FORM 1 – 1A & ENVIRONMENTAL MANAGEMENT PLAN

Proposed Redevelopment of Municipal Property – BIT Cottage

At

Plot Bearing CS No. 328/10, of Matunga Division, Bhau Daji Road, F/North Ward, Mumbai.

Developed By

M/s Heet Builders Pvt. Ltd.

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FORM I

FORM-1

(I) Basic Information

Sr. No.	Item	Details
1	Name of the Project	Proposed Redevelopment of municipal property known as BIT cottage
2	S. No. in the Schedule	8a
3	Proposed capacity/area /length/tonnage to be handled/command area/lease area/ number of wells to be drilled	**Plot Area**: 4,748.28 sq. m **FSI Area:** 9,364.19 sq. m **Non- FSI Area:** 11,438.34 sq. m **Total Construction Area:**20,802.53 sq. m
4	New/Expansion/Modernization	New Project
5	Existing Capacity/Area etc.	Vacant land
6	Category of Project i.e. 'A' or 'B'	'B'
7	Does it attract the general condition? If Yes, Please specify	No
8	Does it attract the specific condition? It yes, Please specify	NA
9	Location	
	Plot/Survey/Khasra No.	C.S. No. 328/10
	Village	Matunga
	Tehsil	Matunga
	District	Mumbai
	State	Maharashtra
10	Nearest railway station/airport along with distance in kms.	Matunga Central Railway Station 0.5 km.
11	Nearest Town, City, District Headquarters along with distance in kms.	Mumbai
12	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	Brihanmumbai Municipal Corporation(BMC)
13	Name of the applicant	Heet Builders Pvt. Ltd.
14	Registered Address	72, Nakoda Street, 1st Floor, JR, Shetty Building, Pydhonie, Mumbai 400003
15	Address for correspondence:	Ackruti Center Point, MIDC Central Road, Marol, Andheri (East), Mumbai- 400069. Tel: 022-66830600, Fax: 022-66830602
	Name	Mr. Bharat Mody
	Designation(Owner/Partner/CEO)	Director
	Address	Ackruti Center Point, MIDC Central Road, Marol, Andheri (East), Mumbai- 400069. Tel: 022-66830600, Fax: 022-66830602

	Pin Code	400069
	E-mail	
	Telephone No.	--
	Fax No.	--
16	Details of Alternative Sites examined, If any. Location of these sites should be shown on a topo sheet	No
17	Interlinked Projects	No
18	Whether separate application of interlinked project has been submitted?	NA
19	If yes, date of submission	NA
20	If no, reason	NA
21	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c) The C.R.Z. Notification, 1991?	No
22	Whether there is any Government Order/Policy relevant/relating to the site?	N/A
23	Forest land involved (hectares)	No
24	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its Relevance with the proposed project.	No

** Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area of mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.)*

(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)	No	The developers proposed 2 buildings along with 3 shops on this land which was residentially occupied hence after the development the land use will remain same i.e. residential.
1.2	Clearance of existing land, vegetation and building?	No	Since it is a vacant land, no demolition work required
1.3	Creation of new land uses:	Yes	Since the proposed project will be developed as a Residential cum Commercial Project, the land use would be residential cum commercial.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	Yes	Detailed feasibility studies and investigation are under process.
1.5	Construction works?	Yes	Construction of Residential cum Commercial Buildings has been proposed.
1.6	Demolition Works?	No	Not required as vacant land
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Temporary construction will be done inside the site for the workers.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations.	Yes	At present no construction activity on the proposed project site .The construction works for the proposed project will depict physical changes in the locality. The project involves construction of Residential and Commercial buildings. The proposed construction project comprises of total 2 building with 3 shops. The total construction area will be 20802.53sq.m.
1.9	Underground works including mining or tunneling?	No	No underground works including mining / Tunneling is required except minor activities like excavation of earth only for foundation, lay down of pipes, underground storage tank, electric cables, soak pits, septic tanks etc.

Sr. No.	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
1.10	Reclamation works?	No	Not Applicable
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable
1.13	Production and manufacturing Process?	No	Not Applicable
1.14	Facilities for storage of goods or materials?	Yes	Temporary sheds will be constructed for the storage of construction materials during construction phase as per the material requirement.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Construction Phase During the construction phase, soak pits and septic tanks will be providing for disposal of waste water. Temporary sanitary toilets will be provided during peak labor force. Operation Phase Total 251 kg/day solid waste will be generated in the project. The biodegradable waste (151 kg/day) will be processed in OWC, required amount of manure will be utilized and the rest will be handed over to the vendors and the non-biodegradable waste generated (100kg/day) will be recycled / treated / handover to KBMC Sludge generated from STP is will be used as manure, Quantity= 17 kg/Day Wastewater generated (68 KLD) from domestic uses will be treated in STP of 1 nos. 70 KLD capacity and treated water will be utilized for car washing and flushing.
1.16	Facilities for long term housing of operational workers?	No	No long-term housing facilities proposed as most of the skilled/unskilled manpower required for the construction /operation activities will be hired from the nearby areas.
1.17	New road, rail or sea traffic during construction of operation?	No	12m. wide D.P. road near the site will be utilized.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	No new Rail/road is required. The entire essential infrastructure is already available.
1.19	Closure or diversion of existing transport routes or infrastructure	No	There will be no diversion or closure of the existing transport routes and

Sr. No.	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
	leading to changes in traffic movements?		infrastructure.
1.20	New or diverted transmission lines or pipelines?	No	Not Envisaged
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Not Envisaged
1.22	Stream crossings?	No	There is no stream passing through the site.
1.23	Abstraction or transfers of water from ground or surface waters?	No	Fresh water requirement of 56 KLD will be met from BMC
1.24	Changes in water bodies or the land surface affecting drainage or run-off	No	There will be no change in the drainage pattern. The project will not materially affect the drainage or run-off in the area.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	The D.P. road near by the site will be utilized for the transportation of material and personal.
1.26	Long-term dismantling or decommissioning or restoration works?	No	NA
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	Yes	Noise pollution due to machineries and air pollution because of dust.
1.28	Influx of people to an area in either temporarily or permanently?	Yes	<u>Construction Phase</u> During the construction phase about 50-75 persons will be deployed on the site from nearby places. Influx of these people will be temporary in nature. <u>Operation Phase</u> On completion of the project, residents will occupy their property. Total population at is expected to be 631 No's
1.29	Introduction of alien species?	No	Not envisaged
1.30	Loss of native species or genetic diversity?	No	Not envisaged
1.31	Any other actions?	No	-

2. Use of Natural resources for construction or operation of 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 thereof (with approximate quantities/ rates, wherever possible) with source of information data
2.1	Land specially undeveloped or agricultural land (ha)	No	It is undeveloped land.
2.2	Water (expected source & competing users) unit KLD	Yes	Construction Phase Total water requirement is expected to be 20 KLD The water demand will be met by water tankers. Operation Phase Total water demand of the project is expected to be 87 KLD approximately and the water requirement will be met by the BMC
2.3	Minerals (MT)	No	Not Applicable
2.4	Construction material – stone, aggregates, and/soil (expected source-MT)	Yes	The construction materials, which will be used in the project site will be bought from authorized local dealer
2.5	Forests and timber (source-MT)	Yes	Apartments will use timber for windows etc.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	Operation Phase : C.L. - 1400 KVA & M.D. – 700 KVA Source: MSEB 2 Nos. 280 KVA DG for back up to emergency facility
2.7	Any other natural resources (use appropriate standard units)	No	Not envisaged

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)	Yes	DG sets will only be used as back up energy during power failures. Drums of HSD will be stored as per the Manufacture, Storage and Import of Hazardous Chemical (MSIHC) rules. Other hazardous materials like paints, thinners will be stored as per MSIHC rules in a separate area away from construction area and housing facility provided for the onsite workers. The storage area will be paved and spillages, if any shall be treated as per Operation Control Procedures defined in the EMP
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Not envisaged
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	Positive impact due to enhanced and hygienic living conditions generation. Aesthetic value of area will be improved. It will provide employment opportunities to the local people in terms of skilled and unskilled labor during construction and service personnel during operational phase.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	Noise and Air Pollution control measures will be implemented so as to cause no harm to nearby residents.
3.5	Any other causes	No	No other causes identified.

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	Not Applicable
4.2	Municipal waste (domestic and or commercial wastes)	Yes	There would be both degradable and non-degradable solid waste produced during the operational phase, which will be around 251 kg/day Biodegraded able waste: 151 kg/d Non-biodegradable waste : 100 kg/d STP sludge : 17 kg/day The biodegradable waste will be processed in OWC, required amount of manure will be utilized and the rest will be handed over to the vendors and the non-biodegradable waste generated will be recycled / treated / handover to BMC
4.3	Hazardous wastes (as per hazardous waste management rules)	Yes	Used oil from DG set will be stored carefully and will be handed over to authorized vendor for disposal.
4.4	Other industrial process wastes	No	Not Applicable
4.5	Surplus product	No	Not Applicable
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Dewatered / dried sludge from STP will be used as manure in Gardening.
4.7	Construction or demolition wastes	Yes	All construction waste will be collected and segregated properly. Most of that will be reused, woods will be reused, and no external woods will be used. No demolition waste generated from the project.
4.8	Redundant machinery or equipment	No	Not Applicable
4.9	Contaminated soils or other materials	No	Not Applicable
4.10	Agricultural wastes	No	Not Applicable
4.11	Other solid wastes	No	Total Municipal solid waste:- 251 kg/day & STP sludge:- 17 kg/Day will be generated

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	Emissions form DG set only in case of emergency. The operation of proposed project does not envisage any major source of air pollution.
5.2	Emission from production processes	No	There is no production as the proposed project is residential complex.
5.3	Emissions from materials handling including storage or transport	Yes	Fugitive emissions will be generated, while handling and transportation of materials to site, this will be temporary in nature.
5.4	Emissions from construction activities including plant and equipment	Yes	During the Operation Phase, DG sets will be operated only as a backup power at project site. Adequate provision made to mitigate the problem.
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	Yes	<u>Construction Phase</u> Fugitive dust emissions will be generated due to movement of vehicles and material handling. <u>Operation Phase</u> During Operation Phase, emissions will be generated from Operation of DG sets. Minimal emissions will be generated from movement of vehicles as fugitive dust as the roads will be paved roads. Odor can be from STP. However, the STP will be working on appropriate technology, so as to minimize odor problems, and it will be strategically located so that no adverse impact is caused.
5.6	Emissions from incineration of waste	No	Not Applicable

Sr. No.	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	Not Applicable
5.8	Emissions from any other sources	No	Not Applicable.

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	Noise generation from construction equipment's used for drilling, cutting operations. During Operation Phase, Noise will be generated due to operation of DG sets. This will be about 90-105 dB (A). All DG sets will be per rules and will confirm to noise standards
6.2	From industrial or similar processes	No	Not Applicable
6.3	From construction or demolition	Yes	The construction noise will be localized, intermittent in nature. This will subside with the completion of the construction phase. The resultant ambient air noise levels will be well within the prescribed norms. The operation will be restricted to day time. Adequate measures taken to keep noise and vibrations under control. No heat or light emission.
6.4	From blasting or piling	No	Not Applicable.
6.5	From construction or operational traffic	Yes	Workers will be provided with protective equipment such as earmuffs etc. The noise levels will be < 70 dB (A).
6.6	From lighting or cooling systems	No	Not Applicable
6.7	From any other sources	No	Not Applicable.

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	Not Applicable.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	The total wastewater generated (68 KLD) from the complex will be treated in 1 Nos. STP of 70 KLD capacity and the treated water (31 KLD) will be utilized for car washing and flushing purpose.
7.3	By deposition of pollutants emitted to air into the land or into water	No	Treated sewage water will be recycled and reused; whereas the surplus 30 KLD will be discharged in Municipal Sewer line.
7.4	From any other sources	No	Not Envisaged
7.5	Is there a risk of long term buildup of pollutants in the environment from these sources?	No	D.G sets will be used as a backup source only for emergency services.

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	Only 'HSD' from DG set is involved but still Fire Fighting System will be provided.
8.2	From any other causes	No	Not Envisaged
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, could burst etc.)?	No	The project falls under seismic zone-III as per IS1893 (Part-1):2002, care will be taken in designs to withstand earthquake of maximum Richter scale in that area. Further it is not flood prone or landslide prone areas. Hence, no risk due to natural hazards is envisaged.

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, and ancillary development or development stimulated by the project which could have impact on the environment e.g.:	Yes	Supporting and ancillary development will take place. The project provides a well-designed residential housing area for the occupants.
	Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)	Yes	Internal Roads, Rainwater Harvesting, STP etc. will be provided
	Housing development	Yes	The project provides a well-designed Residential area.
	Extractive industries	No	
	Supply industries		
	Other	No	Residential Project
9.2	Lead to after use of the site, which could have an impact on the environment	No	Not Applicable.
9.3	Set a precedent for later developments	No	Already many such projects are on the way
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Not Applicable.

(iii) Environmental Sensitivity

Sr. No.	Areas	Name/ Identity	Aerial distance (with 15-km) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	Not Applicable.
2	Areas which are important or sensitive of ecological reasons – wetlands, water courses or other	No	Not Applicable.

Sr. No.	Areas	Name/ Identity	Aerial distance (with 15-km) Proposed project location boundary
	water bodies, coastal zone, biospheres, mountains, forests		
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration.	No	Not Applicable.
4	Inland, coastal, marine or underground waters	No	Not Applicable.
5	State, national boundaries	No	The project is located within Municipal limits.
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	Not Applicable.
7	Defense installations	No	No defense installation in the neighborhood.
8	Densely populated or built-up area	Yes	Residential & Commercial area all around the site.
9	Areas occupied by sensitive man made land uses *(hospitals, schools, places of worship, community facilities)*	Yes	Schools, hospitals and small temples are observed in 5 km radius.
10	Areas containing important, high quality or scarce resources *(ground water resource, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	No	The project will tap BMC water for its use after proper permissions are obtained.
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	No	Not Applicable.
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	This area is generally plain & come under seismic zone –III.

Declaration:

"I hereby given undertaking that the data and information given in the application and enclosures are true 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 give, if any to the project will be revoked at our risk and cost".

Date: 28 /03/2014

Place: Mumbai

D/S: Mrs. Maya Vaidya
Signature of the Applicant

FORM IA

FORM-1A
(Only for construction projects listed under item 8 of Schedule)

Checklist of Environmental Impacts

1. Land Environment

<table>
<tr><th>Requirement</th><th>Compliance</th></tr>
<tr><td>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 form the competent authority are 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.</td><td>The proposed land use is in conformation with the approved Municipal Master Plan/Development Plan of Brihanmumbai Municipal Corporation (BMC)</td></tr>
<tr><td>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.</td><td>Name & location: Proposed Redevelopment of Municipal Property known as BIT cottage on plot bearing C.S. No. 328/10, of Matunga Division, Bhau Daji Road in F North Ward under DCR 33(7) BIT Co.op. Housing Society LTD.
A. Propose Building Details :
<table>
<tr><th>Sr. No</th><th>Bldg. Type</th><th>No. of Buildings</th><th>Configuration</th></tr>
<tr><td>1</td><td>Proposed residential cum commercial buildings</td><td>2 along with 3 shops</td><td><u>Rehab A&B wing:</u>
St. +11
<u>Rehab C wing:</u>
Gr. +4
<u>Sale A,B & C Wing:</u>
Basement 1 & 2+St. + 7 flr.</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
B. Area Statement :
(i)Land Area:
<table>
<tr><td>Plot Area.</td><td>4,748.28 sq. m</td></tr>
<tr><td>FSI Area</td><td>9,364.19sq. m</td></tr>
<tr><td>Non-FSI Area</td><td>11,438.34 sq. m</td></tr>
<tr><td>Total Construction Area</td><td>20,802.53sq. m</td></tr>
</table>
C. Parking Statement: Parking space will be provided as per norms.
<table>
<tr><td>Parking Required</td><td>Parking Provided</td></tr>
<tr><td>135No’s</td><td>150No’s</td></tr>
</table>
D. Occupancy Load: 631 No’s.
E. Water requirement :
Construction phase : 20 KLD
<table>
<tr><td>Workers</td><td>4 KLD</td></tr>
<tr><td>Construction</td><td>16 KLD</td></tr>
</table>
Source: Tanker (depending upon construction activity)
Operation Phase: 87 KLD; Source: BMC.
<table>
<tr><td>Domestic</td><td>56 KLD</td></tr>
<tr><td>Flushing</td><td>28 KLD</td></tr>
<tr><td>Car washing</td><td>3 KLD</td></tr>
</table>
F. Power Requirement :
Construction Phase : 100KVA
Operation Phase : : C.L. – 1400 KVA
M.D. –700 KVA
G. Road Connectivity: service Road
</td></tr>
<tr><td>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 landuse, disturbance to the local ecology)</td><td>The proposed activity will improve the basic infrastructure facilities of the area.
Open spaces, community facilities are simultaneously being augmented in the surroundings.</td></tr>
<tr><td>1.4. Will there be any significant land distribution resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity etc may be given)</td><td>There will be no significant land disturbance due to the project. The existing terrain will be retained.</td></tr>
<tr><td>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)</td><td>Natural Drainage System will not be altered.</td></tr>
</table>

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)

WASTE	MANAGEMENT
Cement Bags	Returned back to vendor or sold to recycler.
Paint container & other Barrels	Will be sold for reuse.
Solid block debris	Reused on the site to construct safety walls and backfilling below roads.
Scrap metal generated	100 % will be sold for recycling
Concrete waste	The balance /waste concrete of higher grade will be diverted to the lower grade PCC of podium areas.
Sand	Wastage of sand will be used for bedding for flooring purpose. Also will be used as filler material for toilets water proofing.
Marble & Granite	Will be sent back to vendor.
Tiles waste	Waste tiles will be cut & will be used for skirting. Broken pieces will be used for china mosaic waterproofing of terraces.
Glass	Will be sold for recycling.
Wooden waste	Will be sold for recycling.
Electrical wires and cables	Will be sold for recycling.
Pipes	Will be sold for recycling.

1.7. Give details regarding water supply, waste handling etc. during the construction period.

<u>Water supply and waste handling during construction phase:</u> During the construction phase about 50-75 persons will be deployed on the site from nearby places. The total requirement of water will be around KLD.
SOURCE : Tanker (Depending upon

<table>
<tr><td></td><td>construction activity)
<table><tr><td>Total Water Required</td><td>20 KLD</td></tr><tr><td>Domestic usage</td><td>4 KLD</td></tr><tr><td>Construction</td><td>16 KLD</td></tr></table>The waste water generated from human settlement will be collected in septic tank and soak pits.</td></tr>
<tr><td>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)</td><td>No low lying area, no wetlands around the site.</td></tr>
<tr><td>1.9. Whether construction debris & waste during construction cause health hazards? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)</td><td>The construction debris will include sand, soil bricks, tin sheets and tiles. Sewage from the labour colony will be treated in septic tanks and soak pits. Organic wastes will be composted.</td></tr>
</table>

2. Water Environment

<table>
<tr><th>Requirement</th><th>Compliance</th></tr>
<tr><td>2.1. Give the total quantity of water requirement for the proposed project with the break-up of requirements for various uses. How will the water requirements met? State the sources & quantities and furnish a water balance statement.</td><td>Source: BMC.
/Recycled Water
<table><tr><td>Total water requirement</td><td>87KLD</td></tr><tr><td>Domestic usage</td><td>56 KLD</td></tr><tr><td>Flushing</td><td>28 KLD</td></tr><tr><td>Car Washing</td><td>3 KLD</td></tr></table>Sewage Generation:
Construction Phase: The waste water generated from human settlement will be collected in septic tank and soak pits.
<table><tr><td>Description</td><td>Quantity of Sewage generated (KLD)</td><td>Treatment/ Disposal</td></tr></table></td></tr>
</table>

	Operational Phase	68 KLD	Treated sewage will be used in flushing, car washing and gardening. Excess treated sewage will be disposed to existing sewer line.
2.2. What is the capacity (dependable flow or yield) of the proposed source of water?	For water supply the project will be dependent on BMC /recycled water. Recycled water will be used for gardening, car washing & flushing.		
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)	Water Supply from BMC.		
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)	Recycled water:31 KLD Flushing Water Requirement : Residential: 28KLD Car Washing : 3 KLD		
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)	No		
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)	The waste water generation from the proposed project will be 68 KLD. 1 STP of total capacity 70 KLD each will be provided for treating the waste water.		
2.7. Give details of the water requirements met from water harvesting? Furnish details of the facilities created.	Rainwater from the roofs will be lead to Rain water Harvesting Tanks through closed piping system.		
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?	The run-offs will be channelized properly through storm water drain and will be diverted to Rain water Harvesting Tanks. The overflow of this pit will be diverted to the Municipal storm water drain.		
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)	There will be no ground water extraction. Ground water recharge through rain water harvesting will be proposed.		

2.10. What precautions/measures are taken to prevent the run-off from construction activities polluting land and aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts)	Run off from the construction will be diverted through natural slope to an artificial pit where settling will be done the overflow will be connected to the municipal storm water drain.
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)	Storm water drain of adequate size will be provided to manage storm water from within the site and appropriate rainwater harvesting structure will be developed in which storm water will be collected and used for recharging ground water.
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)	Proper sanitation facilities will be provided at site for construction labours and staff. Temporary toilets with septic tank and soak pit will be provided considering peak labour force. Composting pit will be provided to take care of food wastes. Adequate housekeeping facilities and practices will be maintained.
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)	The quantity of wastewater (68 KLD) generated from the project will be treated in 1 STP (capacity 70 KLD each) and 31 KLD recycled water will be used for gardening, car washing and flushing purpose. 30 KLD water will be released into sewer line.
2.14. Give details of dual plumbing system if treated wastewater is used for flushing of toilets or any other use.	There will be separate pipelines for the supply of treated water from STP and the fresh water. Treated water will be used for the flushing purposes, landscaping purposes & car washing, while the fresh water will be used for domestic consumption.

3. Vegetation

Requirement	Compliance
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)	The project site is surrounded by developed roads. The local ecosystem and biodiversity will not be hampered because of this development.
3.2. Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project).	No
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)	RG provided

4. Fauna

Requirement	Compliance
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.	There will be no displacement of fauna - both terrestrial and aquatic and there will be no barrier on their movement. There is no endangered species found except the local species.
4.2. Any direct or indirect impacts on the avifauna of the area? Provide details.	There will be no impact on the avifauna (birds) of the area. The site was not found to be nesting/breeding/feeding ground for any significant bird species. The trees planted may attract birds in the future creating a positive impact on the avifauna.
4.3. Prescribe measures such as corridors, fish ladders etc. to mitigate adverse impacts on fauna.	The project is located on landmass and there is no need to provide corridors and fish ladders etc.

5. Air Environment

Requirement	Compliance
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)	The proposed project activity will not increase any atmospheric concentration of gases and result in heat islands. Air emissions will increase due to vehicular movements.
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.	There will be burning of fuel through D.G. sets, traffic movements, operation of construction machines / equipment and domestic activities at site. Construction activities will lead to dust generation, emission of NO_2, SO_2 and PM. The impacts on the ambient air quality during construction phase will be temporarily and reversible in nature (for short duration) and will be restricted to only a small area. During operation phase, D.G. set will be having adequate stack height, there will be development of green-area and maintenance of vehicles, all these efforts will reduce the impact.
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	The proposed project will provide sufficient parking to its occupants and visitors. Adequate measures have been proposed to manage the traffic within and outside the site. A

and exit to the project site.	main entry point will be provided. The vehicular traffic movement within the facility will be such that it will not disturb the landscaped areas and organized open spaces. Entry and exit will be provided to ensure that no hindrance is caused to the site traffic. Roads of sufficient width will be provided. Necessary arrangements will be made for smooth entry and exit of vehicles.150 no. of parking will be provided.
5.4. Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.	Adequate provisions have been made in the internal roads, for smooth vehicles entry and exit and as well as pedestrian movements.
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.	As the entry and exit will be made safe and smooth, there will be low noise and vibrations despite the increased traffic. The major source of noise will be vehicular movement during operation phase. The mitigation is proposed through a detailed EMP that has been planned to reduce the noise and vibration impacts during the construction phase.
5.6. What will be the impact of D.G. sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.	Sound proof canopy will be provided which will negate the noise and anti-vibration mounts will be provided to reduce the impacts due to vibrations from the D.G. Acoustic enclosure will be provided with proper stack height.

6. Aesthetics

Requirement	Compliance
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?	The proposed construction activity will not result in the obstructions of a view, scenic amenity or landscapes. Better designed structure and well planned landscape will add up aesthetics of that zone.
6.2. Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?	There will be negligible adverse impact due to new constructions on the existing structures. Due care will be taken to minimize the impacts on surroundings: • The construction site will be covered from all 4 sides with tin sheets to prevent dust emissions and other pollutants to the surrounding environment. • The setbacks are sufficient to take care of the

	depth to which the structure goes without the fear of soil collapse in addition to piling.
6.3. Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.	The design of the project is influenced by the regulation set out by local authority and modern needs of the society.
6.4. Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.	There are no anthropological or archaeological sites or artefacts nearby proposed site.

7. Socio-Economic Aspects

Requirement	Compliance
7.1. Will the proposal result in any changes to the demographic structure of local population? Provide the details.	There will be no change to the demographic structure of local population due to the proposed activity. The expected population will be 631 No's. The proposed project shall provide value addition to the existing infrastructure, as due to development of this Project facility such as public transport, water supply, telex communications, power lines, road maintenance etc. shall be upgraded in and around the project premises. The project is situated in the residential zone and hence there will be no change in demographic structure.
7.2. Give details of the existing social infrastructure around the proposed project.	Proposed project is located within the residential zone of high urban infrastructure region. It is a well-developed area, having all modern amenities. 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?	The proposed project will not cause any adverse effects on local communities, disturbance to sacred sites or other cultural values.

8. Building Materials

Requirement	Compliance
8.1. May involve the use of building materials with high-embodies energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of	The basic engineering materials like aggregate, cement, sand and bricks/blocks will be purchased locally. However, finishing materials will be purchased keeping in mind the energy conservation aspect.

building materials and their energy efficiency)	
8.2. Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?	During construction phase, sources of noise pollution will be due to operation of machinery like compressors, compactors, concrete plant, cranes etc. as well as transportation vehicles. This will cause nuisance to the occupants of the nearby area. The project proponents have agreed to take precautions to control noise pollution as mentioned under: • Use of equipment generating noise of not greater than 90 dB (A). • High noise generating construction activities would be carried out only during day time and in a staggered fashion. • Installation, use and maintenance of mufflers on equipment. • Workers working near high noise construction machinery would be supplied with ear muffs/ear plugs. To reduce air emissions: • All vehicles will be having proper PUC certificates. • Roads will be paved in advance to reduce dust emissions. • Unpaved roads will be kept wet. • Stock piles will be secured by covering with plastic. • Construction machinery will be regularly maintained.
8.3. Are recycled materials used in roads and structures? State the extent of savings achieved?	Yes. Inert demolished material will be used in road filling to maximum extent. Centring material will be reused from other projects of the same contractor.
8.4. Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.	Garbage will be collected manually from each of the building and carted to collection spot. The garbage collected from flats will be segregated into biodegradable 151 kg/day and non-bio degradable 100 kg/day. The biodegradable waste (151 kg/day) will be treated in OWC and the manure will be used for landscaping at site and as replacement for saw dust in OWC. Non-biodegradable waste generated 100 kg/day will be handed over to recyclers/vendors for further use. Sludge generated from STP will be used mixed with the manure generated from biodegradable

	wastes and used in fertilizing the gardens.

9. Energy Conservation

Requirement	Compliance
9.1. Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of build-up area? How have you tried to minimize energy consumption?	Source: TATA • Construction Phase: 100 KVA Operation Phase : C.L. 1400 KVA & M.D. – 700 KVA Capacity of DG Set: D.G sets (for essential services) — 2 DG of 280 KVA. Energy saving by non-conventional method: ➢ All internal common area are proposed to work on high energy efficient lamps(CFL) as specified in bureau of energy efficiency, which again results in saving in general consumption. ➢ All Lifts and pumps are proposed on VFD drives which results in 30% saving in consumption. To minimize the energy consumption, solar energy will be utilized to maximum extent.
9.2. What type of, and capacity of, power back-up to you plan to provide?	2 No's DG Sets of 280 KVA with 80% Loading Factor will be proposed for back up during power failure. Low Sulfur diesel will be used as fuel to run standby D.G. sets
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?	Plain clear glass will be used.
9.4. What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.	Building orientation, design and wind sizes will be designed in such a way that shading provided will prevent solar radiation and adequate ventilation to reduce humidity.
9.5. Does the layout of streets and 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?	Yes. To minimize the energy consumption, solar energy will be utilized to maximum extent.
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 West and the Roof? How much energy saving has been effected?	Depending upon the site condition location, efforts will be made by the Architects to maximize the shading of Walls on the East and West and the Roof.
9.7. Do the structures use energy-efficient	As it is a residential complex there is no

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.	centralised mechanical cooling system provided. Energy efficiency in lighting and mechanical systems will be achieved by: 1. Purchase of energy efficient appliance. 2 Adjusting the settings and illumination levels to ensure minimum energy used for Desired comfort levels. 3. Installing programmable on/ off timers and sensors for low occupancy areas 4. Use of solar energy for common areas, landscape lighting 5. Use of compact fluorescent lamps and low voltage lighting. 6. Use of common lights with CFL & LED luminary in landscaping area.
9.8. What are the likely effects of the building activity in altering the microclimates? Provide a self assessment on the likely impacts of the proposed construction on creation of heat islands & inversion effects?	Adequate distance is maintained between the lay out and surrounding buildings. Adequate open area will be available for greenery. The building material does not have excessive use of glass or metals. The project proponent is advised to use paints that will not absorb significant radiation. Mosaic tiles will be used for roof heating. As a cumulative impact, the proposed project is not likely to adversely impact the microclimate.
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.	• Mosaic tiled roof will be provided to reduce roof heating • External wall will be painted with high reflective paints • Single insulation window panel will be provided
9.10. What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.	Proper precautions and safety measures will be taken as per the instructions of the Chief Fire Officer, BMC. Moreover proper fire detection/extinguishing system, exit facilities, etc. will be installed for safety purpose.
9.11. If you are using glass as wall material, provide details and specifications including emissivity and thermal characteristics.	No glass will be used for wall.
9.12. What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.	Proper natural ventilation will be providing in rooms. Air changes/hour is as per Bureau of Indian Standards (National Building Code, 2005).
9.13. To what extent the non-conventional energy technologies are utilised in the overall energy consumption? Provide details of the renewable energy technologies used.	Non-conventional energy technologies will be utilized to maximum extent to reduce the load on conventional energy sources.

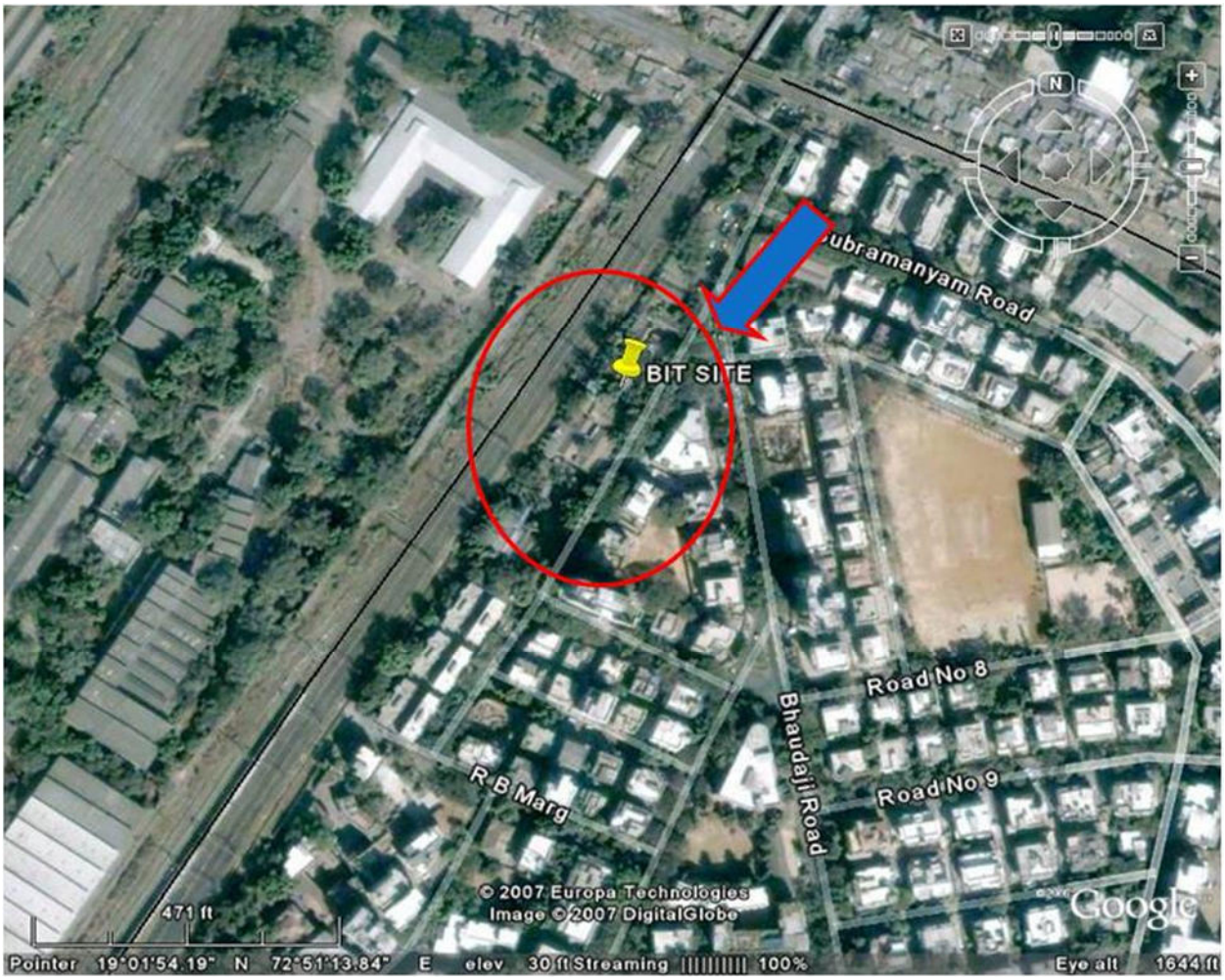
PROJECT SUMMARY

PROJECT SUMMARY

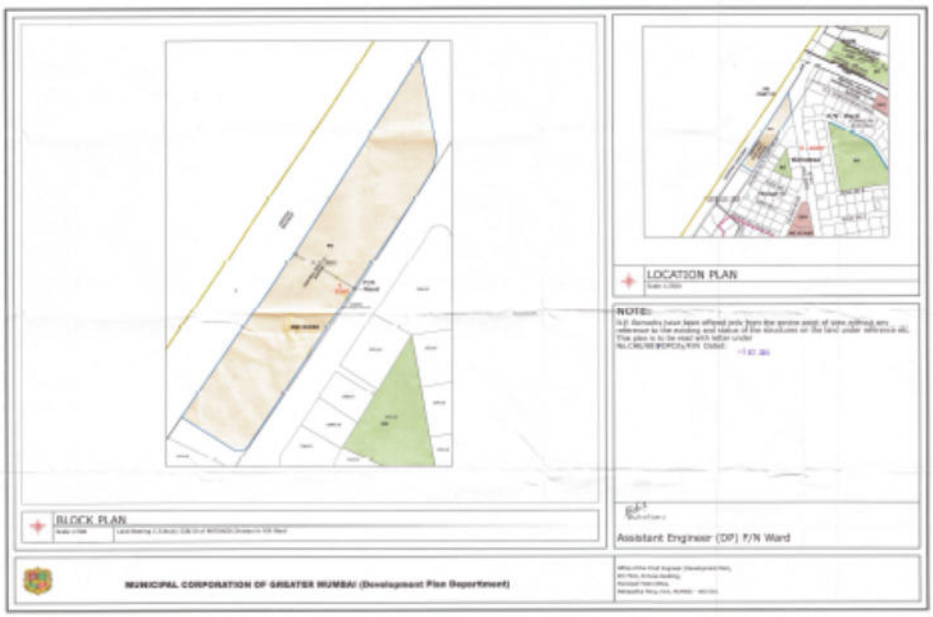
The proposed project is redevelopment of Municipal property known as BIT cottage on plot bearing C.S No. 328/10 of Matunga Division, Bhau Daji Road in F/North Ward. Mumbai.

Latitude: **19° 01'54.19"N**
Longitude: **72°51'13.84"E**

- **The Satellite Image is as follows**



- **The DP Plan is as follows:**



- **The Area statement is as follows:**

FSI AREA SQ.M	NON FSI AREA SQ.M	TOTAL CONSTRUCTION AREA SQ.M
9,364.19	11,438.34	20,802.53

- **Proposed Building Details:**

  Rehab:
  Wing A & B: St + 11
  Wing C: Gr + 4

  Sale
  Wing A, B & C: 2B + St + 7 Flrs.

- **Water Consumption:**
  - Source: MCGM / Recycled Water
  - Construction Phase: 40 KLD (depending upon the construction activity)
  - Operation Phase: 87 KLD

- **Power Requirements:**
  - Source: Reliance
  - Construction Phase: 100 KVA
  - Operation Phase:

- Connected Load: 1.4 MW
- Demand Load: 0.7 MW

- **Parking Requirements:**
  - Parking required: 135
  - Parking provided: 150

- **Solid Waste:**
  - Bio-degradable: 0.151 TPD
  - Non – biodegradable: 0.100
  - Total: 0.251 TPD

EM P

ENVIRONMENTAL MANAGEMENT PLAN

INTRODUCTION

For the purpose of this document, Environment Management Plan is more of a general plan than a specific plan as the magnitude of the project does not demand an EIA study.

The following environmental management procedures apply to the environmental issues relevant to the site. The procedures aim to provide criteria and indicators to measure the environmental performance, as well as mitigation controls to reduce potential impacts. The EMP will be planned for construction and operating stages of the project and includes the following elements:

- Air pollution control and management
- Water pollution control and management
- Noise pollution control and management
- Storm water management
- Hazardous and solid waste management
- Plantation, landscaping and land management
- Management of Social Issues
- Occupational, safety and health issues
- Best management practices
- Energy conservation

A summary of project activities, expected environmental impacts and proposed environmental management measures for controlling the likely impacts are presented at the end of this chapter.

SN 1: Environmental Management Procedure

Performance objective	• Responsible environmental management of the site. • No environmental incidents that may lead to stopping work on site. • Provide open communication and consultation with the stake holders as well as employees and the general public. • Carry out regular audits and inspections of the site during construction. • Minimize outstanding corrective actions.
Goals	• All personnel inducted prior to commencing work. • Record all non-conformances and evidence of corrective actions taken. • No adverse environmental impact resulting from any incidents or emergencies on site, and no cessation of works due to environmental incidents or breaches.
Mitigation Measures	Training and Awareness • All personnel should be trained to carry out their designated duties relating to the implementation of this EMP. • All Contractor personnel will be inducted prior to commencing work on site. A register of induction participants will be maintained. • Sub-contractors will be inducted on site prior to carrying out their work to

ensure they understand the key values, constraints and environmental management practices on site.

- A register of sub-contractor induction will be maintained. A targeted induction, providing relevant site information and responsibilities, will be provided for external suppliers and deliveries to the work site wherever practical, especially those likely to have a repeated or continuous presence on site.

Communication and Consultation

- Internal communication will occur on site through normal daily, weekly and monthly meetings where environmental issues will be discussed as part of each meeting.
- Consultation and communication with external bodies including government agencies and other affected stakeholders will be undertaken as required. This will be the responsibility of the Project Director and the Project Manager.

Audits and Inspections

- The internal site audit process will be used to verify that the site procedures are managing the environmental risks for the site and enable demonstration of the Contractor's environmental due diligence. An internal site audit will be conducted every week during construction.
- Weekly site inspections aim to ensure that environmental management requirements are addressed and that the environmental objectives are met at the site. The Site Health Safety and Environment Officer and Contractor representative, will carry out these site inspections. A member of Project's Management Team will attend as required. The inspection will be undertaken in accordance with the Inspection Checklist given in Appendix G.
- The weekly site inspections will review environmental aspects associated with the site operations and identify any non-conformances or issues that may require remedial action. The date and time of inspections will be recorded, as well as comments on non-compliance with the EMP and remedial action taken as required. A register of weekly internal site audits will be maintained, including originals of the Inspection Checklists.

Records

- Records will be kept for the following:
- A register of environmental complaints, detailing the nature of the complaint, date of complaint, corrective action taken and the date it was resolved - this will include non-conformances as identified from the weekly internal site audits and monthly external environmental audits;
- A register of incidents, such as spillages and leakages, which would include the date, nature of the incident and corrective action taken;
- Data on the types and quantities of waste removed from the site;
- Records of formal consultation or communication;

	• Site audit reports; • Site inspection checklists; and • Training and induction attendance. • These records will be maintained by the Contactor and made available upon request, in the event of an incident, and for inspection by the Project Manager or relevant authorities. Emergency and Incident Management • In the event of an emergency the site emergency procedures take precedent. The environmental implications will be assessed and managed only when the emergency has been contained and it is safe to access the site. • If an incident takes place that has environmental implications, an incident reporting form will be completed, including implementation of any corrective actions. • If the emergency or incident has caused or may cause material harm the Contractor must notify Project Manager.
Performance Measures	• Environmental management of the site proceeds within the parameters of this EMP, and non-conformances are addressed in accordance with the guidelines identified and within timelines specified. • Only 2 or fewer environmental incidents of sufficient seriousness to require the cessation of work at the site (as a whole) occur during the course of the entire demolition and construction works. • All required records are complete and up-to-date. • Emergencies are handled in accordance with the site emergency response plan.
Monitoring / Auditing / Reporting	• Training and Induction Register. • Formal consultation and communication records. • Audit and Inspection Reports, including completed site Inspection Checklists. • Environmental Complaints, Non-conformances and Corrective Actions Register. • Incident Report Forms. • Waste generation and disposal records. • Photo monitoring points at key locations across the site (as above).
Corrective Action	• If 3 or more environmental incidents that result in or require a "stop work" on the site occur during the entire duration of the construction works, then a full review of work practices and operating procedures - as well as the provisions of this EMP and environmental guidelines – will be carried out jointly by the Contractor and Projects. • Investigations/corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register. • The Contractor, according to an agreed responsibility and timescale, will

	assign or close out correction actions.
Responsibility	The Contractor.

SN 2: – Air Emissions

Performance Objective	To minimize the potential impact of construction related air emissions, including dust, on neighboring and nearby receptors.
Goals	• No complaints received from neighboring and nearby receptors relating to air quality due to site activities. • No adverse irreversible impacts on site values. • No impacts on staff health.
Mitigation Measures	• Dust suppression will be aided by the retention of existing vegetation, including grasses, across those areas of the site not affected by demolition/construction activities – including environmentally sensitive and protected areas. Clearing of the work area to mineral soil will not be a routine forerunner to commencing operations, and grass cover will be maintained across work areas as far as is practical. • Excavation of soil and rock, including rock cutting/breaking, can generate dust. Weather conditions will be assessed during excavation and rock removal activities, and under strong wind conditions (39-49 kph average wind speeds) that can raise excessive dust these activities will cease. • The storage of soil and spoil has potential to generate dust in adverse weather conditions. Soil and spoil dumps/mounds will be stabilized using suitable materials such as hessian or jute-mat covers. Soil/spoil will be stored for as short a time as practical and long-term storage areas will receive interim stabilization. • Vegetation mulching can generate dust. Weather conditions will be assessed during the mulching activities, and under strong wind conditions (39-49 kph average wind speeds) that can raise excessive dust mulching will cease. • Water application will be used for dust suppression. Mulching and hessian or jute-mat covers are alternative dust suppression measures that may be used, especially in areas not subject to vehicle traffic. • Cleared, disturbed or exposed areas will be stabilized as soon as practical after construction. Dust control measures will be left in place, and maintained as required, until vegetation/grass cover has been established or the location developed to its final stable use/condition.

	• Silt fencing and erosion control structures will be regularly maintained to ensure that deposits do not become a dust source (refer EP09). • Except in emergencies, vehicles will be restricted to sealed or otherwise hardened/surfaced routes wherever possible. Low vehicle speeds will be enforced on unsealed accesses and work areas within the site in order to reduce dust. • Vehicles carrying fill, spoil or other potential dust generating materials will not be loaded above their side and tail boards, and all such loads will be covered. Suppliers and delivery vehicles will be required to cover their loads, where there is a potential for dust generation (or spills), as part of the Contractor's supply/purchasing procedures. • Maintain all vehicles, plant and equipment used during construction in a proper and efficient condition to ensure emissions are minimized. • Operate all vehicles, plant and equipment used during construction in a proper and efficient manner. • Vehicle emissions will be minimized by avoiding unnecessary engine running time - such as while loading, waiting, or for driver comfort. • Hazardous materials with the potential to generate dust or air-borne particulates will be treated in accordance with the Hazardous Materials Management Plan (see EP04). • Under no circumstances will waste, vegetation or other materials be burnt on-site. • The use of ozone depleting substances during construction operations will be avoided.
Performance Measures	Number of dust related complaints received from neighboring receptors - target of less than 3 complaints for the entire demolition/construction period.
Monitoring / Auditing / Reporting	• Dust and air quality complaints from neighboring receptors will be recorded in the Environmental Complaints, Non-conformances and Corrective Actions Register. • All Contractor staff will conduct constant visual monitoring for excess emissions and dust generation. • Vehicles, plant and machinery entering or in use on the site will be regularly checked by the Contractor to ensure compliance with the appropriate emission standards. Checks will be by visual inspection (no visible exhaust emissions after 30 seconds running). • Audits and reporting will be conducted in accordance with EP01, including the implementation of the recommendations and corrective actions.
Corrective Action	• The Contractor will follow-up all dust and air quality complaints from neighboring receptors (nearby land • holders/uses) within 2 business days. Mitigation measures will be reviewed and implemented within 2 days. • If staff observations and external complaints indicate air quality and/or dust objectives are not being met - on more than 3 incidences in any 7 day period - the Contractor will identify those activities most likely to be contributing to the problems, review the operations and environmental controls in place for

	the activity(s), and implement appropriate corrective actions. • Where air quality and/or dust objectives are repeatedly unmet, or external complaints persist, the Contractor will install a High Volume Air Sampler (HVAS) or other appropriate air quality monitoring technology at a selected location on or off site to provide continuous empirical data to assist in managing this issue. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Projects. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Management.
Responsibility	All site personnel.

SN 3 – Flora and Fauna, Vegetation, Weeds and Pests

Performance Objective	• No damage to native vegetation identified for retention on site. • To minimize the potential for the introduction and spread of weeds.
Goals	• No unauthorized removal of, or damage to, native vegetation. • No new weed species introduced into the site as a result of landscaping activities.
Mitigation Measures	• Native vegetation clearing will be minimized across the site during construction activities in line with the Preferred Project Scheme and Site Landscape Plan. Operational areas and works scheduling will be planned/identified to avoid any un-necessary clearing of native vegetation. Areas of native vegetation to be retained, and restricted areas, will be clearly flagged and/or fenced on-site using woven barrier fencing or similar. • Fencing around trees and other retained native vegetation will be erected to prohibit access and prevent soil compaction during construction works, as identified in the Site Landscape Plan. • Soil, spoil, demolition wastes and other materials will not be stockpiled within the "drip line" of trees to be retained. • Trees will be pruned in preference to total removal wherever practical. • Each existing tree removed will be replaced by two new native tree plantings, of local provenance unless otherwise agreed by the tree authority, as shown in the Site Landscape Plan to achieve a net increase in the number of trees ultimately on-site. • Erosion and sedimentation control measures will be implemented to minimize areas conducive to the introduction and establishment of weeds. • Except in emergencies, only approved access roads and parking/turning areas are to be used by vehicles on site, and vehicles will be restricted to sealed or otherwise hardened/surfaced routes as far as possible. Vehicles will not be permitted to park on any unsealed areas under retained trees. • Noxious weeds will be controlled as required by the relevant legislation/regulation, and class of weed in question.

	• Spraying will not be permitted as a weed control measure within the site. Herbicide use - using low-risk low persistence products and direct application methods will be carefully managed. • Cleared/disturbed areas will be stabilized, rehabilitated and planted according to the Site Landscape Plan. • Landscape and amenity plantings - as shown in the Site Landscape Plan will employ native species propagated from plants of local provenance. • Food scraps and putrescible waste will be stored in securely covered bins/containers, so as not to attract pest (and native) animals.
Performance Measures	• No net reduction in the extent of native vegetation across the site as a whole. • No new weed occurrences, no spread of existing weeds infestations. • Weed management controls have been carried out on site, with an overall reduction in the incidence of weeds. • No increase in the occurrence of feral and pest animals. • Fire management, including access requirements, proceeds unimpeded during demolition/construction and any wildfire incidents are appropriately managed.
Monitoring / Auditing / Reporting	• All workers on site will be vigilant for any new weed outbreaks, and immediately report any suspected occurrences to the Contractor's on-site manager. • Flagging and fencing to protect trees and native vegetation/bush land areas to be retained will be inspected weekly, and repaired or upgraded as required. • The Contractor will keep records of the area, and type, of native vegetation disturbed during the works - and whether such impacts were planned/approved or accidental/inadvertent and unauthorized. • The Contractor will record details of any wildlife injuries or deaths across the site due to demolition/construction activities and report this information monthly to the Project Manager. • Audits will be conducted in accordance with EP01 including the implementation of the recommendations and corrective actions. Monitoring for weed outbreaks will be conducted during these audits.
Corrective Action	• The Contractor will immediately make good any areas of native vegetation that are inadvertently disturbed or cleared without authorization. • The Contractor will - at the direction of Project Manager – be responsible for compensatory plantings of native vegetation where required to replace areas removed/disturbed during demolition/construction and especially for any unplanned or unauthorized clearing. Only local plant material will be used. • If a substantial outbreak of a declared noxious weed is found then as soon as practicable the Contractor will have a qualified person assess and treat the area, if necessary, by hand pulling individual plants. Under no circumstances will the plants found be chopped, slashed or burned due to the potential for spreading of seed. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions

	Register as maintained by the Contractor and Project Manager. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Manager.
Responsibility	All site personnel.

SN 4 – Hazardous Materials

Performance Objective	• To reduce the potential risk of contamination of air, land and water arising from Dangerous Goods. • To reduce the potential of health risks and contamination of water from contaminated soils on site. • To reduce the potential of health risks to site workers, and others, from Dangerous Goods.
Goals	• No spills and or land contamination on-site or off-site. • Contaminated soils remain inert on site or are removed from site if area is within building envelope. • No adverse health effects for site workers, and others.
Mitigation Measures	• Based on the outcomes of the audit, a Hazardous Material Management Plan will be prepared, addressing the potential environmental impacts and incorporating the measures included in this EMP as well as other mitigation measures appropriate to the findings of the audit. • Site induction of all personnel, including contractors, will include information on hazardous materials and emergency response procedures. • Persons handling dangerous chemicals and materials will wear appropriate PPE and receive appropriate training in its use. • No bulk (in excess of 20 litre containers) fuels; lubricants and chemicals will be stored on site. Any limited quantities of fuels, lubricants and chemicals on-site will be held in a centralized location(s) with suitable bunding, on an impervious base, vented, and other containment/safety measures as well as appropriate spill kits or incident response equipment provided. • Fuels, chemicals, solvents and other hazardous liquids will not be decanted or handled in the vicinity of the central drainage line and major storm water inlet points • Material Safety Data Sheets (MSDS) will be located at the site office for all hazardous and dangerous goods used during construction operations. The Contractor will ensure that all materials are handled, used and disposed of in accordance with their MSDS. • The Contractor will provide and maintain appropriate first aid, emergency response and fire-fighting equipment at readily accessible locations across the site at all times. • Spill containment and treatment equipment and materials will be available near storage areas of hazardous materials. Spill kits and other suitable incident response equipment will also be located at other key points around the site and maintained ready for use. Spills of hazardous materials will be contained and collected for treatment at a licensed waste disposal facility.

	• Workers will be vigilant for hazardous materials that may be uncovered during excavations, any suspect material(s) will be reported to the Contractor's on-site manager immediately. • Totally enclosed containment will be provided for all hazardous waste prior to removal from site. • Hazardous waste, including any contaminated soils and storm water, must be disposed of to a CPCB licensed waste disposal facility as soon as possible. The Contractor will ensure that hazardous/contaminated wastes will only be transported and disposed of by disposal contractors holding appropriate licenses and copies of appropriate disposal documentation must be provide to the Contractor. • Plant, equipment and vehicle refueling on-site will be limited to essential requirements only where it is not practical to refuel off-site. • No vehicle maintenance, and non-operational/routine plant or equipment maintenance, will be conducted on-site.
Performance Measures	• Hazardous Material Management Plan prepared and implemented. • Number of incidents involving the handling or storage of Dangerous Goods - target of 1 (or fewer) non-conformance per month, with no significant environmental or health consequences. • Appropriate handling and storage of Dangerous Goods to be evident on-site at all times.
Monitoring / Auditing /Reporting	• The Contractor will maintain a Hazardous Substances Register listing all hazardous/dangerous materials occurring on-site or brought onto the site, along with MSDS and emergency response procedures. • The Contractor will keep records of the appropriate disposal of any hazardous/contaminated wastes or materials, including copies of appropriate disposal documentation. • The Contractor will conduct inspections, at least every second day, to ensure that hazardous materials guidelines are being adhered to across the site and all spill/response equipment is available. These inspections will be increased to daily for activities involving asbestos, or in asbestos affected areas of the site. • Incident Report Forms will be completed by the Contractor for any unplanned events/incidents involving • Hazardous/dangerous materials. These will include details of the implementation and effectiveness of any corrective actions, and measures identified to prevent a recurrence of the incident. Incident Report Forms will be provided to the Project Manager and recorded in the Environmental Complaints, Non-conformances and Corrective Actions Register. • Audits will be conducted in accordance with EP01, including the implementation of the recommendations and corrective actions. • The Contractor will notify the Project Manager immediately in the event of a "pollution incident" which could cause harm to the environment or personnel.
Corrective Action	• Spills or other non-conformances involving hazardous/dangerous materials

	will be dealt with immediately by the Contractor including remediation as directed by the Project Manager and appropriate agency (if warranted). Incident management will involve a stop work around an effected area or across the entire site if necessary to protect the health/safety and the environment. • In the event of an emergency the site emergency procedures take precedent and environmental implications will be assessed and managed only when the emergency has been contained and it is safe to access the site. • Operating procedures will be reviewed following any serious spills or hazardous materials incidents. • If hazardous materials are uncovered/suspected during excavations the Contractor shall cease all work in that vicinity (and fence the area if appropriate) and investigate the nature and risk of the material(s). Appropriate management responses will be determined in discussion with the Project Manager. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Management. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project management

SN 5 – Noise and Vibration

Performance Objective	To minimize the potential construction noise impact on neighboring receptors and comply with relevant regulations.
Goals	Minimize noise complaints due to site construction activities.
Mitigation Measures	• The Contractor will adhere to the standard construction hours as detailed in Section 1.6 of this EMP. Work outside these hours will require prior approval, to be obtained via the Project Manager. The Contractor will ensure that all sub-contractors are aware of, and adhere to, these construction hours. • Deliveries to the site will be scheduled to occur during the standard construction hours. The timing of truck movements and heavy machinery access to and from the site will also be scheduled to limit any potential noise impacts on surrounding receptors. • Vehicles, plant and machinery will be fitted with appropriate noise abatement equipment, regularly maintained in accordance with the manufacturers' instructions and in good working order. • Noisy hand-held construction tools/equipment – such as power saws, planers, nail-guns etc. – will be used inside the structures where the works are occurring wherever practical or as close to the final works site as practical or on the side of structures facing away from potential receptors. Sub-contractors will be deterred from playing loud music, or radios, outside structures or from vehicles. • Vehicles, plant and equipment will be turned off when not in use - idling or "standby" modes will be avoided.

	• The Contractor may advise surrounding landholders/users of the commencement, and expected duration, of major noise producing stages of the construction process as well as the contact/complaints process in place. • PPE will be worn by all workers undertaking or in the proximity of noisy activities, as required by Work Place Health and Safety Legislation.
Performance Measures	• No excess or un-necessary noise generation. • Number of noise complaints received from nearby receptors, and dutiful response to any complaints received. • Number of structural impacts to heritage buildings arising from vibration.
Monitoring / Auditing /Reporting	• Noise levels will be measured by the Contractor as required in response to complaints, and the results recorded. • Audits will be conducted in accordance with EP01 including the implementation of any recommendations and/or corrective actions. • Maintain the Complaints Register, in regard to noise complaints from nearby receptors and authorities.
Corrective Action	• The Contractor will follow-up all noise complaints from neighboring receptors (nearby land holders/uses) within 2 business days. Mitigation measures will be reviewed and implemented within 2 days where necessary. • If noise monitoring and/or complaints indicate prolonged and excessive noise levels, or if the noise generation standard has not been met at any site on 3 consecutive monitoring incidences. then the following corrective actions may be implemented: ➢ restrict excess noise generating activities to specific less noise sensitive, times of the day; ➢ modify work practices, where practical, to generate less noise; ➢ install temporary acoustic barriers for problem activities/sites; ➢ include, and enforce, penalty provisions in subcontractor arrangements for excess noise generation; ➢ reviewing and limiting work hours for problem activities/sites, or plan noise generating activities to be undertaken concurrently where practical in short burst of excess noise; ➢ Conduct follow-up monitoring to assess the effectiveness of actions taken, and lies with complainants as required. • The contractor will investigate and rectify any unusually noisy plant, machinery and equipment - including requiring investigation and repair actions by sub-contractors. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Manager. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Management.
Responsibility	Project Manager Contractor.

	All site personnel.

SN 6 – Traffic and Parking Control

Performance Objective	• To provide a safe working environment and minimize disruption/impacts to the local traffic, neighbors and the public. • To ensure no traffic impacts on retained heritage buildings, fenced or environmentally sensitive areas and significant wildlife species.
Goals	• No disturbance to local traffic, neighbors and the public. • No unauthorized parking. • No vehicle or machinery impacts on environmentally sensitive areas, significant wildlife and retained heritage buildings.
Mitigation Measures	• The Contractor will prepare a Traffic Management Plan based on their proposed demolition/construction programme and in consultation with the relevant road authority and other relevant stakeholders. The Traffic Management Plan will be prepared prior to the start of works by a traffic consultant and approved by the Principal Certifying Authority. It will address access to the site, heavy vehicle haulage routes to/from the site, impacts on the local road network and minimizing potential disruption to traffic and residents, efficient circulation within the site, parking needs of construction vehicles and employees vehicles, and similar. The Traffic Management Plan shall comply with RTO *Manual for Traffic Control at Work Sites* • The contractor will ensure that workers including subcontractors, as well as regular delivery drivers and suppliers as far as practical, are altered to the 40 kph speed limit on Road. The Contractor will respond promptly to any complaints of excessive speeds on this road by works related traffic - this may include warnings, penalties and contract termination or similar. • Wherever practical deliveries to the site will be scheduled outside morning and evening peak traffic periods. • The Contractor will ensure that emergency access to the site is possible at all times when work/workers are on-site and so will monitor illegal parking and obstructing vehicles. • Except in emergencies, vehicles will be restricted to sealed or otherwise hardened/surfaced routes as far as possible (to limit dust generation, reduce erosion potential, lower Pc risks, and other environmental and management reasons). Where an unsealed or natural surfaced area is to be, or becomes, subject to regular vehicle movements the Contractor will temporarily surface this area with crushed sandstone, gravel, geotextile or other suitable materials. • A 20 kph speed limit will apply, and be enforced, for all vehicle movements within the site during construction works for safety and logistical reasons, given the confined site area. • Construction traffic circulation within the site will minimize truck reversing movements in order to reduce noise from truck alarms. • The Contractor will control site access/entry to ensure that only authorized

	vehicles associated with the works – and Project Management staff - enter the site.
Performance Measures	• Vehicles are only using the designated on-site roads/accesses and only parking in the designated areas - • With fewer than 1 non-conformance or incident per fortnight. • Speed limits adhered to, on and off site. • No complaints recorded regarding vehicle movements and parking.
Monitoring / Auditing /Reporting	• Vehicle movement log will be maintained for all vehicles entering the site. • As part of routine daily operations the Contractor's senior onsite staff will monitor and enforce on-site speed limits and access/parking restrictions. Significant or repeated breaches will be recorded, for reporting the Project Manager and enforcement/penalty actions where required. • Audits will be conducted in accordance with EP01, with implementation of the recommendations and corrective actions.
Corrective Action	• The Contractor will follow-up all traffic related complaints from the Traffic Police, RTO, neighbors, Municipal Council or other agencies within 2 business days. Correction or mitigation measures will be reviewed and implemented within 2 days where necessary. • All near misses or vehicle accidents on-site will be immediately investigated by the Contractor and appropriate corrective/preventative actions identified and implemented as necessary. • Additional temporary speed humps and traffic slowing devices may be installed; and a special construction traffic speed limit of 20 kph will be notified and enforced, by the Contractor. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Management. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Management or other relevant agencies.
Responsibility	Contractor. All site personnel.

SN 7 – Waste Management

Performance Objective	To minimize the generation of wastes, maximize reuse and recycling and ensure that waste is disposed of at approved locations and in an authorize fashion.
Goals	• No evidence of site contamination as the result of waste. • No waste disposal infringements.
Mitigation Measures	• Identify the likely demolition and construction waste for the site - including the nature and anticipated volumes of waste. Investigate appropriate disposal and handling options for construction. The Contractor will be required to prepare a Waste Management Plan prior to the commencement of works. • The Contractor will be required to make the best efforts to accurately

	calculate and order materials requirements, to assist in minimizing waste due to over-ordering, and will encourage minimum packaging practices and suppliers. • The site induction of all personnel, including contractors, will include information on recycling, wastes and spill or incident response procedures. • The Contractor will encourage and assist sub-contractors to minimize waste and maximize re-use/recycling wherever practical. • On-site temporary ablution facilities will be established for the construction personnel and bunded to prevent any spills contaminating storm water or soils. These facilities will be sourced and maintained by a licensed contractor. • All wastes will be separated and segregated into: hazardous and non-hazardous wastes (i.e. oils, paints, contaminated/non-contaminated soil, etc.) waste states (liquids, solid), waste types (flammables, corrosives, etc.) • The Contractor will be required to separate and recycle, as far as practical, the following waste types/streams – steel, timber, concrete, masonry, vegetation, glass, plastics, and paper/cardboard. • The Contractor and Project Manager will agree, at the commencement of each major stage of the demolition and construction process, on targets for the volume of material to endeavor to recycle. • The Contractor will separate and stockpile reusable and recyclable products for re-use on-site or collection by an approved recycling contractor. • Demolition and waste/recyclable construction materials will be stockpiled/stored well clear of environmentally sensitive areas, including the central drainage line and major storm water inlet points Waste/recyclables stockpiles will be suitably silt fenced along their down slope and cross-slope margins if they contain mobile/erodible, soiled or suspect materials. • Road vehicles carrying waste material will not be loaded above their side and tail boards and all loads will be covered. • The Contractor will supply necessary bins and skips, including bins/containers at individual work areas plus larger centralized receptacles if required, for the effective management of wastes and recyclables across the site. The Contractor will supply recycling bins for glass, aluminum cans, scrap metal, paper for collection and transport to a recycling facility. • All skips and bins will be provided with suitable lids, that will be locked at night where necessary (especially those containing food or putrescible waste), to prevent the spread of waste by wind or foraging by animals. • All non-recyclable waste - including litter, garbage, and other solid waste - will be removed to a licensed waste disposal facility. • All non-recyclable hazardous waste - including petroleum products, chemicals and solvents, and other potentially hazardous materials - will be removed to a licensed waste disposal facility authorized to dispose of such materials. Separate containers will be provide for chemicals and chemical containers, paint and paint containers, render waste and other materials that cannot be disposed of in the general waste stream.

	• All works areas will be maintained in a clean and hygienic condition. The Contractor will organize a weekly "sweep" of the entire site to remove any stray/windblown litter and ensure that the area is clean. • Suitable containment materials, spill kits, and other incident response equipment will be maintained on-site throughout the works. • Personnel on site will be required to not feed fauna. Food scraps and putrescible waste should be either removed from site each day or adequately contained to prevent foraging by native and feral fauna.
Performance Measures	• Wastes are stored and managed correctly on site, with fewer than 1 waste non-conformance or "incident"- such as uncontained materials, windblown waste, bin/hopper overflows, unhygienic work sites - per week, on average, across the entire demolition and construction period. • No storm water or soil contamination due to waste non conformances or "incidents". • Target recycling volumes are achieved, on monthly intervals, over the entire demolition and construction period. • Licensed sub-contractor used for hazardous and nonhazardous waste disposal. • Documented evidence that waste has been disposed of correctly/legally by sub-contractors/waste contractors.
Monitoring / Auditing /Reporting	• The Contractor will conduct weekly inspections of all waste and recycling stations, stockpiles, facilities and equipment to ensure their functionality and continuing effectiveness. Records will be kept of these inspections. • Records of waste generation and disposal, as well as the extent of re-use and recycling, will be maintained and available on-site. • The Contractor will provide a summary of the above records and inspections to the Project Manager monthly - including details as to the attainment, or otherwise, of agreed recycling targets. • The Contractor will keep records of waste volumes and disposal locations, including transfer receipts and other documents to validate the appropriate disposal of wastes from the site. These records will be made available for inspection by the Project Manager at least fortnightly. • Audits will be conducted in accordance with EP01, including the implementation of any recommendations and/or corrective actions. • MSDS's for all potentially hazardous substances used on site will be maintained.
Corrective Action	• Any spills or leakages/overflows, or non-conformances with specified waste management practices, involving nonhazardous wastes will be remediated by the Contractor within 2 working days. • Any waste infringements will be addressed immediately, or within 1 working day at most. • Any spills or leakages/overflows, or non-conformances with specified waste management practices, involving hazardous wastes will be responded to immediately upon detection. Further details of hazardous material management are provided in EP04.

	• Penalties and punitive measures will be included, and enforced as warranted, in contracts with waste disposal subcontractors. • The Contractor will seek to continually improve waste minimization and management as well as recycling/reuse performance throughout the entire demolition and construction works. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Management. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by the Project Management.
Responsibility	• Contractor. • All site personnel

SN 8 – Water Quality, Storm water and Erosion

Performance Objective	Minimize the impact of water movement on and off site and its associated erosions, sedimentation and potential pollution effects.
Goals	• No extended or unmanaged areas of erosion on-site, and any sediment deposition or run-off across or from the site. • No discharge of sediment into the Little Penguin foreshore nesting/breeding area or Spring Cove. • No detrimental modification to the existing drainage patterns. • No discharge of contaminated storm water. • No pollution incidents.
Mitigation Measures	• The Contractor will install all soil and water management structures in accordance with the Erosion and Sediment Control Master plan. These will be in place prior to the commencement of demolition and construction works, and any advance activities likely to generate erosion and sedimentation impacts. • Silt fencing with sand bags, or coconut coir where approved, is the principal erosion and sediment control device to be employed on the site. The entire northern and western margins of the demolition and construction works area will be fully contained by these barriers for the entire duration of the works - as detailed on the Erosion and Sediment Control Master plan. • The upper (southern) section of the existing central watercourse will also be entirely contained by these heavy duty erosion and sediment control barriers. • Temporary silt fencing will be installed at selected locations across the site, as shown on the Erosion and Sediment Control Master Plan, and elsewhere as considered necessary by the Contractor or as directed by the Project Manager during the course of demolition and construction works. • The Contractor's works schedule will, as far as practical and efficient, Endeavour to minimize the extent of excavation and disturbed soil exposed at any one time.

	• Top soil will be separated from sub-soil materials and rock and will be re-used on-site wherever possible - if not compromised by weed propagules or other constraints. • The Contractor's works schedule will minimize the stockpiling of excavated or imported material to prevent exposure to wind and potential for sediment mobilization in runoff. Excessively steep faces or long slopes will be avoided to minimize erosion potential and the risk of slumping/slope failure. The Contractor will protect stockpile sites by silt fences on the lower side and margins (if needed) and upslope berms (to divert water flows), to the Project Manager's satisfaction. • Stockpiles will not be located in proximity to existing or proposed drainage lines and major storm water inlets, in environmentally sensitive areas, or within the "drip line" of trees to be retained. • Excavated, filled or sheeted/top-dressed areas with exposed soil will be stabilized as soon as practicable to minimize opportunities for erosion and sediment mobilization. Silt fencing and other erosion/sediment control measures will remain in place until a site is revegetated and/or stable. • The Contractor will be vigilant to identify any areas of the site that may become susceptible to erosion as a result of excavation, stockpiling, modifications to surface flows, or other factors during the demolition/construction works and will take appropriate measures to protect such sites (and down slope areas) from adverse erosion and sediment impacts. • The contractor will regularly clean and maintain silt fences and other erosion and sediment control devices, including the removal (as required) of sediment and other build-up. • Cleaning will only occur during periods of dry weather. • Temporary diversion structures, to intercept and divert clean runoff around work areas, will be installed by the Contractor as/where required. • The Contractor will inspect the site within 24 hours of a significant rain event for signs of erosion or contaminated holding waters. • Heavy plant and vehicle movements will be restricted to hard surfaces within the site after significant rain events or periods of water logging. • The cleaning of tools, vehicles, plant and equipment – only carried out as part of routine/efficient operations - will be undertaken away from sites where runoff could enter the storm water or drainage system. • Drains will be suitably protected to ensure that sediment laden runoff does not enter the storm water system. • Additional storm water and erosion/sediment control measures will be implemented - as set out in the Erosion and Sediment Control Master plan, (refer EP09) to prevent over-loading or contamination of the storm water system during the demolition/construction phase. • All redundant/obsolete storm water pipes or pits, and other old/unused pipes, will be removed or crushed/filled or otherwise made unusable to prevent access and possible entrapment by rodents or other wildlife.

	• To ensure the quality of storm water leaving the site fuels, lubricants, chemicals and wastes will be stored and handled -and any spills managed - as set out in EP04 and EP08.
Performance Measures	• Only minor localized areas of erosion evident for limited periods during demolition and construction, and all erosion is under active management/control/remediation. • Only minor localized areas of sediment run-off and deposition within the site and no sediment discharge/deposition across the grassed area, • All storm water and drainage on-site is managed to minimize or ameliorate impacts. • There is no oily sheen on the water surface, or litter in the discharge, of catchment storm water structures. • There is no turbid water released from the sediment structures. • No discharge of contaminated storm water, with storm water leaving the site meeting the following parameters: • less than 50mg/L suspended solids; • pH 6.5 to 8.5; and • No visible oil or grease, and no surface sheen. • No uncontrolled storm water discharges across the nesting/breeding area. • No pollution incidents.
Monitoring / Auditing /Reporting	• The Contractor will conduct regular inspections (at least once weekly) of erosion and sediment control devices to ensure their efficient operation and capacity. • The Contractor will regularly - at least once weekly – inspect watercourses and drainage lines (including storm water drainages) for visual signs of contamination and sediment. • The Contractor will monitor the quality of storm water leaving the site, at least fortnightly or immediately after major rainfall events, over the duration of the construction works and the results recorded. Monitoring frequencies may be increased during period of higher risk for storm water contamination - as directed by the Project Manager. Monitoring will include an assessment of suspended solids and turbidity, pH, salinity, petroleum products, visible oils and grease, potassium and nutrients, and heavy metals. • The Contractor will inspect the site within 24 hours of a significant rain event for signs of erosion or contaminated holding waters and to ensure that all erosion and sediment control devices are intact and operational. This will include visual assessment of any turbidity in adjacent waters • Monitoring of revegetation progress and soil stabilization. • Site audit and inspection reports.
Corrective Action	• Silt fencing and other erosion/sedimentation control measures will be upgraded and additional fencing or other measures installed, as required by the results of site inspections and monitoring. • The Contractor will install any additional temporary storm water detention and settling ponds, geotextile fabric filters, and other measures as/where required to better control storm water flows and discharges from the site as

	indicated by the results of site inspections and monitoring. • Excessive sediment movement will be priority issues requiring immediate corrective and preventative action by the Contractor. This will include stopping work across all or part of the site as necessary, until the source of these problems can be identified and addressed to the satisfaction of the Project Manager. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Management. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Management.
Responsibility	Contractor. All site personnel.

SN 9 – Management of Construction

Performance Objective	• To manage construction operations, activity and facilities to minimize impacts on the sensitive areas within the site (i.e. flora and fauna) and associated off-site impacts. • To provide a safe, effective and efficient construction site.
Goals	• To maximize the use of existing facilities, existing developed/disturbed areas, or areas identified for early demolition/disturbance works for construction related facilities. • No adverse impacts from temporary works offices and facilities. • To safely manage vehicle movement within the site and ensure no vehicle or machinery impacts on environmentally sensitive areas, significant wildlife and retained heritage buildings. • To manage storage and waste areas with a minimum of impacts on the site, while still allowing for effective operation and construction/demolition usage. • No pollution incidents and no evidence of site contamination as the result of waste.
Mitigation Measures	• The Traffic Management Plan to be prepared prior to the start of works (refer EP07) will address efficient circulation within the site, management of construction parking areas, and construction worker/employee access to the site. • Except in emergencies, vehicles will be restricted to the internal circulation route and designated parking areas as set out in the Site Layout Plan. • That section of the proposed construction parking area in the site's south-western boundary, and that part of the proposed vehicle circulation route accessing this parking area, that are not on the existing bitumen road surface will be temporarily surfaced with crushed sandstone or concrete, gravel, geotextile or other suitable materials. Bunding or temporary drainage will be provided if required.

	• The Contractor will control site access/entry to ensure that only authorized vehicles associated with the works – and staff - enter the site. Off-site construction worker/employee parking will be encouraged and enforced as required (due to the limited availability of on-site parking) (refer EP07). • Those proposed storage/waste facilities not located on existing sealed areas (Sites 2, 3, 4 and 5) will be temporarily surfaced - for the duration of their use - with crushed sandstone or concrete, gravel, geotextile or other suitable materials to minimize soil contact and prevent these areas from becoming ponding, mud, erosion, dust, traffic ability or environmental problem areas. • All storage/waste facilities will be provided with silt control measures (silt fencing or silt control "sausages") along their down slope and cross-slope margins. Those storage/waste facilities that contain hazardous wastes will be bunded along their down slope and cross-slope margins. • All storage/waste areas will be kept clean and tidy. All waste skips and bins will be provided with suitable lids, that will be locked at night where necessary (especially those containing food or putrescible waste), to prevent dust nuisance or the spread of waste by wind or foraging by animals.
Performance Measures	• Vehicles are only parking in the designated areas and only using the designated on-site roads/accesses - with fewer than 1 non-conformance or incident per fortnight. • Construction materials and wastes are stored and managed correctly on site, with fewer than 1 non-conformance or "incident"- such as off-storage sediment deposition, uncontained mobile materials, windblown waste, bin/hopper overflows, - per week, on average, across the entire demolition and construction period. • No hazardous materials are stored in storage/waste area 5. • No failures in the silt fencing and no resultant sediment discharge/deposition across the area.
Monitoring / Auditing /Reporting	• As part of routine daily operations the Contractor's senior onsite staff will monitor and enforce on-site access/parking restrictions. Significant or repeated breaches will be recorded, for reporting the Project Manager and enforcement/penalty actions where required. • The Contractor will conduct regular inspections (at least weekly) of all fencing, bunding and other containment or management measures in place at storage/waste facilities. • Those storage/waste facilities used for the storage of hazardous materials will be inspected daily. • The Contractor will inspect all storage/waste facilities within 24 hours of a significant rain event to ensure their integrity and that all containment or management measures are intact and operational. • Records will be kept of the above storage/waste facilities inspections, and the Contractor will provide a summary of these records and inspections to the Project Manager monthly. • Audits will be conducted in accordance with EP01, with implementation of the recommendations and corrective actions.

Corrective Action	• All near misses or vehicle accidents on-site will be immediately investigated by the Contractor and appropriate corrective/preventative actions identified and implemented as necessary. Any alterations to the on-site vehicle circulation scheme as set out in the Site Layout Plan will require approval from Project Management. • Any storage/waste spills, leakages/overflows, failures, incidents or non-conformances - involving non-hazardous wastes - will be remediated by the Contractor within 2 working days. Incidents involving hazardous materials will be responded to immediately upon detection (refer EP04 and EP08). • Those storage/waste sites subject to repeated slit fencing failure or erosion/sediment problems (more than 3 incidents in any 4 week period), or used for the longer-term/on-going (2 consecutive weeks or more) storage of mobile/erodible or soiled or suspect materials, will be bunded. • Investigations and/or corrective actions undertaken as a result of a complaint, audit, inspection or incident will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register as maintained by the Contractor and Project Management. • The Contractor according to an agreed responsibility and timescale will assign or close out all corrective actions undertaken by them, or undertaken as directed by Project Management.
Responsibility	Contractor. All site personnel.

Operation Phase

Water conservation and development measures need to be taken including all possible potential for reuse and recycling of water. These could be in the form of the following.

Wastewater Treatment Plant

The wastewater generated during the operational phase will be 68 KLD.

Water Consumption

Water consumption will be minimized by a combination of water saving devices and other domestic water conservation measures.

Domestic and Commercial Usage

- Use of water efficient plumbing fixtures (ultraflow toilets and urinals, low flow sinks, water efficient dishwashers and washing machines). Water efficient plumbing fixtures use less water with no marked reduction in quality and service.
- Leak detection and repair techniques.
- Sweep with a broom and pan where possible, rather than hose down for external areas.
- Meter water usage, employ measurement and verification methods. Monitoring water use is a precursor for management.

- Awareness campaign to disseminate knowledge on strategies and technologies that can be caused for water conservation.

Horticulture

- Drip irrigation and controlled tap system shall be used for the lawns and other green area. Drip irrigation can save between 15-40% of the water use, compared with other watering techniques.
- Plants with similar water requirements shall be grouped on common zones to match precipitation heads and emitters.
- Use of low-volume, low-angle sprinklers for lawn areas.
- Select controllers with adjustable watering schedules and moisture sensors to account for seasonal variations and calibrate them during commissioning.
- Selecting a drought resistant grass and using lawn chemicals and fertilizer sparingly also reduces watering needs.
- Place 3 to 5 in. of mulch on planting beds to minimize evaporation.

Operation Phase:

The philosophy of solid waste management at proposed project will be to encourage the four R's of waste i.e. waste reduction, reuse, recycling, and recovery (materials & energy). This will result in lesser reliance on land filling. Regular public awareness meetings will be conducted to involve the residents in the proper segregation, storage, recycling and individual composting options and techniques.

The Environmental Management Plan for the solid waste focuses on three major components during the life cycle of the waste management system, i.e. collection & transportation, treatment or disposal and closure & post closure care of treatment/disposal facility.

PLANTATION, LANDSCAPING AND ECOLOGICAL MANAGEMENT

Proposed project changes the natural environment. But it also creates a built environment for its inhabitants; Area will be left for recreational area which will be utilized for green development. The project requires the implementation of following choices exclusively or in combination.

Construction Phase

- Restriction of construction activities to defined project areas, which are ecologically less sensitive.
- Restrictions on location of labour camps and offices for project staff near the project area to avoid human induced secondary additional impacts on the flora and fauna species.
- Cutting, uprooting of trees or small trees present in and around the project site for cooking, burning or heating purposes by the laborers will be prohibited and suitable alternatives for this purpose will be found.
- After completion of major construction work, the green belt will be developed with recommended plant species, as there will be no or less disturbance in these areas.
- Cutting, uprooting of existing plants in the periphery will be prohibited and other plants in the site will be minimized.

- After completion of soil work, temporary vegetation preferably grasses are to be planted to minimize soil erosion.

Operation Phase

Enhancement of the current ecology at the proposed site will entail the following measures:

Plantation and Landscaping

Plantation and landscaping in the project area will help to improve the terrestrial habitat for birds, effectively serve as pollutant absorbent, act as recreation place for the residents and add to overall aesthetics of the area.

Effort should be made by the project authority for the development of a "nature trail" within the green belt site to provide the inhabitants an experience of aesthetic value. When the inhabitants take a walk through the "nature trail", watching the birds, insects and small mammalian species or feel the cool breeze, the natural

Green Belt Development Plan

The plantation matrix adopted for the green belt development includes pits. In addition, earth filling and manure may also be required for the proper nutritional balance and nourishment of the sapling. It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration.

For the purpose of pollution attenuation, the green belt shall be developed in three tiers as stated below:

First Tier: Shrubs species having good levels of air pollution tolerance limits which is referred to as Tolerance zone.

- Broken or interrupted: The branching pattern and canopy formation is not uniform e.g.: Palm varieties in between the shrub species at regular intervals in the first tier.
- Dropping canopy: The branches and leaves droop downwards. e.g.: *Polyalthia longifolia* can be planted in between the shrubs in the first tier.

Second Tier: Trees having fast growth potential with conical canopy called as dispersion zone.

- Round type: The shape of the crown is more or less rounded; branches and leaves are closely arranged e.g.: Ficus species is suitable for second and third tier.
- Flat topped canopy: The branches of the crown uniformly given flat-topped crown and the spread of the crown are wide to cover a wide area. e.g.: *Cassia fistula* is *s*uitable for second and third tire.

Third Tier: Trees having hairy leaves with thick and round canopy called as absorption zone.

- Cylindrical type: The branches and leaves form a close network and give the longitudinal spread e.g.: Dalbergia species in between the trees in the third tier.
- Chimney type: The branches give the appearance of long chimney e.g.: Eucalyptus on the outer rows of the third tier.
- Conical type: The growth of main stem and horizontal branches appear in the form of a cone e. g. Casuarina in peripheral rows of the third tier.

Selection of Plant Species for Green Belt Development

The selection of plant species for the development depends on various factors such as climate, elevation and soil. The list of plant species, which can be suitably planted, and having significant importance are provided in the table below. The plants should exhibit the following desirable characteristic in order to be selected for plantation.

- The species should be fast growing and providing optimum penetrability.
- The species should be wind-firm and deep rooted.
- The species should form a dense canopy.
- As far as possible, the species should be indigenous and locally available
- Species tolerance to air pollutants like PM_{10}, SO_2 and NO_x should be preferred.
- The species should be permeable to help create air turbulence and mixing within the belt.
- There should be no large gaps for the air to spill through.
- Trees with high foliage density, leaves with larger leaf area and hairy on both the surfaces.
- Ability to withstand conditions like inundation and drought.
- Soil improving plants (Nitrogen fixing, rapidly decomposable leaf litter).
- Attractive appearance with good flowering and fruit bearing.
- Bird and insect attracting tree species.
- Sustainable green cover with minimal maintenance

Maintenance of Plantation

Necessary steps to take for better results are:

- One/ two years old seedlings will be planted for plantation
- Regular de-weeding, mulching of seedlings and application of oil cakes and organic manure will be carried out to boost up the growth.
- Watering of the plantation during the dry season

Parks and Avenue Plantation

Parks and gardens maintained for recreational and ornamental purposes will not only improve the quality life at the proposed site but also the aesthetic value in the area. The plan for plantation in parks and avenues is described below.

Parks

- Ornamental trees with branches spread out as shade for people to relax.
- Suitable patches of lawns, with cactus and other small flowering xerophytes plants.

Avenue Plantation

- Trees with colonial canopy with attractive flowering
- Trees with branching at 10 feet and above
- Trees with medium spreading branches to avoid obstruction to the traffic.
- Fruit trees to be avoided because children may obstruct traffic and general movement of public.

SOCIO-ECONOMIC ENVIRONMENT

The social management plan has been designed to take proactive steps and adopt best practices, which are sensitive to the socio-cultural setting of the region.

INCOME OPPORTUNITY FOR LOCAL COMMUNITY

The project provides an employment opportunity for the local community, as tender specification for construction and operation would include a favorable employment opportunities for the locals. The main principles are outlined below:

- Employment strategy would provide for preferential employment of local labour.
- General recruitment procedures will be transparent, public and open to all.
- Recruitment procedures will be publicized in advance.
- There will be no discrimination on basis of gender, caste or other factors.

Contractors would be required to abide to employment priority towards locals and abide by the Indian labour laws regarding standards on employee terms and conditions.