

**SIX-MONTHLY ENVIRONMENTAL COMPLIANCE
REPORT OF STIPULATED CONDITIONS OF
ENVIRONMENTAL CLEARANCE
(OCTOBER 2021 TO MARCH 2022)**

For:

Proposed Construction of New Institutional Buildings
Within the Existing Institutional Complex of
M/s Matha Amrithanandamayi Math

Submission to:

Ministry of Environment,
Forests & Climate Change (MoEFCC)

Submitted by:

M/s Mata Amritanandmayi Math

June, 2022



MATA AMRITANANDAMAYI MATH

Amritapuri, Kollam, Kerala, India - 690 546

Date: 28-June-2022

To,

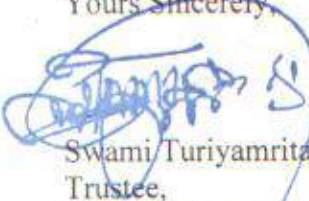
**Chief Conservator of Forests,
Ministry of Environment, Forest and Climate Change,
Regional Office (SZ), Kendriya Sadan,
4th Floor, E&F Wings, 17th Main Road,
Koramangala II Block, Bangalore – 560034**

Sub: Submission of six-monthly compliance report of stipulated conditions of Environmental Clearance for the proposed buildings construction within the existing institutional complex at Clappana and K S Puram Village and Panchayat, Taluk Karunagappally, District Kollam, for the period of October 2021 to March 2022.

Sir,

In accordance to the condition of Environmental Clearance received from State Environmental Impact Assessment Authority for the above project vide letter no. 1295/EC1/2019/SEIAA, dated 19th November, 2020; we are submitting herewith six monthly Compliance report of stipulated condition of Environmental Clearance (soft copy) for the period of October 2021 to March 2022.

Thanking you,
Yours Sincerely,


Swami Turiyamritananda Puri
Trustee,
Mata Amritanandamayi Math



Copy to: The Member Secretary, State Environmental Impact Assessment Authority (SEIAA),
Thiruvananthapuram, Kerala.

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Chapter 1

INTRODUCTION AND PROJECT DESCRIPTION**1.1 Introduction**

The proposed construction of new institutional buildings within the existing institutional complex in K.S Puram and Clappana Villages, Karunagapally Taluk, Kollam District is being developed by M/s Matha Amrithanandamayi Math. The project is being spread over an area of 11.019 ha. It is proposes to construct new buildings like research centre, addition of existing biotech building, hostel buildings, services buildings along with additional supporting infrastructure facilities.

This project has been granted environmental clearance vide letter no. 1295/EC1/2019/SEIAA at dated 19th November, 2020 (Attached as **Annexure I**) by the State Environment Impact Assessment Authority, Kerala.

1.2 Project Description

Sl No.	Item	Details
1	Name of the project	Proposed building construction within the existing institutional complex
2	Total plot area	11.019 ha.
3	Proposed built-up area	82,772.98 sq.m.
4	Expected project cost	Rs. 82.34 Crores
5	Maximum no. of floors	Ground + 13 floors (Proposed Hostel Block)
6	Maximum height of building	42.45m (Proposed Hostel Block)
7	Total water requirement	430 KL/day (Fresh 204KLD + Recycled 226 KLD)
8	Domestic water requirement	314 KL/day (Flushing + Non flushing)
9	Sewage generation	251 KL/day
10	Sewage disposal Facility	Sewage Treatment Plant & Recycling

11	Total power requirement	3.2 MVA
12	Source of power	Kerala State Electricity Board & DG Sets (Standby)
13	Capacity of DG Sets	250A (2 Numbers)

1.3 Present Status

Site approval and permission is granted for the erection of **Amrita Research Centre-Educational Building** in Survey/ Re survey No 1/4-2, 1/5-1, 1/5-1-2, 1/11, 1/12, 1/13-1-2, 1/13-1, 5/1, 6/4, 6/4-2-2, 6/4-2-4, 6/4-2-3, 6/5, 6/6-2, 6/6-3, 6/8-2, 6/9-2, 6/10, 6/11,6/12 Kulasekharapuram Village Karunagappally Taluk, Kollam District for Educational purpose. The building permit is attached as **Annexure III**. We conducted soil test at the location of Amrita Research Centre-Education Building at two specified points. The results are attached as **Annexure VIII**

1.4 Purpose of the Project

This six-monthly report is being submitted as per the condition stipulated in the Environmental Clearance letter. Further, the study will envisage the environmental impacts that have generated in the local environment due to the project.

Chapter 2

POINT WISE COMPLIANCE REPORT AS PER EC CONDITIONS

Name of Project : Construction of new institutional buildings within the existing institutional complex of M/s Matha Amrithanandamayi Math in K.S Puram and Clappana Villages, Karunagapally Taluk, Kollam District.

Clearance No. : SEIAA/HR/2016/376 dated 20th May, 2016

Period of compliance Report : October 2021 to March 2022

Part A – SPECIFIC CONDITIONS

I. Construction Phase

Sl No.	Conditions Imposed	Compliance Status
1	“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.	“Consent for Establishment has been obtained before the construction of the project. Copy of ‘Consent For Establishment’ (CFE) from KSPCB is enclosed as Annexure-IV
2	All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.	Adequate Toilet/Sanitary facilities will be provided for labors during the construction phase.
3	A First Aid Room will be provided in the project both during construction and operation of the project.	A First Aid Room with all necessary medical aids will be provided at site.
4	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.	Drinking (purified) water for construction workers will be arranged at the site. Provision for mobile toilets will be arranged, also safe disposal of wastewater and solid waste generated at site will be ensured.

5	All the topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the tire project site.	Noted and will be followed.
6	Disposal of muck during construction phase should not create any adverse effect on the neighboring communities and be disposed of by taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.	Site debris will be stored within the site and will be reused in site for backfilling.
7	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.	The project is only construction of commercial development and there is no involvement of toxic metal and heavy metal. However, proper care shall be taken during construction so that there is no contamination to groundwater.
8	Construction spoils, including bituminous materials 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 groundwater.	There is no hazardous waste envisaged in the construction stage of the project. However, we will comply with Hazardous Waste (Management and Handling) Rule, 2003 if any such material is encountered in the process.
9	Any hazardous waste generated during the construction phase, should be disposed of as per applicable rules and norms with necessary approval of the Kerala State Pollution Control Board.	Rules and norms of the KSPCB will be followed.
10	The diesel generator set to be during the construction phase should be low Sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards.	Only low sulphur diesel (LSD) will be used during the construction phase.
11	The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from the Chief Controller of Explosives shall be taken.	Yes all the necessary precautions will be taken to ensure compliance of all the safety norms.

12	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.	The operation of vehicles will be undertaken only during non-peak hours. For ferrying construction material only good condition vehicles will be used
13	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 the 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.	Ambient noise level during day and night are well within the standards. Ambient air and noise quality is being monitored closely. The monitoring report of ambient air, noise and water quality is attached as Annexure-V . Also, measures will be taken up during construction phase to reduce noise pollution by installing barricade sheets, proper leveling of roads etc.
14	Fly ash should be used as building material in construction as per the provisions of Fly Ash Notification September 1999 and amended as on 27 th August 2003. (The above condition is applicable Power Stations)	Will comply as per provisions of Fly Ash Notification of September 1999
15	Ready mixed concrete must be used in building construction.	Yes, only ready mixed concrete will be used in construction
16	Storm water control and its re-use per CGWB and BIS standards for various applications.	It will be undertaken as proposed in the EIA report.
17	Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.	It will be followed as per G.O. No. FEE 188 ENV 2003 dated 14.08.2004
18	Permission to draw ground water shall be obtained from the Central Authority prior to construction/ operation of the project.	Noted
19	Separation of grey and black water should be done by the use of a dual plumbing line for separation of grey and black water.	Will be followed. It is proposed for dual plumbing for separation of grey and black water.

20	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.	Noted and will be followed
21	Use of glass may be reduced by up to 40% to reduce the electricity consumption and load on air conditioning. If necessary, use high quality double glass with special reflective coating in windows.	Noted and will be followed
22	Roofs should meet perspective requirements as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfil requirement.	Noted and will be followed
23	Opaque wall should meet perspective requirements as per energy Conservation Building Code which is proposed to be mandatory for all air conditioned spaces while it is aspirational for non-air conditioned spaces by use of appropriate thermal insulation material to fulfil requirements.	Will be followed
24	The approval of the competent authority shall be obtained for structural safety of the buildings due to earthquake, adequacy of firefighting equipment, etc. as per National, Building Code including protection measures from lightning etc.	Noted and will be followed
25	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.	Will be followed
26	Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the protected proponent if it was found that construction of the project has been started without obtaining environmental clearance.	Construction of the Project has been undertaken after obtaining the EC.

II. Operation Phase:

Sl No.	Conditions Imposed	Compliance status
1	The installation of the Sewage Treatment Plant (STP) should be certified by an independent expert and a report in this regard should be submitted to the Ministry before the project is commissioned for operation. Treated affluent emanating from STP shall be recycled / reused to the maximum extent possible. Treatment of 100% grey water by decentralized treatment should be done. Discharge of unused treated effluent shall conform to the norms and standards of the Kerala State Pollution Control Board. Necessary measures should be made to mitigate the odor problem from STP.	The norms and standards of the KSPCB will be followed.
2	The solid waste generated should be properly collected and segregated. Wet garbage should be composted, and dry/inert solid waste should be disposed of to the approved sites for land filling after recovering recyclable material.	Noted and will be followed
3	Diesel power generating proposed as backup power for elevators and common area illumination during the operation phase should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of the 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 in consultation with Kerala State pollution Control Board.	Noted and will be followed
4	Noise should be controlled to ensure that it does not exceed the prescribed standards.	Noise level monitoring will be carried out periodically to keep a check on the noise pollution load from the project.

	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.	
5	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.	Necessary steps will be incorporated while designing the green belt.
6	Weep holes in the Compound walls shall be provided to ensure natural drainage of rainwater in the catchment area during the monsoon period.	Noted and will be followed
7	Rainwater harvesting for roof run-off and surface run-off, as planned, 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.	Rain water harvesting will be implemented as per the submitted plans. Pre-treatment will be carried out before recharging the surface run off.
8	The ground water level and its quality should be monitored regularly in consultation with the Central Ground Water Authority.	Noted
9	Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized, and no public space should be utilized.	Noted and will be followed.
10	A Report on the energy conservation measures confirmed to energy conservation norms finalized by Bureau of Energy Efficiency should be prepared incorporating details about building materials & technology, R & U Factors etc and submitted to the Ministry in three months time.	Noted
11	Energy conservation measures like installation of CFLs/TFLS for the lighting the	Noted and will be followed.

	areas outside the building should be an integral part of the project design and should be in place before project commissioning. Use CFLs and TFLs should be properly collected and disposed of/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.	
12	Adequate measures should be taken to prevent odor problems from solid waste processing plants and STPs.	Noted and will be followed.
13	The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation.	Noted

III. Post Operational Phase:

SI No.	Conditions Imposed	Compliance status
1	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.	Noted

PART B – GENERAL CONDITIONS:

	Conditions Imposed	Compliance Status
1	Rainwater Harvesting capacity should be installed as per the prevailing provisions of KMBR / KPBR, unless otherwise specified elsewhere.	Noted and will be followed.
2	The Environment Monitoring Cell as agreed	Complied.

	under the affidavit filed by the proponent should be formed and made functional.	
3	Suitable avenue trees should be planted along either side of the tarred road and open parking areas, if any, inclusive of approach roads and internal roads.	Noted and will be followed.
4	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.	Noted and will be followed.
5	Safety measures should be implemented as per the Fire and Safety Regulations.	Noted and will be followed.
6	STP should be installed and made functional as per KSPCB guidelines including that for solid waste management.	Noted and will be followed.
7	The conditions specified in the Companies Act, 2013 should be observed for Corporate Social Responsibility.	Noted and will be followed.
8	The proponent should plant trees at least 5 times of the loss that has occurred while clearing the land for the project.	Noted and will be followed.
9	Consent from Kerala State Pollution Control Board under Water and Air Act(s) should be obtained before initiating activity.	“Consent for Establishment has been obtained before the construction of the project. Copy of ‘Consent For Establishment’ (CFE) from KSPCB is enclosed as Annexure-IV
10	All other statutory clearances should be obtained, if applicable, by project proponents from the respective competent authorities including that for blasting and storage of explosives.	This condition has been noted and all required measures will be taken for compliance.
11	In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by this Authority.	Noted.
12	The Authority reserves the right to add additional Safeguard measures subsequently, if found necessary, and to take action including revoking the environment clearance under the	Agreed.

	provisions of the Environment (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.	
13	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.	Agreed.
14	The environmental safeguards contained in the EIA Report should be implemented in letter and spirit.	Will be complied
15	Provision should be made for supply of kerosene or cooking gas and pressure cooker to the laborers during the construction phase.	Noted and will be followed.
16	Officials from the Regional of MOEF, Bangalore 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.	Full cooperation will be extended during the inspection of officials from the concerned Departments for monitoring the project site and will be followed as per recommendation.
17	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.	Agreed
18	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of	Agreed

	India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.	
19	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.	Agreed
20	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.	Complied. Photocopies of the newspaper advertisements,” Kerala Koumudi” and “The New Indian Express” dated 5th December, 2020, is enclosed as Annexure-VI
21	A copy of the clearance letter shall be sent by the proponent to concerned Grama Panchayat/ 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.	The Institution has not received any suggestions/representations while processing the proposal. This condition has been complied with.
22	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 email) and upload the status of	Being Complied.

	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	
23	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.	Noted and will be followed.
24	The proponent should provide a notarized affidavit (indicating the number and date of Environmental Clearance Proceedings) that all the conditions stipulated in the EC shall be scrupulously followed.	Complied. A notarized affidavit specified is attached as Annexure II

Chapter 3

DETAILS OF ENVIRONMENTAL MONITORING

3.1 Ambient Air Quality Monitoring

3.1.1 Ambient Air Quality Monitoring Stations

Ambient air quality monitoring has been carried out at one location, being near the proposed **Amrita Research Centre-Educational Building** to assess the ambient air quality of Project Site. This will enable to have an analytical understanding about air quality and the changes in the air environment in the study area with respect to the condition prevailing.

The location of the ambient air quality monitoring station is given in Table 1.

Table 1: Details of Ambient Air Quality Monitoring Stations

S. No.	Sample Code	Location Name
1	EN22030374	Project Site

3.1.2 Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters and methodology:

Table 2: Ambient Air Quality Monitoring Methodology

Sl.No.	Description of Test	Test Parameter	Test Method
1	Ambient Air Quality	Particulate Matter (PM ₁₀)	IS 5182 Part 23: 2006 RA 2017
		Particulate Matter (PM _{2.5})	EPA 40 CFR Part 50 Appendix – L
		Sulphur Dioxide (SO ₂)	IS 5182 Part 2: 2001 RA 2017
		Oxides of Nitrogen (NO ₂)	IS 5182 Part 6: 2006 RA 2017
		Carbon monoxide (CO)	IS 5182 Part 10: 1999 RA 2014

3.1.3 Ambient Air Quality Monitoring Results

All parameters were observed within the corresponding stipulated limits at monitoring location. The detailed on-site monitoring results are attached as **Annexure V**.

3.2 Groundwater Quality Monitoring

3.2.1 Groundwater Quality Monitoring Locations

Keeping in view the importance of groundwater as an important source of drinking water, sample of ground water was collected from the bore well at project site for the assessment of impacts of the project on the groundwater quality. Water sample was collected from one location near the project site. The sample was analyzed for various parameters to compare with the standards for drinking water as per IS: 10500 for ground water sources. The details of water sampling locations are given in Table 3.

Table 3: The Details of Water Sampling Locations

S. No.	Sample Code	Location Name
1	WT22030229	Project Site

3.2.2 Methodology of Groundwater Quality Monitoring

Samples were collected as grab sample and the samples were analyzed as per the standard procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA) and CPCB. The analytical techniques and the test methods adopted for testing of ground water are given in Table 4.

Table 4: Ground Water Quality Monitoring Methodology

Sl.No.	Description of Test	Test Parameter	Test Method
3	Water Quality	Colour	IS 3025 Part 4:1983 RA 2017
		Odour	IS 3025 Part 5:2018
		Turbidity	IS 3025 Part 10:1984 RA 2017
		pH	IS 3025 Part 11:1983 RA 2017
		Conductivity	IS 3025 Part 14:1984 RA 2019
		Total Dissolved Solids	IS 3025 Part 16:1984 RA 2017
		Total Hardness (asCaCO ₃)	IS 3025 Part 21:2009 RA 2019
		Calcium (as Ca)	IS 3025 Part 40:1991 RA 2019
		Magnesium (as Mg)	IS 3025 Part 46:1994 RA 2019
		Chloride (as Cl)	IS 3025 Part 32:1988 RA 2019
		Total Alkalinity (asCaCO ₃)	IS 3025 Part 23:1986 RA 2019
		Iron (as Fe)	IS 3025 Part 53:2003 RA 2019
		Sulphate (SO ₄)	IS 3025 Part 24:1986 RA 2019
		Coliform Bacteria	IS 15185 : 2016
		E coli	IS 15185 : 2016

3.2.3 Ground Water Quality Monitoring Results

All parameters were observed within the corresponding stipulated limits at monitoring location. The detailed on-site monitoring results are attached as **Annexure V**.

3.3 Ambient Noise Monitoring

3.3.1 Ambient Noise Monitoring Locations

The main objective of noise monitoring in the study area is to assess the present ambient noise levels at the project site. Ambient noise monitoring was conducted at 1 location at the front side of the project, site as given in Table 5.

Table 5: The Details of Noise Monitoring Locations

S. No.	Location Code	Location Name
1	EN22030375	Project Site

3.3.2 Methodology of Noise Monitoring

Noise levels were measured using digital sound level meter. The noise levels were monitored on working days only. The test methods adopted for testing of ambient noise are given in Table 6.

Table 6: Ambient Noise Monitoring Methodology

Sl.No.	Description of Test Items	Test Parameter	Test Method
2	Noise Quality	Ambient Sound Level	IS 9989:1981 RA:2008

3.3.3 Ambient Noise Monitoring Results

The locations wise ambient noise monitoring result are summarized in **Annexure V**.

3.4 Soil Monitoring

3.4.1 Soil Monitoring Locations

The objective of the soil monitoring is to identify the impacts of ongoing project activities on soil quality and also predict impacts. The physico-chemical characteristics of soils were examined by obtaining soil samples from selected points and analysis of the same. One sample of soil was collected from the project site for studying soil characteristics, the location of which is listed in Table 7.

Table 7: Details of Soil Quality Monitoring Location

S. No.	Location Code	Location Name
1	EN22030376	Project Site

3.4.2 Methodology of Soil Monitoring

The homogenized samples were analyzed for physical and chemical characteristics (physical, chemical and heavy metal concentrations). The samples have been analyzed as per the established scientific methods for physico-chemical parameters. The analytical techniques and the test methods adopted for testing of soil sample are given in Table 8.

Table 8: Soil Quality Monitoring Methodology

Sl. No.	Description of Test Items	Test Parameter	Test Method
1	Soil Quality	pH	IS 10158: 1982 RA 2014
		Conductivity	IS 14767: 2000 RA 2016
		Water Holding Capacity	SEAL/EN/SLS/SOP/01
		Particle Size Distribution	SEAL/EN/SLS/SOP/14
		Organic Matter	IS 2720 Part 22:1992
		Sodium as Na	USEPA 7000B:2009
		Chlorides	SEAL/EN/SLS/SOP/08
		Sulphate	IS 2720 Part 27: 1977
		Total Kjeldahl Nitrogen (as N)	IS 14684 :1999 RA 2014
		Available Potassium	SEAL/EN/SLS/SOP/03
		Total Phosphorous (as P)	IS 10158: 1982 RA 2014

3.4.3 Soil Monitoring Results

The physico-chemical characteristics of the soil, as obtained from the analysis of the soil sample are summarized in **Annexure V**.

ANNEXURE I

(Environmental Clearance Letter from SEIAA)



Validity expires on :18.11.2027

**PROCEEDINGS OF THE ADMINISTRATOR, STATE
ENVIRONMENT IMPACT ASSESSMENT AUTHORITY,
THIRUVANANTHAPURAM
(Present: ANIL P ANTONY)**

Sub: SEIAA- Application for Environmental Clearance for Proposed construction of new institutional buildings within the existing institutional complex of M/s Matha Amrithanandamayi Math in K.S Puram and clappana Villages, Karunagapally Taluk, Kollam District- Granted - Orders issued

State Environment Impact Assessment Authority, Kerala

No. 1295/ECI/2019/SEIAA

dated, Thiruvananthapuram 19.11.2020

- Ref :1. Application received dated 25.03.2019 from the Swami Thiriyamrithanandapuri(Trustee& Authorized Signatory), M/s Mata Amritanandamayi Math, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana P.O, Kollam , Kerala 690525
2. Minutes of the 97th SEAC meeting held on 21st & 22nd May, 2019.
3. Minutes of the 99th SEAC meeting held on 26th & 27th June, 2019.
4. Minutes of the 113th SEAC meeting held on 15th, 16th & 17th September, 2020.
5. Minutes of the 105th SEIAA meeting held on 22nd & 23rd October 2020
6. G.O(Rt.) No.29/2019/Envr dt.12.04.2019.

ENVIRONMENTAL CLEARANCE NO.92/2020

1. SEIAA received application dated 25.03.2019 from the Swami Thiriyamrithanandapuri(Trustee& Authorized Signatory), M/s Mata Amritanandamayi Math, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana P.O, Kollam , Kerala 690525, seeking EC for proposed buildings construction within the existing institutional complex of M/s Mata Amritanandamayi Math in survey No. in K.S Puram village: 1/4/2,1/5/1,1/5/1/2, 1/8/2, 1/9, 1/9/3, 1/9/1, 1/11, 1/12, 1/13/1/2, 1/13/1, 1/14, 5/1, 6/4, 6/4/2/2, 6/4/2/4, 6/4/2/3, 6/5, 6/6/2, 6/6/3, 6/8/2, 6/9/2, 6/10, 6/11, 6/12 and survey No. in Clappana village: 371/3, 372/4, 372/5, 372/5/2, 372/6/1, 372/7, 372/9, 372/9/1, 372/9/2, 373/1, 373/2, 373/5/2/3, 373/7/2, 373/8, 373/9, 373/11, 373/13, 373/14, 373/15, 373/16, 374/1, 372/2, 374/3, 374/4, 374/5/2, 374/6/2, 374/6/3, 374/7, 374/8/1/2, 374/9, 374/10, 374/11, 374/14, 374/15, 374/16,

374/17, 374/18, 375/6, 375/7, 375/8, 375/9, 375/10, 375/12/1, 375/15, 376/10, 375/4, 372/1 It is interalia, noted that the project comes under the Category B of Schedule 8 (b) of Environment Impact Assessment Notification 2006.

2. Total build up area of the proposed project is 82,772.98sq.m.. The proposed building site resides in Karunagapally taluk in Kollam district.
3. The proposal was placed in the 97th SEAC meeting held on 21st & 22nd May, 2019. The Committee decided to invite the proponent for presentation.
4. The proposal was placed in the 99th SEAC meeting held on 26th & 27th June, 2019. The proponent was made a presentation. The Committee entrusted Dr.R.Ajayakumar Varma & Smt.Beena Govindan Kumar for field inspection. Later on due to the inconvenience of Dr. Ajayakumar Varma, Shri. K.Krishna Panicker was deputed to the subcommittee and the subcommittee visited the project site on 6th July 2019.
5. The proposals was placed in the 113th SEAC meeting held on 15th, 16th & 17th September, 2020.
The Committee discussed and accepted the additional details / clarifications submitted by the proponent. The Committee decided to recommend the issuance of EC subject to the following specific conditions in addition to the general conditions:
I) The proponent has to plant one tree for every 80m2 . This comes around 1034 trees. While planting trees, local species to be selected.
II) The proponent has to clean and protect all crisscrossing canals and ponds within the campus for excess storm water flow and ground water recharge. Adequate silt traps need to be provided to prevent soil runoff.
III) Though building sites keep mandatory distance from the houses located there, the proponent has to take special care that the drilling for pile foundation excavation is not causing any damage to those houses.
IV) The proponent has to develop an environmental management plan in consultation with Harithakeralam Mission and Local Self Government Institutions to clean and protect the canals outside the campus and should be implemented with community participation.
V) Proponent must ensure that Levelling, back filling and construction process would not result in any kind of water logging or flooding that affects the community living nearby.
VI) Climate responsive design as per Green Building Guidelines in practice should be adopted
VII) Vegetation should be adopted appropriately on the ground as well as over built structure such as roofs, basements, podiums etc.

- VIII) Exposed roof area and covered parking should be covered with material having high solar reflective index
- IX) Building design should cater to the differently-abled citizens
- X) Provide safe and healthy basic facilities for construction workers as per the Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- XI) Water efficient plumbing features should be adopted
- XII) Design of the building should be in compliance to Energy Building Code as applicable
- XIII) Energy conservation measures including harnessing of solar energy should be adopted

6. The proposal was placed in the 105th SEIAA meeting held on 22nd & 23rd October 2020.

Authority noted that SEAC had appraised the proposal based on the details given in application Form, additional details/documents obtained from the proponent as the part of the appraisal, field inspection report and SEAC had recommended to issue EC.

The Authority accepted the recommendation of SEAC and decided to issue EC for 7 years subject to the following specific condition in addition to the general conditions.

- i) Authority noticed that in the field inspection report of SEAC dated 6th July 2020, there was a mention about Clearance /clarification from KCZMA. As this project is implemented in a coastal zone and National water way (T.S.Canal) is close by and there are criss crossing canals and streams in the project region, Project proponent shall obtain clearance of KCZMA under Coastal Zone Regulation 2011.
- II) The proponent has to clean and protect all crisscrossing canals and water bodies within the campus and in the vicinity for excess storm water flow and ground water recharge. Adequate silt traps need to be provided to prevent soil erosion.
- III) Though building sites keep mandatory distance from the houses located there, the proponent has to take special care to see that the drilling for pile foundation excavation is not causing any damage to those houses.
- IV) Proponent must ensure that Levelling, back filling and construction process would not result in any kind of water logging or flooding that affects the community living nearby.
- V) Climate responsive design as per Green Building Guidelines in practice should be adopted
- VI) Exposed roof area and covered parking should be covered with material having high solar reflective index
- VII) Building design should cater to the differently-abled citizens
- VIII) Water efficient plumbing features should be adopted

(X) Design of the building should be in compliance to Energy Building Code as applicable

X) Energy conservation measures including harnessing of solar energy should be adopted

XI) Project proponent shall not disturb the wet land of Ecological importance in the project area.

XII) Corporate Environment Responsibility (CER): As per OM no F.No.22-65/2017-IA,II dated 30th September 2020, the project Proponent shall prepare an Environment Management Plan (EMP) as directed by SEAC during appraisal, covering the issues to address the environmental problems in the project region, indicating both physical and financial targets year wise. The EMP shall be implemented in consultation with District Collector. The indicated cost for CER shall be not less than 1-2% of the project cost depending upon the nature of the Project, for an amount of the follow up action on implementation of CER shall be included in the half yearly report which will be subjected to field inspection at regular intervals.

XIII) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project (Circular No.J-11013/41/2006-IA,II(I) of GoI, MoEF dt.22.09.2008).

7. In this circumstance, Environmental Clearance is granted to Swami Turiyanritanandapuri (Trustee & Authorized Signatory) M/s Mata Anritanandamayee Math, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana P.O, Kollam, Kerala subject to the condition in para 6 of this order and the usual general conditions for projects other than mining appended hereto. Also 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.

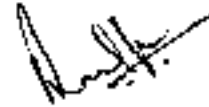
9. Validity of the Environmental Clearance will be for seven years from the date of issuance of E.C, subject to inspection by SEIAA on annual basis and compliance of the conditions, subject to earlier review of E.C in case of violation or non-compliance of any of the conditions stipulated herein or genuine 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 Half Yearly Compliance Report (HYCRs) with its contents of a covering letter, compliance report and environmental monitoring data has to be in PDF format merged into a single document. The email should clearly mention the name of the project, EC No and date, period of submission and to be sent to the Regional Office of MoEFF & CC by email only at email ID rosz.bug-mefcc@gov.in . Hardcopy of HYCRs shall not be acceptable.

Vi The given address for correspondence with the authorized signatory of the project is, Swami Turiyamritmandapuram (Trustee & Authorized Signatory). M/s Mata

Amritanandamay Math, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana
P.O, Kollam -690525



ANIL P ANTONY

Administrator, SEIAA

To,

Swami Turiyamritanandapuri(Trustee& Authorized Signatory)
M/s Mata Amritanandamayi Math
Amrita Vishwa Vidyapeetham
Amritapuri Campus
Clappana P.O
Kollam -690525

Copy to:

1. MoEF Regional Office, Southern Zone, Kendriya Sadan, 4th Floor, E&F Wing, II Block, Koramangala, Bangalore-560034.(through e-mail: ros.z.bng-mefcc@gov.in)
2. The Principal Secretary to Government, Environment Department
3. The Director, Directorate of Environment & Climate Change, 4th Floor KSRTC Bus Terminal, Thampoor, Thiruvananthapuram. Kerala 695001
4. The District Collector, Kollam
5. The District Town Planner, Kollam.
6. The Tahsildhar, Kollam Taluk, Kollam District.
7. The Member Secretary, Kerala State Pollution Control Board
8. The Secretary, Kollam East Village, Kollam District
9. Chairman. SEIAA, Kerala
10. Website
11. Stock file
12. O/c

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, Bangalore 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 prespective 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 lightning 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 project 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 effluent 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 treated effluent 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 conforming 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.

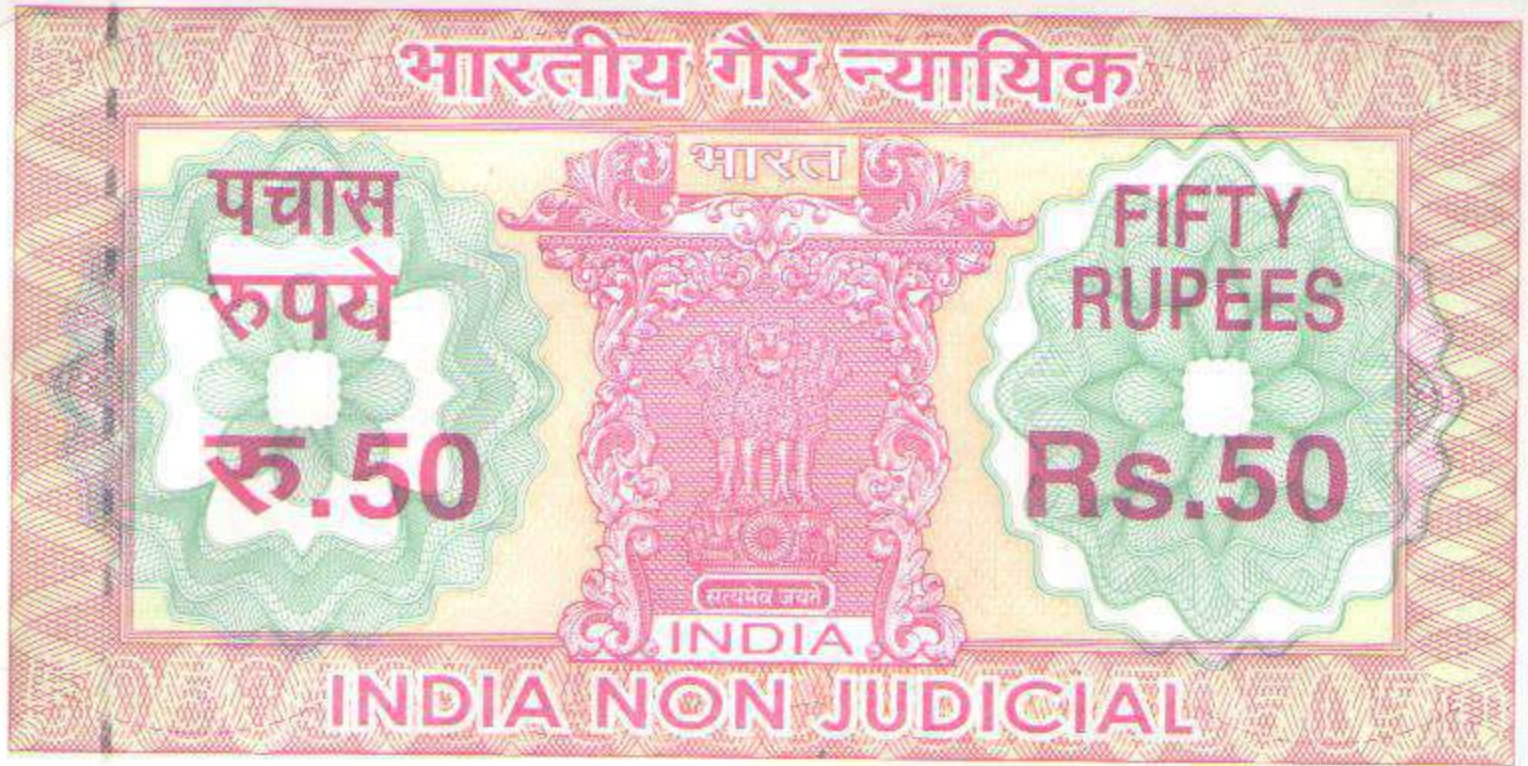
III. Post Operational Phase

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

Administrator, SELAA

ANNEXURE II

(Notarized Affidavit)



കേരളം കേരള KERALA

-1-

BZ 928634

AFFIDAVIT

I, Swami Turiyamritanandapuri, Trustee & Authorized Signatory of M/s Mata Amritanandamayi Math, having its correspondence office at Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana P.O., Kollam - 690 525 do hereby affirm and confirm as follows:

Place : Kollam
Date : 29.06.2021

DEPONENT
Swami Turiyamritananda Puri
Trustee, Mata Amritanandamayi Math



P.K. SUDHEER
ADVOCATE & NOTARY
Roll No. K. 458/1992, Reg. No. 21726
KARUNAGAPPALLY, KOLLAM, KERALA



Number 3525
Date 28-06-2021

Handwritten signature and text in Malayalam script.

STAMP VENDOR
KOLLAM (SPECIAL LICENSE)



भारतीय गैर न्यायिक

पचास
रुपये
रु.50



FIFTY
RUPEES
Rs.50

INDIA NON JUDICIAL

കേരളം KERALA

- 2 -

BZ 928637

1. That, M/s Mata Amritanandamayi Math proposes the buildings construction within the existing institutional complex in Survey Nos. in K S Puram Village 1/4/2, 1/5/1, 1/5/1/2, 1/8/2, 1/9, 1/9/3, 1/9/1, 1/11, 1/12, 1/13/1/2, 1/13/1, 1/14, 5/1, 6/4, 6/4/2/2, 6/4/2/4, 6/4/2/3, 6/5, 6/6/2, 6/6/3, 6/8/2, 6/9/2, 6/10, 6/11, 6/12 and Survey Nos. in Clappana Village 371/3, 372/4, 372/5, 372/5/2, 372/6/1, 372/7, 372/9, 372/9/1, 372/9/2, 373/1, 373/2, 373/5/2/3, 373/7/2, 373/8, 373/9, 373/11, 373/13, 373/14, 373/15, 373/16, 374/1, 374/2, 374/3, 374/4, 374/5/2, 374/6/2, 374/6/3, 374/7, 374/8/1/2, 374/9, 374/10, 374/11, 374/14, 374/15, 374/16, 374/17, 374/18, 375/6, 375/7, 375/8, 375/9, 375/10, 375/12/1, 375/15, 376/10, 375/4, 372/1, Karunagappally Taluk, Kollam District, Kerala.

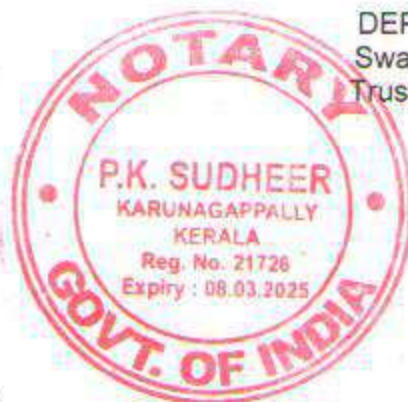
Place : Kollam
Date : 29.06.2021

DEPONENT
Swami Turiyamritananda Puri
Trustee, Mata Amritanandamayi Math



P.K. SUDHEER
ADVOCATE & NOTARY

Roll No. K. 458/1992, Reg. No. 21726
KARUNAGAPPALLY KOLLAM, KERALA



28-06-2021 Re 53/

അമൃതാനന്ദമയി
മാതാ അമൃതാനന്ദമയി മാതാ
മാതാ അമൃതാനന്ദമയി മാതാ

G. UNNIKRISHNAN
STAMP VENDOR
KOLLAM / SPECIAL LICENSE



भारतीय गैर न्यायिक

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BZ 928635

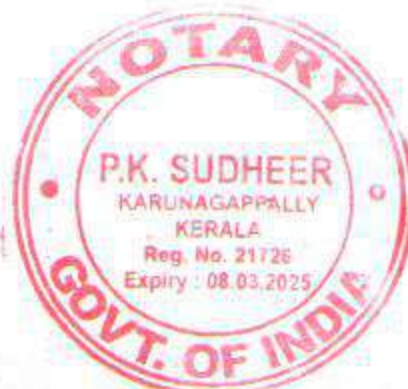
2. That, the Environmental Clearance proceedings number and date are No1295/EC1/2019/SEIAA , 19.11.2020.
3. That, all the conditions stipulated in the Environment Clearance would be scrupulously followed.




Place : Kollam
Date : 29.06.2021

DEPONENT
Swami Turiyamritananda Puri
Trustee, Mata Amritanandamayi Math


P.K. SUDHEER
ADVOCATE & NOTARY
Roll No. K. 458/1992, Reg. No. 21726
KARUNAGAPPALLY, KOLLAM, KERALA




G. UNNIKRISHNAN
STAMP VENDOR
KOLLAM (SPECIAL LICENSE)



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28-06-2021
കാ. 58/
സ്വാമി തുരിയാമൃതാനന്ദ പൂരി
തൃശ്ശൂർ ജില്ലാ ട്രസ്റ്റി
കോളം

भारतीय गैर न्यायिक

पचास
रुपये
रु.50



FIFTY
RUPEES
Rs.50

INDIA NON JUDICIAL

കേരളം KERALA

- 4 -

BZ 928636

Verification :

Verified that my above statements are true to the best of my knowledge and belief and nothing material has been concealed therein.

Place : Kollam
Date : 29.06.2021

DEPONENT
Swami Turiyamritananda Puri
Trustee, Mata Amritanandamayi Math



Solemnly affirmed and signed before me by the
deponent herein who I knew personally &
my skin of being genuine on the 29th day
of June 2021.

Not: P.K. Sudheer.



P.K. SUDHEER
ADVOCATE & NOTARY

Roll No. K/458/1992, Reg. No. 21726
KARUNAGAPPALLY, KOLLAM, KERALA



3527
28-06-2021

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ANNEXURE III

(Building Permit- Amrita Research Centre-
Educational Building)



Kulasekharapuram Gramapanchayat
Kollam
Kerala Panchayat Building Rules
APPENDIX B2
[See rule 6(17) & 9(4)]
SITE APPROVAL AND BUILDING PERMIT
Kulasekharapuram Grama Panchayat

No. K3- 7302/17

Date. 05/10/2021

Ref :- Application dated. 07/09/2017 from Secretary, Mata Amritanandamayi Math, Amritapuri Campus, Clappana P.O

Site approval and permission is granted for the erection / re-erection / addition / alteration of building / hut/ digging of well/ **Amritha Research Centre - Educational Building** (specify the construction) in building No..... or near the building No.....in Survey / Re survey No 1/4-2, 1/5-1, 1/5-1-2, 1/11, 1/12, 1/13-1-2, 1/13-1, 5/1, 6/4, 6/4-2-2, 6/4-2-4, 6/4-2-3, 6/5, 6/6-2, 6/6-3, 6/8-2, 6/9-2, 6/10, 6/11, 6/12 Kulasekharapuram Village Karunagappally Taluk Kollam District for **Educational** (specify the occupancy) purpose subject to the conditions stated below:

1. Adequate safety measures shall be ensured for protection against damage to health, life, buildings and property of the workers and inhabitants around, during and after building construction. The owner and the developer shall be solely responsible for any such damages.
2. The Permit provided under these rules, shall be valid for 5 years from the date of issue and may be renewed once each for 5 years.
3. The Application for renewal shall be submitted to the Secretary in white paper, typed or written in ink, fixed with necessary court fee stamp and accompanied by copy of permit and approved Plan.
4. The Permit Issued under the Kerala Building Rules, 2019 and remaining value at the commencement of these rules shall be deemed to have been issued under these rules and may be renewed for like period and on like terms, as a permit issued.
5. Conditions As Per Order No. C/1132/2018/D. Dis, Dated. 04/10/2018 of District Town Planner, District Town Planning Office, Kollam are Strictly Obeyed.
6. Conditions As Per Order No. 1295/EC1/2019/SEIAA, Dated. 19/11/2020 of The Administrator, State Environment Impact Assessment Authority, Thiruvananthapuram are Strictly Obeyed.
7. Permit is valid upto 5 years from 05/10/2021 to 04/10/2026

(a) Set backs (m) (minimum & average) K.P.B.R - 2019 Rule. 26

Building 1	Front yard	Rear Yard	Side - 1	Side - 2
	15.33 m	7.83 m	7.55 m	12.76 m

(b) Plot Area (sq m) – 101.46 are

(c) FSI : 1.62

Coverage : 34.99 %

(d) Details of proposed building

Floors	Building No.1			Building No.2		
	Occupancy – Educational			Occupancy		
	Height Of the Building – 29.85 m			Height Of the Building.....m		
	Use	Built-up area(Sq.m.)	Area Provided for Parking inside the building(Sq.m)	Use	Built-up area(Sq.m.)	Area Provided for Parking inside the building(Sq.m)
Basement Floor	Educational	2555.57 m2	-	-	-	-
Ground Floor	Educational	2009.06 m2	-	-	-	-
First Floor	Educational	1498.87 m2	-	-	-	-
Second Floor	Educational	2127.79 m2	-	-	-	-
Third Floor	Educational	1683.38 m2	-	-	-	-
Fourth Floor	Educational	1683.38 m2	-	-	-	-
Fifth Floor	Educational	1683.38 m2	-	-	-	-
Sixth Floor	Educational	1683.38 m2	-	-	-	-
Seventh Floor	Educational	1683.38 m2	-	-	-	-
Terrace Floor	Educational	176.98 m2	-	-	-	-
Machine Room	Educational	123.90 m2	-	-	-	-
Total		16909.07 m2	-	-	-	-



Signature and name of Secretary

[Signature]

SECRETARY

Kulasekharapuram Grama Panchayat
Adinadu North - 690 542
Phone- 0476 2640217

ANNEXURE IV

(Consent for Establishment (CFE) from KSPCB)

FILE NO. :PCB/HO/KLM/ICO/05/2017

Date of issue :26/11/2018



KERALA STATE POLLUTION CONTROL BOARD

CONSENT TO ESTABLISH

ISSUED UNDER

Section 25 of Water (Prevention & Control of Pollution) Act, 1974

Section 21 of the Air (Prevention & Control of Pollution) Act, 1981

and

Environment (Protection) Act, 1986

As per Application No. :7121029

Dated:17-04-2018

TO

M/s AMRITA VISHWA VIDYAPEETHAM, AMRITAPURI CAMPUS

Clappana P.O,

Kollam-690525.

Consent No. :PCB/HO/KLM/ICE-exp/03/2018

Valid Upto :31/03/2023

1. GENERAL

1.1. This integrated consent is granted subject to the power of the Board to withdraw consent, review and make variation in or revoke all or any of the conditions as the Board deems fit.

1	VALIDITY	31/03/2023
2	Name and Address of the establishment	AMRITA VISHWA VIDYAPEETHAM, AMRITAPURI CAMPUS CLAPPANA PO 690525
3	Communication	Telephone :0476-2801280 Fax :- E-mail:director@am.amrita.edu
4	Occupier Details	Director, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana PO, Kollam District, Kerala Pin: 690525
5	Local Body	Clappana/Kulashekarapuram
6	Survey Number	The location and survey no. of the building and STP as per the site plan attached.
7	Village	Clappana
8	Taluk	KARUNAGAPALLY
9	District	Kollam
10	Capital Investment(Rs in Lakhs)	Rs.8234.49 Lakh
11	Scale	Large
12	Category	RED
13	Annual fee(Rs)	Rs.2,48,510/-
	Total Fee remitted(Rs)	Rs.12,42,550/-
14	Activity	Expansion of the educational institution including hostel buildings,academic buildings, biotechnology and research buildings; Total built-up area- 94484 sq.m; STP of capacity 1500 KLD.

2. CONDITIONS AS PER

The Water(Prevention and Control of Pollution)Act, 1974

- 2.1 Sewage Treatment Plant (STP) consisting of treatment units having adequate capacity shall be made functional/ arrangement for sewage treatment shall be provided, as per the proposal submitted along with the application, before commissioning of the establishment. Additional facilities required, if any, to achieve the standards laid down by the Board u/s 17(1)(g) of the Water Act shall also be made along with.
- 2.2 Water Consumption : 800 KLD
- 2.3 Effluent Generation : 640 KLD
- 2.4 The characteristics of effluent after treatment shall confirm to the following tolerance limits:

Sl.NO.	Characteristics	Unit	Tolerance Limit	
			Sewage	Trade Effluent

- 2.5 Mode of disposal of treated effluent : A part of the treated effluent is used for gardening and balance is discharged into backwaters.

3. CONDITIONS AS PER

The Air(Prevention and Control of Pollution)Act, 1981

- 3.1 Adequate air pollution control measures shall be provided before commissioning of the industry. Additional facilities required, if any, to achieve the standards laid down by the Board shall also be made along with.

Stack No.	Sources of Emission	Emission Rate(Nm3/Hr)	Stack Height above		Control Equipment
			Ground Level	Roof Level	

- 3.2 Emission characteristics shall not exceed the following:

Sl.No.	Parameter	Limiting Standards (mg/Nm3)
--------	-----------	-----------------------------

4. CONDITIONS AS PER

The Environment (Protection) Act, 1986.

- 4.1 The construction activities shall be carried out strictly in compliance with the provisions of the Noise Pollution (Regulation and Control) Rules 2000.
- 4.2 Used lead acid batteries shall be disposed of as per the Batteries (Management and Handling) Rules, 2001
- 4.3 e-waste shall be disposed off safely as per E-Waste (Management) Rules, 2016.

5. ADDITIONAL CONDITIONS

- 5.1. The location of the buildings and Sewage Treatment Plant shall be as per the drawing attached.Sewage treatment plant as per the proposal submitted along with the application shall be constructed and made functional before commissioning.

5.2 The condition no.2.4 as follows,

The characteristics of effluent after treatment shall confirm to the following tolerance limit:

Sl.NO.	Characteristics	Unit	Tolerance Limits		
			Irrigation/ Soak pit	Flushing/ Gardening	Discharge to Public Sewer
1	pH	-	5.5-9	6.5-8.5	5.5-9
2	TSS	mg/l	100	20	600
3	BOD	“	30	3	350
4	Oil & Grease	“	10	1	20

5.3. This consent is granted subject to the power of the Board to review and make variations in all or any of the conditions as per section 21 of the Air (Prevention and Control of Pollution) Act 1981 and section 25 of the Water (Prevention and Control of pollution) Act 1974.

5.4. This consent unless withdrawn earlier and subject to condition no. 5.2 shall be valid for five years from the date of issue. At the end of validity period if the construction is in progress the same shall be renewed through online. If the construction is yet to be started, the applicant shall apply afresh for consent to establish.

5.5. The date of commissioning shall be intimated, at least one month in advance, to the District Office of the Board.

5.6. Consent to Operate shall be obtained before commissioning the unit under the Water (Prevention and Control of Pollution) Act, the Air (Prevention and Control of Pollution) Act and the relevant Rules under Environment (Protection) Act. For this, application shall be submitted one month in advance.

5.7. The applicant shall comply with the instructions that the Board may issue from time to time regarding prevention and control of air, water, land and sound pollution.

5.8. Energy meter shall be installed exclusively for the effluent treatment and system and shall be maintained properly.

5.9. Arrangements shall be provided for rainwater harvesting before commissioning

5.10. Natural drainage of the area shall be protected.

5.11. During the construction phase, the building materials shall be transported with proper cover or after

wetting to prevent spreading of dust during transportation. Water sprinkling shall also be arranged to suppress spreading of dust outside the premises.

5.12. The construction debris, mud discharge etc. if any from the construction site shall be disposed off as per Construction and Demolition Waste Management Rules, 2016.

5.13. Suitable species of trees and plants shall be maintained within and along the periphery of the premises to form green belt to improve the environment.

K SAJEEVAN

Digitally signed by K SAJEEVAN
Date: 2018.12.06 16:59:08
+05'30'

DATE :26/11/2018

SIGNATURE & SEAL OF ISSUING AUTHORITY
CHAIRMAN

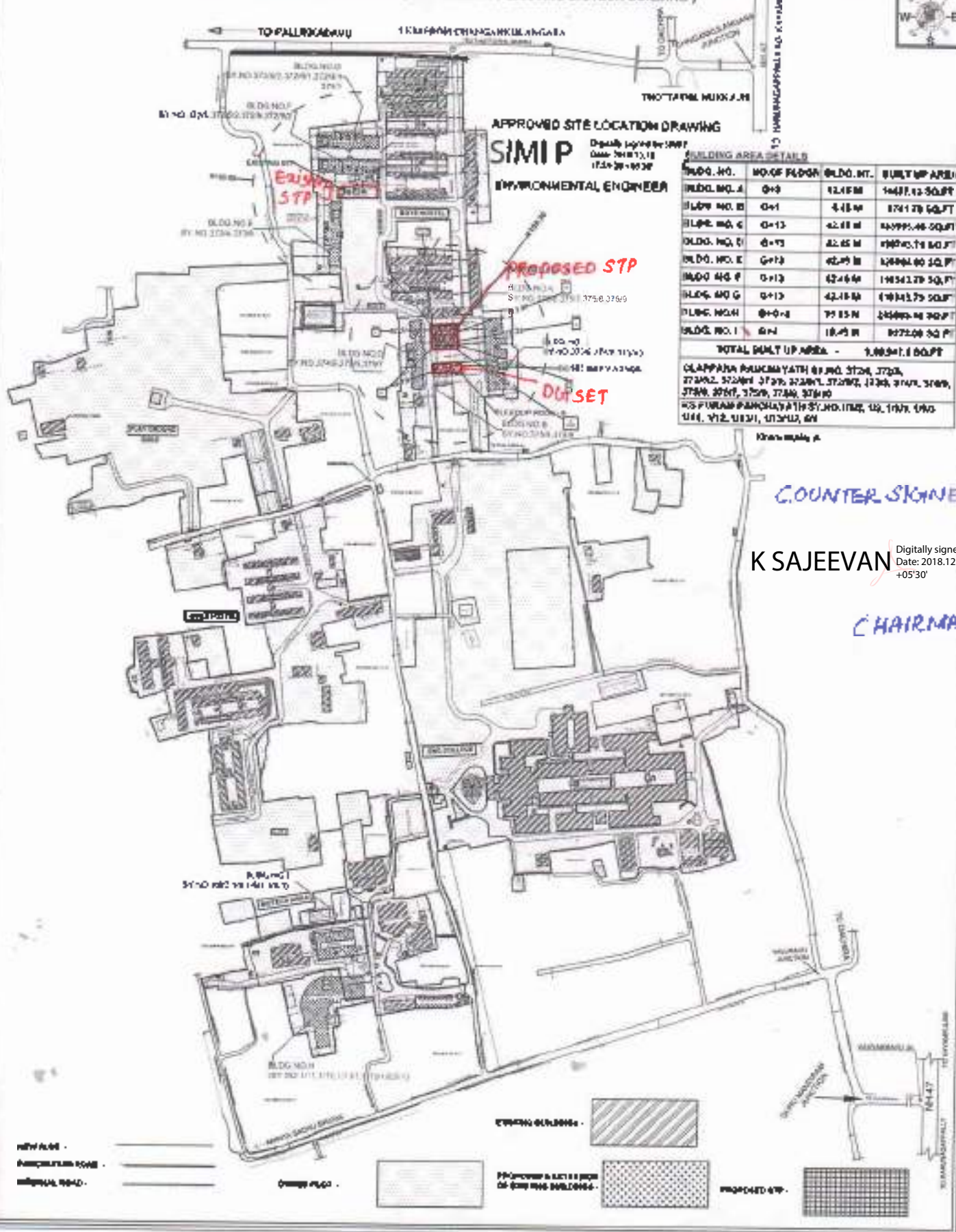


To

M/s Amritha Vidyapeetham,
Amritapuri Campus,
Clappana P.O,
Kollam-690525.

1. This digitally signed document is legally valid as per the Information Technology Act 2000

2. For verifying this document please go to krocmms.nic.in and search using date of issue/name of the unit/Application Number in "Consent Granted Applications" link in the home page of the Board's Online Consent Management and Monitoring System.



ANNEXURE V

(Monitoring Report)

TEST REPORT

ULR No: TC540222000002293F		
LRI No.:SEAAL22030942A	Date: 30-03-2022	Page 1 of 1

CUSTOMER DETAILS	
Customer Name & Address	M/s Mata Amritanandamayi Math Amritapuri Campus Karunagappally Kollam District
Customer Reference	Test Request dt: 23-03-2022

DETAILS OF MONITORING			
Product Category	Atmospheric Pollution	Sample Code	EN22030375
Sample Name	Ambient Noise	Monitoring Commenced on	23-03-2022/ 06:00
Monitoring Location	Project Site	Monitoring Completed on	24-03-2022/ 06:00
Test Method	IS 9989:1981	Monitored by	Lab Authorized Sampler
Latitude	N 09°05.868'	Longitude	E 076°29.417'

SAMPLING SITE DETAILS			
Survey No.	383/4-2,384/1,371/3,388/2-2,359/1		
Village	Clappana& K S Puram	Taluk	Karunagappally
District	Kollam	State	Kerala

MONITORING RESULTS - Leq					
TIME	RESULTS dB(A)	TIME	RESULTS dB(A)	TIME	RESULTS dB(A)
06:00	34.0	14:00	45.6	22:00	33.0
07:00	36.5	15:00	46.0	23:00	34.4
08:00	40.4	16:00	47.0	24:00	36.9
09:00	43.5	17:00	47.4	01:00	37.6
10:00	45.6	18:00	42.5	02:00	37.3
11:00	48.4	19:00	39.3	03:00	38.0
12:00	46.0	20:00	35.8	04:00	36.9
13:00	45.3	21:00	35.4	05:00	38.7

SL No.	PARAMETERS	UNIT	RESULT
1	Ambient Sound Level (Leq) Day Time (06:00 to 22:00)	dB(A)	44.1
2	Ambient Sound Level (Leq) Night Time (23:00 to 05:00)	dB(A)	37.3

Remarks:

End of Report

Shency Joy
Dy. TM Chemical

Checked by:

The results are related only to the samples submitted for analysis and this test report shall not be reproduced except in full, without the written approval of the laboratory.

Laiju P. N.
Laboratory Head
Authorized Signatory

Standard^S Environmental & Analytical Laboratories

Accreditation & Approval: NABL accredited Testing Laboratory as per ISO/IEC 17025:2017

vide Certificate No. TC - 5402 & "A" Grade Laboratory approved by KSPCB.

K.J. Tower, Pathalam, Udyogamandal P.O., Ernakulam-683 501, Tel. 0484-2546660, 93 87 27 24 02, 90 74 34 14 43

Web: www.sealabs.in, E-mail: seaalab@gmail.com

TEST REPORT

ULR No:TC540222000002292F		
LRI No.:SEAAL22030941A	Date: 30-03-2022	Page 1 of 1

CUSTOMER DETAILS	
Customer Name & Address	M/s Mata Amritanandamayi Math Amritapuri Campus Karunagappally Kollam District
Customer Reference	Test Request dt: 23-03-2022

SAMPLE DETAILS			
Product Category	Atmospheric Pollution	Sample Code	EN22030374
Sample Name	Ambient Air	Sample Received on	25-03-2022
Sample Conditions at Receipt	Fit for Analysis	Test Commenced on	25-03-2022
Sampled by	Lab Authorized Sampler	Test Completed on	30-03-2022

DETAILS OF SAMPLING			
Sampling Location	Project Site	Date of Sampling	23-03-2022
Sampling Procedure	SEAAL/ENL/GEN/SOP/02	Humidity	69 %
Latitude	N 09°05.877'	Longitude	E 076°29.420'

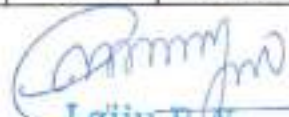
SAMPLING SITE DETAILS			
Re-Survey No.	383/4-2,384/1,371/3,388/2-2,359/1		
Village	Clappana& K S Puram	Taluk	Karunagappally
District	Kollam	State	Kerala

TEST RESULTS- CHEMICAL PARAMETERS					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	RESULT	NAAQ Standards
1	Particulate Matter, PM ₁₀	IS 5182 (Part 23):2006	µg/m ³	37.9	Max 100
2	Particulate Matter, PM _{2.5}	EPA 40 CFR (Part 50) Appendix - L	µg/m ³	16.4	Max 60
3	Sulphur Dioxide as SO ₂	IS 5182 (Part 2): 2001	µg/m ³	<2.00	Max 80
4	Oxides of Nitrogen as NO ₂	IS 5182 (Part 6): 2006	µg/m ³	<2.00	Max 80
5	Carbon monoxide (CO)	IS 5182 Part 10: 1999	mg/ m ³	< 0.10	Max 4.00

Remarks:

End of Report


Shency Joy
Checked by:


Lajju P. N.
Laboratory Head
Authorized Signatory

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TEST REPORT

ULR No: TC540222000002294F

LRI No.:SEAAL22030943A

Date: 30-03-2022

Page 1 of 2

CUSTOMER DETAILS

Customer Name & Address	M/s Mata Amritanandamayi Math Amritapuri Campus Karunagappally Kollam District
Customer Reference	Test Request dt: 23-03-2022

SAMPLE DETAILS

Product Category	Pollution & Environment	Sample Code	EN22030376
Sample Name	Soil	Sample Received on	25-03-2022
Sample Conditions at Receipt	Fit for Analysis	Test Commenced on	25-03-2022
Sample Quantity & Packing	500g in Plastic Bag	Test Completed on	30-03-2022
Sampled by	Lab Authorized Sampler	Information Provided by Customer	---

DETAILS OF SAMPLING

Sample Source	Project Site	Date of Sampling	23-03-2022
Sampling Procedure	SEAAL/ENL/GEN/SOP/08	Sample Temperature	31 °C
Latitude	N 09°05.857'	Longitude	E 076°29.388'

SAMPLING SITE DETAILS

Re-Survey No.	383/4-2,384/1,371/3,388/2-2,359/1		
Village	Clappana & K S Puram	Taluk	Karunagappally
District	Kollam	State	Kerala

TEST RESULTS- CHEMICAL PARAMETERS

Sl. No.	PARAMETERS	TEST METHOD	UNIT	RESULT
1	pH	IS 10158: 1982	---	6.58
2	Conductivity	IS 14767: 2000	μS/cm	260


Shency Joy
Dy. TM Chemical


Laiju P. N.
Laboratory Head

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TEST REPORT

ULR No: TC540222000002294F		
LRI No.:SEAAL22030943A	Date: 30-03-2022	Page 2 of 2

TEST RESULTS- CHEMICAL PARAMETERS					
Sl. No.	PARAMETERS		TEST METHOD	UNIT	RESULT
3	Water Holding Capacity		SEAL/EN/SLS/SOP/01	%	65.2
4	Particle Size Distribution	Clay	SEAL/EN/SLS/SOP/14	%	22.5
		Sand	SEAL/EN/SLS/SOP/14	%	46.1
		Silt	SEAL/EN/SLS/SOP/14	%	31.4
5	Organic Matter		IS 2720 Part 22:1992	%	0.28
6	Sodium as Na		USEPA 7000B:2009	%	0.20
7	Chlorides		SEAL/EN/SLS/SOP/08	mg/Kg	125
8	Sulphur as SO ₄		IS 2720 Part 27: 1977	%	0.06
9	Total Kjeldahl Nitrogen (as N)		IS 14684 :1999	mg/Kg	412
10	Available Potassium		SEAL/EN/SLS/SOP/03	mg/Kg	8.10
11	Total Phosphorous (as P)		IS 10158: 1982	mg/Kg	78.2

Remarks:

End of Report


Shency Joy
 Dy. TM Chemical


Lalju P. N.
 Laboratory Head

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 Web: www.sealabs.in, E-mail: seaalab@gmail.com

TEST REPORT

ULR No: TC540222000002295F

LRI No.:SEAAL22030944A

Date: 30-03-2022

Page 1 of 2

CUSTOMER DETAILS

Customer Name & Address	M/s Mata Amritanandamayi Math Amritapuri Campus Karunagappally Kollam District
Customer Reference	Test Request dt: 23-03-2022

SAMPLE DETAILS

Product Category	Water	Sample Code	WT22030229
Sample Name	Surface Water	Sample Received on	25-03-2022
Sample Conditions at Receipt	Fit for Analysis	Temperature @ Receipt	4 °C
Sample Quantity & Packing	2 litre & 500mL Plastic Bottle	Test Commenced on	25-03-2022
Sampled by	Lab Authorized Sampler	Test Completed on	30-03-2022
Information Provided by Customer	---		

DETAILS OF SAMPLING

Sample Source/Location	Pond Water - Project Site	Date of Sampling	23-03-2022
Sampling Procedure	SEAAL/ENL/GEN/SOP/01 & SEAAL/MBL/SOP/06	Sample Temperature	31 °C
Latitude	N 09°06'01.2''	Longitude	E 76°29'23.9''

SAMPLING SITE DETAILS

Survey No.	383/4-2,384/1,371/3,388/2-2,359/1		
Village	Clappana& K S Puram	Taluk	Karunagappally
District	Kollam	State	Kerala

TEST RESULTS- CHEMICAL PARAMETERS

Sl. No.	PARAMETERS	TEST METHOD	UNIT	RESULT	Requirement as per Acceptable Limit of IS 10500 : 2012
1	Colour	IS 3025 (Part 4):1983	Hazen	1.00	Max 5
2	Odour	IS 3025 (Part 5):2018	---	Agreeable	Agreeable


Shency Joy
Dy. TM Chemical
Checked by:


Salini T. S.
Microbiologist
Authorized Signatory


Laiju P.N.
Laboratory Head
Authorized Signatory

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TEST REPORT

ULR No: TC540222000002295F

LRI No.:SEAAL22030944A

Date: 30-03-2022

Page 2 of 2

TEST RESULTS- CHEMICAL PARAMETERS

Sl. No.	PARAMETERS	TEST METHOD	UNIT	RESULT	Requirement as per Acceptable Limit of IS 10500 : 2012
3	Turbidity	IS 3025 (Part 10):1984	NTU	0.30	Max 1
4	pH	IS 3025 (Part 11):1983	---	6.85	6.50 - 8.50
5	Conductivity	IS 3025 (Part 14):1984	µS/cm	33900	---
6	Total Dissolved Solids	IS 3025 (Part 16):1984	mg/L	22030	Max 500
7	Total Hardness as CaCO ₃	IS 3025 (Part 21):2009	mg/L	3927	Max 200
8	Calcium as Ca	IS 3025 (Part 40):1991	mg/L	260	Max 75
9	Magnesium as Mg	IS 3025 (Part 46):1994	mg/L	795	Max 30
10	Chloride as Cl	IS 3025 (Part 32):1988	mg/L	14496	Max 250
11	Total Alkalinity as CaCO ₃	IS 3025 (Part 23):1986	mg/L	141	Max 200
12	Iron as Fe	IS 3025 (Part 53):2003	mg/L	0.20	Max 1
13	Sulphate as SO ₄	IS 3025 (Part 24):1986	mg/L	31.9	Max 200

TEST RESULTS - BIOLOGICAL PARAMETERS


Sl. No.	PARAMETERS	TEST METHOD	UNIT	RESULT	Requirement as per Acceptable Limit of IS 10500 : 2012
1	Total Coliforms	IS 15185 : 2016	----	Present/100 ml	Absent/100 ml
2	E coli	IS 15185 : 2016	----	Absent/100 ml	Absent/100 ml

Remarks:

End of Report


Shency Joy
 Dy. TM Chemical
 Checked by:


Salini T. S.
 Microbiologist
 Authorized Signatory


Lalju P. N.
 Laboratory Head
 Authorized Signatory

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vide Certificate No. TC - 5402 & "A" Grade Laboratory approved by KSPCB.

K.J. Tower, Pathalam, Udyogamandal P.O., Ernakulam-683 501, Tel. 0484-2546660, 93 87 27 24 02, 90 74 34 14 43

Web: www.sealabs.in, E-mail: sealab@gmail.com

Calibration Certificates

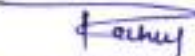
CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/19	ULR No. : CC306521000002457F	Page : 01 Of 03
------------------------------------	------------------------------	-----------------

- Name & Address Of Customer** : **STANDARD ENVIRONMENTAL & ANALYTICAL LABORATORIES**
K.J Tower, Above SBI-TSC Eloor Branch, Pathalam,
Udyogamandal P.O, Ernakulam, Kerala-683 501.
- UUC Fitted in Instrument**
 - Name Of Machine : Respirable Dust Sampler
 - Make : Envirotech
 - Model no/serial No. : APM 460/1807-DTF-2013
- Description of Unit Under Calibration**
 - Name of Instrument : Orifice Manometer
 - Range : 0.6-1.5 m3/min
 - Resolution : 0.025 (0.6-0.8 & 1.3-1.5) m3/min, 0.01(0.8-1.3)m3/min.
 - Make : ---
 - Instrument ID. No. : SEAAL/ENL/EQ/001
 - Sr. No. : ---
 - Model No./Type/Size : ---/Analogue/---
- Condition Of the item on receipt** : Satisfactory
- Calibration Contract Form No.** : ETPL/N/2107031
- Discipline/Group** : Fluid Flow Calibration
(Group:Flow Measuring Device)
- Date of receipt of the item** : 20.07.2021*
- Date & Place of Calibration** : 20.07.2021
At Site
- Next due date of calibration
(As suggested by customer)** : 19.07.2022
- Certificate Issue Date** : 22.07.2021
- Environmental condition** :

Temperature	27.3	°C
Humidity	59	% RH
Pressure	751	mmHg
- Standard Operating Procedure No.** : ETPL/SOP/RDS/03B

PREPARED BY



Mr. Rahul Khalsi



AUTHORISED SIGNATORY



Mr. Sagar Ranpura
(Technical Manager)

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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/19	ULR No. : CC306521000002457F	Page : 02 Of 03
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13. Details Standards used for calibration & traceability

Description of Reference Standards	Calibration Certificate No.	Due Date	Calibrated By
Top loading Calibrator ID No.:ETPL/FW/TLO/07	CA 2360 2103 694	22.03.2022	FCRI
Digital Pressure Calibrator ID No.:ETPL/P/PRC-200/05	PICAL/0621/P/036	20.06.2022	PI Calibration

Calibration Result

Sr No	Average Flow Readings in Standard (m3/min)	Average Flow readings in UUC (m3/min)	Corrected readings in standard (m3/min)	Corrected Readings in UUC (m3/min)	Error (%)
1	0.650	0.650	0.637	0.637	0.000
2	0.790	0.800	0.775	0.784	1.266
3	0.980	0.990	0.961	0.971	1.020
4	1.000	1.010	0.981	0.990	1.000
5	1.340	1.350	1.314	1.324	0.746

Expanded Uncertainty at 95 % Confidence level and K=1.96	± 2.20 % of Rdg
--	---------------------

PREPARED BY

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Doyal Estate, National Highway No. 8, Opp. APMC Market Gate-1, Jetalpur, Ahmedabad-382426.



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Mr. Sagar Ranpura
(Technical Manager)

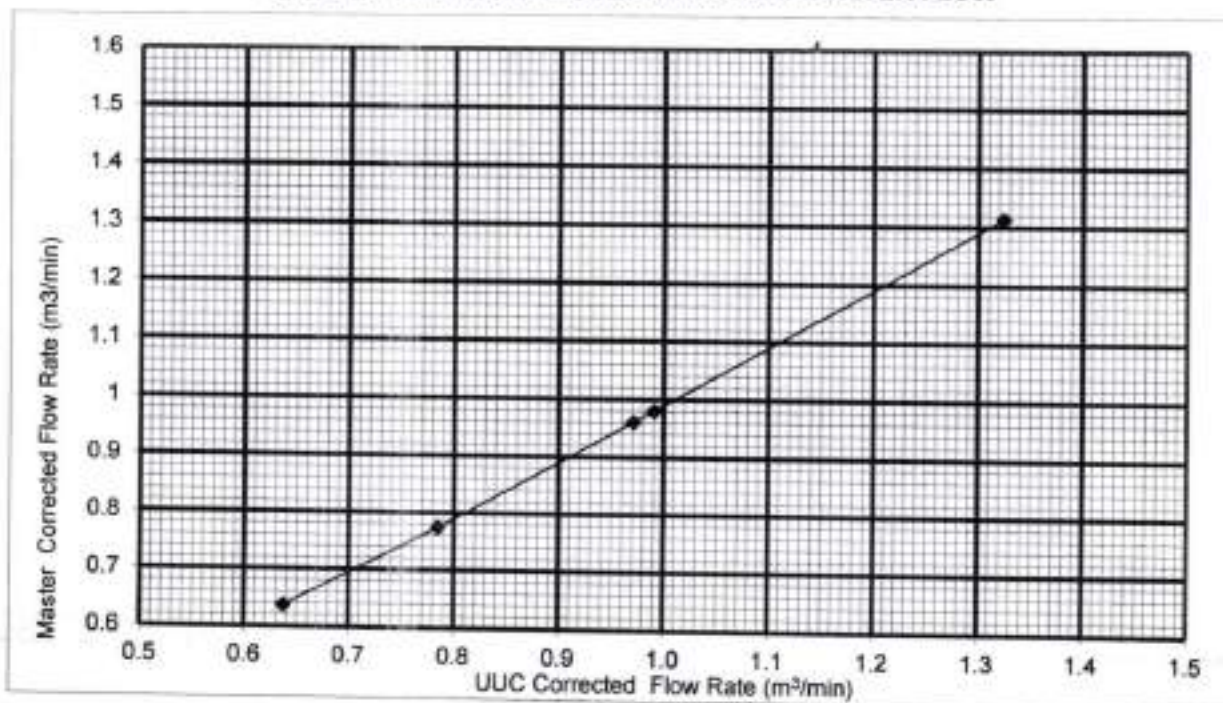
CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/19

ULR No. : CC306521000002457F

Page : 03 Of 03

CALIBRATION CURVE FOR ORIFICE MANOMETER FLOW



Sr.No.	Corrected Readings in UUC(X) m3/min	Corrected readings in standard (Y) m3/min
1	0.637	0.637
2	0.784	0.775
3	0.971	0.961
4	0.990	0.981
5	1.324	1.314

14. Remarks :

- 1) The Results are obtained at the time of calibration only related to the item calibrated.
- 2) The calibration certificate shall not be reproduced without written approval of Eonair Technologies Pvt. Ltd.
- 3) The Values has been roundoff as per IS-2 1960 wherever applicable.
- 4) The calibration results reported in this certificate are valid at the time of calibration & Under the stated condition of measurement.
- 5) Reference used are directly traceable to National /International standard through unbroken chain of calibration.
- 6) Uncertainty of measurements are given at confidence level 95 % with coverage factor $k = 1.96$.
- 7) Formet No:FF-01, Amendment No:04.
- 8) UUC=Unit Under Calibration.
- 9) The calibration is done using air as medium and Top Loading Orifice as reference standard and is kept at downstream and Orifice manometer inlet free to open atmosphere.

PREPARED BY

Mr. Rahul Khatasi

EONAIR TECHNOLOGIES PVT. LTD.



End Of Certificate

AUTHORISED SIGNATORY

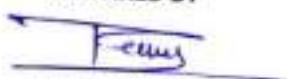
Mr. Sagar Ranpura
(Technical Manager)

CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/20	ULR No. : CC306521000002458F	Page : 01 Of 02
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1. Name & Address Of Customer	STANDARD ENVIRONMENTAL & ANALYTICAL LABORATORIES K.J Tower, Above SBI-ISC Eloor Branch, Pathalam, Udyogamandal P.O, Ernakulam, Kerala-683 501.
2. Description of Unit Under Calibration	
Name Of Instrument	Stop Watch (Fitted in Respirable Dust Sampler, Make:Envirotech, Model No:APM 460, Sr. No.-1807-DTF-2013)
Range	Parameter to be calibrated : TIME
Resolution	24 Hrs.
Make	0.01 Sec
Instrument ID. No.	---
Sr. No.	SEAAL/ENL/EQ/001A
Model No./Type/Size	T-188
	---/---/---
3. Condition Of the item on receipt	Satisfactory
4. Calibration Contract Form No.	ETPL/N/2107031
5. Discipline/Group	Electro-Technical Calibration (Group:-TIME & FREQUENCY)
6. Date of receipt of the item	20.07.2021
7. Date & Place of Calibration	20.07.2021 At Site
8. Next due date of calibration (As suggested by customer)	19.07.2022
9. Certificate Issue Date	22.07.2021
10. Environmental condition	Temperature 26.8 °C Humidity 57 % RH
11. Standard Operating Procedure No	ETPL/SOP/TIME/07A

PREPARED BY



Mr. Rahul Khalasi



AUTHORISED SIGNATORY



Ms. Sangita Zala
(Technical Manager)

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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/20	ULR No. : CC306521000002458F	Page : 01 Of 02
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12. Details of Standards used for calibration & traceability

Description of Reference Standards	Calibration Certificate No.	Valid up to	Calibrated By
Digital Timer ID No.:ETPL/ET/DT/03	2106/0125/01	07.06.2022	Excellent Services

CALIBRATION RESULTS

Time Calibration

Sr. No.	Standard Reading				UUC Reading				Error		Expanded Uncertainty in \pm (Second)
	Hour	Minutes	Second	1/100 Second	Hour	Minutes	Second	1/100 Second	Second	1/100 Second	
1	00	30	0	19	00	30	0	23	—	4	20.00

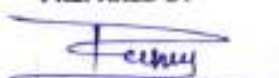
Time Calibration

Time Calibration							
Sr. No.	Standard Reading				UUC Reading	Error	Expanded Uncertainty in
	Hour	Minutes	Second	1/100 Second	Minutes	%	± (Second)
1	00	30	0	19	30	0.00018	20.00

13. Remarks

- 1)The Results obtained at the time of calibration only related to the item calibrated.
- 2)The calibration certificate shall not be reproduced without written approval of Eonair Technologies Pvt. Ltd.
- 3)The values has been roundoff as per IS-2 1960 wherever applicable.
- 4)The calibration results reported in this certificate are valid at the time of calibration & under the stated condition of measurement.
- 5)Reference used are directly traceable to National / International standard through unbroken chain of calibration.
- 6)Uncertainty of measurements at 95 % confidence level with coverage factor $k = 1.96$.
- 7)Format No.: FF-01 , Amendment No.:04
- 8)Unit Under Calibration reading and Standard Reading are average of 3 reading.

PREPARED BY


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CALIBRATION CERTIFICATE

CERTIFICATE NO.:ETPL/N/2107031/24	ULR No. : CC306521000002462F	Page : 01 Of 02
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- | | |
|---|---|
| 1. Name & Address Of Customer

2. UUC Fitted in Instrument
Name Of Machine
Make
Model No/Serial No.

3. Description of Unit Under Calibration
Name Of Instrument
Range
Resolution
Make
Instrument ID. No.
Sr. No.
Model No./Type /Size

4. Condition Of the item on receipt

5. Calibration Contract Form No.

6. Discipline/Group

7. Date of receipt of the item

8. Date & Place of Calibration

9. Next due date of calibration (As suggested by customer)

10. Certificate Issue Date

11. Environmental condition

12. Standard Operating Procedure No. | : STANDARD ENVIRONMENTAL & ANALYTICAL LABORATORIES
K.J Tower,Above SBI-ISC Eloor Branch,Pathalam,
Udyogamandal P.O,Ernakulam,Kerala-683 501.

: Mini Fine Particulate Sampler
: Envirotech
: APM 550 niini/188-DTK-2013

: Rotameter
: 0 to 20 LPM
: 0.5 LPM
: Flow Star
: SEAA/ENL/EQ/002
: AG13D638
: --/--/--

: Satisfactory

: ETPL/N/2107031

: Fluid Flow Calibration
(Group:Flow Measuring Device)

: 20.07.2021

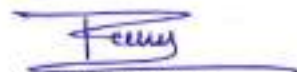
: 20.07.2021
At Site

: 19.07.2022

: 22.07.2021

: Temperature 26.4 °C
Humidity 54 % RH

: ETPL/SOP/RM/01B |
|---|---|

PREPARED BY

Mr. Rahul Khalasi

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CALIBRATION CERTIFICATE

CERTIFICATE NO.:ETPL/N/2107031/24	ULR No. : CC306521000002462F	Page : 02 Of 02
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13. Standards used for calibration & traceability

Description of Reference Standards	Calibration Report No.	Valid up to	Calibrated By
Name : Laminar gas flow calibrator ID No.:ETPL/FW/LGF/02	PICAL/0321/F/352	14.03.2022	Politech

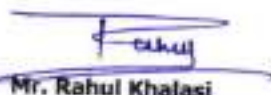
Calibration Result

SR NO	SET ON UUC LPM	READING ON STANDARD (LPM)					AVERAGE READING (LPM)	DEVIATION (LPM)	EXPANDED UNCERTAINTY at 17 LPM
		1	2	3	4	5			
1	17.00	17.18	17.18	17.19	17.18	17.18	17.182	0.182	2.19 %

14. Remarks :

- 1) The Results are obtained at the time of calibration only related to the item calibrated.
- 2) The calibration certificate shall not be reproduced without written approval of Eonair Technologies Pvt. Ltd.
- 3) The Values has been roundoff as per IS-2 1960 wherever applicable.
- 4) The calibration results reported in this certificate are valid at the time of calibration & Under the stated condition of measurement.
- 5) Reference used are directly traceable to National /International standard through unbroken chain of calibration.
- 6) Uncertainty of measurements are given at confidence level 95 % with coverage factor $k = 1.96$.
- 7)Formet No:FF-01,Amendment No:04.
- 8)UUC=Unit Under Calibration.
- 9)The calibration is done using atmospheric air,unit under calibration and LEF gas flow calibrator connected in series,the mode of flow is vacuume and regulated by air flow control valve.

PREPARED BY



Mr. Rahul Khalasi



AUTHORISED SIGNATORY



Mr. Sagar Ranpura
(Technical Manager)

End Of Certificate

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Doyal Estate, National Highway No. 8, Opp. APMC Market Gate-1,
Jetalpur, Ahmedabad-382426.

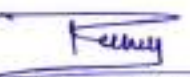
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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/25		ULR No. : CC306521000002463F	Page : 01 Of 02
1. Name & Address Of Customer	:	STANDARD ENVIRONMENTAL & ANALYTICAL LABORATORIES K.J Tower, Above SBI-ISC Eloor Branch, Pathalam, Udyogamandal P.O, Emakulam, Kerala-683 501.	
2. Description of Unit Under Calibration	:	Stop Watch (Fitted in Make: Envirotech, Model No: APM 550 mini, Sr No.-188-DTK-2013) Parameter to be calibrated : TIME	
Name Of Instrument	:	Stop Watch (Fitted in Make: Envirotech, Model No: APM 550 mini, Sr No.-188-DTK-2013)	
Range	:	24 Hrs.	
Resolution	:	0.01 Sec	
Make	:	—	
Instrument ID. No.	:	SEAAL/ENL/EQ/002A	
Sr. No.	:	T-1807	
Model No./Type/Size	:	—/—/—	
3. Condition Of the item on receipt	:	Satisfactory	
4. Calibration Contract Form No.	:	ETPL/N/2107031	
5. Discipline/Group	:	Electro-Technical Calibration (Group:-TIME & FREQUENCY)	
6. Date of receipt of the item	:	20.07.2021	
7. Date & Place of Calibration	:	20.07.2021 At Site	
8. Next due date of calibration (As suggested by customer)	:	19.07.2022	
9. Certificate Issue Date	:	22.07.2021	
10. Environmental condition	:	Temperature 27.5 °C Humidity 57 % RH	
11. Standard Operating Procedure No	:	ETPL/SOP/TIME/07A	

PREPARED BY



Mr. Rahul Khalasi



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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/25	ULR No. : CC305521000002463F	Page : 01 Of 02
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12. Details of Standards used for calibration & traceability

Description of Reference Standards	Calibration Certificate No.	Valid up to	Calibrated By
Digital Timer ID No.:ETPL/ET/DT/03	2106/0125/01	07.06.2022	Excellent Services

CALIBRATION RESULTS

Time Calibration

Sr. No.	Standard Reading				UUC Reading				Error		Expanded Uncertainty in \pm (Second)
	Hour	Minutes	Second	1/100 Second	Hour	Minutes	Second	1/100 Second	Second	1/100 Second	
1	00	30	0	15	00	30	0	23	---	8	20.00

Time Calibration

Sr. No.	Standard Reading				UUC Reading		Error	Expanded Uncertainty in
	Hour	Minutes	Second	1/100 Second	Minutes		%	± (Second)
1	00	30	0	15	30		0.00014	20.00

13. Remarks

- 1)The Results obtained at the time of calibration only related to the item calibrated.
- 2)The calibration certificate shall not be reproduced without written approval of Eonair Technologies Pvt. Ltd.
- 3)The values has been roundoff as per IS-2 1960 wherever applicable.
- 4)The calibration results reported in this certificate are valid at the time of calibration & under the stated condition of measurement.
- 5)Reference used are directly traceable to National / International standard through unbroken chain of calibration.
- 6)Uncertainty of measurements at 95 % confidence level with coverage factor $k = 1.96$.
- 7)Format No.: FF-01 , Amendment No.:04
- 8)Unit Under Calibration reading and Standard Reading are average of 3 reading.

PREPARED BY


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(Technical Manager)

-----End Of Certificate-----

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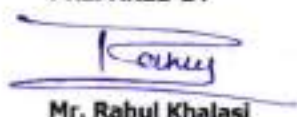
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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/21	ULR No. : CC306521000002459F	Page : 01 Of 02
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- Name & Address Of Customer** : **STANDARD ENVIRONMENTAL & ANALYTICAL LABORATORIES**
K.J Tower, Above SBI-ISC Eloor Branch, Pathalam,
Udyogamandal P.O, Ernakulam, Kerala-683 501.
- UUC Fitted in Instrument**
Name Of Machine : Gaseous Sampling Attachment
Make : Envirotech
Model No./Serial No. : APM-411/5213-DTJ-2013
- Description of Unit Under Calibration**
Name Of Instrument : Rotameter
Range : 0 - 2 LPM
Resolution : 0.1 LPM
Make : Flow Star
Instrument ID. No. : SEAAL/ENL/EQ/003
Serial No. : AG15D6419-1443
Model No./Type /Size : ---/---/---
- Condition Of the item on receipt** : Satisfactory
- Calibration Contract Form No.** : ETPL/N/2107031
- Discipline/Group** : Fluid Flow Calibration
(Group:Flow Measuring Device)
- Date of receipt of the item** : 20.07.2021
- Date & Place of Calibration** : 20.07.2021
At Site
- Next due date of calibration (As suggested by customer)** : 19.07.2022
- Certificate Issue Date** : 22.07.2021
- Environmental condition** : Temperature 26.5 °C
Humidity 57 % RH
- Standard Operating Procedure No.** : ETPL/SOP/RM/01B

PREPARED BY



Mr. Rahul Khalasi



AUTHORISED SIGNATORY



Mr. Sagar Ranpura
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CALIBRATION CERTIFICATE

CERTIFICATE No.: ETPL/N/2107031/21	ULR No. : CC306521000002459F	Page : 02 Of 02
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13. Details of Standards used for calibration & traceability


Description of Reference Standards	Calibration Certificate No.	Valid up to	Calibrated By
Laminar gas flow calibrator ID No:ETPL/PW/LGF/03	PICAL/0321/F/353	14.03.2022	Polltech

Calibration Result

SR NO	SET ON UUC LPM	READING ON STANDARD (sccm)					AVERAGE READING (sccm)	DEVIATION (sccm)	EXPANDED UNCERTAINTY at 2 LPM
		1	2	3	4	5			
1	0.3	321.3	321.2	321.3	321.3	321.2	321.3	21.3	3.25 %
2	0.5	533.9	533.2	532.8	532.4	532.9	533.0	33.0	
3	1.0	1045.3	1045.0	1045.0	1045.9	1045.2	1045.3	45.3	
4	1.5	1555.9	1555.5	1555.1	1555.3	1555.3	1555.4	55.4	
5	2.0	2065.3	2065.8	2065.1	2065.3	2065.1	2065.3	65.3	

14. Remarks :

- 1) The Results are obtained at the time of calibration only related to the item calibrated.
- 2) The calibration certificate shall not be reproduced without written approval of Eonair Technologies Pvt. Ltd.
- 3) The Values has been roundoff as per IS-2 1960 wherever applicable.
- 4) The calibration results reported in this certificate are valid at the time of calibration & Under the stated condition of measurement.
- 5) Reference used are directly traceable to National /International standard through unbroken chain of calibration.
- 6) Uncertainty of measurements are given at confidence level 95 % with coverage factor $k = 1.96$.
- 7) Format No:FF-01, Amendment No:04.
- 8) UUC=Unit Under Calibration.
- 9) The calibration is done using atmospheric air, unit under calibration and LEF gas flow calibrator connected in series, the mode of flow is vacuum and regulated by air flow control valve.
- 10) sccm=standard cubic centimetre per minute.
- 11) 1 sccm=0.001 LPM.

PREPARED BY

Mr. Rahul Khalasi


End Of Certificate

AUTHORISED SIGNATORY

Mr. Sagar Ranpura
(Technical Manager)
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Dayal Estate, National Highway No. 8, Opp. APMC Market Gate-1,
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ADDING VALUE

ROOTS METROLOGY & TESTING LABORATORY

(A Division of Roots Industries India Limited)

No. 37, First Main Road, SIDCO Industrial Estate, Thirumazhisai, Chennai - 600 124.
Phone : 044 - 26811673, 82200 26203, 96776 52679, E-mail : chrmrtl@rootsemail.com



Issued Date : 08-07-2021

CALIBRATION CERTIFICATE

ULR Number: CC220121000005441F

NAME AND ADDRESS OF THE CUSTOMER	Certificate No.	: CRM/TL/01/421100642-A1
M/S. STANDARDS ENVIRONMENTAL & ANALYTICAL LABORATORIES	Date Of Calibration	: 07/07/2021
K.J TOWER, PATHALAM, UDYOGAMANDAL P.O	Suggested Calibration Due	: 06/07/2022
ERNAKULAM KERALA Pincode -683501	Customer Reference & Date	: Mail - 06/07/2021
	Customer PO Ref. & Date	: Na -

1. DESCRIPTION OF DUC

Name of the DUC	: Sound Level Meter	Date of Receipt of Item	: 07/07/2021
Range / Size	: 30-130 dbA	Receiving Condition of DUC	: GOOD
L.C	: 0.1dDa	Ref. Document	: As per manufacturer's
Identification	: SEAAL/ENL/EQ/040	Cal. Procedure Ref.No.	: CRM/TL/WI/205
Sl. No.	: 130911982	Environmental Conditions	: 20.4°C & 50.9% RH
Make	: HTC Instruments	Uncertainty of Measurement	: As Reported
Model	: SL-1352	Location	: —

2. DETAILS OF MASTER USED

Standard Instrument Used	Make	ID NO.	Traceable To /Certificate No.	Validity
Sound Level Calibrator	Lutron	CRM/TL-355	FCRI/EQL/20-21/282	16/09/2021

The masters are traceable to National / International standards as per ISO / IEC 17025.

Calibration Field : Mechanical

3. CALIBRATION RESULTS

3.1 CALIBRATED AT THE RANGE :

All values in dBA

STANDARD VALUE	CALIBRATED VALUE	ERROR	EXPANDED UNCERTAINTY ±
94	94.0	0.0	0.26
114	113.8	-0.2	0.27

4. REMARKS

4.1. Uncertainty estimated for a confidence level of 95% at the K factor = 2

4.2. The reported results are valid only for the condition of the items received at the time and under the stated conditions of the calibration.

4.3. DUC - Device Under Calibration

CALIBRATION LABEL / STATUS

White : Calibrated & The results are stated as indicated.

** End **

CALIBRATED BY (CALIBRATION ENGINEER)	AUTHORIZED BY (QM/TM/DY/TM/Sc/Ed)	This Report refers only to the sample submitted and may not be reproduces in full or in part, without written permission from Roots Metrology & Testing Laboratory, Chennai.	1 of 1
 P. Pradeep	 NEELAKANDAN R		
Calibration Label / Status :	White : Calibrated <input checked="" type="checkbox"/>	Green : Accepted - Valid for use <input type="checkbox"/>	* NEXT CALIBRATION DUE AS PER CUSTOMERS PLAN AND REQUIREMENT
	Yellow : Limited use (Refer report) <input type="checkbox"/>	Red : Rejected-Out of use (Refer report) <input type="checkbox"/>	

ANNEXURE VI

(Photocopies of the Newspaper Advertisements)

Waste treatment, sea wall our top priority: Congress

Waste management and sea wall construction are the top priorities of the Congress party in Kollam, as the party prepares for the upcoming local body elections. The party leaders have emphasized the need for effective waste management and the construction of sea walls to protect the coastal areas of the district.



Waste management and sea wall construction are the top priorities of the Congress party in Kollam, as the party prepares for the upcoming local body elections.



Waste management and sea wall construction are the top priorities of the Congress party in Kollam, as the party prepares for the upcoming local body elections.

Waste management and sea wall construction are the top priorities of the Congress party in Kollam, as the party prepares for the upcoming local body elections.

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Waste management and sea wall construction are the top priorities of the Congress party in Kollam, as the party prepares for the upcoming local body elections.

Cops crack mining case of minor girls

The police have cracked a mining case involving minor girls in Kollam. The case was reported by the local community and the police have taken strict action against the offenders.

The police have cracked a mining case involving minor girls in Kollam. The case was reported by the local community and the police have taken strict action against the offenders.

The police have cracked a mining case involving minor girls in Kollam. The case was reported by the local community and the police have taken strict action against the offenders.

Police crack mining case of minor girls

Police crack mining case of minor girls

Police crack mining case of minor girls

Police crack mining case of minor girls

NOTICE

This notice is to inform the public that the proposed...
 The notice contains detailed information about a public project or event, including dates, locations, and contact details for further information.

ANNEXURE VII

(Copy of Approval of Lab)



National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

**STANDARDS ENVIRONMENTAL & ANALYTICAL
LABORATORIES**

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

K.J TOWER, PATHALAM, UDYOGAMANDAL P.O., ERNAKULAM, KERALA, INDIA

in the field of

TESTING

Certificate Number: TC-5402

Issue Date: 21/11/2021

Valid Until:

20/11/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : STANDARDS ENVIRONMENTAL & ANALYTICAL LABORATORIES

Signed for and on behalf of NABL



N. Venkateswaran
Chief Executive Officer



KERALA STATE POLLUTION CONTROL BOARD CENTRAL LABORATORY

കേരള സംസ്ഥാനമലിനീകരണ നിയന്ത്രണ ബോർഡ്

കേന്ദ്ര പരീക്ഷണശാല

An Environmental Laboratory recognised under E(P)A 1986



Certificate No.
TC 8525

Ref. No. PCB/CL/RL/76/2013



Date: 09.02.2022
(Nine page Document)

CERTIFICATE OF APPROVAL OF LABORATORY 'A' GRADE – COMMERCIAL CATEGORY

Approval No. PCB/CL/RL/76/2021

Valid up to 12.10.2023

- Ref: 1. Certificate of Approval No.PCB/CL/RL/76/2013 dated 05.02.2020 valid upto 12.10.2021
2. NABL Certificate TC-5402 valid upto 20.11.2023
3. Application dated 30.06.2021.

The Certificate of approval as 'A' Grade Commercial Category' laboratory for analysis of parameters for Water, Wastewater, Solid waste, Ambient air, Stack emission and sound level measurements is issued to the **STANDARDS ENVIRONMENTAL & ANALYTICAL LABORATORIES**, Pathalam, Udyogamandal P.O., Ernakulam – 683 501. The approval is based on the particulars furnished in the application cited, inspection findings and subject to the following conditions.

CONDITIONS

1. This certificate is granted subject to power of the Board to review, revise or revoke the same.
2. This certificate, subject to Condition No.1, shall be valid upto 12.10.2023 In case the continuance of approval is desired, application shall be submitted at least two months in advance of the date of expiry to the Chief Environmental Scientist, Kerala State Pollution Control Board, Gandhinagar, Ernakulam - 682 020.
3. Any change of analytical personnel shall be reported to the Chief Environmental Scientist, with bio-data of the newly appointed persons.

(Continued...2)





4. Records of all analytical personnel shall be maintained for a minimum period of six months and shall be produced, if called for, for inspection by the Board Officers.
5. The Laboratory shall take part in analytical quality control exercise conducted by the Board.
6. The method of analysis of each parameter shall be specified in the analysis report.
7. The authenticity/accuracy of results will be considered in increasing order from grade C to B to A, when results of the same sample are reported by laboratories of different grades.
8. The washings and balance of samples of effluent/solid waste shall be treated and disposed safely.
9. The approval is applicable for analysis of the following parameters in water air and emission.

The approval as "A" Grade commercial Category is issued to the laboratory for analysis of the following parameters:

I. WATER

1. Colour
2. Odour
3. Temperature
4. Turbidity
5. pH value
6. Electrical Conductivity
7. Total Solids
8. Fixed Solids
9. Volatile Solids
10. Inorganic Solids
11. Organic Solids
12. Total Dissolved Solids
13. Total suspended solids
14. Total Hardness
15. Acidity
16. Total alkalinity
17. Phenolphthalein Alkalinity
18. Phenolic Compounds
19. Calcium
20. Magnesium

(Continued...3)



21. Chloride
22. Sulphate
23. Sulphide
24. Nitrate
25. Nitrite
26. Fluoride
27. Free Ammonia
28. Ammoniacal Nitrogen (Marine water)
29. Total Phosphates
30. Residual Chlorine
31. Total Kjeldhal Nitrogen
32. Oil & Grease
33. Iron
34. Manganese
35. Nickel
36. Aluminium
37. Arsenic
38. Cadmium
39. Copper
40. Total Chromium
41. Hexavalent Chromium
42. Lead
43. Mercury
44. Silica
45. Dissolved Oxygen
46. Biochemical Oxygen Demand
47. Chemical Oxygen Demand
48. Ammonia as NH_3
49. Anionic Detergents (Surfactant) as (MBAS)
50. Barium as Ba
51. Benzene as C_6H_6
52. Benzo (a) Pyrene
53. Boron as B
54. Carbonate Hardness as CaCO_3
55. Chloramines
56. Cobalt
57. Colour Retention fo KMnO_4
58. Dissolved Phosphate as P
59. Molybdenum as Mo
60. Non-Carbonate Hardness as CaCO_3

(Continued...4)



61. Oxygen Absorbed in 4 Hrs @ 27°C
62. Pesticides
63. Potassium as K
64. Residual Sodium Carbonate
65. Salinity
66. Selenium as Se
67. Silver as Ag
68. Sodium Adsorption Ratio
69. Sodium as Na
70. Taste
71. Vanadium as V
72. Water Neutralization: To neutralize 100 ml sample of water, using Phenolphthalein as an indicator, using 0.02N NaOH
73. Water Neutralization: To neutralize 100 ml sample of water, using mixed indicator using 0.02N H₂SO₄
74. Zinc as Zn
75. Pass 850 micron Sieve
76. Poly Aromatic Hydrocarbon
77. Poly Chlorinated bi-phenyl
78. Trihalomethanes

II. WASTES (LIQUID/SLURRY/SLUDGE/SOLID/SEMI-SOLID)

1. Hexavalent Chromium Cr⁶⁺
2. Antimony as Sb
3. Arsenic as As
4. Cadmium as Cd
5. Calcium as Ca
6. Chromium as Cr
7. Cobalt as Co
8. Copper as Cu
9. Iron as Fe
10. Lead as Pb
11. Magnesium as Mg
12. Manganese as Mn
13. Mercury as Hg
14. Nickel as Ni
15. Phosphorus as P
16. Potassium as K
17. Selenium as Se
18. Silver as Ag
19. Sodium Adsorption Ratio

(Continued...5)



20. Sodium as Na
21. Total Nitrogen as N
22. Zinc as Zn

III. AMBIENT AIR

1. Suspended Particulate Matter
2. Particulate Matter less than (PM_{10})
3. Particulate Matter less than ($PM_{2.5}$)
4. Sulphur dioxide as SO_2
5. Ozone
6. Ammonia
7. Hydrogen Sulphide
8. Carbon Monoxide
9. Lead
10. Arsenic
11. Benzene
12. Benzo (a) pyrene
13. Nickel as Ni
14. Total Hydrocarbon (Hydrocarbon)
15. Oxides of Nitrogen as NO_x

IV. STACK/EMISSION PARAMETERS

1. Particulate Matter
2. Sulphur dioxide as SO_2
3. Oxides of Nitrogen as NO_x
4. Temperature
5. Velocity of gas discharged
6. Hydrogen Sulphide
7. Ammonia
8. Carbon Monoxide
9. Carbon Dioxide
10. Oxygen
11. Lead as Pb
12. Mercury as Hg
13. Nickel as Ni
14. Sulphuric Acid Mist
15. Vanadium as V
16. Volume of gas discharged
17. Fluoride as F

(Continued...6)



V. WORK ENVIRONMENT AND INDOOR QUALITY

1. Ammonia as (NH₃)
2. Arsenic as As
3. Benzene as (C₆H₆)
4. Benzo (a) Pyrene Particulate Phase only
5. Carbon dioxide (as CO₂)
6. Carbon monoxide (as CO)
7. Hydrogen Sulphide
8. Lead as Pb
9. Nickel as Ni
10. Nitrogen dioxide as NO₂
11. Oxygen (as O₂)
12. Ozone as (O₃)
13. Particulate Matter (size less than 2.5 µm) or PM_{2.5}
14. Respirable Particulate Matter (PM₁₀)
15. Sulphur Dioxide as SO₂
16. Total Particulate Matter (TPM)

VI. MICRO BIOLOGICAL PARAMETERS

1. Coliforms
2. Fecal Coliforms
3. E-coli
4. Salmonella spp
5. Yeast & Mould
6. Shigella spp
7. Vibrio Cholerae
8. Vibrio Parahaemolyticus
9. Pseudomonas aeruginosa
10. Enterobacteriaceae
11. Faecal Streptococci
12. Standard Plate Count

VII. NOISE MEASUREMENT

1. Noise level Measurement (Impulse/Leq)
2. Barometric Pressure
3. Heat Stress (working envi)
4. Illumination
5. Relative Humidity
6. Ambient Temperature
7. Wind Speed

(Continued...7)



VIII. SOIL

1. Aluminium
2. Ammonical Nitrogen
3. Available Calcium
4. Available Nitrogen
5. Available Phosphorus
6. Available Potassium
7. Bicarbonate (as HCO_3) in saturation extract
8. Bulk Density
9. Cadmium
10. Calcium
11. Calcium Carbonate
12. Cation Exchange Capacity
13. Chloride (as Cl^-) in saturation extract
14. Chromium
15. Conductivity
16. Copper as Cu
17. Exchangeable Calcium
18. Exchangeable Magnesium
19. Exchangeable Potassium
20. Exchangeable Sodium
21. Exchangeable Sodium Percent (ESP)
22. Hexavalent Chromium as Cr^{6+}
23. Iron
24. Lead as Pb
25. Magnesium
26. Manganese as Mn
27. Mercury
28. Moisture
29. Nickel as Ni
30. Organic Matter
31. Particle Density
32. pH
33. Porosity
34. Potassium
35. Sodium
36. Sodium Adsorption Ratio
37. Soil Type
38. Soluble Calcium in saturation extract
39. Soluble Magnesium in saturation extract
40. Soluble Potassium in saturation extract
41. Soluble Sodium in saturation extract

(Continued...8)



42. Sulphur
43. Texture – Clay
44. Texture – Sand
45. Texture – Slit
46. Total Kjeldahl Nitrogen as N
47. Total Nitrogen as N
48. Total Phosphorus as P
49. Water Holding Capacity
50. Zinc

The approval as “B” Grade commercial Category is issued to the laboratory for analysis of the following parameters:

I. WATER

1. Mineral Oil
2. Total Organic Carbon

II. WASTE WATER

1. Benzo (a) Pyrene
2. Mixed Liquor Suspended Solids
3. Mixed Liquor Volatile Suspended Solids
4. Settleable Solids
5. Settled Sludge Volume
6. Sludge Volume Index
7. Bio Assay

III. MICRO BIOLOGICAL PARAMETERS

1. Ligionella
2. Lypolytic Organisms count
3. Proteolytic Organisms count

IV. STACK/EMISSION PARAMETERS

1. Arsenic as As
2. Cadmium as Cd
3. Chlorine as Cl
4. Chromium as Cr
5. Cobalt as Co
6. Copper as Cu
7. Formaldehyde
8. Hydrochloric Acid
9. Hydrogen Fluoride
10. Methane
11. Moisture
12. Non-Methane Hydrocarbon
13. Total Hydrocarbon

(Continued...9)



V. AMBIENT AIR PARAMETER

1. Fluoride as F
2. Hydrochloric Acid
3. Chlorine as Cl
4. Sulphur Tri-oxide
5. Acid Mist

VI. WORK ENVIRONMENT AND INDOOR AIR QUALITY

1. Acid Mist
2. Chlorine as Cl
3. Fluoride as F
4. Hydrochloric Acid
5. Sulphur Tri-oxide as SO₂
6. Suspended Particulate Matter
7. Total Hydrocarbon

VII. SOIL

1. Total Organic Carbon

VIII. NOISE MEASUREMENT

1. Ventilation

For and on behalf of the
KERALA STATE POLLUTION CONTROL BOARD

[Signature]
V. T. SAJIMON

CHIEF ENVIRONMENTAL SCIENTIST & GOVT. ANALYST

To: **Sri. LAIJU. P. N.**
Head of Laboratory,
Standards Environmental & Analytical Laboratories,
K J Tower, Pathalam, Udyogamandal P. O.,
Ernakulam – 683 501.

Copy to: 1. The Member Secretary,
Kerala State Pollution Control Board,
Thiruvananthapuram.

2. The Environmental Engineer,
Kerala State Pollution Control Board,
District Office, Ernakulam.

3. Stock file

ANNEXURE VIII

(Soil Test Reports)

SOIL INVESTIGATION REPORT

CLIENT

**M/s. AMRITA VISHWAVIDYAPEETHAM
AMRITAPURI CAMPUS
AMRITAPURI
CLAPPANA.P.O.
KOLLAM-690525**

SITE

AMRITAPURI, KOLLAM

Period of Investigation:29/04/2022 to 23/05/2022

M/s.APLAB SYSTEMS

**53/1010, WILLY VILLA
PARADISE ROAD
VYTTILA - 682019**

**REPORT ON SUB SOIL EXPLORATION FOR PROPOSED AMRITA
RESEARCH BUILDING (G+6) FOR M/s. AMRITA VISHWA
VIDYAPEETHAM AT AMRITAPURI, KOLLAM**

1. INTRODUCTION

There is a proposal to construct a Amrita research building (G+6) at Amritapuri, Kollam for M/s.Amrita Vishwa Vidyapeetham, Amritapuri, Kollam. It is decided to carry out a detailed sub soil investigation to find out Safe bearing capacity and selection of appropriate foundation for the building.

The work was awarded to M/s .APLAB Systems, 53/1010, Willy Villa, Paradise Road, Vyttila - 682019. A detailed investigation and laboratory studies were carried out from 29/04/2022 to 23/05/2022.

This report summarizes the subsoil investigations and furnishes the recommendation on the type of the foundation to be provided.

2. SCOPE OF WORK

The scope of work at this site, entrusted with us comprised of

- 2.1 Mobilization of boring rigs with all necessary equipments and skilled/unskilled personals for the field work.
- 2.2 Boring two bore holes of diameter 150 mm, with drilling equipments in sand, silt, clay and gravel to a maximum depth of 46.07m or till the spoon rebound at the selected location fixed by the client.
- 2.3 Conduction of Standard Penetration tests in bore hole at every 1.5 m depth or change of strata and prepare bore log showing details.
- 2.4 Collection of disturbed samples in air tight polythene bags with proper labelling and transportation to laboratory.
- 2.5 Conducting the laboratory tests on the disturbed samples as per Indian Standards and furnishing the results.
- 2.6 Preparation and submission of the detailed report with field and laboratory results.

3. PROGRAMME OF INVESTIGATION




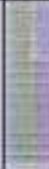


3.1 FIELD INVESTIGATION

- 3.1.1 One boring unit with all necessary equipment along with a team of technical personal with skilled labourers were mobilised at the work site.
- 3.1.2 Two bore holes of 150 mm were bored to a depth suggested by client, below the existing ground level. Bore holes were made as per IS: 1892-1979, using rotary drilling.
- 3.1.3 Representative samples were collected at every 1.0m interval depth or change of strata, whichever is earlier.

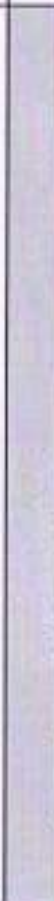

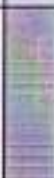



- 3.1.4 The samples collected were carefully sealed and transported to laboratory for tests.
- 3.1.5 Standard Penetration Tests were conducted at every 1.5m intervals after that, as per IS: 2131-1981. Before testing borehole was cleaned properly and Split Spoon Sampler is placed centrally in bore hole. A standard hammer of 63.5 kg is dropped from a height of 75 cm and number of blows for penetration of sampler for 0-15 cm, 15-30 cm and 30-45 cm were noted. Number of blows required for 15-45 cm penetration is reported as N value.
- 3.1.6 Bore holes were terminated after the investigation.

3.2 *LABORATORY INVESTIGATION*

- 3.2.1 The following laboratory tests were conducted on the selected samples as relevant IS codes.
- a) Particle size Analysis(IS .2720-Part 4-1985)
 - b) Water content (IS .2720-Part 2-1973)
 - c) Bulk density (IS .2720-Part 9-1992)
 - d) Specific Gravity (IS .2720-Part 3-1980)
 - e) Direct Shear Test (IS .2720-Part 13-1986)
 - f) Liquid Limit & Plastic Limit (.2720-Part 5-1985)
 - g) Triaxial Test (IS.2720(Part-11)-1971)

CLIENT		M/s.AMRITA VISHWAVIDYAPEETHAM, AMRITAPURI, KOLLAM														
PROJECT:		PROPOSED AMRITA RESEARCH BUILDING (G+6)														
SITE:		AMRITAPURI, KOLLAM														
BORE HOLE NO. : BH-I								Date of start:29/04/2022								
								Date of completion:01/05/2022								
TYPE OF BORING: Rotary Drilling								Ground water table:0.60m below GL								
Description of soil	Thickness of layer m	Depth in m below GL	Bore log	Standard Penetration Test					Graph of 'N' value						Remarks	
				depth (m)	15 cm	30 cm	45 cm	N Value	10	20	30	40	50	γ _s		
Sand (Black)	14.00	14.00		1.00	3	6	6	12								
				2.00	3	2	1	3								
				3.00	3	3	2	5								
				4.50	5	4	6	10								
				6.00	4	6	8	14								
				7.50	9	10	11	21								
				9.00	10	16	14	20								
				10.50	8	10	13	23								
				12.00	31	>50	-	>50								20cm balance
				13.50	25	28	22	>50								10cm balance No Sample
Clay (Black)	2.80	16.80		15.00	2	1	3	4								
Clayey Sand (Black)	3.20	20.00		17.00	3	6	28	34								
				19.00	29	30	20	>50							8cm balance	
Cemented Stone	1.00	21.00		20.00												Recovery-50%
Lateritic Clayey Sand (White,Red)	4.00	25.00		21.00	11	15	27	42								
				23.00	18	14	17	31								

Lateritic Clay with Sand (Red,Grey)	4.00	29.00		25.00	21	15	15	30							
				28.00	8	12	21	33							
Lateritic Clayey Sand (Grey, Brown)	10.40	39.40		31.00	11	14	25	39							
				34.00	10	17	20	37							
				37.00	18	20	25	45							
Sand with Pebbles (White)	2.10	41.50		40.00	>50	-	-	>50							32cm balance
Sand (White)	4.57	46.07		43.00	>50	-	-	>50							41cm balance No Sample
				46.00	>50	-	-	>50							38cm balance
Bore hole terminated at 46.07m depth															

CLIENT		M/s.AMRITA VISHWAVIDYAPEETHAM, AMRITAPURI, KOLLAM														
PROJECT:		PROPOSED AMRITA RESEARCH BUILDING (G+6)														
SITE:		AMRITAPURI, KOLLAM														
BORE HOLE NO. : BH-II								Date of start:02/05/2022								
								Date of completion:03/05/2022								
TYPE OF BORING: Rotary Drilling								Ground water table:0.60m below GL								
Description of soil	Thickness of layer m	Depth in m below GL	Bore log	Standard Penetration Test					Graph of 'N' value						Remarks	
				depth (m)	15 cm	30 cm	45 cm	N Value	10	20	30	40	50	V/S		
Sand (White)	14.60			1.00	1	2	2	4								
				2.00	1	1	1	2								
				3.00	1	1	2	3								
				4.50	1	2	3	5								
				6.00	2	5	16	21								
				7.50	3	6	18	24								
				9.00	33	28	22	>50								8cm balance
				10.50	>50	-	-	>50								32cm balance
				12.00	>50	-	-	>50								31cm balance
				13.50	>50	-	-	>50								33cm balance
Sandy Clay (Black)	3.90			15.00	1	2	6	8								
				17.00	1	2	4	6								
Lateritic Clayey Sand (Grey,Red)	6.10			19.00	20	23	27	>50							5cm balance	
				21.00	16	18	27	45								
				23.00	15	19	21	40								

Lateritic Clayey Sand (Red)	6.40	31.00		25.00	11	12	17	29							
				28.00	10	10	14	24							
Lateritic Clay with Sand (White,Red)	8.00	39.00		31.00	10	14	18	32							
				34.00	11	16	19	35							
				37.00	10	17	16	33							
Sand with pebbles (White)	7.04	46.04		40.00	>50	-	-	>50							35cm balance
				43.00	>50	-	-	>50							38cm balance
				46.00	>50	-	-	>50							41cm balance
Bore hole terminated at 46.04m depth															



51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS
TEST RESULTS

: Amritapuri, Kollam

Not sufficient sample test

(All the tests are done on remoulded sample collected from SPT spoon)

COCHIN GEOTECHNICAL LABORATORY

51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS

Bore hole No.	Depth m	Description of soil	Natural water content (%)	Bulk density g/cc	LL %	PL %	Grain size distribution %					Type of Sample	Type of test	Specific gravity	Cohesion c kg/cm ²	Angle of internal friction ϕ°
							Silt & Clay	Sand								
								Fine	Medium	Coarse	Gravel					
I	21.0	Clayey Sand (SC)	22.95	1.717	41.9	16.1	45	38	17	0	0	ds	Direct Shear	2.65	0.26	26
I	25.0	Sandy Clay (CH-SP)	23.99	1.652	42.7	17.3	52	33	11	1	3	ds	Triaxial	-	0.30	22
I	34.0	Clayey Sand (SC)	15.04	1.593	32.3	10.8	45	40	15	0		ds	Direct Shear	2.64	0.29	25
I	40.0	Clayey Gravelly Sand (SC-GC)	22.25	1.818	-	-	11	15	18	40	15	ds	Direct Shear	-	0.06	35
I	46.0	Sand (SP)	12.76	1.851	-	-	2	14	66	17	1	ds	Direct Shear	2.67	0.00	36
II	1.0	Sand (SP)	18.76	1.665	-	-	4	68	28	0	0	ds	Direct Shear	-	0.00	23
II	3.0	Sand (SP)	15.34	1.680	-	-	2	59	38	1	0	ds	Direct Shear	2.63	0.00	22
II	4.5	Sand (SP)	16.45	1.665	-	-	2	57	41	0	0	ds	Direct Shear	-	0.00	26
II	7.5	Sand (SP)	19.12	1.743	-	-	3	84	12	1	0	ds	Direct Shear	2.66	0.00	31

(All the tests are done on remoulded sample collected from SPT spoon)



COCHIN GEOTECHNICAL LABORATORY

51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS

Bore hole No.	Depth m	Description of soil	Natural water content (%)	Bulk density g/cc	LL %	PL %	Grain size distribution %					Type of Sample	Type of test	Specific gravity	Cohesion c kg/cm ²	Angle of internal friction ϕ°
							Silt & Clay	Sand			Gravel					
								Fine	Medium	Coarse						
II	12.0	Sand (SP)	17.08	1.816	-	-	5	72	23	0	0	ds	Direct Shear	-	0.00	34
II	15.0	Sandy Clay (CH-SP)	65.68	1.502	134.1	48.8	92	6	2	0	0	ds	UCC	2.60	0.24	0
II	19.0	Clayey Sand (SC)	20.76	1.621	-	-	40	38	22	0	0	ds	Direct Shear	-	0.20	27
II	23.0	Clayey Sand (SC)	16.09	1.688	-	-	32	44	24	0	0	ds	Direct Shear	2.65	0.21	29
II	28.0	Clayey Sand (SC)	16.19	1.720	-	-	24	18	57	1	0	ds	Direct Shear	-	0.14	30
II	34.0	Sandy Clay (CH-SP)	24.64	1.579	54.1	23.9	63	27	10	0	0	ds	Triaxial	2.65	0.22	26
II	43.0	Gravelly Sand (SP-GP)	5.45	1.816	-	-	1	4	49	34	12	ds	-	Not sufficient sample for strength test		
II	46.0	Gravelly Sand (SP-GP)	5.41	1.862	-	-	1	4	46	35	14	ds	-	Not sufficient sample for strength test		

(All the tests are done on remoulded sample collected from SPT spoon)



Vyttila
14/05/2022

STATIC CONE PENETRATION TEST, DYNAMIC CONE PENETRATION TEST,
PILE SONIC INTEGRITY TEST, STANDARD PENETRATION TEST, FIELD VANE SHEAR TEST,
PILE LOAD TEST, PLATE LOAD TEST, DIGITAL SURVEYING

RECOMMENDATIONS

INTRODUCTION

M/s. APLAB Systems, 53/1010, Willy Villa, Paradise Road, Vytilla, had conducted the site investigation for the construction of the Amrita research building (G+6) at Amritapuri, Kollam for M/s. Amrita Vishwa Vidyapeetham, Amritapuri, Kollam. Two boreholes were taken up to maximum depth of 46.07 m using rotary drilling. Standard Penetration Tests were conducted at regular vertical intervals and the samples taken from boreholes during the investigation, were tested in the laboratory.

DATA AND DISCUSSIONS

Soil profile in BH-I location shows that top layer is of sand up to 14.0 m depth with N value ranging from 3 to >50. Beneath that it is clay up to 16.8 m depth with N value of 4. This is followed by a layer of clayey sand up to 20.0 m depth with N value varying between 34 and >50. After that there is a cemented stone layer up to of 21.0 m depth with core recovery = 50%. Below that, it is lateritic clayey sand up to 25.0 m depth with N value of 31 and 42. It is succeeded by a layer of lateritic clay with sand up to 29.0 m depth having N value of 30 and 33. After that lies lateritic clayey sand up to a depth of 39.4 m with N value ranging from 37 to 45. Beneath this, it is sand with pebbles up to a depth of 41.5 m with N value >50. This is underlain by sand up to bored depth 46.07 m having N value >50. Ground Water table is located 0.6 m below the ground level.

Soil profile in BH-II location topsoil consists of sand up to 14.6 m depth with N value ranging from 2 to >50. Below that there is sandy clay up to 18.5 m depth having N value of 6 and 8. Beneath that it is lateritic clayey sand up to a depth of 24.6 m with N value varying between 40 and >50. This is followed by a layer of lateritic clayey sand up to 31.0 m depth with N value of 24 and 29. After that it is lateritic clay with sand up to 39.0 m depth with N value ranging from 32 to 35. It is succeeded by sand with pebbles layer up to bored depth 46.04 m having N value >50. Ground Water table is located 0.6 m below the ground level.

Proposed structure is a G+6 building. Soil profiles in the boreholes show slight variations. Top sandy soil has low shear strength. So shallow foundation is not advisable for the proposed structure. Around 6.0 m depth, sandy soil becomes stiffer. Around 14.0 m depth, clay or sandy clay soil shows less stiffness and shear strength at both locations.

Around 19.0 m depth stiffer lateritic clayey sand is available. For lighter loads foundation may be rested in this layer. Denser sand layer is available after 39.0 m depth. So, foundation can be rested in layer.

RECOMMENDATIONS

- i) It is recommended to provide DMC/drilling concrete pile foundation to support column loads. Each pile should have a length of around 41.0 m to 42.0 m depending on the availability of dense sand layer having N value >50. Pile should be rested in dense sand layer having N value >50 with an embedment of about two times diameter into sand layer with N value >50. Based on the above, following recommendations are made.


Sl no	Pile Diameter mm	Tip resistance kN	Side friction kN	Safe axial load kN	Uplift load kN	Lateral load kN
1	600	700	520	1220	540	60
2	700	1120	610	1730	670	80
3	800	1670	700	2370	810	110
4	900	2380	790	3170	960	135
5	1000	3260	880	4140	1120	170

- ii) For lighter loads, it is recommended to provide DMC/drilling concrete pile foundation to support column loads. Each pile should have a length of around 21.0 m depending on the availability of lateritic clayey sand layer having N value >40. Pile should be rested in lateritic clayey sand layer having N value >40 with an embedment of about 2.0 m into lateritic clayey sand layer with N value >40. Based on the above, following recommendations are made.

Sl no	Pile Diameter mm	Tip resistance kN	Side friction kN	Safe axial load kN	Uplift load kN	Lateral load kN
1	600	340	180	520	210	60
2	700	550	210	760	260	80
3	800	810	240	1050	320	110
4	900	1150	270	1420	380	135
5	1000	1550	300	1850	450	170

- iii) Factor of safety of 2.5 for bearing, 2.5 for side friction, 3.5 for side friction and 1.33 for weight of pile for uplift are taken for the design. For calculating side friction top 2.5 m of soil discarded. Piles are considered as long piles and pile heads are considered as fixed heads. Lateral load is taken as the load corresponding to deflection of 1% of diameter of pile at ground level.
- iv) The sub structure has to be constructed, as per latest IS code. It should be certified by a qualified engineer.
- v) The load carrying capacity of pile should be ensured by conducting static pile load test (initial test and routine) as per IS.2911 (Part IV) or by conducting High Strain Dynamic Pile Load test.
- vi) Pile integrity testing should be done to ensure the quality of piling, diameter and depth of pile.
- vii) These recommendations are based on two borehole data obtained. If any variation in the soil profile is observed during the boring operation, it should be referred to a Geotechnical Engineer.

Kottayam
22/05/2022


Dr. Hari.G, *M.Tech, Ph.D.*
Professor in Civil Engineering
Saintgits College of Engineering, Kottayam
(Mobile No.94470-97042)

OPEN TO SKY

K 5

SCHOOL OF BIO-TECHNOLOGY
MESS HALL

BIOTECH

PROPOSED RESEARCH BUILDING

56.03

37.65

42.29

24.23

44.13

31.93

20.47

53.72

31.77

50.49

45.94

19.38

15.59

22.68

22.00

22.75

BORSHOLE 1

BORSHOLE 2

BORSHOLE 3

BOX

SOIL INVESTIGATION REPORT

CLIENT

**M/s. AMRITA VISHWAVIDYAPEETHAM
AMRITAPURI CAMPUS
AMRITAPURI
CLAPPANA.P.O.
KOLLAM-690525**

SITE

AMRITAPURI, KOLLAM

Period of Investigation:29/04/2022 to 23/05/2022

M/s.APLAB SYSTEMS

**53/1010, WILLY VILLA
PARADISE ROAD
VYTILA - 682019**

**REPORT ON SUB SOIL EXPLORATION FOR PROPOSED AMRITA
RESEARCH BUILDING (G+6) FOR M/s. AMRITA VISHWA
VIDYAPEETHAM AT AMRITAPURI, KOLLAM**

1. INTRODUCTION

There is a proposal to construct a Amrita research building (G+6) at Amritapuri, Kollam for M/s.Amrita Vishwa Vidyapeetham, Amritapuri, Kollam. It is decided to carry out a detailed sub soil investigation to find out Safe bearing capacity and selection of appropriate foundation for the building.

The work was awarded to M/s .APLAB Systems, 53/1010, Willy Villa, Paradise Road, Vyttila - 682019. A detailed investigation and laboratory studies were carried out from 29/04/2022 to 23/05/2022.

This report summarizes the subsoil investigations and furnishes the recommendation on the type of the foundation to be provided.

2. SCOPE OF WORK

The scope of work at this site, entrusted with us comprised of

- 2.1 Mobilization of boring rigs with all necessary equipments and skilled/unskilled personals for the field work.
- 2.2 Boring two bore holes of diameter 150 mm, with drilling equipments in sand, silt, clay and gravel to a maximum depth of 46.07m or till the spoon rebound at the selected location fixed by the client.
- 2.3 Conduction of Standard Penetration tests in bore hole at every 1.5 m depth or change of strata and prepare bore log showing details.
- 2.4 Collection of disturbed samples in air tight polythene bags with proper labelling and transportation to laboratory.
- 2.5 Conducting the laboratory tests on the disturbed samples as per Indian Standards and furnishing the results.
- 2.6 Preparation and submission of the detailed report with field and laboratory results.

3. PROGRAMME OF INVESTIGATION







3.1 FIELD INVESTIGATION

- 3.1.1 One boring unit with all necessary equipment along with a team of technical personal with skilled labourers were mobilised at the work site.
- 3.1.2 Two bore holes of 150 mm were bored to a depth suggested by client, below the existing ground level. Bore holes were made as per IS: 1892-1979, using rotary drilling.
- 3.1.3 Representative samples were collected at every 1.0m interval depth or change of strata, whichever is earlier.

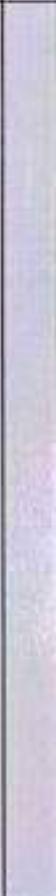





- 3.1.4 The samples collected were carefully sealed and transported to laboratory for tests.
- 3.1.5 Standard Penetration Tests were conducted at every 1.5m intervals after that, as per IS: 2131-1981. Before testing borehole was cleaned properly and Split Spoon Sampler is placed centrally in bore hole. A standard hammer of 63.5 kg is dropped from a height of 75 cm and number of blows for penetration of sampler for 0-15 cm, 15-30 cm and 30-45 cm were noted. Number of blows required for 15-45 cm penetration is reported as N value.
- 3.1.6 Bore holes were terminated after the investigation.

3.2 *LABORATORY INVESTIGATION*

- 3.2.1 The following laboratory tests were conducted on the selected samples as relevant IS codes.
- a) Particle size Analysis(IS .2720-Part 4-1985)
 - b) Water content (IS .2720-Part 2-1973)
 - c) Bulk density (IS .2720-Part 9-1992)
 - d) Specific Gravity (IS .2720-Part 3-1980)
 - e) Direct Shear Test (IS .2720-Part 13-1986)
 - f) Liquid Limit & Plastic Limit (.2720-Part 5-1985)
 - g) Triaxial Test (IS.2720(Part-11)-1971)

CLIENT		M/s.AMRITA VISHWAVIDYAPEETHAM, AMRITAPURI, KOLLAM														
PROJECT:		PROPOSED AMRITA RESEARCH BUILDING (G+6)														
SITE:		AMRITAPURI, KOLLAM														
BORE HOLE NO. : BH-I								Date of start:29/04/2022								
								Date of completion:01/05/2022								
TYPE OF BORING: Rotary Drilling								Ground water table:0.60m below GL								
Description of soil	Thickness of layer m	Depth in m below GL	Bore log	Standard Penetration Test					Graph of 'N' value						Remarks	
				depth (m)	15 cm	30 cm	45 cm	N Value	10	20	30	40	50	V.G		
Sand (Black)	14.00	14.00		1.00	3	6	6	12								
				2.00	3	2	1	3								
				3.00	3	3	2	5								
				4.50	5	4	6	10								
				6.00	4	6	8	14								
				7.50	9	10	11	21								
				9.00	10	16	14	20								
				10.50	8	10	13	23								
				12.00	31	>50	-	>50								20cm balance
				13.50	25	28	22	>50								10cm balance No Sample
Clay (Black)	2.80	16.80		15.00	2	1	3	4								
Clayey Sand (Black)	3.20	20.00		17.00	3	6	28	34								
				19.00	29	30	20	>50							8cm balance	
Cemented Stone	1.00	21.00		20.00												Recovery-50%
Lateritic Clayey Sand (White,Red)	4.00	25.00		21.00	11	15	27	42								
				23.00	18	14	17	31								

Lateritic Clay with Sand (Red,Grey)	4.00	29.00		25.00	21	15	15	30							
				28.00	8	12	21	33							
Lateritic Clayey Sand (Grey, Brown)	10.40	39.40		31.00	11	14	25	39							
				34.00	10	17	20	37							
				37.00	18	20	25	45							
Sand with Pebbles (White)	2.10	41.50		40.00	>50	-	-	>50							32cm balance
Sand (White)	4.57	46.07		43.00	>50	-	-	>50							41cm balance No Sample
				46.00	>50	-	-	>50							38cm balance
Bore hole terminated at 46.07m depth															

CLIENT		M/s.AMRITA VISHWAVIDYAPEETHAM, AMRITAPURI, KOLLAM														
PROJECT:		PROPOSED AMRITA RESEARCH BUILDING (G+6)														
SITE:		AMRITAPURI, KOLLAM														
BORE HOLE NO. : BH-II								Date of start:02/05/2022								
								Date of completion:03/05/2022								
TYPE OF BORING: Rotary Drilling								Ground water table:0.60m below GL								
Description of soil	Thickness of layer m	Depth in m below GL	Bore log	Standard Penetration Test					Graph of 'N' value						Remarks	
				depth (m)	15 cm	30 cm	45 cm	N Value	10	20	30	40	50	>50		
Sand (White)	14.60	14.60		1.00	1	2	2	4								
				2.00	1	1	1	2								
				3.00	1	1	2	3								
				4.50	1	2	3	5								
				6.00	2	5	16	21								
				7.50	3	6	18	24								
				9.00	33	28	22	>50								8cm balance
				10.50	>50	-	-	>50								32cm balance
				12.00	>50	-	-	>50								31cm balance
				13.50	>50	-	-	>50								33cm balance
Sandy Clay (Black)	3.90	18.50		15.00	1	2	6	8								
				17.00	1	2	4	6								
Lateritic Clayey Sand (Grey,Red)	6.10	24.60		19.00	20	23	27	>50							5cm balance	
				21.00	16	18	27	45								
				23.00	15	19	21	40								

Lateritic Clayey Sand (Red)	6.40	31.00		25.00	11	12	17	29						
				28.00	10	10	14	24						
Lateritic Clay with Sand (White,Red)	8.00	39.00		31.00	10	14	18	32						
				34.00	11	16	19	35						
				37.00	10	17	16	33						
Sand with pebbles (White)	7.04	46.04		40.00	>50	-	-	>50						35cm balance
				43.00	>50	-	-	>50						38cm balance
				46.00	>50	-	-	>50						41cm balance
Bore hole terminated at 46.04m depth														

COCHIN GEOTECHNICAL LABORATORY

51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS
TEST RESULTS

Report. No. CGL/L/131/22

CLIENT : Amrita Vishwa Vidyapeetham (C/o M/s. APLAB Systems)
SITE : Amritapuri, Kollam

SITE

: Amritapuri, Kollam

Bore hole No.	Depth m	Description of soil	Natural water content (%)	Bulk density g/cc	LL %	PL %	Grain size distribution %					Type of Sample	Type of test	Specific gravity	Cohesion c kg/cm ²	Angle of internal friction ϕ°
							Silt & Clay	Sand								
								Fine	Medium	Coarse	Gravel					
I	1.0	Sand (SP)	15.52	1.759	-	-	3	70	27	0	0	ds	Direct Shear	2.65	0.00	30
I	3.0	Sand (SP)	14.62	1.655	-	-	2	59	39	0	0	ds	Direct Shear	-	0.00	26
I	7.5	Sand (SP)	17.40	1.775	-	-	2	73	25	0	0	ds	Direct Shear	2.66	0.00	31
I	12.0	Sand (SP)	17.06	1.798	-	-	4	76	20	0	0	ds	Direct Shear	-	0.00	34
I	15.0	Clay (CH)	75.85	1.460	132.4	45.8	98	2	0	0	0	ds	UCC	2.60	0.22	0
I	19.0	Clayey Sand (SC)	23.69	1.795	-	-	12	68	20	0	0	ds	Direct Shear	-	0.06	34
I	20.0- 21.0	Cemented Stone		2.481								uds				

NOT SUFFICIENT SAMPLE FOR STRENGTH TEST

640.159

100%

COCHIN

100%

(All the tests are done on remoulded sample collected from SPT spoon)



COCHIN GEOTECHNICAL LABORATORY

51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS

51/937 A, Paradise Road, Vyttila
 CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS

Bore hole No.	Depth m	Description of soil	Natural water content (%)	Bulk density g/cc	LL %	PL %	Grain size distribution %					Type of Sample	Type of test	Specific gravity	Cohesion c kg/cm ²	Angle of internal friction ϕ°					
							Silt & Clay	Sand													
								Fine	Medium	Coarse	Gravel										
I	21.0	Clayey Sand (SC)	22.95	1.717	41.9	16.1	45	38	17	0	0	ds	Direct Shear	2.65	0.26	26					
I	25.0	Sandy Clay (CH-SP)	23.99	1.652	42.7	17.3	52	33	11	1	3	ds	Triaxial	-	0.30	22					
I	34.0	Clayey Sand (SC)	15.04	1.593	32.3	10.8	45	40	15	0		ds	Direct Shear	2.64	0.29	25					
I	40.0	Clayey Gravelly Sand (SC-GC)	22.25	1.818	-	-	11	15	18	40	15	ds	Direct Shear	-	0.06	35					
I	46.0	Sand (SP)	12.76	1.851	-	-	2	14	66	17	1	ds	Direct Shear	2.67	0.00	36					
II	1.0	Sand (SP)	18.76	1.665	-	-	4	68	28	0	0	ds	Direct Shear	-	0.00	23					
II	3.0	Sand (SP)	15.34	1.680	-	-	2	59	38	1	0	ds	Direct Shear	2.63	0.00	22					
II	4.5	Sand (SP)	16.45	1.665	-	-	2	57	41	0	0	ds	Direct Shear	-	0.00	26					
II	7.5	Sand (SP)	19.12	1.743	-	-	3	84	12	1	0	ds	Direct Shear	2.66	0.00	31					

Unremoulded sample collected from SPT spoon

(All the tests are done on remoulded sample collected from SPT spoon)



STATIC CONE PENETRATION TEST, DYNAMIC CONE PENETRATION TEST,
PILE SONIC INTEGRITY TEST, STANDARD PENETRATION TEST, FIELD VANE SHEAR TEST,
PILE LOAD TEST, PLATE LOAD TEST, DIGITAL SURVEYING

COCHIN GEOTECHNICAL LABORATORY

51/937 A, Paradise Road, Vyttila P.O Ernakulam-682019
CENTER FOR ULTIMATE GEOTECHNICAL SOLUTIONS

Bore hole No.	Depth m	Description of soil	Natural water content (%)	Bulk density g/cc	LL %	PL %	Grain size distribution %					Type of Sample	Type of test	Specific gravity	Cohesion c kg/cm ²	Angle of internal friction ϕ°
							Silt & Clay	Sand								
								Fine	Medium	Coarse	Gravel					
II	12.0	Sand (SP)	17.08	1.816	-	-	5	72	23	0	0	ds	Direct Shear	-	0.00	34
II	15.0	Sandy Clay (CH-SP)	65.68	1.502	134.1	48.8	92	6	2	0	0	ds	UCC	2.60	0.24	0
II	19.0	Clayey Sand (SC)	20.76	1.621	-	-	40	38	22	0	0	ds	Direct Shear	-	0.20	27
II	23.0	Clayey Sand (SC)	16.09	1.688	-	-	32	44	24	0	0	ds	Direct Shear	2.65	0.21	29
II	28.0	Clayey Sand (SC)	16.19	1.720	-	-	24	18	57	1	0	ds	Direct Shear	-	0.14	30
II	34.0	Sandy Clay (CH-SP)	24.64	1.579	54.1	23.9	63	27	10	0	0	ds	Triaxial	2.65	0.22	26
II	43.0	Gravelly Sand (SP-GP)	5.45	1.816	-	-	1	4	49	34	12	ds	-	Not sufficient sample for strength test		
II	46.0	Gravelly Sand (SP-GP)	5.41	1.862	-	-	1	4	46	35	14	ds	-	Not sufficient sample for strength test		

TESTING
* Col. Complex

remoulded sample collected from SPT spoon

(All the tests are done on remoulded sample collected from SPT spoon)



Vyttila
14/05/2022

RECOMMENDATIONS

INTRODUCTION

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Soil profile in BH-II location topsoil consists of sand up to 14.6 m depth with N value ranging from 2 to >50. Below that there is sandy clay up to 18.5 m depth having N value of 6 and 8. Beneath that it is lateritic clayey sand up to a depth of 24.6 m with N value varying between 40 and >50. This is followed by a layer of lateritic clayey sand up to 31.0 m depth with N value of 24 and 29. After that it is lateritic clay with sand up to 39.0 m depth with N value ranging from 32 to 35. It is succeeded by sand with pebbles layer up to bored depth 46.04 m having N value >50. Ground Water table is located 0.6 m below the ground level.

Proposed structure is a G+6 building. Soil profiles in the boreholes show slight variations. Top sandy soil has low shear strength. So shallow foundation is not advisable for the proposed structure. Around 6.0 m depth, sandy soil becomes stiffer. Around 14.0 m depth, clay or sandy clay soil shows less stiffness and shear strength at both locations.

Around 19.0 m depth stiffer lateritic clayey sand is available. For lighter loads foundation may be rested in this layer. Denser sand layer is available after 39.0 m depth. So, foundation can be rested in layer.

RECOMMENDATIONS

- i) It is recommended to provide DMC/drilling concrete pile foundation to support column loads. Each pile should have a length of around 41.0 m to 42.0 m depending on the availability of dense sand layer having N value >50. Pile should be rested in dense sand layer having N value >50 with an embedment of about two times diameter into sand layer with N value >50. Based on the above, following recommendations are made.


Sl no	Pile Diameter mm	Tip resistance kN	Side friction kN	Safe axial load kN	Uplift load kN	Lateral load kN
1	600	700	520	1220	540	60
2	700	1120	610	1730	670	80
3	800	1670	700	2370	810	110
4	900	2380	790	3170	960	135
5	1000	3260	880	4140	1120	170

- ii) For lighter loads, it is recommended to provide DMC/drilling concrete pile foundation to support column loads. Each pile should have a length of around 21.0 m depending on the availability of lateritic clayey sand layer having N value >40. Pile should be rested in lateritic clayey sand layer having N value >40 with an embedment of about 2.0 m into lateritic clayey sand layer with N value >40. Based on the above, following recommendations are made.

Sl no	Pile Diameter mm	Tip resistance kN	Side friction kN	Safe axial load kN	Uplift load kN	Lateral load kN
1	600	340	180	520	210	60
2	700	550	210	760	260	80
3	800	810	240	1050	320	110
4	900	1150	270	1420	380	135
5	1000	1550	300	1850	450	170

- iii) Factor of safety of 2.5 for bearing, 2.5 for side friction, 3.5 for side friction and 1.33 for weight of pile for uplift are taken for the design. For calculating side friction top 2.5 m of soil discarded. Piles are considered as long piles and pile heads are considered as fixed heads. Lateral load is taken as the load corresponding to deflection of 1% of diameter of pile at ground level.
- iv) The sub structure has to be constructed, as per latest IS code. It should be certified by a qualified engineer.
- v) The load carrying capacity of pile should be ensured by conducting static pile load test (initial test and routine) as per IS.2911 (Part IV) or by conducting High Strain Dynamic Pile Load test.
- vi) Pile integrity testing should be done to ensure the quality of piling, diameter and depth of pile.
- vii) These recommendations are based on two borehole data obtained. If any variation in the soil profile is observed during the boring operation, it should be referred to a Geotechnical Engineer.

Kottayam
22/05/2022


Dr. Hari G., M.Tech, Ph.D.
Professor in Civil Engineering
Saintgits College of Engineering, Kottayam
(Mobile No.94470-97042)

OPEN TO SKY

11.49

SCHOOL OF BIO-TECHNOLOGY
MESS HALL

BIOTECH

PROPOSED RESEARCH BUILDING

24.23
42.29

ROSEHOLE 1

22.75

31.93

53.72

ROSEHOLE 2

20.47

31.77

50.49

85.91

ROSEHOLE 3

22.00

22.68

15.59

56.03

ET
BOX