Validity expires on 04.02.2025

सत्यमेव जयते

Proceedings of the State Environment Impact Assessment Authority Kerala

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

Sub: **SEIAA- Environmental Clearance for the Residential-cum-Commercial Building Project 'Artech Ferns' in Survey Nos. 238/11, 238/11-2 Kollam West Village, Kollam Taluk & District, Kerala by Mr.Felix Babu & Mr.John A Ferns - Granted-Orders issued**

State Environment Impact Assessment Authority, Kerala

No. 1139/EC/SEIAA/KL/2017 dated, Thiruvananthapuram 05.02.2018

Ref: 1. Application received on 19.07.2017 from Mr.Felix Babu & Mr.John A Ferns, Green Land, Kollam
2. Minutes of the 79th meeting of SEAC held on 25th & 26th September 2017
3. Minutes of the 80th meeting of SEAC held on 11th October 2017
4. Minutes of the 81st meeting of SEAC held on 30th & 31st October 2017
5. Minutes of the 82nd meeting of SEAC held on 25th November 2017
6. Minutes of the 78th meeting of SEIAA held on 15th December 2017
7. Affidavit dated 16.01.2018 from Mr.Viju Varghese, Deputy General Manager & Authorised Signatory, M/s Artech Realtors Pvt. Ltd.

ENVIRONMENTAL CLEARANCE NO.12/2018

Mr.Felix Babu & Mr.John A Ferns, Green Land, Sakthikulangara, Kollam District, Kerala vide their application received on 19.07.2017 has sought Environmental Clearance under EIA Notification, 2006 for the proposed Residential cum Commercial building Project 'Artech Ferns' in Survey Nos. 238/11, 238/11-2 in Kollam West Village, Kollam Taluk & District, Kerala. It is interalia, noted that the project comes under the Category B, 8(a) of Schedule of EIA Notification 2006.

The proposed project site falls within Latitude 8°53'20.92" N to Longitude 76°34'24.90" E. The height of the proposed building is 110 m and the total plot area of the proposed project is 9227.16 m^2. The total built-up area of about 53,807.73 m^3 with supporting infrastructure facilities.

Details of the project as provided by the project proponent.

BASIC INFORMATION OF BUILDING PROJECT
PART A

PROJECT DETAILS			
File No	1139/EC/SEIAA/KL/2017		
Name /Title of the project	Artech Ferns Residential cum Commercial Building Project		
Name and address of project proponent.	Mr. Felix Babu and Mr John A Ferns Green Land, Sakthikulangara, Kollam District, Kerala		
Owner of the land	Mr. Felix Babu and Mr John A Ferns		
Survey Nos. District/Taluk/ and Village etc.	Ammachiveedu 238/11, 238/11-2, Kollam West Village, Kollam Taluk, Kollam District, Kerala		
Category/Sub Category and Schedule	8 a, Category (B2)		
Date of submission of Application	19th July 2017		
Total Built up Area& No. of Floors	Total Built-up area including residential and commercial	53807.73 m^2	
	No. of Floors	B+G+32	
No of apartments	225 dwelling units		
Height of the building from the ground level	110 m above GL		
GPS Co-ordinate	Latitude	8°53'20.92" N	
	Longitude	76°34'24.90" E	
Brief description of the project.	Total Plot area:	9227.16 m^2	
	Total Built-up area including residential and commercial	53807.73 m^2	
	Built up area for residential	49163.63 m^2	
	Built up area for Commercial	4644.1 m^2	
	Height of the building	110m above Ground Level	
	No. of Flats	225	
	No. of Floors	B+G+32	
Is it a new Project or expansion/modification of an existing project?	New Project		
Details of the Project Cost	INR 9167.84 lakhs		
If CRZ recommendation applicable?	Not Applicable		
Distance from nearby habitation	Kollam, Distance of 6 km		
Distance from nearby forest, if applicable	None within 15 km radius		
Distance from protected area,	None within 15 km radius		

Wildlife Sanctuary, National Park etc.			
Distance from nearby streams/rivers/National Highway Roads and Airport	Water body	Rameshwaram Temple Pond	0.48m.
		Mahaganapathy TemplePond	0.19 km
	Nearest Road	PWD road	
	Airport	Trivandrum International Airport at a distance of 68km	
Is ESA applicable? If so, distance from ESA limit	Not Applicable		
IMPACT ON WATER			
Details of water requirement per day in KLD	The total water requirement for the project during monsoon season is 239 KLD and during non - monsoon season is 259 KLD.		
Water source/sources.	The source of water will be the wells, KWA supply and harvested rainwater.		
Details of water requirements met from water harvesting.	Rainwater harvesting system will be constructed for the project. Kollam has an average annualrainfall of 1500 mm. This will be available distributed in nearly 70 rain days scattered over monsoon spells and a few summer showers. This will be stored in underground tank (capacity 890 m^3) and used in the fill and draw mode during rainy days. Un-stored rain water will be used to charge ground water through recharge pits and rain gardens.		
What are the impacts of the proposal on the ground water?	One open wells and one bore well already exist at the site and were installed by owners of the land for irrigation. Rainwater harvesting system will be installed for the recharge of ground water		
WASTE MANAGEMENT			
Explain the facilities for Liquid waste Management	During operation phase, the sewage generation from the building will be 170m^3/day and will be treated in full-fledged Sewage Treatment Plant effluent by MBBR process.		
Solid Waste Management	The total quantity of solid waste expected is 1185 kg/day. Out of which 390 kg/day will be non-biodegradable and 795 kg/day will be biodegradable. The project proponents have proposed provision for segregation and collection of biodegradable & non-biodegradable waste within the premises. Biodegradable waste will be treated in Biogas Plant. The non-biodegradable waste will be handed over to recyclers. Dried sludge from STP will be used as manure within the premises for plants.		
E-Waste Management	E-waste generated during the operation phase of the project will be handed over to authorized e-waste collection centres.		

Facilities for Sewage Treatment Plant	Sewage Treatment Plant with capacity to treat 180 m^3 will be constructed to treat waste water. Design Basis of Treatment plant is Moving Bed Bio Reactor.Disinfected effluent meeting irrigation standards will be used for irrigating thelandscape and for washing access roads.
How much of the water requirement can be met from the recycling of treated waste water? (Facilities for liquid waste treatment)	All secondary requirements like flushing (69m^3/day), gardening (21m^3/day) and HVAC (37m^3/day) would be fulfilled by treated sewage from STP. Excess treated sewage during non-monsoon (26m^3/day) and monsoon seasons (47m^3/day) shall be discharged to subsurface flow engineered wetland and disposed to the existing drain.
What is the incremental pollution load from waste water generated from the proposed activities?	During operation phase, the sewage generation from the building will be 170m^3/day and will be treated in full-fledged Sewage Treatment Plant effluent by MBBR process. Treated sewage will be reused for flushing, HVAC and gardening. Excess treated sewage during non-monsoon and non- monsoon season shall be discharged to subsurface flow engineered wetland and discharged to the existing drain. Details of the quantities and composition of wastewater generated from the proposed activity is given in EC.
How is the storm water from within the site managed?	Storm water runoff will be minimized by intercepting the same in rain water harvesting tanks and recharge pits. The details of the storm water management plan as well as the storm water management layout are given in Annexure.
Will the deployment of construction laborers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)	➢ During construction phase, temporary toilets with connection to compact STP (portable) will be provided. Hence there will not be unsanitary conditions around the project site. ➢ On site accommodation will not be provided to the construction workers as they are fromthe nearby localities and they will have their permanent accommodation offsite. Laborersemployed by contractor will be accommodated offsite as per contract terms. ➢ Regular segregation and disposal of solid waste generated by these workers shall be as per Municipal Solid Waste Management Rules and Construction and Demolition Waste Management Rules, 2016. ➢ First aid and medical facilities will be provided to all the employees and labourers working on the site. ➢ Proper housekeeping will be maintained throughout the premises.

<table>
<tr><td></td><td>➢ Pest and vector control measures will be done on site.</td></tr>
<tr><td>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)</td><td>Sewage Treatment Plant with capacity to treat 180 m^3 will be constructed to treat waste water. Design Basis of Treatment plant is Moving Bed Bio Reactor.
The treatment will include the following unit/ equipment
Preliminary Treatment:
• Screen Chamber
• Oil & Grease Trap
• Raw Sewage Collection Tank (Equalizer)
• Raw Sewage Transfer pumps
Biological Treatment (Secondary Treatment):
• MBBR Bioreactor
• Secondary Clarifier
• Sludge pump for feeding into biogas plant and for residual sludge treatment
Tertiary Treatment:
• Filter feed tank
• Pressure Sand Filter (PSF)
• Activated Carbon Filter (ACF)
• UV disinfection system

Facilities for Recycling and disposal:-
• Treated sewage will be recycled forflushing and gardening
• The sludge from STP will be dried, composted and used as manure</td></tr>
<tr><td>Give details of dual plumbing system if treated waste is used for flushing of toilets or any other use.</td><td>Colour coding for dual plumbing system shall be done as per standard practices. Recycling of treated sewage is used for flushing, HVAC and gardening.</td></tr>
<tr><td colspan="2">TRAFFIC MANAGEMENT</td></tr>
<tr><td>Sufficiency of Parking Space (Explain)</td><td>The project proponents have proposed to provide well organized parking arrangement. The details of Parking Statement is as follows:-
<table>
<tr><td></td><td>Category</td><td>Parking area provision</td></tr>
<tr><td>Residential</td><td>4 Wheelers</td><td>350</td></tr>
<tr><td></td><td>2 Wheelers</td><td>1300 m^2</td></tr>
<tr><td>Commercial</td><td>4 Wheelers</td><td>64</td></tr>
<tr><td></td><td>2 Wheelers</td><td>237.6 m^2</td></tr>
</table></td></tr>
<tr><td>Widthofaccess road</td><td>PWD Road with a width of 10m</td></tr>
<tr><td colspan="2">ENERGY CONSERVATION</td></tr>
<tr><td>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?</td><td>The details if the power requirement during operation phase is as follows :-
<table>
<tr><td></td><td>Power requirement</td><td>Source of Power</td></tr>
<tr><td>Residential</td><td>2000 KVA</td><td>KSEB Transformer</td></tr>
<tr><td></td><td>200KVA</td><td>1 DG sets (in the</td></tr>
</table></td></tr>
</table>

			case of power failure)
	Commercial	160 KVA	KSEB Transformer
		160 KVA	DG sets (in the case of power failure)
	The energy consumption is proposed to be reduced by the use of solar energy lighting devices in the driveways and the garden. This is expected to save 120 Units/day.		
What type of, and capacity of power back-up to you plan to provide?	DG set will be provided for power back up. Two DG set of 200 kVA will be used for residential and 160 kVA will be used for commercial.		
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?	The project site is located in a place with predominantly tropical climate. Glass used should preferably avoid long and wavelengths (IR and UV). Soft glass which absorbs UV with special features to reflect IR radiation will be used for blazing. Typically locally available Saint Gobain™ neutral glass Evolite® or its equivalent will be used. Typical specifications are light transmission 50%, solar factor 0.5, shading coefficient 0.58 and U-value 5 (0.88 W/m2 K). Glass is not used as a wall material		
What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project	The following passive solar features are incorporated in the building design: ➢ Orientation: Building is oriented to take advantage of north facing during summer,partly compromising with alignment with access road. ➢ Open spaces equivalent to atrium are provided in interconnected rows of building. ➢ This provides partial shading from solar exposure from east and west for dwellingunitscoming on the interior side. ➢ Distributes breeze in summer to majority of units. ➢ In general the design and orientation of the building helps to avoid solar heat buildupandinduces cooling to living spaces.		
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	The building orientation and alignment are laid out in such a way that solar heating of the walls is minimized (at no time solar heating is needed since minimum night temperature is 23°C.) Front side of the building is access entry with aesthetically laid garden. This area can be partly used for solar energy harvesting. However, it is planned to install PV array on roof top on the south facing side. This will partly shade the roof.		
Is the shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on	The building is located at a place predominantly with tropical features, especially hot and humid climate. Cooling is the preferred feature. Vertical walls on the east and west will bepainted with white or light shade		

the East and the West and the Roof? How much energy saving has been effected?	paints with low heat absorption.
Do the structure use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.	Being a multiunit, affordable housing project central air conditioning is not provided. For common facilities like street lighting, common space illumination and water treatment facilities, electrical devices with green energy star certification will be used.
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?	Un-shaded roof portion will be provided with expanded poly styrene sheet insulation to reduce adverse thermal effect. Paved areas will be covered under the canopy of shade trees in the landscape. Open spaces will be covered with grass turf and with garden shrubs so that heat absorption by paving materials and open soil can be minimized. Irrigation of landscape with treated effluent will keep the surroundings cool. This will mitigate heat island effect to a large extent.
What are the thermal characteristics of the building envelope? (a) Roof (b) external walls; and (c) fenestration? Give details of the materials used.	The following materials are used in the construction of walls and roof. Their thermal properties are also given.

Material	Thermal mass C (kJ/Km^2)	Thermal inertia($Jm^2K^{-1}S^{-0.5}$)
Cement plastering	1.480	1033.02
Brick wall	1.601	1139.69
EPS insulation	0.032	33.55
Cellular concrete	0.739	372.78
Dense concrete	2.120	1920.98

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.	The residential units are provided with facilities for incorporating air conditioning. Individual units will have its option based the attitude of the owner.
Details of renewable energy (non – conventional) used.	Solar energy proposed to be utilized for hot water supply as well as for common area and outdoor lighting. Solar PV units of 15 kWcapacities will be installed in each tower to meet power demand for lighting up the common spaces and outdoors. It is proposed to save 180units/day by the use of solar energy.
IMPACT ON AIR ENVIRONMENT	
What are the mitigation measures on generation of dust, smoke , odours, fumes or hazardous gases	The mitigation measures on generation of dust, smoke , odours, fumes or hazardous gases are ➢ The traffic congestion will be avoided by proper parking arrangement and maintainingsmooth traffic flow

<table>
<tr><td></td><td>➢ Regular PUC check-up for vehicles
➢ DG sets will be used as per CPCB norms
➢ Proper maintenance of DG sets shall be done and Low sulphur fuel shall be used</td></tr>
<tr><td>Details of internal traffic management of the site.</td><td>The project proponent will provide adequate driveways and walkways. The circulation plan is showing the details of the internal roads, walkways etc. are shown in Annexure.</td></tr>
<tr><td>Details of noise from traffic, machines and vibrator and mitigation measures</td><td>The proposed project being residential cum shopping mall development, the source of noise is mainly vehicular noise. The project proponents have proposed to provide well organized parking arrangement and maintaining smooth traffic flow which would help in reducing traffic congestion and noise levels. Trees would act as noise barrier and will reduce the noise level.</td></tr>
<tr><td>Air quality monitoring in detail</td><td>The details of background air quality levels are given below and all the parameters are found to be within the desired limits specified by CPCB.
<table>
<tr><th rowspan="2">Parameters</th><th rowspan="2">Unit</th><th colspan="2">Value reported</th><th>NAAQ</th></tr>
<tr><th>A1</th><th>A2</th><th>Standards</th></tr>
<tr><td>PM_{10}</td><td>$\mu g/m^3$</td><td>74.2</td><td>65.1</td><td>100</td></tr>
<tr><td>$PM_{2.5}$</td><td>$\mu g/m^3$</td><td>20.5</td><td>18.7</td><td>60</td></tr>
<tr><td>SO_2</td><td>$\mu g/m^3$</td><td>8.1</td><td>7.8</td><td>80</td></tr>
<tr><td>NO_2</td><td>$\mu g/m^3$</td><td>8.5</td><td>8.0</td><td>80</td></tr>
<tr><td>CO</td><td>$\mu g/m^3$</td><td>0.9</td><td>1.0</td><td>2</td></tr>
</table></td></tr>
<tr><td>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.</td><td>The project proponents have proposed to provide well organized parking arrangement. The details of Parking Statement is as follows:-
<table>
<tr><td></td><td>Category</td><td>Parking area provision</td></tr>
<tr><td rowspan="2">Residential</td><td>4 Wheelers</td><td>350</td></tr>
<tr><td>2 Wheelers</td><td>1300 m^2</td></tr>
<tr><td rowspan="2">Commercial</td><td>4 Wheelers</td><td>64</td></tr>
<tr><td>2 Wheelers</td><td>237.6 m^2</td></tr>
</table></td></tr>
<tr><td>Provide details of the movement patterns with internal roads, bicycles tracks, Pedestrian pathways, footpaths etc., with areas under each category</td><td>The project proponent will provide adequate driveways and walkways. The project site is directly accessible from a 10 m wide PWD road. The circulation plan is showing the details of the internal roads, walkways etc. are shown in Annexure.</td></tr>
<tr><td>Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.</td><td>The proposed project being residential cum shopping mall development, the source of noise is mainly vehicular noise. The project proponents have proposed to provide well organized parking arrangement and maintaining smooth traffic flow which would help in reducing traffic congestion and noise levels. Trees would act as noise barrier and will reduce the noise level.</td></tr>
<tr><td>What will be impact of DG sets &</td><td>D.G. Sets will be operated only in case of power</td></tr>
</table>

<table>
<tr><td>other equipments on noise levels & vibration in & ambient air quality around the project site? Provide details</td><td>failures during operational phase. The Pollutants like SPM, SO2 that may arise from emissions from D.G. sets will be discharged through vent of proper height. D.G. sets are with inbuilt acoustic enclosures to reduce the noise of D.G. sets while in operation. Plantation of trees would act as noise barrier and will reduce the noise level.</td></tr>
<tr><td colspan="2">IMPACT ON BIODIVERSITY AND ECO RESTORATION PROGRAMMES</td></tr>
<tr><td>Will the project involve extensive clearing or modification of vegetation (Provide details)</td><td>The project does not involve extensive clearing or modification of vegetation. The list of existing trees in the site is given in the table below. There are no endangered species in the site. All the trees were cleared and handed over to the project proponent by the owner of the land.
<table>
<tr><th>Common Name</th><th>Scientific Name</th><th>No.of Trees in the site</th></tr>
<tr><td>Coconut tree</td><td>Cocos nucifera</td><td>110</td></tr>
<tr><td>Indian almond</td><td>Terminalia catappa</td><td>14</td></tr>
<tr><td>Mango Tree</td><td>Mangifera indica</td><td>8</td></tr>
<tr><td>Papaya</td><td>Carica papaya</td><td>7</td></tr>
<tr><td>Bamboo</td><td>Bambusoideae</td><td>21</td></tr>
<tr><td>Banana</td><td>Musa acuminata</td><td>28</td></tr>
<tr><td>Teak</td><td>Tectona grandis</td><td>3</td></tr>
<tr><td>Drumstick</td><td>Moringa oleifera</td><td>5</td></tr>
<tr><td>Neem</td><td>Azadirachta indica</td><td>3</td></tr>
<tr><td>Jackfruit tree</td><td>Artocarpus heterophyllus</td><td>5</td></tr>
<tr><td>Cashew</td><td>Anacardium occidentale</td><td>4</td></tr>
<tr><td>Rain Tree</td><td>Albizinia saman</td><td>4</td></tr>
</table></td></tr>
<tr><td>What are the measures proposed to minimize the likely impact on vegetation (details of proposal for tree plantation/ landscaping)</td><td>An area of 3675.58 m^2(podium and ground) is allocated for green belt. In addition, the sides of the internal roads will be provided with garden plants. The rain gardens will accommodate shrubs.
Landscape plan attached for the details of tree plantation and landscaping.</td></tr>
<tr><td>Is there any displacement of fauna – both terrestrial and aquatic – If so what are the mitigation measures? Presence of any endangered species or red listed category (in detail)</td><td>No, there will not be any displacement of fauna –both terrestrial and aquatic or creation of barriers for their movement.
No endangered species or red listed category is sited.</td></tr>
<tr><td colspan="2">SOCIO- ECONOMIC ASPECTS</td></tr>
<tr><td>Will the proposal result in any change to the demographic structure of local population? Provide the details.</td><td>There will be maximum influx of 2610 people. These are people looking for affordable housing in the city and will enhance the metropolitan structure of the city.
<table>
<tr><th>Purpose</th><th>Total Occupancy</th></tr>
<tr><td>Residential</td><td>1345</td></tr>
<tr><td>Commercial</td><td>759</td></tr>
</table></td></tr>
</table>

	Total	2104
Give details of the existing social infrastructure around the proposed project	The project site is located in the within 5 km radius of Kollam City. Educational institutions such as TKM college of Engineering, Sree Narayana College, Fathima College of pharmacyand. Hospitals such as Kollam District Hospital, Travancore Medical College Hospital, KIMS Hospital, etc. are located within 10 km radius. Kollam East Police station, Kollam SP office and City Commissioner's office, places of worship and recreation facilities are also available within 10 km radius.	
Will the project cause adverse effects on local communities, disturbances to sacred sites or other cultural values? What are the safeguards proposed?	There is Ammachiveedu Muhurthi Temple in the immediate vicinity of the site. As this project is a residential development, it will not cause adverse effects on local communities, disturbance to sacred sites or other cultural values.	
Out of the total plot area % of spaces provided for i)Recreational facility ii)Parking iii)Open Spaces	Recreational facility - 618.90m^2 Parking - 207.9m^2 Open Spaces - 4152.22m^2	
BUILDING MATERIALS		
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)	Pozalona Portland cement shall be used which already contains 15% Fly ash. Construction materials from nearest source are chosen to minimize energy consumption for transportation. Construction materials like aggregates are purchased from within 25 km, thus the embedded transportation energy is only 25 km-tons. Cement will be procured from the nearest factory located at Tirunelveli, Tamil Nadu.	
Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?	The material required for construction activities shall be procured from company's authorized / approved vendors only. The vendor's performance is monitored periodically. In case of urgency or non-availability of materials from authorized/approved vendors, it will be procured from the open market to maintain the pace of the work. The mode of transport for above materials will be by trucks and / or by trailers. ➢ The construction material will be carried in properly covered vehicles. ➢ Security staff presents at site will supervise loading and unloading of material at site. ➢ Construction material will be stored at identified site/ temporary godowns at site. ➢ The material handling location will be surrounded by a sheet wall up to 4 m.	
Are recycled materials used in roads and structures? State the extent of savings achieved?	The construction waste will be used for laying the internal roads	
Give details of the methods of collection, segregation & disposal	➢ Segregation of three types of garbage i.e. biodegradable, non-biodegradable and domestic	

of the garbage generated during the operation phases of the project.	hazardous shall be done ➢ Non- biodegradable garbage: Shall be segregated into recyclable and non-recyclable waste ➢ Recyclable waste: Shall be handed over to recyclers. ➢ Biodegradable garbage shall be treated in Biogas plant and slurry will be fed to the STP. ➢ The domestic hazardous waste shall be handed over to authorized waste collectors.
RISK MANAGEMENT	
Are there sufficient measures proposed for risk hazards in case of emergency such as accident at the site during construction & post construction phase.	This is residential cum commercial project. Hence hazardous materials will not be handled except for fuels used in vehicles, and special oils used in vehicles and machinery.
Storage of explosives/hazardous substance in detail	Storage of reserve fuel will be permitted. No hazardous materials will be used.
What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans	The project proponents are implementing a fire safety plan based on National Building Code. The emergency/ disaster management plan is enclosed as Annexure.
Litigation/court cases if any	No
AESTHETICS	
Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?	The project site is in the midst of occupied land with high rise buildings. The proposed construction will not cause any obstruction of a view, scenic amenity or landscapes.
Will there be any adverse impacts from new constructions on the existing structures? What are considerations taken into account?	No, The proposed buildings are coming up on a parcel of land well separated from existing buildings either by road width plus set back distance or with vacant land. There will not be any adverse impacts from the new construction on the existing structures.
Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.	The project site is not covered by any master plan for development. As such there is no restriction on the design, except those imposed by building rules and regulations. The building rules and regulations are compiled and clearance will be obtained from State Town Planning Department.
Are there any anthropological or archaeological sites or artifacts nearby? State if any other significant features in the vicinity of the proposed site have been considered	Yes. St Thomas Fort, Tangasseri which is presently managed by the Archaeological Survey of India (ASI) is 0.98 km away from the proposed site.
Details of CSR activity and the amount set apart per year	Proposed common CSR Budget

Sl.No.	Particulars	Rs in lakhs
1.	Promotion of Health Care	1.50

	2.	Promotion of Education including Special Education	4.20
	3.	Contribution to PM's National Relief Fund	1.00
	4.	Ensuring Environmental Sustainability	10.00
		Total	Rs. 16.70 lakhs
Details of NABET approved EIA Consultant engaged-Their name, address and accreditation details	ULTRA-TECH Environmental Consultancy and Laboratory Door No. 27/2957 A1, First Floor, Vaniampilly, K P Vallon Road, Kadavanthra, Kochi - 682020. Mob : +91 9895 200 526 NABET Accreditation No: NABET/EIA/1417/RA010		
Details of Authorized Signatory and address for correspondence	Mr Viju Varghese Deputy General Manager (MEP) Artech Realtors Pvt Ltd Artech House TC/24/2014(1), Thycaud, Thiruvananthapuram, 695014 Mob: 9388189889		
SUMMARY AND CONCLUSION			
Overall justification for implementation of the project.	The project site has many complexes in its vicinity. The project site is very near to Deva Matha convent school and NSS College, Kaankathumukk. The project site is easily accessible to all offices and major hospitals such as Dr.Kumardas Hospital, Kollam District Hospital etc. The tourist destinations such as Thangassery Beach are also nearby. The project will also create / add job opportunities for support staff like Security, Maintenance, Household Workers etc.		
Explanation of how adverse impact has been mitigated.	Environmental Management plan has been prepared considering all the likely adverse impacts. Proper implementation of the Environment Management plan as well as proper monitoring of the environmental parameters will ensure that all adverse impacts have been mitigated.		

2. The proposal was placed in the 79th meeting of SEAC held on 25th& 26th September 2017 and decided to defer the item for field inspection. During site visit, the adequacy of water source and internal roads all around the building were specially examined. The committee directed the proponent to keep ready the water yield test results of the open well at the site.

Accordingly Inspection was conducted by a sub committee consisting of Sri S Ajayakumar and Sri John Mathai, on 6/10/2017. The proposal is for a residential cum commercial building proposed as a joint venture between M/s Artech Realtors and MrFelixBabuand Mr John A Ferns. Built up area for commercial building is 2787 sq.m and residential building area is 52954 sq.m. Height of building is B+G+32 floors.

The proposal contains a commercial block and two residential towers. Commercial and residential bocks are separated by an internal road. At present the proposed residential blocks contains internal road. The proponents are planning to make some changes with roads all around. There is a house in the backside having entry to the plot. The ownership of this entry/exit to be submitted. Parking for commercial use and residential use are segregated and found to be adequate. Vehicle movement pattern is also satisfactory.

Ammachiveedu temple is located in the rear side of the plot. Since STP and other facilities are provided on the other side of the building blocks, there will not be any adverse effects on the temple environment. Excavation for basement is limited to 2m depth and excavated earth is not proposed to be taken out of the plot.

The proponents were asked to submit a revised site plan containing

a) Internal roads running all around the building.
b) Location of the source wells and their yield test report
c) Enhanced area for material recovery facility and methods of solid waste disposal
d) Soil test report of the site
e) Clarity on the ownership of the entry/exit road on the eastern side.

3. The proposal was placed in the 80th meeting of SEAC held on 11th October 2017. The committee decided to defer the item for considering in the next meeting.

4. The proposal was placed in 81st SEAC meeting held on 30th & 31st October 2017. The proposal was appraised by SEAC after considering Form I, Form IA, Conceptual plan, field visit report and all other documents and details provided by the proponent. The Committee directed the proponent to submit the following additional documents/details;

a. Details of the internal roads running all around the building.
b. Location of the source wells and their yield test report
c. Enhanced area for material recovery facility and methods of solid waste disposal
d. Soil test report of the site
e. Clarity on the ownership of the entry/exit road on the eastern side.

The proponent submitted the additional documents sought by 81st SEAC.

5. The proposal was placed in the 82nd meeting of SEAC held on 25th November 2017. The Committee appraised the proposal based on Form 1, Form I A, field inspection report of the Sub Committee and all other documents submitted with the proposal. The Committee decided to Recommend for issuance of EC subject to general conditions. SEIAA may obtain an appropriate commitment for CSR activities.

6. The Authority considered the proposal in its 78th meeting held on 15th December 2017. Authority accepted the recommendation of SEAC and decided to issue EC subject to general conditions.

As per the landmark judgment dated 3rd September 2017 of the Principle Bench of National Green Tribunal (NGT), developers should give a satisfactory explanation on the facilities provided for open space, recreational grounds and

parking facilities at the project site as they have an important bearing on the life of people. The above direction has to be complied by the Proponent.

2% of the total project cost should be set apart for CSR activities for taking up welfare activities of the local community in consultation with the local body. The CSR amount should be utilized before the completion of the project and should be included in the annual account of the company and the expenditure statement should be submitted to SEIAA along with the compliance report after getting certified by a Chartered Accountant. A notarised affidavit for the commitment of CSR activities and also agreeing all the general conditions should be submitted before the issuance of EC. The proponent has submitted the affidavit vide reference 7th cited satisfying all the conditions.

7. Environmental Clearance as per the EIA Notification 2006 is therefore granted for the proposed Residential cum Commercial building Project 'Artech Ferns' in Survey Nos. 238/11, 238/11-2 in Kollam West Village, Kollam Taluk & District, Kerala by Mr.Felix Babu & Mr.John A Ferns, Green Land, Sakthikulangara, Kollam District, Kerala subject to the conditions in para 6 above and 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.

8. 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.

9. 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.

10. 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, Kollam to take legal action under the Environment (Protection) Act 1986.

iii. The given address for correspondence with the authorized signatory of the project is, Mr.Viju Varghese, Deputy General Manager, M/s Artech Realtors Pvt. Ltd, Artech House, TC/24/2014(1), Thycaud, Thiruvananthapuram – 695014.

Sd/-
P.H.KURIAN I.A.S
Member Secretary (SEIAA)

To,

Mr.Felix Babu & Mr.John A Ferns,
Green Land, Sakthikulangara,
Kollam District, Kerala

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, Kollam
4. The District Town Planner, Kollam
5. The Tahsildhar, Kollam Taluk
6. The Member Secretary, Kerala State Pollution Control Board
7. The Secretary, Kollam West Village, Kollam Taluk, Kollam
8. Chairman, SEIAA, Kerala
9. Website
10. Stock file
11. 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