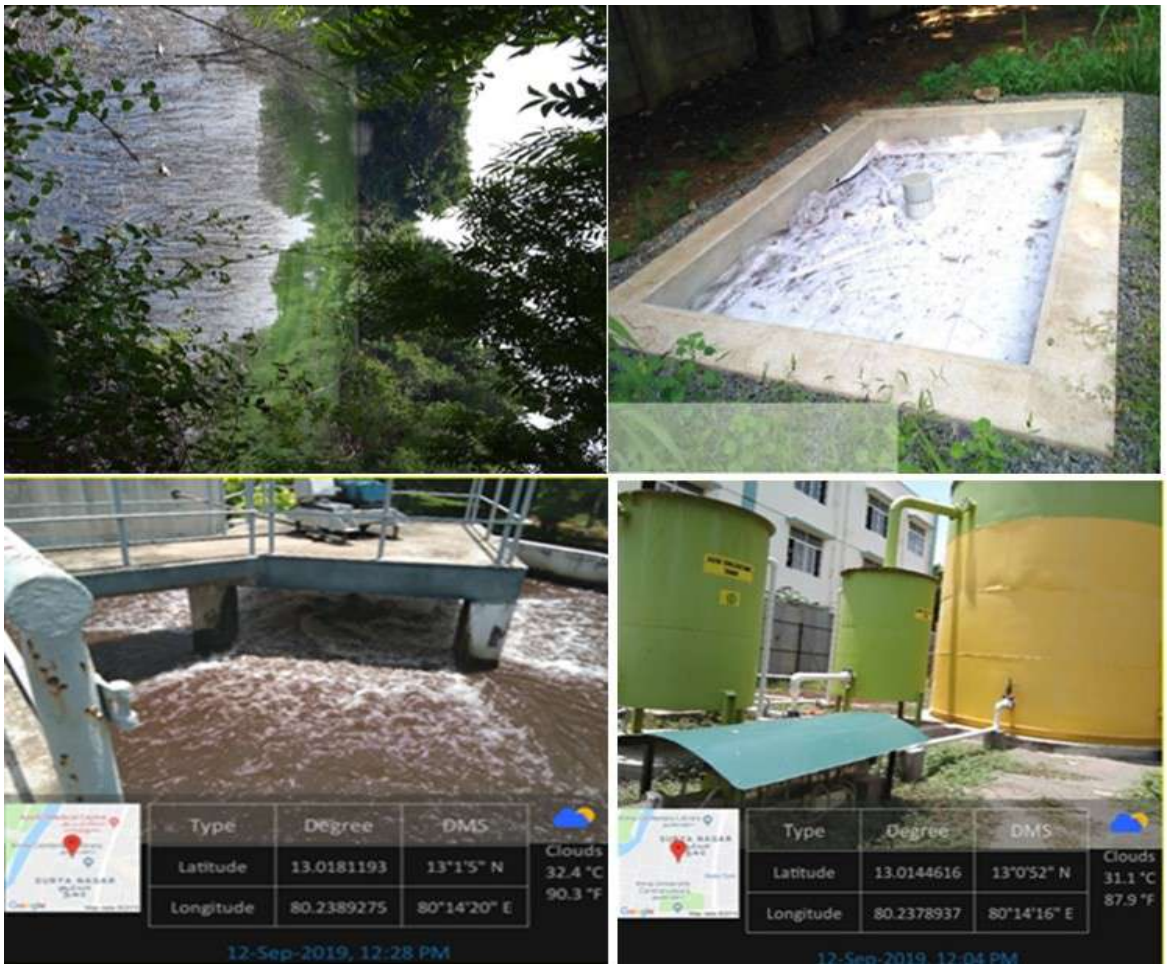
7.1.6. QUALITY AUDITS ON ENVIRONMENT AND ENERGY REGULARLY UNDERTAKEN BY THE INSTITUTION

3. REPORT ON **ENVIRONMENTAL AUDIT AT ANNA UNIVERSITY, CHENNAI**



Prepared by

ESTATE OFFICE

Anna University, Chennai - 600 025

September 2019

PROFESSOR AND ESTATE OFFICER
ANNA UNIVERSITY
CHENNAI - 600 025.

REGISTRAR
ANNA UNIVERSITY
CHENNAI-600 025.

7.1.6. - 3. REPORT ON ENVIRONMENTAL AUDIT AT ANNA UNIVERSITY

1.0 PREAMBLE

The prevalent environmental issues at the campuses of Anna University are related to Water Supply, Wastewater Management and Solid Waste Management. The Estate Office, Deans of various campuses and authority of Hostels are responsible for managing these issues. Periodic audits of these issues are carried out by involving experts from different Departments / Centres of the University and inviting experts from external agencies. Water Audit of the Campus in terms of quantification of water demand including hostels and quarters, the supply of water from CMWSSB and groundwater sources, devising and implementing water conservation measures and collection, treatment and reuse and disposal of wastewater have been undertaken in the year 2018-19. Biodegradable Wastes (food, vegetable, paper and cloth wastes) from the Hostel and academic zones of the Campus are managed by Biomethanation.

2.0 FORMATION OF TECHNICAL COMMITTEE

A Technical Committee for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses was constituted by the Vice-Chancellor vide Proceeding (Annexure- I) comprising of the following members:

Table - 1 Member of Technical Committee

Sl. No.	Name	Designation and Organization	Role
1.	Dr. Kurian Joseph	Professor, Centre for Environmental Studies, AU	*Member*
2	Dr. S. Amal Raj	Professor, Centre for Environmental Studies, AU	*Member*
3	Dr. B. V. Mudgal	Professor, Centre for Water Resources, AU	*Member*
4.	Dr. Ligy Phillip	Professor, Department of Civil Engineering, IIT Madras, Chennai	*Member*
5.	Dr. L. Elango	Professor & Head, Department of Geology, AU	*Member*
6.	Dr. K. Gunasekaran	Professor & Estate Officer, AU	*Coordinator*

The first meeting of the Technical Committee was held on 05.08.2019 at 11.00 a.m. in the Chamber of Professor and Estate Officer.

The first technical committee discussed in details about the data furnished regarding the water demand in the hostels, quarters and institution area for Main campus and MIT campus, existing sources of water supply, the borewells available in the campuses, the rainwater harvesting attempts, the groundwater level in the campus, the stormwater drainage pattern and quality of groundwater in the campuses, etc., and with inputs from the Hostel wardens, Centre for Environmental Studies and Institute of Remote Sensing, Anna University. The technical committee suggested the Estate Office prepare the detailed proposal for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses based on the future requirement and suggested to present during the second technical committee meeting *(Minutes of the first Technical Committee Meeting enclosed as Annexure-II).*

The second meeting of the Technical Committee was held on 18.09.2019 at 11.00 a.m. in the Chamber of Professor and Estate Officer.

During the second technical committee, a detailed presentation on the demand and supply of water, demand for treatment of wastewater by different techniques was made to the technical committee. The technical committee and recommended the following items such as CEG and MIT (Main and Annex) campus water supply system and sewerage system for further action *(Minutes of the second Technical Committee Meeting enclosed as Annexure-III).*

3.0 BASELINE DESCRIPTION

The land area details of Main and MIT campuses and the layout of Water Supply and Sewerage Systems of Main Campus are presented in Table - 2 and Figure - 1 respectively.

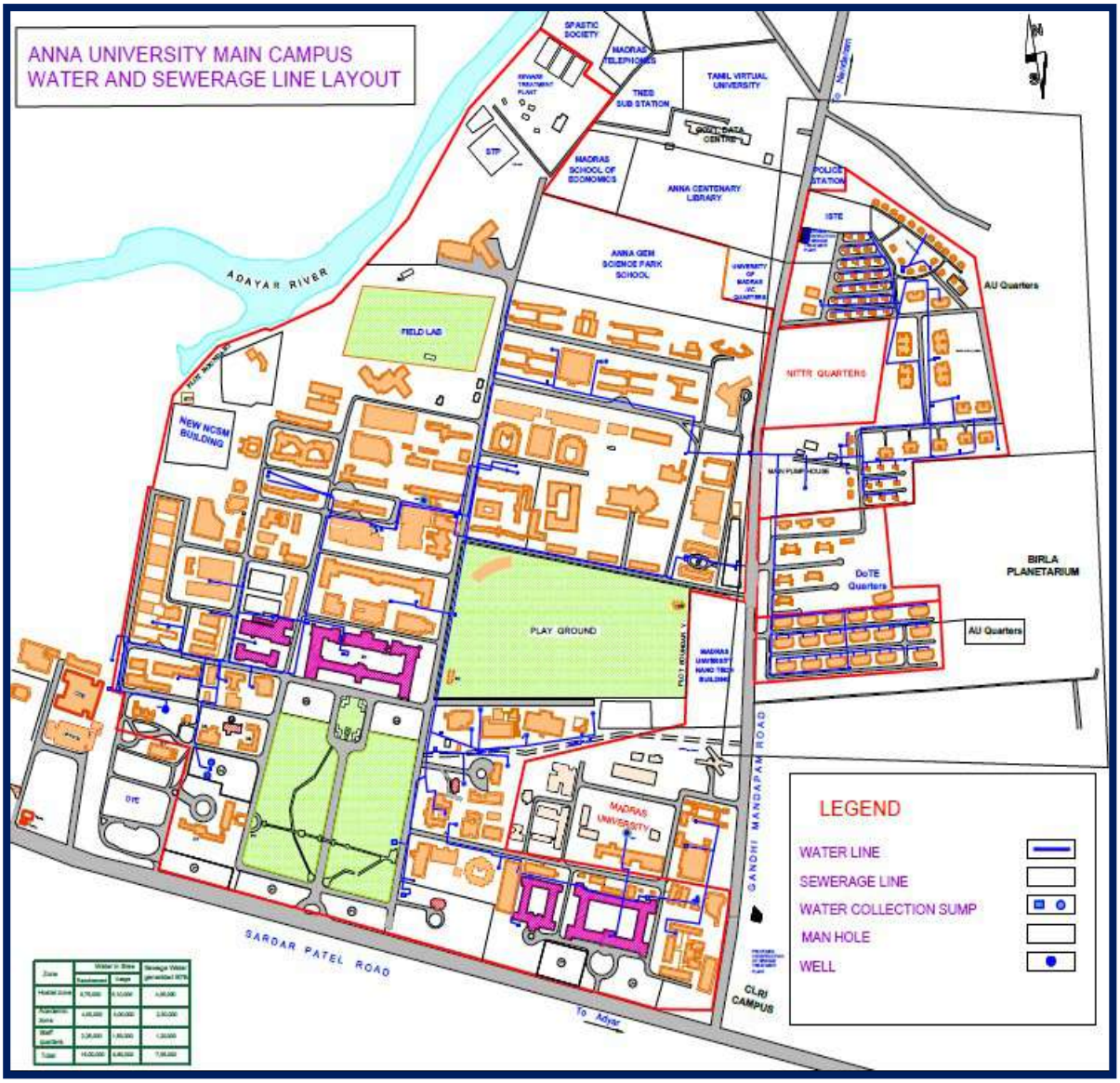


Figure - 1 Layout of Water Supply and Sewerage Systems in Main Campus

Table - 2 Land Area Details (Main & MIT Campus)

Land Area Details (Main & MIT)	
Campus Details	**Land Area (Acres)**
Main Campus	151
Tharamani Campus	5
Highways Land	10
Main Campus Quarters	30
MIT Main	28.2
MIT Annex	22.5
Total	**246.7**

3.1 EXISTING WATER SUPPLY AND SEWERAGE LINES (CEG & MIT)

The existing Water Supply and Sewerage Lines laid during the formation of University (1978) for the water supply and wastewater generation load around 2000 hostellers and 1000 day scholars. Now the student's strength increased to three to four-folds. The present hostellers and day scholar strength is around 10000 and 5000 respectively. The quarter's strength increased from 300 to 1650 members. This matter is also discussed in the technical committee meeting and the committee recommended to re redesign the entire Water Supply and Sewerage Line to meet the present and future conditions. The daily water requirement, source of water supply and details of open / bore well of CEG and MIT campus are given in Table - 3, Table - 4 and Table - 5 respectively.

Table - 3 Daily Water Requirement for the (Main and MIT) Campus

Campus Total Water Requirement per Day	
Hostel (CEG, AC Tech., SAP, NRI) – 6500 students	8,75,000 litres
Staff Quarters (Main Campus) - 307 Quarters	2,25,000 litres
Departments / Centres / University (Main Campus) (40 Nos. of Underground Sump **x** 10,000 litres capacity with one time filling and distribution)	4,00,000 litres
Total water requirement per day	**15,00,000 litres**

Table - 4 Sources of Water Supply

Source of Water Supply	
Metro Water	**Liters**
a) Through pipe line	
1.Main campus (Main pump house)	150000
2.A.C.Tech hostels	100000
3.A.C.Tech Campus (A.C.Tech & SAP)	50000
b) Through lorry (CEG campus)	**150000**
Through Borewell	
1.CEG campus	100000
2.A.C.Tech & SAP campus	50000

By Hostels - Through Lorry (Private)	
1.CEG hostels	280000
2.A.C.Tech hostels	50000
3.International hostels	30000
Total	**960000**

Table- 5 Details of Open / Bore Wells

Sl. No.	Open / Bore Well	Numbers	Condition
Maintained by Estate Office and Hostel Office			
1	Bore Well	48	37 Working (11 Not Working)
2	Open Well	11	6 Working (5 Renovation)

The location of open and bore well and Geo-tagged photographs of the same in the CEG main campus is shown in Figures – 2 and 3 respectively.

Figure - 2 Open & Bore Well Locations in Main Campus

Borewell near AC Tech Ladies Hostel	Borewell near AC Tech Boys Hostel	Borewell near CEG Boys Hostel	Borewell inside of CEG Main Building
Well near AC Tech Main Building	Well near Computer Science Building	Well near SAP Hostel Building	Well inside Guest House Premises
Tank with Bunds at MIT Annex campus	Stabilization Pond near STP	Pond near International Hostel	Well at MIT campus

Figure - 3 Geo-tagged Photos of bore wells, open wells and Tanks

Table - 6 Water Availability / Requirement at MIT Main & Annex Campus

Water Availability	
Main	**Liters/day**
Six Bore Wells	10000
Three Open Well	66000
Tankers	96000
Annex	**Liters/day**
Eight Bore Wells	72000
Two Open Well	25000
Tankers	-
Total	**269000**
Water Requirement	
Main	**Liters/day**
Academic Complex	200000
Hostels	270000
Mess	50000
Annex	**Liters/day**
Quarters Old (95 Persons)	15000
Quarters New (160 Persons)	22000
Hostels	100000
Mess	70000
Total	**727000**

3.2 EXISTING RAINWATER HARVESTING (RWH) STRUCTURES AND UTILIZATION IN THE CAMPUS

Anna University had implemented various rainwater harvesting structures such as ponds, underground sump, open well, recharge pit, recharge well, recharge trench, etc., to harvest runoff generated from the rooftop as well as surface runoff since 1980's. In order to harvest the surface runoff and rooftop rainwater, many recharge structures had been installed in the past and new RWH structures have been being installed around the campus. Some of the existing RWH installed in our campuses (CEG, MIT and SAP) of the Anna University to improve the water resources potential of the Campuses are given in the following table and details of the installations are explained in the following sections.

Table - 7 Details of the RWH Installations in the Campuses

Sl. No.	Name Building/Area	Harvesting Method	Type of RWH Structure	Approximate Catchment Area / Roof Area (m^2)	Year of Installation
CEG Campus					
1	Centre for Water Resources (CWR) - Building & Open Space	Rooftop & Surface Water RWH	Underground sumps and low-level open tank	3000	1980 and 2012
2	Department of Electronics and Communication Engineering (ECE)	Rooftop	Underground sump	1800	2018
3	Department of Printing Technology	Rooftop	Underground sump	796	2018
4	Department of Power Systems Engineering	Rooftop	Underground sump	741	2018
5	University Guest House - Building & Open Space	Rooftop & Surface Water RWH	Open Well	850	2019
6	Open Space Near NRI Hostel - Open Space		Recharge Pond	2000	2018
CEG Hostels					
1	Open Space Near Hostel Blocks of 6, 7, 8, 11 and Ladies Hostel	Rooftop & Surface Water RWH	Recharge Pit	30000	2018
2	Mantharai Hostel (Block 6)	Rooftop	Recharge Pit	891	2019
3	Roja Hostel Building	Rooftop	Underground sump	671	2019
4	Mega Mess Building	Rooftop	Underground sump	1592	2018
5	Vaigai Hostel Building	Rooftop	Underground sump	769	2019
6	Thamarai Hostel Building	Rooftop	Underground sump	601	In Constructio n
MIT Campus					
7	Admin and Department of Instrumentation Engineering building	Rooftop	Open Well	1775	2018
SAP Campus					
8	SAP Annex Building	Surface Water RWH	Open Well	1500	2019

3.2.1 RWH in CEG Campus

Three decades ago, Centre for Water Resources (CWR), CEG, had created a rooftop rainwater collecting system to meet the water requirements of hydraulic experiments for academic and research purposes. The Centre has an open sump of capacity 3.5 lakhs litres and an underground sump of capacity 8.8 lakh litres. The volume of water harvested is used in hydraulics labs of both UG and PG which requires a huge volume of water for its experiments. This system is still maintained properly to support the laboratory requirements of CWR as shown in Figure - 4.

Figure – 4 Rooftop rainwater collection sumps in Centre for Water Resources

The rooftop area of three buildings (ECE, Printing and Power systems departments) had been connected to nearby sumps through filters to harvest the rooftop rainwater as shown in Figures - 5 to 7.

Figure - 5 Rooftop RWH in Power System Dept.

Figure - 6 Rooftop RWH in the ECE Dept.

Figure - 7 Rooftop RWH in the Printing Department

The surface runoff and rooftop rainwater from the University guest house (CEG Campus) and its nearby area are harvested to the nearby open well through a filter as shown in Figure - 8.

Figure - 8 Surface and Rooftop RWH in and around the University Guest House

3.2.2 Recharge Pond

The recharge pond has been constructed on the western side of the CEG campus to collect the surface runoff generated from the campus and to improve the groundwater potential of the campus as shown in Figure - 9. The approximate area of the recharge pond is around 2000 m^2.

Figure - 9 Recharge Pond on the western side of the CEG campus

3.2.3 RWH in CEG Hostels

During the year 2018, five recharge pits had been constructed in CEG hostel buildings on the north-eastern side of the CEG Campus and near Ladies hostel. Also, the roof water of Mantharai block (6th Block) connected to the nearby recharge pit as shown in Figure - 10. The typical cross-section of the recharge pit is given in Figure - 11.

Figure - 10 Rainwater Harvesting Structures at various hostel blocks

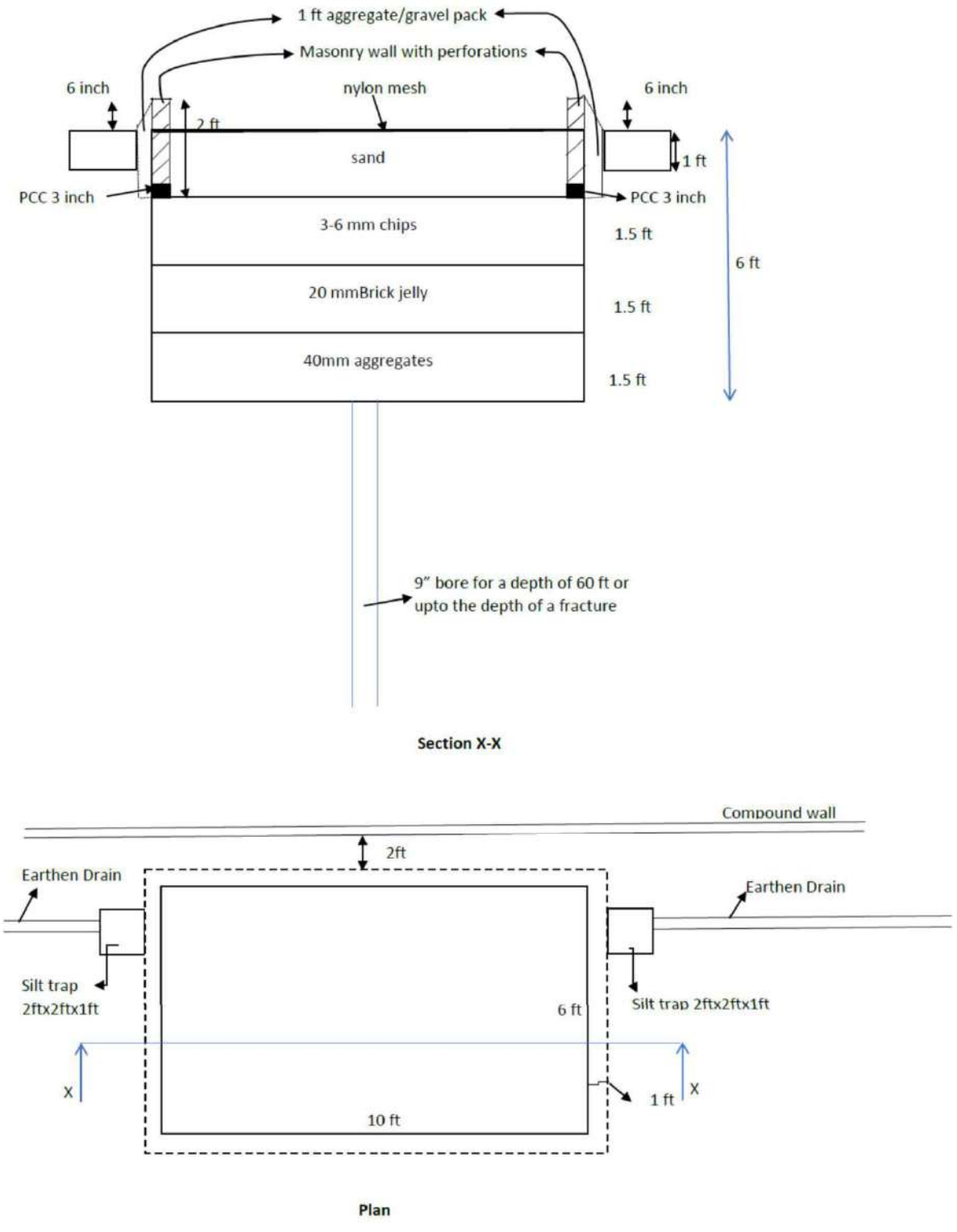


Figure - 11 Typical plan and cross-section of the recharge pit installed in hostels

3.2.4 Rooftop Rainwater Harvesting In Mega Mess of CEG Hostel

Rooftop rainwater harvesting in the mega mess of CEG hostel is implemented by connecting all the drain pipes to the underground sump of capacity 1 lakh litres through a filter as shown in Figure - 12. Similarly, the rooftop rainwater harvesting is implemented in hostel blocks of Roja and Vaigai and all are connected to the nearby collection sumps through a filter.

Figure - 12 Rooftop RWH in various Hostel Blocks of CEG

3.2.5 RWH in MIT CAMPUS

In MIT campus, the rooftop rainwater from the new administrative building, old and new Instrumentation Engineering buildings are collected and filtered through an individual filter then harvested to the nearby open well as shown in Figure - 13. The total roof area covered from the three buildings under the RWH system is 1775 m^2.

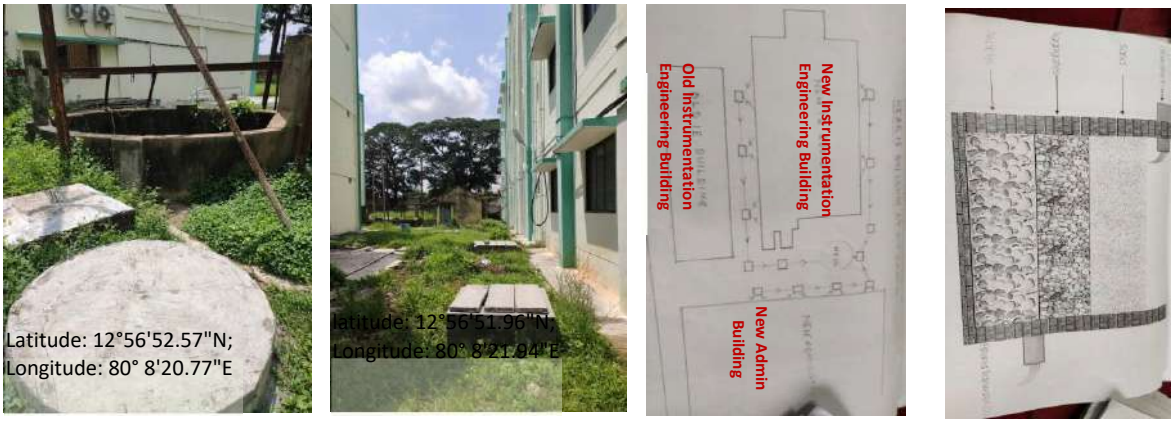


Figure - 13 Rooftop RWH in the new building of MIT Campus

3.2.6 RWH in SAP Campus

In SAP campus, the surface runoff and rooftop rainwater from the new building and its nearby area is collected and diverted to the nearby open well as shown in Figure - 14.

Figure - 14 Surface and Rooftop RWH in and around the new building of SAP Campus

3.3 Work in Progress

The rooftop rainwater harvesting for a roof area of 601 m^2 in the Thamarai block to be connected with underground sump is under construction as shown in Figure - 15.

Figure - 15 Rooftop RWH in Thamarai Block (Construction in progress) of CEG Hostel

4.0 WASTEWATER AUDIT

The quantity of wastewater generated from the quarters, hostels and institution area and methods of treatment done currently and the methods of disposal, current techniques adopted for treatment, the other methods of treatment, ultrafiltration followed by flushing in water closets with dual plumbing arrangements were also discussed in detail by the Technical Committee.

The detail pertains to all four campuses, water and wastewater audit reports prepared by the Estate Office for all the four campuses and disused in the Technical Committee meeting is enclosed herewith.

4.1 EXISTING WASTEWATER COLLECTION AND TREATMENT SYSTEMS

The wastewater is being generated from various parts of the campus such as a hostel, mess, department and academic blocks. The wastewater is collected through an underground sewer network and transported to the Sewage Treatment and Recycling plant. The capacity of the existing STP is 0.300 MLD with secondary treatment. The treated wastewater is used for gardening. The sewage is treated by an activated sludge process followed by pressure sand filtration and Activated Carbon Filtration. The treated wastewater is used for irrigating Lawns and Gardens through Sprinkler Irrigation Systems. The vegetable wash water from the kitchen is used for the in-house vegetable garden. It is also proposed to modernize the existing Sewage Treatment Recycling Plant to improve the treated water quality standards for the flushing purpose in the new buildings. The existing Sewage Treatment Plant at Main Campus is shown in Figure - 16.

Figure - 16 Existing Sewage Treatment Plant at Main Campus

5.0 SOLID WASTE MANAGEMENT

Solid Waste Management in the campus is carried out by dividing the campus into two zones namely Academic and Hostel. The hostel zone generates food, vegetable, paper and cloth wastes; whereas the academic zone generates canteen and paper wastes as major wastes. In addition to those, the dry leaves will also constitute a major portion of solid waste. One time Plastic usage is banned on the campus which has restricted the plastic waste in campus

5.1 Biomethanation of Organic Wet Waste

A biogas plant, with a feed capacity of 1000 kg/day, was sanctioned for about Rs. 30, 00,000/- (Rupees Thirty Lakhs only) under Rashtriya Uchchatar Shiksha Abhiyan (RUSA) scheme to the main campus. The Director, Institute of Energy Studies, Anna University was responsible for the installation of the plant. The biogas plant was installed behind the Mega Mess of CEG Hostel and started functioning from 05.08.2018. The organic wet waste generated from hostel kitchens and messes of CEG, A.C. Tech and SAP campuses including NRI Hostels and Canteen are sent to the biogas plant, where the gas generated is used for cooking purposes at the Mega Mess hostel kitchen and the slurry generated is used as fertilizer in the organic farm at the campus. The capacity of this plant is to generate approximately 760 commercial gas cylinders to the CEG Mess for which the hostel pays for manpower. Currently, the Bio-Gas plant is producing approximately 25 commercial gas cylinders per month. The Plan and Photographic views of the biogas plant are shown in Figure - 17 and Figure - 18 respectively.

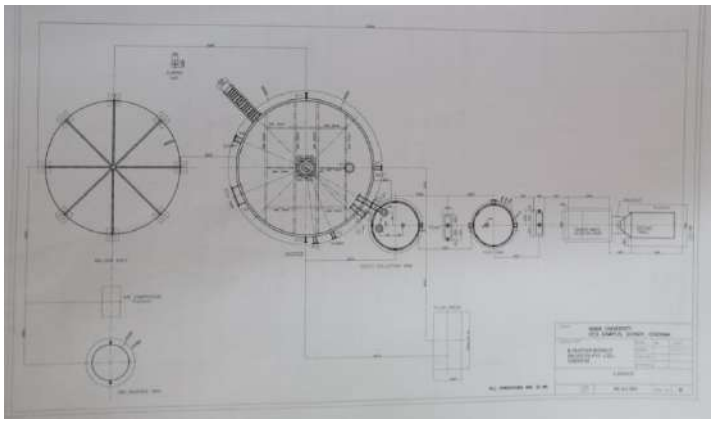


Figure - 17 Plan of Biogas Plant at Anna University

The copy of Sanction Proceedings for biogas plants under the RUSA scheme is enclosed in Annexure - IV.

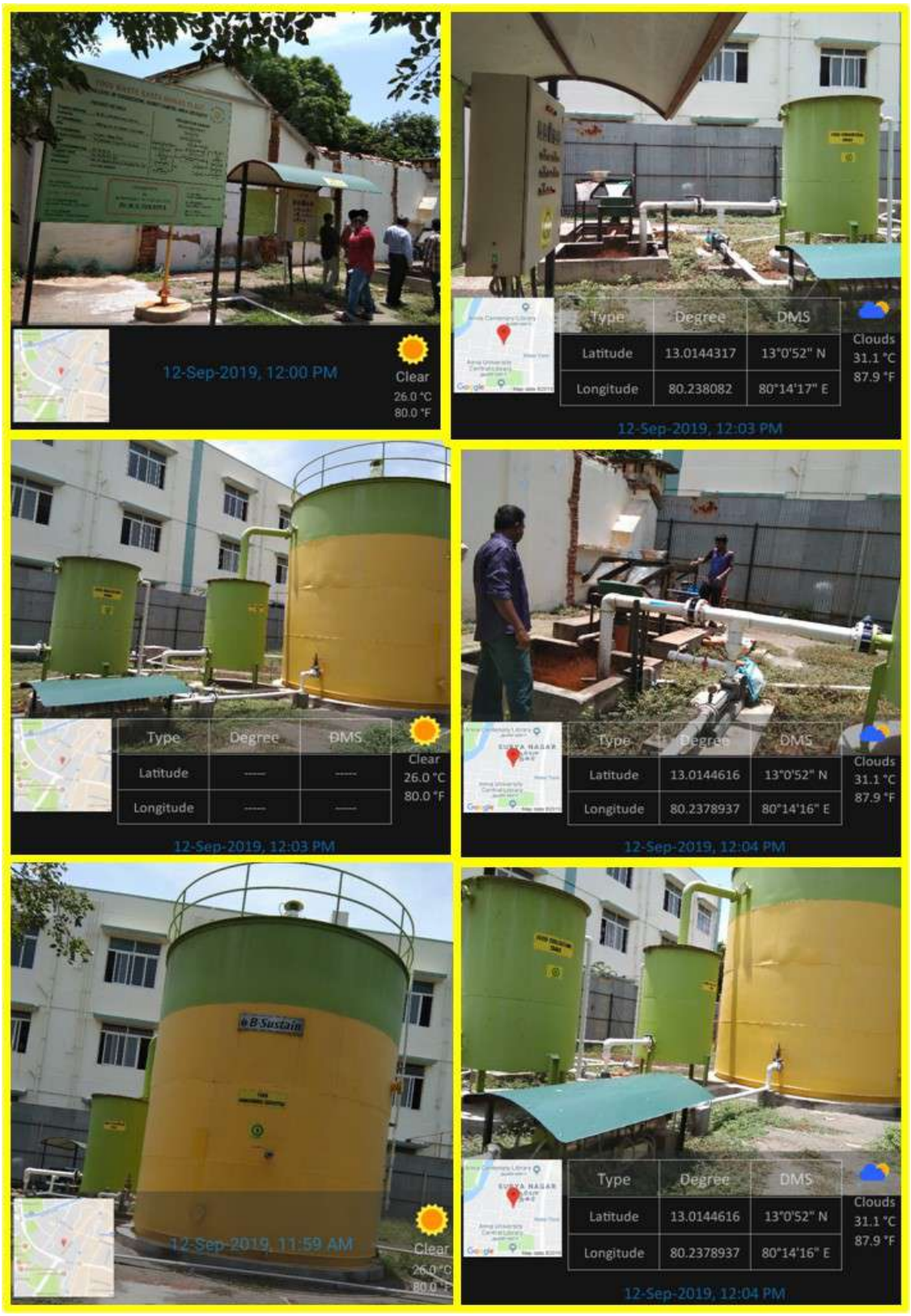


Figure - 18 Views of a biogas plant at Main Campus, Anna University

5.2 Dry and Inorganic Waste Management

Dry and inorganic wastes on the campus include dry leaves, branches of trees, papers and thrown away stationary materials from the academic zone and wastes from hostel blocks and canteen. Various types of waste collection bins are kept inside every classroom, lawns and pathway and cafeterias. The dry wastes collected in these bins are transferred to trolly type bins which are disposed of through authorized waste collectors of Corporation of Chennai. The pictorial views of various types of waste collection bins on the campus are presented in Figure – 19. The copy of the agreement executed between Dean, CEG and M/s. Biolife Environmental Services are attached in Annexure - V

Figure - 19 Various Types of Waste Collection Bins in the Campus

6.0 RECOMMENDATIONS OF THE COMMITTEE

The Technical Committee recommended for formulating the proposals for storing rainwater, enhancing groundwater level, restoration and digging of open wells, drilling of borewells for feasibility and further process. The committee also recommended adding disinfection followed by ultrafiltration units in the existing treatment plant in order to reuse the treated wastewater for flushing. In addition to that, additional sewage treatment plants were recommended to treat the sewage which is let out untreated. In addition to that, the committee recommended some modifications in order to increase the biogas production from the Biomethanation plant.

7.0 ACTION TAKEN

Based on the recommendation of the committee, the following measures have been initiated for the installation of new sewage treatment plants.

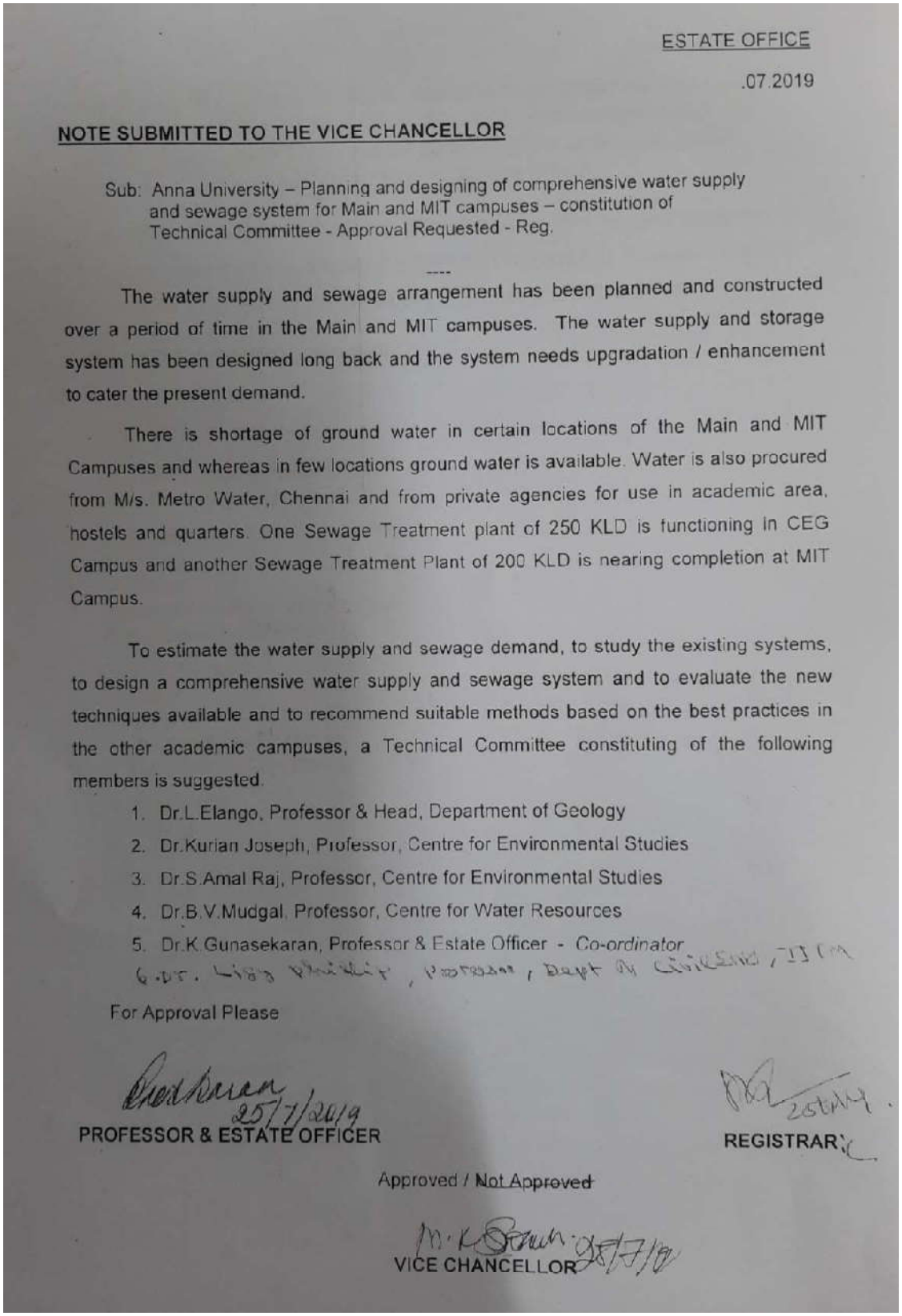
(i) A new STP to collect and treat 0.15 MLD of sewage from A.C Tech and SAP campus
(ii) Diversion of 0.10 MLD of sewage to STP at NCSCM
(iii) A new STP to collect and treat 0.15 MLD of sewage from Staff Quarters
(iv) A new STP to collect and treat 0.05 MLD of sewage at Tharamani Campus
(v) A new STP to collect and treat 0.20 MLD of sewage at Annex complex, MIT campus

The location of the proposed STP for a capacity of 0.20 MLD at MIT campus is shown in Figure - 20.

Figure - 20 Proposed wells and STP in MIT Campus

Annexure - I

Copy of VC note approval for the Formation of Technical Committee towards the planning and design of comprehensive Water supply & sewage system



ESTATE OFFICE

.07.2019

NOTE SUBMITTED TO THE VICE CHANCELLOR

Sub: Anna University – Planning and designing of comprehensive water supply and sewage system for Main and MIT campuses – constitution of Technical Committee - Approval Requested - Reg.

The water supply and sewage arrangement has been planned and constructed over a period of time in the Main and MIT campuses. The water supply and storage system has been designed long back and the system needs upgradation / enhancement to cater the present demand.

There is shortage of ground water in certain locations of the Main and MIT Campuses and whereas in few locations ground water is available. Water is also procured from M/s. Metro Water, Chennai and from private agencies for use in academic area, hostels and quarters. One Sewage Treatment plant of 250 KLD is functioning in CEG Campus and another Sewage Treatment Plant of 200 KLD is nearing completion at MIT Campus.

To estimate the water supply and sewage demand, to study the existing systems, to design a comprehensive water supply and sewage system and to evaluate the new techniques available and to recommend suitable methods based on the best practices in the other academic campuses, a Technical Committee constituting of the following members is suggested.

1. Dr.L.Elango, Professor & Head, Department of Geology
2. Dr.Kurian Joseph, Professor, Centre for Environmental Studies
3. Dr.S.Amal Raj, Professor, Centre for Environmental Studies
4. Dr.B.V.Mudgal, Professor, Centre for Water Resources
5. Dr.K.Gunasekaran, Professor & Estate Officer - *Co-ordinator*

6. Dr. [illegible], Professor, Dept. of Civil Engg., MIT Campus

For Approval Please

25/7/2019

PROFESSOR & ESTATE OFFICER

25/7/19

REGISTRAR

Approved / ~~Not Approved~~

M. K. Surappa 25/7/19

VICE CHANCELLOR

Annexure - II

Copy of Minutes of the Meeting of the First Technical Committee

Minutes of the first meeting of Technical Committee for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses held on 05.08.2019 at 11.00 a.m. in the Chamber of Professor & Estate Officer.

The first meeting of Technical Committee for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses was held on 05.08.2019 at 11.00 a.m. in the Chamber of Professor and Estate Officer.

The following members were present:

1. Dr. Kurian Joseph,
   (Member)
   Professor,
   Centre for Environmental Studies
   Anna University, Chennai-25.

2. Dr. S. Amal Raj,
   (Member)
   Professor,
   Centre for Environmental Studies
   Anna University, Chennai-25.

3. Dr. B. V.Mudgal,
   (Member)
   Professor,
   Centre for Water Resources,
   Anna University, Chennai-25.

4. Dr. Ligy Phillip,
   (Member)
   Professor,
   Department of Civil Engineering,
   IIT Madras, Chennai.

5. Dr. L. Elango,
   (Member)
   Professor & Head,
   Department of Geology,
   Anna University, Chennai-25.

6. Dr. K. Gunasekaran,
   (Coordinator)
   Professor & Estate Officer,
   Anna University, Chennai-25.

The Professor & Estate Officer and the Coordinator of the Committee welcomed the members.

A detailed presentation about the water demand in the hostels, quarters and institution area for Main campus and MIT campus were presented. The existing sources of water supply, the borewells available in the campuses, the rain water harvesting attempts, the ground water level in the campus, the storm water drainage pattern and quality of ground water in the campuses were presented with inputs from the Hostel wardens and from the studies of Centre for Environmental Studies and Institute of Remote Sensing.

The quantity of waste water generated from the quarters, hostels and institution area and methods of treatment done currently and the methods of disposal were presented. The current techniques adopted for treatment, the other methods of treatment, ultra filtration followed by flushing in water closets with dual plumbing arrangements was also discussed in detail. The proposals for storing rain water, enhancing ground water level, restoration and digging of open wells, drilling of borewells were discussed and the estate officer was requested to formulate proposals based on the discussions and was requested to present the proposals in the next meeting to discuss about the feasibility and further process.

The meeting ended with thanks to the members.

Dr. S. Amal Raj
(Member)
Professor,
Centre for Environmental Studies
Anna University, Chennai-25.

Dr. B. V. Mudgal
(Member)
Professor,
Centre for Water Resources,
Anna University, Chennai-25.

Dr. L. Elango
(Member)
Professor & Head,
Department of Geology,
Anna University, Chennai-25.

Dr. Kurian Joseph
(Member)
Professor,
Centre for Environmental Studies
Anna University, Chennai-25.

Dr. Ligy Phillip
(Member)
Professor,
Department of Civil Engineering,
IIT Madras, Chennai.

Dr. K. Gunasekaran
(Member)
Professor & Estate Officer,
Anna University, Chennai-25.

Annexure - III

Copy of Minutes of the Meeting of the Second Technical Committee

Minutes of the second meeting of Technical Committee for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses held on 18.09.2019 at 11.00 a.m. in the Chamber of Professor & Estate Officer.

The second meeting of Technical Committee for planning and designing of comprehensive water supply and sewage system for Main and MIT Campuses was held on 18.09.2019 at 11.00 a.m. in the Chamber of Professor and Estate Officer.

The following members were present:

1. Dr. Kurian Joseph,
   (Member)
   Professor,
   Centre for Environmental Studies
   Anna University, Chennai-25.
2. Dr. S. Amal Raj,
   (Member)
   Professor,
   Centre for Environmental Studies
   Anna University, Chennai-25.
3. Dr. B. V. Mudgal,
   (Member)
   Professor,
   Centre for Water Resources,
   Anna University, Chennai-25.
4. Dr. Ligy Phillip,
   (*Member)*
   Professor,
   Department of Civil Engineering,
   IIT Madras, Chennai.
5. Dr. L. Elango,
   (Member)
   Professor & Head,
   Department of Geology,
   Anna University, Chennai-25.
6. Dr. K. Gunasekaran,
   (Coordinator)
   Professor & Estate Officer,
   Anna University, Chennai-25.

Dr. L. Elango, Professor & Head, Department of Geology, Anna University was on leave and expressed his inability to attend.

The Professor & Estate Officer and the Coordinator of the Committee welcomed the members. A detailed presentation on the demand and supply of water, demand for treatment of waste water by different techniques was made.

The following aspects were discussed, recommended by the Committee for further action:

Water Supply System

- Development of pond (on the northern side of International Hostel and East of Building Technology Centre) with RCC retaining wall in the northern side of the proposed pond with the height of 5 m from the existing level.
- Digging of open well on the southern side of the pond for additional water supply for day-to-day use in the Main campus.
- The necessary storm water channels to the pond are to be constructed.
- Rejuvenation of open well in staff quarters of Anna University.
- Restoration of all open wells (Field lab, CSE Department, Quarters etc.,) for operation and rain water harvesting from nearby building roof top.
- Groundwater is available for tapping in SAP, A.C. Tech academic area, A.C. Tech hostel area and in quarter's area. If any bore wells are to sunk it is advised to locate in the above areas.
- It is recommended to install water meters from all sources of supply and at all points of demand nodes.
- A precast duct with the opening of 3' x 3' to be constructed across Gandhi Mandapam Road to enable crossing of water supply lines form quarters to the CEG campus.

CEG Campus Sewerage System

- To construct sewage treatment facility (capacity 0.2 MLD) with Sequencing Batch Reactor technique (SBR) ~~(Air lift pump method)~~ on the rear side of the CEG main canteen.

- The treated waste water from the above proposed facility is to be used for lawns and gardening in the CEG main building gardens, A.C. Tech, SAP and V.C. Quarters.
- The existing treatment plant capacity to be enhanced by another 0.3 MLD with Moving Bed Bio Reactor with ultra-filtration facility.
- The treated water from the proposed unit to be used for flushing of water closets.
- The dual plumbing system to be installed in all hostel and institute buildings with proper network.
- To install automatic pumping on lowering of water level in over head tanks below the demarcated minimum level especially in the water tanks supplying ultra-filtered water to the Water closets.
- The additional treated water to be stored in the advanced oxidisation pond to recharge the groundwater.
- The old root zone treatment units are to be demolished as they are not functioning for more than 10 years.
- A precast duct with the opening of 3' x 3' to be constructed across Gandhi Mandapam Road to enable crossing of waste water supply lines form quarters to the CEG campus.

MIT Campuses

Water Supply

- The existing pond in the MIT Annex (Rani Thottam) to be developed with proper stone revetments on the sides.
- Necessary storm water channels to be laid to drain water into the proposed pond.
- It is proposed to lay the two pipe lines (one for ground water another for ultra filter water) from MIT Annex to the MIT Main Campus through railway track or along the road with necessary permission.
- Groundwater is available only in the MIT Annex and if any bore wells are to sunk it is advisable to locate in the above campus.

- It is recommended to install water meters from all sources of supply and at all points of demand nodes.

Waste Water Treatment

- It is proposed to construct 0.25 MLD waste water treatment plant by SBR Technique ~~(Air-lift pump method)~~ with ultra-filtration in the MIT Annex.
- Laying of pipe network and dual plumping system in all hostel blocks and institute buildings for supply of ultra-filtered treated waste water.
- To install automatic pumping on lowering of water level in over head tanks below the demarcated minimum level especially in the water tanks supplying ultra-filtered water to the Water closets.

The coordinator of the committee thanked the members for the valuable contributions and suggestions for inspiring the water supply and sewage treatment / reuse in Main and MIT Campuses.

18/09/19

Dr. S. Amal Raj
(Member)
Professor,
Centre for Environmental Studies
Anna University, Chennai-25.

18/9

Dr. B. V. Mudgal
(Member)
Professor,
Centre for Water Resources,
Anna University, Chennai-25.

On Leave

Dr. L. Elango
(Member)
Professor & Head,
Department of Geology,
Anna University, Chennai-25.

18/9/19

Dr. Kurian Joseph
(Member)
Professor,
Centre for Environmental Studies
Anna University, Chennai-25.

Dr. Ligy Phillip
(Member)
Professor,
Department of Civil Engineering,
IIT Madras, Chennai.

18/9/2019

Dr. K. Gunasekaran
(Member)
Professor & Estate Officer,
Anna University, Chennai-25.

Annexure - IV

Copy of Registrar's Proceedings on Sanction of Biogas Plant under RUSA Scheme

ANNA UNIVERSITY::CHENNAI -25

REGISTRAR

Procs.No. 847/RUSA/PD3/2013-2(a) Date: 08.05.2017

Sub: Anna University – P&D office – Implementation of RUSA scheme – Establishment of Solar PV based street lighting & Biogas Plant – Revised Sanction – Accorded.

Ref: 1. This office Procs.No.847/RUSA/PD4/2013-2, dated: 17.08.2016.
2. Lr.No.nil, dated: 25.04.2017, from the Director, Institute for Energy Studies.
3. Registrar's approval dated: 27.04.2017.

****

In the reference 1st cited, sanction was accorded for a sum of Rs.1,30,00,000/- to the Director, Institute for Energy Studies, Anna University, towards the Establishment of Solar PV based street lighting and Biogas Plant, under RUSA scheme during the financial year 2016-17.

In the reference 2nd cited, the Director, Institute for Energy Studies, Anna University has requested to issue a revised sanction for the financial year 2017-18.

In the reference 3rd cited, the Registrar has approved to issue revised sanction for the financial year 2017-18.

Accordingly, a revised sanction is hereby accorded for a sum not exceeding Rs.1,30,00,000/- (Rupees One Crore and Thirty Lakhs only) to the Director, Institute for Energy Studies, Anna University, towards Establishment of Solar PV based street lighting and Biogas Plant under RUSA scheme as per the details given below.

S.No.	Name of work / Name of Campus	Amount (Rs.)	Total Amount (Rs.)
1.	Establishment of Solar PV based street lighting :		
	a. College of Engg. Guindy campus	50,00,000	1,00,00,000
	b. Madras Institute of Tech. campus	50,00,000	
2.	Biogas Plant - College of Engg. Guindy campus	30,00,000	30,00,000
	Gross Amount		1,30,00,000

The purchase procedure should be strictly followed as per University norms and the sanctioned amount shall be utilized in time, so as to submit the Utilization Certificate to the funding agency at the earliest.

The expenditure in this regard is debitable under the head of account "M.H.No.7.1.10.35 – RUSA scheme.

Necessary entries have been made in the Sanction Register vide page No.6 and Sl.No.1 for the year 2017-18.

REGISTRAR

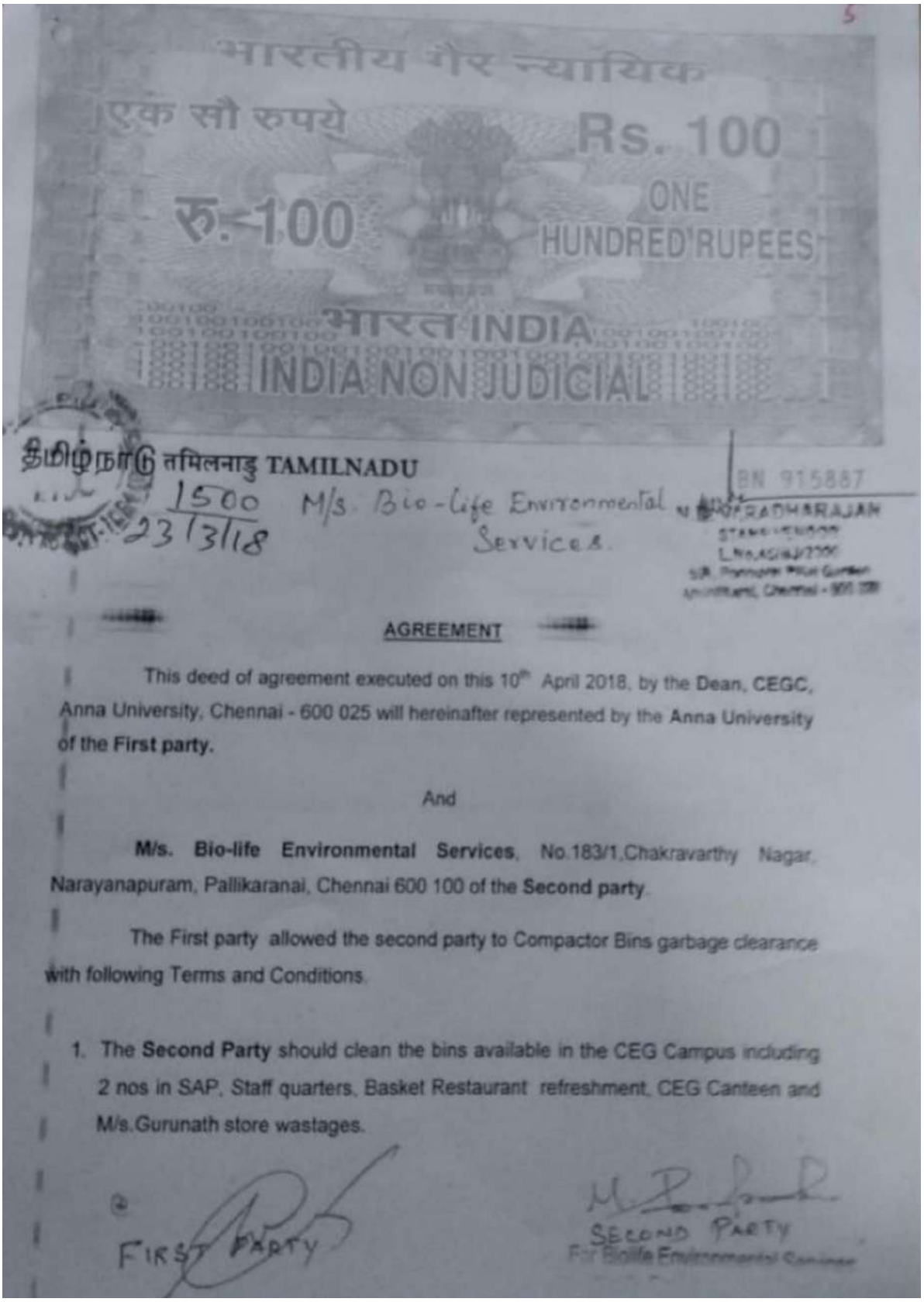
To
The Director, Institute for Energy Studies, Anna University

Copy to: 1. Bill
2. The Professor & Estate Officer, Anna University
3. The Dean's - CEG & MIT, Anna University
4. The Deputy Registrar (F&G), Anna University
5. The Superintendant, FA50 section

8.5.17

Annexure - V

Copy of Agreement Executed between Dean, CEG and M/s. Bio-life Environmental Services on Waste Collection and Disposal



भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

1500 M/s. Bio-Life Environmental Services.

23/3/18

BN 915887

AGREEMENT

This deed of agreement executed on this 10th April 2018, by the Dean, CEGC, Anna University, Chennai - 600 025 will hereinafter represented by the Anna University of the **First party.**

And

M/s. Bio-life Environmental Services, No.183/1,Chakravarthy Nagar, Narayanapuram, Pallikaranai, Chennai 600 100 of the **Second party**.

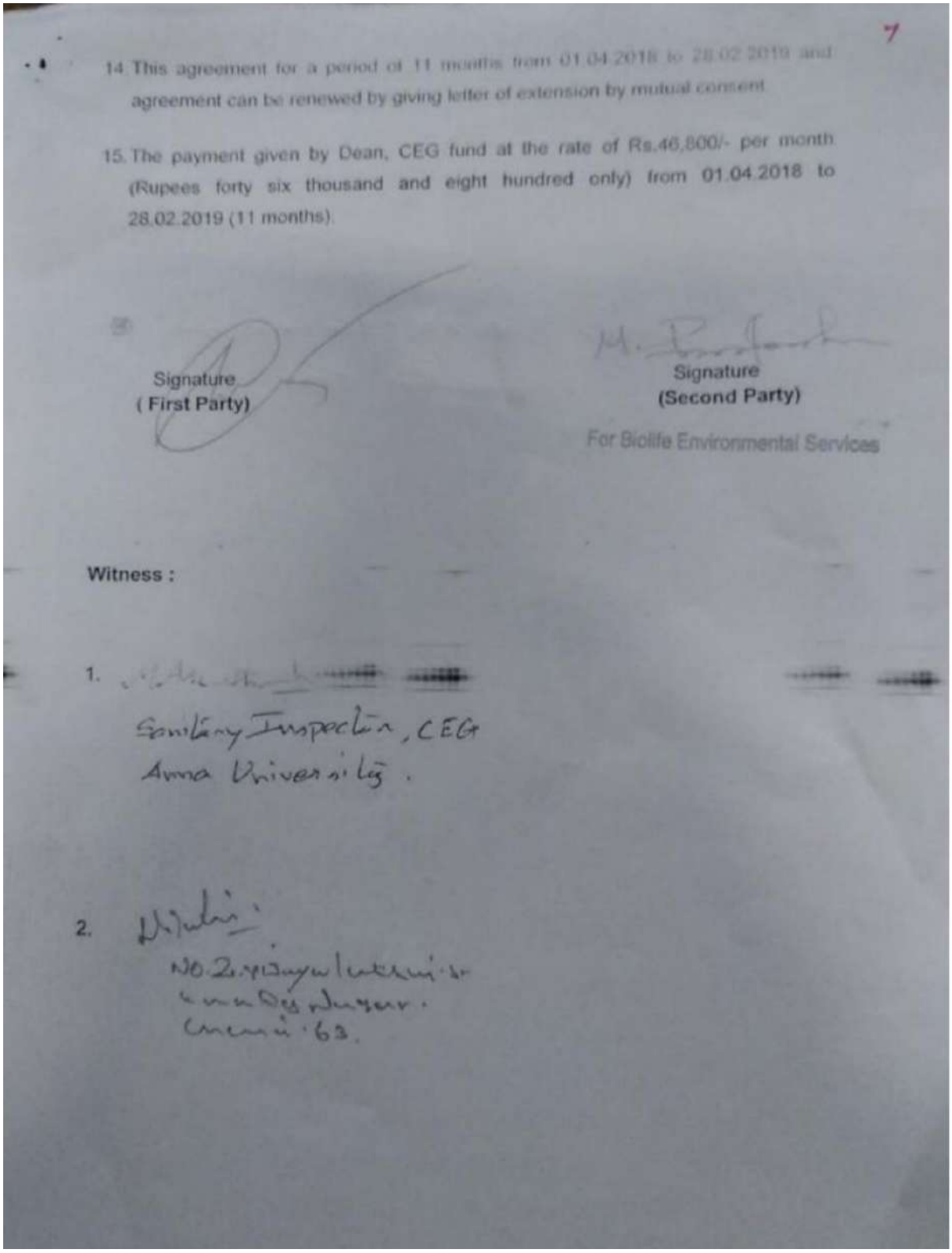
The First party allowed the second party to Compactor Bins garbage clearance with following Terms and Conditions.

1. The **Second Party** should clean the bins available in the CEG Campus including 2 nos in SAP, Staff quarters, Basket Restaurant refreshment, CEG Canteen and M/s.Gurunath store wastages.

FIRST PARTY

SECOND PARTY

For Bio-life Environmental Services



7

14. This agreement for a period of 11 months from 01.04.2018 to 28.02.2019 and agreement can be renewed by giving letter of extension by mutual consent.

15. The payment given by Dean, CEG fund at the rate of Rs.46,800/- per month (Rupees forty six thousand and eight hundred only) from 01.04.2018 to 28.02.2019 (11 months).

Signature
(First Party)

Signature
(Second Party)

For Biolife Environmental Services

Witness :

1. Sanitary Inspector, CEG
Anna University.

2.

10/6/2020
PROFESSOR AND DEAN
ANNA UNIVERSITY
CHENNAI-600 025

10/6/2020