ARTECH

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CIN. No. U45201 KL2005PTC018729

The Director, **Dt. 23 / 05 / 2017**
I.A. Division – III,
Ministry of Environment, Forests & Climate Change,
Indira Paryavaran Bhavan,
Jor Bagh Road, New Delhi – 110 003.

Sub.:- Environmental Clearance – Expansion of Residential cum Commercial Project at Survey Nos. 1834/1-1, 1834/3, 1828, 1828/1, 1828/2, 1832, 1833/2, 1833/1, 1833, 1831/1, 1831/2, 1831/3, 1805/B, 1804/B, 1829, 1830, 1806-B, 1806-C, 1830/2, 1805/B, 1806/B, 1806 C, 1830, Village Vanchiyoor, Thiruvananthapuram Municipality, Thiruvananthapuram Taluk & District, Kerala – Application – Reg.

Respected Sir,

We are developing a housing cum commercial Project at Vanchiyoor Village, Thiruvananthapuram District, Kerala. Attached herewith are the following documents for the expansion of the residential cum commercial project:

1. Duly filled Form – 1 (Appendix I)
2. Duly filled Form – 1A (Appendix II)
3. Conceptual Plan
4. Environment Clearance

You are requested to consider our application and accord Environmental Clearance to the expansion project at the earliest.

Thanking you,
Yours respectfully,
For Artech Realtors (P) Ltd.

P. S. ASOK
(Authorized Signatory)

Encl. :- As Above

APPENDIX I

(See paragraph – 6)

FORM 1

(I) Basic Information

Sr. No.	Item	Details
1.	Name of the project/s	**Environmental Clearance for Expansion (increase in built-up area of 7,920.46 sq.m.) of Residential cum Commercial Project by M/s Artech Realtors Pvt. Ltd.**
2.	S. No. in the schedule	**8 (a), Construction Project with built-up area 36,514.85 sq.m. (construction in progress) which is more than 20,000 sq. m. and less than 1,50,000 sq. m.**
3.	Proposed capacity / area / length / tonnage to be handled/command area/lease area/ number of wells to be drilled	**Total Plot Area = 0.8372 ha. (8,372 sq. m.)** **Total Built-up Area = 36,514.43 sq. m.** **(28,593.97 sq.m. as per Environment Clearance already obtained from MoEF + 7,920.46 sq.m. expansion area. The copy of Environmental Clearance issued by MoEF is attached with the application).**
4.	New/Expansion/Modernization	**Expansion**
5.	Existing capacity/area etc.,	**Expansion of the Residential cum Commercial project. Environment Clearance obtained for the Project from MoEF vide letter No. 21-69/2011-IA.III dt. 04-04-2012 and the construction for the Residential cum Commercial projects is in progress.** **Existing area details which is E.C. obtained :-** **Total Plot Area = 0.911 ha. (9,017.11 sq. m.)** **Total Built-up Area = 28,593.97 sq. m.**
6.	Category of Project i.e. 'A' or 'B'	**Category 'B' as per EIA Notification, 2006 & Category 'A' as per MoEF&CC Notification No. S.O. 804(E) dt. 14/03/2017**
7.	Does it attract the general condition? If yes, please specify	**NO**
8.	Does it attract the specific condition? If yes, please specify	**NO**
9.	Location	**Survey Nos. 1834/1-1, 1834/3, 1828, 1828/1, 1828/2, 1832, 1833/2, 1833/1, 1833, 1831/1, 1831/2, 1831/3, 1805/B, 1804/B, 1829, 1830, 1806-B, 1806-C, 1830/2, 1805/B, 1806/B, 1806 C, 1830, Village Vanchiyoor, Thiruvananthapuram Municipality, Thiruvananthapuram Taluk & District, Kerala**
	Plot/Survey/Khasra No.	**Survey Nos. 1834/1-1, 1834/3, 1828, 1828/1, 1828/2, 1832, 1833/2, 1833/1, 1833, 1831/1, 1831/2, 1831/3, 1805/B, 1804/B, 1829, 1830,**

		1806-B, 1806-C, 1830/2, 1805/B, 1806/B, 1806 C, 1830,
	Village	**Vanchiyoor**
	Tehsil	**Thiruvananthapuram**
	District	**Thiruvananthapuram**
	State	**Kerala**
10.	Nearest railway station/airport along with distance in Kms	**The nearest railway station is Pettah Railway Station which is at about 1 km. and Trivandrum Int. Airport is at about 3 km. away from the project site.**
11.	Nearest Town, city, District Headquarters along with distance in Kms	**Trivandrum town (the project site is within the town area)** **Thiruvananthapuram District Headquarter at Kudappanakunnu, (about 8.5 km.)**
12	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	***Village office address :-*** **Vanchiyoor Village Office,** **Thiruvananthapuram Taluk & District,** **Kerala-695035. Ph. 0471-2465480.** ***Corporation Address :-*** **Thiruvananthapuram Corporation,** **Vikas Bhavan P.O.,Thiruvananthapuram,** **Kerala-695033.Phone: 0471-2320821.**
13	Name of the applicant	**M/s Artech Realtors Pvt. Ltd.**
14	Registered Address	**M/s Artech Realtors Pvt. Ltd.** ***"Artech House"*, TC/24/2014 (1), Thycaud P.O.,** **Thiruvananthapuram, Kerala-695014.**
	Address for correspondence :	**Mr. T.S. Ashok, Managing Director,** **M/s Artech Realtors Pvt. Ltd.** **"*Artech House*", TC/24/2014 (1),** **Thycaud P.O., Thiruvananthapuram,** **Kerala-695014.**
	Name	**Mr. T.S. Ashok**
	Designation (Owner/Partner/CEO)	**Managing Director**
	Address	**Mr. T.S. Ashok, Managing Director,** **M/s Artech Realtors Pvt. Ltd.** **"*Artech House*", TC/24/2014 (1),** **Thycaud P.O., Thiruvananthapuram,** **Kerala-695014.**
	Pin Code	**Kerala-695014.**
	E-Mail	**asok@artechrealtors.com &** **viju@artechrealtors.com**
	Telephone No.	**0471-3018114- 3018118**
	Fax No.	**Nil**
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet	**Not Applicable** **Village-District-State** **1.** **2.**
17	Interlinked Projects	**Not applicable**
18	Whether separate application of interlinked projects has been submitted?	**Not applicable**
19	If yes, date of submission	**Not applicable**
20.	If no, reason	**Not applicable**
21	Whether the proposal involves	

	approval/clearance under: If yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c)The CRZ Notification,2011 ?	 **NO** **NO** **NO**
22	Whether there is any Government Order/Policy relevant/relating to the site?	**NO**
23	Forest land involved (hectares)	**NO**
24	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	**NO**

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sr. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	**Yes**	**There will be permanent change in land use, land cover or topography including increase in intensity of land use.** **The project site is located within Thiruvananthapuram Municipality & District, Kerala. The project is the expansion of the Residential cum Commercial project. Environmental Clearance was granted by MoEF vide E.C. No. 21-69/2011-IA.III dt. 04-04-2012 for 28,593.97 sq. m. and the construction work at site is almost completed.** **During operation phase, on full occupancy of residential cum commercial project, the maximum population expected is 3,334 persons (fixed population in apartments with staff & visitors in commercial area - floating population on full occupancy) and hence there is increase in the intensity of land use.** ***(Source: population is calculated based on NBC).***

1.2	Clearance of existing land, vegetation and buildings?	**Yes**	**There were some of native species of trees and different varieties of shrubs, herbs, grass & climbers at site.** **For the development of the project, these species were cleared.**
1.3	Creation of new land uses?	**Yes**	**The new land use will be for residential cum commercial project.**
1.4	Pre-construction investigations e.g. bore houses, soil testing?	**Yes**	**Pre-construction Soil Investigation has been carried out for the site. As per the soil investigation report, the water table was encountered upto a depth of about 1.5 m. below the ground level.**
1.5	Construction works?	**Yes**	**Construction of residential cum commercial project. Internal roads for movement inside the complex were constructed.**
1.6	Demolition works?	**No**	**Not applicable**
1.7	Temporary sites used for construction works or housing of construction workers?	**Yes**	**Temporary sheds were constructed for housing of construction workers (about 125 persons).**
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	**Yes**	**Earthwork for the foundation of structures were carried out. The top soil which was kept at site for landscaping work, for back filling work and for internal road construction and excess excavated earth were stored in the land of the project proponent**
1.9	Underground works including mining or tunneling?	**Yes**	**No underground works including mining / tunneling required except the foundation work for the structures.**
1.10	Reclamation works?	**No**	**Not applicable**
1.11	Dredging?	**No**	**No dredging work required.**
1.12	Offshore structures?	**No**	**No offshore structure required.**
1.13	Production and manufacturing processes?	**No**	**No production / manufacturing process involved.**
1.14	Facilities for storage of goods or materials?	**Yes**	**Separate raw material store of cement and other construction materials is made within the project premises. Bricks and steel laid in open.**
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	**Yes**	**Solid waste generation will be about 579 Kg/day and which will be collected separately as Bio-degradable and Non-biodegradable waste as per the MSW Rules, 2000. The non-biodegradable and recyclable waste would be sold to the vendors. The biodegradable waste would be sent to the composting (in vessel) facility to be developed within the premises. Further, the spent oil from the D.G. sets (defined as hazardous waste) will be sold to C.P.C.B. approved recyclers.** **Effluent :- Domestic sewage of 131 KL /**

			day will be generated which will be treated through Sewage Treatment Plant installed within the project premises.
1.16	Facilities for long term housing of operational workers?	**No**	**The project is commercial cum residential project and no accommodation facility is developed for the operational workers.**
1.17	New road, rail or sea traffic during construction or operation?	**No**	**Not applicable**
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	**No**	**Not applicable**
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	**No**	**Not applicable**
1.20	New or diverted transmission lines or pipelines?	**No**	**Not applicable**
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	**No**	**Not applicable**
1.22	Stream crossings?	**No**	**No stream crossings in the project.**
1.23	Abstraction or transfers of water form ground or surface waters?	**No**	**Yes, abstraction of water from ground through well.**
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	**No**	**Not applicable**
1.25	Transport of personnel or materials for construction, operation or decommissioning?	**Yes**	**Transportation of personnel / material during the construction and operation phase is envisaged.**
1.26	Long-term dismantling or decommissioning or restoration works?	**No**	**Not applicable**
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	**No**	**Not applicable**
1.28	Influx of people to an area in either temporarily or permanently?	**No**	**The project is residential cum commercial project and the project would provide job facilities for about 250 persons in the operation phase.** **Further, on full occupancy of the project, the maximum population expected is 3,334 Persons (floating population) and hence there will be influx of people to the project area.**
1.29	Introduction of alien species?	**No**	**Not applicable**

1.30	Loss of native species or genetic diversity?	**Yes**	**There were some of native trees, shrubs, herbs and grass, some of them are native species, were lost during site development.**
1.31	Any other actions?	**None**	**Nil**

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

S. No.	Information/checklist confirmation	Yes / No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	**Yes**	**Plot area of 0.8372 ha. is earmarked for residential cum commercial project and the site is under construction stage.**
2.2	Water (expected source & competing users) unit: KLD	**Yes**	**Construction phase :–** **The construction work at site is almost completed. The water consumption during construction phase is for meeting the domestic requirement (9 KLD) of the construction labourers and for construction purposes water requirement (15 KLD).** **The sources of water are from stored rain water, KWA supply & well water.** **Operation phase :-** **The total daily domestic water consumption for the project would be 164 KLD (which includes fresh water requirement of 91 KLD) (taken @ 45 LPCD for staffs & 15 LPCD for shoppers & 70 LPCD for restaurant area & 135 LPCD for residents). The sources of water during operation phase for the project are:-** **1. Roof Rain water (Non-flushing req.) (Rainy days-Concurrent use)** **2. Stored rain water / well water / KWA supply (Non flushing req.) (non-rainy days)** **3. Treated waste water from STP (Flushing Req.) (Entire Year)** **The details regarding the water consumption related items are provided at daily water balance chart and daily water consumption chart attached.**
2.3	Minerals (MT)	**No**	**Not Applicable**
2.4	Construction material – stone, aggregates, sand / soil (expected source-MT)	**Yes**	**Steel : 21,060 MT** **M-Sand: 45,215 Cu. Mtr.** **Hollow Blocks & Cement blocks : 29,096 Cu.m.** **Cement : 1,80,413 Bags** **The construction materials was brought from local suppliers available in the area.**
2.5	Forests and timber (source – MT)	**Yes**	**Wood was used for frame of doors however recyclable wood used for doors.**
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	**Yes**	**Total Power Req. : 3,570 kW** **Power Source: Kerala State Electricity Board.** **Total capacity of D.G. Sets (200 KVA x 1 No. + 630 KVA x 3 Nos.+ 160 kVA x 1 no.) (Standby power back up arrangement)**

			Fuel – Low Sulphur HSD
2.7	Any other natural resources (use appropriate standard units)	**No**	**Not applicable**

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. N.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	**Yes**	**This is a residential cum commercial project and no storage of hazardous chemicals (as per MSIHC Rules) will be done, apart from diesel storage for D.G. Sets which will be operated only during emergency and suitable arrangement will be adopted for the same. It will be stored in HDPE drums and kept in covered rooms under lock and key.**
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	**No**	**Suitable drainage and waste management measures are adopted in both the construction and operation phase which will restrict stagnation of water or accumulation of water within the site & the surroundings. This will effectively restrict the reproduction and growth of disease vectors. Good house keeping and hygienic measures will be followed to avoid any cause which can lead to occurrence of disease.**
3.3	Affect the welfare of people e.g. by changing living conditions?	**Yes**	**The project is a residential cum commercial project and thereby the standard of living index of the people around the project site will definitely improve. Also there will be various ancillary activities like convenient shops, transport facilities etc. attached to the project which will benefit the local people and change their living condition.**
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	**No**	**Not applicable. There is no storage of any material within the site which will affect the vulnerable groups of people.**
3.5	Any other causes	**None**	**Not applicable**

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	**No**	**No such spoil over burden or mine waste will be generated. The construction debris was used for back filling purposes.**

4.2	Municipal waste (domestic and or commercial wastes)	**Yes**	**The total Municipal solid waste to be generated from the project would be about 579 Kg/day on full occupancy during operation phase.**
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	**Yes**	**The oil used in the D.G. sets (as a standby source of power) after certain of hours of operation, needs to be changed. This used oil from the D.G. Sets will be sold to the CPCB approved recyclers. The list of authorized recyclers are M/s Perfect Alloys, Chengannur, M/s Peejay Enterprises, Thiruvalla, M/s Excel Petrochemicals, Kochi & M/s Cee Jee Lubricants, Aluva are the approved recyclers for discarded batteries & used oil located in Kerala. Used oil will be stored in HDPE drums in isolated covered facility.**
4.4	Other industrial process wastes	**No**	**Not applicable**
4.5	Surplus product	**No**	**Not applicable**
4.6	Sewage sludge or other sludge from effluent treatment	**Yes**	**The sludge from S.T.P. will be partially recycled for enhancing biological treatment and the excess sludge will be sent to the filter press and de-canted sludge will be used in green area.**
4.7	Construction or demolition wastes	**Yes**	**Construction waste was used for back filling purposes.**
4.8	Redundant machinery or equipment	**No**	**Not applicable**
4.9	Contaminated soils or other materials	**No**	**Not applicable**
4.10	Agricultural wastes	**No**	**Not applicable**
4.11	Other solid wastes	**Yes**	**Some horticulture waste will be generated and which will be disposed accordingly.**

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S. No.	**Information/Checklist confirmation**	**Yes / No**	**Details thereof (with approximate quantities / rates, wherever possible) with source of information data**
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	**Yes**	**The operation of project does not envisage any major air pollutant generating sources except D.G. Sets and vehicular movement during construction phase and operation phase. It D.G. set of 62.5 kVA x 1 no. capacity during construction phase and (200 KVA x 1 No. + 630 KVA x 3 Nos. + 160 kVA x 1 no.) in operation phase.**
5.2	Emissions from production processes	**No**	**Not applicable. No production activity envisaged.**

5.3	Emissions from materials handling including storage or transport	**Yes**	**This was restricted to the construction phase and within the project site only.**
5.4	Emissions from construction activities including plant and equipment	**Yes**	**Dust was generated during unloading of construction materials, drilling and grinding operations etc. This was restricted to the construction phase and within the project site only.**
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	**Yes**	**Construction work at site is almost over and during construction phase dust was generated during the handling of construction materials. Sprinklers for suppression of dust were installed during construction phase to minimize the dust generation. Wind breakers (i.e. barricades with GI sheets) at all vulnerable sides (all along the nearby houses) or locations or using shade nets were used for dust control.**
5.6	Emissions from incineration of waste	**No**	**Not applicable, no incineration proposed.**
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	**No**	**Not applicable**
5.8	Emissions from any other sources	**No**	**Not applicable**

6.0 Generation of Noise and Vibration, and Emissions of Light and Heat:

S. No.	**Information / Checklist confirmation**	**Yes / No**	**Details thereof (with approximate quantities/rates, wherever possible) with source of information data**
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	**Yes**	**During construction, the machinery used for construction were of highest standards and reputed make and adhere to international standards. These standards itself take care of noise generated from these machines. No heavy machinery was required. Hence insignificant impacts due to construction machinery were envisaged. Noise barriers all along the project boundary were created. Also the marble / tile cutting area noise barrier enclosures were created at appropriate height.**
6.2	From industrial or similar processes	**No**	**Not applicable**
6.3	From construction or demolition	**Yes**	**Due to the various construction activities, there was short term noise impacts in the immediate vicinity of the project site.**
6.4	From blasting or piling	**No**	**No blasting / pilling were adopted in the construction process.**
6.5	From construction or operational traffic	**Yes**	**Some amount of noise is generated from vehicular movement in the construction and operation phase.**

6.6	From lighting or cooling systems	**No**	**The lighting provided within the project area during construction phase and operation phase are limited to the permissible lux level. The project is residential cum commercial project thereby some buildings will be centrally air conditioned (except residential block) and cooling system will be installed for the commercial buildings.**
6.7	From any other sources	**No**	**Not applicable**

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	**No**	**Used Oil from the D.G. Sets will be stored in HDPE drums and will be kept at a separate place and sold to CPCB approved recyclers. Therefore there is no risk of contamination due to used oil. The storage of used oil will be in such a way that no spillage of hazardous materials.**
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	**No**	**Sewage will be disposed off through Sewage Treatment Plant developed within the premises. There is no chance of spillage or discharge of sewage and all the sewage will be chanalized properly through closed pipes to the STP. The sewage after treatment will be utilized for flushing, horticulture & cooling purposes.**
7.3	By deposition of pollutants emitted to air into the land or into water	**No**	**There is no emission except of D.G. set. By use of HSD diesel, the emission from the D.G. sets will be within the norms.**
7.4	From any other sources	**No**	**Not applicable**
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	**No**	**Not applicable**

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	**Yes**	**The project is a residential cum commercial project. The chances of explosions, spillages, fire are minimal. During construction all the labours were provided with suitable personal protective equipment (PPE) as required under the health & safety norms. Training and awareness about the safety norms**

			was provided to all supervisors and labours involved in construction activity. No major hazardous waste is being stored within the project site. No Industrial or process activity is involved in this project hence chances of chemical hazards and accidents are minimal. However, suitable fire fighting measures will be provided.
8.2	From any other causes	**No**	**Not applicable**
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	**No**	**As per seismic classification, the project site falls in Zone-III. No reported cloudburst in the area. Also, there is no hilly area around the project site, there is no chance of landslide. Structural design aspects as applicable would be incorporated.**

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:		**Appropriate infrastructure like roads, power supply, waste management and waste water treatment will be developed within the site so that chances of occurrence of any adverse impacts are minimized.**
	• Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)	**Yes**	**During construction skilled, unskilled and professional work force including temporary and permanent employees were hired locally in order to generate the employment to the local people. While during the project operation stage for the purpose of day-to-day maintenance, workers will be employed. Moreover, more employment will be created as a result of positive induced development in the immediate vicinity of project site.**
	• housing development	**Yes**	**Residential cum commercial project**
	• extractive industries	**No**	**Not applicable**
	• supply industries	**No**	**Not applicable**
	• other	**No**	**Not applicable**
9.2	Lead to after-use of the site, which could have an impact on the environment	**No**	**Not applicable**
9.3	Set a precedent for later developments	**No**	**Not applicable**
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	**No**	**Not applicable**

(III) Environmental Sensitivity

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	**No**	**None within the area.**
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests		**<u>Water bodies :-</u>** **Amayizhanchan thodu – 0.5 km.** **Lakshadweep Sea - 3.5 km.**
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	**No**	**None within the area**
4	Inland, coastal, marine or underground waters		**Amayizhanchan thodu – 0.5 km.** **Lakshadweep Sea - 3.5 km.**
5	State, National boundaries	**No**	**None within the area**
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	***No***	**Not applicable**
7	Defense installations	**Yes**	**Military area at Pangodu about 5 km.**
8	Densely populated or built-up area	**Yes**	**Thiruvananthapuram City is densely populated**
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	**Yes**	**There are several hospitals, schools, places of worship, educational institution and other community facilities located near the project site**
10	Areas containing important, high quality or scarce resources *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	**No**	**None within the area**
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	**No**	**No critically polluted area is located within 15 km. radius.**
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (*earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	**No**	**The project site area falls under Zone-III, according to the Indian Standards Seismic Zoning Map and falls in Zone-III. No reported earth quake, subsidence, erosion, cloudburst in the area or in its surroundings.**

(IV). Proposed Terms of Reference for EIA studies

Ans. The project is having built-up area 36,514.43 sq.m. which is less than 1,50,000 sq.m. and therefore, as per EIA Notification, 2006, the project falls under 8 (a) and hence EIA Studies is not required for this project.

"I hereby give an undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

P. S. ASOK

Place : **Trivandrum, Kerala**

Managing Director
M/s Artech Realtors Pvt. Ltd.
"Artech House",
TC/24/2014 (1),
Thycaud P.O.,
Thiruvananthapuram,
Kerala- 695014.

APPENDIX II

(See paragraph 6)

FORM-1 A

(Only for construction projects listed under item 8 of the Schedule)

(Environmental Clearance for Expansion of Residential cum Commercial Project by M/s ARTECH REALTORS (P) LTD.)
at
(Survey Nos. 1834/1-1, 1834/3, 1828, 1828/1, 1828/2, 1832, 1833/2, 1833/1, 1833, 1831/1, 1831/2, 1831/3, 1805/B, 1804/B, 1829, 1830, 1806-B, 1806-C, 1830/2, 1805/B, 1806/B, 1806 C, 1830, Village Vanchiyoor, Thiruvananthapuram Municipality, Thiruvananthapuram Taluk & District, Kerala)

CHECK LIST OF ENVIRONMENTAL IMPACTS

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

1.0 LAND ENVIRONMENT
(Attach panoramic view of the project site and the vicinity)

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

Ans. The project site is located within the Municipality limits of Thiruvananthapuram Municipal Corporation, Thiruvananthapuram, Kerala.
The vicinity map and the satellite map showing the location of the project site & it's surroundings is attached. The layout plan & building plan is enclosed. The conceptual plan showing the location of STP, Solid waste processing area, landscape area, parking area, rain water storage tanks, location of wells, building blocks, entry & exit to the site, internal traffic circulation within the site and surrounding etc. is attached.
The project site is within the Municipality limits and external infrastructural services available / proposed viz. water supply, electricity supply, storm water drainage & sewage facility, road connectivity, common solid waste disposal facility, fire fighting and health & educational institutions.

1.2. List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.

Ans. The major project requirements for this construction projects are mentioned below:-

Objective of the project	**=**	**Residential cum Commercial project**
Facilities developed	**=**	**124 Residential units with Recreation club and Shopping Mall with Retail area, Food courts, Multiplex & Shops etc.**
Total Cost of the Project	**=**	**Rs. 36.73 Crores**

Total Plot area	**=**	**0.8372 ha. (8,372 sq.m.)**
Total Ground Coverage	**=**	**4,535.16 sq.m (54.17%)**
Total Open Space	**=**	**3,836.84 sq.m. (45.83)**
Total Built-up area	**=**	**36,514.43 sq.m.**
Max. Height of the building	**=**	**40.65 m.**
Total Domestic Water Req.	**=**	**164 KL / day**
Sewage Generation	**=**	**131 KL / day**
Sewage Disposal Facility	**=**	**Sewage Treatment Plant & Recycling**
Treated Water Available from STP	**=**	**118 KL / day**
Source of Water	**=**	**Roof Rain water (Non-flushing req.) (Rainy days-Concurrent use), Stored rain water / well water / KWA supply (Non flushing req.) (non-rainy days) & Treated waste water from STP (Flushing Req.) (Entire Year)**

The details of the daily water requirement balance chart (rainy days & non – rainy days) is provided. Also attached is the activity wise population & daily water consumption details are attached.

Total Power Requirement	**=**	**3,570 kW**
Source of Power	**=**	**Kerala State Electricity Board & D.G. Sets (standby)**
Capacity of D.G. Sets	**=**	**200 KVA x 1 No. + 630 KVA x 3 Nos. + 160 kVA x 1 no.**
Parking provided	**=**	**277 Cars + 50 Two wheelers**

Connectivity ***:-***

The access road to the project site is from 10 m. wide road (Pattoor Jn. – Vanchiyoor) and another access from 22 m. wide (Airport-Patoor Jn.) which is well connected to entire city.
The nearest railway station is Pettah Railway Station which is at about 1 km. and Trivandrum Int. Airport is at about 3 km. away from the project site.

1.3. What are the likely impacts of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing land use, disturbance to the local ecology).

Ans. The project site is located within Thiruvananthapuram Corporation, Thiruvananthapuram District, Kerala. There would be no negative impacts on the existing facilities adjacent to the project site. The project has provision for (i) Treatment of sewage and it's fully recycling thereby there is no discharge outside the project premises during rainy days and during non rainy days (ii) The project has made provision for rain water storage tank which will be used as concurrent source of water during rainy days

and for non-rainy days. (iii) By the composting facility (in vessel) to be installed within the project site, the bio-degradable solid waste disposal will be managed within the site thereby no disposal outside the site.(v) There are various native species of trees, shrubs, herbs etc existing at site as part of floral ecology. Some of the native species were cut for development of the project site. As part of the eco restoration, large number of saplings of native species would be planted. Due to the eco restoration, the impact to floral and faunal ecology will be short term.

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

Ans. There will be no significant land disturbance occur due to the construction project. The project site falls within Zone-III as per the seismological classification map of India. There is no history of subsidence of the project site or it's surroundings in the past. There is a level difference of about ± 0.75 m. and the slope is towards south side of the project site.

The ground water table is 1.5 m. The bore hole soil profile data of the site is provided.

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

Ans. There was a level difference of about ± 0.75 m. and the slope is towards south side of the project site. The project development does not affect the drainage pattern of the site and surroundings. There is a storm water drain available near to the project site.

1.6. What are the quantities of earthwork involved in the construction activity- cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc.)

Ans. Earthwork for the foundation of structures was carried out. The top soil was kept at site for landscaping work, for back filling work and for internal road construction and excess excavated earth were stored in the land of the project proponent.

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

Ans. The construction work at site is almost completed. The water requirement during construction period is from the well water, KWA & stored rain water. The domestic water requirement was 9 KL per day and for construction purposes was about 15 KL per day. Further, by using of ready mix concrete (RMC) & curing agents, the water was reduced substantially. The sewage generation from labourers during construction period was about 7 KL/day and this quantity of domestic waste was disposed through mobile STP. The non bio-degradable waste, the empty cement bags, other packaging materials etc. was disposed to the vendors. The bio-degradable solid waste from the labour colony was disposed in a bio-bin system for microbial composting from the labourer.

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

Ans. Not applicable.

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

Ans. The construction waste consists of earth, debris concrete, lumber, masonry and cardboards which are about 35%, 15%, 12% and 10% respectively. Construction waste was disposed for backfilling purposes. The non-biodegradable waste was stored and sold to the vendors. The packaging material like cement bags etc. was also sold to the vendors.

2.0 WATER ENVIRONMENT

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

Ans. The details are provided below :-
The total daily water requirement, water balance chart and source of water during the operation phase of the project calculated on the basis of full occupancy are mentioned below: -

Total Domestic Water Req.	**= 164 KL / day (which includes 97 KLD of fresh water req.)**
Sewage Generation	**= 131 KL / day**
Sewage Disposal Facility	**= Sewage Treatment Plant & Recycling**
Treated Water Available	**= 118 KL / day**
Source of Water	**= Roof Rain water (Non-flushing req.) (Rainy days-Concurrent use), Stored Rain Water / Wells / KWA water supply (Non flushing req.) (non-rainy days) & Treated water from STP (Flushing Req.) (Entire Year)**

The project has made provision for rain water storage tank will be used for the concurrent use of water and hence as source of water during rainy days & non-rainy days. The source of water for this well water & stored rain water through tanks and hence the availability of water is ensured.

The Water Balance Chart (rainy days & non-rainy days) is attached. The activity wise population & daily water consumption details are attached.

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

Ans. The source of water for the project during operation phase will be water from the Rain water collection tank (315 KL x 2 nos.) within the site of for meeting the water requirement for non-flushing (during rainy days). During non-rainy days, the source of water is from stored rain water & for well water for meeting the non-flushing water requirement. The treated water from STP would meet the water requirement for flushing, horticulture & cooling requirements. Therefore by these sources and by an integrated water management approach, a dependable source of water is ensured. Further details are provided in attached water balance chart.

2.3. What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)

Ans. The sources of water for the project will be from stored rain water during rainy days & non-rainy days for non-flushing purposes & treated sewage for meeting the flushing water requirement. Also for the drinking purposes KWA water supply will also be another source of water to the project. The water quality of the well at site is collected and analyzed through an

approved laboratory. It is observed that the analyzed values physical, chemical parameters of the well water analyzed is fit for potable purposes to meet the drinking water standards as per IS 10500. Also attached is the well water quality report.

2.4. How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)

Ans. The project has provision for treatment of sewage. The quantity of treated water from STP which is fit for recycling to meet the flushing requirement (70 KLD), horticulture (1 KLD) & excess to the cooling requirement. The details of recycling and it's usage are provided in water balance chart.

2.5. Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)

Ans. Since there is minimal dependency on public supply (only for drinking), there is no diversion of water from other users. The water supply for the project is from stored rain water, well water and recycled water and hence there will be minimum impact to the surrounding.

2.6. What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)

Ans. There would be no incremental pollution load from wastewater generated from the project activity because the whole waste water of this project would be treated through S.T.P. within the project area and the treated water from S.T.P will be fully re-used during non rainy days and no discharge outside the project site during rainy days. Therefore, no impact outside the site.

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

Ans. One of the major source of water for the project will be water from stored rain water in tanks constructed within the site for meeting the water requirement for non-flushing activities. The capacity of the rain water storage tank requirement is = ground coverage of the building x 25 ltr. as per KMBR. The statutory requirement works out to be about 114 KL. However, provision is made for storage of 630 KL which is about 5.5 times of the statutory requirement.

2.8. What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long term basis? Would it aggravate the problems of flooding or water logging in any way?

Ans. As per the soil investigation report, the ground water is higher level. Due to this factors, the percolation to the ground before the site development is very poor. Further, it is proposed to use rain water through storage tanks. Due to these measures, there would not be any incremental load and will not cause any flooding or water logging. The excess runoff from the site before discharge outside will be passed through a de-siltation cum oil removal unit. The excess storm water will be chanalized to the drain available at site.

2.9. What are the impacts of the proposal on the ground water? (Will there be tapping of ground water; give the details of ground water table, recharging capacity, and approvals obtained from competent authority, if any)

Ans. Pre-construction Soil Investigation has been carried out for the site. As per the soil investigation report, the ground water table is at higher level. The source of water for the residential cum commercial project will be water from Rain water storage tanks for meeting the water requirement during rainy days-concurrent use and stored for non-rainy days and well water at site for meeting the water requirement for non-flushing activities and water supply from Kerala Water Authority and hence the availability of water is ensured and due to the reasons mentioned above, the dependency on ground water will be minimal.

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

Ans. The run-off during construction phase will be partially channelized to the rain water storage tank. The excess runoff will be channelized from the site after de-silting and oil removal and therefore, the run-off will not contaminate the land and aquifer.

2.11. How is the storm water from within the site managed? (State the provisions made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)

Ans. The roof run-off from the site will be appropriately channalised to the storm water collection tank constructed within the site and surface run-off will be connected to the external storm water drain available at site. The surface runoff will be properly channelized.

2.12. Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)

Ans. The project has provision of laborers and the domestic sewage will be channelised to the STP for treatment of sewage during the construction period to handle the sewage. Also, the food waste disposal from laborers through the microbial bio-bin facility. Also, it is proposed to have a dedicated staff for good house keeping of the construction site premises and the labourer premises. These measures will ensure good hygienic conditions around the area.

2.13. What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal)

Ans. The project has provision of STP of 10 KL capacity for the treatment of sewage during construction phase and STP of 158 KL capacity within the project premises to treat the sewage during operation phase. The treatment theory is based on MBBR technology. The total quantity of sewage generation will be 131 KL/day. The treated water will be fully recycled for meeting the flushing, horticulture & cooling water requirement. There will be no sewage discharge from the project premises after development of the project site.

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

Ans. The treated waste water from the Sewage Treatment Plant during the operation phase of the project will be used for flushing, horticulture & cooling purposes and for which dual plumbing system is proposed.

3.0 VEGETATION

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

Ans. There were some of native species of trees and different varieties of shrubs, herbs, grass & climbers at site. For the development of the project, these species were cleared.

3.2. Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)

Ans. There were some of native species of trees and different varieties of shrubs, herbs, grass & climbers at site. For the development of the project, these species were cleared.
As per the "*Kerala Promotion of Tree Growth in Non-Forest Areas (Amendment) Act, 2007*", no permission is required for cutting of these trees.

3.3. What are the measures proposed to be taken to minimize the likely impacts on important site features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale)

Ans. It is proposed to have large number (mostly flowering, medicinal & shady trees) of tree plantation (native species) within the project area and the landscape plan is attached.

4.0 FAUNA

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

Ans. There will be no displacement of fauna due to the construction of the residential cum commercial project.

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

Ans. There is no direct or indirect impact on the avifauna of the area due to this project. The project after the eco restoration with lot of flowering trees and fruit bearing trees will enhance the presence of avifauna.

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

Ans. Not applicable.

5.0 AIR ENVIRONMENT

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

Ans. The project is residential cum commercial project and it will not increase atmospheric concentration of gases, the project has provision of D.G. Sets for standby arrangement of electricity and will run only during power failure. The stack attached to the D.G. Sets will follow all the rules and regulations of State Pollution Control Board and Central Pollution Control Board.
The ambient air quality of the site carried out through an approved laboratory and the ambient air quality report is attached.

5.2. What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.

Ans. During construction phase, there will be generation of dust & smoke due to this project. The dust generation during construction phase will be controlled by enclosures at appropriate locations and also by sprinkling of water for suppression of dust. The gas/smoke generation expected is from

D.G. sets only and the gases will be vented out through stack of appropriate height.

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

Ans. The project would provide vehicle parking facilities within the project premises. The parking plan for this project would follows KMBR guidelines. The total number of parking provided is 277 cars + 50 Two wheelers. The conceptual plan clearly shows the internal traffic management with entry and exit to the project site. Also attached is the parking plan. The site development will provide minimum drive way as per KMBR at all around the building block for easy & smooth vehicular movement.

The access road to the project site is from 10 m. wide road (Pattoor Jn. – Vanchiyoor) and another access from 22 m. wide (Airport-Patoor Jn.) which is well connected to entire city.

The nearest railway station is Pettah Railway Station which is at about 1 km. and Trivandrum Int. Airport is at about 3 km. away from the project site.

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

Ans. The conceptual plan clearly shows the internal traffic management with entry and exit to the project site, all internal roads with width, pedestrian path ways etc. The total area earmarked for internal roads. Further provision of ramps are provided for the easy access to the building for physically challenged persons.

5.5. Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.

Ans. The project is a residential cum commercial project and there would be some increase in noise and vibration due to the vehicular movement within the project site. The project has provision of large area for the parking for the vehicles and the parking arrangement which is planned, that there would be easy movement of vehicles within the project area and smooth movement is provided for the vehicles to reduce the traffic congestion.

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

Ans. The D.G. sets which would be used for the project will be with sound proof acoustic enclosures and hence there will be no impact to the surroundings. The D.G. sets would be attached with proper anti vibration pads to reduce any vibration impact to the site surrounding.

The flue gases from the D.G. sets will be vented out through stack of appropriate height as per C.P.C.B. norms to reduce the impacts on air quality around the project site.

The ambient noise level of the site is carried out through an approved laboratory and the ambient noise level report is attached.

6.0 AESTHETICS

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

Ans. There is no natural feature of aesthetics located in the immediate vicinity of the project site.

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

Ans. The project site surrounded with commercial, residential, institutions and in the east side the project site is access road the project site i.e. 10 m. wide road (Pattoor Jn.–Vanchiyoor) and other access road is from 22 m. wide (Airport–Patoor Jn.). There will be no any adverse impacts due to the development of the project.

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

Ans. The project would be constructed in conformity with the Kerala Municipal Building Rules (KMBR).

The project site is within the Municipality limits and external infrastructural services available / proposed viz. water supply, electricity supply, storm water drainage & sewage facility, road connectivity, common solid waste disposal facility, fire fighting and health & educational institutions.

As per seismic classification, the project site falls in Zone-III. No reported cloudburst in the area. Also, there is no hilly area around the project site, there is no chance of landslide. Structural design aspects as per the seismic codes – IS 1893 (2002), IS 13920 (1993) and IS 456 (2000) as applicable would be incorporated in our project.

6.4. Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.

Ans. There is no report of existence of any anthropological or archaeological site nearby the project area. The project site is located in Thiruvananthapuram Municipal Limits. The vicinity map showing the site & surrounding area is provided.

7.0 SOCIO-ECONOMIC ASPECTS

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

Ans. **The project is a residential cum commercial project. During operation phase, on full occupancy of the project, the maximum population expected is 3,334 persons (floating) and hence there will be influx of people (fixed) to the project area and surrounding.**

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

Ans. There are several schools, colleges, religious places commercial and residential buildings, Govt. and private offices, hospitals, which are located around the project site. The vicinity map showing the surrounding details of the project is provided.

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

Ans. The project would not cause any adverse effects on local communities, disturbance to sacred sites or other cultural values. The project is a shopping mall cum hotel project and thereby the living index of the people around the project site will definitely improve. Also there will be various ancillary activities like convenient shops, transport facilities etc. attached to the project which will benefit the local people and change their living condition.

8.0 BUILDING MATERIALS

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

Ans. The project is a residential cum commercial project and the building is a centrally air conditioned building (except residential block), the selection of building materials plays a major role in the energy consumption. The project will make all attempts to use to avoid building materials with high embodied energy. Cement blocks & hollow blocks will be replaced with country made red bricks. Further, the river sand will be replaced by manufactured sand from stone crushers. The glass used will be low emissivity and having U value as per ECBC norms.

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

Ans. All vehicles which bring construction material to the site would possess Pollution Under Control Certificates (PUC). All vehicles would be of close body to avoid spread of dust from the loose materials, and vehicles which bring sand, stone dust, etc. would ensure that the above mentioned material are properly wetted during transportation to avoid dust generation. Pucca Road to be made in the construction site for the vehicle movement so that the dust generation due to the vehicular movement within the project site can be minimized. Stacking of construction material shall be confined to the project site only. All the D.G. Sets would have attached with Acoustic Enclosure for the sound pollution control and all sound generating construction activity to be minimized.

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

Ans. The plastic (non-biodegradable solid waste) was used along with coal tar during the construction of internal roads. This will increase the life of roads.

8.4. Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.

Ans. The details are given below :-

SOLID WASTE

- ✓ **The project will generate about 579 Kg/day from the premises.**
- ✓ **The solid waste from the project will be segregated into two categories at source itself as per Municipal Solid Waste Rules, 2000 by providing appropriate colored bins i.e., Bio-degradable (green bins) & non-biodegradable (blue bins).**
- ✓ **The non-biodegradable and recyclable waste would be sold to the vendors.**
- ✓ **The biodegradable waste composting facility (in vessel) developed within the premises.**

e-Waste :-

- ✓ **Discarded computer parts, monitor, key boards etc. constitutes e-waste and this waste will be stored in an earmarked area.**
- ✓ **E-waste will be generated after 4-5 years latency period**
- ✓ **Separate earmarked space will be provided for e-waste storage.**

- ✓ **E-waste will be disposed as per E Waste (Management & Handling) Rules.**

HAZARDOUS WASTE

- ✓ **As per Hazardous Waste (Management & Handling Rules), 2003, the hazardous waste i.e., the used oil from D.G. sets, discarded oil filters and discarded batteries and stored separately and will be disposed to CPCB / SPCB authorized vendors only.**
- ✓ **M/s Pefect Alloys, Chenganpur, M/s Peejay Enterprises, Thiruvalla, M/s Excel Petrochemicals, Kochi and M/s Cee Jee Lubricants, Aluva are the approved recyclers for discarded batteries & used oil located in Kerala.**

9.0 ENERGY CONSERVATION

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

Ans. The total power requirement is estimated to be 3,570 kW and will be from by Kerala State Electricity Board. The project will make provision of D.G. Sets (200 KVA x 1 No. + 630 KVA x 3 Nos. + 160 kVA x 1 no.) as standby arrangement of electricity. The project will have provision of power saving and maximum natural light provsion to minimize energy consumption.

- **Use of solar street lights would be adopted in the green area and along the internal roads of the project.**
- **Use of C.F.L./ LED lamps which consume less energy would be adopted.**
- **Solar water heating system in residential block.**
- **Building materials would be selected to have less heat gain to the building to comply ECBC norms.**

Sr. No.	Description of Material with Specification for Residential Building (Non-air conditional building)	U-Value Achieved (W / m2 K)	Type & Manufacturer
1.	WALLS (Cement plaster + Insulative internal plaster + 200 mm thick Cement Blocks, External enamel coating) with wall insulation	< 1.25	Wall insulation Gyproc gypsum plaster – 15 mm on interrior surface, Make : Saint. Gobtain – Gyproc
2.	ROOF (115 mm RCC + 65 mm Vermiculate + 100 mm brick coba + 25 mm Roof Tiles finish) with Roof insulation	< 0.5	Elastopor PUR Board 50 mm + HDPE 500 micron + Geotextiles Make : BASF
3.	GLASS (Single Clear 4 mm Glass)	4.20	Neutral Colour, Clear (non reflective) Make : M/s Asahi India (AIS)

Sr. No.	Description of Material with Specification for Commercial Building (Air-conditional building)	U-Value of the overall assembly
1.	EXTERNAL WALL External finish + 200 mm thick Cement Blocks + Thermal insulation + Stone clading wall plastered on both side with 5 mm thick aluminium composite panel	0.39 W / m2 K)
2.	ROOF 150 mm thick expanded polystyrene insulation + Water Proofing Compound + 40 mm thick Roof Tiles Grouted with 1:4 Cement Mortar	0.367 W / m2 K)
3.	GLASS Glazing shall be of double glass with air gap (6 mm + 12 mm air gap + 6 mm)	3.30 W / m2 K)

- **Targeted energy saving is about 24%.**

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

Ans. The project proponent has made provision of D.G. Sets (200 KVA x 1 No. + 630 KVA x 3 Nos. + 160 kVA x 1 no.) as standby arrangement of electricity.

9.3. What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?

Ans. The glass used will be low emissivity and the other specifications of the glass will comply with the norms as per ECBC U.

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

Ans. All the relevant features are incorporated like the orientation of the building, shading effect etc.

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

Ans. Due consideration has been taken for maximum use of the solar energy while preparation of layout plans. The project has made provision for solar panel system (hot water purpose) in building block area and solar energy devices will be used for street lighting, emergency lighting in the project. Further, provision would be made to set-up a Solar Power Plant based on Photo-Voltaic (PV) technology, on the roof top of the building. The size of the solar power plant for the buildings was calculated to be 20 kWp. The solar power plant is connected at LT level (0.433 kV) in parallel with the electrical grid of the institute. The solar power plant would be able to generate more than 30,000 units annually and cater to partial electrical requirement of the building. The entire generation from the solar power plant would be self-consumed by the commercial building and hence batteries are not required for storage purposes. Additional requirement of power during the day would be met by the supply from electrical grid or D.G. sets. It is envisaged that the solar power plant would result in substantial saving of electricity from the gird or diesel consumption in D.G. sets.

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

Ans. All the relevant features are incorporated like the orientation of the building, shading effect etc.

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

Ans. Suitable energy optimization will be adopted during the calculation of energy load of the project. The space heating load will be minimized using passive solar structure and suitable buildings envelop material. Uses of incandescent lamp and halogen lamps have been avoided and energy efficient LED lamps will be used for all common area. The diesel generator sets shall be automatically controlled to optimize their usage based on the actual load requirements at any time. Variable frequency drive systems would be adopted for the lifts, etc to maximize the energy saving.

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

Ans. More open spaces are provided within the site to creation of any heat islands. The roads and parking spaces would be with concrete slabs intermittent with grass on surrounding.

9.9. What are the thermal characteristics of the building envelope? (a) roof; (b) external walls; and (c) fenestration? Give details of the material used and the U-values or the R values of the individual components.

Ans. The building construction material namely bricks, concrete and steel are being used in the construction. U-factor, also known as Thermal Transmittance, is heat transmission in unit time through unit area of a material or construction and the boundary air films, induced by unit temperature difference between the environments on each side.

The glass used will be low with low emissivity and the other specifications of the glass will comply with the norms as per ECBC U. The further details are:-

Roof will be insulated with vermiculite (50 mm) + brick coba (100 mm) + tiles (25 mm) above the RCC slab (150 mm).

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

Ans. List of equipments provided for Fire Fighting Measures:-

A. The major equipments provided for Fire Fighting Measures are Main Hydrant Pump, Sprinkler Pump, Diesel Engine Pump, Jockey Pump.

B. Capacity of Fire Water Storage Tanks & Number:-

It is proposed to have Fire Water Storage Tank appropriate capacity of overhead tank for fire fighting provided at the tower.

C. Fire Detecting Equipments: -

The Fire Detecting Equipments would be as per BIS and NBC norms.

D. Other Fire Fighting Measures: -

The other Fire Fighting Measures includes, an Emergency Control Room, Separate Fire exit during emergency, all rooms with Fire Detector / Smoke Detector, Fire Extinguishes at each entry and exit point on each floor, (5 Kg, 10 Kg and 9 Ltr. capacity), Public address system etc. The Fire Fighting Measures are backed by Electrical supply from D.G. sets in case of emergency.

The nearest fire station is at Chacka Fire Station which is about 3 km. away from the project site.

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

Ans. The glass will be used Low-e glass. Opaque assemblies shall be modeled as having the same heat capacity as the proposed design but with minimum U-factor.

The glass used will be low with low emissivity and the other specifications of the glass will comply with the norms as per ECBC norms.

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

Ans. Infiltration is the uncontrolled inward air leakage through cracks and crevices in any building element and around windows and doors of a building caused by pressure differences across these elements due to factors such as wind, inside and outside temperature differences, and imbalance between supply and exhaust air systems.

9.13. To what extent the non-conventional energy technologies are utilised in the overall energy consumption? Provide details of the renewable energy technologies used.

Ans. The uses of non-conventional source of energy in the construction project are as follows: -

a. Solar Water Heater: -

The construction project would install solar panels for hot water requirements in the building block and hence the dependency on

electricity for hot water generation can be minimized. This would conserve lot of coal which produces the electricity through public supply and also load on D.G. sets also would be reduced and conserve diesel.

b. Solar Street Light: -

It is also suggested to use solar cell powered street lights within the project site for conservation of electricity.

c. Use of LED Lamps: -

The project proponent would use LED Lamp which conserve less electricity.

10.0 Environment Management Plan

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

Environmental Management Plan

Sr. No.	Potential Impact	Action	Parameters for Monitoring
I. Construction Phase			
1.	Air Emissions	All equipments are operated within specified design parameters	Random checks of equipment logs/manuals
		Vehicle trips to be minimized to the extent possible	Vehicle logs
		Any dry, dusty materials stored in sealed containers or prevented from blowing.	Absence of stockpiles or open containers of dusty materials.
		Compaction of soil during various construction activities	Construction logs
		Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for PM_{10} & $PM_{2.5}$, SO2 and NOx,
2.	Noise	List of all noise generating machinery onsite along with age to be prepared. Equipments are maintained in good working order.	Equipment logs, noise reading
		Night working is to be minimized.	Working hour records
		Generation of vehicular noise	Maintenance records of vehicles
		Implement good working practices (equipment selection and sitting) to minimize noise and also reduce its impacts on human health (ear muffs, safe distances, and enclosures).	Site working practices records, noise reading
		No machinery running when not required.	
		Acoustic mufflers / enclosures to be provided in large engines	Mufflers / enclosures in place
		Noise to be monitored in ambient air within the plant premises.	

		The noise level will not exceed the permissible limit both during day and night times.	Noise reading
		All equipments operated within specified design parameters.	Random checks of equipment logs / manuals
		Vehicle trips to be minimized to the extent possible	Vehicle logs
3.	Waste water Discharge	No untreated discharge to be made to surface water, ground water or soil	No discharge hoses in vicinity of watercourses.
		The discharge point should be selected properly and sampling and analysis should be undertaken prior to discharge	Discharge norms for effluents as given in consent to operate by PCB.
		Take care in disposal of wastewater generated such that soil and groundwater resources are protected	
4.	Soil Erosion	Minimize area extent of site clearance, by staying within the defined boundaries	Site boundaries not extended / breached as per plan document
		Protect topsoil stockpile where possible at edge of site	Effective cover in place
5.	Drainage and effluent Management	Ensure drainage system and specific design measures are working effectively. The design to incorporate existing drainage pattern and avoid disturbing the same.	Visual inspection of drainage and records thereof
6.	Waste Management	Implement waste management plan that identifies and characterizes every waste arising associating with project activities and which identify the procedure for collection handling & disposal of each waste arising.	Comprehensive waste management plan in place and available for inspection on site. Compliance with MSW Rules and Hazardous Waste (Management & Handling Rules)
7.	Non-routine events and cool dental releases	Plan to be drawn up Considering likely emergencies and steps required to prevent / limit consequences	Mock drills and records of the same
8.	Environmental Management Cell/Unit	The Environmental Management Cell / Unit is to be set up to ensure implementation and monitoring of environmental safeguards.	A formal letter from the management indicating formation of Environment Management Cell
II. Operational Phase			
9.	Air Emissions	Stack emissions from DG set to be optimized and monitored	The ambient air quality will conform to the standard for PM_{10} & $PM_{2.5,}$ SO_2, and NO_x, CO as given by PCC.
		Ambient air quality within the premises of the proposed unit to be monitored. Exhaust from vehicles to be minimized by use of fuel efficient vehicles and well maintained vehicles having PUC certificate.	The ambient air quality will conform to the standards for PM_{10} & $PM_{2.5}$ as given by PCC Vehicles logs to be maintained

		Vehicle trips to be minimized to the extent possible	Vehicle logs
10.	Noise	Noise generated from operation of DG set to be optimized and monitored DG sets to generate less than 75 dB(A) Leg at 1.0 m from the source DG sets are to be provided at service building with a acoustic enclosures with height of chimney above roof level or as specified by SPCB	Maintain records of vehicles
		Generation of vehicular noise	Maintain records of vehicles
11.	Wastewater Discharge	No untreated discharge to be made to surface water, groundwater or soil,	No discharge hoses in vicinity of watercourses
		Take care in disposal of waste water generated such that Soil and groundwater resources are protected	Discharge norms for effluent
12.	Drainage and effluent Management	Ensure drainage system and specific design measures are working effectively. Design to incorporate existing drainage pattern and avoid disturbance.	Visual inspection of drainage and records thereof
13.	Indoor air contamination	Contaminants such as CO, CO2 and VOCs to be reduced by providing adequate ventilation.	Monitoring of indoor air contaminants such as CO, CO2 and VOCs
14.	Energy Usage	Energy usage for air-conditioning and other activities to be minimized Conduct annual energy audit for the buildings	Findings of energy audit report
15.	Emergency preparedness, such as fire fighting	Fire protection and safety measures to take care to fire and explosion hazards to be assessed and steps taken for their prevention.	Mock drill records, on site emergency plan, evacuation plan
16.	Environment Management Cell/Unit	The Environment Management Cell/Unit to be set up to ensure implementation and monitoring of Environmental safeguards	A formal letter from the management indicating formation of Environment Management Cell

(B) ENVIRONMENTAL MONITORING PLAN

The environmental monitoring programmed is a vital process in the management Plan for any construction project. This helps in signaling the potential problems that would result from the project and will allow for prompt implementation of effective corrective measures. The environmental monitoring will be required during construction and operational phases.

Water Quality and Public Health

Since water contamination leads to various water related diseases, the project authorities shall establish a procedure for water quality surveillance and ensure safe water for the consumers. A detailed epidemiological study related to water borne diseases shall be carried out and the data shall be complied for every year in the project area. This data would help the authority in finding out the trends for

incidence of water related diseases prevalent in the area, which would help them to take suitable remedial measures for reducing or eradicating the occurrence of these diseases in future.
Water quality parameters shall be monitored before and after the completion of the project. Monitoring shall be carried out on quarterly basis to cover seasonal variations. Water quality shall be analyzed by applying the standard techniques. The parameters recommended for monitoring are as follows :

• pH • Dissolved Oxygen • Biochemical Oxygen Demand • Chemical Oxygen Demand • Total Dissolved Solids • Total Suspended Solids • Total Alkalinity • Temperature • Total Hardness • Calcium • Temperature	• Calcium • Magnesium • Iron • Chloride • Sulphate • Nitrate • Fluoride • Total Nitrogen • Total Phosphate • Total Coliforms

Air and Noise Quality Monitoring

The attributes to be monitored as a part of the mitigation measures are Air Quality, Noise Levels; the monitoring programme for the construction and operation stage is presented in Table given below :-

ENVIRONMENT MANAGEMENT PLAN

OPERATION PHASE				
Sr. No.	Particulars	Approx. Recurring Cost/Annum	Approx. Capital Cost	Basis for Cost Estimation
		(Rs. In Lacs)		
1.	Sewage Treatment Plant	3.0	20.0	Capital Cost
2.	Water Treatment Plant (WTP)	2.0	6.0	Construction of WTP
3.	Solid Waste Management Plan	6.0	15.0	Coloured bins at appropriate locations & composting facility (in vessel)
4.	Noise Control for D.G. Sets	2.0	6.0	D.G. Sets will be new and will be fitted with acoustic enclosures
5.	D.G. Sets Emission stacking, sampling	1.0	3.0	The capital cost would include cost of providing adequate height of stack, ladder, platform and stack monitoring
6.	Green Area development including Grass Coverage	2.0	8.0	Green Area Development, cost of plants, plantation cost, manure etc.
7.	Rain Water storage tank	6.0	25.0	Construction of Rain Water storage tank
	TOTAL	**22**	**83**	

ENVIRONMENT MONITORING PLAN

OPERATION PHASE				
Sr. No.	Particulars	Parameters	Frequency	Approx. Recurring Cost / Annum (Rs. In Lacs)
1.	Ambient Air	PM_{10} & $PM_{2.5}$, SO_2, NOx, CO	Once in a season	1.0
2.	Stack Emission	SPM, SO2 , NOx	Every six months	0.25
3.	Treated Water from STP	pH, BOD, COD, Oil & Grease, TSS, bacteriological parameters	Once in a month	1.0
4.	Rain water & well water	As per IS : 10500	Once in a month	1.0
5.	Noise Level	24 Hrs. Noise Level	Once in a month	0.60
	TOTAL			**3.85**

ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management System constitutes provision of an Environmental Division, which should be staffed by an Environmental Engineer / Office, and Environmental Assistant and other assistant (miscellaneous works). The task assigned should include supervision and co-ordination of studies, monitoring and Implementation of environmental mitigation measures.

ENVIRONMENT MANAGEMENT / MONITORING CELL
FREQUENCY OF MEETING – ONCE IN THREE MONTHS
(Construction Phase & one year of operation phase)

Sr. No.	Members	Role
1.	Director	Chairman
2.	Project Manager	Member
3.	Health & Safety Officer	Member
4.	Representative of NABL accredited laboratory	Member
5.	Representative of NABET accredited Environmental Consultant	Member
6.	Representative of STP & Bio-bin unit supplier	Member
7.	Project Engineer	Member & Convener

ENVIRONMENT MANAGEMENT / MONITORING CELL
FREQUENCY OF MEETING – ONCE IN THREE MONTHS
(Operation phase – After handing over to RWA)

Sr. No.	Members	Role
1.	Secretary, RWA	Chairman
2.	Maintenance Engineer	Member
3.	Representative of NABL accredited laboratory	Member
4.	Representative of NABET accredited Environmental Consultant	Member
5.	Representative of STP & Supplier of composting unit	Member
6.	Project Engineer	Member & Convener

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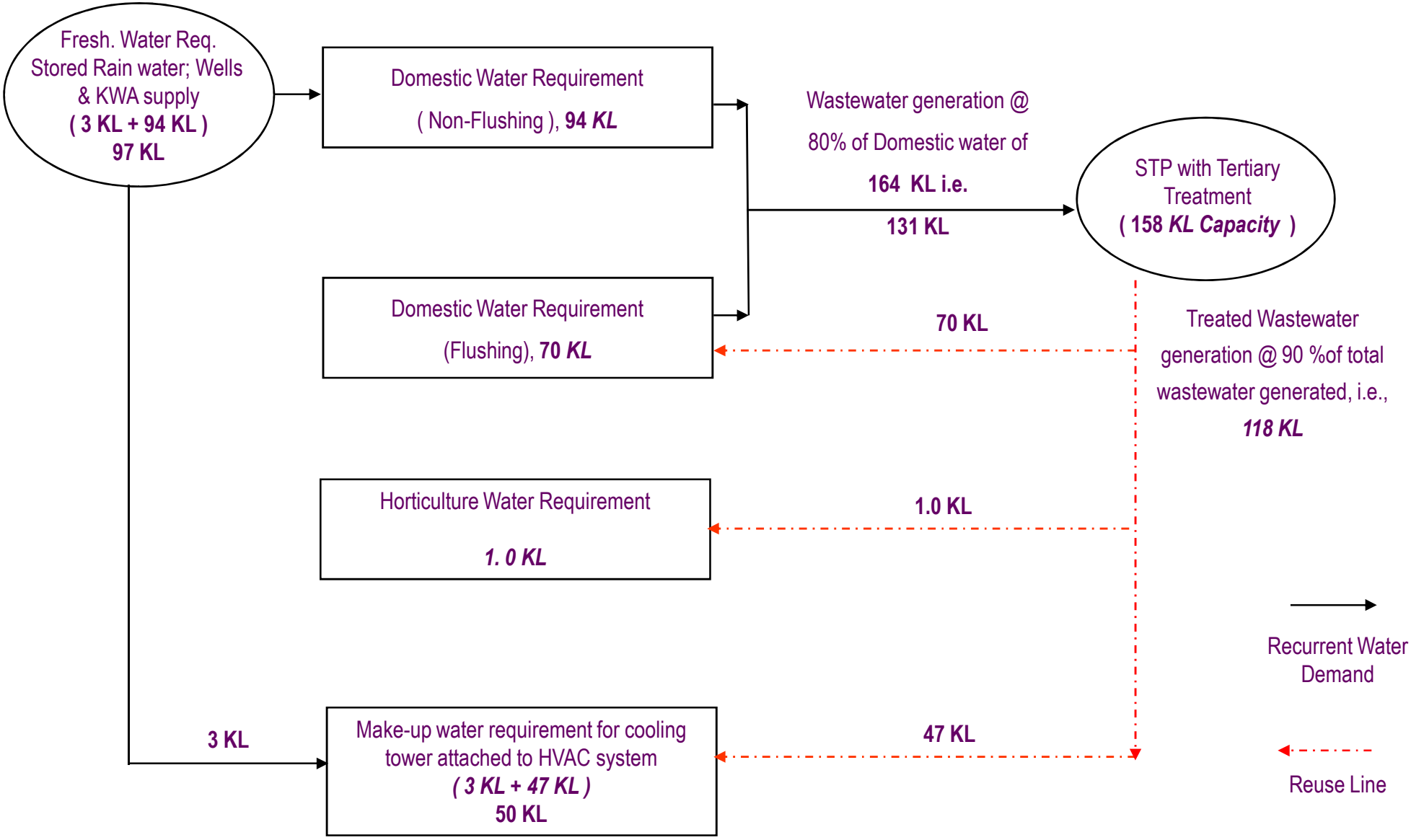
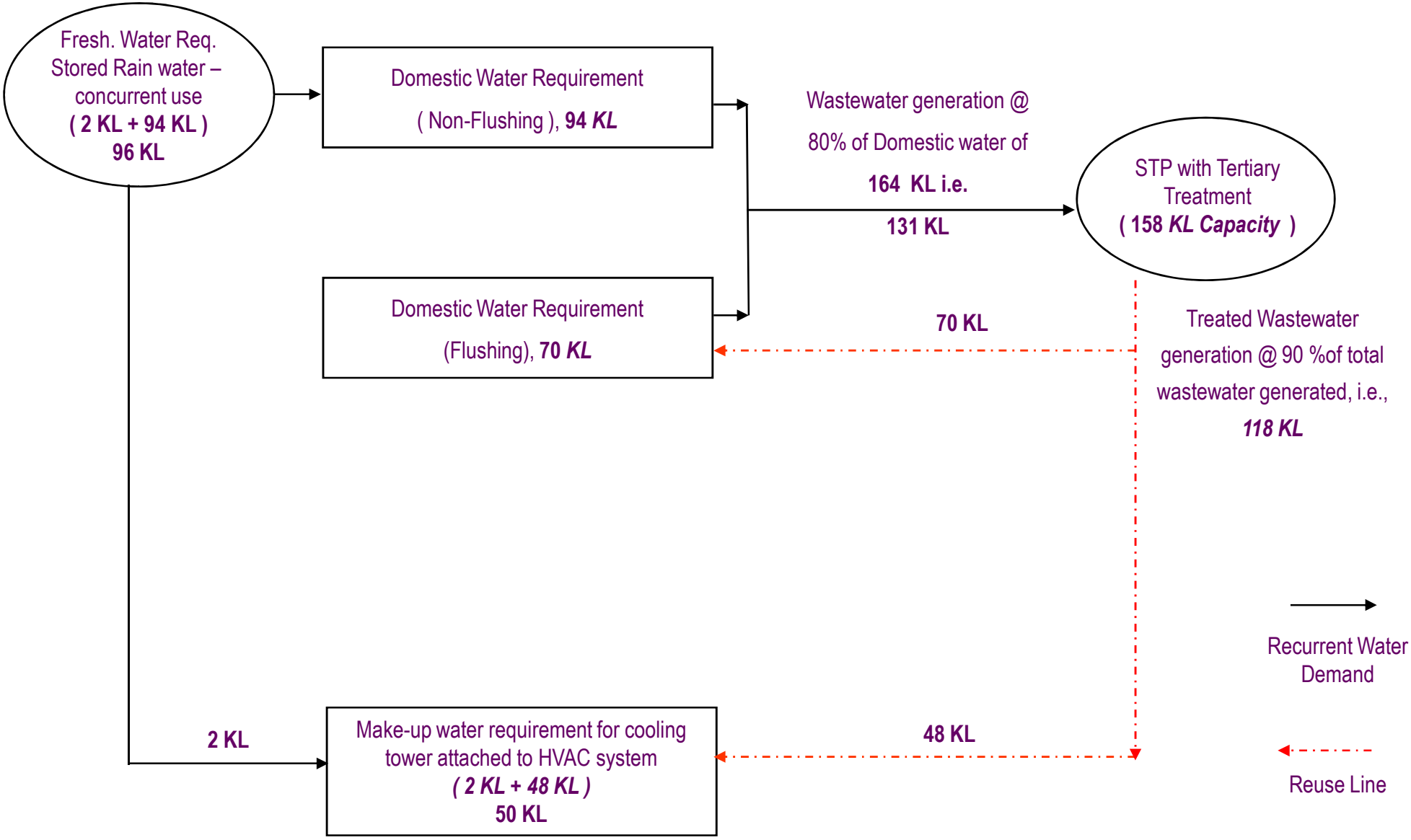
ACTIVITY WISE POPULATION & DAILY WATER CONSUMPTION DETAILS

ACTIVITY	FAR area (in sq.m.) / Apts	POPULATION	NON-FLUSHING REQ. (in KL)	FLUSHING REQ. (in KL)	TOTAL (in KL)
Retail area (shoppers)	2,505	835 Persons (1 person / 3 sq.m. for Gr. & 1st floor)	835 x 5 Ltr. = 4.175	835 x 10 Ltr. = 8.35	12.525
Retail area (shoppers)	2,944	491 Persons (1 person / 6 sq.m. for above floors)	491 x 5 Ltr. = 2.455	491 x 10 Ltr. = 4.91	7.365
Food court	548 seats	548 Persons (1 person / seat)	548 x 5 Ltr. = 2.74	548 x 10 Ltr. = 5.48	8.22
Multiplex	537 seats	537 Persons (1 person / seat)	537 x 45 Ltr. = 24.165	548 x 25 Ltr. = 13.70	37.865
House keeping staff (Retail, food court, Multiplex)	-	241 Persons (10% of above population of 2,411)	241 x 15 Ltr. = 3.615	241 x 30 Ltr. = 7.23	10.845
Apartments	124	620 Persons (124 apts. X 5 persons)	620 x 90 Ltr. = 55.80	620 x 45 Ltr. = 27.90	83.70
Club area	-	62 Persons (10% of residential population)	62 x 15 Ltr. = 0.93	62 x 30 Ltr. = 1.86	2.79
TOTAL			93.88 Say 94 KL	69.43 Say 70 KL	163.31 Say 164

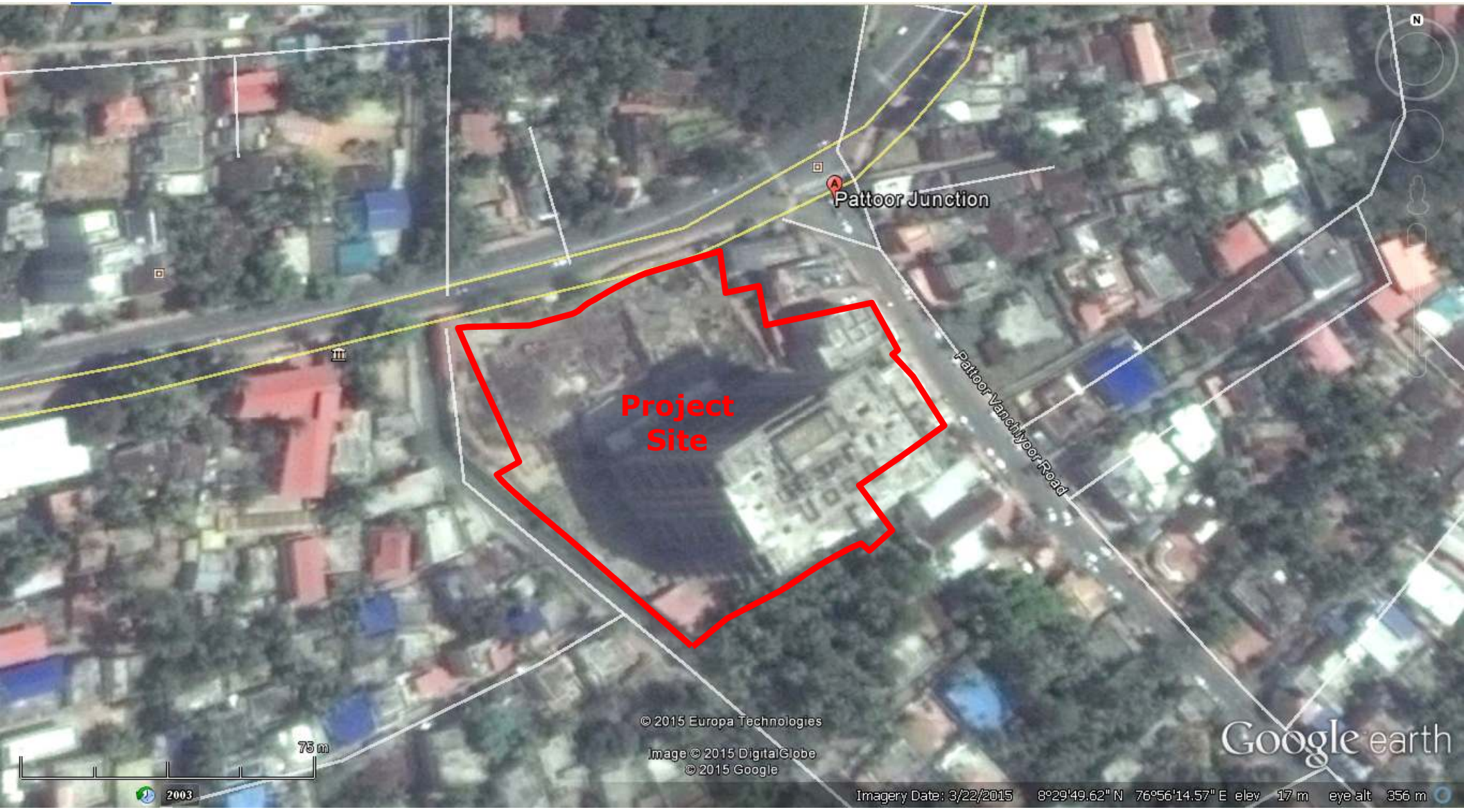
DAILY WATER CONSUMPTION BALANCE CHART
(NON-RAINY DAYS) (ZERO EXIT DISCHARGE)



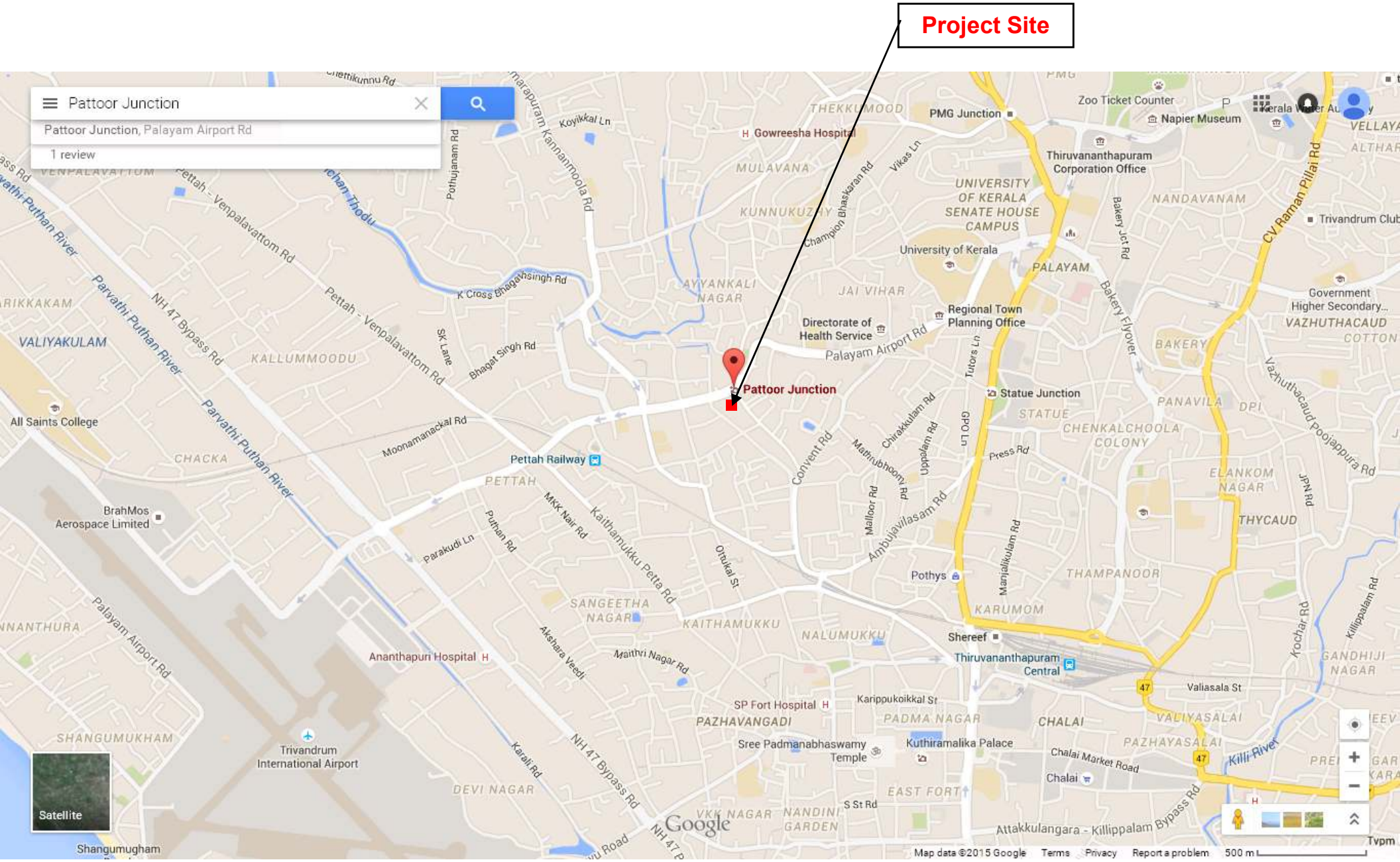
DAILY WATER CONSUMPTION BALANCE CHART
(RAINY DAYS) (ZERO EXIT DISCHARGE)



SATELLITE MAP OF THE SITE & SURROUNDINGS

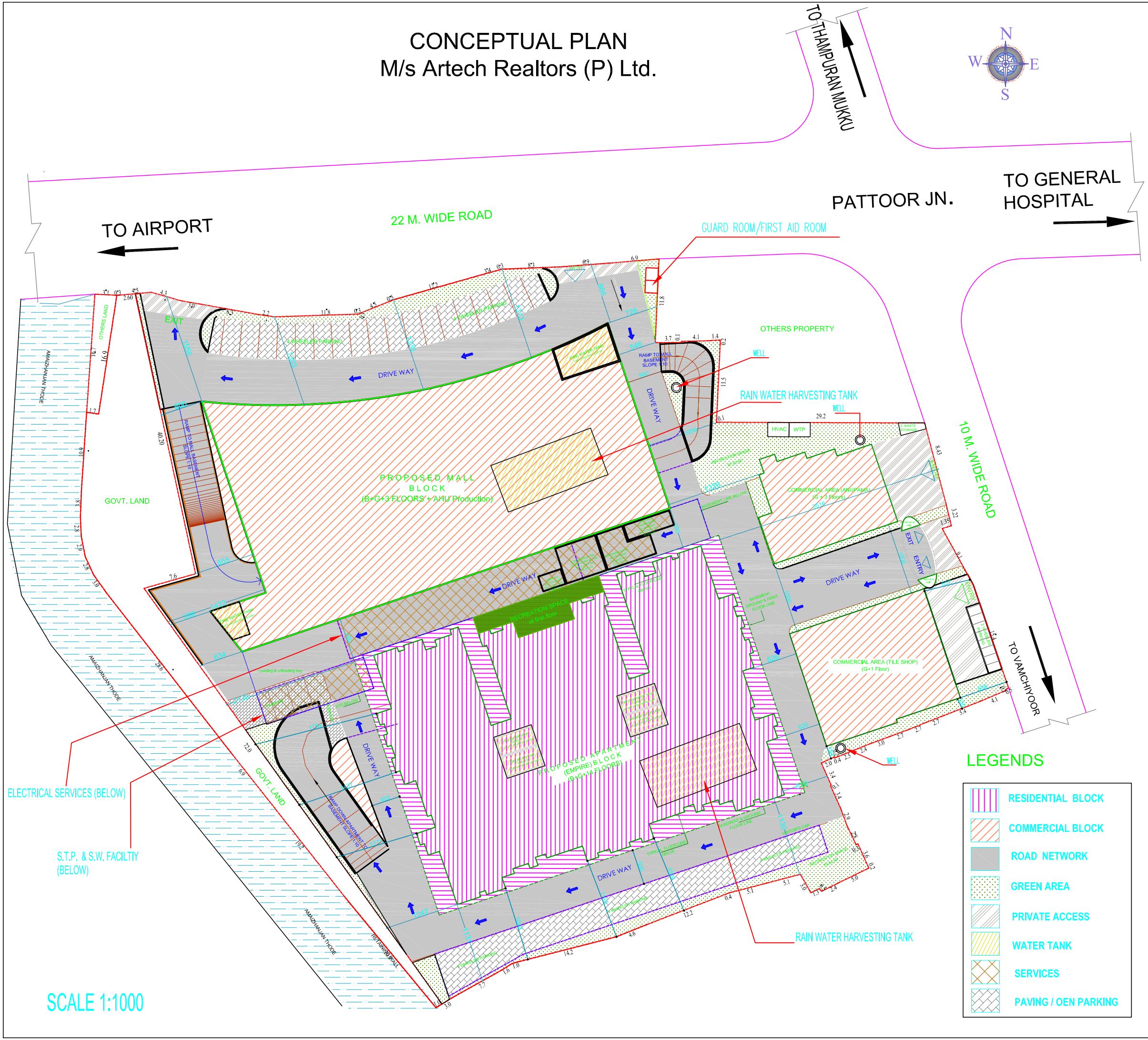


VICINITY MAP OF THE SITE & SURROUNDINGS



SITE PHOTOGRAPHS - M/s ARTECH REALTORS (P) LTD.

CONCEPTUAL PLAN
M/s Artech Realtors (P) Ltd.



F.No. 21-69/2011-IA.III
Government of India
Ministry of Environment & Forests
(IA.III Division)

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi-110 003.

Dated: 4th April, 2012

To
M/s. Artech Realtors (P). Ltd.,
TC 15/1453, A.I.R. Road,
Vazhuthacaud,
Thiruvananthapuram – 695 014 (Kerala)

Subject: **Environmental Clearance for the construction of Artech Empire & World Mall, Residential and Commercial Project at S.No. 1805-B, 1804-B, 1829, 1830, 1830/1, 1831/2, 1831/3, 1806-B, 1806-C, 1830-2, 1833/1, 1833, 1832, 1833/2, 1834/3, 1828, 1828/1 and 1828/2, Village Vanichiyoor, Corporation-Thiruvananthapuram, Thiruvananthapuram, Kerala by M/s. Artech Realtors Pvt. Ltd – Reg.**

Sir,

This has reference to your application No. Nil dated 18.06.2011 seeking prior Environmental Clearance for the above project under the EIA Notification, 2006. The proposal has been appraised as per prescribed procedure in the lights of provisions under the EIA Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., the Form-1 &1A, Conceptual Plans and the additional clarifications furnished in response to the observations of the Expert Appraisal Committee constituted by the competent authority in its meetings held on 17th – 18th October, 2011 and recommended environmental clearance for the project.

2. It is interalia, noted that the project involves the Residential & Commercial project on a plot area is 0.911 ha. The total built-up area is 28,593.97 sq.m. It is proposed to construct 97 residential units (Basements + Ground Floor + 11 Floors) recreation club & mall block (Basement + Ground floor + 3 Floors). The total water requirement is 62.275 KLD (fresh water requirement is 39.436 KLD). The capacity of STP proposed is 68 KLD. Treated waste water to be used for flushing - 22.839 KLD, horticulture - 2 KLD and cooling 25.591 KLD. Total solid waste generation will be 396.10 Kg/day. The power requirement is 2,850 KW. The total parking spaces proposed are for 328 cars + 34 two wheelers. Total cost of the project is Rs. 30.16 Crores. The proposed project is 3.5 km away from the sea and hence it will not attract CRZ Notification, 1991.

3. The Expert Appraisal Committee, after due consideration of the relevant documents submitted by the project proponent have recommended for the grant of Environmental Clearance for the project mentioned above,

Accordingly, the Ministry hereby accord necessary Environmental Clearance for the above project as per the provisions of Environmental Impact Assessment Notification – 2006 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

PART A – SPECIFIC CONDITIONS

I. Construction Phase

(i) "Consent for Establishment" shall be obtained from Kerala State Pollution Control Board under Air and Water Act and a copy shall be submitted to the Ministry before start of any construction work at the site.

(ii) The total height of the building is 35.05 m. The guidelines issued by the Ministry of Environment & Forests for High Rise Building vide O.M. No. 21-270/2008-IA.III dated 07.02.2012 shall be followed strictly for the project.

(iii) Storage of diesel shall not be placed in the basement along with DG set. Necessary space shall be earmarked away from the building blocks.

(iv) Proposals for storm water drainage shall be worked out after analyzing the contour levels of the site and the surrounding area and the carrying capacity of storm water drains and their outfall.

(v) Proper meters shall be provided to continuously record the quantity of treated waste water recycled for different purposes.

(vi) A First Aid Room will be provided in the project both during construction and operation of the project.

(vii) All the topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.

(viii) Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

(ix) Soil and ground water samples will be tested to ascertain that there is no threat to ground water quality by leaching of heavy metals and other toxic contaminants.

(x) Construction spoils, including bituminous material and other hazardous materials, must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.

(xi) Any hazardous waste generated during construction phase, should be disposed off as per applicable rules and norms with necessary approvals of the Kerala State Pollution Control Board.

(xii) The diesel generator sets to be used during construction phase should be low sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards.

(xiii) The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from Chief Controller of Explosives shall be taken.

(xiv) Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

(xv) Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB/ KSPCB.

(xvi) Fly ash should be used as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003.

(xvii) Ready mixed concrete must be used in building construction.

(xviii) Storm water control and its re-use as per CGWB and BIS standards for various applications.

(xix) Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

(xx) Permission to draw ground water shall be obtained from the competent Authority prior to construction/operation of the project.

(xxi) Separation of grey and black water should be done by the use of dual plumbing line for separation of grey and black water.

(xxii) Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.

(xxiii) Use of glass may be reduced by up-to 40% to reduce the electricity consumption and load on air-conditioning. If necessary, use high quality double glass with special reflective coating in windows.

(xxiv) Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfill requirement.

(xxv) Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code which is proposed to be mandatory for all air-conditioned spaces while it is aspirational for non-airconditioned spaces by use of appropriate thermal insulation material to fulfill requirement.

(xxvi) The approval of the competent authority shall be obtained for structural safety of the buildings due to earthquake, adequacy of fire fighting equipments, etc. as per National Building Code including protection measures from lightening etc.

(xxvii) Regular supervision of the above and other measures for monitoring should be in place all through the construction phase, so as to avoid disturbance to the surroundings.

(xxviii) Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.

(xxix) Connectivity to the National Highway shall be redesigned and submitted to NHAI/PWD and necessary approval shall be obtained prior construction at site.

II. Operation Phase

i) The installation of the Sewage Treatment Plant (STP) should be certified by an independent expert and a report in this regard should be submitted to the Ministry before the project is commissioned for operation. Treated affluent emanating from STP shall be recycled/ reused to the maximum extent possible. Treatment of 100% grey water by decentralized treatment should be done. Discharge of unused treated affluent shall conform to the norms and standards of the Kerala State Pollution Control Board. Necessary measures should be made to mitigate the odour problem from STP.

ii) The solid waste generated should be properly collected and segregated. Wet garbage should be composted and dry/ inert solid waste should be disposed off to the approved sites for land filling after recovering recyclable material.

iii) Diesel power generating sets proposed as source of back-up power for elevators and common area illumination during operation phase should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use low sulphur diesel. The location of the DG sets may be decided with in consultation with Kerala State Pollution Control Board.

iv) Noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured at the boundary of the building shall be restricted to the permissible levels to comply with the prevalent regulations.

v) The green belt of the adequate width and density preferably with local species along the periphery of the plot shall be raised so as to provide protection against particulates and noise.

vi) Weep holes in the compound walls shall be provided to ensure natural drainage of rain water in the catchment area during the monsoon period.

vii) Rain water harvesting for roof run- off and surface run- off, as plan submitted should be implemented. Before recharging the surface run off, pre-treatment must be done to remove suspended matter, oil and grease. The borewell for rainwater recharging should be kept at least 5 mts. above the highest ground water table.

viii) The ground water level and its quality should be monitored regularly in consultation with Central Ground Water Authority.

ix) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.

x) A Report on the energy conservation measures confirming to energy conservation norms finalise by Bureau of Energy Efficiency should be prepared incorporating details about building materials & technology, R & U Factors etc and submit to the Ministry in three months time.

xi) Energy conservation measures like installation of CFLs/TFLs for the lighting the areas outside the building should be integral part of the project design and should be in place before project commissioning. Use CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid mercury contamination. Use of solar panels may be done to the extent possible.

xii) Adequate measures should be taken to prevent odour problem from solid waste processing plant and STP.

xiii) The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation.

PART – B. GENERAL CONDITIONS

i) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.

4. Officials from the Regional Office of MOEF, Bangalore who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional office of MOEF, Bangalore.

5. In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by this Ministry.

6. The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.

7. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.

8. These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and control of Pollution) act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006.

9. The project proponent should advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the Kerala Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at http://www.envfor.nic.in. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Bangalore.

10. Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation v/s. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.

11. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad/Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.

12. The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, SO_2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

13. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

Yours faithfully,

(Lalit Kapur)
Director (IA.III)

Copy to:

(1) The Secretary, Department of Environment, Government of Kerala, Thiruvananthapuram.
(2) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 110 032.
(3) The Member Secretary, Kerala State Pollution Control Board, Plamoodu Junction, Pattom Palace, P.O. Thiruvananthapuram - 695 004.
(4) The CCF, Regional Office, Ministry of Environment & Forests(SZ), Kendriya Sadan, IVth floor, E&F wings, 17th Main Road, Koramangala II Block, Bangalore – 560 034.
(5) IA - Division, Monitoring Cell, MOEF, New Delhi – 110 003.
(6) Guard file.

(Lalit Kapur)
Director (IA.III)