Validity expires on 16.08.2024

सत्यमेव जयते

Proceedings of the State Environment Impact Assessment Authority Kerala

Present: Prof. (Dr.) K.P. Joy, Chairman, Dr. J. Subhashini, Member & Sri. James Varghese, I.A.S., Member Secretary.

Sub: SEIAA- Environmental clearance for the proposed Residential cum Commercial project, Artech Urban Terrace in Sy. Nos. 126/2, 126/2-1 & 126/2-2 at Uliyazhathura Village, Thiruvananthapuram Taluk, Thiruvanthapurm District, Kerala- Application of Sri. Viju Varghese, Deputy General Manager , M/s Artech Realtors Pvt. Ltd. - EC Granted-Orders issued

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STATE ENVIRONMENTAL IMPACT ASSESSMENT AUTHORITY, KERALA

No. 1023/SEIAA/EC1/114/2016 ***dated, Thiruvananthapuram 17.08.2017***

Ref: 1. Application dated 11.01.2016 from Sri.Viju Varghese, Deputy General Manager, Artech Realtors Private Ltd, Artech House, T C /24/2014(1), Thycaud P.O

2. Minutes of the 64th meeting of SEAC held on 16th & 17th November 2016.
3. Minutes of the 67th meeting of SEAC held on 27th January 2017.
4. Minutes of the 69th meeting of SEAC held on 9th & 10th March2017.
5. Minutes of the 68th meeting of SEIAA held on 12th May 2017.
6. Affidavit dated on 20.06.2017 from Sri.Viju Varghese

ENVIRONMENTAL CLEARANCE NO. 56 /2017

Sri.Viju Varghese, Deputy General Manager, Artech Realtors Private Ltd, Artech House, T C /24/2014(1), Thycaud P.O., Thiruvananthapuram submitted application for Environmental Clearance of the Proposed Artech Urban Terrace , vide his application dated 11.01.2016 and has sought environmental clearance under the EIA Notification, 2006 for the Residential cum Commercial project in Sy. Nos. 126/2, 126/2-1 & 126/2-2 at Uliyazhathura Village, Thiruvananthapuram Taluk, Thiruvanthapurm District, Kerala. It is interalia, noted that the project comes under the Category B, 8(a) of Schedule of EIA Notification 2006. No forest land is involved in the present project. The height of the proposed building is 58m and the total plot area of the proposed project is 9520 m^2 and the total built-up area is 51681.56 m^2. The total power requirement is 2010 KVA which will be sourced through KSEB. Renewable energy devices used is solar water heaters. Keraladithyapuram Canal is the nearest water body is situated at a distance of 2.2 km. The proponent has stated that there is

no litigation pending against the project and /or land in which the project is proposed to be set up.

Details of the project as furnished by the applicant are as follows :-

BASIC INFORMATION OF BUILDING PROJECT

	Project details	
1.	File No	1023/SEIAA/EC/114/2016
2.	Name /Title of the project	Environmental Clearance for the Proposed Artech Urban Terrace Project of M/s. Artech Realtors Private Ltd. Thiruvananthapuram.
3.	Name and address of project proponent.	Mr. Viju Varghese, Deputy General Manager Artech Realtors Private Ltd, Artech House, TC/24/2014(1) Thycaud P.O Thiruvananthapuram
4.	Owner of the land	Mr. T.S.Asok PA holder
5.	Survey Nos. District/Taluk/ and Village etc.	Survey Nos. 126/2, 126/2-1,126/2-2 in Ullizhathura Village, Thiruvananthapuram Taluk, Thiruvananthapuram
	PROJECT DETAILS	
6.	Date of submission of Application	11.01.2016
7.	Total Built up Area	**51681.56** sq.m.
8.	No of apartments	329 apartments,21 Floors (2 Basement Floor + Ground Floor +18 floors)
9.	Height of the building	58 m
10.	Brief description of the project.	Residential Apartment Project planning 329 apartment units with a commercial complex in plot Survey Nos. 126/2,126/2-1,126/2-2 in Uliyazhathura Village, Thiruvananthapuram Taluk, Thiruvananthapuram The total plot area is **9520** sq.m and the proposed total built up area is **51681.56** sq.m.Out of 51681.56 sq.m 400 sq.m is commercial complex
11.	Is it a new Project or expansion/modification of an existing project?	New Project
12.	Details of the Project Cost	102 Crores
13.	Distance from nearby habitation	Nearest House is 80 m away from the proposed site.
14.	Distance from nearby forest, if applicable	No forest in 10 km radius of the project site
15.	Distance from protected area, Wildlife Sanctuary, National Park etc.	No such areas within 10 km radius of the project site
16.	Distance from nearby streams/rivers/National	Keraladithyapuram Canal

	Highway Roads and Airport	The proposed site is along Sreekariyam-Pothencode road. Nearest Highway is NH 47 (Salem-Kanyakumari high way) 2.5 km Thiruvananthapuram Railway Station – 11.4 km Thiruvananthapuram Airport – 11.45 km
17.	Is ESA applicable? If so distance from ESA limit	Not fall in ESA
	Impact on water	
18.	Details of water requirement per day in KLD	During the construction phase, peak water demand will be 16.75KLD and during operation phase Fresh water requirement :240.125 KLD
19.	Water source/sources.	During the construction phase, peak water demand will be 16.75KLD which will be soruced from the well/ bore well and during operation phase Fresh water requirement :240.125 KLD which will be sourced from well water/ Bore well, rain water harvesting and recycling of treated waste water.
20.	Details of water requirements met from water harvesting.	600 cum capacity rain water harvesting tank is provided for the storage of rain water during monsoon season. During rainy season 94.65 KLD fresh water requirement shall be met through this.
21.	What are the impacts of the proposal on the ground water?	Total water requirement is 240.125KLD , out of which 152.40KLD is fresh water. The source of water for the proposed project will be water supply from well/ bore wells and rain water harvesting tank. The flushing and green belt water requirements will be fulfilled through treated water from STP No incremental pollution load due to wastewater generated from the proposed activity because the whole waste water of this project will be treated through STP within the project area and the treated water from the STP wili be reused for toilet flushing and gardening . Balance treated water will disposed through soak pits and no contamination to the surface water
	WASTE MANAGEMENT	
22.	Explain the facilities for 1) Liquid waste Management	Sewage Treatment plant of 250 cum capcity with four stage treatment with ultrafiltration will be implemented

	2) Solid Waste Management	Total solid waste generation is 690kg/ day Out of which 275.8 kg is biodegradable which is treated using biogas plant having capacity 30 cum capacity . Non Biodegradable (379.25 kg) which is disposed through authorized vendors and waste burners .
	3) E-Waste Management	Being residential cum commercial project it will not generate huge quantity of E- Waste. However provision will be given Waste storage area for collection and segregetation of e- waste generated and it will be disposed through authorized recyclers.
	4) Facilities for Sewage Treatment Plant	A waste water treatment plant having capacity 250 cum will be operated during operation phase. Preliminary treated sullage is treated along with Sewage. Treatment includes, Anerobic digesion, MBBR Process, Filtration , disinfection and ultra filtration. Treated water quality will met the requirement of KSPCB recycling standards.
23.	How much of the water requirement can be met from the recycling of treated waste water? (Facilities for liquid waste treatment)	About 77.325KLD treated Water is being reused for toilet flushing (77.325KLD) landscaping (10.4KLD). Excess treated water (116.04 KLD) will be passed through soak pit for ground water recharge. The daily fresh water requirement will be reduced by recycling of treated waste water The details of recycling and its usage in monsoon and non monsoon are provided in Water
24.	What is the incremental pollution load from waste water generated from the proposed activities?	No incremental pollution load due to wastewater generated from the proposed activity because the whole waste water of this project will be treated through STP within the project area and the treated water from the STP will be reused for toilet flushing . Balance treated water will disposed through soak pits and no contamination to the surface water
25.	How is the storm water from within the site managed?	The run offwater from the terrace will be collected through the collection chamber and charged to the rain water harvesting pits. The excess water and surface run-off will be collected through the channel provided all along the service roads, considering the countour level of the site.

26.	Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)	There will be no labour camp inside the project site and the project proponent will provide for the proper sanitation facilities such as toilets and septic tanks in construction sites . Most of the labours hired locally.
27.	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)	About 213 KLD of sewage will be collected through a well designed sewer network an will be treated in Waste water Treatment Plant having 250 cum capacity. The quality of the treated sewage will meet the standards prescriped by KSPCB. Chemical Treatment, Anerobic Upflow Filter, MBBR process , Disinfection, Ordinary filtration, Activated carbon filtration and Ultra filtration technologies will be included in the treatment scheme.
28.	Give details of dual plumbing system if treated waste is used for flushing of toilets or any other use.	Dual system will be provided to reuse the treated sewage for flushing purposes and horticulture purposes
Energy Conservation		
29.	Details of power requirement and 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?	The total power requirement is about 2010KWH which will be sourced from Kerala State Eelctricity Board. One DG sets having capacity 160 KVA. and another 2 nos. of 200KVA will be used as backup power during power failure. Energy consumption will be minimized by through conservation measures like: • Use of energy efficient appliances • Use of solar lights in open areas / internal roads • Using solar water heaters • utilization of daylight glass for windows • Proposed to install the daylight sensors amd lighting fixtures. Energy efficient internal and external lighting luminaries (as applicable) which are at least three star rated under BEE labeling program. In addition to the above 10% (30KW) of the total power requirement is met through Solar power.
30.	What type of, and capacity of power back-up to you plan to provide?	One DG sets having capacity 160 KVA. and another 2 nos. of 200 KVA will be used as backup power during power failure.
31.	What are the characteristics of the glass you plan to use? Provide specifications of its	Glass is used for windows. It is proposed to use High performance

	characteristics related to both short wave and long wave radiation?	glass, which reduces the ingress of heat and at the same time allows higher penetration of daylight. The U value of glass should be of the order of 0.4 $W/m^{2\circ}K$ and the R value 0.59 $m^{2\circ}K/W$. The exact characteristics will be decided during the procurement stage.
32.	What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project	Passive solar architectural features are considered while designing the buildings in respect of orientation of building thermal insulation aspects for wall with fenestration & roof is considered as per ECBC 2007 Guidelines viz., Balconies, Projections, Recessed window etc., • It is proposed to be use solar energy for street lighting and water heating. • Windows, skylights and glazing will be provided to reduce both heating/ cooling energy consumption. • Use of exterior shading devices canopies and interior shading devices (roller blinds) Shrub planting will helps in shading walls and windows
33.	Does the layout of streets & buildings maximize the potential for solar energy devices ? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex ? Substantiate with details	10% of the total power consumption is met through solar Power. Solar water heaters are provided for hot water. Solar Lights will be used for street lighting. Emergency lighting using high intensity LED's helps in reducing energy and maintenance cost.
34.	Is the 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?	Shading will be effectively used to reduce heat radiation from paved areas. Sunshades will be provided to control the penetration of solar radiation. The buildings will be so oriented as to facilitate maximum ventilation and natural illumination, thus reducing the requirement of air conditioning and artificial lighting during day time. Proper landscaping and green belt development will enhance aesthetics and reduce noise and vibration caused by traffic. Lighting will be mostly by LED lamps which are energy efficient.
35.	Do the structure use energy-efficient space conditioning , lighting and mechanical systems? Provide technical details. Provide details of transformers and motor	The buildings will be so oriented as to facilitate maximum ventilation and natural illumination, thus reducing the requirement of air conditioning and

<table>
<tr><td></td><td>efficiencies, lighting intensity and air-conditioning load assumptions ? Are you using CFC and HCFC free chillers? Provide specifications.</td><td>artificial lighting during day time. Proper landscaping and green belt development will enhance aesthetics and reduce noise and vibration caused by traffic. Lighting will be mostly on CFL and LED lamps which are energy efficient.</td></tr>
<tr><td>36.</td><td>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?</td><td>As the proposed project is a residential apartment with commercial complex , the air pollutants released into the atmosphere are very less and that too will be from vehicles / standby DG sets. There will not be major impacts on the microclimate. The proposed trees and bushes planted around the buidlings will help in reducing ambient air temperature.</td></tr>
<tr><td>37.</td><td>What are the thermal characteristics of the building envelope? (a) roof (b) external walls; and (c) fenestration? Give details of the materials used.</td><td>Building material having lower U-value and the insulating material having higher R-value to have optimum energy performance. Building envelope will be done by light colours so that UV absorption is reduced and associated cooling requirements are minimized. The indicative U and R values of material are as follows:
<table>
<tr><th>Materials</th><th>U Value W/m^2 °K</th><th>R Value W/m^2 °K</th></tr>
<tr><td>Wall</td><td>0.56</td><td>1.79</td></tr>
<tr><td>Roof</td><td>0.56</td><td>1.79</td></tr>
<tr><td>Glass</td><td>0.40</td><td>0.59</td></tr>
</table></td></tr>
<tr><td>38.</td><td>What is the rate of air non-conventional energy technologies are utilized in the overall energy consumption? Provide details of the renewable energy technologies used.</td><td>By using the Solar street lights and Solar water heaters there will be reduction in the overall energy consumption</td></tr>
<tr><td>39.</td><td>Details of renewable energy (non – conventional) used.</td><td>Average power consumption / day - 60 units/Block = 180 units
Average annual power consumption - 180 x 365 days = 65700 units
10% of average annual power consumption = 6570 units
(solar power required)
Hence power in watts (Taking avg. 4 hr generation/day) = 16425
(Round to 17 KW)
Area required for mounting solar panels to generate 17 KW x 8 Sq.m = 136 Sq.M
But actual requirement is as follows.
Actual common area power consumption (Expected)- 3500kWh per month.
Proposed solar station generation is to</td></tr>
</table>

		be less than our consumption requirements. So the capacity of solar plant required is =3500/(4x30)=30kW.
	IMPACT ON AIR ENVIRONMENT	
40.	What are the mitigation measures on generation of dust, smoke , odours, fumes or hazardous gases	Being a residential cum commercial project it will generate minimum dust, smoke and odourous fumes . During the construction phase only a minor quantity of dust and smoke will generate from handling & transport activities of construction materials, which will be suppressed by sprinkling of water in the activity zone and insignificant level of smoke will arise from the construction equipment & vehicles which will be mitigated by proper equipment maintenance. All equipments are operated within specified design parameters. Vehicle trips to be minimized to the extent possible. Isolate the construction area with flexible enclosures/ curtains so that the air emissions will not spread in the surroundings. Sprinkling of water in the construction area and unpaved roads. Proper maintenance of vehicles shall be done. Restrict dust-generating activities, such as blasting or top soil removal, to calm wind conditions. Cover heavy vehicles moving offsite. Restrict vehicle speed on construction roads and ensure vehicles use only dedicated construction roads and access points. Visually monitor particulate emissions from diesel vehicles and carryout regular maintenance of equipment
41.	Details of internal traffic management of the site.	Adequate parking spaces will be provided as per the KMBR(Kerala municipal building rule) I.The site is along Sreeariyam – Pothencode road . The entrance and exit are designed in such a way that it will not disturb the existing traffic. 389 Nos of Cars 12nos for disabled and 1534.94 sq.m of two wheelers parking space will be provided in basement floor and in an open area of

		906.51 sq.m
42.	Details of noise from traffic, machines and vibrator and mitigation measures	The noise level inside the site will be increased slightly due to the movement of vehicles and from the machines used during construction and operation phase . The noise level will be reduced by the slow movement and proper maintenance. Proper placement of speed humps will reduce the speed of the vehicles. The project proponents have proposed to provide well organized parking arrangements and maintaining smooth traffic flow which would help in reducing traffic congestionand noise levels. Trees will also act as noise barriers.
43.	Air quality monitoring in detail	Ambient air monitoring will be done quarterly with an accredited Environmental laboratory . Control measures will be taken if any variation in the measured values of Particulate Matter, Sulphur Dioxide and nitrous oxide. Noise monitoring also done monthly.
44.	Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.	Adequate parking spaces will be provided as per the KMBR(Kerala municipal building rule) . The site is near to Sreekaryam- Pothencode road , to avoid any traffic congestion in the existing road alignment of main internal road, internal traffic plan and additional space from the entry and entry and exit of vehicles from the main gate will be provided in such a way that the proposed project will not affect the existing traffic of the near by public road.
45.	Provide details of the movement patterns with internal roads, bicycles tracks, Pedestrian pathways, footpaths etc., with areas under each category	All internal roads will be planned scientifically with access roads, drive ways and walkways.Also additional space provided in entry and eexit of vehicles from the main gate.
46.	Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.	The noise level inside the site will be increased slightly due to the movement of vehicles and from the machines used during construction and operation phase . The noise level will be reduced by the slow movement and proper maintenance. Proper placement of speed humps will reduce the speed of the vehicles.

		The project proponents have proposed to provide well organized parking arrangements and maintaining smooth traffic flow which would help in reducing traffic congestionand noise levels. Trees will also act as noise barriers.
47.	What will be impact of DG sets & other equipments on noise levels & vibration in & ambient air quality around the project site? Provide details	D.G. sets will be installed with inbuilt acoustic enclosures and will be placed on araised platform to minimize the vibration. The green belt development will also help in reducing noise levels at the project site. Construction equipments are also selected based on the low vibration and emission loads. DG sets will be provided with adequate stack heights as per the CPCB rules which will reduce the impact on air quality.
	SOCIO- ECONOMIC ASPECTS	
48.	Will the proposal result in any change to the demographic structure of local population ? Provide the details.	The project is meant to improve the housing facility. The livelihood opportunites of the the local population will increase and economic status of nearby people will get improved by the development of residential and commercial buildings around . The project will provide job opportunities for local people during construction and operational phases. Hence the project will improve the economic status of local populace.
49.	Give details of the existing social infrastructure around the proposed project	The site and nearby areas are not thickly populated. Basic infrastructure facilities schools, religious places and shops are available.
50.	Will the project cause adverse effects on local communities, disturbances to sacred sites or other cultural values? What are the safeguards proposed?	No, the proposed project will not cause any adverse effects on the local communities. There are no sacred sites or cultural values nearby.
	BUILDING MATERIALS	
51.	May involve the use of building materials with high –embodied energy. Are the construction materials produced with energy efficient process? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)	Standard list of building materials will be used for construction, but some of them have high emboded energy. However it will be seen that cement will have ingredients of pozolonic ash, steel will have some percent as scrap raw material recycled and use of glass is minimal. Efforts have been taken to minimize the use of virgin wood and Building

		materials with high embodied energy, to the possible extent and materials with high recycle content are proposed to be used in the project. Use of M-sand and hollow solid cement blocks will reduce the consumption of natural resources and emboded energy. Selection of energy efficient material in the proposed project, wherever feasible has been considered in each stage of construction. Also the regionally available materials (Within 250 km radius from the project site) will be given priority to minimize the transportation energy loss
52.	a) Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?	Transport and handling of materials during construction may result in little increase in the concentration of suspended particulate matter (SPM) as well as noise. The side effects would be for a short span of time and temporary. The following mitigative measures will be taken to minimize the effects on air and noise: • Materials will be covered using Tarpaulin sheets during the transportation. Adequate stockpile height will be maintained. • Water sprinkling will be done at regular intervals. • To avoid dusting due to wind, temporary windshield barrier will be provided with the help of galvanized iron sheets and bamboos. • Personal Protective Equipments such as nose masks, earplugs/earmuffs, helmets, safety shoes etc. conforming to Indian Standards will be provided to all workers Vehicles/ equipments for construction purpose will be in good condition and will confirm to emission standards
53.	Are recycled materials used in roads and structures? State the extent of savings achieved?	• Excavated top soil will be used for leveling within the site. • Sub soil will be used for landscaping. Excess soil will be removed from the site and disposed according to the existing rules. • Broken concrete will be used for erosion control. • Construction debris such as concrete, bricks, metals and stones

		etc will be used for strengthening of internal drive ways.
54.	Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.	The garbage will be collected and stored in garbage collection room and segregated as Bio-degradable waste, inert waste and Non-biodegradable waste using different color coded bins. Additional space will be provided in material recovery facility yard .
	Risk Management	
55.	Are there sufficient measures proposed for risk hazards in case of emergency such as accident at the site during construction & post construction phase.	A fire fighting system will be provided as per part 4 of the National Building code 2005 . The fire fighting system consists of fire water storage tanks, automatic fire alarm system, smoke alarms, fire extinguishers and fire hydrants. Fire exits will be provided at buildings and signs to fire exits will be given. Sprinkler system will be provided in all floors. Emergency evacuation plan and mock drills at regular interval will be prepared for the project. During construction phase first aid control measures will be provided in addition to the safety precautions. During an emergency situation, ambulance and transportation facilities to the nearest hospital will be arranged within minutes. Emergency contact numbers will available with supervisors.
56.	Storage of explosives/hazardous substance in detail	Glass is proposed to be used for window, it will have low conductance and high insulation properties so that heat ingress into the inside of the building will be minimised. This will reduce the air conditioning load where air conditioners are proposed to be used. The U – factor of Glass is 0.4 W/m^2 deg. K and the R value 0.59 m^2 deg. K/W given for vendors.
57.	What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans	The building will not have significant pressure difference inside and outside. Controlling infiltration is one of the measures to conserve energy. Infiltration will be reduced by sealing cracks and gaps and by properly placed plants near the buildings.
	AESTHETICS	
58.	Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these	There are no such places important to scenic beauty in the vicinity of the project site. The proposed project

	considerations taken into account by the proponents?	development itself improves aesthetic environment by constructing a green belt and landscaping.
59.	Will there be any adverse impacts from new constructions on the existing structures? What are considerations taken into account?	No Existing structures in the project area. The site will be barricaded with dust screens and noise barriers so that externalities of the construction activities will not be affect the nearby residents.
60.	Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.	The design processes are governed by Kerala Municipal Building Fule, Fire and safety rules, pollution norms energy efficiency , codes and standards, economy aesthetics and eco friendliness. The poject poponents are commiteed to adhere to these aspects. Pemits are being obtainted from the various agencies involved.
61.	Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered	There are no anthropological, archaeological, artifact sites within the vicinity of the site.
62	Details of CSR activity and the amount set apart	2016-17 budget allocated for CSR activity Rs. 655000/- (recurring)and 450000/- (non recurring) for various social development activities and charitable service. Details are attached in Annexure
63	Details of NABET approved EIA Consultant engaged-Their name, address and accreditation details	Certificate No.:NABET/ EIA/305/IA15 dated January 20, 2015 Envirochem Laboratories Private Ltd, 5/589, Thozhuthungal Building, Kovilakathumpadam Thrissur 680 020
64	Details of Authorized Signatory and address for correspondence	Mr. Viju Varghese, Deputy General Manager Artech Realtors Private Ltd, Artech House, TC/24/2014(1) Thycaud P.O Thiruvananthapuram. Contact No.9388189889 0471-2327117 e-mail : viju@artechrealtors.com

	Summary and Conclusion	
65	a) Overall justification for implementation of the project.	Aretech Urben Terrace project is a residential cum commercial project meant to improve the housing facility in Trivandrum. Being a large construction project it will follow the environmental regulations and proper waste management facilities individually. Also livelihood opportunities of the local population will increase and economic status of nearby people will get improved by the development of residential and commercial buildings around. The proposed project does not pose any environment hazard during construction and operation phase by proper implementation of Environmental Management Plan (EMP). Proper implementation of the EMP during construction and operation phase will ensure mitigation of any untoward incident. The site does not having any endangered, rare or threatened flora and fauna and do not belong to the red category IUCN and schedule I of wildlife protection.. An Environmental Monitoring Plan overseen by a Committee has been provided. Further human welfare measures as per CSR norms have been provided.
23.	b) Explanation of how adverse impact have been mitigated.	Proposed development will not alter the features in the surroundings. Being a ne construction project it will generate some pollution during construction and operation phase in the project and surrounding area. But a proper Environmental management plan will be strictly adopted during construction and operation phase to mitigate, land, air, water and soil environment. Air pollution control measures, waste water treatment facilities, Solid waste management facilities , rain water harvesting facilities, treated water recycling, green belt development, slope management, parking facilities

SEIAA

		will mitigate all impacts . The site does not contain any of the species of rare and endangered category not belonging to the red category of IUCN or scheduled I of Wildlife Protection Act, 1972. The demand of water during and after construction will be met from the local source (wells) and rainwater harvesting tank and treated water. Total water requirement for the construction phase is 17 KLD and in operational phase its240 KLD. Sewage water treated through a Sewage Treatment Plant (STP) having a capacity of 250 KLD the treated water used for toilet flushing and green belt development. Total solid waste generated in the operational phase is 690 kg /Day biodegradable waste will be treated in biogas plant part of solid waste handed over recyclers and another part is disintegrated by waste burner. The total power requirement 2010 KVA sourced from Kerala State Electricity Board (KSEB) and two backup DG set of 230 KVA and 160KVA is proposed.. An adequate provision will be made for Car/vehicle parking at the proposed project site. A green belt will be established with 24 species in an area of 1813.34 sq. m

2. The proposal was placed in the 64th meeting of SEAC held on 16th& 17th November, 2016. The Proponent and the architect attended the meeting. The total built up area of the project is 51681 sq.m. The PP informed that the parking space is providing as per KMMR Rules. The committee is of the opinion that the rain water harvesting capacity is to be modified as per the built-up area. The yield test of bore well is to be conducted. Sufficient space for Material Recovery Facility for storing non bio degradable waste is to be provided. The quantity of solar energy to be produced to be indicated. The area earmarked for keeping solar energy battery to be clearly earmarked. The google map of the area empowering the project area to be provided.

The committee deferred for site inspection to verify the ground realities especially the following aspects.

1) Details of cutting & quantity of earth to be taken out.

2) Negotiation of curve.
3) To examine the possibility of buried pipelines of KWA in the locality.
4) Working of incinerators.

The Sub Committee of SEAC conducted the field visit and the report is as follows;

Site inspection for the Residential cum Commercial Project of Artech realtors in Uliyazhthura Village, Thiruvananthapuram district was conducted on 07.12.2016 by the sub-Committee of SEAC consisting of Sri S Ajayakumar and Sri John Mathai in the presence of the representatives of the proponent.

Site is located in a lateritic ridge at Puthukunnu, located to the north of Powdikonam with access from the road connecting Powdikonam and Pothencodu. The plot occupies the crestal and south sloping part of the hill ridge. The main internal road is planned as a winding one with acute angle turning. Internal traffic circulation, entry and exit points were discussed and found to be inadequate due to the winding nature of the main road. Parking provided is adequate. Cutting and levelling is planned but specific details are yet to be finalised. Storm water is planned to be discharge into the existing drains to the north where the over flow from the KWA unit is discharged. One bore well is planned at the site as source of water. Project has planned to maximise use of solar energy. Solid waste management is planned with insitu segregation and disposal. A strip of private land separates the KWA facility from this unit. The main inlet/distribution lines are on the other side of the main road and may not interfere with the development of this project.

Following clarifications may be sought:-

1. *Alternate/Modified conceptual plan with a) change in alignment of main internal road avoiding acute angle turning on slopes b) change in entry/exit with modified traffic circulation c) entry point to be brought to that of road level and d) provide a free space of at least a lane width (3.6 m) all along the main road for clear visibility to the winding part and traffic management.*
2. *Specific details of excavation, copy of structural drawings to assess the cutting and slope and quantity of earth to be taken out*
3. *Details of RWH facility - location and quantity to be stored.*
4. *Source of water to be developed internally. The yield must be specified.*
5. *Details of maximum use of solar energy with quantity.*
6. *Details regarding the mechanism of solid waste segregation and disposal*
7. *Connectivity to the existing road side drain to be ensured*

3. The proposal was considered in the 67th SEAC Meeting held on 27th January 2017. The Committee appraised the proposal based on Form I, Form I A, Conceptual Plan, field inspection report of the Sub Committee and all other documents submitted with the proposal. The Committee deferred the item for submission of the following clarifications sought in the field visit report.

1. *Alternate/Modified conceptual plan with a) change in alignment of main internal road avoiding acute angle turning on slopes b) change in entry/exit with modified traffic circulation c) entry point to be brought to that of road level and d) provide a free space of at least a lane width (3.6 m) all along the main road for clear visibility to the winding part and traffic management.*
2. *Specific details of excavation, copy of structural drawings to assess the cutting and slope and quantity of earth to be taken out*
3. *Details of RWH facility - location and quantity to be stored.*
4. *Source of water to be developed internally. The yield must be specified.*
5. *Details of maximum use of solar energy with quantity.*
6. *Details regarding the mechanism of solid waste segregation and disposal*
7. *Connectivity to the existing road side drain to be ensured.*

Subsequently the proponent submitted the above mentioned documents sought by the 67th SEAC.

4. The proposal was considered in the 69th meeting of SEAC held on 9th and 10th March 2017. The proposal was appraised by SEAC considering Form I, Form IA, Conceptual plan, field visit report and all other documents and details provided by the proponent. The committee verified the additional documents submitted by the proponent and found satisfactory. The Committee decided to **Recommend for issuance of EC** subject to the general conditions in addition to the following specific conditions.

1. *Modified Conceptual Plan to be followed.*
2. *RWH capacity should be for a minimum capacity of 600 KL*
3. *10% of the Power Consumption should be utilised from solar energy.*
4. *Connectivity to the existing roadside drain to be ensured.*
5. *Material Recovery Facility will be a minimum of 40 m^2.*

SEIAA may insist for a commitment from the proponent for spending an appropriate amount for CSR activities in consultation with the local body.

5. The proposal was considered in the 68th Meeting of SEIAA held on 12th May 2017. The Authority decided to issue EC subject to the above specific conditions in addition to the general conditions. An affidavit should be submitted agreeing to follow the modified conceptual plan. EC will be issued only after getting an undertaking stating that 2% of the total cost should be spend for CSR activities in consultation with the local panchayath.

6. The proponent has submitted the affidavit dated on 20.06.2017 and stating that all the specific and general conditions shall be strictly implemented. Environmental Clearance as per the EIA notification 2006 is therefore granted to the Residential cum Commercial project, Artech Urban Terrace by Sri. Viju Varghese, Deputy General Manager , M/s Artech Realtors Pvt. Ltd in Sy. Nos. 126/2, 126/2-1 & 126/2-2 at Uliyazhathura Village, Thiruvananthapuram Taluk, Thiruvanthapurm District, Kerala subject to the specific

conditions mentioned in para 4 above, the usual general conditions for projects other than mining appended hereto and the following green conditions should be strictly adhered to.

Green Conditions.

1. Adequate rain water harvesting facilities shall be arranged for.
2. Technology and capacity of the STP to be indicated with discharge point (if any) of the treated effluent.
3. Effluent water not conforming to specifications shall not be let out to water bodies.
4. Maximum reuse of grey water for toilet flushing and gardening and construction work shall be ensured.
5. Dual plumbing for flushing shall be done.
6. Provisions for disposal of e-wastes, solid wastes, non-biodegradables and separate parking facility for the buildings shall be provided.
7. Generation of solar energy to be mandatory for own use and/or to be provided to the grid.
8. There shall be no compromise on safety conditions and facilities to be provided by the project proponent, which shall be ensured for occupation, regularisation or consent to operate.

7. The clearance will also be subject to full and effective implementation of all the undertakings given in the application form, all the environmental impact mitigation and management measures undertaken by the project proponent in the documents submitted to SEIAA, and the mitigation measures and waste management proposal as assured in the Form - 1 and Form-1A, Environment Management Plan as submitted. The assurances and clarifications given by the proponent in the application and related documents will be deemed to be part of these proceedings as conditions as undertaken by the proponent, as if incorporated herein.

8. Validity of the Environmental Clearance will be seven years from the date of issuance of E.C, subject to inspection by SEIAA on annual basis and compliance of the conditions, subject to earlier review of E.C in case of violation or non-compliance of any of the conditions stipulated herein or genuine complaints from residents within the scrutiny area of the project.

9. Compliance of the conditions herein will be monitored by the State Environment Impact Assessment Authority or its agencies and also by the Regional Office of the Ministry of Environment and Forests, Govt. of India, Bangalore.

i. Necessary assistance for entry and inspection by the concerned officials and staff should be provided by the project proponents.

ii. Instances of violation if any shall be reported to the District Collector, Thiruvananthapuram to take legal action under the Environment (Protection) Act 1986.

iii. The given address for correspondence with the authorized signatory of the project is, Sri.Viju Varghese, Deputy General Manager, Artech Realtors Private Ltd, Artech House, T C /24/2014(1), Thycaud P.O., Thiruvananthapuram

Sd/-

JAMES VARGHESE.I.A.S,
Member Secretary (SEIAA)

To,

Sri.Viju Varghese,
Deputy General Manager,
Artech Realtors Private Ltd,
Artech House, T C /24/2014(1), Thycaud P.O.,
Thiruvananthapuram

Copy to:

1. MoEF Regional Office, Southern Zone, Kendriya Sadan, 4th Floor, E&F Wing, II Block, Koramangala, Bangalore-560034
2. The Additional Chief Secretary to Government, Environment Department
3. The District Collector, Thiruvananthapuram
4. The District Town Planner, Thiruvananthapuram
5. The Tahsildhar, Thiruvananthapuram Taluk
6. The Member Secretary, Kerala State Pollution Control Board
7. The Director, Dept. of Environment and Climate Change, Govt. of Kerala, Tvm-24
8. The Secretary, Municipal Corporation of Thiruvananthapuram, VikasBhavan P.O, Tvpm – 695 033
9. Chairman, SEIAA, Kerala
10. Website
11. Stock file
12. O/c

Forwarded/By Order

Administrator, SEIAA

GENERAL CONDITIONS *(for projects other than mining)*

(i) Rain Water Harvesting capacity should be installed as per the prevailing provisions of KMBR / KPBR, unless otherwise specified elsewhere.

(ii) Environment Monitoring Cell as agreed under the affidavit filed by the proponent should be formed and made functional.

(iii) Suitable avenue trees should be planted along either side of the tarred road and open parking areas, if any, inclusive of approach road and internal roads.

(iv) The project shall incorporate devices for solar energy generation and utilization to the maximum possible extent with the possibility of contributing the same to the national grid in future.

(v) Safety measures should be implemented as per the Fire and Safety Regulations.

(vi) STP should be installed and made functional as per KSPCB guidelines including that for solid waste management.

(vii) The conditions specified in the Companies Act, 2013 should be observed for Corporate Social Responsibility.

(viii) The proponent should plant trees at least 5 times of the loss that has been occurred while clearing the land for the project.

(ix) Consent from Kerala State Pollution Control Board under Water and Air Act(s) should be obtained before initiating activity.

(x) All other statutory clearances should be obtained, as applicable, by project proponents from the respective competent authorities including that for blasting and storage of explosives.

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

(xii) The Authority 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 Environment (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.

(xiii) The stipulations by Statutory Authorities under different Acts and Notifications should be complied with, including 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.

(xiv) The environmental safeguards contained in the EIA Report should be implemented in letter and spirit.

(xv) Provision should be made for supply of kerosene or cooking gas and pressure cooker to the labourers during construction phase.

(xvi) Officials from the Regional of MOEF, Banglore who would be monitoring the implementation of environmental safeguards should be given full co-operation, 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.

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

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

(xix) Any appeal against this Environmental Clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under section 11 of the National Environment Appellate Act, 1997.

(xx) The project proponent should advertise in at least two local newspapers widely circulated in the region, one of which (both the advertisement and the newspaper) shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the Department of Environment and Climate Change, Govt. of Kerala and may also be seen on the website of the Authority at www.seiaakerala.org. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same signed in all pages should be forwarded to the office of this Authority as confirmation.

(xxi) A copy of the clearance letter shall be sent by the proponent to concerned GramaPanchayat/ District Panchayat/ Municipality/Corporation/Urban Local Body and also to the Local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The Environmental Clearance shall also be put on the website of the company by the proponent.

(xxii) The proponent shall submit half yearly 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)** and 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 respective Regional Office of MoEF, Govt. of India and also to the Directorate of Environment and Climate Change, Govt. of Kerala.

(xxiii) The details of Environmental Clearance should be prominently displayed in a metallic board of 3 ft x 3 ft with green background and yellow letters of Times New Roman font of size of not less than 40.

(xxiv) The proponent should provide notarized affidavit *(indicating the number and date of Environmental Clearance proceedings)* that all the conditions stipulated in the EC shall be scrupulously followed.

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. All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.

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

iv. Adequate drinking water and sanitary facilities should be provided for construction workers at the site, Provision should be made for mobile toilets. The safe disposal of wastewater and solid wastes generated during the construction phase should be ensured.

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

vi. 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.

vii. 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.

viii. 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.

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

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

xi. 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.

xii. 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 the applicable air and noise emission standards and should be operated only during non-peak hours.

xiii. 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.

xiv. Fly ash should be used as building material in construction as per the provisions of Fly Ash Notification of September, 1999 and amended as on 27th August 2003. (The above condition is applicable Power Stations).

xv. Ready mixed concrete must be used in building construction.

xvi. Storm water control and its re-use per CGWB and BIS standards for various applications.

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

xviii. Permission to draw ground shall be obtained from the Computer Authority prior to construction/operation of the project.

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

xx. 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.

xxi. Use of glass may be reduced by upto 40% to reduce the electricity consumption and load on airconditioning. If necessary, use high quality double glass with special reflective coating in windows.

xxii. Roof should meet prespective requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfil requirement.

xxiii. Opaque wall should meet perspective requirement as per energy Conservation Building Code which is proposed to be mandatory for all airconditioned spaces while it is aspirational for non-airconditioned spaces by use of appropriate thermal insulation material to fulfil requirement.

xxiv. 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.

xxv. 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.

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

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 decentralised 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 purposed 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.

III Post Operational Phase

Environmental Monitoring Committee with defined functions and responsibility should foresee post operational environmental problems e.g. development of slums near the site, increase in traffic congestion, power failure, increase in noise level, natural calamities, and increase in suspended particulate matter etc. solve the problem immediately with mitigation measures

For Member Secretary, SEIAA