

FORM – 1A

“REDEVELOPMENT OF BOMBAY DEVELOPMENT DIRECTORATE (BDD) CHAWLS”

At

Village Lower Parel, Worli, Mumbai

By

**MUMBAI HOUSING AND AREA DEVELOPMENT
BOARD**

(A regional unit of MHADA).

Griha Nirman Bhavan, Kalanagar, Bandra (East), Mumbai-400 051

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 programme]

1	LAND ENVIRONMENT [Attach panoramic view of the project site and the vicinity]
1.1	<p>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.</p> <p>Site Location: This is redevelopment project of BDD - Chawl at Worli, Mumbai, Maharashtra. The site under reference is located at Worli and falls within the limits of Municipal Corporation of Greater Mumbai (M.C.G.M.)</p> <p>Site History: The Bombay Development Department (BDD) was set up in 1920 by the then Governor of the province, <i>Sir George Lloyd</i> who was appointed by the British Government of India. Bombay Development Directorate (BDD) had constructed these Chawls between the years 1921 to 1925.</p> <p>There are such four different locations of BDD chawls in Mumbai at Naigaon, N. M. Joshi Marg (Lower Parel), Worli, which are on State Govt.'s land and at Sewri, which is on Bombay Port Trust land. Now these chawls are 90 years old and are in dilapidated conditions. External infrastructure provided to the buildings, such as, water supply, sewage and storm water drainage has deteriorated and is in need of urgent replacement. The overall condition of BDD chawl buildings is deteriorating and they may not sustain very long under the present condition. A contributing factor is that the maintenance of the buildings is getting expensive with each year for State PWD dept. due to very meager rent.</p> <p>A Housing policy was tabled in the legislative assembly of Maharashtra in November, 2008. The redevelopment of BDD chawls and old colonies is one of the major objectives declared in the policy. The redevelopment of BDD chawls, located in the heart of Mumbai, is envisaged as a model for redevelopment of the old colonies, so as to provide existing occupants better housing and also to optimize the development potential of the land.</p> <p>A meeting was held on 3rd Feb 2015 about redevelopment of BDD chawls in the chamber of Hon. State Housing Minister with MAHARASHTRA HOUSING & AREA DEVELOPMENT AUTHORITY (MHADA) and instructions were issued to MHADA to submit proposal. The proposal of BDD chawls was presented before Hon. Chief Minister, Govt. of Maharashtra on 7th May 2015 and as instructed, MHADA submitted the proposal to Govt. on 25th May 2015 as per DCR 33(9) of MCGM.</p> <p>As per the minutes of meeting on dt. 07/05/2015 of GOM, MHADA started procedure for invitation of expression of interest for appointment of Consultants & Architects for the redevelopment of BDD Chawls at 3 locations i.e. Naigaon, N. M. Joshi Marg (Lower Parel), Worli.</p> <p>The site under reference is located at Worli and falls within the limits of Municipal Corporation of Greater Mumbai (M.C.G.M.). There are total 121 nos. of Chawls at Worli site. These are of 90 years old</p>

and in dilapidated conditions. These Chawls are of Ground + 3 floors with 20 flats on each floor and carpet area of each tenement is 160 sq. ft.
State Cabinet Ministry has approved the redevelopment proposal on 17th March 2016.

MAHARASHTRA HOUSING & AREA DEVELOPMENT AUTHORITY (MHADA) has been appointed as Nodal Agency for this redevelopment work of BDD Chawls at Worli; vide GOM resolution dt. 30.03.2016. The land under these BDD Chawls is vested with MHADA vide GOM resolution dt. 29.08.2016. The Master plan for redevelopment project is principally approved by Empowered committee of GOM, in meeting held on 16.09.2016.

This project involves Redevelopment of existing buildings / structures along with Construction of Reservation & permissible Sale component.

Land use Pattern:

Project site is in Residential Zone and General Industrial Zone.
DP Remarks is attached as **Enclosure**.

Site Levels:

Project site land is flat.

The following details are enclosed:

1.	Site Location Map	Enclosure 4
2.	Surrounding features of the proposed site	Enclosure 5
3.	Conceptual Plan	Enclosure 6

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.**

A. Connectivity and community facilities

Project site will be well connected by roads. Nearby railway station is Lower Parel railway station of main line of Western railway. Basic amenities like School and Commercial, Bank, Dispensaries, Nursing Homes, Balwadi, Welfare Centre, Society offices, Police Chowki, Post Office are also provided within project site. Other amenities like shopping, hospitals etc. are also available nearby the project site.

B. Building Details:

Table 1: Building details

Building type	No. of Buildings	Flats /Shops/ Units
Redevelopment	87 Residential Buildings	Total Flats: 9812 Nos. Shops: 639 Nos. Balwadi: 9 Nos. Welfare Centre: 9 Nos. Society Offices: 8 Nos. Police Chowki: 6 Nos. Bank: 4 Nos. Fitness Centre: 7 nos. Dispensary: 8 Nos. Nursing Home: 4 nos. Post Offices: 3 Nos. Library: 8 Nos. Community Hall: 7 Nos.
Reservation	1 School Building	--

Sale	10 Residential Buildings & 1 Commercial building	Total Flats: 4996 Nos. Offices Club House
-------------	---	---

C. Area Statement:

Table 2: Area Statement

No.	Description	Area (Sq.mt.)
1.	Total Plot Area	2,21,424.81
2.	Deduction	82,913.16
3.	Net Plot Area	1,38,511.65
4.	Ground coverage	1,22,661.86
5.	Recreational Ground (RG) area on ground	19,584.23
7.	Built – up area as per FSI	11,15,242.30
8.	Total construction built – up area (FSI + NON FSI)	23,66,984.04

D. Parking Statement:

Parking provision is as DCR and details shall be submitted.

E. Occupancy Load:

Table 4: Occupancy Load

No.	Building	Occupancy
I	Redevelopment Building	52818
II	Reservation Building	3404
III	Sale Buildings	29942
	Total	86164

Reference: National Building Code (NBC) -2016 – Part 9, Page 11, Occupant Load

F. Water requirement for the project:

1. During Construction Phase:

- From M.C.G.M. : 41 KLD.(For workers)
- From Water tankers: 45 -50 KLD (For Construction - Depending on construction activity)

2. During Operational Phase:

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

Table 5: Water requirement (Domestic and flushing requirement)

No.	Building	Occupancy	Domestic & flushing Requirement (KLD)	
			Domestic	Flushing
I	Redevelopment Building	52818	4526	2289
II	Reservation Building	3404	85	68
III	Sale Buildings	29942	2363	1219
	Total	86164	6974	3576

Reference: Criteria for Water Requirement: National Building Code (NBC) -2016 – Part 9, Page 11, Water Requirement & CPHEEO manual

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 6: Total water requirement for the project and source

No.	Description	Quantity of water required in KLD				Source of water supply
I Construction phase						
1	For Workers	41				M.C.G.M.
2	For Construction	45-50 (Depending upon the construction activity)				Water tankers
II Operation phase						
	Description	Redevelopment	Reservation	Sale	Total	Source of water supply
1	Domestic	4526	85	2363	6974	M.C.G.M./Rain water harvesting tanks during rainy days
2	Flushing	2289	68	1219	3576	Treated sewage from STP
3	Gardening	63				Treated sewage from STP

*Water requirement for gardening purpose is considered as 3 liters per square meter of gardening area on ground and 1 liters per square meter of podium area.

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 7: Sewage Generation

No	Description	Quantity of Sewage generated (KLD)	Treatment/ Disposal
1.	Construction Phase	39	Disposal of sewage to sewer line
2.	Operation Phase	9155	Treatment in STP and reuse of treated sewage (available for recycling – 8240 KLD) for flushing (3576 KLD), gardening (63 KLD) and watering of PG areas within the premises. Excess treated sewage during non-monsoon season and monsoon season shall be disposed to sewer line. The dried sludge shall be used as manure for plants within the premises.

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

H. Solid Wastes:

1) During Construction Phase:

Table 8: Solid Wastes During Construction Phase

No. of workers	Solid Waste Generation Kg /day		
	Non-Biodegradable	Biodegradable	Total
500	30	20	50

Considerations for solid waste generation:

- For workers: 40% biodegradable garbage and 60% non biodegradable garbage out of total 0.1 Kg/person /day

The solid waste generation due to workers dwelling on the site will be segregated and will be handed over to MCGM.

2) During Operation Phase:

Table 9: Solid Wastes During Operation Phase

No.	Building	Occupancy	Solid Waste Generation (Kg/day)		
			Non-biodegradable	Biodegradable	Total
I	Redevelopment Building	52818	13464	8976	22440
II	Reservation Building	3404	204	136	340
III	Sale Buildings	29942	7042	4695	11737
	Total	86164	20710	13807	34517

Considerations for solid waste generation as per NBC 2016:

- For Residential: 40 % biodegradable garbage and 60 % non biodegradable garbage out of total 0.450 Kg/person /day
- For Shops, School, Society Office, Welfare Centre, Bank, Post Office, Balwadi, Police Chowki, Dispensary, Nursing Home, Commercial: 40 % biodegradable garbage and 60 % non biodegradable garbage out of total 0.1 kg/person/day

The total quantities of solid waste that will be generated in the project will be 34517 kg/day. Out of which 20710 kg/day will be non-biodegradable and 13807 kg/day will be biodegradable.

- Segregation of non biodegradable and biodegradable garbage on site.
- Biodegradable garbage: Treatment in Organic Waste Converters (OWCs)
- Non- biodegradable garbage:
 - Recyclable waste : To recyclers
 - Non-recyclable waste: To M.C.G.M.
- Dried sludge from STP will be used as manure within the premises for plants.

➤ E- Waste from Offices shall be stored separately and recycled through authorized dealers.

➤ Bio – Medical Waste:

There are Dispensary & Nursing Home which shall generate small quantity of bio-medical waste. Bio-medical waste will be handled and disposed as per Bio-medical waste Management rules, 2016.

I. Power requirement:

Source of Electricity: Local Authority

Details shall be submitted

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).
	There shall have some impacts on water, air environment, power requirement but it shall be mitigated by providing proper pollution control facilities. STP shall be provided for treatment of recycling of sewage there by reducing fresh water demand. Also for water conservation, rain water harvesting shall also 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 & operation 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 shall be obtained for these buildings from registered Consulting Structural Engineer.
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)
	No
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)
	Demolition debris and Excavation material shall be partly reused & remaining shall be disposed to the authorized landfill site with prior permission of Local Authority. Construction waste generated during construction activity shall be partly reused and remaining shall be disposed to authorized landfill site
1.7	Give details regarding water supply, waste handling etc during the construction period.
	Water Requirement during Construction Phase: From Water tankers (For Construction):41 KLD (Depending upon the construction activity). From MCGM (For Workers):45 - 50 KLD The sewage generated approximately 39 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: Construction waste generated during construction activity shall be partly reused and remaining shall be disposed to authorized landfill site. From Construction labour : Segregation of wastes generated by construction labours into biodegradable and non-biodegradable and shall be handed over to M.C.G.M. Biodegradable garbage = 20 kg/day Non-biodegradable garbage = 30 kg/day Total = 50 kg/day Proper segregation of the wastes done and shall be handed over to Local Authority.
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.

Water Requirement & Source:

During Construction Phase –

For Workers : From M.C.G.M.: 41 KLD

For Construction : From Water tankers : 45-50 KLD

During Operational Phase

Table 11: Total Water Requirement & Source

Description	Quantity of water required (KLD)				Source of water supply
	Redevelopment	Reservation	Sale	Total	
Domestic	4526	85	2363	6974	M.C.G.M./Rain water harvesting tanks during rainy days
Flushing	2289	68	1219	3576	Treated sewage from STP
Gardening		63			Treated sewage from STP

- 2.2 **What is the capacity (dependable flow or yield) of the proposed source of Water?**
Domestic Water Supply from Municipal Corporation of Greater Mumbai (M.C.G.M.)
- 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 supply shall be supplied 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 (3576 KLD) & gardening (63 KLD) would be fulfilled by treated sewage from STP. Excess treated sewage shall be disposed to 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)**
Drinking water supply shall be supplied from M.C.G.M.
- 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 all buildings will be 9155 KLD and will be treated in full fledged Sewage Treatment Plants (STPs) of adequate capacities. Treated sewage will be reused for flushing (3576 KLD) and gardening (63 KLD). Excess treated sewage shall be disposed to sewer line. The dried sludge shall be used as manure for plants within the premises.
- UNTREATED AND TREATED SEWAGE QUALITY:**
- Table 12: Untreated & Treated Sewage Quality**
- | No. | Details | Values | | Units |
|-----|------------------------|-----------|-----------|--------|
| | | Untreated | Treated | |
| 1. | pH | 7.0 – 8.0 | 6.5 – 7.5 | -- |
| 2. | Total Suspended solids | 200 – 450 | <10 | mg/lit |
| 3. | Chemical Oxygen Demand | 400 – 600 | <30 | mg/lit |
| 4. | BOD, 3 day, 27 °C | 250 – 400 | <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.**

	Provision of Rain Water Harvesting system shall be done. Details shall be submitted																										
2.8	<p>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?</p> <p>Computation of the external catchment area contributing the project site and subsequently estimation of the contributing runoff & capacities of external drain study report shall be submitted in EIA report</p> <p>Precaution to avoid water logging on site:</p> <ul style="list-style-type: none"> • Minimizing the incremental runoff from the site with the help of rain water harvesting system • Proper management of channelization of storm water from site by using proper SWD system and discharge points of adequate capacity • Use of screens and silt traps to SWD • Proper maintenance of storm water drainage to avoid choking of drains and flooding on site 																										
2.9	<p>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)</p> <p>The ground water table at the project site high i.e. 5.5 mt. to 7.2 mt., hence ground water recharging is not proposed.</p>																										
2.10	<p>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).</p> <p>The runoff from the site during construction phase would be prevented as under:</p> <ol style="list-style-type: none"> 1. Use of polymeric dust suppression spray for dust suppression instead of use of water 2. Curing water should be sprayed on concrete structures, free flow of water will not be allowed for curing 3. Use of wet jute cloth covering the walls and soaking the same with minimum quantity of water to avoid dripping. 																										
2.11	<p>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).</p> <p>Storm water drain is designed considering peak runoff after development and in accordance to the governing authority regulations</p>																										
2.12	<p>Will the deployment of construction laborers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)</p> <ul style="list-style-type: none"> • Disposal of sewage to Sewer line. • Disposal of segregated waste to M.C.G.M. • First aid and medical facilities • Proper housekeeping • Site sanitation 																										
2.13	<p>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).</p> <p>Design Basis of Treatment plant – MBBR (MOVING BED BIO REACTOR)</p> <p>Table 13: Untreated & Treated Sewage Quality</p> <table border="1"> <thead> <tr> <th rowspan="2">Details</th> <th colspan="2">Values</th> <th rowspan="2">Units</th> </tr> <tr> <th>Untreated</th> <th>Treated</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>7.0 – 8.0</td> <td>6.5 – 7.5</td> <td>--</td> </tr> <tr> <td>Total Suspended solids</td> <td>200 – 450</td> <td><10</td> <td>mg/lit</td> </tr> <tr> <td>Chemical Oxygen Demand</td> <td>400 – 600</td> <td><30</td> <td>mg/lit</td> </tr> <tr> <td>BOD, 3 day, 27 °C</td> <td>250 – 400</td> <td><10</td> <td>mg/lit</td> </tr> <tr> <td>Oil & Grease</td> <td>50</td> <td><5</td> <td>mg/lit</td> </tr> </tbody> </table>	Details	Values		Units	Untreated	Treated	pH	7.0 – 8.0	6.5 – 7.5	--	Total Suspended solids	200 – 450	<10	mg/lit	Chemical Oxygen Demand	400 – 600	<30	mg/lit	BOD, 3 day, 27 °C	250 – 400	<10	mg/lit	Oil & Grease	50	<5	mg/lit
Details	Values		Units																								
	Untreated	Treated																									
pH	7.0 – 8.0	6.5 – 7.5	--																								
Total Suspended solids	200 – 450	<10	mg/lit																								
Chemical Oxygen Demand	400 – 600	<30	mg/lit																								
BOD, 3 day, 27 °C	250 – 400	<10	mg/lit																								
Oil & Grease	50	<5	mg/lit																								

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

• **Preliminary Treatment:**

The treatment will include the following unit / equipment;

- Screen Chamber
- Oil & Grease Trap
- Raw Sewage 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 scraped and collected in drums to be disposed as per statutory norms. The sewage will be collected in raw collection tank. Uniform mixing is achieved by providing aeration grid (air sparing) 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 from raw sewage collection tank 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 sent to the Sludge collection pit and shall be dewatered using a Filter press. The filtrate will be taken to the Raw Sewage Collection Tank. The dried sludge shall be used as manure for gardening.

• **Tertiary Treatment:**

The treatment will include the following unit / equipment;

- Filter feed tank
- Pressure Sand Filter (PSF)
- Activated Carbon Filter (ACF)
- 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 PSF followed by ACF. 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 shall be used for secondary requirement.

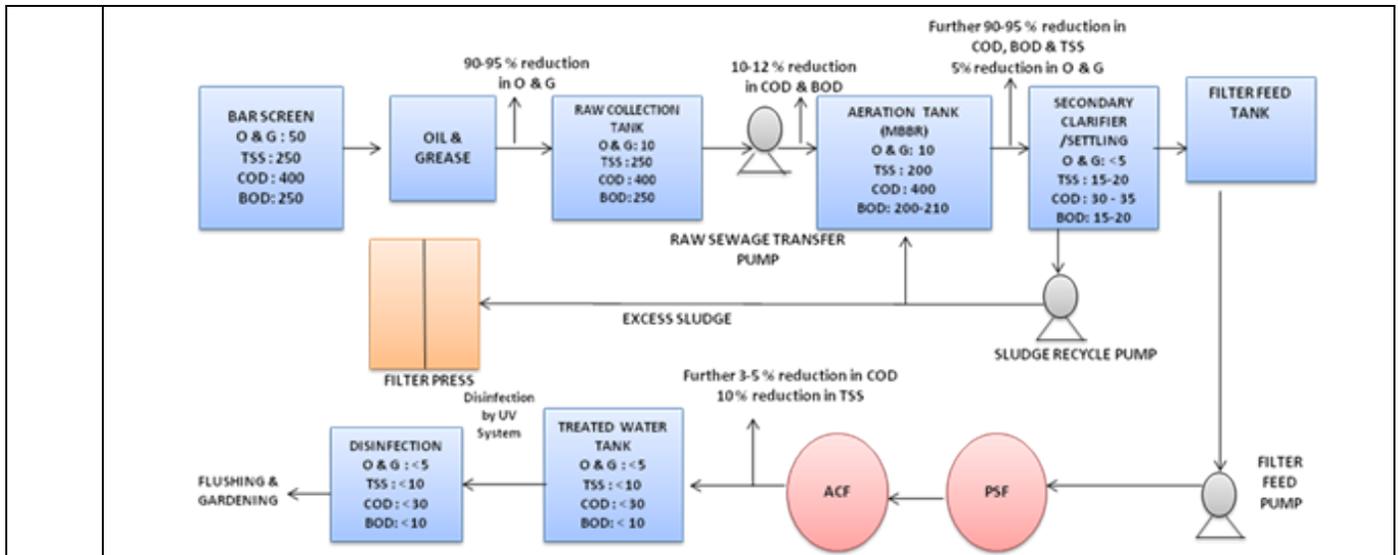


Figure: STP process diagram (MBBR process)

2.14	<p>Give details of dual plumbing system if treated waste used is used for flushing of toilets or any other use.</p> <p>Recycling of treated sewage for flushing & gardening shall be done Color coding for dual plumbing system shall be done as per standard practices.</p>
3	VEGETATION
3.1	<p>Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with its unique features, if any)</p> <p>No.</p>
3.2	<p>Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project).</p> <p>Detailed account of the trees & vegetation affected by the project shall be submitted.</p>
3.3	<p>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)</p> <p>New trees of various varieties shall be planted as per local norms</p>
4	FAUNA
4.1	<p>Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.</p> <p>No</p>
4.2	<p>Any direct or indirect impacts on the avifauna of the area? Provide details.</p> <p>No</p>
4.3	<p>Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna.</p> <p>Not applicable.</p>
5	AIR ENVIRONMENT
5.1	<p>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)</p> <p>One season baseline data for ambient air parameters namely RSPM, Oxides of Sulphur, Oxides of Nitrogen and CO at project site and within study area along with Air Quality Modelling study report shall be detailed out in EIA report.</p>
5.2	<p>What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.</p>

	<p>Sources of Air pollution During Construction phase :</p> <ul style="list-style-type: none"> • Increased level of dust and other air pollutants due to 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 <p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Use of polymeric dust suppression system wherever possible. • 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 workers • Provision of masks to workers <p>Sources of Air pollution During Operational phase :</p> <ul style="list-style-type: none"> • The gaseous emissions from vehicles • Emissions from DG sets <p>Mitigation Measures:</p> <ul style="list-style-type: none"> • 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 trees of various varieties which will act as noise and dust buffers <p>Generally for EIA studies of construction projects we use secondary data from nearest base station of Indian Metrological Department (IMD), Regional Metrological Centre, Mumbai (Being nearest base station). The parameters for which data have been collected are Wind speed, Wind direction, Temperature, Relative humidity and same shall be reported in EIA.</p>
5.3	<p>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.</p> <p>The project proponents have planned well organized parking arrangement & traffic management plan. Present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site shall be submitted.</p>
5.4	<p>Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.</p> <ul style="list-style-type: none"> • The project proponents have proposed to provide adequate well organized parking arrangement. • Separate entry /exit points for different sector • Use of proper lane marking from the external road to car park • Proper directional arrows used in parking bays • Proper internal road designed for avoiding traffic <p>Detailed Traffic movement and management plan shall be submitted.</p>
5.5	<p>Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.</p> <p>Sources of Noise pollution During Construction phase :</p> <ul style="list-style-type: none"> • Noise due to demolition and construction activities

	<ul style="list-style-type: none"> • Impact due to transportation activities • Nuisance due to noise polluting work at night • Noise due to DG sets <p>Mitigation Measures:</p> <ul style="list-style-type: none"> • During 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 • No noise polluting work in night shifts • Provision of barricades along the periphery of the site • Acoustic enclosure for DG sets. <p>Sources of Noise pollution During Operational phase :</p> <ul style="list-style-type: none"> • Impact of noise due to vehicular traffic • Noise generated due to DG sets <p>Mitigation Measures:</p> <ul style="list-style-type: none"> • 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 new trees of various varieties • Maintain acoustic enclosure for DG sets
5.6	<p>What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.</p> <p>D.G. Set will be operated only in case of power failures during operational phase. The Pollutants like RSPM, SO₂ that may arise from emissions from D.G. Sets will be discharged through vent of proper height. 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.</p>
6	AESTHETICS
6.1	<p>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?</p> <p>No.</p>
6.2	<p>Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?</p> <p>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 Program.</p>
6.3	<p>Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.</p> <p>No</p>
6.4	<p>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.</p> <p>Not Applicable</p>
7	SOCIO-ECONOMIC ASPECTS:
7.1	<p>Will the proposal result in any changes to the demographic structure of local population? Provide the details.</p> <p>There will be influx of about ~ 33346 persons. (Reservation and Sale occupancy only)</p>
7.2	<p>Give details of the existing social infrastructure around the proposed project.</p> <p>The project is a building construction and Area Development project which includes modern and necessary amenities. Civil structures, School, Colleges, Hospitals, Recreation facilities, Markets, etc. are available in the area to a reasonable degree.</p>

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)
	Cement containing fly ash shall be used. Construction materials from nearest source shall be chosen to minimize fuel consumption for transportation
8.2	Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?
	The material required for construction activities shall be procured from company's authorized / approved vendors only. The vendor's performance is monitored periodically. In case of urgency or non-availability of materials from authorized/approved vendors, it will be procured from the open market to maintain the pace of the work. The mode of transport for above materials will be by trucks and / or by trailers. <ul style="list-style-type: none"> • The construction material shall be carried in properly covered vehicles • All the contractors / Vendors shall be instructed to use vehicles having PUC certificates • Security staff presents at site will supervise loading and unloading of material at site • Construction material shall be stored at identified site/ temporary Godowns at site • Suitable construction platform for vertical expansion project provided at site.
8.3	Are recycled materials used in roads and structures? State the extent of savings achieved?
	Cement containing fly ash shall be used. Construction materials from nearest source shall be chosen to minimize fuel consumption for transportation
8.4	Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.
	<ul style="list-style-type: none"> • Segregation of non biodegradable and biodegradable garbage on site • Bio degradable garbage: Treatment in OWCs (Organic Waste Convertors) • Non- biodegradable garbage: Segregated into recyclable and non-recyclable waste <ul style="list-style-type: none"> ○ Recyclable waste: Shall be handed over to recyclers & ○ Non-recyclable waste: Shall be handed over to M.C.G.M. • STP Sludge (Dry sludge): Use as manure within the premises for plants • E- Waste shall be stored separately and disposed to authorized recyclers. • Bio-medical waste will be handled and disposed as per Bio-medical waste Management rules, 2016
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?
	Source of Electricity: Local Authority Details shall be submitted
9.2	What type of, and capacity of, power back-up to you plan to provide?
	DG sets shall be provided for emergency backup during power failure including environmental management facilities.
9.3	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?
	ECBC Compliance analysis Study report shall be given in EIA report
9.4	What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.
	The roof shall be insulated so that there will not be direct heat gain due to sunlight.

9.5	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.
	Provision of Solar panels
9.6	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?
	It is proposed to insulate the roofs of these buildings to minimize the heat gain and intern saving the electricity.
9.7	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-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.
	This is not a centrally air conditioned building, hence not applicable.
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?
	The proposed project is of residential & commercial type and will not have space conditioners or glass wall. Alteration of microclimate is not notable in this case. Systematic design of buildings in order to assure light ventilation, open spaces , green areas , tree plantation as per requirement are considered which will help to reduce the effect of creation of heat island.
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.
	It is proposed to insulate the roofs of these buildings to minimize the heat gain and intern save the electricity. ECBC Compliance analysis Study report shall be given in EIA report
9.10	What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.
	Precautions and safety measures against fire hazards shall be proposed as per CFO norms.
9.11	If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.
	ECBC Compliance analysis Study report shall be given in EIA report
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.
	Provision of solar panels
10	Environment 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. Project specific EMP with location and design specific details shall include the following elements for construction phase and operation phase <ul style="list-style-type: none"> • Air Pollution Control and Management • Noise Control and Management • Water Conservation • Sewage Treatment and Operation and Maintenance • Storm water management • Solid, Hazardous and E Waste Management • Energy Conservation and use of Non conventional energy

- Traffic Management
- Plantation, Landscaping and Land Management
- Management of Social Issues Occupational, Safety and Health issues
- Environmental Monitoring
- Emergency Response Plans for emergency scenarios
- Environmental Management System

For the effective and consistent functioning, 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 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

Detailed environment management plan including design specific, location specific, & operation phase attributes shall be submitted in EIA report.