the Marathi language of the local concerned within seven days of issue of this letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the Maharashtra Pollution Control Board and may also be seen at Website at http://envis.maharashtra.gov.in.

(lii) Project management should submit half yearly compliance reports in respect of the stipulated prior environment clearance terms and conditions in hard & soft copies to the MPCB & this department, on 1st June & 1st December of each calendar year.

(liii) A copy of the clearance letter shall be sent by proponent to the concerned Municipal Corporation and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

(liv) The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, $SO_2$, NOx (ambient levels as well as stack emissions) or critical sector parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

(lv) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.

(lvi) The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

4. The environmental clearance is being issued without prejudice to the action initiated under EP Act or any court case pending in the court of law and it does not mean that project proponent has not violated any environmental laws in the past and whatever decision under EP Act or of the Hon'ble court will be binding on the project proponent. Hence this clearance does not give immunity to the project proponent in the case filed against him, if any or action initiated under EP Act.

5. In case of submission of false document and non compliance of stipulated conditions, Authority/ Environment Department will revoke or suspend the Environmental Clearance without any intimation and initiate appropriate legal action under Environmental Protection Act, 1986.

6. The Environment department reserves the right to add any stringent condition or to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the department or for that matter, for any other administrative reason.

7. **Validity of Environment Clearance**: The environmental clearance accorded shall be valid for a period of 5 years.

8. In case of any deviation or alteration in the project proposed from those submitted to this department for clearance, a fresh reference should be made to the department to assess the adequacy of the condition(s) imposed and to incorporate additional environmental protection measures required, if any.

9. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution ) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling ) Rules, 1989 and its amendments, the public Liability Insurance Act, 1991 and its amendments.

10. Any appeal against this environmental clearance shall lie with the National Green Tribunal , Van Vigyan Bhawan, Sec- 5, R.K. Puram, New Dehli – 110 022, if preferred, within 30 days as prescribed under Section 35 of the National Green Tribunal Act, 2010.

(Valsa R Nair Singh)
Secretary,Environment
department & MS, SEIAA

**Copy to:**

1. Shri. P.M.A Hakeem, IAS (Retd.), Chairman, SEIAA, 'Jugnu' Kottaram Road, Calicut- 673 006 Kerla.

2. Shri. Dr. S. Devotta, Chairman, SEAC, T2/302 Sky City, Vanagaram – Ambattur Road, Chennai – 600 095

3. Member Secretary, Maharashtra Pollution Control Board, with request to display a copy of the clearance.

4. The CCF, Regional Office, Ministry of Environment and Forest (Regional Office, Western Region, Kendriya Paryavaran Bhavan, Link Road No- 3, E-5, Ravi-Shankar Nagar, Bhopal- 462 016). (MP).

5. Regional Office, MPCB, Mumbai

6. Collector, Mumbai.

7. Commissioner, Brihan Mumbai Municipal Corporation, Mumbai.

8. IA- Division, Monitoring Cell, MoEF, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi-110003.

9. Director(TC-1), Dy. Secretary(TC-2),Scientist-1,Environment department

10. Select file (TC-3).

# Government of Maharashtra

No.: SEAC- 2010/CR-293/TC-2
Environment department,
Room No. 217, 2nd floor,
Mantralaya Annexe,
Mumbai 400 032
Date: 18th February, 2013

**To,**
M/s. The Bombay Dyeing & Mfg. Co. Ltd.
Neville House, J.N. Herdia Marg, Ballard Estate,
Mumbai – 400 001

**Subject** : "ISLAND CITY CENTER" at C. S. No. 223, 1/983, 1/128 (pt) & 120 (pt) Dadar Naigaum division at G.D. Ambedkar Marg, Wadala, Mumbai by M/s. The Bombay Dyeing & Mfg. Co. Ltd. - Environmental clearance regarding.

**Reference** : Even number environment clearance letter dated 7th December 2012

**Sir,**

This has reference to your letter dated 22.11.12 on the above mentioned subject. The matter was considered in 53rd meeting of SEIAA.SEIAA decided to amend the EC letter after verifying the documents as-

**No. of Buildings–**

- Sale – Residential:
  Tower A (2 B + G + 3 parking floors + club house + 66 floors) with 247 flats
  Tower B with 3 wings (3 B + G + 7 parking floors + Club house + 26 floors) with 417 flats

2. Project information of all other points is as per minutes of SEIAA. Terms and conditions stipulated in even number environment clearance letter dated **7th December 2012** remains the same.

(Valsa R Nair Singh)
Secretary, Environment
department & MS, SEIAA

**Copy to:**

1. **Shri. P.M.A Hakeem, IAS (Retd.), Chairman, SEIAA, 'Jugnu' Kottaram Road, Calicut- 673 006 Kerla.**

2. **Additional Secretary, MOEF, 'Paryavaran Bhawan' CGO Complex. Lodhi Road, New Delhi – 110510.**

3. Member Secretary, Maharashtra Pollution Control Board, with request to display a copy of the clearance.

4. The CCF, Regional Office, Ministry of Environment and Forest (Regional Office, Western Region, Kendriya Paryavaran Bhavan. Link Road No- 3, E-5, Ravi-Shankar Nagar. Bhopal- 462 016).[MP]

5. Regional Office, MPCB, Mumbai.

6. Collector, Mumbai.

7. IA- Divisio,. Monitoring Cell, MoEF, Paryavaran Bhavan. CGO Complex, Lodhi Road, New Delhi-11000

8. Select file (TC-3).