

2023

# REPORT FOR POLLUTION

## THE AIRAN PARADISE

### Address:

Situated at KHASRA NO 3, MAUJA ALLEHPUR, TEH. &  
DISTT.- MATHURA

DASS RASAYNIK SERVICES  
441 SECTOR 16, SIKANDRA AVAS YOJNA SIKANDRA  
AGRA – 282007 PH. NO. - 8218595706

03/07/2023



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## **PROJECT REPORT**

### **A) Air Pollution Contribution Assessment and Management**

- 1) Details of project configuration with the description of Plant / Equipment / Facility along with process flow diagram of the proposed/industry with identified sources of air pollution due to various project activities.

a. Details of the Project Configuration with description:

Particulars	Details
Name of the Project	THE AIRAN PARADISE
Name of the Company	SOMPTUEUX STAYS PRIVATE LIMITED
Registered Office	C/O RAJ KUMAR AGRAWAL, OPP. KALYAN KAROTI, Kalyan Karoti, Jaisinghpura Bangar, Mathura, Mathura, Uttar Pradesh, 281001
Project Address	KHASRA NO 3, MAUJA ALLEHPUR, TEH. & DISTT.- MATHURA
Project Cost	19 Crore Approx.
Category of Project	Hotel
Total Plot area	Plot Area – 3235.00 Sqm
Built up Area	Built up Area – 4417.40 Sqm
Green Area	Green Area – 333.80 Sqm
No. of Floors	B+G+4
No. of Rooms and other facilities	40 rooms, Restaurant, Banquet Hall, Hall.
Plant & Machinery	DG set 2 x 300 Kva Autoclave – No Burner – No HVAC System – 160 Tr apprx. No any heavy machinery.
Total Power Load	386 KVA

Layout Plan is attached as Annesure-1



GOOGLE MAP COORDINATES : 27.555120, 77.632976

### **Google map location of Project site**

#### **b. Identified sources of Air Pollution due to various project activities.**

##### **i) During Construction Phase**

The potential sources of air emissions during the construction and development phase of the project will be as follows:

- Dust from earth works (during site preparation)
- Emissions from Gen.sets
- Emission from the operation of construction equipment and machines.
- Fugitive emissions from vehicles

- Fugitive emissions during the unloading of material at the site
- Projected site is surrounded with good metalled and wide roads so chances of dust emissions are at Minimum level.
- Generation of exhaust gases is likely due to movement and operation of machinery for construction. This impact will be much localized. Increment in Air Pollution level will be a short – term.
- Use of proper Personal Protective Equipment (PPE) such as earmuffs will mitigate any adverse impact of the noise.
- The Project shall implement all necessary Air Pollution Control infrastructures like smog guns, green curtain, regular sprinkling to keep the raw material moist in order to minimize the anticipated dust emission. Therefore, impact will be temporary and restricted within the vicinity of the construction activities only.

ii) During Operational Phase

The Project shall function on the principle of clean & green environment. The major sources of Air Pollution in the post operation phase shall be –

- Vehicular movement associated with daily functioning of the project.
- Alternate power backup by way of genset.

The project shall strictly ensure entry and movement of only Bharat Standard compliance vehicles having pollution under control certificate. It is anticipated that the contribution of vehicular emissions in ambient air quality will be marginal but will be below the stipulated National Ambient Air Quality Standards for NO<sub>2</sub> (60µg/m<sup>3</sup>).

The DG set 300 KVA 2 nos. shall be based on cleaner fuel natural gas only and hence neutralize any possibility of air / noise pollution emanating from the project.

The Gensets shall be meeting the emission limit as prescribed by MoEF&CC, Govt. of India vide its Notification dated 07 March 2016 as reproduced below:

Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	≤ 4.0
CO	≤3.5

The Gensets shall be equipped with adequate acoustic enclosures to meet the norms of 75dB (A) at 1 metre from enclosure surface. The gensets shall also be provided with adequate stack height as per the provisions of Environment Protection Rule as reproduced below:

Table 4.3: DG set Stack height Rule, as per MoEF

50-100 KVA	Ht. of the building + 2.0 meter
100-150 KVA	Ht. of the building + 2.5 meter
50-100 KVA	Ht. of the building + 3.0 meter
100-150 KVA	Ht. of the building + 3.5 meter

The Project shall develop in- house parking facility for the entire projected vehicular load so that there will be possibility of any erratic traffic conditions leading to localize traffic jam and air pollution.

In addition to above, the project shall be developing green belt as per the norms of MVDA to further conserve and improve the Ambient Air Quality within the premises.

- 2) Details of anticipated parameters of air pollution (like PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, Co, HC, VOCs, NH<sub>3</sub>, H<sub>2</sub>S etc.) due to each activity of the project with emission rate in appropriate units (say kg/hr or kg/day)

a) During Construction Phase

- i. The anticipated Air Pollutants during construction phase shall be PM<sub>10</sub> & PM<sub>2.5</sub> arising due to the construction activities and handling of raw material. The project shall implement all necessary measures like smog guns, green curtains, sprinkling to suppress the dust concentration within the localize area.
- ii. The use of natural gas based genset of 10 KVA capacity shall be emitting NO<sub>x</sub> & CO within the permissible limit as prescribed by MoEF & CC, Govt. of India vide Notification dated 07 March, 2016 as reproduced below:

Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	≤ 7.5
CO	≤ 3.5

The operation of 10 KVA Genset is projected to emit following pollution load -

Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	0.016
CO	0.007

- iii) The Project in its construction phase shall necessitate movement of heavy vehicles for transportation of the raw material. The project shall ensure plying of Bharat Stage Norms Compliant vehicles with valid Pollution under Control Certification. The emission mandated for heavy vehicles by Central Pollution Control Board are as reproduced below:

Norms	Co (g/Kmhr)	HC (g/Kmhr)	NO <sub>x</sub> (g/Kmhr)	PM (g/Kwhr)
Bharat Stage-IV	1.5	0.96	3.5	0.02

During the construction phase, the project activity shall involve plying of 5 to 6 vehicles / day to meet the requirements of raw material transportation and other aspects. The projected pollution load due to plying of vehicles during the construction phase is as below:

Carbon Monoxide	0.002 g/s
Hydrocarbon	0.0013 g/s
Nitrogen Oxide	0.005 g/g
Particulate Matter	0.1 g/hr

b) During Operation Phase

- i) The use of natural gas based genset of 300 KVA capacity, 2 numbers shall be emitting NO<sub>x</sub> & CO within the permissible limit as prescribed by MoEF & CC, Govt. of India vide Notification dated 07 March, 2016 as reproduced below:

Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	≤ 4.0
CO	≤ 3.5



The operation of 300 KVA Genset is projected to emit following pollution load -

Emission Limits (g/kW-hr	
NO <sub>x</sub> + NMHC	0.26
CO	0.23

- ii. The Project in its operational phase shall necessitate movement of light duty vehicles for movement of the guests, visitors and staff. The project shall ensure plying of Bharat Stage Norms Compliant vehicles with Pollution under Control Certification. The emission mandated for light vehicles is as reproduced below:

AIR POLLUTANTS		
Emission Standards for Ligh-duty Diesel Vehicles (GVW ≤ 3500 kg) Bharat IV for light vehicles in G/K wh		Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV
CO	0.14	CO 1.0
HC	0.039	HC +NO <sub>x</sub> 0.18 (Combined)
NO <sub>x</sub>	0.253	
PM	0.005	

The project is designed for an infrastructure of 40 rooms. Based upon an average occupancy of 70%, the operation phase shall witness approximately 28 vehicles / day to achieve the same. Subsequently, the project is also having dining hall/Restaurant for 217 people, 1 pre-function hall area of 700 people capacity and banquet hall for 280 peoples. The regular operation of these additional facilities shall result in to 165 vehicles coming into the project daily. Visitors approximately 50 are projected to introduce 25 vehicles / day. The daily vehicle load is 218 four wheelers. The projected pollution load arising out of plying of the vehicles is as below:

AIR POLLUTANTS	
Emission Standards for Light-duty Diesel Vehicles (GVW $\leq$ 3500 kg) Bharat IV for light vehicles in G/Kwh	Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV
Total No of light vehicles 218	Total No of Cars 218
CO 0.14 gm/s	CO 1.0 gm/km
HC 0.039 gm/s	
NOx 0.253 gm/s	
PM 0.005 gm/s	

The Project shall be implemented on the methodology and following the principles of clean environment wherein all necessary and adequate measure shall be implemented to mitigate the anticipated air pollution and ensure clean ambient air as per the provisions of Environment Protection Rules. The Project shall be functional only on clean fuel and electricity with no use of any boiler.

- 3) Details of physical parameters of each stack of the industries such as height, diameter, exit velocity, gas temperature, flow rate.

The project shall be implemented on the methodology and following the principles of clean environment wherein all necessary and adequate measures shall be implemented to mitigate the anticipated air pollution and ensure clean ambient air as per the provisions of Environment Protection Rules. The project shall be functional only on clean fuel and electricity will no use of any boiler.

Stack shall only be provided on the gas fired gensets during the construction as well as the operational phase. In addition, the gensets shall be provided with integrated acoustic enclosures to meet the norms of 75 dB (A) sound pressure level at a distance of 1 metre from enclosure surface. The physical parameters of stack shall be as below:

Source (Gas fired Genset)	Stack Height (mtr. Above roof)	Diameter (mtr.)	Exit Velocity (mtr/s)	Gas Temperature ( $^{\circ}$ C)	Flow Rate (m <sup>2</sup> /s)
10 KVA	2.0	0.4	8.0	100	0.80
300 KVA	3.5	0.6	10.0	120	2.14

The operation of gas fired gen.sets shall be strictly in accordance with the law and parameters prescribed in the mandate to ensure that there is no adverse impact in the ambient air and noise environment due to its operation.

- 4) Details of roads/traffic movement within the premises and outside the premises of the proposed project till the main road, as in many cases, large number of movement of vehicles is expected, which become a major source of vehicular pollution as well as re-suspension of road dust (depending upon type of road). Likely movement of such activities needs to be quantified with daily emission load (vehicle exhaust and road dust re-suspension).

a) During Construction phase.

The Project in its construction phase shall necessitate movement of heavy vehicles for transportation of the raw material. The project shall ensure plying of Bharat Stage Norms Compliant vehicles with valid pollution under control certification. The emission mandated for heavy vehicles by central pollution control board are as reproduced below.

Norms	Co(g/Kmhr)	HC (g/Kmhr)	No <sub>x</sub> (g/Kmhr)	PM(g/Kmhr)
Bharat Stage- IV	1.5	0.96	3.5	0.02

During the construction phase, the project activity shall involve plying of 5 to 6 vehicles/day to meet the requirements of raw material transportation and other aspects. The projected pollution load due to plying of vehicles during the construction phase is as below:

Carbon Monoxide	0.002g/s
Hydrocarbon	0.0013g/s
Nitrogen Oxide	0.005g/s
Particulate Matter	0.1g/hr

b) During Operational Phase

The project in its operational phase shall necessitate movement of light duty vehicles for movement of the guests, visitors and staff. The project shall ensure plying of Bharat Stage Norms Compliant vehicles with valid

pollution under control certification. The emission mandated for light vehicles is as reproduced below.

AIR POLLUTANTS			
Emission Standards for Light-duty Diesel Vehicles (GVW $\leq$ 3500 kg) Bharat IV for light vehicles in G/Kwh		Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV	
CO	4	CO	1.0
HC	1.1	HC+NOx 0.18 (Combined)	
NOx	7		
Pm	0.15		

The project is designed for an infrastructure of 40 rooms. Based upon an average occupancy of 70%, the operation phase shall witness approximately 28 vehicles / day to achieve the same. Subsequently, the project is also having dining hall/Restaurant for 217 people, 1 pre-function hall area of 700 people capacity and banquet hall for 280 peoples. The regular operation of these additional facilities shall result in to 165 vehicles coming into the project daily. Visitors approximately 50 are projected to introduce 25 vehicles / day. The daily vehicle load is 218 four wheelers. The projected pollution load arising out of plying of the vehicles is as below:

AIR POLLUTANTS			
Emission Standards for Ligh-duty Diesel Vehicles (GVW $\leq$ 3500 kg) Bharat IV for light vehicles in G/Kwh		Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV	
Total No of light vehicles 218		Total No of Cars 218	
CO	0.14 gm/s	CO	1 gm/km
HC	0.039 gm/s		
NOx	0.253 gm/s		
PM	0.005 gm/s		

The project shall be implemented on the methodology and following the principles of clean environment wherein all necessary and adequate measures shall be implemented to mitigate the anticipated air pollution and ensure clean ambient air as per the provisions of Environment Protection. The project shall be functional only on clean fuel and electricity with no use of any boiler.

- 5) Details of DG sets as well as other heavy machinery with operational schedule & fuel consumption.

The project shall be implemented on the methodology and following the principles of clean environment wherein all necessary and adequate measures shall be implemented to mitigate the anticipated air pollution and ensure clean ambient air as per the provisions of Environment Protection rules. The project shall be functional only on clean fuel and electricity with no use of any boiler.

Stack shall only be provided on the gas fired gensets during the construction as well as the operational phase. In addition, the gensets shall be provided with intergrated acoustic enclosures to meet the norms of 75 dB (A) sound pressure level at a distance of 1 metre for enclosure surface. The physical parameters of stack shall be below:

Source (Gas fired Genset)	Stack Height (mtr. Above roof)	Diameter (mtr.)	Exit Velocity (mtr/s)	Gas Temperature ( <sup>0</sup> C)	Flow Rate (m <sup>2</sup> /s)
10 KVA Construction Phase	2.0	0.4	8.0	100	0.80
300 KVA Operational Phase	3.5	0.6	10.0	120	2.14

The operation of gas fired gensets shall be strictly in accordance with the law and parameter prescribed in the mandate to ensure that there is no adverse impact in the ambient air and noise environment due to its operation.

In addition, the project shall be having following major plan to facilitate its smooth functioning.

- Heat Pumps: Heat pumps of 50 KWx2 pumps. For heat pumps electric load will be 25 Kw.
- HVAC System – 160 Tr. approx.

- 6) Details of air pollution control systems proposed for each parameter of concern at each of the source of generation ant their efficiency.

a) During Construction Phase

The major source of generation of dust shall be construction activity as well as transportation of the raw material. Following measures shall be incorporated in order to effectively mitigate the dust generation and ensure that the ambient air quality is not adversely impacted.

Activity	Air Pollution control Measure
Emissions From Construction Equipment and movement of vehicles	<ul style="list-style-type: none"> <li>• Only compliant vehicles with valid 'Pollution under control' certificate permitted.</li> <li>• Construction material shall be covered during transportation</li> </ul>
Dust Generation during Earth work	<ul style="list-style-type: none"> <li>• Wetting the surface before starting the excavation and while removing the debris, immediately at the end of the day.</li> <li>• Dust Suppression measures such as sprinkling of water (to wet the dust prone area/construction site.) will be done at regular intervals to control fugitive dust emissions during construction activities.</li> </ul>
Fugitive dust generation due to wind from stock piling of earth/sand or other loose construction material.	<ul style="list-style-type: none"> <li>• Stock piling of construction material shall be done at designated and approved places away from habitation and water bodies/drains. Regular sprinkling of water and covering stack piles should be done to prevent wind-blown dust.</li> <li>• Temporary barriers (berms, silt fence or sandbag) shall be erected to prevent spreading of construction material.</li> </ul>
Noise pollution	<ul style="list-style-type: none"> <li>• All plant and equipment used in construction shall strictly conform to the prescribed noise standards of Central pollution control board.</li> <li>• All construction personal should be provided with ear plugs and other personal protective equipment.</li> </ul>
Waste Management	<ul style="list-style-type: none"> <li>• The construction and demolition waste shall be reused as much as required for the project and excess waste shall be disposed at an approved site as per the construction and demolition waster management rules, 2016</li> </ul>
Water sprinkling for dust control	<ul style="list-style-type: none"> <li>• Sprinkling of water for dust control at the construction area including sites of material storage at every 2 hr interval as dust suppression measures during construction activities.</li> </ul>
Storage of construction	<ul style="list-style-type: none"> <li>• Separate storage areas with three side covering with temporary barricading of 2 height is</li> </ul>

material	<p>provided for course and fine aggregate material to minimize dust expansion.</p> <ul style="list-style-type: none"> <li>• Land of material storage (base of storage sites) sites shall be protected with high thickness plastic sheets.</li> <li>• Loose course and fine aggregate material to be covered by high thickness plastic sheets to prevent dust expansion.</li> </ul>
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b) During Operational Phase.

- The project is not having any boiler and all the operations are based upon natural gas and electricity.
- Gensets 300 KVA, 2 numbers to be operated on natural gas in order to ensure the emission concentration of NO<sub>x</sub> and CO to be within the stipulated norms. The Gensets shall be equipped with adequate acoustic enclosures to meet the norms of 75Db (A) at 1 meter from enclosure surface. The gensets shall also be provided with adequate stack height as per the provisions of Environment Protection Rules.
- The vehicles plying within the premises shall be Bharat Stage compliant with valid PUC certification.

7) Quantification of the net contribution (in kg/d or during the activity period) of air pollution parameters due to the proposed project (without and with control system a) During Construction Phase.

a) During Construction Phase

- i. The anticipated Air Pollutants during construction phase shall be PM 10 & PM<sub>2.5</sub> arising due to the construction activities and handling of raw material. The project shall implement all necessary measures like smog guns, green curtains, sprinkling to suppress the dust concentration within the localize area.
- ii. The use of natural gas based genset of 10 KVA capacity shall be emitting NO<sub>x</sub> & CO within the permissible limit as prescribed by MoEF&CC, Govt. of India vide Natification dated 07 March, 2016 as reproduced below:

iii.

Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	≤ 4.7
CO	≤ 3.5

The operation 10 KVA Genset is projected to emit following pollution load-

Genset Pollution Load (g/s)	
NO <sub>x</sub> + NMHC	0.026
CO	0.019

iv. The Project in its construction phase shall necessitate movement of heavy vehicles for transportation of the material. The project shall ensure plying of Bharat Stage Norms compliant vehicles with valid pollution under control certification. The emission mandated for heavy vehicles by central pollution control board are as reproduced below:

v.

Norms	Co(g/Kmhr)	HC (g/Kmhr)	No <sub>x</sub> (g/Kmhr)	PM(g/Kmhr)
Bharat Stage- IV	1.5	0.96	3.5	0.02

During the construction phase, the project activity shall involve plying of 5 to 6 vehicles/day to meet the requirements of raw material transportation and other aspects. The projected pollution load due to plying of vehicles during the construction phase is as below:

Carbon Monoxide	0.002 g/s
Hydrocarbon	0.0013 g/s
Nitrogen Oxide	0.005 g/g
Particulate Matter	0.1 g/hr

b) During Operation Phase

i. The use of natural gas based genset of 300KVA capacity, 2 numbers shall be emitting NO<sub>x</sub> & CO within the permissible limit as prescribed by MoEF&CC, Govt. of India vide Notification dated 07 March, 2016 as reproduced below:



Emission Limits (g/kW-hr)	
NO <sub>x</sub> + NMHC	≤ 4.0
CO	≤ 3.5

The operation of 300 KVA Genset is projected to emit following pollution load-

Genset Pollution Load (g/s)	
NO <sub>x</sub> + NMHC	0.04
CO	0.38

- ii. The project in its operational phase shall necessitate movement of light duty vehicles for movement of the guests, visitors and staff. The project shall ensure plying of Bharat Stage Norms Compliant vehicles with valid pollution under control certification. The emission mandated for light vehicles is as reproduced below:

AIR POLLUTANTS	
Emission Standards for Light-duty Diesel Vehicles (GVW ≤ 3500 kg) Bharat IV for light vehicles in G/Kwh	Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV
CO 4	CO 1.0
HC 1.1	HC+NO <sub>x</sub> 0.18 (Combined)
NO <sub>x</sub> 7	
Pm 0.15	

The project is designed for an infrastructure of 40 rooms. Based upon an average occupancy of 70%, the operation phase shall witness approximately 28 vehicles / day to achieve the same. Subsequently, the project is also having dining hall/Restaurnat for 217 people, 1 pre-function hall area of 700 people capacity and banquet hall for 280 peoples. The regular operation of these additional facilities shall result in to 165 vehicles coming into the project daily. Visitors approximately 50 are projected to introduce 25 vehicles / day. The daily vehicle load is 218 four wheelers. The projected pollution load arising out of plying of the vehicles is as below:

AIR POLLUTANTS			
Emission Standards for Ligh-duty Diesel Vehicles (GVW $\leq$ 3500 kg) Bharat IV for light vehicles in G/Kwh		Emission norms for passenger cars (CPCB standard for Vehicular Exhaust gm/km) – Considering Bharat Stage IV	
Total No of light vehicles 218		Total No of Cars 218	
CO	0.14 gm/s	CO	150.0 gm/km
HC	0.039 gm/s		
NO <sub>x</sub>	0.253 gm/s		
PM	0.005 gm/s		

The project shall be implemented on the methodology and following the principles of clean environment wherein all necessary and adequate measures shall be implemented to mitigate the anticipated air pollution and ensure clean ambient air as per the provisions of Environment protection rules. The project shall be functional only on clean fuel and electricity with no use of any boiler.

- 8) Identification of zone of influence of the air pollution sources of the proposed project on the surrounding area using appropriate air quality model and assessment of its significance level (with and without control systems). Depending upon activity level of the proposed project, different zones can be identified.

Air Modeling is attached as Annexure – V

## **AIR POLLUTION SCORE OF PROPOSED PROJECT OF M/S THE AIRAN PARADISE, MAUJA ALLEHPUR, MATHURA, U.P**

The proposed project is a hotel including Restaurant, Banquet Hall, meditation, Fitness & wellness facilities etc. The project is having 40 rooms. No boiler shall be installed in the project and electricity shall be the main source of fuel. Genset employed 300 KVA, 2 nos. shall be based on natural gas. Green belt will be developed eco-friendly species in a area of 333.80 sq.m as per the provisions of MVDA

The Air Pollution score for the said project activity is calculated strictly in accordance with CPCB documents titled "Final Document on Revised classification of Industrial Sectors Under Red, Orange, Green and White Categories". The relevant portion of scoring methodology is reproduced as below:

### **AIR POLLUTION SCORE**

Sl. No.	Air Pollutants Group	'Range of Prescribed Standard' of criteria pollutants	Marks
1.	Group A1A	Presence of criteria air pollutants having prescribed standard limits up- to 2 mg/Nm <sup>3</sup>	30
2.	Group A1B	Presence of criteria air pollutants having prescribed standard limits from 3 to 10 mg/Nm <sup>3</sup>	25
3.	Group A1C	Presence of criteria air pollutants having prescribed standard limits from 11 to 50 mg/Nm <sup>3</sup>	20
4.	Group A1D	Presence of criteria air pollutants having prescribed standard limits from 51 to 250 mg/Nm <sup>3</sup>	15
5.	Group A1E	Presence of criteria air pollutants having prescribed standard limits from 251 mg/Nm <sup>3</sup> and above	10
6.	Group A1F	Generation of fugitive emissions of Particulate matters which are: <ul style="list-style-type: none"> <li>• Not generated as a result of combustion of any kind of fossil-fuel.</li> <li>• Generated due to handling/processing of materials without involving the use of any kind of chemicals.</li> <li>• Which can be easily contained /controlled with simple conventional methods.</li> </ul>	10
7.	Group A1G	Generation of Odours which are:	10

		<ul style="list-style-type: none"> <li>Generated due to application of binding gums/cements/adhesives/enamels.</li> <li>Which can be easily contained/controlled with simple conventional methods</li> </ul>	
8.	Group A2F1	All such industries in which the daily consumption of coal/fuel is more than 24 MT/day and the particular (Particulate/gaseous/process) emissions from which can be controlled only with high level equipments/technology like ESPs, Bag House Filters, High Efficiency chemical wet scrubbers etc.	10
9.	Group A2F2	All such industries in which the daily consumption of coal/fuel is from 12 MT/day to 24 MT/day and the particular (particulate/gaseous /process) emissions from which can be controlled with suitable proven technology.	5
Overall Air Pollution Score – $A = A1 + A2$			
NOTE- <ul style="list-style-type: none"> <li>Air pollutants covered under Group A1A: Cd+Th, Dioxins &amp; Furans, Mercury, Asbestos</li> <li>Air Pollutants covered under Group A1B: HF, Nickel + Vanadium, HBr, Manganese, Lead, H<sub>2</sub>S, P<sub>2</sub>O<sub>5</sub> as H<sub>3</sub>PO<sub>4</sub></li> <li>Air pollutants covered under Group A1C: Chlorine, Pesticide compounds CH<sub>3</sub>Cl, TOC, Total Fluoride, Hydrocarbons, NH<sub>3</sub>, HCL vapour &amp; Mist, H<sub>2</sub>SO<sub>4</sub> Mist, SO<sub>2</sub></li> <li>Air Pollutants covered under Group A1D: CO, PM, CO, NO<sub>x</sub></li> <li>Air Pollutants covered under Group A1E: NO<sub>x</sub> with liquid-fuel, SO<sub>2</sub> with liquid-fuel.</li> </ul>			

CPCB in its classification of industrial sectors has classified Hotel Sector in 3 categories as follows:

#### Hotel Industry Sector as categorized in CPCB document

Sl. No.	Industry Sector	A1	A2	A	Remarks
1.	Hotels having overall wastewater generation @100 KLD and more	15	-	15	i. Mainly water polluting. Small boiler may be installed. ii. The water pollution score is normalized to 100 & valid for Hotels having waste-water generation > 100 KLD. iii. The hotels having more than 20 rooms and waste-water generation less than 100 KLD and

					having a coal/oil fired boiler, the pollution score will be 35/40 & are categorized as orange. iv. The hotels having more than 20 rooms and waste-water generation less than 10 KLD and having no-boiler & no hazardous waste generation, the pollution score will be 20 & are categorized as Green.
2.	Hotels (< 3 star) or hotels having > 20 rooms and less than 100 rooms.	20	-	20	Mainly water polluting WP score is normalized to 100.
3.	Hotels (up to 20 rooms and without boilers)	-	-	-	This score is valid for hotels having overall waste-water generation less than 10 KLD.

The proposed project shall not be using either coal or oil as fuel, there will be boiler installed and genset shall operate only on natural gas. CPCB in its categorization of Hotel has given Air Pollution Score as 15 for the Hotel setup operational on Coal/Oil fired boilers. Hence, in view of the fact that there shall be no use of Coal/Oil fired boilers. Hence, in view of the fact that there shall be no use of Coal/Oil and even the boiler is not being installed, the air pollution score is bound to be below 15 in line with CPCB methodology.

The criteria air pollutant for the proposed project shall be from the natural gas fired gensets which shall qualify as Group A1E and hence shall attract air pollution score of 10. Further, due to the absence of odour and fugitive emissions, the Group A1F & A1G is also absent. Further, the score of Group A2 is for industries using Coal/ Fuel either more than 24 MT/day or between 12 to 24 MT/day besides installation of air pollution control system like ESP, Bag filter etc. as mandatory. In the case under consideration, there being on installation of boiler as well as no use of Coal/Oil, hence the Group A2 factors i.e. Group A2F1 & Group A2F2 are absent.

The emission from gas fired genset shall comprise of criteria of pollutants NO<sub>x</sub> and CO. Based upon the emission norms laid down for Genset run on dedicated Natural Gas (NG) or Liquid Petroleum Gas (LPG) by MoEF & CC, Government of India vide notification dated 07.03.2016 and anticipated pollution load and flue gas volume, the criteria pollution concentration shall remain between Group A1D and A1E and hence shall attract air pollution score between 10 to 15.

Air Pollution score	Applicability of Group A1D	15
Air Pollution Score	Absence of Group A2F1 & A2F2	Zero
Total Air Pollution Score	----	15

In view of above justification, the Air pollution score of proposed project of M/s THE AIRAN PARADISE, MAUJA ALLEHPUR, Mathura, U.P. is equivalent of Group A1D score which is 15. Hence, the air pollution score is computed as 15 for the project under consideration.

- 9) Assessment of prevalent ambient air quality air quality status in the zone of influence and meteorological conditions (secondary or primary data)

CENTRAL POLLUTION CONTROL BOARD						
CONTINUOUS AMBIENT AIR QUALITY						
Station	Omex Eternity, Vrindavan – UPPCB					
Parameter	PM2.5, PM10, NOx, SO2, CO					
Avg.period	24 Hours					
From	24-05-2023 TO 00:00:00Z 00:00					
To	24-06-2023 TO 16:49:59Z 00:00					
Omex Eternity, Vrindavan – UPPCB						
From Date	To Date	PM2.5	PM10	NOx	SO2	CO
24-05-2023 00:00	25-05-2023 00:00	38.49	126.77	20.88	41.88	1.48
25-05-2023 00:00	26-05-2023 00:00	37.26	128.05	35.43	42.07	1.53
26-05-2023 00:00	27-05-2023 00:00	28.23	109.44	15.64	41.38	0.95
27-05-2023 00:00	28-05-2023 00:00	23.38	102.51	13.99	41.4	1.14
28-05-2023 00:00	29-05-2023 00:00	30.59	113.44	18.82	41.67	1.11
29-05-2023 00:00	30-05-2023 00:00	36.06	131.34	17.78	42.89	1.13
30-05-2023 00:00	31-05-2023 00:00	34.45	105.12	17.11	41.96	1.15
31-05-2023	01-06-2023	25.08	148.73	16.71	42.49	0.96

00:00	00:00					
01-06-2023	02-06-2023	20.54	112.81	16.92	43.05	1.05
02-06-2023	03-06-2023	28.01	147.12	30.43	41.59	1.43
03-06-2023	04-06-2023	30.82	133.11	31.8	43.21	1.4
04-06-2023	05-06-2023	34.3	117.15	19.27	42.88	1.37
05-06-2023	06-06-2023	38.16	118.98	26.33	42.42	1.45
06-06-2023	07-06-2023	52.17	157.15	50.24	47.77	2.08
07-06-2023	08-06-2023	55.48	159.23	43.58	52.55	2.02
08-06-2023	09-06-2023	56.19	169.35	32.7	43.16	1.98
09-06-2023	11-06-2023	54.01	147.28	43.33	43.81	2.27
11-06-2023	12-06-2023	57.45	179.71	37.8	45.08	2.07
12-06-2023	13-06-2023	64.03	157.72	48.43	45.68	2.37
13-06-2023	14-06-2023	66.07	158.35	64.1	45.6	2.5
14-06-2023	15-06-2023	46.59	111.03	27.65	44.95	1.62
15-06-2023	16-06-2023	38.49	94.49	19.28	45.36	1.3
16-06-2023	17-06-2023	30.19	89.21	17.53	45.17	1.19
17-06-2023	18-06-2023	29.04	131.79	17.98	45.41	1.05
18-06-2023	19-06-2023	40.41	102.96	22.91	47.26	1.36
19-06-2023	20-06-2023	54.91	157.85	39.88	46.5	2.01
20-06-2023	21-06-2023	36.76	154.07	29.76	46	1.41
21-06-2023	22-06-2023	23.95	103.8	18.69	46.34	0.87
22-06-2023	23-06-2023	20.64	98.89	16.23	48.2	0.77
23-06-2023	24-06-2023	18.04	99.68	16.23	45.67	0.89
24-06-2023	25-06-2023	20.29	99.97	17.59	46.24	0.91

- 10) Details of additional measures to be taken to offset the net contribution of air pollution from the proposed project and expected expenses to be incurred on these measures.

The budget provisions have been kept in the project cost towards the environment protection, control & mitigation measures and implementation of EMP, both during the construction and operation phase.

- Anti-Smog Gun installation during the construction phase to effectively control fugitive dust emissions including PM10 and PM2.5 emissions.
- Tarpaulin sheets cover the debris & over designated transport vehicles ensured.
- Water sprinklers at unloading points, roads and all other hotspots for dust control.
- Green covering at construction site.

- The ambient air quality during construction phase to be monitored regularly by approved laboratory.
- Metalled roads with green pavements.
- Smooth traffic movement inside the project area by dedicated personnel.
- Only Bharat Stage Compliant vehicles to ply within the project site.
- Gensets on clean fuel natural gas with adequate stack and acoustic enclosure.

Environmental Budget to be incurred on net contribution of air pollution measures.

S. No.	Construction Phase			Operation Phase	
	Particulars	Capital Cost (Rs. Lacs)	Recurring Costs (Rs. Lacs/Year)	Capital Cost (Rs. Lacs)	Recurring Costs (Rs. Lacs/Year)
1.	Environmental Monitoring	--	0.25	-	2.0
2.	Horticulture/Green belt	5.0	-	15.0	6.0
3.	Smog gun	5.0	0.50	-	-
4.	Genset	1.5	0.20	50.0	10.0
5.	Tarpaulin sheets cover/Green Nets	0.15	-	-	-
	Total	11.65	0.95	65	18

Total Environmental Budget to be incurred on net contribution of air pollution measures is 95.6 lac i.e. approx. 96 lacs (For both construction and operation phase)

- 11) Landuse of the surrounding area on Google Earth Map including distance from any eco-sensitive zone, world heritage site etc. along with kml file of the proposed industrial unit with clear marking of plant boundary.

The proposed project is construction of Hotel at Khasra No. 03 Mauza ALLEHPUR, Teh & Distt. Mathura Eco-sensitive zone, world heritage site.

Protected areas as per wildlife protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries)	Sur Sarovar Bird Sacturay- 50.4.3 km (SE)
Rivers/Lakes	Yamuna river – 14 km (E)



Archaeological important places	Mathura Museum – 11.2km (SE)
Religiously Important sites	Krishna Janam Bhumi – 9.2 km (NE) Vrindavan Banke Bihari temple – 10 (NE)

#### B. Other Environmental Aspects.

- Distance from Hospital -3 Km
- Distance from Educational institutions -3 Km
- Distance from Housing Society -4Km
- Distance from NHAI -0 Km
- Distance from Air Port -150 Km
- Distance from Yamuna Express Way -28 Km

- 12) Proposed Infrastructure details covering Greenbelt, Social Infrastructure, Connectivity, Drinking water system, Sewage and effluent management system and industrial and solid waste management.

#### Social Infrastructure and Connectivity:

Items	Details
<b>Connectivity</b>	
Nearest road connectivity	Vrindavan Road: Adjacent to the site Chennai Delhi Highway Yamuna Express Way -28 km
Nearest Railway Station	Mathura Junction: 12 km (SE)
<b>Social Infrastructure</b>	
Hospitals	Jagatgura Chikitshalay -7km(E) Radha Rani Hospital -7 km (E)
Educational Institutes	Kanha Makhan Public School -5km (E)

#### Drinking water system and Sewage management system:

A provision of 180 lpcd (liters per capita per day) for domestic water requirements for hotel shall be made. This in accordance with the Manual of Water Supply, Central Publish Health and Environmental Engineering Organization (CPHEEO), Ministry of Housing, Government of India (GOI), hence the total water requirements shall be:

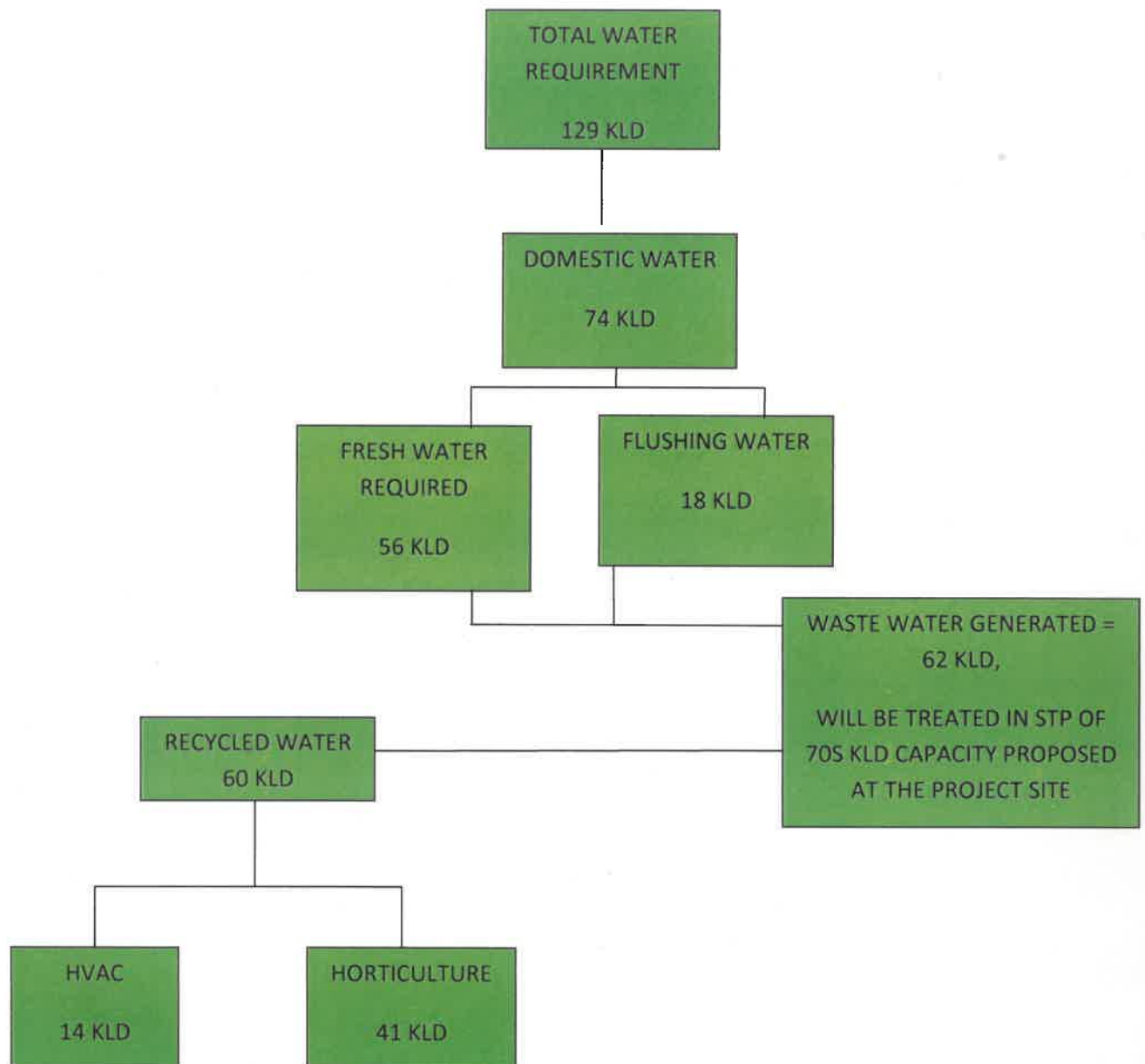
Source : Manual on Norms and Standards for Environmental Clearance of Construction Projects, MoEF.

The details of total water requirement for the project and its breakup, source of water and water balance is given below:

### Water Calculations

S. No	Description	Total Occupancy	Rate of water demand (lpcd)	Fresh Water Requirement (KLD) (including cold and hot water)	Flushing water Requirement (KLD)	Total Water Requirement (KLD)	Domestic waste water @ 80% fresh water to STP	Flushing waste water @ 95% to STP
1.	Hotel (40 Guest Rooms) *2 person per room	Total Guest(70% of room occupancy) 56 persons	Total water @180 LPCD Fresh Water @120 LPCD Flushing Water @60 LPCD	6.72	3.36	10.08	5.376	3.192
2.	Staff	100	Total water @45 LPCD Fresh Water @30 LPCD Flushing Water @15 LPCD	3	1.5	4.5	2.4	1.425
3.	Visitors	50	Total water @45 LPCD	1.50	0.75	2.25	1.425	0.60

			Fresh Water @30 LPCD Flushing Water @15 LPCD					
4.	All day Restaurant /Dining/coffee shops (97.52 SQM), PreFunction(834 sqm) , Banquet hall (288.49 sqm)	70 + 834 + 280 =1184	Total water @35 LPCD Fresh Water @25 LPCD Flushing Water @10 LPCD	29.60	11.84	41.44	23.68	11.248
5.	Kitchen	-	-	7	-	7	5.6	-
6.	Filtration Backwash	-	-	2	-	2	1.6	-
7.	Laundry	-	-	4	-	4	3.2	-
8.	Fire Fighting	-	-	2	-	2	1.6	-
Total Domestic Water				55.82~56	17.45~18	73.27~74	44.881~45	16.465~17
9	Horticulture		@51/sqm (796 sqm)		41	41		
10	HVAC		160 Tr	-	14	14		
Grand Total				56	73	129	Total waste water generated 62 KLD	



## WATER BALANCE

Sewage and effluent management system: STP of 70 KLD with MBBR Technology is proposed to be installed at the site. Details of the STP are at Annexure – II

Solid waste management: Detail of solid waste generation is attached as Annexure- III

13. Details of other environmental components (water, land, noise, solid and industrial waste, Storm Water/RWH, flora-fauna, social aspects etc.) with mitigation/environment management plan including proposed expenditure to be undertaken during the construction, operation and the entire life cycle.

S. No	Environmental Components	Potential Impacts	Potential Source of impact	Controls Through EMP & design	Impact Evaluation	Parameters for Monitoring
1.	Groundwater Quality	Ground water contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Waste water generated from Labors.</li> <li>• Spillage of hazardous construction material such as oil, paints, tar, adhesive, sealants etc. and subsequent leaching.</li> </ul>	<ul style="list-style-type: none"> <li>• Septic Tank</li> <li>• Limited use of hazardous material</li> <li>• Effective storage to avoid spillage</li> <li>• Proper disposal, in case of spillage</li> </ul>	<p>No significant impact as majority of laborers would be locally deployed.</p> <p>If uncontrolled, the impact would be long term and significant. But, with effective control, anticipated impact is insignificant.</p>	<ul style="list-style-type: none"> <li>• No discharge hoses in vicinity of watercourses.</li> <li>• Discharge norms for effluents as given in CPCB/MoEF/Conseco to establish by UP State Pollution Control Board. Log books, records for storage and usage of hazardous construction material.</li> </ul>
			<ul style="list-style-type: none"> <li>• Operation Phase</li> <li>• Sewage disposal</li> <li>• Maintenance activity like repair, paints which involve hazardous material such as oil, paints, tar, adhesive, sealants etc. and subsequent leaching</li> </ul>	<ul style="list-style-type: none"> <li>• Waste water will be treated in STP proposed at the project site.</li> <li>• Limited use of hazardous material</li> <li>• Effective storage to avoid spillage</li> <li>• Proper disposal, in case of spillage,</li> </ul>	<p>No significant negative impact on ground water quality envisaged.</p>	<ul style="list-style-type: none"> <li>• No discharge hoses in vicinity of watercourses.</li> <li>• Discharge norms for effluents as given in consent to operate by UP State pollution Control Board.</li> </ul>

2.	Groundwater Quantity	Ground Water Depletion	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Use of water through private tankers for construction activity</li> </ul>	<ul style="list-style-type: none"> <li>• Rain water collection in temporary pits along the low lying areas of slope.</li> <li>• Use of water through private tankers</li> </ul>	No significant negative impact on ground water quality envisaged.	<ul style="list-style-type: none"> <li>• Record of water tanker receipts</li> <li>• Visual inspection of temporary storm water collections pits.</li> </ul>
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>• Waste water generated from ground water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Storm water collection for Water Harvesting</li> <li>• Ensure drainage system and specific design measures are working effectively</li> <li>• Design to incorporate existing drainage pattern and avoid disturbing the same.</li> <li>• Awareness Campaign for reduced water use.</li> </ul>		<ul style="list-style-type: none"> <li>• Records of proper operation and maintenance of RWH pits, especially pre and post monsoon.</li> <li>• Visual inspection of drainage and records thereof</li> </ul>

3.	Surface water Quality	Surface water contamination	<ul style="list-style-type: none"> <li>• Construction Phase</li> <li>• Discharge of the runoff</li> <li>• Increased soil erosion from excavated site</li> <li>• Discharge of wastewater generated</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Excavation during dry season and proper management of excavated soils</li> <li>• Site barricading Mobile toilets and mobile STP / soak pits</li> <li>• Proper disposal of waste water</li> </ul>	Temporary and not significant	<ul style="list-style-type: none"> <li>• No discharge hoses in vicinity of watercourses.</li> <li>• Discharge norms for effluents as given in consent to operate by UP State pollution Control Board.</li> <li>• Visual inspection of temporary storm water collections pits</li> <li>• Well managed &amp; maintained drainage systems</li> </ul>
			<u>Operational Phase</u> <ul style="list-style-type: none"> <li>• During rainfall, the runoff will be guided into rainwater harvesting pits</li> </ul>	<ul style="list-style-type: none"> <li>• Rainwater is generally devoid of any impurities and can ensure good quality water if certain precautions are taken described in</li> <li>• Waste water will be treated in onsite STP proposed at the project site.</li> </ul>	Not significant	<ul style="list-style-type: none"> <li>• No discharge hoses in vicinity of watercourses.</li> <li>• Discharge norms for effluents as given in consent to operate by UP State pollution Control Board.</li> <li>• Records of proper operation and maintenance of RWH pits, especially pre and post monsoon.</li> <li>• Visual inspection of drainage and records thereof</li> </ul>



4	Air Environment	Dust Emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• All heavy construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Dust suppression through water sprinkling using water trucks, handheld sprays and automatic sprinkler systems.</li> <li>• Vehicles transporting loose construction material should be covered.</li> <li>• Compaction of soil during various construction activities. Any dry, dusty material stored in sealed containers or under tarpaulin to prevent from blowing</li> <li>• Contractors will be advised to provide dust masks for the employed labour.</li> <li>• Vehicle trips to be the extent possible.</li> <li>• Tyre washing at entry and exit points to prevent transportation of soil and dust, to and fro from the site.</li> </ul>	<p>Not significant because dust generation will be temporary and will settle fast due to dust suppression techniques used.</p>	<ul style="list-style-type: none"> <li>• Visual inspection for minimizing dust emission at site.</li> <li>• Vehicle logs</li> <li>• Absences of stockpiles or open containers of dusty material</li> <li>• Construction logs</li> <li>• Inspection by contractors for labour health and safety precautions.</li> <li>• Records of any medical conditions of workers, such as asthma, that could be aggravated due to dust emissions.</li> </ul>
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		Emissions of PM, SO <sub>2</sub> , NO <sub>2</sub> and CO	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Operation of construction equipment and vehicles during site development</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid on site construction</li> <li>• PUC certified vehicles</li> <li>• Use of Improved equipments and maintenance of equipments to be operated at site.</li> <li>• Ambient air quality within the premises to be monitored</li> </ul>	Temporary and not significant	<ul style="list-style-type: none"> <li>• Random checks of equipment/ vehicles logs/ manuals</li> <li>• The ambient air quality shall conform to the standards for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub></li> </ul>
			<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Indoor air quality/ Contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery, isolation and ventilation of spaces, especially When using any toxic materials or creating Exhaust fumes.</li> <li>• Protection of stored on-site and installed absorptive materials from moisture damage</li> <li>• Ensuring a clean job site to control potential contaminants such as dirt, dust and debris</li> <li>• Cleaning up spills, and keeping work Area dry.</li> </ul>	Temporary and insignificant with good housekeeping practices	<ul style="list-style-type: none"> <li>• Maintenance of logs/ manual for storage and use of VOC and formaldehyde products</li> <li>• Employment of housekeeping staff during construction</li> </ul>

				<ul style="list-style-type: none"> <li>• Avoid finish materials with high VOC and formaldehyde levels</li> </ul>		
			<p>Construction Phase</p> <ul style="list-style-type: none"> <li>• Power generation through Genset operation</li> <li>• Emissions from vehicular traffic</li> <li>• Emissions from nearby industrial areas</li> </ul>	<ul style="list-style-type: none"> <li>• Use of low cleaner fuel NG in the Genset, if available.</li> <li>• Stacks will be provided of adequate height (as per MoEF norms)</li> <li>• Stack emissions from genset of be monitored.</li> <li>• Exhaust from vehicles to be minimized by use of fuel efficient vehicles and well maintained vehicles having PUC certificate.</li> <li>• Green belt to be provided with dust absorbing species to help reduce PM levels.</li> <li>• Walking tracks to reduce the use of vehicle within premises.</li> <li>• Ambient air quality within the premises of the proposed unit to be monitored.</li> </ul>	<p>Not significant as Genset would be used as power back-up only.</p>	<ul style="list-style-type: none"> <li>• Vehicle logs to be maintained</li> <li>• Stack monitoring records to be maintained.</li> <li>• The ambient air quality will conform to the standards for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub></li> </ul>

			<u>Construction Phase</u> Indoor air quality/contamination	<ul style="list-style-type: none"> <li>• Perform a building flush out before occupancy.</li> <li>• Contaminants such as CO, CO<sub>2</sub> and VOCs to be dispersed by providing adequate ventilation</li> <li>• Ventilation for the basement to flush out the stale air.</li> <li>• Use of Green seal low VOC paints</li> <li>• Prohibit smoking in common areas.</li> </ul>	Temporary and insignificant with good housekeeping practices	<ul style="list-style-type: none"> <li>• Monitoring of indoor air contaminants such as CO, CO<sub>2</sub> and VOCs.</li> </ul>
5	Noise Environment	Noise emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Operation of construction equipment and vehicles during site development</li> </ul>	<ul style="list-style-type: none"> <li>• List of all noise generating machinery onsite along with age to be prepared.</li> <li>• Equipment to be maintained in good working order and operated within specified design parameters.</li> <li>• Generation of vehicular noise</li> <li>• Night time working to be minimized.</li> <li>• Implement good working practices (equipment selection and siting) to minimize</li> </ul>	Significant and temporary	<ul style="list-style-type: none"> <li>• Equipment logs, manuals, noise reading.</li> <li>• Working hour records</li> <li>• Maintenance records of vehicles</li> <li>• Site working practices records, noise reading</li> <li>• Mufflers/enclosures in place</li> <li>• Noise reading</li> <li>• Vehicle logs</li> </ul>

				<p>noise and also reduce its impacts on human health (ear muffs, safe distances and enclosures).</p> <ul style="list-style-type: none"> <li>• Acoustic mufflers/ enclosures/ anti-vibration pads to be provided in gensets and large engines.</li> <li>• Noise to be monitored in ambient air within the premises.</li> <li>• Vehicle trip to be minimized to the extent possible.</li> <li>• Use of PPE such as ear muffs as ear muffs to onsite workers.</li> <li>• Job rotation, if necessary</li> </ul>		
			<p><u>Construction Phase</u></p> <ul style="list-style-type: none"> <li>• Noise from vehicular movement.</li> <li>• Noise from genset operation.</li> <li>• Noise from nearby industrial areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Peripheral plantations to act as noise barriers.</li> <li>• Providing acoustic enclosures and anti-vibration pads for genset if installed</li> <li>• Generation of vehicular noise</li> <li>• Vehicle trips to be minimized to the extent possible.</li> <li>• Gensets are to be provided within acoustic enclosures</li> </ul>	<p>Not significant</p> <p>Short-term exposure within permissible limit</p>	<ul style="list-style-type: none"> <li>• Maintain record of operations</li> <li>• Maintain record of vehicles.</li> </ul>

				with height of chimney as specified by MoEF.		
6	Land Environment	Land use		<ul style="list-style-type: none"> <li>Green area 646.85sqm.</li> </ul>	Significant and irreversible	-
		Leveling and Demolition work	Topography around the proposed project is almost plain, so will not be affected during the construction and post construction phase	-	Positive Impact	-
		Soil Erosion	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>Excavation of top soil</li> <li>Loosening of soil due to movement of heavy vehicles and/or other construction activity.</li> </ul>	<ul style="list-style-type: none"> <li>Excavated top soil should be covered with tarpaulin sheets or filled cement bags around the soil and by site barricading.</li> <li>Minimize area extent of site clearance, by staying within the defined boundaries.</li> <li>Creating temporary dug pits at the drainage slope of projects site to collect loose soil along with run off storm water</li> </ul>	Low and insignificant	<ul style="list-style-type: none"> <li>Site inspection to assure proper storage of excavated soil.</li> <li>Records of usage of excavated top soil within premises.</li> <li>Records of trees planted</li> </ul>

				<ul style="list-style-type: none"> <li>• Tire washing at entry and exit points to prevent transportation of soil to and fro from the site.</li> <li>• Initiation of plantation to bind soil.</li> </ul>		
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>• Erosion of soil during rainfall</li> <li>• Topography around the proposed project is almost plain, so no impact</li> </ul>	<ul style="list-style-type: none"> <li>• Plantation of soil binding species</li> <li>• Turf/grass lawn maintenance</li> <li>• RWH pits (with desilting chamber) to collect washed away soil along with run off</li> <li>• Use of the recovered soil from desilting chamber, Detail of RWH pits is attached as Annexure-IV</li> </ul>	Positive impact	<ul style="list-style-type: none"> <li>• Records of trees/ shrubs/ grasses planted</li> <li>• Records of proper operation and maintenance of RWH pits, especially pre and post monsoon.</li> </ul>
		Soil contamination Waste management (prior to site clearance)	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Disposal of construction debris and other waste.</li> <li>• Protection of excavated top soil.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction waste/debris will be collected and suitably used on site as per construction waste management plan.</li> <li>• Preventing oil spillage from gensets, heavy vehicles or construction equipments by proper upkeep and</li> </ul>	<ul style="list-style-type: none"> <li>• Impact will be local, as any waste generated will be reused for construction activities.</li> <li>• Spillage shall be avoided, and in case of spillage, it shall be disposed as per.</li> </ul>	<ul style="list-style-type: none"> <li>• Effective cover in place.</li> <li>• Site boundaries not extended/ breached as per plan document.</li> <li>• Comprehensive waste management plan in place and available for inspection on site.</li> <li>• Compliance with solid wastes management rules, 2016</li> </ul>

				<p>maintenance of machinery.</p> <ul style="list-style-type: none"> <li>• Proper storage of oil, paints, varnishes, adhesives etc. to prevent spillage.</li> <li>• Implement waste management plan that identifies and characterizes every waste associated with proposed activities and which identifies the procedures for collection, handling, and disposal of each waste arising.</li> </ul>	Not significant.	
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> <li>• Dumping of municipal solid waste on land.</li> <li>• Handling of waste oil from genset.</li> <li>• Operation, renovation or repair activities using paints, varnishes, primers, repair or road (tar, bitumen), batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Solid waste from site will be collected on a daily basis and managed as per SWM Rule 2016.</li> <li>• Waste oil generated will be sold to authorized recyclers</li> </ul>	<p>Not significant.</p> <p>Negligible impact</p>	<ul style="list-style-type: none"> <li>• Inspection of the operator handling the waste.</li> <li>• Compliance with solid wastes Management and Handling Rules), 2016 &amp; Amendments and</li> </ul>



			Waste etc.			
7	Biological Environment	No impact as the land was barren before construction	<u>Construction Phase</u> -	-	No impact	
		Increase of green cover  Increase in avian fauna, butterflies etc, hence pollination	<u>Operation Phase</u> <ul style="list-style-type: none"> <li>• Plantations along the periphery of the complex.</li> <li>• Green belt development including both regional and ornamental species</li> </ul>	<ul style="list-style-type: none"> <li>• Plantation of species that are native to the area, fast growing and with good canopy cover.</li> <li>• Minimization of true area and increase of vegetative area.</li> </ul>	Beneficial impact	<ul style="list-style-type: none"> <li>• Inspection of the environment management cell.</li> <li>• Select plants will be grown as per normal horticulture practice.</li> <li>• Adequate provisions for water and protection of the saplings.</li> </ul>
8	Socio-Economic Environment	Socio-economic Condition	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Employment opportunities for labourers</li> </ul>	<ul style="list-style-type: none"> <li>• Skilled semi-skilled and unskilled labour will get employment</li> <li>• Improvement in their social conditions</li> </ul>	Beneficial impact	

			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>• Employment opportunities for local vendors and workers.</li> <li>• Boost to local market for increased demand in goods of daily need.</li> <li>• Labourer shall get employment due to operation, renovation or repair activities</li> </ul>	<ul style="list-style-type: none"> <li>• Project will provide employment opportunities.</li> <li>• Improvement in their social conditions.</li> </ul>	Beneficial impact	
12	Site Management	Environment Management cell	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Environmental Monitoring</li> <li>• Management and decision making of environmental issues</li> </ul>	<ul style="list-style-type: none"> <li>• The environmental management cell/Unit is to set up to ensure implementation and monitoring of environmental safeguards</li> </ul>	Beneficial impact	A formal letter from the management indicating formation of Environment Management cell
			<u>Construction Phase</u> <ul style="list-style-type: none"> <li>• Environmental Monitoring</li> <li>• Management and decision making of environmental issues</li> </ul>	<ul style="list-style-type: none"> <li>• The environmental management cell/Unit is to set up to ensure implementation and monitoring of environmental safeguards</li> </ul>	Beneficial impact	A formal letter from the management indicating formation of Environment Management cell

## **ENVIRONMENTAL MANAGEMENT PLAN**

The Environmental Management plan is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner and understand the potential environmental risks arising from the proposed project and take appropriate actions to minimize those risks. EMP also ensures that the project implementation is carried out in accordance with the planned design and by taking appropriate mitigative actions to reduce adverse environmental impacts during project's life cycle.

The proposed project will create certain inevitable impacts, both during construction and operation phase, and can be reduced significantly with the help of effective implementation of a well-designed IMP. The potential environmental impacts, which need to be regulated, are mentioned below:

Air pollution due to the emission of particulate matter and gaseous pollutants from operation of D. G. Sets during power failure and vehicular movement:

Noise pollution due to various noise generating equipment as well as vehicular movement;

- Water resource management to ensure continuous water supply
- Waste water generation from domestic activities; and
- Generation of municipal solid wastes from residences, shops and hospital,
- Maintenance of roads, parks, common areas including constructional, electrical and plumbing wastes,
- Energy conservation methods
- Maintenance of Building Management Systems and emergency aids.
- Occupational health hazards

### **EMP DURING CONSTRUCTION PHASE**

Control of pollution during construction phase is of considerable importance. Waste generated from construction activity includes construction debris, waste from the labor tents, and hazardous waste. Besides waste generation, management of topsoil, traffic movement, operation of construction equipment's and diesel generating sets, site security and aesthetical development of green area and roadside plantation are some areas for which management measures are required.

Strategy for environmental management in construction work should be based on three- pronged approach comprising of .

- Pollution prevention
- Pollution control
- Protection of pollution recipients

The following aspects of construction activity require control measures during the construction phase of time present scheme. Topography and Physiography.

During the development, construction and post construction phase of the proposed project, no significant impact is anticipated do local or regional topography and physiography, hence exhaustive management plan is not required. It is however proposed to carry out extensive turfing with local species apart from proposed plantations and greens.

## **Soil**

### **Development & Construction Phase**

During the construction phase., various kinds of wastes are generated that will be disposed in varied ways. The following measures will be taken to prevent soil contamination at site and ensure waste management:

### **Vegetation and top soil management**

- Remove vegetative cover only from the specific site on which construction will take phase.
- Plantation as proposed shall be started at the earliest:.
- The top soil will be stripped from constructional areas and stockpiled for later reuse in landscaping.
- Promote use of organic fertilizers.
- Construction of erosion prevention troughs, as deemed necessary.
- To prevent the erosion of excavated loose soil produced as a result of excavation, site preparation activities and excavation work would be undertaken during dry season after monsoon is over.

## **Site Preparation**

The clearance of site will involve removal of some wild, rain-fed vegetation and shrubs. Substantial quantity of soil will be produced requiring stock piling and back tilling to minimize disruption of soil and for conservation of top soil; the contractor shall take the top soil out separately and stockpile it and the same has been utilized for landscaping development.

Other measures, which would be followed to prevent soil erosion and contamination include:

- Maximize use of topsoil for landscaping.
- Avoid excavation during monsoon season
- Care should be taken to avoid soil erosion.
- To prevent soil contamination by oil/grease, leak proof containers shall be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through impervious drains and treated appropriately before disposal.
- Removal of as little vegetation as possible during the development, and re-vegetation of bare areas after the project.
- Working in a small area at a point of time

## **Construction Debris**

Projected hotel construction site is already leveled & plain. There is no existing construction so there will be no bulky and heavy debris.

As concrete and masonry constitute the majority of waste generated, recycling of this waste in conversion to aggregate can offer benefits of reduced landfill space and reduced extraction of raw material for new construction activity. This is particularly applicable to the proposed project site as the construction is to be completed in a phased manner. The management of major construction debris includes:

- Fuel and oil would be stored in cement lined storage yard and handled carefully to prevent soil contamination through leakage or spillage.
- All metal, paper, plastic wastes, debris and cuttings would be collected from site as soon as particular construction activity is over and will be resold to vendors for recycling.

- During construction of flexible pavement, bitumen wastes will be collected (if any) and disposed in environmentally sound manner. Mixed debris with high gypsum, plaster, shall not be used as till, as they are highly susceptible to contamination, and will be given to recyclers.
- The number, frequency and area of movement of heavy machinery will also be restricted.
- Recycling of construction wastes into aggregates for use in the project site.
- Spent waste lubricant if any generated during servicing of genset will be disposed through authorized recycler.
- Wastes from the labour camps will be collected and disposed as per the existing practices in the site.

### **Waste from Labor Settlements and Biomass**

Construction activity involves some workforce to stay at site. Local labour shall be employed to the maximum possible extent so that resident labor is not required or minimum. The latter will require basic infrastructure welfare facilities like housing, sanitation and other essential services. The proposed site shall be provided with suitable sanitation facilities like supply of potable water and sanitary latrines to allow proper standards of hygiene. Solid waste generated would mainly comprise of household domestic waste, which shall be collected and disposed off at the nearest municipal waste collection site.

### **Handling of Construction Equipment**

Vehicles deployed for construction work, transportation of debris and other machinery at site shall be properly handled to minimize emissions of particulates and gaseous pollutants and vehicle's maintenance shall be monitored regularly so as to avoid noise pollution and accidental spillage of oils and greasy matters. Loading and unloading operations and movement of trucks shall be properly regulated to minimize the impact of noise on the persons engaged in civil, mechanical and erection works.

## **MANAGEMENT OF ENVIRONMENTAL PARAMETERS**

### **A. Water Environment**

The vehicle maintenance area shall be located in such a manner so as to prevent contamination of ground water by accidental spillage of oil. Unauthorized dumping of waste oil shall be prohibited. Fire hydrant and fire extinguishers shall be provided at places vulnerable to fire and explosion. Sites of deposition of building material wastes shall be cordoned. The open drains carrying waste water shall be covered with concrete slabs to prevent the dust fall due to wind erosion and shall be collected in cemented trenches for reutilization to a greater extent.

### **B. Air Environment**

Erosion of soil due to winds cause dust nuisance in the area. The dust nuisance created by the excavations, leveling and transportation activities shall be properly controlled by sprinkling of water, providing dust arresting panels, regular removing of construction waste material, proper storage of building material and keeping strict vigilance on trucks not to create any air pollution. Pollution under Check certificate (PUC) shall be collected at the entry gate of complex

### **C. Land Environment**

The newly formed land shall be brought to normal formation merging with the surrounding environment. Proper slope and stabilization of the ground shall be maintained to drain the surface run-off during monsoon. Necessary action shall be taken on draining system to arrest erosion of soil during severe monsoon and dry summer. Also, tree plantation work along the internal roads and boundaries of the site shall be carried out side-by-side the construction work. Plantation will improve the quality of soil and enhance the aesthetics.

### **D. Noise Environment**

Noise resulting from operation of construction machinery may constitute and additional environmental stress. Arrangement shall be made to provide noise pollution status the proposed site during construction phase. In case a source is found making significantly higher noise, immediate action shall be taken to bring down its noise to a tolerable limit. Workers employed in high noise areas will be rotated. Earplugs/snuffs, or other hearing protective wear will be provided to those working very close to the noise generating machinery. Proper maintenance of construction equipments shall be done at regular interval.

## Site Security

A construction site is a potentially hazardous environment. To ensure that the local inhabitants are not exposed to these hazards, the site shall be secured by fencing and manned entry points.

## POST CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

### Air Quality Management

To mitigate the impact of pollutants from diesel generator sets and vehicular traffic during the operational phase of the site the following measures are recommended for implementation:

- D.G. set air pollution control measures
- Vehicle emission controls and alternatives
- Greenbelt development.

### GREEN BELT PLAN

Plants grown in such a way so as to function as pollutant sinks are collectively referred to as greenbelts. These plants should also provide an aesthetic backdrop for persons using the site and for the surrounding community.

General principles in greenbelt design considered for this study area:

- Type of pollution likely air, noise, water and land pollution generated from the activities at the site.
- Agro-climatic zone and sub-zone where the greenbelt is located
- Water quantity and quality available in the area
- Soil quality in the area,

Green belt is designed to minimize the predicted levels of the possible air and noise pollutants. While designing the scheme the following facilities are considered:

- Site perimeter and approach road along the internal roads.
- Along the internal roads.



## GREENBELT DESIGN FOR SITE

The selection of plant species for the development depends on various factors such as climate, elevation and soil. The selection of the trees is based on their phenology (thus road side trees will not have leaf fall (luring summer and rainy seasons when shade is most needed)).

The criteria of the species are based on, pollution mitigation capacity (including Particulate matter), large leaf surface area, deep root system and less litter mail. Faster growing trees with lighter canopy will be planted alternatively with relatively slow growing trees with wider canopy. Trees of about 6 m heights will be planted at 3 m intervals, 2.5 m away from the load curbing as per CPCB guidelines. Trees will be planted along the outer periphery at centerline of toad between the set back line and the boundary of the plots. Palms and shrubs will be planted along the roads and around recreational lawns.

The list of plant species, which can be suitably planted, and having significant importance are

List of Plant Species to be planted in the Green Area

S. No.	Scientific Name	Standard Name
1	Cycas Circinalis	Cycas
2	Phoenix dactylifera	Date Palm
3	Alstonia scholaris	Chitwan
4	Cassia fistula	Amaltas
5	Saraca asoca	Ashoka
6	Bougainvillea glabra	Bougainvillea
7	Nyctanthes arbortristis	Harsingar
8	Cascabela thevetia	Kaner
9	Delonex ragia	Gulmohar
10	Callistemon citrinus	Bottlebrush

## GREENBELT MANAGEMENT

It is presumed that the selected plants will be grown as per normal horticultural practice and the authorities responsible for the plantation will make adequate provisions for water and protection of the saplings. A budgetary cost estimate is also prepared for greenbelt development.

### Water Source

Tertiary treated water will be used and also water tankers at the initial stages of development of the plant.

### Irrigation Method

Water hydrants may be installed at 50 m intervals to irrigate area under shrubs and ground covers.

### Genset

Genset will be installed and used during power failure.

### **Traffic Movement**

- For vehicles, adequate space for smooth movement and parking shall be provided at the proposed site to avoid any congestion and idling state emissions.
- Proposed project shall have parking as per norms in the basement and open, as the case may be.
- Separate entries and exits for smooth movement of traffic through adequate traffic Signage.
- Plantation shall be provided at roadsides and open spaces with the specific species to attenuate dust and cyclonic winds.
- The ambient air quality shall be monitored regularly to ensure that the activities at the site are not polluting the ambient environment.

As mentioned above that the stand by Genset shall not be running continuously, only be operated during interruption of electric supply. For good dispersion of gaseous emission, all Gensets shall be provided chimney

of adequate height, as per norms of CPCB. Regarding spread of PM<sub>10</sub> and PM<sub>2.5</sub> into the environment stringent action shall be taken for the maintenance of roads and roadside plantation.

## **Noise Management**

No noisy sources except Gensets and traffic movement are envisaged at the proposed site. Following activities shall be taken to control the noise pollution:

- Gensets shall be acoustically treated to attenuate the noise.
- Noise barriers in the form of tree envelope and greenbelt to attenuate noise pollution shall be planted around the site, both sides of the roads and open places.
- Good metalled and wide roads shall be provided at the site and shall be well maintained for smooth flow of traffic.
- Monitoring of noise levels shall be carried out regularly to ensure that noise level does not exceed permissible standards.

**Greenbelt Development:** The following species can be used as in a greenbelt to serve as noise breakers:

- Leucanaleucocephala (Subabual)
- Fiscus Benjamin (Weeping fig)
- Saraca Indica (Ashoka)

## **Management of Water Environment**

### **A. Fresh Water**

The net fresh water requirement is estimated to be 45 KL1) which tvilli be fulfilled from Ground water.

Rain winter harvesting scheme is proposed to recharge ground water and attain sustainable system.

The wastage of water shall be minimized by a combination of water saving devices and other domestic water conservation measures. Some of the measures are given below:

#### **(i) Domestic and Commercial Usage**

- Use of water efficient plumbing fixtures (low-flow toilets & urinals, low flow sinks, water efficient dish washers and washing machines).
- Leak detection and repair techniques.
- Awareness Campaign for reduced water use.
- Metered water consumption.

#### (ii) Horticulture

- Use of drip irrigation system.
- Grouping of plants with similar water requirement.
- Use of low volume and low angle sprinklers for greens.
- Provide controllers with adjustable watering schedules.

### **B. Rain Water Harvesting**

The rainwater shall be diverted from the rooftop using rain water pipes to the surface/underground drainage network. The entire area shall be subdivided for recharging structures.

It has been proposed to provide desilting tanks and recharge wells for the desired purpose. The rainwater will be diverted into the desilting tank to remove impurities and the outflow of the desilting tank will be taken into the recharge well.

Desilting tank is like an ordinary container having provision for the inflow, outflow and overflow. Apart from removing silt it holds the excess amount of water till it is soaked up by the recharge structure. The bottom of tank will have unpaved surface layer of coarse sand to allow standing water to percolate into the soil. The rainwater collected in these desilting chambers shall also be used for horticulture use. The recharge well consists of 250-300 mm dia bore holes in the middle of the pit. 160 mm dia perforated PVC pipe will be lowered in the middle of the boreholes and the pit will be filled in 3 layers of 500 mm each consisting of boulders, gravel and coarse sand. This system is proposed for ground water recharge.

### **Solid and Hazardous Wastes Management**

The philosophy of solid waste management 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 solid waste management plan, options and techniques.

The disposal of municipal solid waste shall comprise of following main activities:

## **Collection and Segregation of waste**

- Floor to Floor collection system will be provided for collection of solid waste in plastic bags/drums.
- Adequate number of colored bins (green and blue — separate for bio-degradable and Non Bio-degradable) are proposed to be provided at the strategic locations.

## **Treatment of waste**

### **(a) Bio-Degradable wastes**

Bio-degradable waste will be subjected to composting and same will be used as manure.

### **(b) Non-biodegradable waste**

**(i) Recyclable wastes:** Recyclable waste like paper, plastics, and metals will be sold to the authorized recycler of the area.

**(ii) Inert Waste:** Inert waste will be disposed.

## **Disposal**

Authorized agency will be hired for collection and disposal of all the solid waste collected from the site. A temporary waste storage site will be allocated on site for temporary storage of waste.

All the waste will be disposed off by the tied up authorized agency at their disposal site by identifying the suitable treatment method listed as below, depending on the type of waste.

- Composting
- Recycling
- Use of inert material in making bricks etc.
- Final disposal at landfill. site

## **ARCHTECTURAL DESIGN**

- Public areas will be cooled by natural ventilation as opposed to air conditioning.
- Maximization of use of natural lighting and achieve minimum glazing factor through building design.
- Passive solar cooling, utilizing building shading through overhangs.

- Ensure that the interior, exterior, common and parking area lightening power densities(LPD) meet the baseline values through 'building area method' (Re/EC13C:)
- Design the building to eliminate or minimize tobacco smoke pollution in common/public areas
- Strategies include building orientation towards the north, appropriately designed window5 to ensure day lightening, double height roof, etc.
- Design of exhaust systems in kitchen anti bathrooms providing adequate fresh air ventilation.
- Adequate cross ventilation in design
- Proper landscaping reduces direct sun from striking and heating up of building surfaces.

### **ENERGY SAVING PRACTICES:**

- Use of Solar power.
- Constant monitoring of energy consumption and defining targets for energy conservation.
- Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort levels.

### **ENVIRONMENT MANAGEMENT SYSTEM**

For the effective and consistent functioning of the proposed hotel complex an Environmental Management System (EMS) shall be established at the site. The EMS shall include the following:

- An Environmental Management Cell (HiVIC;)
- Environmental Monitoring – Personnel Training
- Regular Environmental Audits and Corrective Action
- Documentation
- Standard Operating Procedures, Environmental Plans and other records.

### **EI-IS Management Cell Structure**

Job profile of manpower constituting EI-IS Management Cell can be described as follows:

#### **(a) Manager EI IS**

Shall be responsible for implementation of Environmental Management Plan and assure regulatory compliance (Environment Clearance Conditions and NOC condition) withal relevant rules and regulations responsible for EMS, Health and

Safety management system implementation. He shall also be responsible for risk analysis, vulnerability assessment, response action plans, mitigation & implementation strategies and disaster management plan. Coordination with Pollution Control Board and other relevant Government Departments. Manager EHS will be reporting to Head-Projects.

**(b) Horticulturist**

Shall be responsible for maintenance of green area He shall report to ETIS Manager.

## **AWARENESS AND TRAINING**

Training and human resource development is an important link to achieve sustainable operation of the facility and environmental management. For successful functioning of the project, relevant EM/P shall be communicated to the following groups of people.

**A. Contractors**

Contractor shall be made aware of the importance of waste segregation and disposal, water and energy conservation. They shall be informed of their responsibilities for Successful operation of various environmental management schemes inside the premises.

**B. Site Staff**

Relevant personnel at site shall be trained for the following.

- Collection, transport, treatment and disposal of solid and hazardous waste.
- Requirements of the Disaster Management Plan in case of an emergency.
- Techniques for waste minimization, water conservation and energy conservation. applicable environmental health and safety regulation and compliance requirements for the same.
- Environmental Management System including environmental monitoring, reporting and documentation needs.

## **RECORD KEEPING AND REPORTING**

Record Keeping and reporting of performance is an important management tool for ensuring sustainable operation of the hotel. Records shall be maintained for regulatory, monitoring and operational issues.

## **ENVIRONMENTAL AUDITS AND CORRECTIVE ACTION PLANS**

To assess whether the implemented EMI' is adequate, periodic environmental audits will be conducted by the Environmental Division. These audits will be followed by corrective action plans (CAP) to correct various issues identified during the audits.

## **MAINTENANCE OF PROPOSED PROJECT**

- The dedicated team shall be deployed for upkeep and maintenance of hotel.
- The security of the complex will be assigned to a private security agency. Entrances shall be guarded by security guards for 24 hours, if in use.
- The power consumption for lifts, pump house, street lighting and other common services shall be separately metered and charged to the occupants on monthly basis.
- Expenditure on maintenance of lift, and substation equipment including replacement of bulbs and tubes for street lighting and common area.
- Services like collection and disposal of garbage, sweeping of area, maintenance of drains and sewer lines shall be assigned to expert agencies and would be charged to the occupants.



## Environmental Budget

S. No.	Construction Phase			Operation Phase	
	Particulars	Capital Cost (Rs. Lacs)	Recurring costs (Rs. Lacs/Year)	Capital Cost (Rs. Lacs)	Recurring Costs (Rs. Lacs/Year)
1.	Environmental	-	0.25	-	2.0
2	Horticulture/Green belt	5.0	-	15.0	6.0
3.	Smog gun	5.0	0.50	-	-
4.	Genset	1.5	0.20	50.0	10.0
5.	Tarpaulin sheets cover/Green Nets	0.15	-	-	-
6.	STP	10.0	-	10.0	3.0
7.	SWM	2.0	1.0	8.0	4.0
	<b>Total</b>	<b>23.65</b>	<b>1.95</b>	<b>83</b>	<b>25</b>

Total environmental Budget for the complete project including construction and operation Phase is 133.60 lac i.e approx. 134 lacs.

14. Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

## **Project Benefits (Financial and social benefits):**

### **JOB OPPORTUNITY:**

The project will generate employment to approx. 500 people (both full time and part time jobs).

The local people shall be given employment in the project, thus bringing about economic benefits to the economically backward local population. During the development and construction of proposed project skilled, semiskilled and unskilled workers per day will get direct employment opportunity, which will have beneficial impact on the socio-economic conditions of the area.

During Construction - 100 approx. employments per day

During operation phase - 400 employments

### **BENEFITS TO WOMEN:**

The proposed facility would generate jobs for the local women laborers during construction as well as during the operation phase. This will considerably reduce their travel time and therefore enable them to attend to their children and also other household chores.

### **WIDER ECONOMIC GROWTH:**

This project will increase the economic activities around the area, creating avenues for direct/ indirect employment in the post project period. There would be a wider economic impact in terms of generating opportunities for secondary occupation such as new markets, and other shops.

### **ADDITIONAL REVENUES FOR DISTRICT GOVERNMENT:**

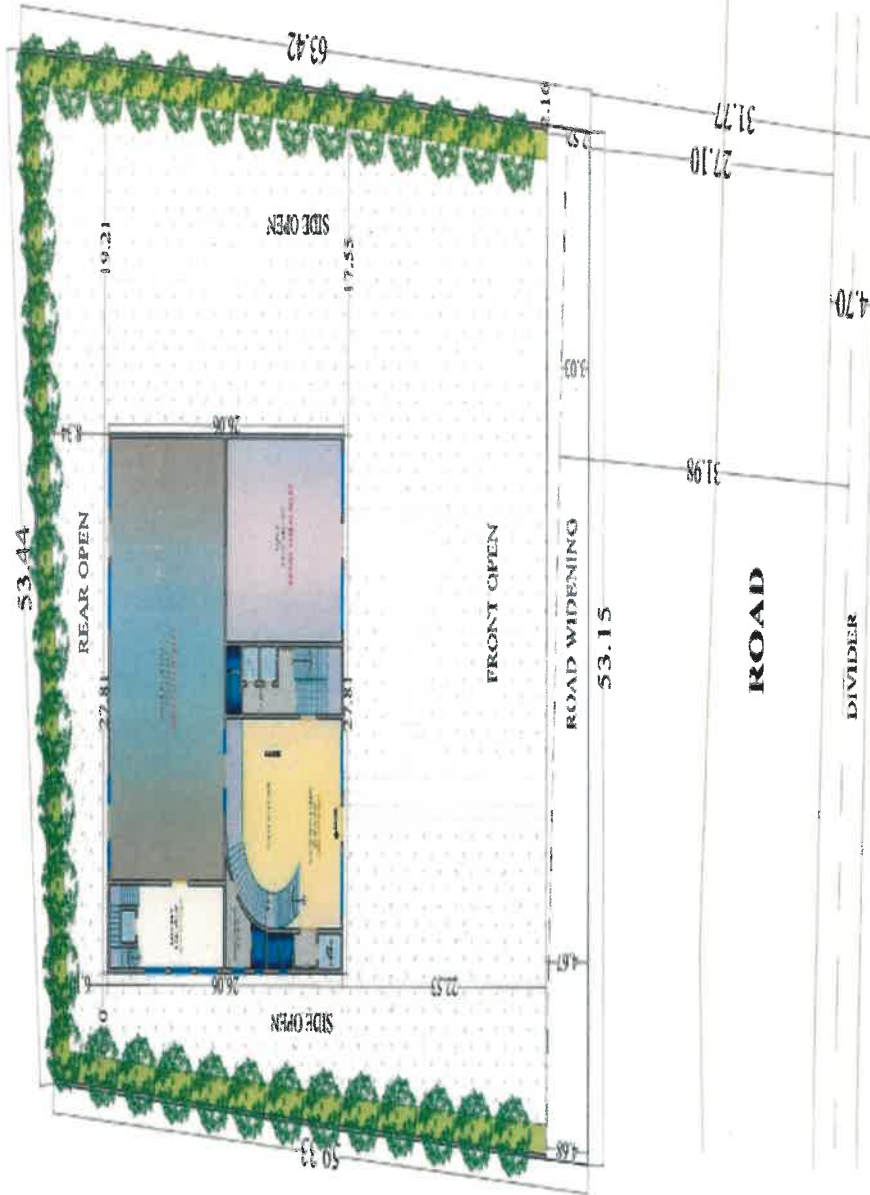
The development of land for any purpose creates both an immediate demand for services, and a flow of revenues to the community from a variety of sources e.g. property tax, licenses and permits fee etc.

## **List of Annexure**

Layout Plan	Annexure I
Details of STP	Annexure II
Details of SWM	Annexure III
Details of RWH Pits	Annexure IV
Air Modeling	Annexure V

# **ANNEXTURE -I**

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ARCHITECTS:  
PRATAPKUMAR SERVICES PVT. LTD.  
VANDANA APARTMENT, NEW DELHI



SHEET TITLE:  
SITE PLAN  
DATE: 10/10/2010  
SCALE: 1:1000  
DRAWN BY: S. S. SINGH  
CHECKED BY: S. S. SINGH  
DATE: 10/10/2010

PROJECT:  
HOTEL BUILDING "THE AIRAN PARADISE"  
KATRA, DIST. JALANDHAR, PUNJAB  
DESIGN BY: S. S. SINGH  
DATE: 10/10/2010

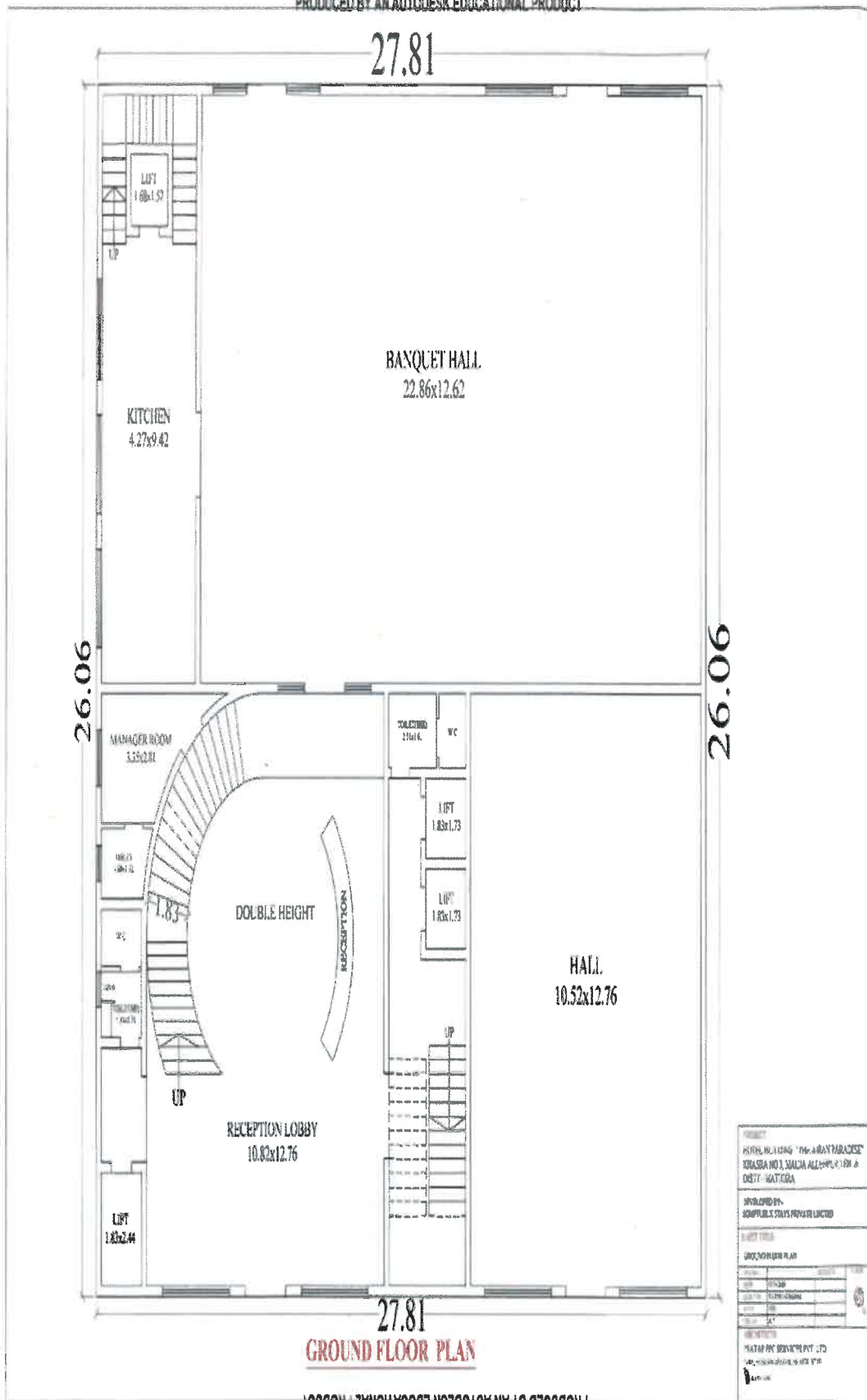
DESIGNED BY:  
SOMPUKUN SINGH PRIVATE LIMITED

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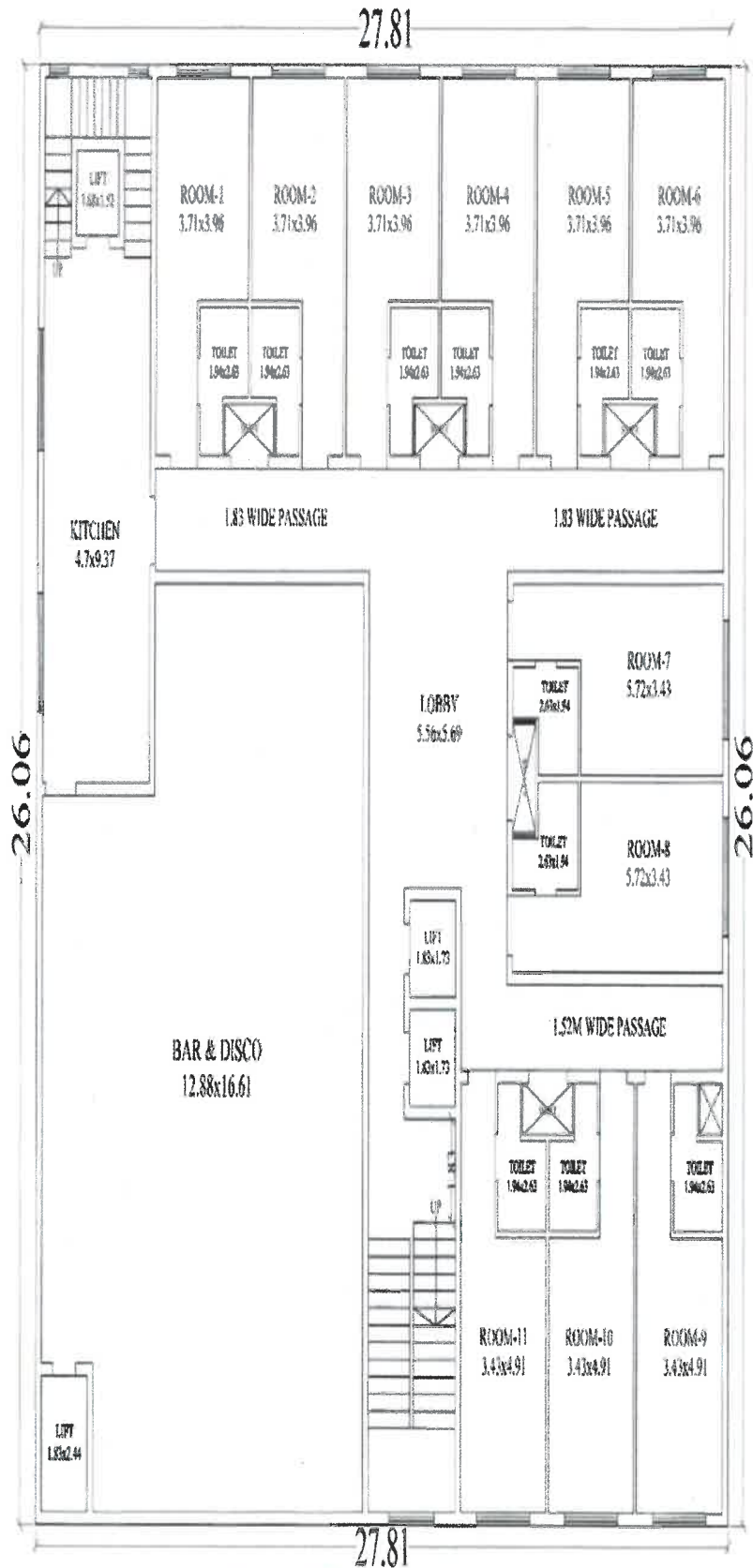


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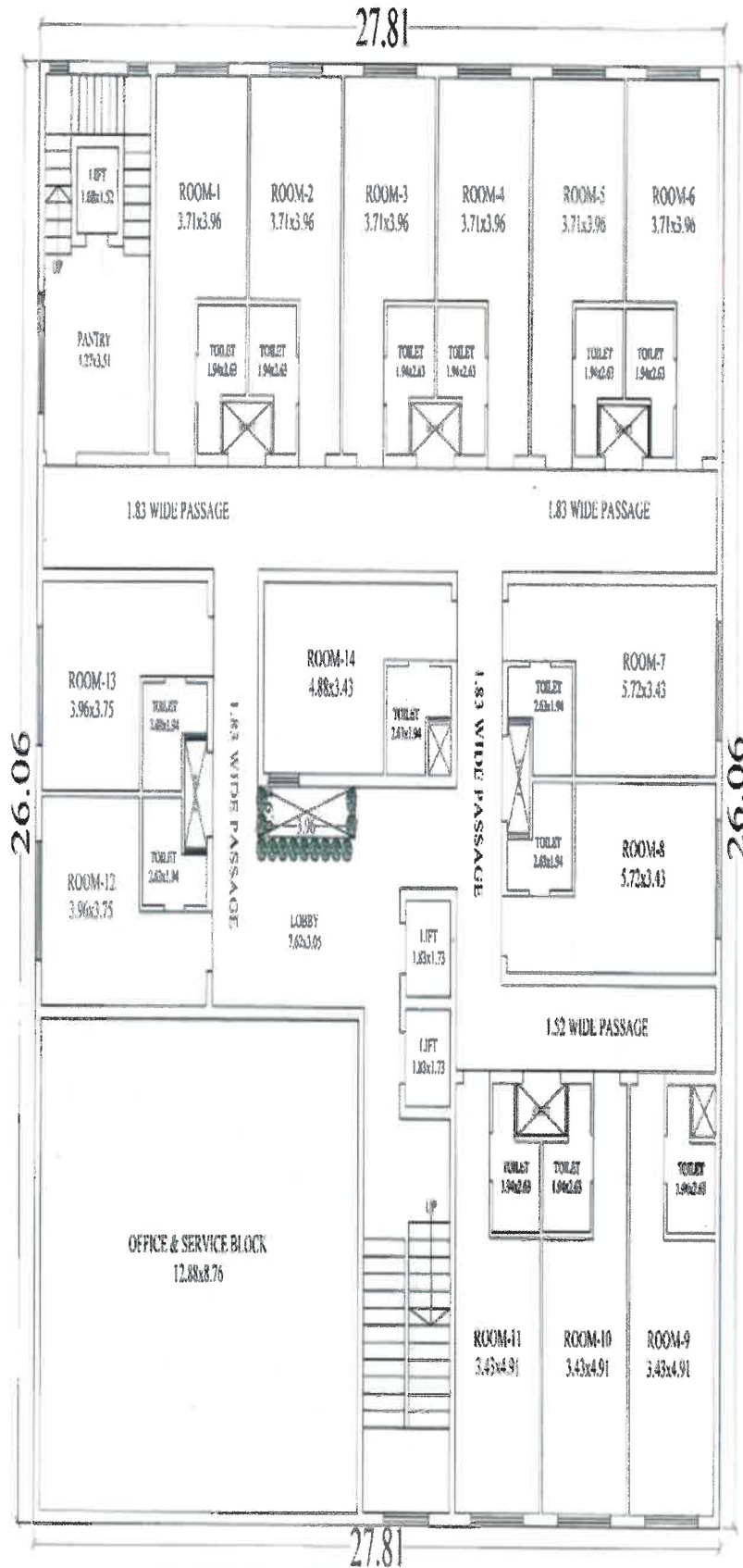


SECOND FLOOR PLAN

PROJECT	
FLOOR PLAN - THE GREAT WALL	
QUANTITY LIST - MATERIALS, EQUIPMENT & COSTS - MATHEMATICS	
DRAWN BY	
CHECKED BY	
PROJECT TITLE	
SECOND FLOOR PLAN	
DATE	2000
SCALE	1:100
PROJECT NO.	1000
DESIGNED BY	
PROJECT NO. 1000	

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THIRD FLOOR PLAN

PROJECT	
HOTEL BUILDING "THE ADAMANT" - KAWASAKI NO 2, 300.31 ALLESTRADE & CNY" - MA, PHIL.	
DESIGNED BY: SHIMIZU STAFF PROJECT LIMITED	
SHEET NO. 1	
THIRD FLOOR PLAN	
DATE	20.03.00
BY	SHIMIZU STAFF PROJECT LIMITED
APP'D	SHIMIZU STAFF PROJECT LIMITED
SCALE	1:100
NOTES	
1. ALL DIMENSIONS ARE IN METERS	
2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED	
3. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED	



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## **ANNEXTURE -II**

## **Design Consideration/Process detail of Sewage Treatment Plant (MBBR BASED)**

**Sewage Treatment Plant** for Sewage generated from the project will be treated in centralized sewage treatment plant of 40 KLD capacity.

### **DESIGN BASIS**

The Compact Sewage Treatment Plant is designed to treat wastewater generated at the proposed site. The treatment plant is designed on basic data as indicated below.

#### **Location of Proposed Compact Sewage Treatment Plant**

The proposed sewage treatment plant will be constructed within the complex. The effluent generated from Guest room toilets, Public area toilet etc. and Kitchen waste to connect Sewer line through Grease trap will be collected in equalization tank after screen chamber and grease trap from where it will be taken to compact sewage treatment plant.

Anticipated effluent parameters before treatment:
pH- 7.5 – 8.5
BOD5 – 250-400 mg/l
COD – 600 – 800 mg/l
S.Solid – 200 – 450 mg/l
Oil & Grease -50mg/l

Sewage discharge standard after tertiary treatment:
pH- 6.0 – 8.5
BOD5 – less than 10mg/l
COD – less than 50mg/l
S.Solid – less than 10mg/l
Oil & Grease less than 1mg/l

## **Treatment Processes**

Wastewater through the treatment system in the Compact Sewage Treatment Plant flows from a previous tank to next tank according to gravitation. The following steps to be considered as part of complete Sewage Treatment Plant.

Separation Process: Removal of debris/floating impurities.

The sewage entering the STP location is received in the grit chamber where bar screens are provided to separate the debris/floating impurities. All these impurities shall be removed manually from bar screens.

### **(1) Biochemical Oxidation Process: Removal of Pollutants (Aerobic Purification)**

The waste from the bar screen chamber travels to the receiving sewage sump for equalizations and thereafter 'transfer to STP Module first chamber called as MBBRreactor where the waste is treated by diffused aeration process for oxidation of organic matter. Air is introduced through blower into the tank to provide sufficient amount of oxygen to wastewater. Presence of air & organic matter invigorates the activity of aerobic bacteria to purify the wastewater. The aeration tank is designed on fluidized aerobic growth contact diffused aeration process. Under suspended MBBRmedia, the growth of microbes' increases surface area and reduce the tent• s size.

### **(2) Separation of Biological Sludge Process: Solid-liquid Separation (Biomass Separation)**

The treated wastewater is further passed to the settling tank, where the treated water separates from the biomass, which settles at the bottom of the tank. The settling tank is designed as tube settler, where PVC tube dek profiles are placed in the inclined (/955<sup>0</sup>) which separate solids/biomass from treated water.

### **(3) Filtration:**

Clarified water is then pumped through the Pressure Sand Filter then to Activated Carbon Filter to remove the traces of suspended solids, organics, color and odor present in the treated sewage and it is disinfected using hypo solution.

- (4) Ultra filtration (UF) Treatment :The treated water from Treated Water Tank is pumped to UF. It removes the fouling materials like particulate matter, suspended solids, bacteria and viruses, colloidal materials (non-reactive silica, iron, aluminium, silt etc.), high molecular weight organic compounds. Ultra filtration is to treat filtered water at a recovery of 90-95%, This is collected in Treated Water Tank -B which is used for flushing.

The treated water after basic treatment and before UF shall be used for landscape and irrigation.

- (5) Sludge Transportation Process: Volume reduction of Excess Sludge (Sludge thickening)

The excess sludge generated in the settling tank (Step 3) is taken to sludge thickener where it will be mixed with air and chemicals like polyelectrolyte to thicken the solids.

During the actual operation, sludge generated through treatment processes is transferred to sludge thickener and from sludge thickener, excess sludge removed and disposed off through sludge dewatering system. Using high-pressure pumps and filter press/ centrifuge system. The dried sludge will be utilized as manure in the horticulture land for plantation etc.

### **Reuse of the Treated Wastewater**

The treated wastewater from filtration plant can be utilized for gardening/flushing use.

## Sludge Removal of Compact Sewage Treatment Plant

The treatment effectiveness of Compact Sewage Treatment Plant is closely related with sludge accumulation conditions. When sludge is transported only between unit equipment of a Compact Sewage Treatment Plant, the amount of sludge will surpass the sludge storage capacity of the Compact Sewage Treatment Plant; thus, impairing the treatment functions. This will cause the sludge to carry over will effluent, which 'must be avoided at all cost. In order to prevent this situation,- sludge that has accumulated in the Compact Sewage Treatment Plant must be removed to a sludge t'eatment facility, etc.

### Equipment test

### Mein unit of the package

The Compact Sewage Treatment Plant is fabricated in RCC/MS with fiber lining having various chambers. The

Process involved bio-chemical treatment process and filtration process. The system work under pressure flow from underground sewage sump and thereafter gravitation flow in the various chambers.

### The Plant consists of

- Bar Screen Chamber
- Oil &. Grease Trap
- Equalization Task
- Aeration (MBBR) Reactor
- Inclined Tube Settler Oiler ice Contact Tank For Disinfection
- Pressure sand filter
- Activated carbon filter
- Treated Water Tank
- Ultra filtration system'
- Sludge holding tank
- Filter press/Centrifuge

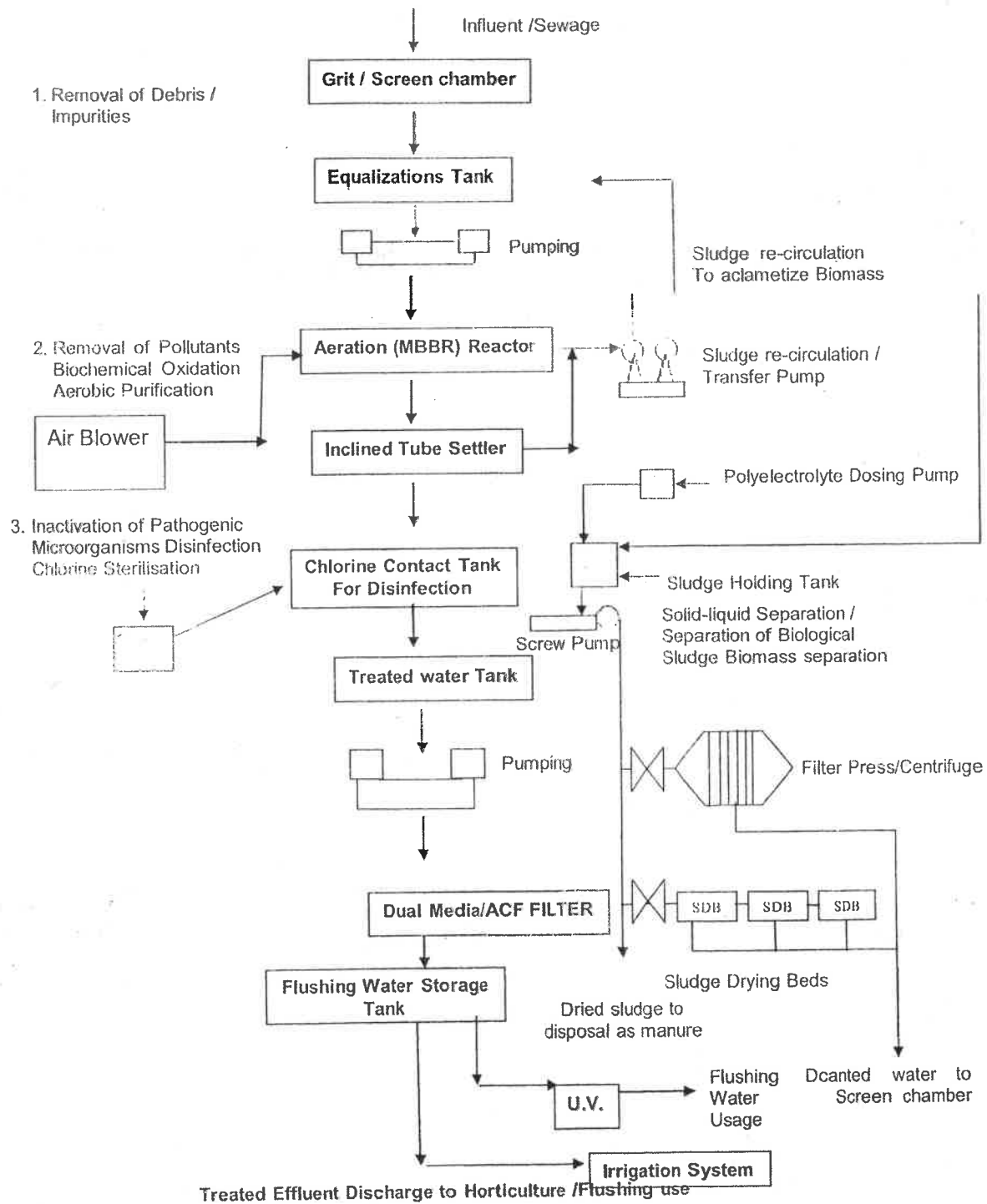
Note:- The cost of STP

Capacity of STP 70 KLD (MBBR)

Total cost Rs. 40 Lac.



## SYSTEM FLOW OF COMPACT SEWAGE TREATMENT PLANT (MBBR TECH)



# **ANNEXTURE -III**

# **SOLID WASTE MANAGEMENT**

## **1. ORGNIC WASTE TREATMENT (CONVERTER):**

General: Every activity of process produces some waste that ore thrown out. Such waste can be recycled. People consume food & waste matter arising from the preparation & consumption produces waste that could be used to produce composting materials. Waste Management is required to be done on daily basses as the amount of waste we generate on daily basses in mammoth in term of tons. I fence organic waste treatment has been Proposed for this project. Organic waste treatment process as follows.

Capacity of Organic waste converter shall be 180Kg / Day of Segregated waste as per Annexure- A

### **COLLECTION OF WASTE AND APPLICATION SANITREAT:**

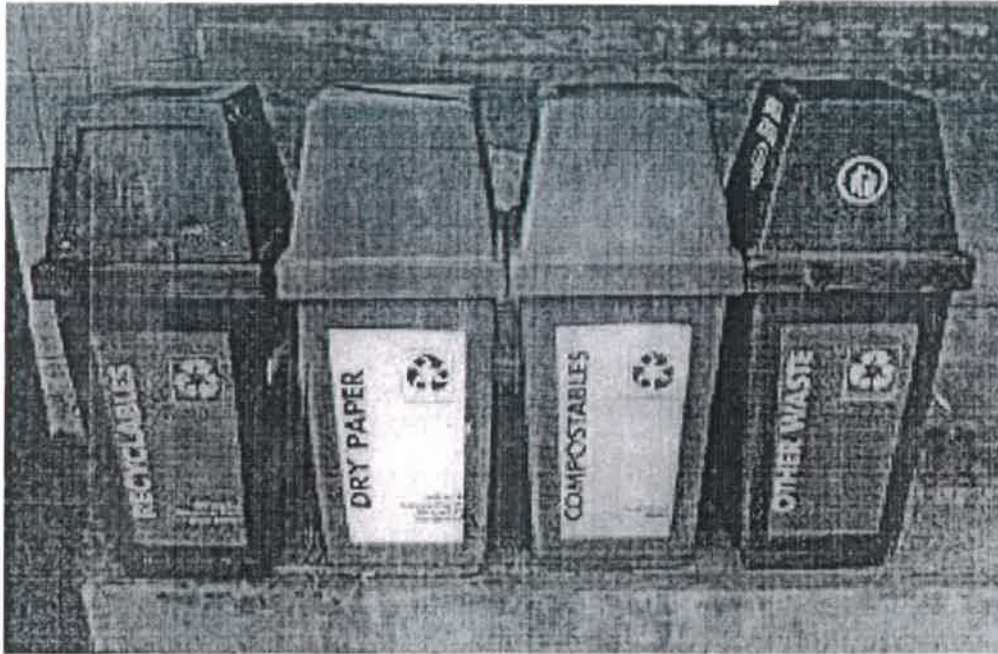
SANITREAT is a free-flowing light brown powder used as an odor control agent in the sanitization of the organic waste. The material should be sprayed

dry over the waste through a powder sprayer. One Kg of Sani treat is enough for treating 1000 kg of organic waste.

**Note: Application of Sani treat can be eliminated if waste does not have foul odour.**

### **SEGREGATION OF WASTE INTO ORGANIC AND IN ORGANIC**

Segregation is the most important process in this process. The garbage shall be collected and sorted into Kitchen waste, bottles, metals, papers and plastics. Organic waste shall be used for making compost. Segregation shall be done to avoid any metal, glass or plastic materials will get mixed organic waste and put into Organic Waste Converter (OWC) which shall damage the blades nr effect the smooth functioning of OWC machine.



## FEEDING OF ORGANIC WASTE INTO ORGANIC WASTE CONVERTER MACHINE

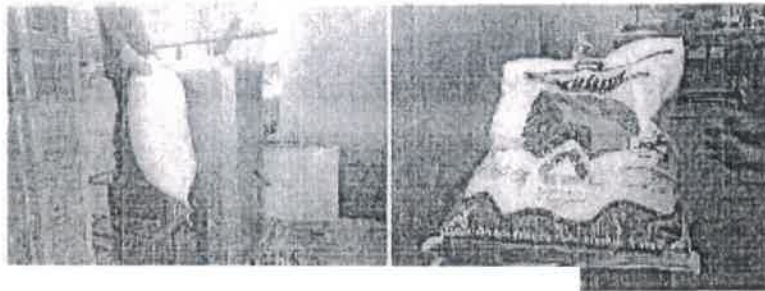
It homogenizes organic waste with appropriate Bio culture and organic media.

The output from OWC machine is a Raw Compost having uniform coloured and soil structured coarse powder, free of bad odour. The leachate shall be controlled during homogenization process in OWC machine. The treated waste should out attract flies, mosquitoes, rats, animals and birds.



### USE OF SAWDUST AND BIOCULUM:

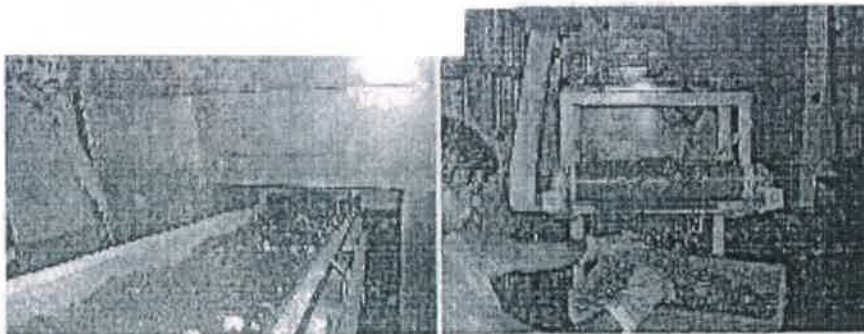
Sawdust absorbs the moisture of the organic waste and Bioculum enhances the decomposition of organic waste. Depending upon the moisture content in the Organic; waste Sawdust is used proportionately.



Use of Sawdust and Bioculum

### COLLECTION OF RAW COMPOST BY CONVEYOR BELT AFTER PROCESSING BY OWO

Use of conveyor belt makes it easy and fast to collect the raw compost processed by Organic Converter Machine.



### STORING THE RAW COMPOST IN CURING SYSTEM FOR 10 DAYS

Raw compost stored in Curing system gets matured and form compost in 10 days process. Compost shall meet the following parameters

Compost pH 6.5 to 7.5

Organic matter 40 to 50%

Pathogens: Should not be observed C: N 15:1

Total Bacterial Count  $3 \times 10^9$

ANNEXURE - A					
S. NO	Description Area	Area	SOLID WASTE GENERATION AS PER NBC - 2016		
		SQM	Occupancy/Nos of Persons	Solid Waste Generated KG/Person per Day	Total Solid waste Generated in Kg/Day
1	<b>BASEMENT</b>				
	HALL	700.416	700	0.3	210
	<b>TOTAL</b>	<b>700.416</b>	<b>700</b>		<b>210</b>
2	<b>GROUND FLOOR</b>				
	Banquet Hall	288.49	289	0.3	86.70
	LOBBY	138.06	40	0.1	4
	KITCHEN	40.22	12	0.4	4.8
	HALL	134.23	135	0.3	40.50
	<b>TOTAL</b>	<b>601</b>	<b>476</b>		<b>136</b>
2	<b>FIRST FLOOR</b>				
	RESTURANT	97.52	68	0.3	20.40
	LOBBY	50.99	15	0.1	1.5
	HALL	134.23	135	0.3	39.60
	MULTI PURPOSE HALL	92.58	93	0.3	27.90
	KITCHEN	49.10	15	0.4	6
	<b>TOTAL</b>	<b>424.42</b>	<b>326</b>		<b>95.40</b>
3	<b>SECOND FLOOR</b>				
	BAR/PUB	213.93	117	0.4	46.80
	KITCHEN	44.039	13	0.4	5.20
	LOBBY	31.63	10	0.1	1
	<b>TOTAL</b>	<b>289.59</b>	<b>140</b>		<b>53</b>

4	<b>SECOND,THIRD &amp; FOURTH FLOOR</b>				
	Guest Rooms (40 Nos. at each Floor @1.75 persons each)	600	1050	0.3	315
	<b>TOTAL</b>	<b>600</b>	<b>1050</b>		<b>315</b>
	<b>GRAND TOTAL</b>	<b>2615.42</b>	<b>2692</b>		<b>809.40</b>
Note : As per NBC – 2016 out of the total solid waste generated, 40 percent may be taken as an organic waste and 60 percent as inorganic waste.					
Hence, total organic waste generated is 809.40 Kg X 0.4 = 323.76					



# **ANNEXTURE –IV**

THE AIRAN PARADISE			
KHATA NO 748 KHASRA NO 695 & KHATA NO 780 KHASRA NO 696, BANKE MAUJA JAIT, TEH. & DISTT.- MATHURA.			
Ref. No. /UPPCB/Mathura (UPPCBRO)/CTE/MATHURA/2023			
CALCULATION FOR SELECTION OF RAIN WATER HARVESTING			
(A)	Calculations for Rain water harvesting system		
	Rainfall Intensity for Design	0.100	m/hr
	Total Plot Area	3017.78	Sqm
	Green area	796	Sqm
	Paved/Road area	1561	Sqm
	Roof area	724.72	Sqm
1.	For Roof/Terrace only		
(i)	Average Runoff co-efficient for terraces and other built-up areas.	0.90	
(ii)	Area-1 considered (For Terrace/Roof only)	724.72	m <sup>2</sup>
(iii)	Theoretical Volume of rain water storage required Approximately (Total Area x 0.90 x 0.100)	65.22	m <sup>3</sup> /hr
2.	For landscaped, green and other open areas.		
(i)	Average Runoff co-efficient for landscaped, green and other open areas.	0.15	
(ii)	Area-2 considered	796	m <sup>2</sup>
(iii)	Theoretical volume of rain water storage required. Approximately (Total Area x 0.15 x 0.100)	11.94	m <sup>3</sup> /hr
3	For road & paved areas:		
(i)	Average Runoff co-efficient for road & paved area.	0.80	
(ii)	Area – 3 considered	1561	m <sup>2</sup>
(iii)	Theoretical volume of rain water storage required. Approximately (Total Area x 0.80 x 0.100)	124.88	m <sup>3</sup>
	Total Volume of rain water generated per hour	202.04	m <sup>3</sup> /hr
	Total storage required in rain water Harvesting tank (15min. retention) period.	50.51	cub-m
	Considering Rainwater harvesting pit of size 4.0m dia and 4.50M effective depth		
		Radius of pit (m)	2
		Effective depth (m)	4.5
	Volume one pit, (V1)	Volume (cu.m)	56.52
	Required harvesting pit for Entire project	Nos.	1.11
	Say Nos.		2

# **ANNEXTURE -V**

## 1. Introduction

The dispersion of a pollutant is completely governed by the local meteorological parameters and therefore this information is a crucial input for dispersion modelling. The vertical mixing of air pollutants strongly depends on the depth and stratification of planetary boundary layer (PBL) which is in-turn governed by the sensible heat flux, large-scale vertical motion, horizontal advection and entrainment at the boundary layer top. Air quality models incorporating parameterization for PBL turbulence, dispersion in the convective boundary layer and terrain interactions of pollutant plume are best suited for the estimation of spatial dispersion of pollutants. Evaluation of some commonly used dispersion models to quantify their predictive capacity and performance. The study showed that despite several limitations and assumptions used in Gaussian air pollution dispersion models, these models are comparatively more accurate and consistent with the random nature of turbulence in the atmosphere and are best suited for pollutant dispersion. The urban scale modelling systems designed using such models are being increasingly employed to reliably provide urban air quality forecasts for protection of public health, recreation purpose, etc

In this study, seasonal variation of fugitive dust has been observed due to the activities involved in the sponge iron plant. Based on the results, control strategies have been suggested which will reduce the dispersion of fugitive dust to the significant level.

## 2 Air Pollution Sources

During operation there will be two numbers of point sources of air emissions. These are stacks attached with DG sets (two numbers). 2 DG sets of 300 KVA with stack height of 6 m above the building height will be used for power backup & increment load from 130 ECU and 130 light vehicles will be considered

## 3 Potential Air Emissions

In this modelling approach, only those sources are considered which are potential source of air pollution due to the proposed project. The major air pollution sources are operation of DG sets and vehicular emissions due to transportation activities. The major air pollutants are given below:

➤ **NO<sub>x</sub> (Nitrogen Oxide):**

The amount of produced NO<sub>x</sub> is a function of the maximum temperature, oxygen concentrations, and residence time. NO<sub>x</sub> will be mainly generated during the high-temperature burning of fuel in the Incinerator, DG Set & vehicle engines, and the amount being formed depends greatly on the combustion temperature. The higher the burning temperature and the more intense the oxygen concentration, the longer the reaction time would be and thereby generating more NO<sub>x</sub> emissions.

Oxides of nitrogen (NO<sub>x</sub>) represent a mixture of mainly nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). They are formed during combustion by: (1) oxidation of nitrogen chemically bound in the waste, and (2) reaction between molecular nitrogen and oxygen in the combustion air. The formation of NO<sub>x</sub> is dependent on the quantity of fuel-bound nitrogen compounds, flame temperature, and air/fuel ratio.

**SO<sub>2</sub> (Sulphur dioxide):**

Reaction between oxygen present in air & sulphur compounds in diesel results in sulphur oxides (SO<sub>x</sub>) during incomplete combustion. (Oxidation of Sulphur to SO<sub>2</sub>).

**CO (Carbon monoxide):**

CO is generated due to the incomplete combustion of fuel in the DG Set & vehicle engines. Its presence can be related to insufficient oxygen, combustion (residence) time, temperature, and turbulence (fuel/air mixing) in the combustion zone. CO emissions will be controlled from the DG sets based on the combustion design efficiencies to be achieved. The DG set is designed to achieve a maximum efficiency of fuel burning for the less emissions of CO.

**PM:**

Particulate matter is emitted as a result of incomplete combustion of organics (i.e., soot) and by the entrainment of non-combustible ash due to the turbulent movement of combustion gases. Particulate matter may exit as

a solid or an aerosol, and may contain heavy metals, acids, and/or trace organics.

## **4 Air Dispersion Modelling Methodology**

### **4.1 Modelling Approach**

The AERMOD View model is the US EPA's one of the regulatory models for many New source Review (NSR) and other air permitting applications.

The AERMOD View model is based on a steady-state Gaussian plume algorithm, and is applicable for estimating ambient impacts from point, area, and volume sources out to a distance of about 50 kilometers. This model accepts hourly meteorological data records to define the conditions for plume rise, transport, diffusion, and deposition. The model estimates the concentration value for source and receptor combination for each hour of input meteorology, and calculates user-selected short-term averages.

### **4.2 Model inputs**

#### **4.2d Source Emissions**

A critical step for conducting air dispersion modelling is to quantify the emissions from the various sources at the project. Emission rates should be estimated in the following order of preference:

- Continuous emissions monitoring data
- Stack Emission Testing data
- Manufacturer's emission data
- Mass balance calculations
- Emission factors
- Engineering calculations

*Table No. I: Details of the sources*

<i>Sr. No.</i>	<i>Parameter</i>	<i>Proposed DG set</i>
<i>1</i>	<i>Major Pollutant</i>	<i>PM, SO<sub>2</sub>, NO<sub>2</sub> &amp; CO</i>
<i>2</i>	<i>No of Stack</i>	<i>02 (3001: VA)</i>
<i>3</i>	<i>Stack attach to</i>	<i>DG set</i>
<i>4</i>	<i>Material of Construction</i>	<i>MS</i>
<i>5</i>	<i>Height of Stack</i>	<i>Building height +6 m</i>

6	Capacity	300 KVA <sup>x 2 nos.</sup>
7	Diameter at the top of Stack	0.35 in

Sr. No.	Parameter	Proposed DG set
8	Temperature	180 <sup>0</sup> C
9	Flue gas Exit velocity	16.3 m/s
A	PM g/s	0.17
B	PM <sub>2.5</sub> g/s	
C	SO <sub>2</sub> g/s	0.008
D	NO <sub>2</sub> g/s	3.55
E	CO <sub>2</sub> g/s	3.11

NOTE: Emission rates are taken as per USEPA AP-42

## LINE SOURCE

Emission Source	Emission Rate
Line emissions	PM <sub>10</sub> -1.75x10 <sup>-3</sup> g/s/m PM <sub>2.5</sub> -8x10 <sup>-4</sup> g/s/m NOx-1x10 <sup>-1</sup> g/s/m COx-3x10 <sup>-1</sup> g/s/m

NOTE: Emission rates are taken as per USEPA AP-42

## 4.3 Model Domain, Receptor Network and Terrains

### Considerations

The selected model domain was 10 km in both the east--west and north-south directions, with the centre of the domain being the centre of the project site.

### 4.3.1 Receptor Network

The selection and location of the receptor network are important in determining the maximum impact from a source and the area where there is significant air quality impact. Impacts were assessed at locations

beyond the fence line. Consequently, the receptor locations were selected as a grid that is defined by discrete Cartesian receptors, square in shape, and with origin at the centre of the proposed project site. A fence line grid was also included with spacing of 984.88 m from the project fence line. Total 446 receptors have been selected for the 10 km buffer of the project with 20 points each side.

#### **4.3.2 Terrain Considerations**

The classification of the land use in the vicinity of the proposed project is needed because dispersion rates differ between urban and rural areas. In general, urban areas cause greater rates of dispersion because of increased turbulent and buoyancy-induced mixing. This is due to the combination of greater surface roughness caused by more buildings and structures and greater amounts of heat released from concrete and similar surfaces. The 11SEPA guidance provides two procedures to determine whether the character of an area is predominantly urban or rural. One procedure is based on land-use type, and the other is based on population density. Both procedures require an evaluation of characteristics within a 3--km radius from the subject source, but the land-use methodology is considered more accurate. Hence, this method was applied and it was determined that the rural dispersion coefficient be selected for this modelling project.

#### **4.3.3 Meteorological Data**

The hourly surface data values for wind speed, wind direction, temperature, rainfall, relative humidity, pressure, cloud cover and ceiling height and solar radiation and at least once daily mixing height data was required. Surface data (temperature, rainfall, relative humidity, pressure, cloud cover and solar radiation well as wind data (direction and speed) for year Nov-21 to Nov-22 for the monsoon season was utilized for the study.

The 2021-22 meteorological pre-processed data was used to determine its Corresponding Wind Rose plot (see Figure 1). Windrose of Vrindavan shows that (Predominantly wind blow from the WNW).



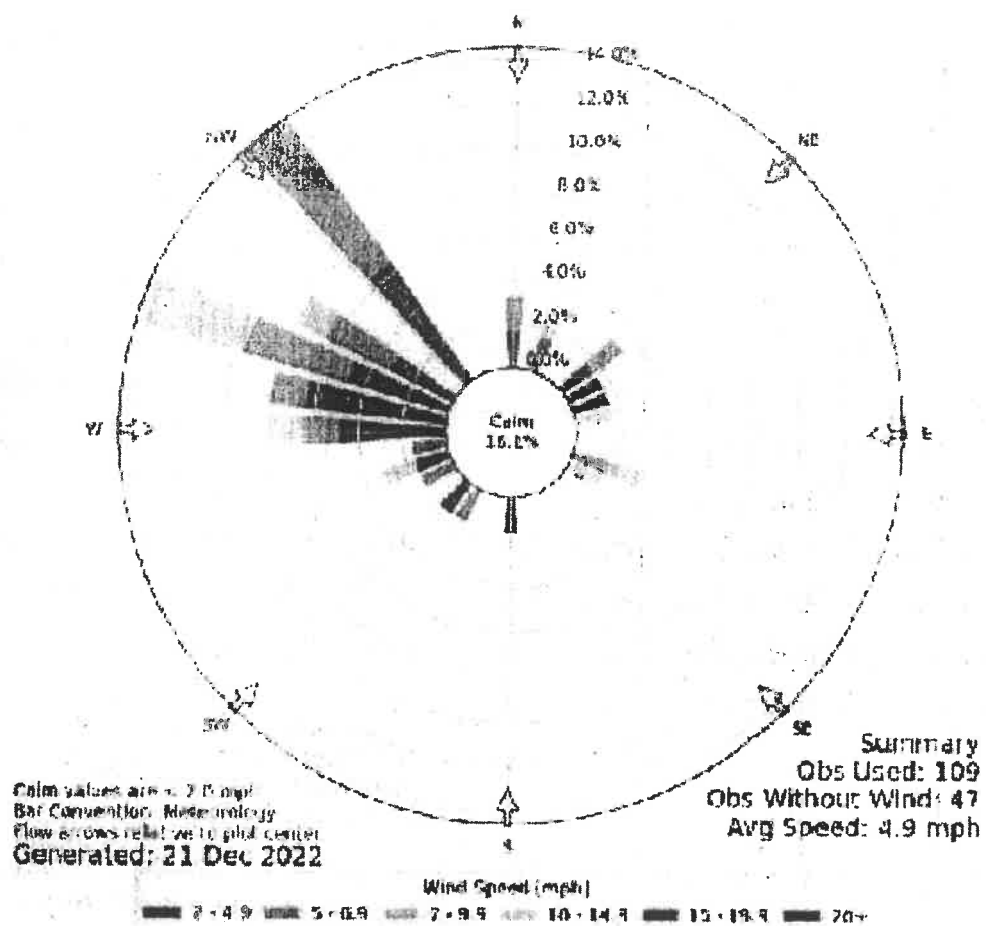


Fig 1: Windrose diagram

## 5 Mudd Results

With the various sources identified, a model domain established of 10 km in the north to south-east direction and centred in the middle of the proposed project, and the necessary input files created, model predictions were made for the pollutants PM for 24 hrs averaging periods for which there are National Ambient Air Quality Standards. Model runs were conducted for the proposed project's air pollutant sources or quality impact in combination with the other defined sources in the vicinity of the project. All the results are coming below permissible limits at project site. Detailed results are shown in table given below:

Table 2: Results of Air Modelling

Pollutant	MAX GLC	Distance
PM	$0.195\mu\text{g}/\text{m}^3$	0.12Km E
So <sub>x</sub>	$0.113\mu\text{g}/\text{m}^3$	0.12Km E
NO <sub>x</sub>	$1.20\mu\text{g}/\text{m}^3$	0.12Km E
Co (8hours)	$2.99\mu\text{g}/\text{m}^3$	0.12Km E

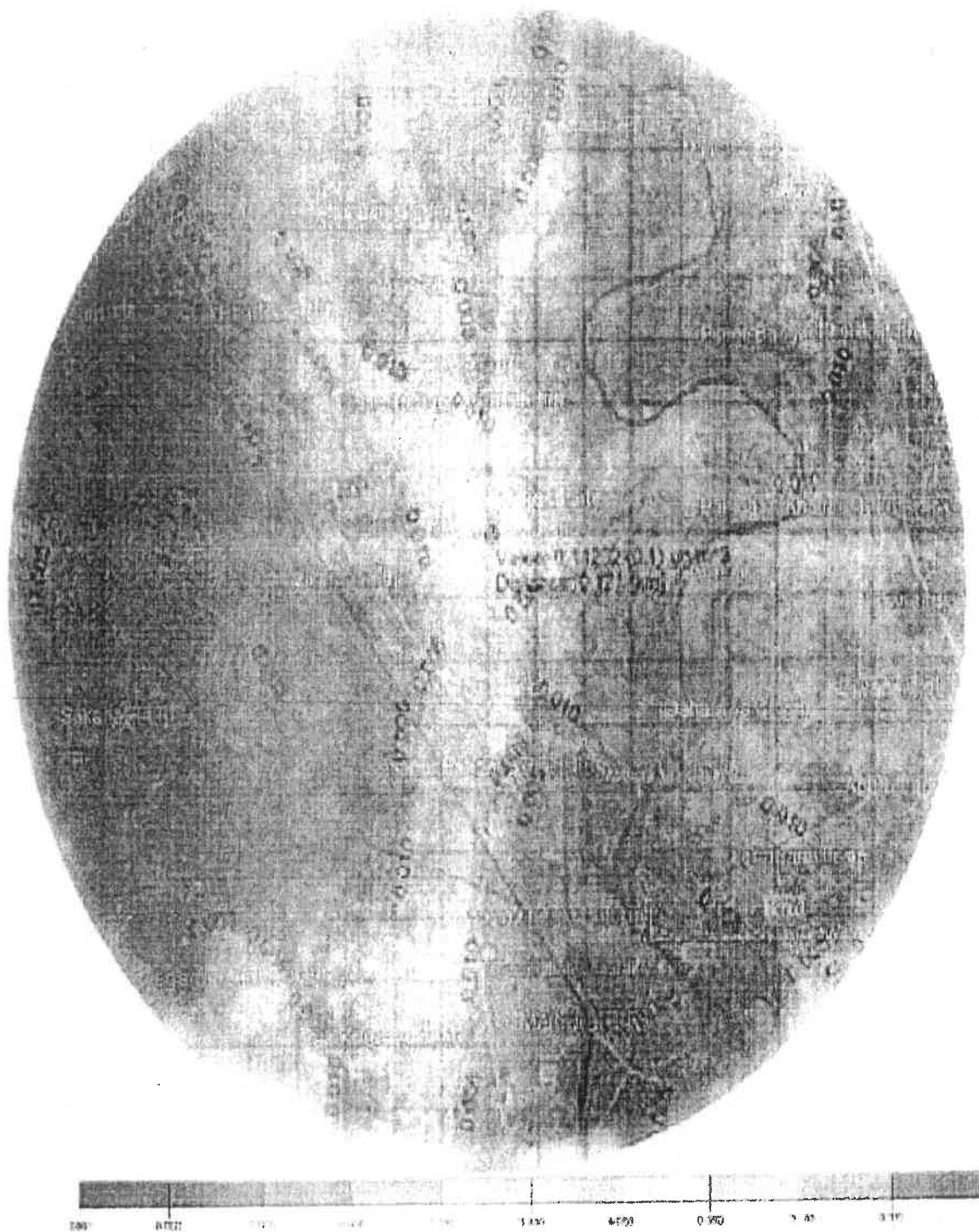


Figure 2: Isopleths showing incremental values for  $\text{SO}_2$

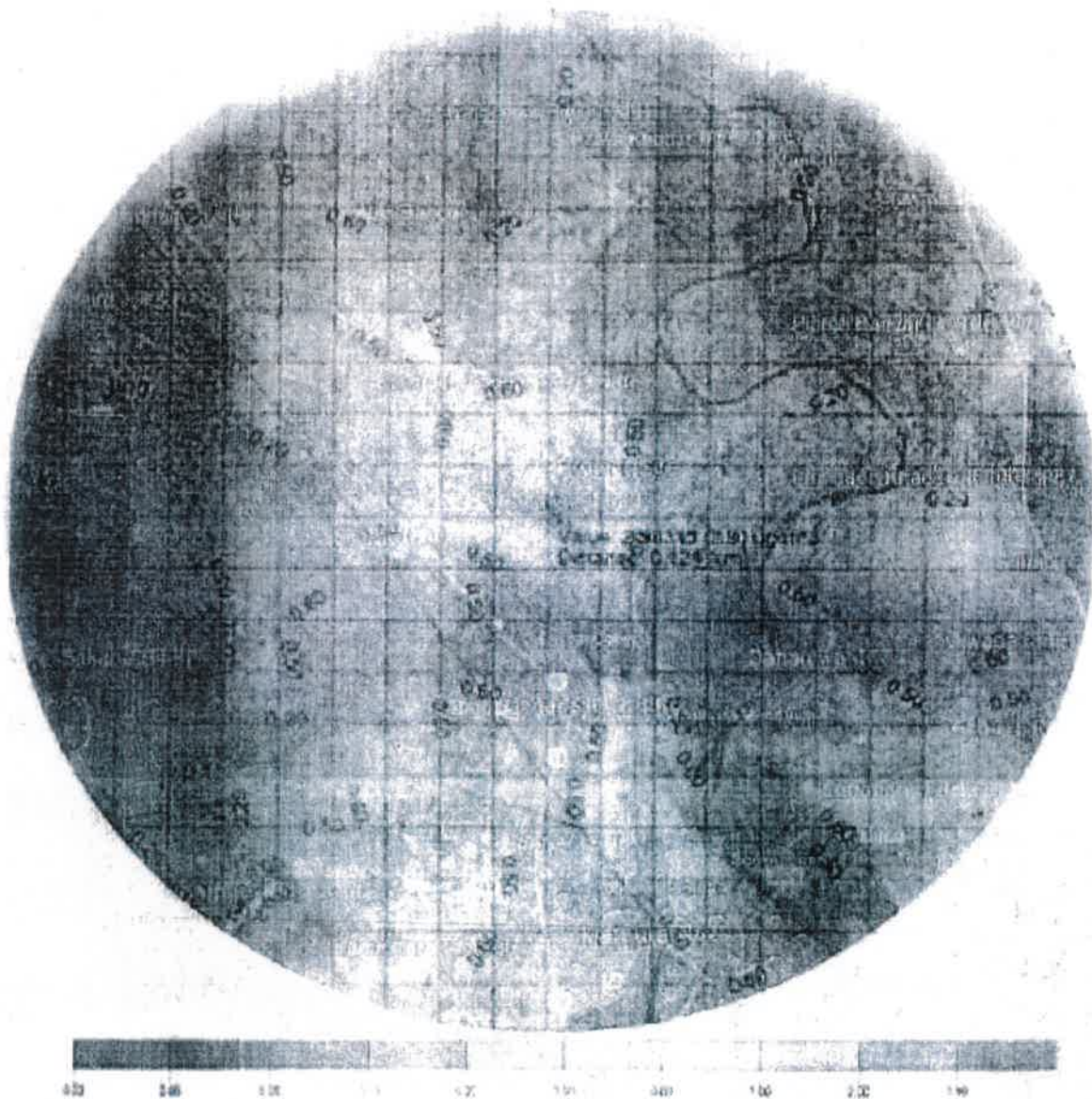


Figure 3: Isopleths showing incremental values for CO



**Figure 4: Isopleths showing incremental values for PM<sub>10</sub>**





Figure 5: Isopleths showing incremental values for NOx