

## FORM-1 A (only for construction projects listed under item 8 of the Schedule)

### CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring programme)

#### 1. LAND ENVIRONMENT

1.1. Will the existing land use get significantly altered from the project that is not consistent with the surroundings? (Proposed land use must conform to the approved Master Plan /Development Plan of the area. Change of land use if any and the statutory approval from the competent authority be submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.

No change in land use. The proposed expansion of the project i.e., construction of additional floor is as additional built up is allowed against TDR. Refer **Annex X** – for the approved Development Plan of existing construction.

The proposal is in conformity with the land use of Mangalore City Development Corporation.

Following maps are attached herewith:

- (i) Site location Map– **Annex I**
- (ii) Surrounding features of the proposed Project site (Aerial view within 500 meters) – **Annex II**
- (iii) Site Plan with proposed expansion– **Annex III**

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.

Note: The figures below are inclusive of the existing development.

Sr.	Project Siting	Description	
1	Total Built-up area	72,762.05 sq.m	
2	Area statement	Area in sq.m	Percentage
	Total site area	14,933.43	-
	Area left for road widening	496.14	
	Area available for construction	14,437.29	100
	Building footage	4,291.74	29.73
	Paved area (roads, ramps, open car parks, etc.)	4,103.81	28.42
	Landscape Area	5,466.74	37.87
	Swimming Pool area	575	3.98
3	Water		
	Water requirement	Construction phase: Source: Existing open well and bore well	

		<b>Requirement:</b> approx. 50 kld  <b>Operation phase:</b> <b>Source:</b> Mangalore City Corporation, openwell and borewell in case of scarcity. <b>Requirement:</b> 149 kld of Freshwater + Recycled water 86 kld												
4	Power													
	Power Requirement	<b>Construction phase:</b> Approx. 80 kVA from MESCOM and 1 DG of 120 kVA backup with fuel (Diesel) approx. 24 l/hr.  <b>Operation Phase:</b> Approx. 630 kVA from MESCOM and 2 Nos .of (250 kVA and 400 kVA) DG set as backup with fuel (Diesel) 250 l/hr												
	Power Source	Mangalore Electricity Supply Company Limited (MESCOM)												
5	Connectivity													
	Access roads	The site is on the Bolor Marigudi road which connects further towards North to National Highway 17.												
	Nearest railway station	Mangalore Central Railway station is approx. 4 km* away. (*Aerial Distance)												
	Nearest airport	Bajpe International Airport – At a distance of approx. 8 km* (*Aerial Distance)												
6	Community facilities	Club house, swimming pool, children play area and other basic amenities.												
7	Parking needs	<table border="1"> <thead> <tr> <th></th> <th>Provided car parks</th> <th>Required car parks</th> </tr> </thead> <tbody> <tr> <td>Lower Basement</td> <td>208</td> <td rowspan="4">326</td> </tr> <tr> <td>Upper Basement</td> <td>272</td> </tr> <tr> <td>Ground Floor</td> <td>55</td> </tr> <tr> <td>Total</td> <td>535</td> </tr> </tbody> </table>		Provided car parks	Required car parks	Lower Basement	208	326	Upper Basement	272	Ground Floor	55	Total	535
	Provided car parks	Required car parks												
Lower Basement	208	326												
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Ground Floor	55													
Total	535													

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).

The project site is located in the moderately populated zone of Mangalore City Corporation limits. The city has very good infrastructure such as roads, water supply and drainage, educational institutions, hospitals and other community facilities. Refer **Annex II** for infrastructure features within 500 m radius of the Project site.  
No adverse impact is likely on the local ecology due to the development of the Project as it is too small to create any impact.

1.4. Will there be any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity, etc. may be given).

Not applicable as the proposed activity involves only vertical construction (addition of one floor).

1.5. Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)

No, not applicable.

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.)

No. The proposed activity doesn't involve any earth work.

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

Water shall be pumped to the building by a network of pipelines by pressure.

**Water supply:** The water requirement during construction phase (50 kl/d) will be majorly for the construction activities and limited domestic use. This will be drawn from the existing open well at the Project site.

**Waste handling:** The details are as follows:

Various types of construction debris such as bricks, blocks, steel, formwork, finishing materials, etc. will be generated. Bricks, metal chips, cut tiles will be used for internal paving. The damaged/ cut pieces of steel, glass etc. will be sold to scrap dealer. Balance construction wastes, if any, will be disposed to authorized MSW site.

1.8. Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)

No. Not applicable. No soil disturbances is envisaged due to the proposed activity.

1.9. Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)

About 1 to 2% of the construction material might be wasted during construction, which is a normal phenomenon. Such waste shall be stored properly on a designated piece of land and shall be recycled in crushed and compacted state for construction of roads as sub-base. Construction debris such as bricks, blocks, steel, formwork, finishing materials, etc. will be generated. Bricks, metal chips, cut tiles will be used for internal paving. The damaged/ cut pieces of steel, glass etc. will be sold to scrap dealer.

Balance construction wastes, if any, will be disposed to authorized MSW site.

No hazardous construction material such as harmful solvents/thinners such as CTC, etc. restricted pesticides, etc. shall be stored, handled or used on the Project site.

## 2. WATER ENVIRONMENT

2.1. Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement met? State the sources & quantities and furnish a water balance statement.

### Construction Phase:

Source: Existing open well and bore well

Requirement: 50 kld

### Operation Phase:

After the expansion, the water requirement will be as follows.

Source: Mangalore City Corporation, existing openwell and borewell in case of scarcity.

Total Requirement: 149 kld fresh water and 86 kld recycled from STP

Freshwater shall be used for domestic uses in residential, clubhouse, swimming pool, etc. Tertiary treated water from STP shall be used for horticulture and flushing.

Total water quantity estimated for the Residential apartment based on land use under various activities and possibility of apartment comes to approx. 235 kld.

The details are given in the water balance is attached as **Annex IV**.

2.2. What is the capacity (dependable flow or yield) of the proposed source of water?

The primary source of water is Mangalore City Corporation, existing openwell and borewell in case of scarcity.

Water requirement will be augmented by making use of treated sewage from proposed Sewage Treatment Plant for flushing and horticulture.

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)

The source of water for domestic use during operation phase is Mangalore City Corporation.

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)

86 kld of recycled water.

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 diversion from other users is proposed in the Project. Freshwater requirement after expansion will be approx. 149 kld sourced from Mangalore City Corporation, existing openwell and borewell in case of scarcity.

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 quantity of treated waste water would be approx. 177 kld of which approx. 86 kld will be reused.

Water requirement and waste water generation	Qty (kld)
<b>Residential</b>	
No. of Dwelling Units (nos.)	267
Estimated peak occupancy (nos.) persons/unit *	1300
Fresh Water requirement @ 105 lpcd	137
Sewage @ 80% of the freshwater required	109
Recycled Water requirement @ 45 lpcd	59
Sewage generation @ 102% of Recycled water	60
<b>Maintenance Staff</b>	
Fresh Water requirement	1
Sewage @ 90% of the freshwater usage	1
Recycled water requirement	1
Sewage generation @ 90% of Recycled water	1
<b>Club House</b>	
Daily peak Club occupancy estimated (nos.) @ 10% of total occupants	130
Fresh water requirement @ 30 lpcd	4
Sewage @ 80% of the freshwater usage	3
Recycled water requirement @ 15 lpcd	2
Sewage generation @ 90% of Recycled water	2
<b>Swimming pool</b>	
Freshwater Requirement for Swimming pool	5
Sewage @ 20% of the freshwater usage	1
Volume of the Swimming pool (m <sup>3</sup> )	258

Water requirement and waste water generation	Qty (kld)
<b>Car Wash</b>	
Fresh water requirement for Car washing @ 20 lit/day	2
Waste Water generation @ 100% of the water used	2
<b>Horticulture</b>	
Recycled Water requirement	25
<b>Total Water required</b>	<b>233</b>
<b>Total Fresh Water requirement</b>	<b>149</b>
<b>Recycled Water requirement</b>	<b>86</b>
<b>Wastewater from Fresh water</b>	<b>114</b>
<b>Total Waste Water to STP</b>	<b>177</b>
<b>Sludge- 3% of total waste water</b>	<b>5</b>
<b>97% of total waste water</b>	<b>172</b>
<b>Excess recycled water to UGD</b>	<b>85</b>
<b>STP Capacity</b>	<b>180</b>

2.7. Give details of the water requirements met from water harvesting? Furnish details of the facilities created.

Water harvesting through Roof Top Harvesting system will be done. Storm water will be directed to the harvesting pits along the storm water network. Refer **Annex V** for Service drawing of storm water network and rainwater harvesting 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?

No. Runoff will increase because of the proposed construction.

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)

No impact on the groundwater is envisaged due to the proposed project.

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

No increase in runoff as the terrace area will remain same.

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)

The storm water overflow will be directed to the Harvesting well and to the drain. Refer **Annex VI** for pre-construction contour of the Project site.

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)

A labour colony of approx. 150 labours exists at the site since 3 yrs. for the ongoing construction. All amenities and sanitary facilities are provided.

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)

Temporary toilets are provided at the site and treated in mobile STP.

During operation, an STP of 180 kld based on SBR system will be constructed at the site. The treated water will be reused for flushing and horticulture purpose.

2.14. Give details of dual plumbing system if treated waste used is used for flushing of toilets or any other use.

Municipal water will be used for domestic purpose (i.e. for drinking, washing, bathing purpose, etc.).

Dual plumbing system shall be used to utilize grey water coming out of the STP. The system will be separately color coded for easy identification. The line shall not be placed along with raw/potable water line to prevent any accidental cross mixing. Grey water shall be stored on elevated reservoirs near the point of use and shall not be supplied under pressure, except for filling up the reservoir. General convention for grey water plumbing shall be followed as in the National Building Code of India, 2005. All repairs to the grey water network shall be done after complete de-pressurization, flushing with raw water and usage of proper PPEs.

There will be separate lines & tanks for treated waste water to be used for flushing, miscellaneous washing and usages, and horticulture. Refer **Annex VII** – Dual plumbing system

### **3. VEGETATION**

3.1. Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with it's unique features, if any)

No impact.

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 tree cutting involved.

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)

As the proposed construction involves only an addition of extra floor, no impact on biodiversity is envisaged. The landscape of the project is already planned.

#### 4. FAUNA

4.1. Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.

No. Not Applicable

4.2. Any direct or indirect impacts on the avifauna of the area? Provide details.

No impact on the avifauna is envisaged due to development of the Project.

4.3. Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna

In absence of likely adverse impacts, no mitigative measures are felt necessary.

#### 5. AIR ENVIRONMENT

5.1. Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)

The project will have 2 stand-by DG sets of 250 kVA and 400 kVA each running on HSD. The DGs will be CPCB type approved set compliant by design for air and noise pollution norms under the Environment (Protection) Act, 1986.

The area comprises a well-swept unconfined air shed. The air emissions from the DG sets are expected to disperse to permissible ground level concentrations within the site boundary. The air quality at the Project site is within the prescribed limits.



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.

No emission of hazardous fumes, dust, or un-restricted air pollution is envisaged from the Project.

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

Adequate parking area shall be provided for the residents and, visitors vehicles in the Project.

The traffic of the Project shall merge with the NH 17 only through a bi-directional road and not directly, thus reducing congestion on the entry gate complex of the Project site.

Most of the occupants are expected to use their own vehicles and public transportation facility easily available on Kuloor Ferry Road.

5.4. Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.

The roads and pedestrian pathways are under construction.

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.

Noise shall be created due to traffic movement inside the Project. This is however expected to be significantly ameliorated by the landscape proposed along the road side. The site being predominately residential, no sensitive receptors are present in the vicinity which could be adversely affected by the unavoidable noise generated due to any activities.

5.6. What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.

The Project will have DG set of 630 kVA for stand-by/intermittent operations for essential utilities of the Project. The DGs will be acoustically enclosed, CPCB type approved set compliant by design for air and noise pollution norms under the Environment (Protection) Act, 1986.

## **6. AESTHETICS**

6.1. Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?

The Project will not result in creation of aesthetic architectural construction in the area. No scenic view will be obstructed.

6.2. Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?

No.

6.3. Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.

The Project will result in creation of aesthetic architectural construction in the area. The buildings will be construction with locally available material.

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.

No.

## **7. SOCIO-ECONOMIC ASPECTS**

7.1. Will the proposal result in any changes to the demographic structure of local population? Provide the details.

No. Too small a size of expansion to create any impact.

7.2. Give details of the existing social infrastructure around the proposed project.

The site is within Mangalore City, where considerable urban development has taken place.

7.3. Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?

No disturbance to local communities, sacred sites or cultural values is envisaged due to the development of the Project.

## **8. BUILDING MATERIALS**

8.1. May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)

No particular building has process related requirements of steel shell structural, aluminum panels or glass façade, therefore only normal usage of high embodied energy construction material.  
In addition to maximum usage of fly ash cement products will make the construction environmentally less impacting.

8.2. Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?

All construction material is transported in tarpaulin covered trucks to minimize dust nuisance. PUC certification of the trucks is ensured. Except steel and cement, all the trucks ferries within a distance of 10 km from the site.

All the construction traffic is carried out during non-peak hours of the day. No transportation of building material is carried out in the night unless under extraordinary circumstances to ensure noise reduction and chances of accidents.

8.3. Are recycled materials used in roads and structures? State the extent of savings achieved?

All the wasted construction debris, approx. 1-2 % of the total construction material is used on-site mainly as road-sub base and for other leveling, compaction and landscaping activities.

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 segregated at source. Biodegradable waste will be composted at the site as per requirement using OWC and used as manure. Rest shall be sent for SWM facility along with the Non-biodegradable waste.

## 9. ENERGY CONSERVATION

9.1. Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?

Approx. power requirement of the Project has been estimated around 630 kvA from MESCOM.

Following energy conservation efforts shall be made in the Project:

- A. Sound design of buildings for maximum natural ventilation and illumination
- B. Design of building shell to reflect most of the solar insulation helping in reduction in AC load
- C. Use of solar energy – solar water heaters for all hot water applications
- D. Use of better specification illuminators, activity specific luminaries, LED illuminators as far as practicable, solar PVs, etc.,

9.2. What type of, and capacity of, power back-up to you plan to provide?

The Project will provide for power backup of essential utilities and emergency illumination. 2 DG sets of 250 kvA and 400 kvA each running on HSD will be installed to meet back up power demand.

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?

Glass with lower U-value (heat transmission co-efficient) and Solar Heat Gain Co-efficient (SHGC) will be used. Shade constructed surfaces on the site with landscape features and utilization of high-reflectance materials for hard scape are proposed to minimise solar heat gain in the buildings.

9.4. What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.

The buildings fenestration sizing, orientation and shading/levering will be designed to minimize solar insulation flux in the summer season in consideration with the sun path analysis.

9.5. Does the layout of streets & buildings maximise the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.

Building layout shall be designed to minimize solar insulation flux in the summer season in consideration with the sun path analysis.

Solar energy shall be utilized to the maximum extent possible by utilizing solar water heaters for all hot water applications.

9.6. Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?

The buildings fenestration sizing and shading orientation and shading/levering will be designed to minimize solar insulation flux in the summer season in consideration with the sun path analysis.

9.7. Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.

Building orientation, shell and fenestration design will be done to maximize natural lighting, ventilation and minimize load on AC.

All the drives used in the utilities, ACs and other electrical appliances will be minimum three star rating from the Bureau of Energy Efficiency. LED illuminators shall be used as far as possible; Advanced CFC free chillers will be used.

9.8. What are the likely effects of the building activity in altering the micro-climates? Provide a self assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?

A very small footprint of the complete Project area will be under buildings. No significant heat island effect of micro climatic change is envisaged due to development of the Project.

Development of landscape and good natural wind sweeping of the area rule out any heat island effect. Generally warm winters and flat topography rules out any serious risk of persistent inversion effect in the area.

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.

1. Roof = 200 to 250 mm thick slab  
U value = 0.352 W/m<sup>2</sup> °C (0.062 Btu/hr.ft<sup>2</sup>.°F )
2. External Walls= Brick Back machinery  
U value=U factor: 0.329 W/m<sup>2</sup> °C (0.058 Btu/hr.ft<sup>2</sup>.°F )
3. Fenestration= clear reflective single glazed window.  
Glass U value= 2.8 W/m<sup>2</sup> K, SHGC =Less than 0.28, VLT = 40-50%

9.10. What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.

Threats of widespread fires in a residential facility are generally very low. However, adequate protection measures are envisaged as part of prevention and control of fire in the Project as prescribed in Part IV of the National Building Code. Firefighting systems required for high-rise building shall be provided before construction and fire approval shall be obtained from concerned regulatory agency. All building requirement of the Fire and Emergency Services Department shall be fulfilled.

9.11. If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.

Not applicable.

9.12. What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.

The building is expected to undergo about 15 air changes per hour for all naturally aspirated open common areas such as corridors, lobbies, stair cases, etc. This rate will be higher in the upper stories of the buildings due to higher wind velocities.

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.

- Light fixtures will be used with energy saving LED & T5 fluorescent tube with electronic chokes.
- All utility panels and common area panel contain kWh energy meter for monitoring energy.
- All lift motor, domestic water pumps, firefighting pumps will be energy efficient motors.
- External Lighting to be controlled by astronomical timer switch.

## **10. Environment Management Plan**

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

A brief description of the Environmental Management Plan is given in the **Annex XI** EMP.