

# **EXECUTIVE SUMMARY**

*for*

**Redevelopment of Residential Building**

**at**

*C. S. No. 1/1 and 1(pt) of Worli Division in G/S Ward,  
Mumbai.*

Developer

**M/s Joy Home Creations Pvt. Ltd.**

Mumbai the capital of Maharashtra is also the financial capital and the most populated city of India. Mumbai has grown in recent decades for many residential and commercial developments. Diminishing of Industrial zones and development of corporate offices, mall culture in very short period is one of the features of today's Mumbai. Mumbai has many old, dilapidated structures. They are very unsafe to retain. Many of them are in CRZ zones. Development of those by rehabilitant those tenants along with development of new flats to compensate the development charges will not be possible if Extra FSI is not used. Because of CRZ conditions the FSI restriction makes those structures unattended.

## **1.1 PREAMBLE**

We are aware that there are constraints on the availability of open land within the city limits coupled with fast growing demand for houses and shortage of housing stock. On the other hand that there are thousands of ageing buildings which are dilapidated and have reached a stage where it is not possible to carry out structural repairs and rehabilitation as the same are not economically viable. The redevelopment of cess dilapidated building has become a necessity since the problem of old and dilapidated buildings in the city of Mumbai grows more acute with each passing year and with each passing monsoon more and more building becomes dangerous and unfit for habitation. Hence, M/s Joy Home Creations Pvt. Ltd. has identified business possibility in this field to provide space for accommodation.

## **1.2 NEED OF PROJECT**

Many buildings collapse each year, killing or injuring people. Many of these buildings are so run down that they are unrepairable and the only solution is to put them down totally and to reconstruct them. Government has floated various schemes wherein they have allowed incentive FSI for carrying out redevelopment schemes. Proposed redevelopment thus will help the existing tenants to get permanent, safe structure. At present they are residing in old building.

Proposed redevelopment on plot bearing C. S No. 1/1 & 1(pt) of Worli Division in G/S Ward, Mumbai belongs to Cess category as per Category Certificate AA&C/GS/Dak-3242/2013-14 dated 25<sup>th</sup> Oct 2013 for building No. 170E, 170DD & 170D, bearing G/S ward nos. GS-6(1D), GS-6(1E) and GS-6(1F) situated at Annie Besant Road, Worli, Mumbai.

Ward No.	A/c No.	Category
GS-6(1D)	GS-14-0045-007-0000	‘AR’
GS-6(1E)	GS-14-0046-003-0000	‘AR’ & ‘ANR’
GS-6(1F)	GS-14-0047-000-0000	‘AR’ & ‘ANR’

In accordance to with the D.C. Regulation 33(7) and Appendix – III to this regulation 33(7) as the above mentioned property is affected by CRZ as per Govt. of India Notification issued under No.SO-114(E) of 19.02.1991 Coastal Regulation Zone Notification 2011 issued under SO. 19(E) dated 06.01.2011 and Office Memorandum issued by MCZMA, Environment Department, Government of Maharashtra dated 02.07.2011, Notification No. TPB 4308/3224/CR-268/08/UD-11 dated 2<sup>nd</sup> March 2009. The Proposed plot is occupied by a Cessed ‘‘AR’ & ‘ANR’’ category building, which is proposed to be redeveloped. As per MoEF Notification dated 6/1/2011, redevelopment of dilapidated, cessed and unsafe buildings in CRZ areas are permitted with special advantages, in which the project is planned as per DCR’s in force as on 6/1/2011 and staircase/ lobby/ lift area is claimed free of FSI, as per clause 35(2)c of DCR 1991. The proposal is submitted for prior CRZ clearance, as per the requirement of amended CRZ notification - 2011 and the check list finalized by MCZMA vide Office Memorandum dated 02/07/2011. The photographs of buildings are given in Figure 1.1 below.



**Figure 1: Photographs of Existing Buildings**

### 1.3 APPLICABILITY OF CRZ NOTIFICATION

As the site under reference is affected by CRZ-II zone, it attracts the CRZ legislation as per 6<sup>th</sup> January 2011 notification for Coastal Regulation Zone (CRZ and the regulating activities in the CRZ). According to para 4 (d) of CRZ notification 2011, the proposal for the construction in the areas falling in CRZ-II shall be approved by the concerned State or Union territory Planning authorities. In accordance with this notification one can obtain recommendations from the concerned CZMA and subsequently CRZ clearance accord on the basis of requisite documents like Form I, CZMP map, DP plan etc.

### 1.4 IDENTIFICATION OF PROJECT PROPONENT

M/s Joy Home Creations Pvt. Ltd. has proposed redevelopment of a residential building on subjected land. The details of the project proponent are given in Table 1.1.

**Table-1.1: Details of Contact Person**

Sr. No.	Particular	Details
1	Name of Developer	M/s Joy Home Creations Pvt. Ltd.
2	Name of Contact person	Mr. Pradeep Parte
3.	Designation of Contact person	Vice President – Liaisoning
4.	Contact No	+91-9820074695
5.	Email	Pradeep.Parte@dheerajrealty.com
6.	Address	M/s Joy Home Creations Pvt. Ltd. 306 Madhava 3 <sup>rd</sup> floor, C-4, BandraKurla Complex, Bandra (East), Mumbai-400051

### 1.5 LOCATION OF THE PROJECT

The proposed project admeasuring about 4970.41 sq. m. of plot area is situated on C. S No. 1/1 & 1(pt) of Worli Division in G/S Ward, Mumbai. The Google image of the proposed site is given in Figure 1.2 and Location of Proposed Project on CZMP Map is given in Figure 1.3.





Figure 2.2 Location of Proposed Project on Google Image

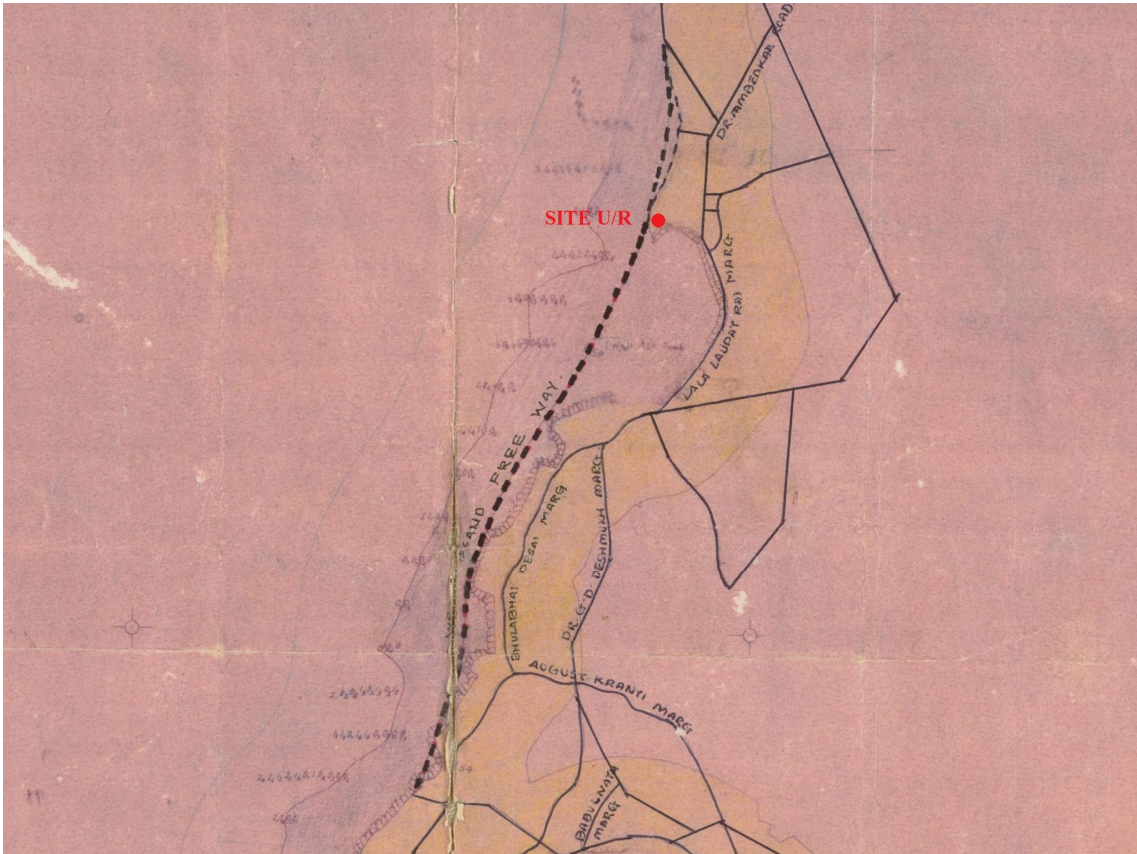


Fig. 1.3: Showing Location of Proposed Project on CZMP Map

## 1.6 DESCRIPTION OF PROJECT SITE

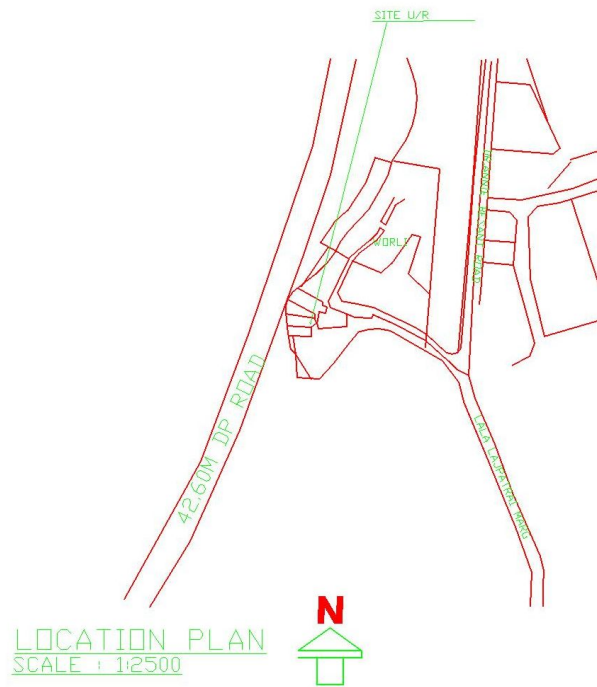
The proposed project has existing access road from Lala Lajpatrai Marg at Worli. The environmental features are illustrated in given Table 1.2 given below.

**Table-1.2: Environmental Setting of Proposed Project**

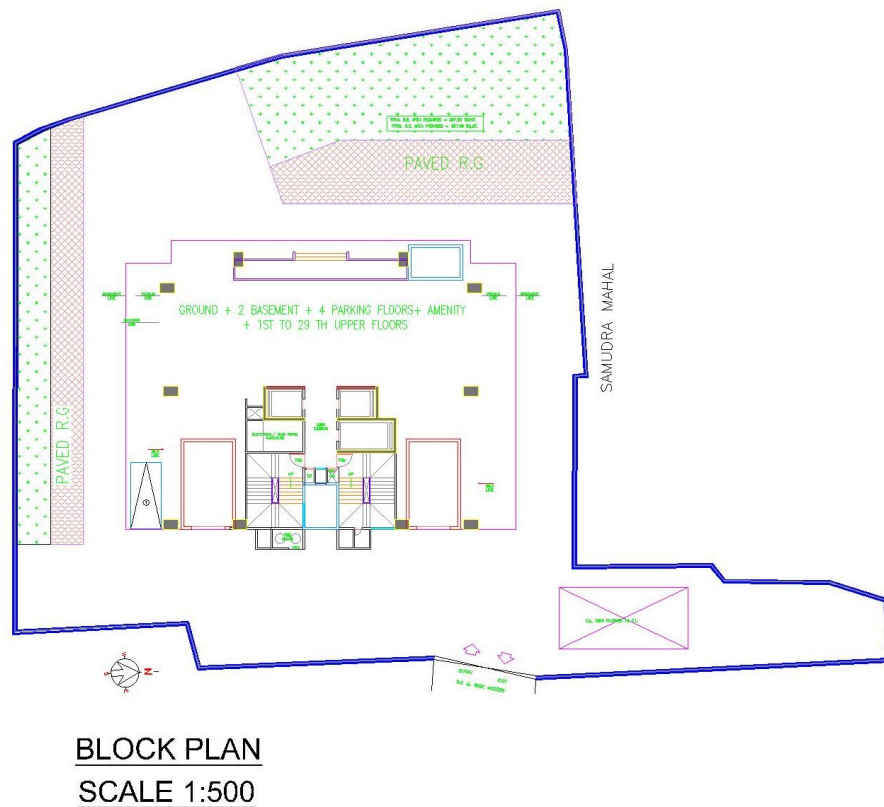
Sr. No.	Particulars	Details
1	Latitude	18 <sup>0</sup> 59' 15.74" N
2	Longitude	72 <sup>0</sup> 48' 40.21" E
3	Elevation above MSL	7.0 m above Mean Sea Level
4	Climatic Conditions	Maximum Temperature :34.4 °C Minimum Temperature :17.5 °C Annual Rainfall :2567.5 mm
5	Present land use at the proposed site	Residential
6	Transport Connectivity	
A	Nearest Highway	Lala Lajpat Rai Marg
B	Nearest Railway Station	Mahalaxmi Station (1.5 km – SE)
C	Nearest Road	Dr. Annie Besant Road Motilal Sanghi Road
7	Social Aspect	
A	Nearest School/College	Happy Home & School for the Blind (550 m- NE) Lala Lajpat Rai College of Commerce (2 km - S) Lala Lajpat Rai Institute of Management (2 km -S)
B	Nearest Hospital	Childrens Orthopaedic Hospital (1.2 km - S) Indian Medical Association (1.7 km -S)
C	Nearest Fire Station	
8	Hills/Valleys	Nil
9	Ecologically sensitive zones within 15-km distance	CRZ - II
10	Seismic Zone	Zone – III

## 1.7 PROJECT LAYOUT

The proposed project is a redevelopment project which comprises of 2 Basement + Ground + 4 parking floors + Amenity + 1<sup>st</sup> to 29<sup>th</sup> Upper residential Floors for residential purpose. The plan showing the location plan and block plan of the proposed project are shown in Figure 1.4 and 1.5 respectively.



**Figure 1.4: Location Plan of the Proposed Site**



**Figure 1.5: Block Plan of the Proposed Site**



## 1.8 BRIEF DESCRIPTION OF PROJECT

The brief description of the proposed project is given Table 1.3.

**Table 1.3: Brief description of the project**

#	Particular	Details
1	Project Type	Residential
2	Location	
	CTS No	CTS No. 1/1 & 1(pt)
	Village	Worli division
	Tehsil	Worli
	District	Mumbai
	State	Maharashtra
3	Site fall under CRZ I/II/III	CRZ - II
4	Distance of proposed building from HTL	20 m (approx.)
5	Proposed Plot Area	4970.41sq. m
6	Permissible FSI	2.50
7	Permissible BUA	12425.62 sq. m
8	Proposed BUA	12425.62 sq. m
9	Total Construction area	28700 sq. m
10	No of Building	1
11	Configuration of proposed Buildings	2 Basement + Ground Floor + 4 Parking Floors + Amenity + 1st To 29th Upper Floors.
12	Population	958 (Residents + Guest + Servants + Club house)
13	Water	
a	Source	MCGM
b	Total water requirement	124 KLD
c	Total sewer generation	99 KLD
d	Mode Of Disposal	Excess wastewater to Municipal Sewer line after treatment in STP
14	Solid Waste Generation	409 kg/day
	Mode of Disposal	In house management - OWC/Handed over to MC
16	Power	
a	Requirement	Connected Load: 1988 KW Maximum Demand: 1105 KW
b	Source	B. E. S. T
17	Project cost	4 Cr. 19 Lacs
18	Parking Details	Parking Provided: 85 Nos.

## 2.0 DESCRIPTION OF THE ENVIRONMENT

### 2.1 METEOROLOGICAL

<i>Relative Humidity</i>	<i>Temperature</i>	<i>Rainfall</i>
Climate of district Mumbai can be generally classified as warm and moderately humid. Relative humidity ranges from 32 % in April to 82 % in July.	Annual Mean Maximum Temperature: 36 °C Annual Mean Minimum Temperature: 16.5 °C	Total Mean Annual Rainfall: 2567 mm

### 2.2 AMBIENT AIR QUALITY

The range of average values of the pollutants is as below.

Parameters	Range of Pollutants Present	Unit
SO <sub>2</sub>	19.0 – 29.0	µg/m <sup>3</sup>
NO <sub>x</sub>	26.5 – 42.0	µg/m <sup>3</sup>
RSPM	78.0 – 168.0	µg/m <sup>3</sup>

### 2.3 NOISE LEVEL

#### *Day Time Noise Levels [(L<sub>day</sub>)]*

The noise levels ranged between 48.20 dB (A) to 74.60 dB (A).

#### *Night Time Noise Levels (L<sub>night</sub>)*

The noise levels ranged between 25.99 dB (A) to 51.15 dB (A).

### 2.5 WATER QUALITY

#### Ground Water Quality:

Parameters	Units
pH	7.8
Suspended Solids	40.0 mg/L
TDS	280 mg/L
Conductivity	300 µs/cm
Chloride	302 mg/L
Hardness	200 mg/L

### 2.5 DEMOGRAPHY AND SOCIO –ECONOMIC PROFILE

Ward	Area	Land Area	Households	Population	Density/Km <sup>2</sup>
G/S	Worli	10 Sq. Km	112639 Apporx.	5,63,195 Apporx.	56,319 Apporx.

Source: District Census Hand Book

**3.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES****3.1 WATER SUPPLY AND WASTE WATER MANAGEMENT****Construction Phase:****Water Supply:**

During construction phase, water will be supplied by MCGM for drinking and other domestic purposes of the construction labours and by tankers to be used for construction. Total water requirement during the construction phase is about 08 cmd. Water will be utilized for domestic use of construction laborers and for construction activity.

**Waste water generation:**

Waste water during the construction phase will be sewage generation, estimated as 8 cmd (80% of water supplied). The details of Water Requirement and Waste generation during Construction Phase are given in Table 1.4.

**Table 1.4: Water Requirement and Waste generation during Construction Phase**

Sr. No.	Purpose	Source	Quantity (cub.m/day)	Waste water generated (cub.m/day)
1.	Domestic use of construction workers	MCGM	10	8 (@80% of water supply)
2.	Construction activity	Tanker water	40	--
	<b>Total</b>		<b>50</b>	<b>8</b>

**Management:**

1. Temporary toilets would be made available for construction workers. It would be directly connected to the existing municipal sewer line for disposal of wastewater.
2. Care will be taken to ensure that the water used for construction purposes does not accumulate on the site to prevent breeding of mosquitoes.

**Operation Phase:****Water Supply:**

During operation phase, water supplied by MCGM will be used for domestic purpose and for other purposes like flushing, gardening etc,

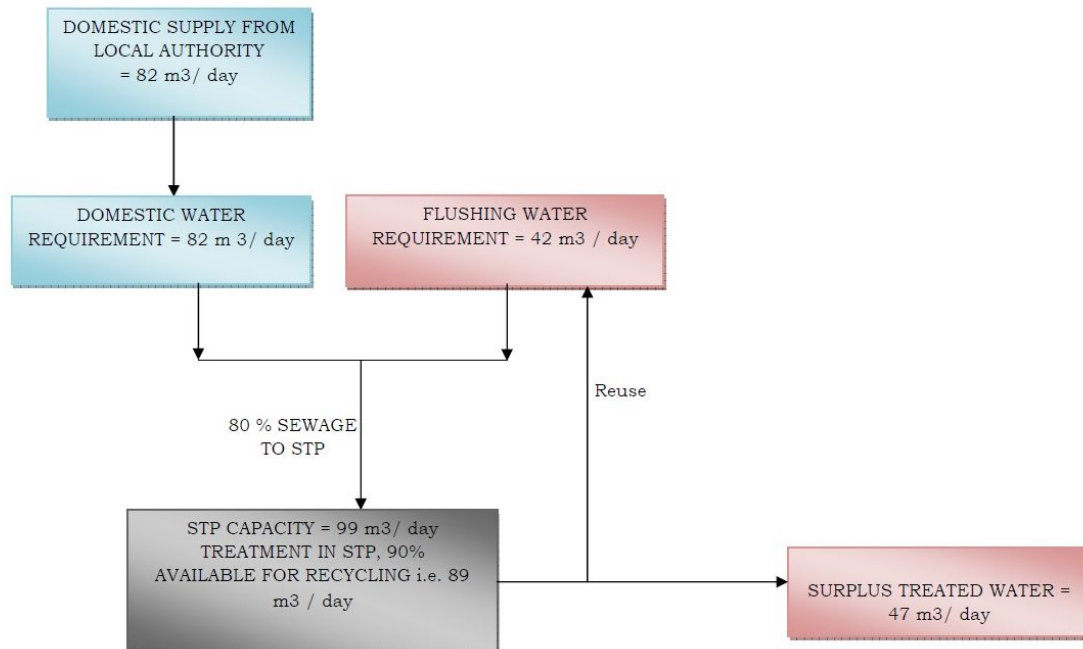
**Water requirement**

The average water consumption for residential buildings has been calculated as 135 litre per capita per day (90 liter for domestic purposes and 45 liter for flushing) (as prescribed by the Central Public Health and Environmental Engineering Organization or CPHEEO). During operation phase, water supplied by MCGM would be used for domestic purpose and for other purposes like flushing & gardening etc., treated water from proposed Sewage Treatment Plants (STP) would be used. The details of Water Requirement and Waste generation during Operation Phase are given in Table 1.5 A and 1.5 B. Water Balance during Monsoon and non-monsoon season is given in figure 1.6A & 1.6 B respectively.

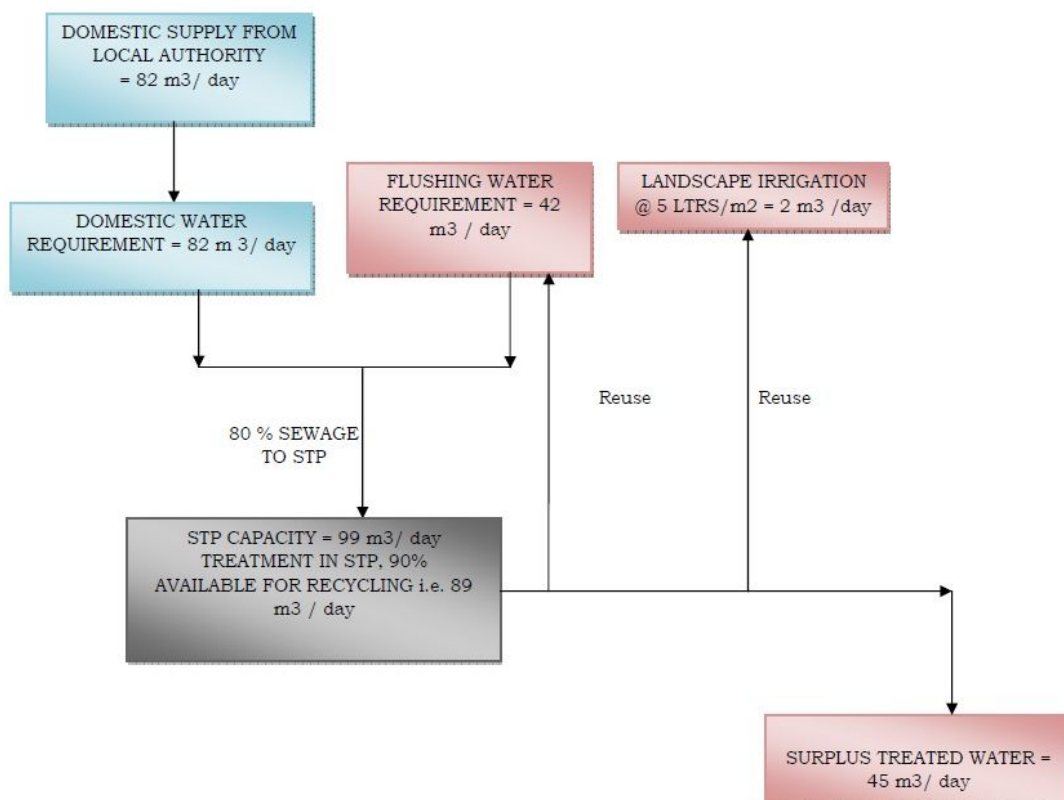
**Table 1.5 A: Water Requirement during Operation Phase**

<b>Purpose</b>	<b>Quantity (CMD)</b>
Total water requirement	124
Domestic water requirement	82
Flushing water requirement	42
Landscape Water Requirement	2
Total sewage generation	99
Total Recycled Water	89
Balance water to sewer line	45





**Figure 1.6A: Water Balance for Monsoon season**

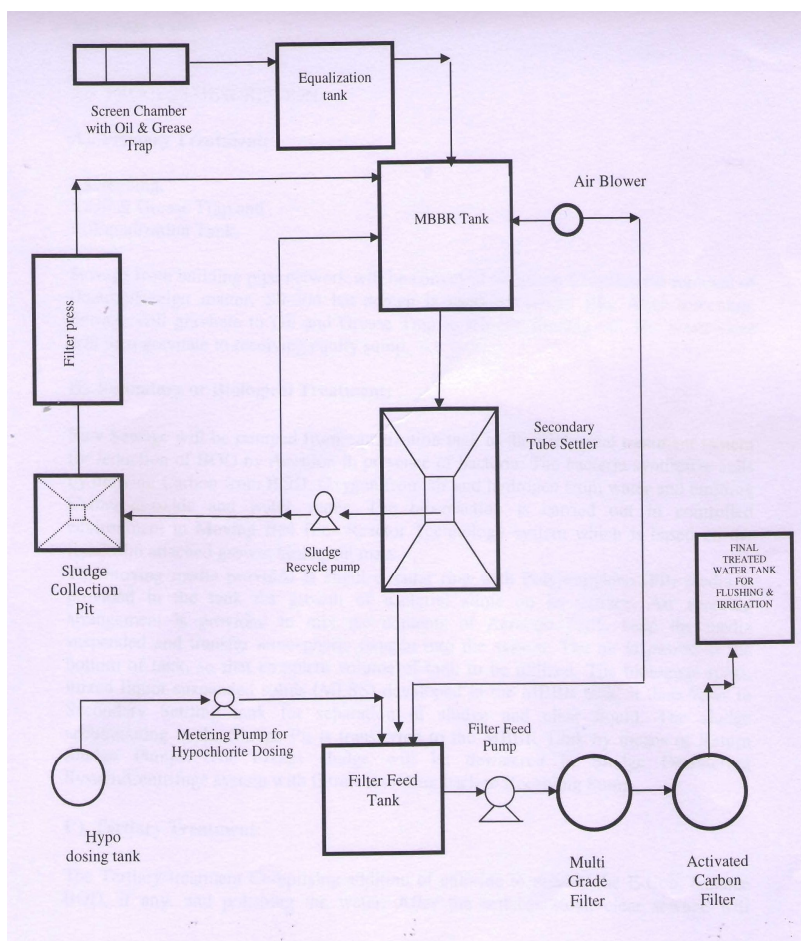


**Figure 1.6B: Water Balance for Non Monsoon season**



### Sewage Treatment Plant (STP) for Wastewater Management:

It is proposed to treat the sewage water in STP system based on **Moving Bed Bio Reactor (MBBR)** not only to reduce the level of pollution in the waste water to the limits specified by the Pollution Control Board but also make it suitable for use in Flushing and Horticulture after the necessary tertiary treatment. MBBR flow sheet is given below in Figure 1.7.



**Figure 1.7: MBBR FLOW SHEET**

### 3.2 SOLID WASTE GENERATION AND MITIGATION MEASURES

#### Construction stage

During the construction stage, construction waste would be generated which would include debris, concrete, steel and other metals, bricks, pallets, packaging and paper products, railings, door and window casings, fixtures, tiles, furnishings etc.

**Operation stage**

During operation phase, solid waste will be generated @ 0.45 Kg/day for residential purposes. The details of solid waste generated during operation phase are given in Table 1.6.

The main solid waste generated from the proposed project is due to consumption of food materials, plastic, packing material and paper. The solid waste will be segregate at the site and recyclable material will be sold out through vendors. Biodegradable waste would be transferred to mechanical composting units within the premises and rest will be disposed off into the garbage collecting vehicles of the local authorities.

**Proposed method for Solid Waste Management**

<b>Sr. No.</b>	<b>Waste Type</b>	<b>Collection and Storage</b>	<b>Method of Disposal</b>
1.	organic waste	Manual collection & storage at ground level.	Treatment in Mechanical composting units provided at the ground level within the premises. The manure generated will be used for gardening.
2.	Inorganic waste	Manual collection & storage in closed rooms at ambient temperature.	Disposed to the Municipal waste collection system and recyclable waste to be taken away by private contractor for resale.

**Table 1.6: Solid Waste Generated during Operation Phase**

Sr. No.	DESCRIPTION	No. of Flats	No of people per flat	Total No of People	Quantity of refuse Kg/person/day	Total Solid waste Generated(Kg/Day)	Bio-degradable waste generated @60% of total waste (Kg/Day)	Non-Biodegradable waste generated @40% of total waste (Kg/Day)
1	Floor 1,2,3,4,6,7,8	91	5	455	0.45	204.8	122.9	81.9
2	Floor 5	10	5	50	0.45	22.5	13.5	9.0
3	Floor 9	7	5	35	0.45	15.8	9.5	6.3
4	Floor 10,11,13,14	12	5	60	0.45	27.0	16.2	10.8
5	Floor 12	2	5	10	0.45	4.5	2.7	1.8
6	Floor 15	3	5	15	0.45	6.8	4.1	2.7
7	Floor 16,17,18,20,21,22,23,24,25,27	20	5	100	0.45	45.0	27.0	18.0
8	Floor 19&26	2	5	10	0.45	4.5	2.7	1.8
9	Floor 28	1	5	5	0.45	2.3	1.4	0.9
10	Floor 29	1	5	5	0.45	2.3	1.4	0.9
11	Servants (one for each flat considered)			149	0.45	67.1	40.2	26.8
12	Visitors			50	0.1	5	3.0	2.0
13	Club House: Area 95 Sqm (6.96 Sqm/person)			14	0.1	1.40	0.8	0.6
	<b>TOTAL</b>	<b>149</b>		<b>958</b>		<b>408.7</b>	<b>245.22</b>	<b>163.48</b>
						<b>0.41 MT/D</b>	<b>0.25 MT/D</b>	<b>0.16 MT/D</b>

OWC Details					
MODEL NO.	SPACE REQUIREMENT FOR MACHINE (M)	SPACE REQUIREMENT FOR CURING (SQR M)	ELECTRICAL SUPPLY (V)	CONNECTED LOAD (HP)	ELECTRICAL CONSUMPTION (kWh)
OWC-60	3M * 4 M	40	230	4	3

## **Proposed method for Solid Waste Management**

Mechanical-composting process and organic waste converter can be used for this purpose. The specifications of the mechanical-composting unit (Organic Waste Converter) are as follows:

- Input: Segregated organic waste
- Model: OWC-60
- Capacity: 25 kg per batch (10 batches per day)
- Batch time: 10-15 minutes
- Power: 4 HP
- Area: 3 m x 4 m for OWC

### **Single Curing System**

- Capacity: 100 Kg a day
- Size: 365 x 120 x 255 cm
- Automatic fogging system

## **Organic Waste Converter – Waste Flow Chart**

The schematic representation for the processes in the organic waste converter i.e. the Waste Flow chart:

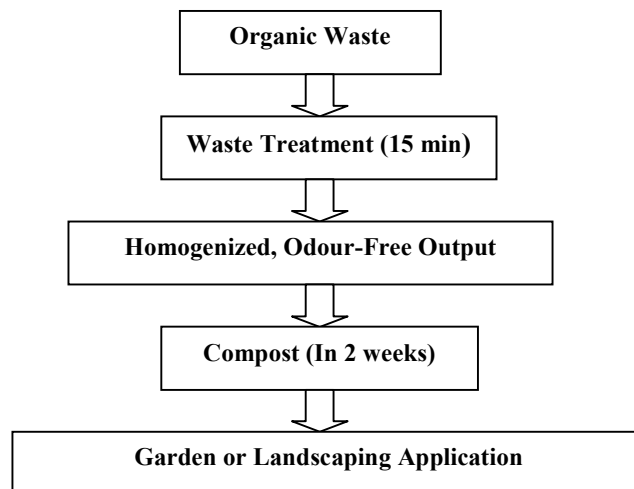




Figure 1.8: Representation of OWC Machine



Figure 1.9: Representation of Curing System

### 3.3 POWER REQUIREMENT

#### During Construction Phase:

Power required for the general purpose will be approx. 100 KW & shall be taken from Local Authority from the existing connection.

#### During Operational Phase:

**Source of Power** – B. E. S. T

**Connected Load**- 1988 KW

**Maximum Demand** – 1105 KW

**DG Back up** –DG set with Acoustic enclosures and with synchronizing Panel

2 No. DG set of 600 KVA capacities. The same will be operated for essential power requirements such as fire lifts, water pumps and passage lighting etc. As in Mumbai there is hardly any power failure is observed, but for essential back up DG set is proposed.

The building will have following energy saving measures

- External lighting is proposed on solar.
- The upper Saleable Flats will be provided with solar geysers.

### 3.4 AIR & NOISE POLLUTION & CONTROL MEASURES

The sources of air & noise pollution are D. G. sets and vehicular movement and honking. By implementing appropriate mitigation measures these effects are expected to become insignificant.

### 3.5 STORM WATER-COLLECTION AND DISPOSAL

Storm water drains will be constructed according to municipal regulations. Storm water from the entire plot will be collected through network of storm drains. Storm water from plot area will be collected in the rainwater harvesting pits provided for this purpose. The overflow from these pits, if any, will be then discharged in the proposed drains. The storm water calculations, design of Storm water Drain and Surface Runoff Prior to Construction for proposed project is given below:

<b>Storm Water calculations</b>	
<b>Rational formula for calculating runoff</b>	<b><math>Q = (C I A) / 360</math></b>
C = Co-efficient of run off I = Intensity of rainfall in mm/ hr. A = Drainage area in hectares.	
Run-off co-efficient for various types of surfaces	
a) Open grounds, unpaved street	0.10 – 0.30
b) Parks, lawns, gardens	0.10 – 0.25
c) Macadam roads, pavements	0.25 – 0.70
d) Asphalt pavements	0.85 – 0.90
e) Water tight roof surface	0.90 – 0.95
<b>Manning's formula for calculating the size of drain</b>	<b><math>Q = A \times V</math></b>
V = Velocity of flow in m/sec. n = Co-efficient of friction, 0.013 R = A/P = Hydraulic mean depth in mts. A = (Top width + bottom width)/2 x depth of flow for trapezoidal Section P = (B + 2Y) for rectangular section. S = Hydraulic bed slope. A = Bottom width x depth of flow for rectangular section P = Wetted perimeter in meters P = Bottom width + (2 x C2 x depth of flow) for trapezoidal section P = (B + 2 x C2 x Y) for trapezoidal section P = Bottom width + 2 x depth of flow for rectangular section	



P =(B + 2Y) for rectangular section. S = Hydraulic bed slope.	
<b>Design of Storm Water Drain</b>	
Catchment Area (Sqr. m)	2440
Intensity of rain fall (mm/hour)	125
Runoff co-efficient for paved areas (c1)	0.9
Paved area considered (%)	86
Catchment area for paved surface (SQ.MTR)	2107
Discharge for paved surface (Q1) (Cumecs)	0.066
Unpaved area considered (%)	14
Catchment area for unpaved surface (SQ.MTR)	333
Discharge for unpaved surface (Q2) (Cumecs)	0.003
Total run off Q = Q1 + Q2 (Cumecs)	0.069
Assume depth of RCC drain (Y) in meter	0.3
Assumed width to depth ratio	0.9
Width of the drain B = 1.35 * Y	0.27
Area of the channel (A = Y * B) in sqr m	0.081
Wetted perimeter of the channel (P = (B + 2Y)) in meters	0.87
Hydraulic mean depth (R = A/P) in meters	0.093
Assumesd slope of the RCC Channel (S ) (1 in 250)	0.004
Calucalated discharge (Cumecs)	0.081
<b>Surface Runoff Prior to Construction</b>	
Catchment Area (Sqr. m)	2440
Intensity of rain fall (mm/hour)	125
Runoff co-efficient for unpaved areas (c2)	0.3
Discharge from plot area (Cumecs)	0.025
Increased Surface Run-Off (Cumecs)	0.044

### 3.6 FIRE FIGHTING MEASURES

For protection of the facility against fire, all the units will be equipped with any one or a combination of the following fire fighting systems:

- Hydrant system;
- Smoke detector, and smoke alarm system
- Fire Detection and alarm system; and
- Different types of fire extinguishers.
- Provision of refuge area
- Precautions will be taken as per NBC & C.F.O NOC

For storage of water for fire fighting in case of emergency, a firewater underground sump will be provided. This will serve the fire fighting needs of the project.

## 4.0 ENVIRONMENTAL MONITORING PROGRAMME

### 4.1 Environmental Monitoring

The Post Project Monitoring to be carried out at the project site will be as mentioned below:

➤ **Air Pollution and Meteorological Aspects**

Both ambient air quality and stack emissions shall be monitored. The ambient air quality shall be monitored once in three months by engaging the services of the laboratory approved by SPCB/MoEF.

➤ **Wastewater Quality**

The wastewater generated from sanitation shall be monitored once in a month for physico-chemical characteristics and results reported to SPCB. The treated water from STP shall be monitored once in a month for physico-chemical characteristics and results.

➤ **Noise Levels**

Noise levels shall be monitored once in three months.

#### Environmental Monitoring Plan

During Construction Phase				
	Item	Parameters	Frequency	Location
1.	Ambient Air Quality	SPM,RSPM,SO <sub>2</sub> NOX , HC & CO	Quarterly	At major construction area. ( total 1 station )
2.	Noise Level	Equivalent noise Level dB (A)	Daily	At major construction area. ( total 1 station )
3.	Drinking Water	Analysis of water for physical, chemical, biological parameters.	Quarterly	Municipal supply
During Operation Phase				
	Item	Parameters	Frequency	Location
1.	Ambient Air Quality	SPM,RSPM,SO <sub>2</sub> NOX , HC & CO	Quarterly	Total 1 station
2.	Noise Level	Equivalent noise Level dB (A)	Quarterly	Total 1 station
3.	Drinking Water	Analysis of water for physical, chemical, biological parameters	Quarterly	Municipal supply

## **5.0 Environment Health and Safety**

All the safety and security measures shall be observed at constructions site. Safety precautions will be observed as per the guidelines during the construction phase. Personal Protective Equipments (PPE) will be provided to all the personnel involved in the construction activities. The project authorities will ensure use of safety equipments for workers during execution process. The safety and security officers shall supervise the site. Proper training will be given to workers and authorities to handle the hazard situation.

### **Safety Measures Onsite**

- 1) Parameters and Quality will be strictly adhered to as per the approved architectural design data/map. All the regulations of government authorities will be followed.
- 2) All the safely precaution will be observed as per the guidelines during the construction phase. Personal Protective Equipments (PPE) will be provided to all the personnel involved in the construction activities.
- 3) Site barricading by corrugated tin sheets up to height of 5.0 mtr will be done to protect the surrounding area of the project site from nuisance /dusting.
- 4) All electrical connections & cables will be checked by authorized persons to ensure the safety of workers on field.
- 5) Water sprinkling will be done, wherever required to reduce the dusting in atmosphere. Jute barricading along building / plot boundary shall be provided to minimize noise level from construction activities.
- 6) The safety and security officers shall supervise the site.
- 7) Safety helmets will be mandatory to all the persons present on the site during the construction Activities
- 8) Hand gloves and dust masks will be provided to persons handling construction materials during the operation.
- 9) Safety belts will be provided to the persons working at height during the operation.
- 10) Safety nets will be arranged at a height at about 5.0 mtrs when the structures get raised above the required height from the ground.

## **6.0 Additional Studies**

### **Disaster Management Plan**

This provision is applicable in the present case only to safety and fire hazard because it is a small residential unit. The only hazards envisaged here are from fire either due to short circuit

or gas cylinder in the kitchen of individual houses. There are no other manmade disasters expected. We have not considered here the natural disasters like flooding, earth quake etc.

Normal safety plans and precautions are expected to be in place as per CFO and MCGM guidelines. To maintain the ecological balance and check any probable harmful effect, proper EMP, good housekeeping around project site, have been suggested.

The fire safety measures followed will be:

- Underground and overhead water storage tank
- Exit sign & Emergency escape route sign shall be provided
- Fire pumps, Sprinkler pumps with jockey pumps to be provided
- Diesel driven standby pump
- Pressurized wet risers at mid-landing in the duct adjoining each staircase with hydrant outlet and hose reel on each floor
- Portable extinguisher and bucket filled with sand shall be kept in Electric meter room, Lift machine room and entire parking.
- Automatic smoke detection & Fire alarm system
- Provision of Refuge Area
- Fire escape staircases, fire lift & fire safety doors as per DC Regulations and in the line with NBC 2005

The Disaster Management Plan studies include:

- Identification of the major hazards to people and the environment;
- Assessment of the risks
- Develop warning system wherever possible
- Develop manpower and measures to prevent / control the risks
- Make advance preparations to face the disaster, minimize the losses, provide help to affected people
- Planning to recover from the effects of the hazard.

## 7.0 LANDSCAPING AND GREENBELT DEVELOPMENT

Adequate land will be available for open spaces and other non-building purposes approx. 397.49 sq. m. area will be taken for green cover / lawn development in the proposed facility. Suitable plant species of local varieties will be planted with adequate spacing and density for their fast growth and survival.

## 8.0 PROJECT BENEFITS

The project proponent seems to be safety conscious and alert about good housekeeping and is environment friendly. We may conclude as under:

- Proposed Redevelopment project is in Worli area of Mumbai. The site under reference is affected by CRZ-II zone. Thus property attracts the CRZ legislation, which is reflected in CZMP plan.
- The proponents are following all the Firefighting safety rules and regulations as prescribed by M.C.G.M. and CFO regulations.
- Building will be designed to meet requirements of seismic zone III-Earthquake resistant.
- Rain water harvesting system is proposed on site.
- Ambient Air Quality of the project site will be within the permissible limit as prescribed by National Ambient Air Quality Standards.
- Solid waste will be collected and segregated and kept separately for wet and dry garbage. Dry garbage will be sorted into recyclable and non recyclable. Recyclable dry garbage will be disposed to authorized recycling agencies and non recyclable will be sent to land fill sites by the municipality. Wet garbage will be treated by Organic waste converter and will be used as manure in garden area.
- Air, water, Noise, soil parameters will be studied during construction as well as after construction to minimize the environmental impact by taking proper precautionary measures.
- No significant impact is seen on flora and fauna.
- Fly-ash will be used in concrete work.
- Total 20 trees will be planted along with landscape development to improve microclimate.

- The project will generate employment opportunities during construction stage and also at operational phase.
- Proposed buildings have considered energy efficient lighting.

## 9.0 COST PROVISION FOR ENVIRONMENTAL MEASURES

### Budget Allocation for Environmental Protection

Environment Protection Measures	Capital Cost (lakh Rs.)	O & M (lakh Rs./year)
Environment Protection measures during construction stage	3.0	-
STP & Sewerage network	40	4.0
RWH System	4.0	0.2
Solid waste Management	6.0	1.8
Energy Saving measures	63.5	1.0
Green Belt development	12	1.2
<b>TOTAL</b>	<b>128.5</b>	<b>8.2</b>