MANIPAL UNIVERSITY
JAIPUR
(University under Section 2(f) of the UGC Act)

13 CLIMATE ACTION

MUJ commitment to be a Carbon Neutral Campus

Manipal University Jaipur is working toward carbon neutrality by focusing on decarbonizing its campus, improving energy efficiency, and increasing the use of renewable energy sources as part of its commitment to sustainability under the Greenhouse Gas Protocol framework. The university's environmental initiatives align with its sustainable development goals, including efforts in energy auditing, waste reduction, and campus-wide awareness programs on climate action and sustainable resource management.

Key Points:

- The University is a **'Zero Discharge Campus'**, with Rain Water Harvesting, Waste water recycling and reuse and Ground Water recharging in place. Water conservation through campus wide drains and ponds for water collection.
- Solar Power Plant of 1.5 MWp is installed on roof-top of the buildings in the Campus – one of the largest roof-top Solar Power Plant in India for any Private University.
- Sewage treatment plants on both sides of the campus.
- All buildings are optimally designed to maximize daylight and minimize heat gains.
- Campus greening through extensive tree plantation.
- The University has a Bio-Gas generation system using Kitchen waste.

MUJ: Awards & Achievements

GRIHA AWARD
First University in the country to be awarded GRIHA award for integrated Water Management.

LEED INDIA PLATINUM Award .
Manipal University has been conferred with this award being the first campus in the country to do so for Green Building . Based on review done by IGBC on the credits submitted by the university, which were evaluated against the rating system for certifying Green Buildings.

GRIHA FIVE STAR RATING
The first University in the country to receive this award for Energy Conservation and Environment Friendly Design.

Head Office HBC

Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004

Phone: 0141-2716840

Registered

File No : F(HDF)/JAIPUR(Sanganer)/6935(1)/2023-2024/5986-5988

Order No : 2023-2024/HBC/2809 **Dispatch Date: Dec 14 2023 1:06PM**

Unit Id : 27890

M/s Manipal University, Jaipur

Khasra No 467,469,474,458/1,473,475, 542, 544
Village Dehmi Kalan, Tehsil Sanganer, Ajmer Road ,
Dehmi Kalan Tehsil:Sanganer
District:JAIPUR

Sub: **Consent to Establish** under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 21(4) of Air (Prevention & Control of Pollution) Act, 1981**.**

Ref: Your application(s) for Consent to Establish dated 16/06/2023 and subsequent correspondence.

Sir,

Consent to Establish under the provisions of Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) and under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder ,**is hereby granted** for your **Manipal University Jaipur plant** situated / proposed at **Khasra No 467,469,474,458/1,473,475, 542, 544 village Dehmi Dehmi Kalan Tehsil:Sanganer District:JAIPUR** , Rajasthan under the provisions of the said Act(s). This consent is granted on the basis of examination of the information furnished by you in consent application(s) and the documents submitted therewith, subject to the following conditions:-

1 That this Consent to Establish is valid for a period from **16/06/2023** to **31/05/2028 or date of commencement of production / commissioning of the project or activities whichever is earlier .**

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below:

Particular	Type	Quantity / Capacity
Gross Built up Area	Product	21,525.00 SQ. METER

3 That in case of any increase in capacity or addition / modification / alteration or change in product mix or process or raw material or fuel, the project proponent is required to obtain fresh consent to establish.

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4 That the control equipment as proposed by the applicant shall be installed before trial operation is started for which prior consent to operate under the provision of the **Water Act and Air Act** shall be obtained. This consent to establish shall not be treated as consent to operate.

5 That the quantity of effluent generation and disposal along with mode of disposal for the treated effluent shall be as under:

Type of effluent	Max. effluent generation (KLD)	Quantity of effluent to be recycled (KLD)	Quantity of treated effluent to be disposed (KLD) and mode of disposal
Domestic Sewage	24.000	16.000	5.000 Plantation and Horticulture within premises

6 That the sources of air emissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

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Sources of Air Emissions	Pollution Control Measures	Prescribed	
		Parameter	**Standard**
Dg set(1010KVA)	ACOUSTIC ENCLOSURE , ADEQUATE AIR POLLUTION CONTROL MEASURES , ADEQUATE STACK HEIGHT , ADEQUATE STACK HEIGHT OF 30 MTR.	NOx (as NO2) (at 15% O2) day basis in ppmv	710 mg/Nm3
		NMHC (as C) (at 15% O2)	100 mg/Nm3
		PM (at 15% O2)	75 mg/Nm3
		CO (at 15% O2)	150 mg/Nm3

7 That the Domestic Sewage shall be treated before disposal so as to conform to the standards prescribed by the Board as notified under the Environment (Protection) Act-1986 for disposal **Into Inland Surface Water**. The main parameters for regular monitoring shall be as under:

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Order No : 2023-2024/HBC/2809 **Dispatch Date:** Dec 14 2023 1:06PM

Unit Id : 27890

Parameters	Standards
Oil and Grease	Not to exceed 10 mg/l
pH Value	Between 6.5 to 9.0
Biochemical Oxygen Demand (3 days at 27C)	Not to exceed 10 mg/l
Chemical Oxygen Demand	Not to exceed 50 mg/l
NH4 (N)	5 mg/l
N total	10 mg/l
Total Suspended Solids	Not to exceed 20 mg/l
Fecal Coliform (MPN per 100 ml)	Not to exceed 100

8 That the unit shall obtain all necessary permission from District Administration, Jaipur and Government of Rajasthan related to establishment of new academic block "Block-3" in "Manipal University", Khasra No 467, 469, 474, 458/1, 473, 475, 542, 544 Village Dehmi Kalan, Tehsil Sanganer, Ajmer Road, Tehsil: Sanganer District: JAIPUR, Rajasthan.

9 That this consent to establish is being issued for Academic Block-3 for Gross Built Up area: 21,525 Sq.m. For any change in area, the unit has to seek fresh consent to establish.

10 That if the project cost exceeds Rs. 104 Crore, the unit shall take/obtain modification in consent after paying fee as applicable.

11 That the unit shall provide adequate & safe infrastructure facility (step ladder) for monitoring at stack of D.G. set.

12 That the unit shall apply for CTO for Built up area @ 21,525 sq.m. within 15 days time period.

13 That the unit shall get amendment in all the previous CTOs for correct Built up area, where the same have been obtained for increased Built up area as compared to approved map.

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14 That unit shall comply standards as specified in Environment (Protection) Act,1986, (Limiting concentration in mg/l, except for pH):
i. pH: 6.5-9.0
ii. BOD 3days, 27 degree Celsius: 10
iii. COD: 50
iv. Oil & Grease : 10
v. TSS: 20
vi. N-total : 10
vii. Fecal Coliform : 100 MPN/100 ml
viii. NH4-N : 5

15 That the unit shall comply with the standards as prescribed vide MOEF notification no. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality.

16 That the unit shall ensure compliance of ambient air quality standard in respect of noise as prescribed under Environment (Protection) Act & Rules made therein.

17 That unit shall provide adequate stack height along with acoustic enclosures on one D.G. set of 1010 KVA. Further unit shall not allow installing any air pollution source i.e. Boiler/Hot water generation etc. without prior consent to establish from the Board under the Air Act 1981.

18 That the total water consumption shall not exceed 30 KLD. The ground water shall not be abstracted without prior NOC from Central Ground Water Authority.

19 That the water flow meters shall be provided at all suitable points to measure quantity of daily water consumption, waste water generation, waste water treated and treated waste water recycled and utilized for plantation/gardening purposes. Daily record of the same shall be maintained and to be submitted to the Board.

20 That the unit shall ensure proper recycling and reuse of domestic waste water after adequate treatment.

21 That the entire domestic waste water generated in tune of 24 KLD shall be treated through existing sewage treatment plant having capacity of 500 KLD (150 KLD +350 KLD).

22 That the unit shall maintain condition of STP of capacity 500 KLD (150 KLD +350 KLD) to achieve the standards prescribed under EP Act 1986 and the unit shall dispose the sludge of STP in scientific manner.

23 That the unit shall provide disinfection system for STP treated water before its utilization in plantation/horticulture purpose.

24 That the unit shall dispose the sludge of STP in scientific manner.

25 That the unit shall not allow making any obstacles to any natural water flow i.e. natural nallah/stream carrying rain water to any water body.

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26 That the unit shall install adequately designed rain water harvesting structure for prevention and recharge of ground water in and around the area.

27 That energy conservation measures like installation of CFLs/FLs for lighting the areas outside the building should be integral part of the project design and should be in place before project commissioning.

28 That used CFL/FLs/LEDs should be properly collected and disposed off/sent for re-cycling as per prevailing rules/guidelines issued by regulatory authority. Use of solar panels also be done to the extent possible.

29 That the solid waste generated should be properly collected & segregated. Wet garbage should be composted and dry/inert solid waste should be disposed off at approved sites for land filling after recovering recyclable materials.

30 That the unit shall comply with the provisions of Hazardous and Other Wastes(Management and Transboundary Movement) Rules, 2016; Solid Waste Management Rules, 2016; Plastic Waste Management Rules 2016; Construction And Demolition Waste Management Rules 2016; Bio-Medical Waste Management Rules, 2016 and E- Waste Management Rules, 2016.

31 That the unit shall ensure proper recycling and reuse of domestic waste water after adequate treatment.

32 That waste water shall always be conveyed/ carried through closed conduit pipe line and no other measure of carrying waste water such as tankers, flexible or temporary pipe line shall be used/practiced.

33 That water meters shall be installed at suitable locations at closed conduit pipe line to measure the quantity of effluent reaching to 500 KLD (150 KLD +350 KLD) STP for treatment.

34 That the surplus/excess/unutilized treated water shall be used for agriculture/plantation.

35 That unit shall utilize entire treated waste water for flushing/process/gardening/non-potable uses and other gainful purpose and zero discharge status shall be maintained outside the premises. No waste water shall be discharged on land/ into sewer line/into natural nala/water body/drain

36 That the unit shall not allow making any obstacles to any natural water flow i.e. natural nallah/stream carrying rain water to any water body.

37 That this consent is being issued on the basis of information /documents submitted by the industry. In case, it is found during post inspection that, the unit has flouted the conditions of consent or provided inadequate control measures & wrong information, the consent may be revoked and action may be initiated under the Provisions of Water Act & Air Act without any further notice.

Registered

File No : F(HDF)/JAIPUR(Sanganer)/6935(1)/2023-2024/5986-5988

Order No : 2023-2024/HBC/2809 **Dispatch Date: Dec 14 2023 1:06PM**

Unit Id : 27890

38 **That the industry shall comply provisions 9(4) & 13(2) of Plastic Waste Management (PWM) Rules -2016 and as amended & shall submit application for registration in form-I to State Board.**

39 **That no Single use Plastic (SUP) items, which are banned vide Ministry of Environment, Forest and Climate Change (MoEF& CC), Government of India notification dated 12/08/2021 shall be used in the unit premises.**

40 **That this consent to establish shall be subject to compliance of any direction or order passed by Court of Law/NGT/CAQM in the matter.**

41 **That the unit shall obtain necessary permission from National Board for Wildlife Clearance (NBWL), if the project falls in ESZ of Notified protected Area and the activity is not covered under permitted activity. The consent is granted under the provisions of Water Act, 1974 and Air Act, 1981 and any other permission/consent w.r.t. Environment Protection Act, 1986 and Forest Conservation Act, 1980, if required, shall have to be obtained before implementation of the project.**

42 **That all the green building concepts/ norms shall be adopted in all possible ways which includes Green walls, solar energy etc., and compliance of this condition shall be submitted along with photograph during the time of CTO application.**

43 **That proper C&D mechanism shall be adopted, and compliance of this condition shall be submitted along with photograph during the time of CTO application.**

44 **That proper wash disposal system shall be developed, and compliance of this condition shall be submitted along with photograph during the time of CTO application.**

45 **That water harvesting system shall be developed for maximum storage and moisture improvement, and compliance of this condition shall be submitted along with photograph during the time of CTO application.**

46 **That proper ventilation measures for energy saving, less toxic materials for reducing indoor pollution and usage of certified wood shall be considered, and compliance of this condition shall be submitted along with photograph during the time of CTO application.**

47 **That proper waste segregation system to be developed.**

48 **That the unit shall take steps to enhance landscaping and green cover in all possible spaces and develop green belt in at least 33% of the total project area.**

49 That, notwithstanding anything provided hereinabove, the State Board shall have the power and reserves its right, as contained **under Section 27(2) of the Water Act and under Section 21(6) of the Air Act** to review anyone or all of the conditions imposed here in above and to make such variation as it deems fit for the purpose of compliance of the **Water Act and Air Act**.

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50 That the grant of this **Consent to Establish** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

51 That the grant of this **Consent to Establish** shall not, in any way, adversely affect or jeopardize the legal proceedings, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This **Consent to Establish** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act and Air Act** and to such other conditions as may, from time to time, be specified by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Establish** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

This bears approval of the competent authority.

Yours sincerely,

Group Incharge[HBC]

(A): **Copy to:-**

1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Jaipur (south) with request to ensure compliance of consent conditions.

2 Master File.

Group Incharge[HBC]

Environmental Audit and Carbon Footprint calculations

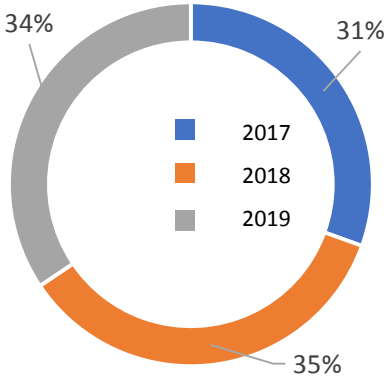
- Manipal University, Jaipur

TABLE OF CONTENT

Environmental Audit for Manipal University, Jaipur

Energy

Annual Energy Consumption 2017/18/19



Key Performance Indicator (KPI)

Energy Performance Index (EPI) per year of MUJ is

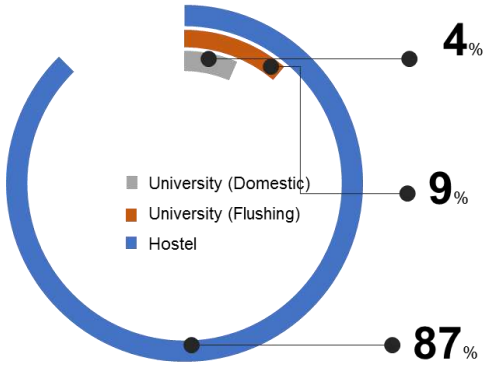
Energy performance Index (2019)
***77.3** kWh/m2.year*

Energy performance per student (Academic + Hostel)
***1,291** kWh/ person. year*

Energy use per student (Hostel)
***2,156** kWh/ person. year*

Water

Water Consumption



Key Performance Indicator (KPI)

Water Consumption per student per year of MUJ is

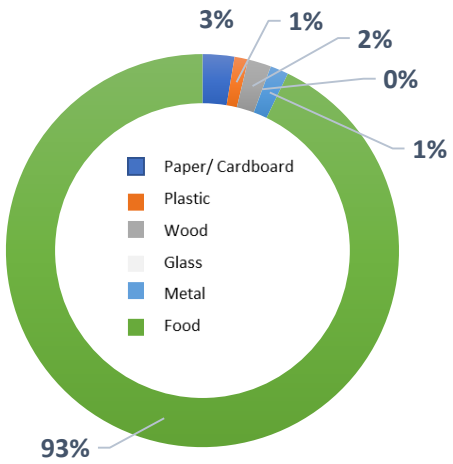
Campus Level:
***56.1** kL/Student. Year*

University Level:
***2.83** kL/Student. Year*

Hostel Level:
***88.4** kL/Student. Year*

Waste

Waste Generation



Key Performance Indicator (KPI)

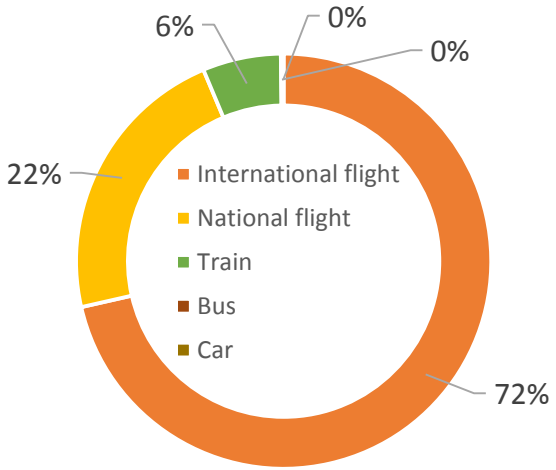
Annual Waste Generation per student per year of MUJ is

Dry Waste:
***2.94** kg/student.year*

Food waste :
***7.9** kg/student.year*

Mobility

TCO2 Equivalent (Commute)



Key Performance Indicator (KPI)

Total MUJ CO2 emission in 2019:

Total CO2 emission from daily commute-
***15,179 TCO2** per student*

Total CO2 emission from out station travel-
***16 TCO2** per student*

Total MUJ CO2 emission in 2019-
***15,195 TCO2** per student*

Dashboard - (Executive Summary)

In this Audit we have mapped the performance of the Students and Staff in the University in four different sectors; Energy Waste, Water and Mobility.

The report will define the ***Key Performance Indicators (KPIs)*** at individual and campus levels. This will further help the university in benchmarking their performance and monitor the KPIs periodically.

Environmental Audit for Manipal University, Jaipur

Manipal University Jaipur (MUJ)

Manipal University Jaipur (MUJ) was launched in 2011, as a self-financed State University. The campus is of 140 Acres including academic and residential area. The multi-disciplinary university offers career-oriented courses at all levels, i.e., UG, PG and doctoral and across diverse streams, including Engineering, Architecture, Planning, Fashion Design, Interior Design, Fine Arts, Hospitality, Humanities, Journalism and Mass Communication, Basic Sciences, Law, Commerce, Computer Applications, Management, etc. The university intents to conduct an Energy Audit and Carbon Footprint Calculation for Manipal University Jaipur campus.

The main objective of this project is to develop and propose recommendations for low carbon transition roadmap for the entire campus of Manipal University, based on the understanding of direct and indirect GHG emissions through energy use in the campus, energy monitoring, benchmarking of embodied energy for existing buildings, aligning the campus strategies with Sustainable Development Goals (SDGs), Energy Efficiency, renewable energy, and environmental performance.

Project Description

- Project name – Manipal University Jaipur
- Typology – Institutional Building
- Type building blocks – Academic, Administrative, Hostel
- Climate zone – Hot and dry
- Location – Jaipur, Rajansthan-303007
- Site area – 5,63,697 m^2
- Built up area – 1,14,389 m^2
- No of students - 9143
- No. of Student (Hostel) - 4978
- No of staff - 1000
- Approximate numbers of day of operation – 210 days

Integrative Design Solution (IDSPL) has been appointed by MUJ to conduct **the Green Audit** for the campus covering the ***Energy and Environmental assessments along with calculation of Carbon Footprint*** of the University.

Abbreviations

AHU	Air Handling Unit
APFC	Automatic Power Factor Control
BEE	Bureau Of Energy Efficiency
CFM	Cubic Feet Per Minute
CPCB	Central Pollution Control Board
DCS	District Cooling System
ECBC	Energy Conservation Building Code
EPI	Energy Performance Index
HVAC	Heating, Ventilation, And Air Conditioning
KL	Kilo Litre
KLD	Kilo Litres /Day
kVA	Kilovolt-Ampere
kVAr	Kilovolt-Ampere Reactive
KW	Kilowatt
kWH	Kilowatt Hour
kWP	Kilowatt Peak
LPM	Litre Per Minute
MEP	Mechanical, Electrical & Plumbing
MVA	Megavolt Ampere
MW	Megawatt
NBC	National Building Code
SOP	Standard Operating Protocol
STP	Sewage Treatment Plant
TR	Ton Of Refrigeration
VFD	Variable Frequency Drive

Environmental Audit for Manipal University, Jaipur

Green audit (Energy & Environmental Audit) serve to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities and save money. Energy & Environmental audits can be a highly valuable tool for college in a wide range of ways to improve their environmental and economic performance and reputation; while reducing wastages and operating costs. Once a baseline data is prepared after the auditing process, the data can serve as a point of departure for further action in campus greening. It will also help the college to benchmark its programs and activities with other peer institutions, identify areas for improvement and prioritize the implementation of future projects.

The data will also provide a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs.

The Green Audit is a requirement under **the Criteria 7 of NAAC, National Assessment and Accreditation Council.**

The basic objective of green audit is to **continually improve**

Benchmarking and analyzing of **the performance of** environment conditions in and around the institutes and colleges

Outcome:

Formalized Management System for Energy and Environmental concerns

Increased awareness towards energy and environment concerns

Reduce Energy Consumption

Reduced carbon footprint

Reduced water footprint

Improved Illumination, Noise level, Ventilation and Indoor Air quality

Overall Sustainable Development

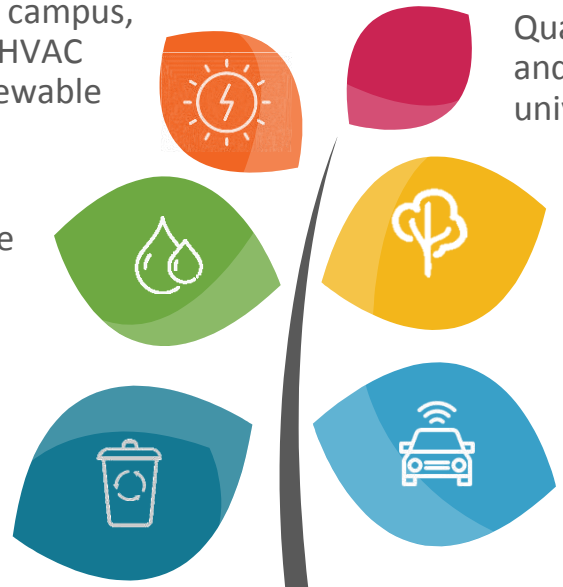
What is Green Audit (Energy & Environment) and what can be achieved from it?

Criteria for conducting the Audit

1. Energy:
The energy criteria covers the Energy use of the campus, lighting systems, HVAC systems, and renewable integration

2. Water:
The criteria includes the water consumption in the campus, water balancing, reusing and recycling of water.

3. Waste:
This criteria covers the solid waste management and food waste generation and its disposal



4. Mobility:
This criteria covers the CO_2 emissions calculation for the campus for the daily commute, national and international trips and analyze the carbon footprint for the transportation.

5. Landscape:
It calculates the CO_2 sequestration, Oxygen secretion through plants and the water requirements for the plant species.

6. Wellness:
This covers the Indoor Air Quality (IAQ), water quality and daylight quality in the university campus.

Structure of the Audit Report

1. Defining the objective of the criteria for evaluation
2. Collecting the available data
3. Analysis of the information
4. Deriving the Key Performance Indicators (KPIs) for University and at Individuals based on the performance.
5. Recommendations to improve the performance under each criterion

In the second phase of the audit, a roadmap will be developed based on the evaluated scenarios. University's benchmarking of the performance can be monitored against the set KPIs. This will help the MUJ to plan informed improvements of infrastructure and services leading to reduced carbon footprint of the campus

MUJ Site Zoning

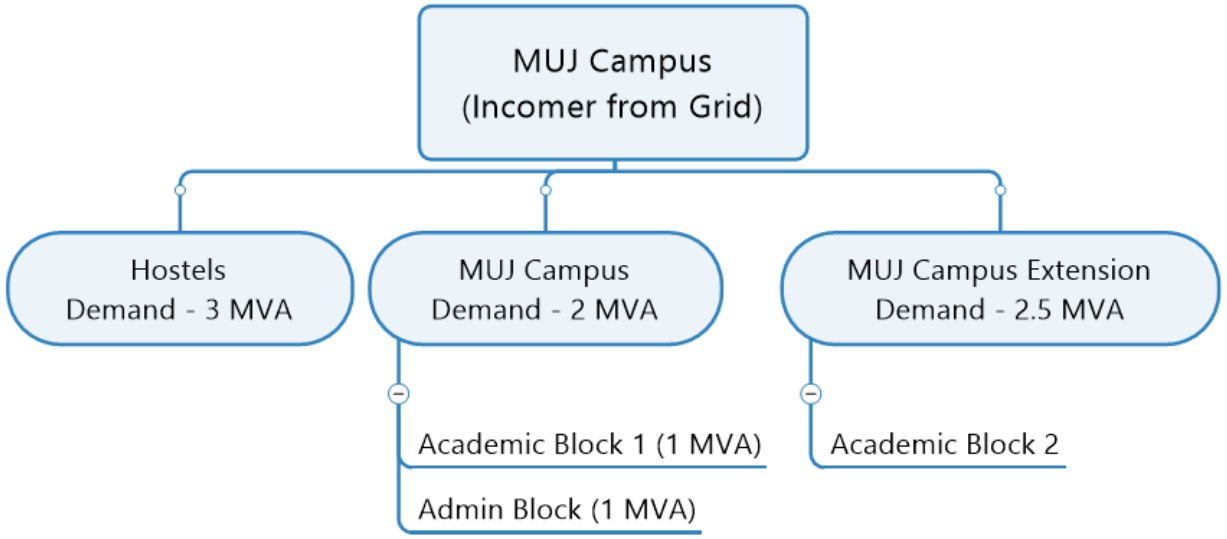
Legends

1	Administrative Block
2	Academic Block
3	Hostel block (Students Residential Area)
4	Staff Residential Area
5	STP & Water harvesting pond
6	Future Expansion
7	Recreational ground

Criteria - Energy

Energy Demand (As of 2019)

MUJ Campus including hostels and staff quarters has an electrical connected load of **7.07 MW** and contract demand of 4,000 kVA which caters to HVAC load, indoor and outdoor lighting, building services like lifts, water pumping, power backup, etc.



Transformer capacities of each area in the campus

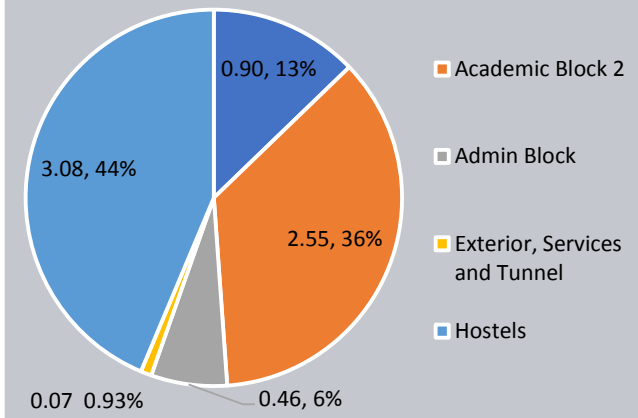
MUJ purchases grid electricity from **Jaipur Vidyut Vitaran Nigam Ltd from 2010** and also uses electricity generated from the on-site Solar PV power plants installed in the campus.
Average Grid Electricity Price – INR 11.84 per kWh during 2020-21
Average Renewable Electricity Price – INR 5.26 per kWh during 2020-21

Source: MUJ Asset List dashboard, Electricity Bills, Handover documents (Hostel, Academic & Admin Area

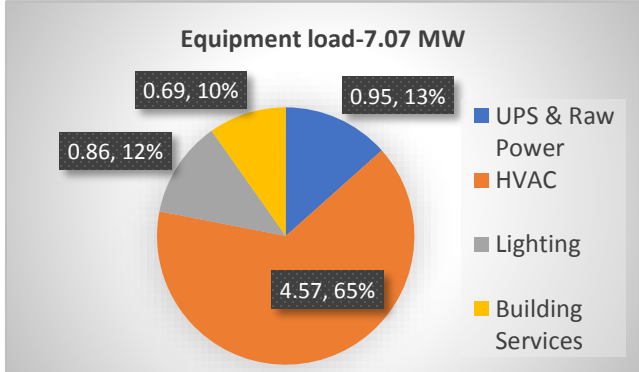
Observations:

Energy Demand Share:

Electrical Connected Load – 7.07 MW



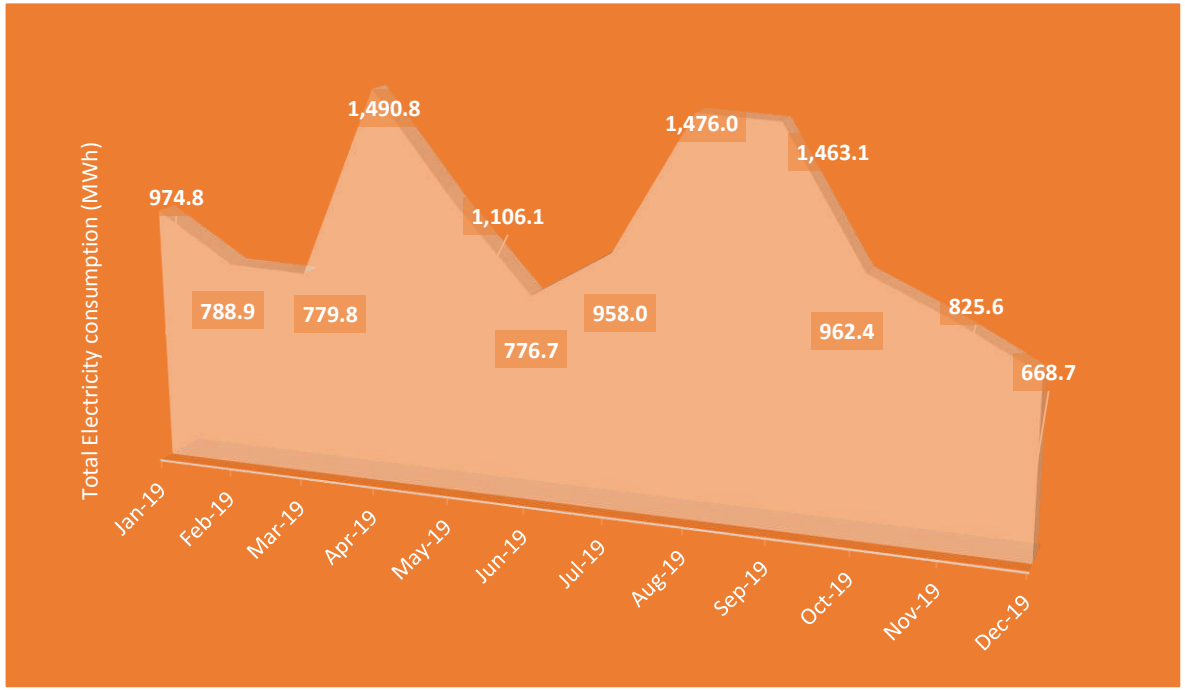
Energy End-use Equipment Demand Break-up



Criteria - Energy

Energy Consumption: Academic and Hostel Area (Jan 2019 - Dec 2019) – Grid + Renewable energy

S/N	Month	Total Electricity Consumption (KWh)
1	January	974,808.30
2	February	788,946.10
3	March	779,796.80
4	April	1,490,753.10
5	May	1,111,942.90
6	June	776,685.60
7	July	957,999.30
8	August	1,481,003.60
9	September	1,483,796.40
10	October	972,188.60
11	November	806,394.20
12	December	650,528.40
Total		**12,274,843.30**



Electricity consumption in the campus is the highest during the month of April, followed by August and September. This is due to higher demand for air conditioning and ventilation during the summer and monsoon periods. June and December months' electricity consumption is low due to the holidays for the students.

Source: Electricity Bills and Solar PV Power generation data from MUJ team

Key Performance Indicator (KPI):

Energy performance Index (2019)

77.3 kWh/m^2.year

33% better performance compared to BEE benchmark for schools and University Buildings.

Energy performance per student (Academic + Hostel)

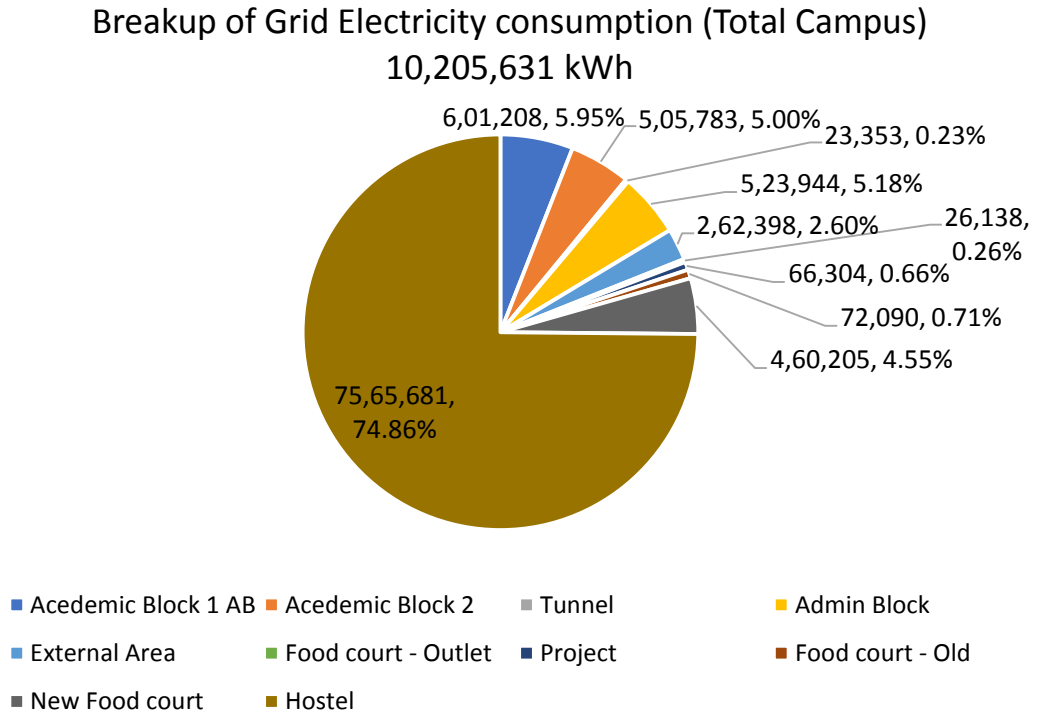
1,291 kWh/ person. year

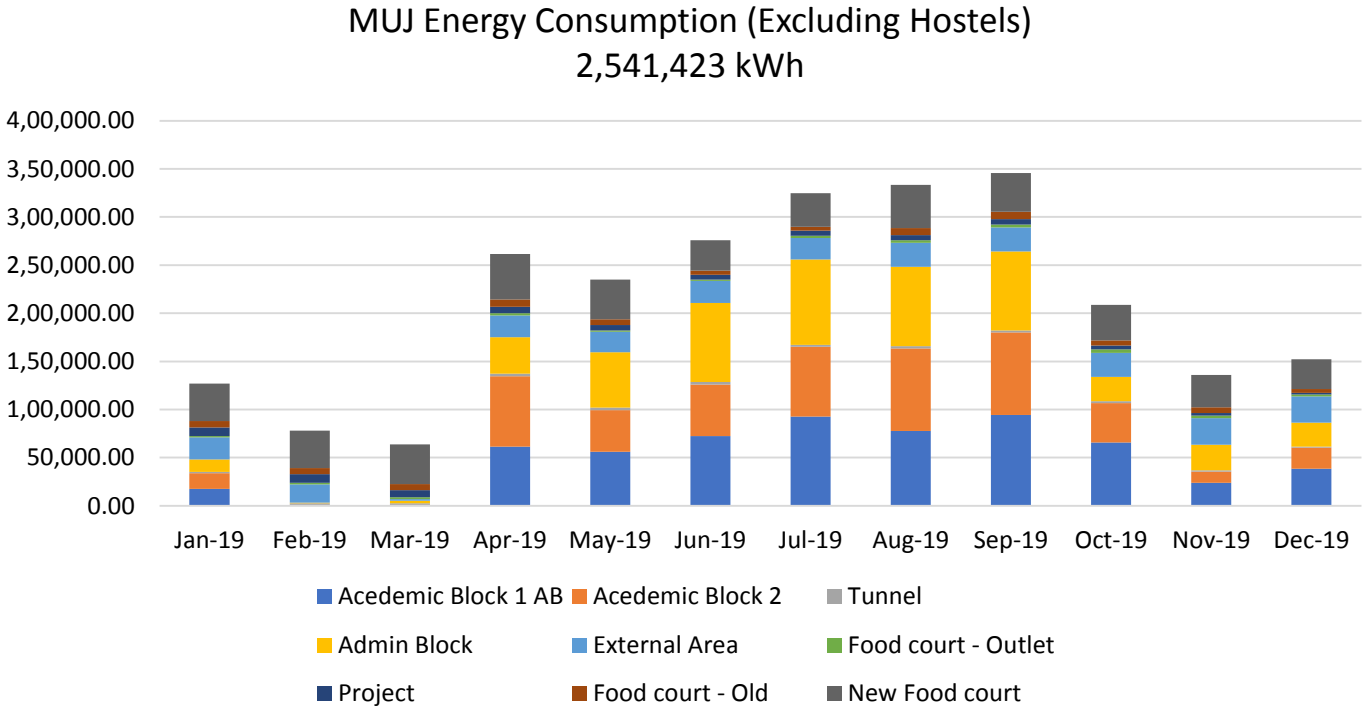
Energy use per student (Hostel)

2,156 kWh/ person. year

Criteria - Energy

Energy Consumption: Spatial Break-up of Grid Energy Consumption (Jan 2019- Dec 2019)



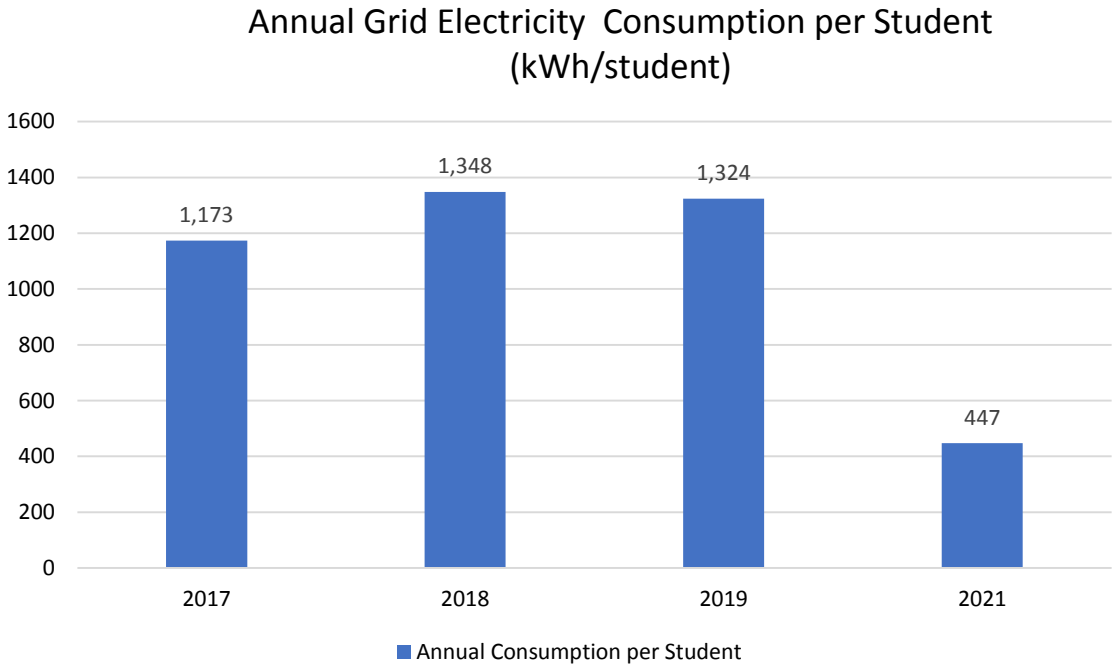


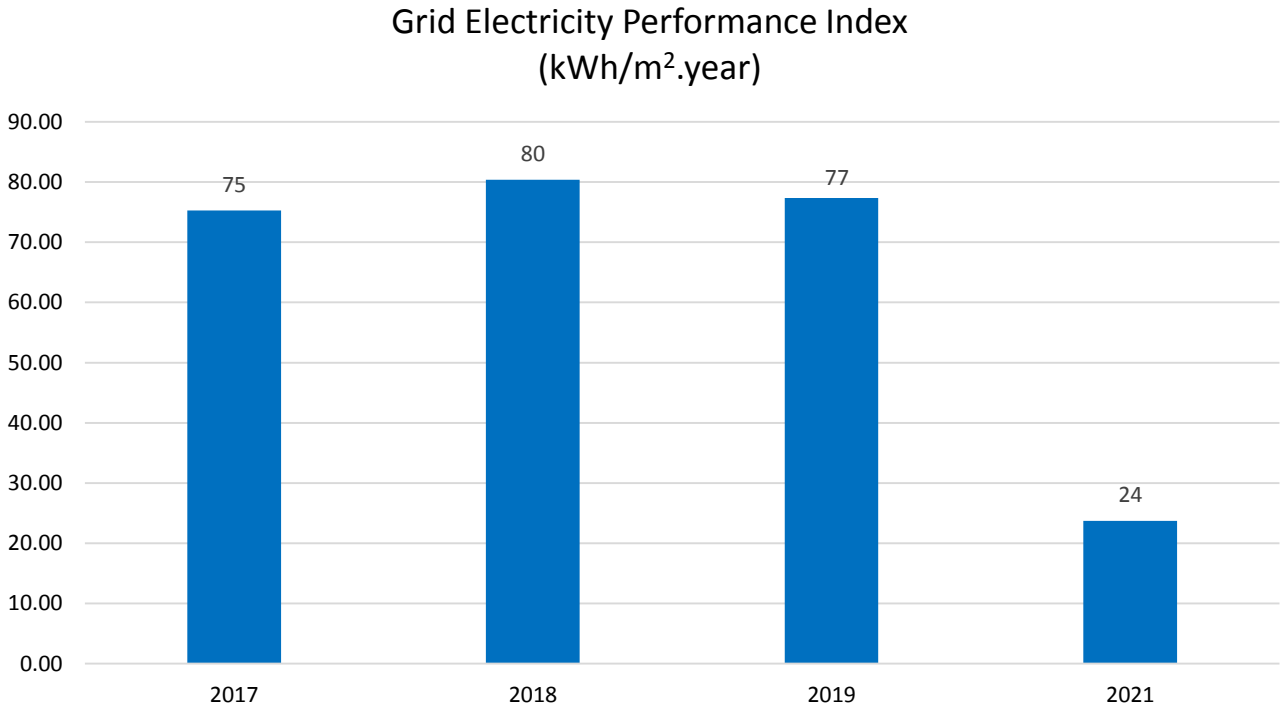
Hostels (consisting of tunnel, food court & residentials) with 75% of the total electricity is the highest consumer in the campus, followed by Academic Block 1, Admin Block and Academic Block 2. Energy consumption in hostels can be attributed to higher share of electrical loads for HVAC, Water Heating and Plug loads. The evidence documents on energy consumption in hostels is not available during the audit.

In the academic area of the campus, **Academic Block 1 and 2** constitutes 44% of the grid electricity consumption, whereas **Food courts (New and Old) and Admin block** uses 22% and 21% of the grid electricity respectively. These are the major **energy cost centres** in the campus.

Criteria - Energy

Energy Key Performing Matrix





Annual energy consumption per capita has increased from 1,173 kWh/student in 2017 to 1,348 kWh/student in 2018 and to 1,324 kWh/student in 2019.
Note: This Calculation consider the no. of students as 9143 for all the three years as data for no. of student for different year was not provided by MUJ team.

Energy Performance Index (EPI) has increased from 75 kWh/m^2.year in 2017 to 80 kWh/ m^2.year in 2018 and to 77 kWh/m^2.year in 2019.
Integration of the staff quarters with the campus has led to the increase in energy consumption of the campus.
Note: Area considered is 1,58,710 m^2.

Lighting Systems: Overview of lighting system

- The MUJ campus uses LED light fixtures for lighting in both the hostels and the academic area, as shown in the picture 1 below. Total lighting load in the building is 860 kW.
- The lighting fixtures data of the campus was not available during the audit, but the total lighting loads are found from the interview with the estate management team and “Project Handover” documents for hostel area.
- The campus has ample daylighting in the circulation areas like corridors and courtyards, as seen in the picture 2 in this slide.
- The quality of lighting was assessed by conducting measurements of illuminance levels across different locations of the campus at the workspace levels (0.8 m) and ground levels (for street lightings). This lighting measurements were compared against lighting levels requirements provided in National Building code 2016 (NBC).

Image 1: LED Lighting Fixtures

Image 2: Daylighting in the corridor area

Criteria - Energy

Lighting Systems: Actual lighting levels inside occupied zones

S.No.	Type	Locations	Lux Level measured	Lux requirements as per NBC standards	Observations
1	Conference room	Admin block ,first floor , Board room	240-275	300-500-750	Lighting levels sufficient but not meeting the NBC standards
2	Classroom	Academic Block- Level 0, Wing B Classroom 18	238-320	200-300-500	Sufficient
3	Office	Level 0, Wing A, Director SAMM 006	176-265	300-500-750	Lighting levels sufficient but not meeting the NBC standards
4	Faculty sitting	Faculty centre AB1	204	300-500-750	1. Few rooms/location have very low visibility. 2. Windows curtains are kept closed during the day.
5	Circulation Area (Below Dome)	Centre of Dome	323	100-150-200	Sufficient
6	Corridor	Faculty centre AB1	14-276	100-150-200	Sufficient
7	Streetlights	Outside Guest house and staff quarters	2-39	6-30	Low Lux levels and light failures
8	Board Room	Academic Block	316-473	300-500-750	

Observations:

Some of the zones in the campus like Faculty offices and Corridor area (First Floor) in Academic Block 1 are poorly lit and the lux levels do not meet the requirements as per NBC 2016.

Also, some of the streetlights in the campus does not meet the lighting requirements, measured at the floor levels, in addition to the lights not working on fewer places.

Lighting design in Academic Block 1 needs to be rectified for uniform distribution of light throughout the spaces. The images in the next slide show the imbalance in lighting distribution in the campus

Lighting Systems: Site survey photographs

Image 3: Low street lux level

Image 4: Low corridor and faculty cabin lux level

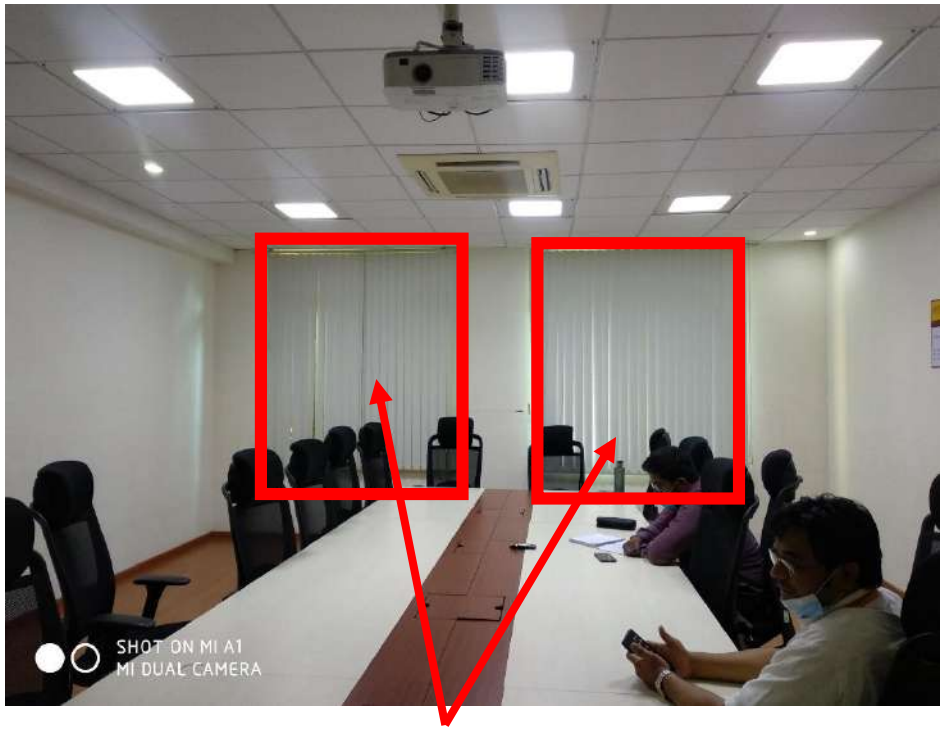


Image 5: No use of day lighting as drapes are shut during the daytime.

Criteria - Energy

HVAC Systems: Total capacity of centralised HVAC system installed in the campus is 3,960 TR

Academic Area - Total HVAC System Size is 1,530 TR
Centralized HVAC system in each building with air-cooled chiller system (constant flow system) and air distribution (Constant air volume system) through Air-Handling Units (AHUs) and Ceiling Suspended Units (CSUs).

Academic Block 1 – 480 TR	COP – 2.72
Academic Block 2 – 810 TR	COP – 3.3
Admin Block – 240 TR	COP – 2.72

Hostel Area - Total HVAC System Size is 2,430 TR
Centralized HVAC system in each building with air-cooled chiller system and air distribution through AHUs, Cassette type units and Fan Coil Units.

Phase I,II & III – 810 TR each	Chiller Average COP – 2.8
High Wall Units of 1.5 to 2 TR Capacity – 60 units FCU – 1,234 units	DX Unit Average COP – 2.9

The HVAC system is operated manually by the facility management team (Daily operations and maintenance). The setpoint for chilled water temperature are fixed, and the pumps flow are maintained at constant flow rate. Only the AHUs are fitted with VFDs, which is not connected to any two-way control valve or automation system. None of the datapoints of the HVAC operation are recorded.

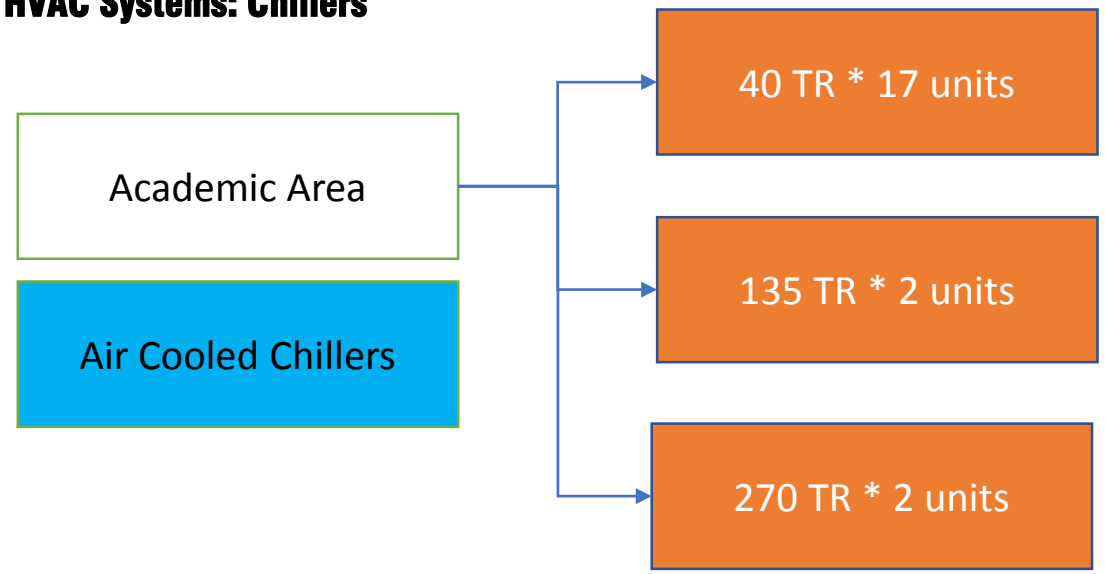
Observations:

The HVAC systems in the academic block 1 and Admin Block are of an ***average age of 11 years*** *(Operated from 2010 onwards)*. The efficiency of the systems with respect to current benchmark design efficiencies are very low. ECBC 2017 mandates the Cooling system shall have a COP of 3.1 (For air cooled chillers). Also, ECBC recommends the use of Water-Cooled Chiller system for buildings with more than 12,500 m2 air-conditioned area), which shall have chiller COP of at least 5.

As, provided in the MEP handover document for Hostel Block, a **load diversity factor of 50%** is considered for the **Hostel HVAC** system. This is a potential reason for the higher energy consumption in hostels, as the chillers having low design efficiency and are operated with constant flow.

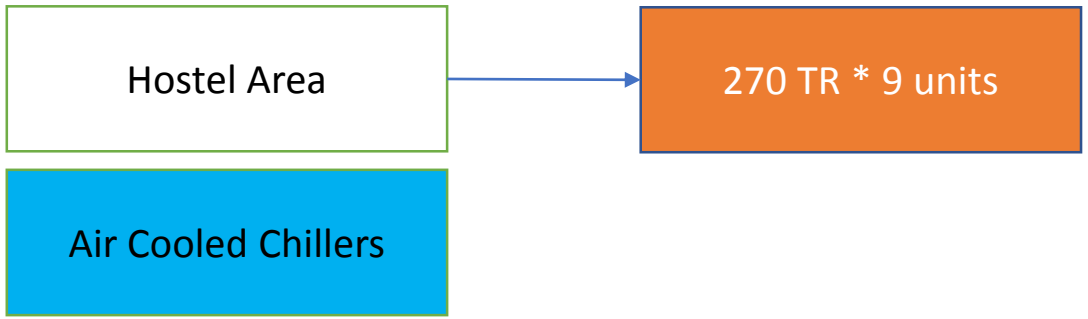
Criteria - Energy

HVAC Systems: Chillers



Chilled Water (CHW) Primary Pumps:

- 6 units in Academic Block 1
- Rest blocks fitted with internal CHW Pumps in Chillers
- No VFD used in operation



Chilled Water (CHW) Primary Pumps:

- 12 units in total for all hostel blocks
- No VFD used in operation

Source: Interview with Facility Management Team and Project Handover documents for Hostel MEP services

Observations:

The chillers are nearing their end-of-life (12th year in operation for Academic and Admin Blocks, which generally have average life cycle of 15 years, and there are visible water leakages in the chiller hydronic system and in the AHU rooms. (Refer to the Site Survey Images 6 and 7).

The design COP of the systems are low and needs enhancement at least up to the ECBC levels, which can save **up *to 25% direct energy savings***. (COP improvement from 2.7 to 5)

The loading of hostel block HVAC system needs to be studied in detail for designing a SOP with full load efficiency operation of the chillers.

Academic Block 1 and Admin block Chiller Units have lower design efficiencies compared to Academic block-2, thereby increasing the share of energy consumption in the campus. As the part of the Admin Block HVAC are operated 24*7 (Chiller and AHU serving board room), the lower efficiency is a potential reason for higher energy consumption from the Admin Block (5.2% Admin Block vs. 5% Academic Block 2).

Criteria - Energy

HVAC Systems: Air Distribution Systems

System Type	Location	Quantity	Capacities
AHU	Academic Area and Admin Block	12	2000 CFM * 9 6000 CFM * 2 7000 CFM * 1
FCUs		617	1 TR * 120 1.5 TR * 124 2 TR * 373
High Wall Units		14	1 TR each
TFAs		133	800 CFM * 122 600 CFM * 11
FCUs	Hostel Area	4827	4800 * 1.5 TR 27 * 2.5 TR

Observations:

The AHUs are fitted with VFDs for efficient operation of fans. The operational schedule is maintained manually by the estate management team.

The classrooms constitute most of the rooms with cassette units, whereas the laboratories are served by supply air grills from the AHUs.

AHU rooms requires periodic maintenance to address water leakages and condensation issues in the AHU and ductwork.
(Refer to the photographs in next slide)

Criteria - Energy

HVAC Systems: Site survey photographs

Image 6: Leakages in chiller supply and return water lines

Image 7: Leakages in AHU rooms

Observations:

Leakages of chilled water supply and return lines were seen during the audit visit;

These leakages can lead to loss of pressure and cooling and hence reduce the performance of the HVAC operation.

These leaks need to be investigated. This may occur due to the exposure to high temperatures/wear tear/corrosion of exposed pipes in the terrace.

Similarly, leakages from the AHUs are also observable in the Academic Block-1, which hampers the efficiency of the system.

Criteria - Energy

HVAC Systems: Site survey photographs

Image 8

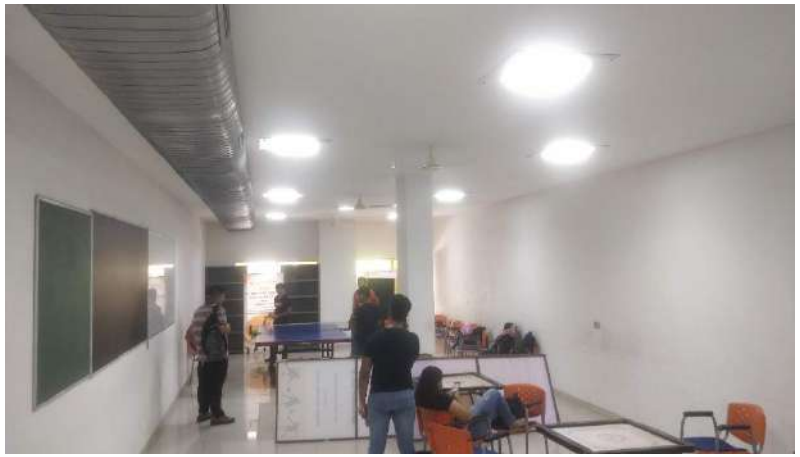
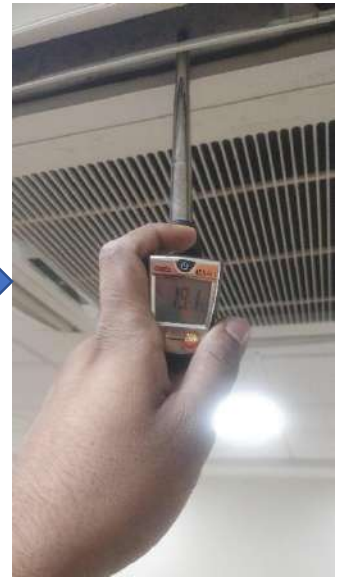


Image 9

Image 10

Image 11: Admin Block – Admission Area – Cassette unit (supplied with chilled water)- Indoor air delivery temperature at FCU is 19.1^{0}C. Relates to low performance of the HVAC.



Observations:

Figure 1, 2 & 3 show the civil engineering labs, biochemical lab and indoor game rooms, which are connected to the same AHU.

As the laboratories disperse particulate matter and volatile chemical components into the air, it may pose an indoor air quality issue and also, a higher load on the AHU filters.

Branching the air flow from the AHU into multiple AHUs for the zones with different air contamination and fresh air requirements can lead to both energy savings and better indoor environmental quality.

Criteria - Energy

HVAC Systems: Monitoring and Automation

Monitoring System	Current Availability	Need for the monitoring
HVAC System Monitoring With Water Flow and Temperature Monitoring	Not available; Only chiller level panels are available, without connectivity to any common monitoring system	Helps the operator and manager in regulating operational leakages and improve performance; Temperature, Pressure and Flow measurements needed for better operational decision making
Electrical Monitoring	Some of the HVAC components are fitted with energy meters but not monitored regularly	Regular energy monitoring can help benchmark the performance and to identify the impact of HVAC on peak demand and energy bills
Thermal Comfort Monitoring	Not available	Helps in understanding HVAC demand side requirements and in improving indoor environmental quality; IAQ and Temperature monitoring is needed.

Observations:

- A central monitoring and automation dashboard is needed to monitor the HVAC operational parameters and operating energy parameters.
- Chilled Water Temperature, Flow Rate and Pressure needs to be monitored for deriving the insights on system performance during varying loads and help sequence the chillers efficiently
- Including outdoor weather station can help derive the operational settings for chilled water flow and temperatures in the system.
- Combinational automation products can help reduce the energy consumption of the HVAC operation

Criteria - Energy

Recommendations – Energy Efficiency in HVAC System

- As HVAC constitutes the major electricity demand and consumption, efficiency improvements need to be implemented in the campus.

- Conduct periodic audits (monthly internal audits) of the chilled water hydronics and air distribution systems to identify visible leakages and address it.
- Modification of the Standard Operating Protocol (SOP) of HVAC Plant operation with control measures on:
  - Seasonal chilled water and indoor temperature set-point variation
  - Recording of pressure and temperature data from the chillers in hourly intervals by the operators and prepare revised operational logics
  - Record energy data from the existing smart energy meters in hourly intervals for chillers and prepare analysis of the collected chilled water properties and energy consumption; Based on the analysis, modify monthly set-points and operational logics.
  - Based on recorded data, develop sequencing of chillers and scheduling of daily operation

High-cost measures Low-cost measures No-cost measures

Observations:

- A central monitoring and automation dashboard will support in monitoring the HVAC operational parameters and operating energy parameters.
- Chilled Water Temperature, Flow Rate and Pressure needs to be monitored for deriving the insights on system performance during varying loads and help sequence the chillers efficiently
- Including outdoor weather station can help derive the operational settings for chilled water flow and temperatures in the system.
- Combinational automation products can help reduce the energy consumption of the HVAC operation

Criteria - Energy

Recommendations – Energy Efficiency - HVAC

- Construct shading structures for DX units in the terraces
- Integrate all the individual DX systems (In admin block) into efficient Packaged Unit or VRF systems
- Establish HVAC and energy data monitoring and control system as mentioned in the right column

Retrofitting of existing air-cooled chillers with water-cooled chillers, where water can be availed from stored rainwater or the treated water from the STP.
(or)
Implement the District Cooling System (DCS) in the campus to serve both academic area and hostel areas, as the campus has diverse loads across the day (Academic area with most loads in the day and hostel and staff quarters with most loads during night). (A brief of DCS is shown in the slides below).

High-cost measures Low-cost measures No-cost measures

Monitoring System Recommendations:

- A central monitoring and automation dashboard is needed to monitor the HVAC operational parameters and operating energy parameters.
- Chilled Water Temperature, Flow Rate and Pressure needs to be monitored for deriving the insights on system performance during varying loads and help sequence the chillers efficiently
- Including outdoor weather station can help derive the operational settings for chilled water flow and temperatures in the system.
- Combinational automation products can help reduce the energy consumption of the HVAC operation

Criteria - Energy

Recommendations – Energy Efficiency- Electrical Distribution

- As the campus has larger number of reactive loads, combined with electronic measurement and control devices installed in individual circuits, the harmonic variations needs to be measured at the incomer level using Smart Energy Meter with THD measurement capabilities.
- Periodical audit of transformer performance (Input and output variation measurement) shall be conducted by operations team

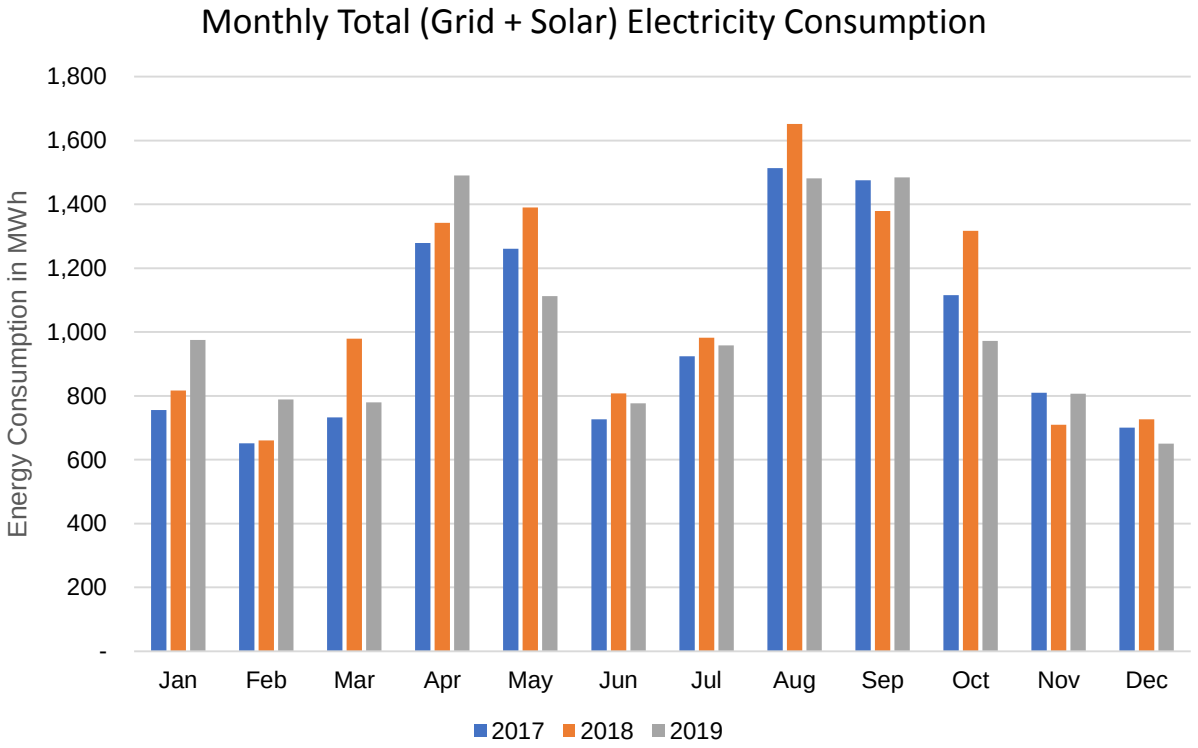
- Installation of harmonic filters at the distribution boards closer to harmonic loads (Circuits with AHUs connected to VFDs)
- Increasing the capacitor bank and APFC system capacity by 25-30% as more reactive loads (For equipment with total loads of 2,450 kW) are operated during the peak demand, compared to the available capacitor bank capacity (520 kVAr)

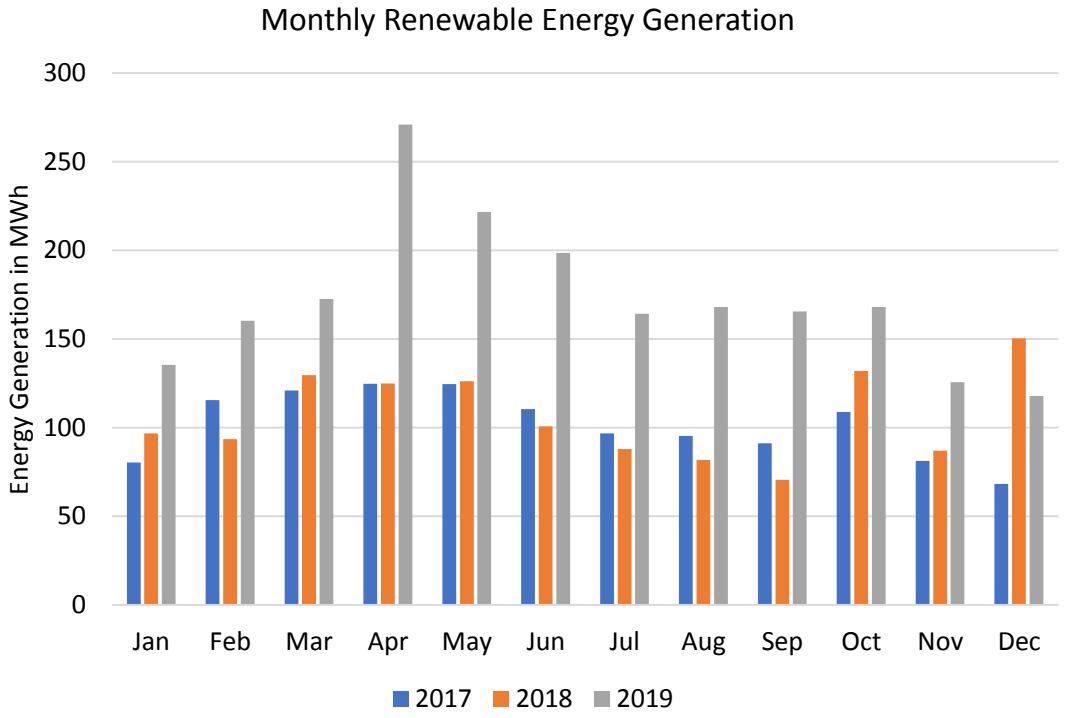
High-cost measures | Low-cost measures | No-cost measures

Observations:

- A central monitoring and automation dashboard is needed to monitor the HVAC operational parameters and operating energy parameters.
- Chilled Water Temperature, Flow Rate and Pressure needs to be monitored for deriving the insights on system performance during varying loads and help sequence the chillers efficiently
- Including outdoor weather station can help derive the operational settings for chilled water flow and temperatures in the system.
- Combinational automation products can help reduce the energy consumption of the HVAC operation

Criteria - Energy



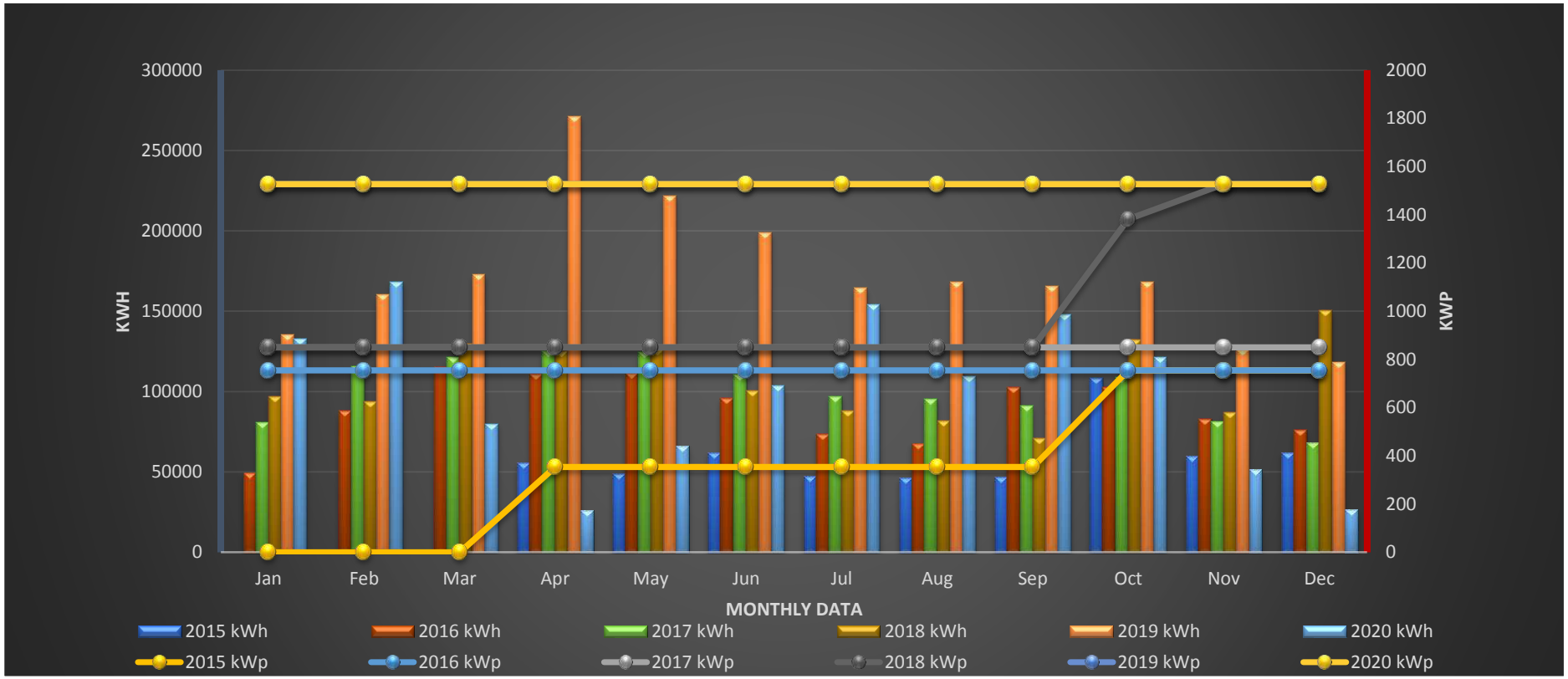


Increase in electricity consumption over past 3 years is visible in the months of April, August, November and January. Average growth of 5% of total electricity consumption is observed in the campus, which can be related to additional electricity requirements from the new buildings like staff quarters, and potentially due to higher temperatures faced during the summer season, causing higher needs for air conditioning and ventilation.

By 2019, the campus has integrated 1.5 MWp of Solar PV Power plants into the local electricity mix of the campus. Increase in the solar PV capacity has reduced the peak grid electricity consumption in the months of July, August, and October.
Solar PV generates the highest amounts of electricity in the months of April, May, June and July , whereas energy consumption during June is very less.

Criteria - Energy

Renewable Energy Systems: Capacity and Generation



By 2015, MUJ campus integrated the Solar PV plant of 754 kWp with its internal grid. The capacity increased to 850 kWp in 2017, and to the final capacity of 1527 kWp by 2019. The Solar PV systems are connected to the local distribution systems located in the Academic Blocks 1 & 2 and the Administrative Block.
The capacity additions have led to the increase in electricity generation from 537,624 kWh in 2015 to 2,069,212 kWh in 2019. This has led to cost savings of 97.89 Lakhs INR per year in 2019, in comparison with electricity purchase from the electricity grid (Average grid electricity price of 9.8 INR/kWh and RESCO electricity price of 5.07 INR/kWh).

Observations:

By 2019, the campus has in operation ***1.527 MW*** of Solar PV power plant, with annual generation of more than 2 GWh electricity. This electricity generated is directly fed into the campus electricity feeders for localized use.

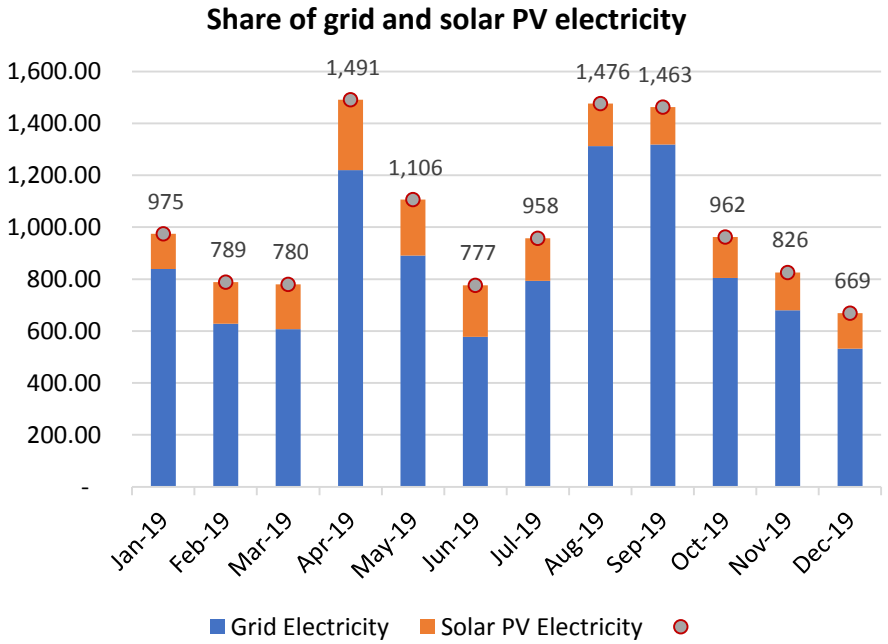
The system is implemented in RESCO mode with power purchase agreements with Cleanmax for 850 kWp and Renewpower for 677 kWp.

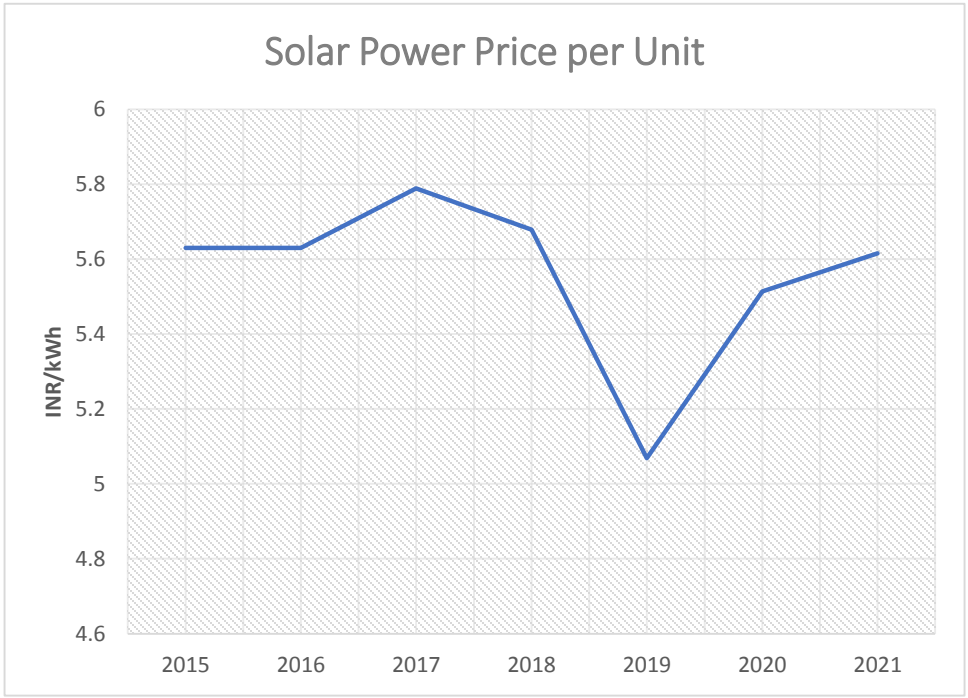
The available potential in Jaipur is of ***1,642 kWh/kWp.year.*** This is not achieved in the MUJ campus SPV installation. The campus SPV generates 2.05 Million Units, whereas the potential for the installed system is 2.65 Million Units. (23% deviation from maximum performance, leading to cost implications of INR 30,60,000 per year).

The cause of this inefficiency in the generation needs to be reviewed by the Estate Management Team in discussion with the Solar PV service providers.

Criteria - Energy

Renewable Energy Systems: Capacity and Generation





The installed solar PV plants has led to reduction in grid electricity use by up to 33% of total electricity consumption.
As seen from the graph, months of March, June, April, May and February produce higher renewable electricity.

The price of solar power was the lowest (INR 5.06 per kWh) in 2019. This can be set as the benchmark cost for the future power purchase agreements.

Observations:

By 2019, the campus has in operation ***1.516 MW*** of Solar PV power plant, with annual generation of 2 GWh electricity.

The system is implemented in RESCO mode with power purchase agreements with 2 vendors.

The available potential of ***1,642 kWh/kWp.year*** is not achieved in the campus, as the campus generates 2.05 Million Units whereas the available potential for the installed system is 2.65 Million Units. (23% deviation from maximum performance)

Recommendations – Renewable Energy

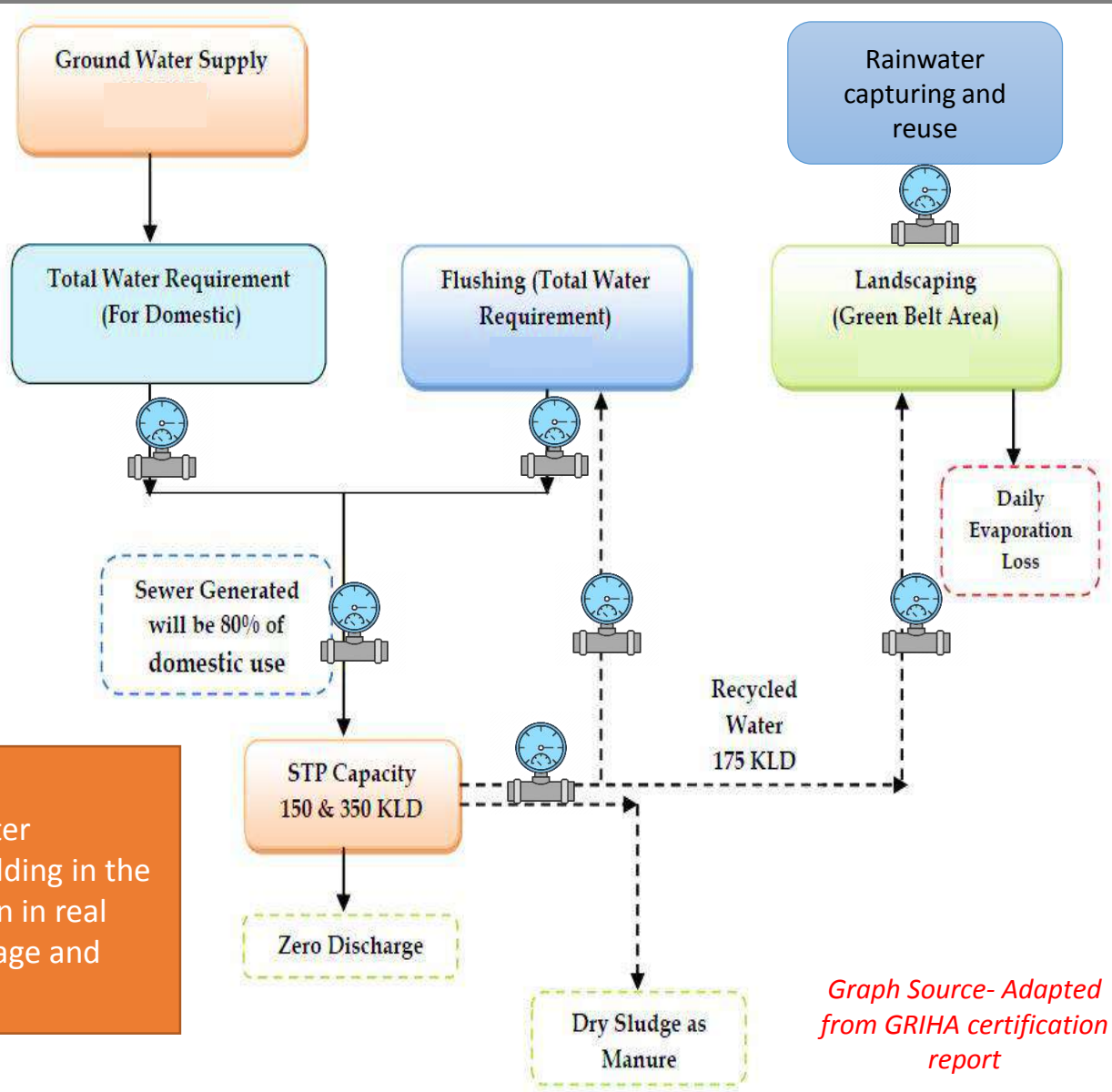
- Any new Solar PV Plant to be installed needs to be designed with maximum efficiency panels for generating maximum from the available roof space. The conditions related to the efficiency of the panels and the associated generation guarantee shall be included into the PPA with the vendors.

- Performance stability can be improved by installation of automatic cleaning systems for the solar PV panels.
- Net metering facility, if provided by the DISCOM, has to be enabled in order to utilize the maximum cost benefits from the generated electricity.

High-cost measures Low-cost measures No-cost measures

Water Source and Distribution in MUJ Campus

Manipal university has an Integrated Water management strategies that are designed & implemented for the campus mainly focusing on triple bottom line benefits i.e., social, economic and environmental benefits. This created a flexible, resilient water infrastructure which helped MUJ progress towards water neutrality.



Graph Source- Adapted from GRIHA certification report

RECOMMENDATIONS -
Water meters to be installed at all water sources/distribution lines at every building in the campus to monitor water consumption in real time basis to understand excessive usage and leaks

Observations:

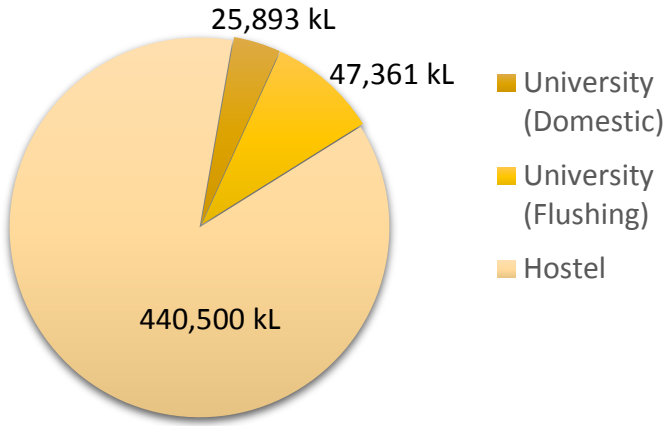
The ground water supply water requirement as per the design guidelines for the MUJ university campus is 220 LKD. The Total water requirement is segregated under domestic use, flushing requirement and landscaping irrigation purposes.
The domestic purpose requirements gets fulfilled through ground water supply. For flushing and landscaping requirements MUJ uses the treated water from the Sewage Treatment Plant (STP). For landscaping requirements MUJ also use the rainwater from the RWH tanks. The dry sludge from the STP is further converted into manure used for on-site landscaping purpose.

Criteria - Water

Water Consumption

- MUJ consumes **25,893 kL/year** of water annually for the university blocks & **440,500 kL/year** for hostel blocks
- Total water consumption is **513,754 kL/year**
- 100% wastewater is treated on site and used for flushing and landscape purposes within the campus.

Water consumption for 2019



University (Administrative +Academic Blocks) data for domestic and flushing comes is shared by MUJ. Data for Sept 2019-Dec. 2019 was not available, so the respective month data of 2018 was used for the analysis
Hostel (Student accommodation + staff accommodation + Guest House) is available from GRIHA report

- To reduce the water usage, all the building toilets in MUJ are equipped with automatic, low flow fixtures and low flush fixtures. These fixtures when compared with conventional fixtures can save significant amount of water.

FIXTURE TYPE	CONVENTIONAL FLOW/ FLUSH FIXTURE FLOW RATE LPF/LPM	FIXTURE FLOW RATES INSTALLED IN MUJ LPF/LPM	Estimated Water Savings (%)
WC Flush	≤ 6 LPF	3 & ≤6 LPF	50%
Sensor Urinals	≤ 3.8 LPF	≤ 0.5 LPF	86%
Restroom Faucets	≤ 9.4 LPM	≤ 2.75 LPM	70%
Pillar cock	≤ 9.4 LPM	≤ 2.75 LPM	70%
Health faucet	≤ 9.4 LPM	≤ 6.4 LPM	32%
Kitchen Faucet	≤ 9.4 LPM	≤ 7.5 LPM	20%

RECOMMENDATIONS-
Regular monitoring of water use at the building level and regular maintenance checks for leaks will ensure additional water savings

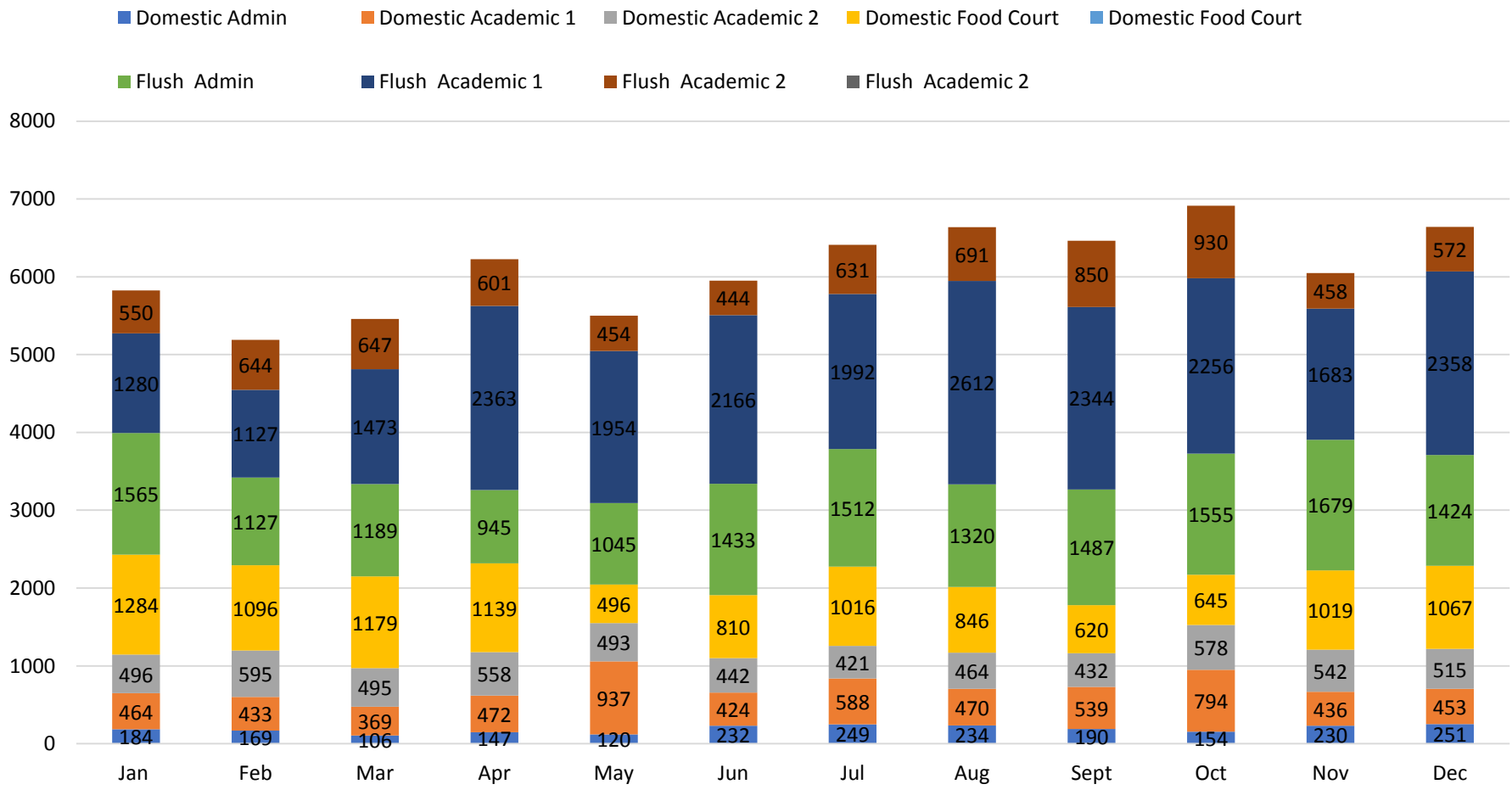
Observations:

The total water consumption in the campus is segregated for domestic and flushing purposes. 80% of waste-water from domestic and flushing purpose is treated and this recycled water is used for landscape irrigation and the dry sludge generated in the sewage treatment plant is used as manure for landscape.

Criteria - Water

Monthly Water Consumption: Admin, AB-1 and AB-2, Hostels

January 2019 to December 2019 Monthly Water Consumption in KL



Key Performance Indicator (KPI):

"Water Consumption per student per year" of MUJ is

Campus Level:
56.1 kL/Student. Year

University Level:
2.83 kL/Student. Year

Hostel Level:
88.4 kL/Student. Year

NOTE- From September to December, all the water consumption data is from 2018 as 2019 data was not provided

Monthly water consumption data of Hostel was not available

Criteria - Water

Water Consumption

For university

Total consumption domestic- 25,893 Kl/year

For hostel (domestic)

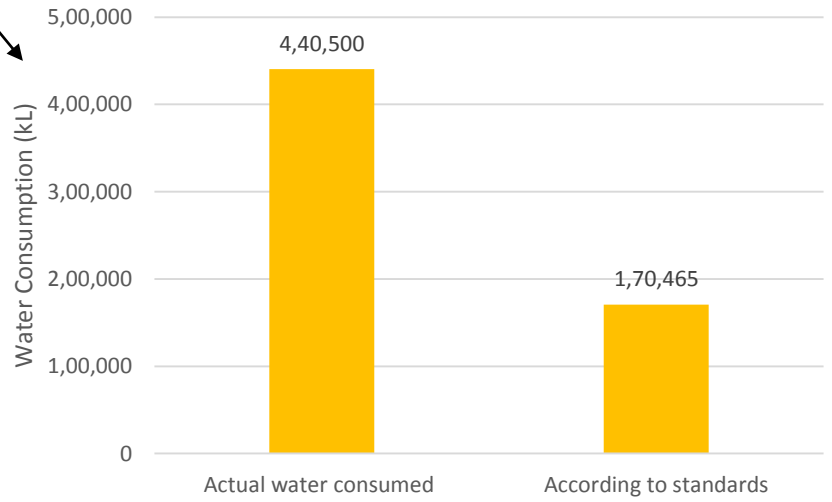
Total consumption- **440,500 Kl/year**

Total consumption excluding flushing- 4,60,912 Kl/year

(all the flushing water requirement is catered by STP treated water)

Total consumption flushing- 47,361 Kl/year

Total no of students in hostel in 2019 - 4140
According to NBC,
Water required for domestic purpose is 135 liters per person per day
Estimated water consumption for 305 days of operation is 170,465 kL/year



COST IMPLICATIONS:
Regular monitoring of water use in the buildings can save – 2,70,036 kL
1 litre of water cost – INR 60/kL
Calculated cost savings – 1,62,02,160 INR

HYPOTHESIS -
As the water savings can be upto 61%, there is a merit of investigating further the water consumption in the hostel area. This can be done by active remote monitoring of water consumption at the building level

Key Performance Indicator (KPI):

"Water Consumption per student per year" of MUJ is

Campus Level:
56.1 kL/Student. Year

University Level:
2.83 kL/Student. Year

Hostel Level:
88.4 kL/Student. Year

Sewage Treatment plant

Manipal University Jaipur has zero discharge waste-water policy. Hence 100% of the wastewater generated on site is treated to tertiary standards and reused within the campus for various purposes like Flushing, cooling tower makeup, Horticulture etc.

MUJ has two Sewage treatment plants with **150kLd** and **350 kLd** respectively.

Membrane Bioreactor (MBR) type Sewage Treatment plant with total capacity of **500 kLd** is commissioned at MUJ university campus considering the future developments & excess wastewater from hostels.

A standalone 350 kLd Sewage Treatment plant is commissioned to serve only the Hostel blocks, excess wastewater is sent to University STP.

Wastewater treated on site will have projected water quality standards meeting Central Pollution Control Board (CPCB) norms.

Observations:

- Annually ***1,14,609 kl/year*** of treated water is available for flushing and landscape uses in MUJ Academic side
- ***30,726 kl/year*** i.e. ***26.7%*** of total available treated wastewater is used for non potable uses in all the buildings.
- ***83,883 kl/ year*** i.e. ***73.3%*** of total available treated wastewater is used for landscape requirement in university campus.

HYPOTHESIS-
If the treated water used for landscape can be reduced by 10-15% then this water can be used for flushing purpose as the 2019 water consumption was flushing is not 100% catered by treated water.

Criteria - Water

Annual Rainwater Potential

Annual rainfall is the sum of daily rainfall, that is collected from building roof area. With this calculation we understand the potential usage of this collected water that can be used for irrigation and flushing purpose.
The table explains the effective harvesting possibilities.

NAME	ROOF AREA (sqm) - X	RUNOFF COeF. - Y	ANNUAL RAINFALL (m) -Z	Effective Harvesting Potential (m^3)- (X*Y*Z)
Admin block	6860	0.95	0.536	3,493
Mess block	5185	0.95	0.536	26,402
AB_1 block	7814	0.95	0.536	3,978
Garden Lawn	3571	0.2	0.536	382
AB_2 block	8565	0.95	0.536	4,361
Garden	3517	0.2	0.536	377
Road	15567	0.95	0.536	7,926
			Total (in kL)	**23,160**

536 mm is the annual rainfall. The driest month is December. There is 3 mm | 0.1 inch of precipitation in December. Most of the precipitation here falls in July, averaging 178 mm | 7.0 inch.

The peak rainfall months (July & August) harvesting potential is **7700 kL** (i.e. 256kLd).

Observations:

- Rainwater holding capacity at MUJ **Hostel blocks 670 kL** & **University blocks is 490 kL**
- Rainwater from roofs is collected on site in the rainwater harvesting tanks and used for irrigation purposes in the MUJ campus.
- Rainwater from different areas on site is conveyed to RWH tanks through channels.

Hypothesis & Recommendations:
The RWH tanks currently used for harvesting the rain water are **not sufficient** to hold the peak demand of rainfall, which is around **7700 kL** for peak rainfall month (i.e. **256 kL/day**). It is important to **increase the harvesting capacity of RWH** tanks to catch the surplus rainwater and utilize it for domestic/ potable purposes in the university campus.

**Source:
Surface areas – Provided by MUJ
Rainwater tank sizes – GRIHA report
Rainfall data - https://en.climate-data.org/asia/india/rajasthan/jaipur-3888/#climate-graph

Criteria - Water

Storm Water Harvesting Potential

Storm water harvesting is the sum of daily rainfall, that is collected from the ground area. With this calculation we understand the potential usage of this collected water that can be used for irrigation and flushing purpose or ground water recharge.
The table explains the effective harvesting possibilities.

Surfaces	GROUND AREA (sqm) - X	RUNOFF COEFFICIENT - Y	ANNUAL RAINFALL (m) -Z	Effective Harvesting Potential (m3- (X*Y*Z)
Granite Flooring	2,381	0.95	0.536	1,212
Road Median	568	0.25	0.536	76
Lawn	14,818	0.2	0.536	1,588
Football ground	10,392	0.35	0.536	1,949
Cricket Ground	16,286	0.35	0.536	3,055
Open Area (batching plant)	15,544	0.5	0.536	4,165
Open area Thadi	16,912	0.5	0.536	4,532
Open area behind basketball ground	17,445	0.25	0.536	2,337
Lawn area near admin block	4,663	0.2	0.536	499
Area under dense tree plantation (No. of trees- 126	23,233	0.25	0.536	3,113
Pathway Area	3,658	0.95	0.536	1,862
			Total (in KL)	**24,393**

536 mm** annual rainfall

**Source: https://en.climate-data.org/asia/india/rajasthan/jaipur-3888/#climate-graph

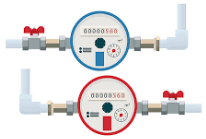
Observations:

Storm water from the site is collected in swales. Part of this water is diverted to a collection tank that also works as a sedimentation pit. The rest of the stormwater is diverted to 3 recharge pits located in the lowest part of the site. The collection tank is in turn connected to the WTP. The swales reduce the rate of flow during conveyance and allow stormwater to percolate into the ground as it reaches the recharge pits.

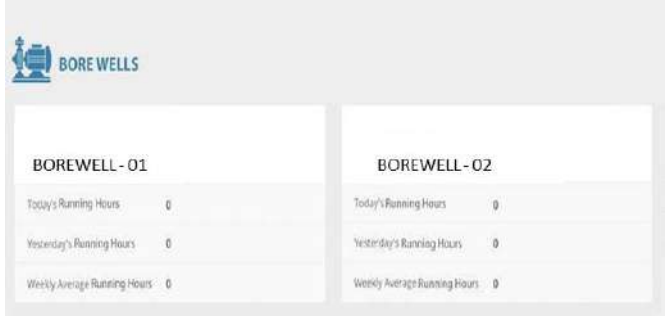
HYPOTHESIS-
There is good scope to collect water and store. Currently, MUJ is collecting water from 35% of its surfaces (roof top and open areas). Considering that Jaipur faces water scarcity due its climate, investing in water harvesting measures will be beneficial lead to cost savings of ~ INR 14,63,580 annually.

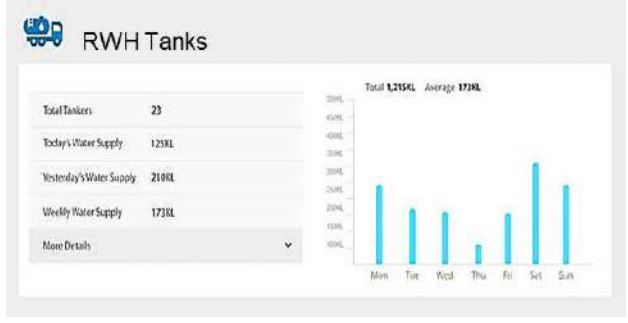
Recommendations:

Following recommendations are suggested to manage water in a sustainable manner:



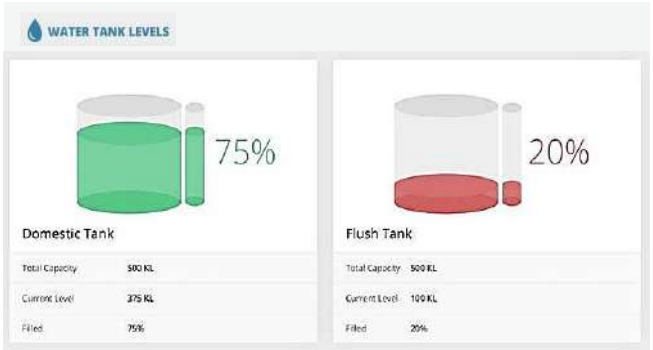
Consider carrying out meter readings on a regular basis (e.g. bi-monthly) or through remote monitoring system in order to monitor water usage. Not only will this make checking water bills much easier but will also allow a baseline to be set from which further reductions can be measured, as well as identifying the possibility to any leaks.

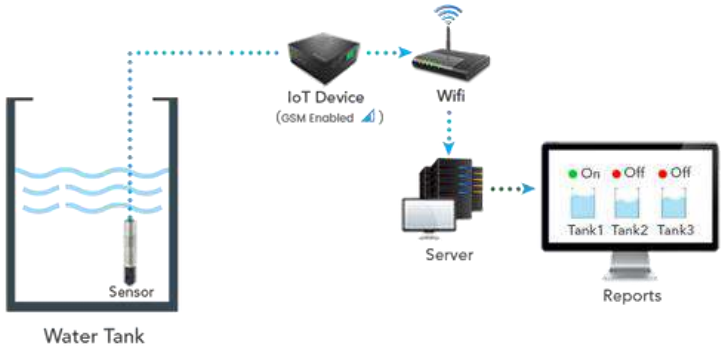




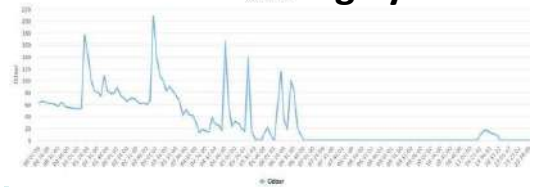
Investigate the feasibility of sub-metering different areas of the buildings and blocks, in order to give a more accurate picture of water use.

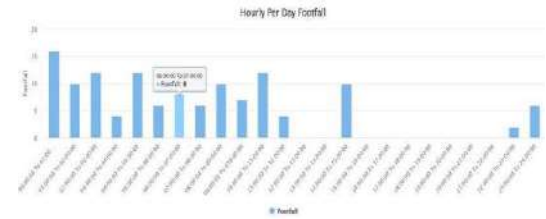
It would be useful to digitalise the tank level in the rainwater harvesting tanks to optimally use the captured rain-water.





Water Monitoring Systems:





Consider installing spray taps or water-saving cartridges in sinks that are still to be refurbished.

Criteria - Waste

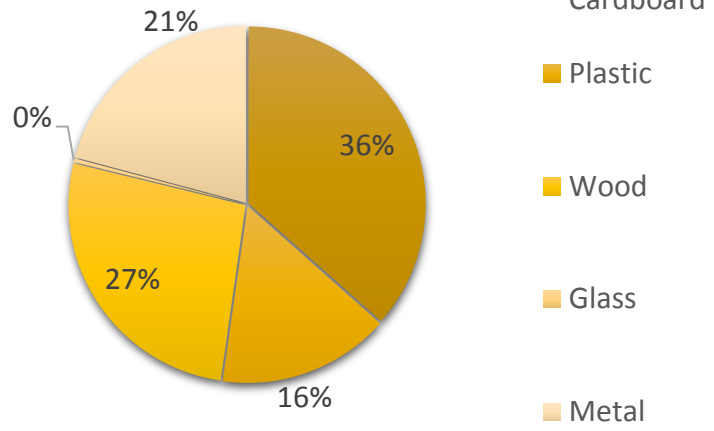
Solid Waste Management:

Solid Waste Generated – January 2019 to December 2019

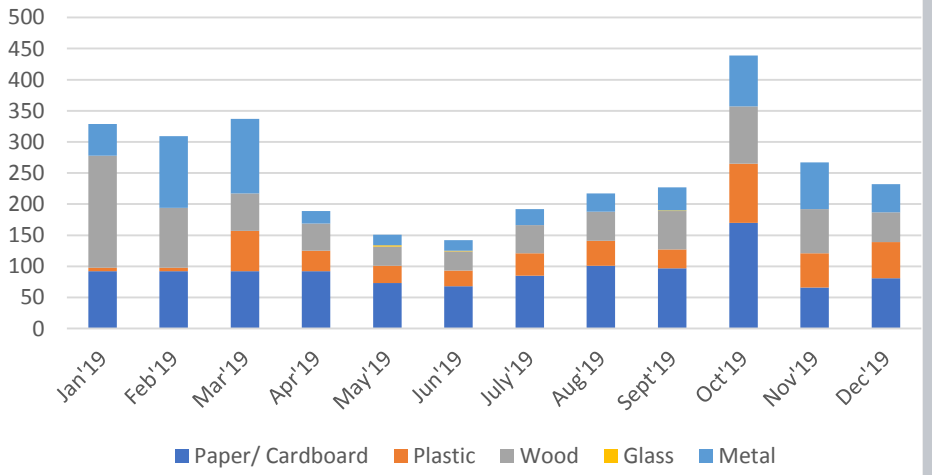
Month	MUJ Academic Blocks					Total (kg)
	Paper/ Cardboard	Plastic	Wood	Glass	Metal	
Jan'19	9206 (92)	6	180	0	51	329
Feb'19	8156 (92)	6	96		115	309
Mar'19	6790 (92)	65	60		120	337
Apr'19	92	33	44	0	20	189
May'19	73	28	31	2	17	151
Jun'19	68	25	31	1	17	142
July'19	85	36	45	0	26	192
Aug'19	101	40	47	0	29	217
Sept'19	97	30	62	1	37	227
Oct'19	170	95	92	0	82	439
Nov'19	66	55	71	0	75	267
Dec'19	81	58	48	0	45	232
Annual waste generation	**1110**	**477**	**807**	**4**	**634**	**3031**

Dry Waste generated –
3031 kg/ year , i,.e **7.2%** **of total solid waste**

Waste generation in 2019: 26,907 kg



Monthly waste generation



Observations:

It seems the first three months (i.e. January, February and March) the paper and cardboard waste generation is comparatively quite high than the rest of the months.

If we consider the average waste generation based on the 9 months of data, the paper waste is the highest waste generated in solid waste (i.e. **1110.6 kgs**). Based on the observations average values for paper waste is considered to understand the waste generation for the first three months (i.e. 92 kgs)
This paper and cardboard waste can be recycled through collaboration with 3rd party vendors.

Key Performance Indicator (KPI):

Solid waste KPI- Annual waste generation/ total number of students
= 26,907/9143
= **2.94 kg/student.year**

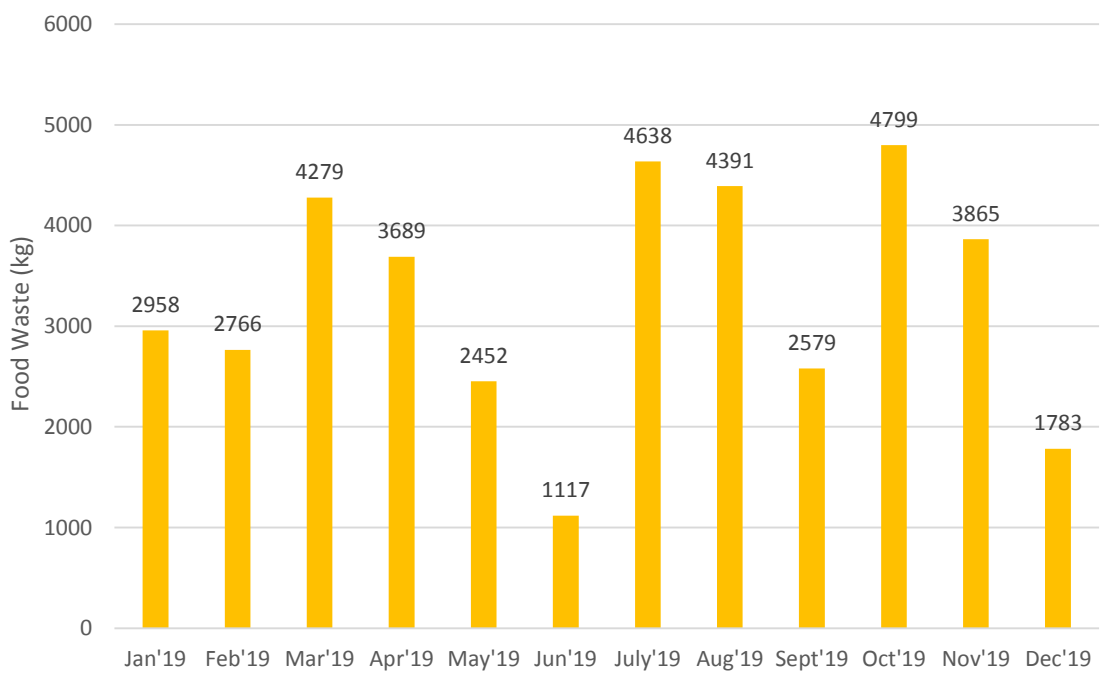
Criteria - Waste

Solid Waste Management:

Food Waste Generated – January 2019 to December 2019

Food Waste at Hostel Blocks	
Month	**Total (kg)**
Jan'19	2958
Feb'19	2766
Mar'19	4279
Apr'19	3689
May'19	2452
Jun'19	1117
July'19	4638
Aug'19	4391
Sept'19	2579
Oct'19	4799
Nov'19	3865
Dec'19	1783
Annual waste generation	**39,316**

Food waste generated in 2019:



Food Waste generated –
39,316 kg/year, i.e. **92.8%** of total solid waste

Observations:

Food waste is the major waste generated in the University. It is important to understand the reason of such high waste generation and also measures to reduce it. MUJ can look for food circularity as suggested in detail in the recommendation section.
Food waste generated in the hostel block can be composed and the dry sludge can be used as manure for landscape purposes.

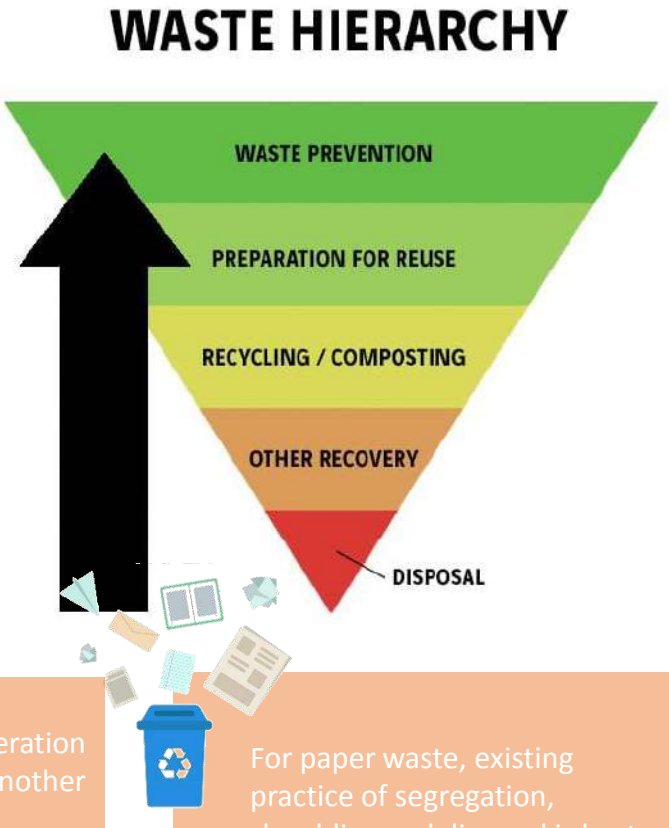
Key Performance Indicator (KPI):

Food waste KPI- Annual waste generation/ total number of students
= 39,361/4978
= **7.9 kg/student.year**

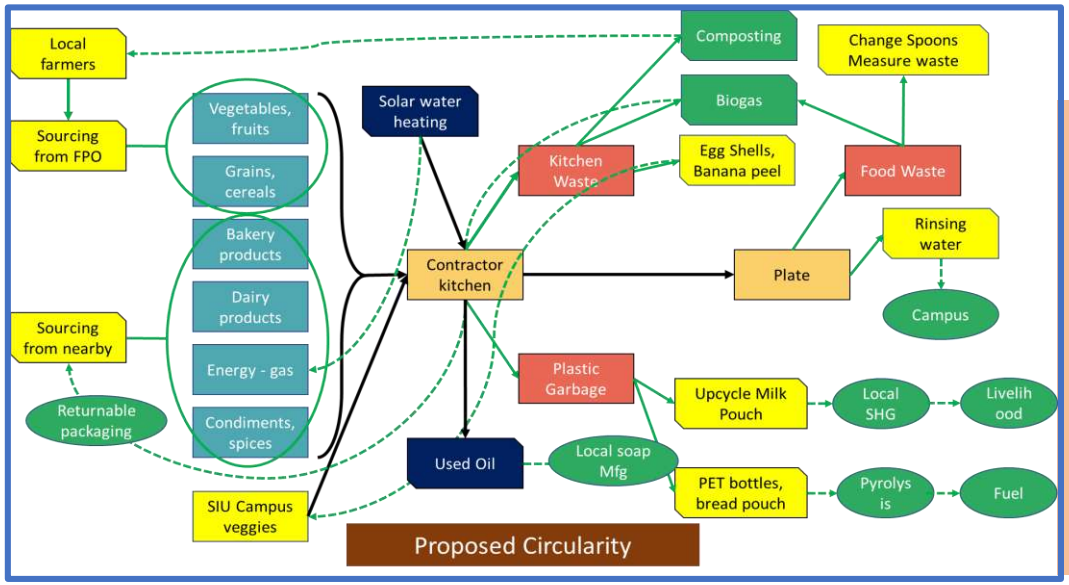
Recommendations:

Consider reducing the number of general waste bins in offices to one or two in order to encourage people to think more carefully about the waste they're producing

Ensure that it's clear as to which bin collects which waste stream.



- Considering the 92.8% of kitchen waste generated, a mechanical organic waste converter is recommended over an anaerobic digestion which would not be technically but financially feasible.
- Also, it is recommended that MUJ should incorporate some management changes, like reducing the plate and spoon sizes and allow servings, so as to reduce the food waste.
- The proposed mechanical organic waste converter shall provide organic manure for the garden



Circular Food Economy

A circular economy for food mimics natural systems of regeneration so that waste does not exist, but is instead feedstock for another cycle.
In a circular economy, organic resources such as those from food by-products, are free from contaminants and can safely be returned to the soil in the form of organic fertiliser. Some of these by-products can provide additional value before this happens by creating new food products, fabrics for the fashion industry, or as sources of bioenergy. These cycles regenerate living systems, such as soil, which provide renewable resources, and support biodiversity.

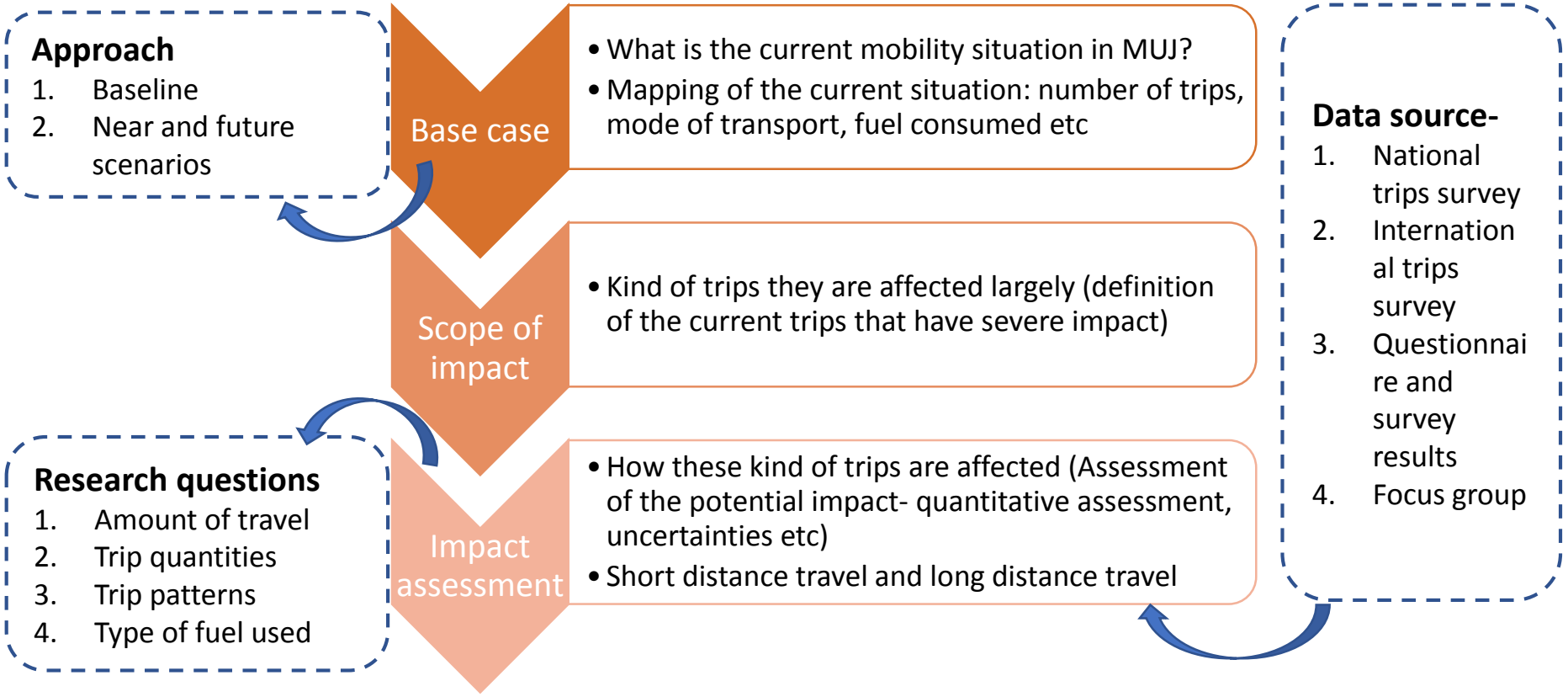
For paper waste, existing practice of segregation, shredding and disposal is best suitable that should be continued as for such limited quantity of paper waste, paper recycling plant would not be a feasible solution to implement on-site

Criteria - Mobility

Mobility Analysis : Introduction

This category includes emissions from the transportation of employees & students between their homes and their campus. Apart from daily commute to the campus, this analysis also includes transportation of employees for business-related activities which includes both national and international trips in vehicles owned or operated by third parties, such as airlines, trains, buses, and passenger cars.

Methodology

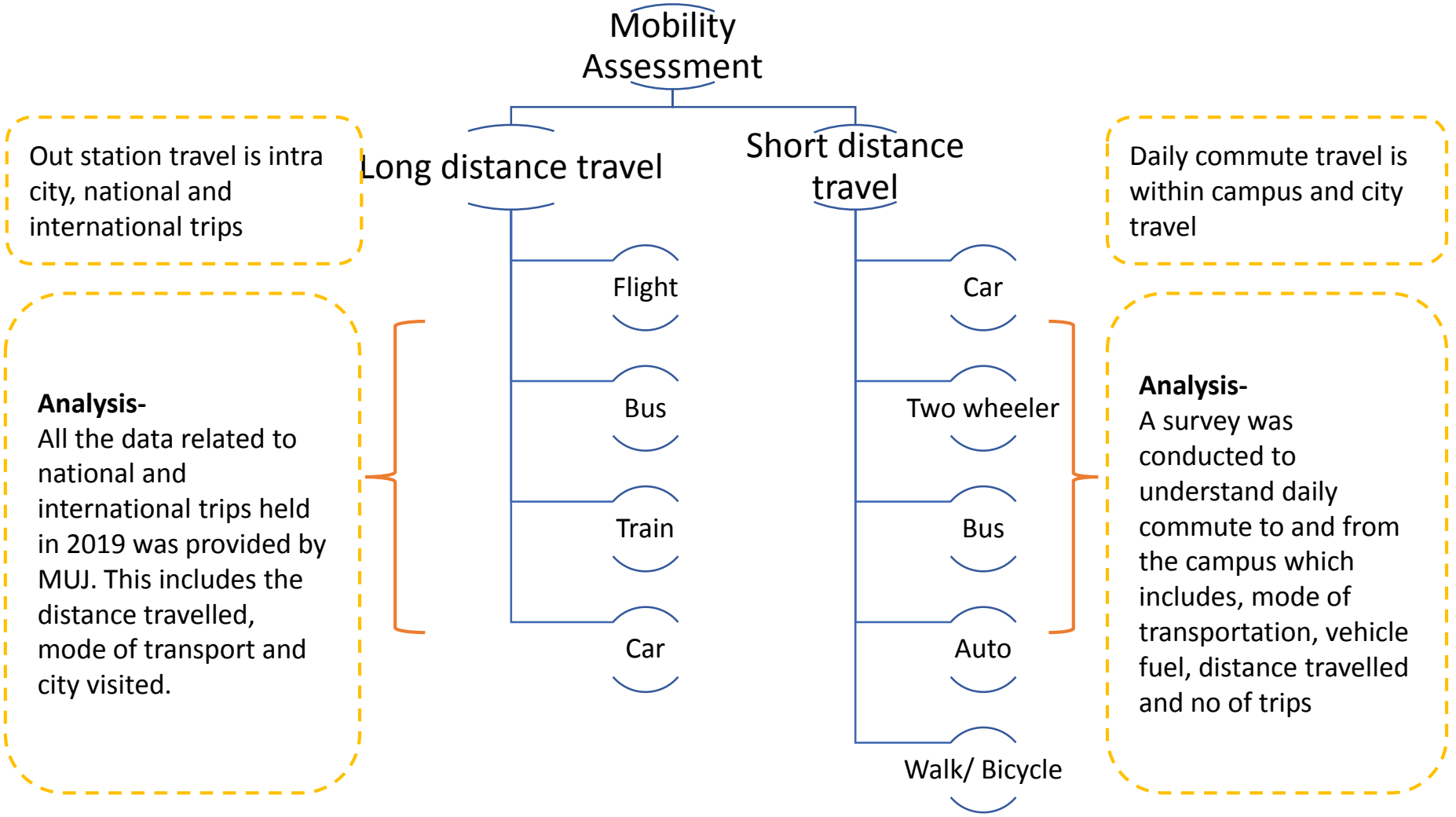


Methodology:

A mobility survey has been conducted for both staff and students (day scholars and residents) where we understood their daily mode of transport, distance traveled, type of fuel and fuel consumed.
From this data received, an emission factor was considered to understand the total carbon emission from each fuel and vehicle type. After finding out the total carbon emission, Tonnes of carbon dioxide (TCO2) equivalent per capita is generated.

Criteria - Mobility

Mobility Analysis : Methodology



Out station travel is intra city, national and international trips

Analysis-
All the data related to national and international trips held in 2019 was provided by MUJ. This includes the distance travelled, mode of transport and city visited.

Daily commute travel is within campus and city travel

Analysis-
A survey was conducted to understand daily commute to and from the campus which includes, mode of transportation, vehicle fuel, distance travelled and no of trips

Key Performance Indicator (KPI):

Total CO_2 emission from daily commute- **15,179 TCO_2** per student

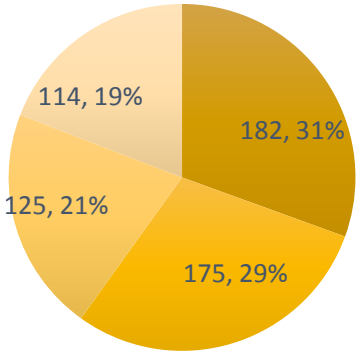
Total CO_2 emission from out station travel- **16 TCO_2** per student

Total MUJ CO_2 emission in 2019- **15,195 TCO_2** per student

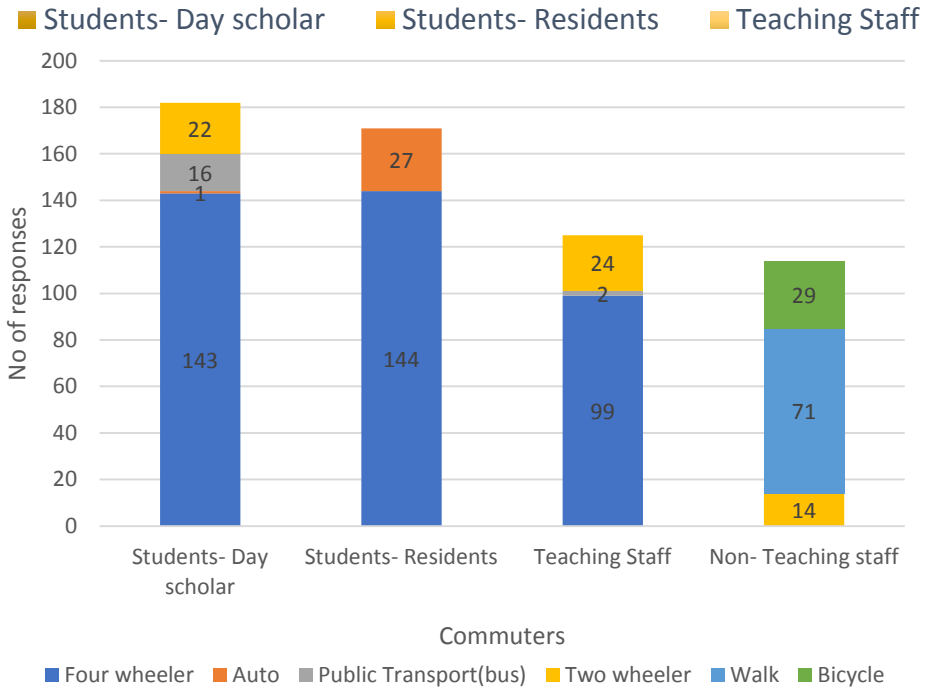
Criteria - Mobility

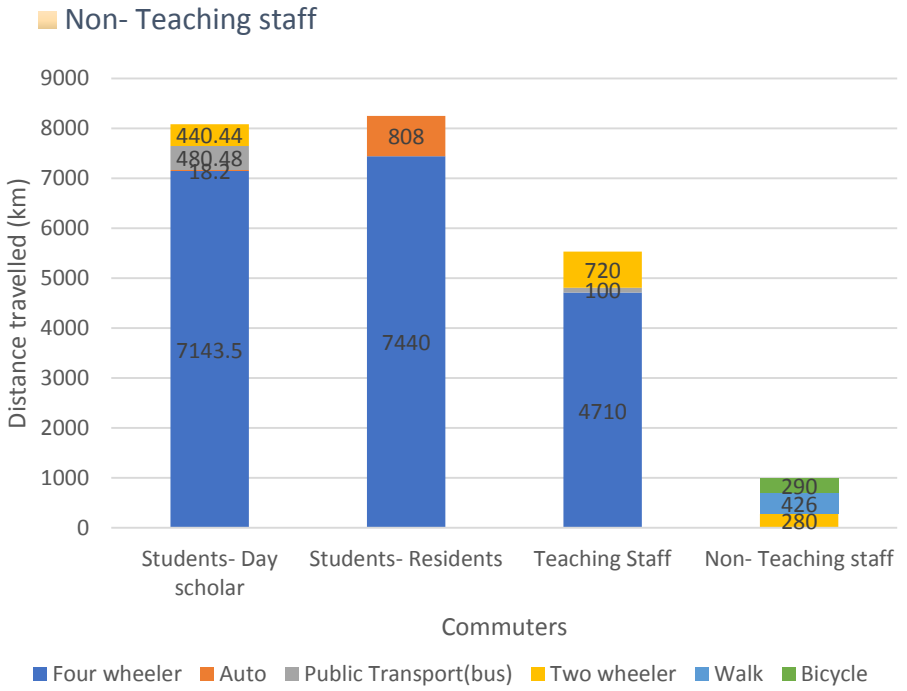
Mobility Analysis : Short distance travel

No. of responses received- 596



From the daily commute held to and from MUJ, all the teaching staff, non teaching staff, day scholar students and resident students are included in the survey. A sample size of minimum 5% of the total strength is considered.
Trips held in car have a travel distance range between 20 to 40 kms whereas, trips held in two wheeler have a travel distance range between 5 to 15 kms and trips held



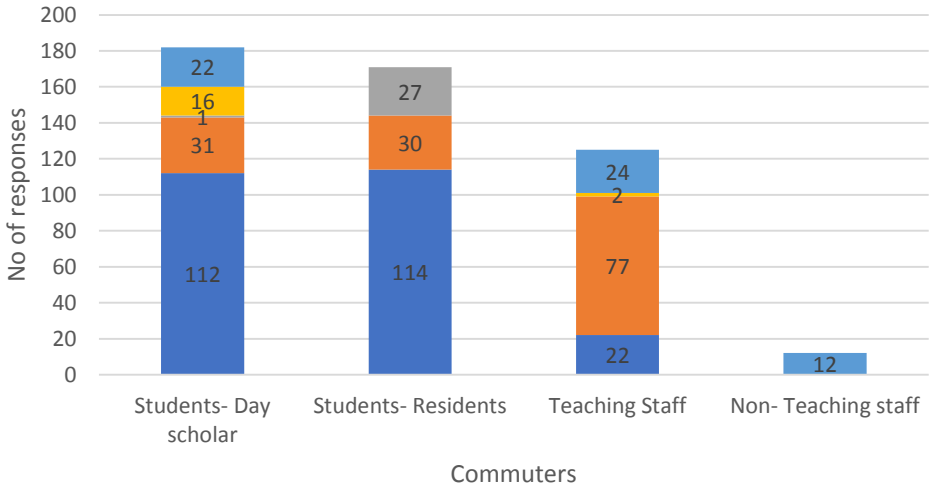


Calculations:

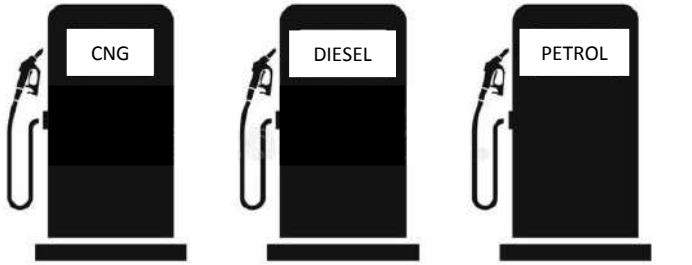
- From the online mobility survey conducted, we have received 596 responses which includes day scholar students, resident students, teaching staff and non teaching staff where we have segregated and filtered the data wrt different mode of transport i.e., four wheeler, auto, public transport, two heeler, walk, bicycle.
- After deriving number of students and staff and their travelling mode, total distance travelled under each mode of transport was evaluated.
- Total no of students under four wheeler * average distance travelled* to and fro trips = total distance four wheeler travelled

Criteria - Mobility

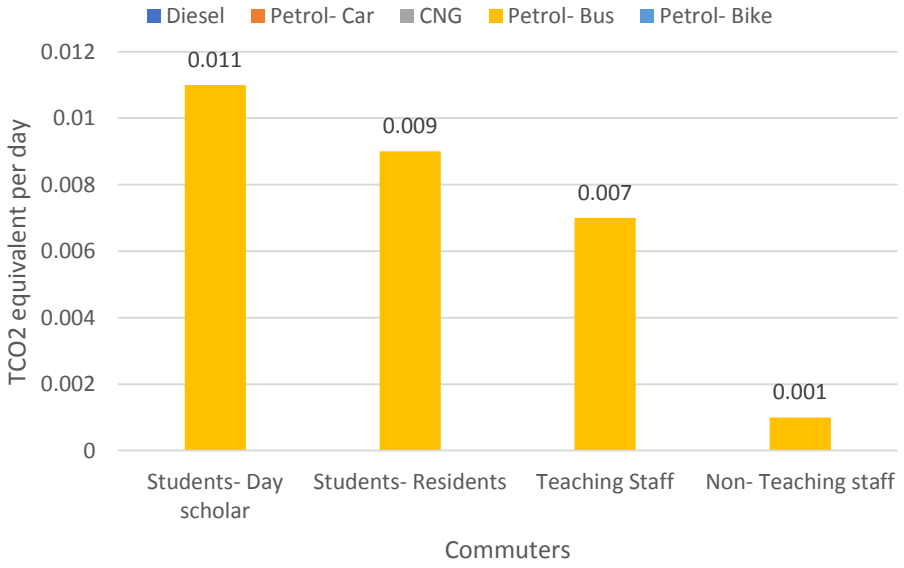
Mobility Analysis : Short distance travel

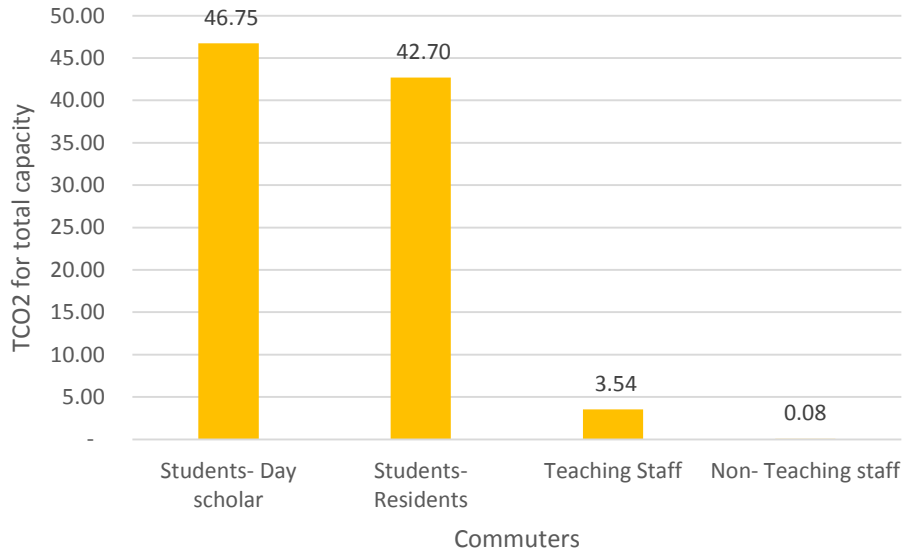


Emission factor for different fuel types



0.48	2.62	2.21





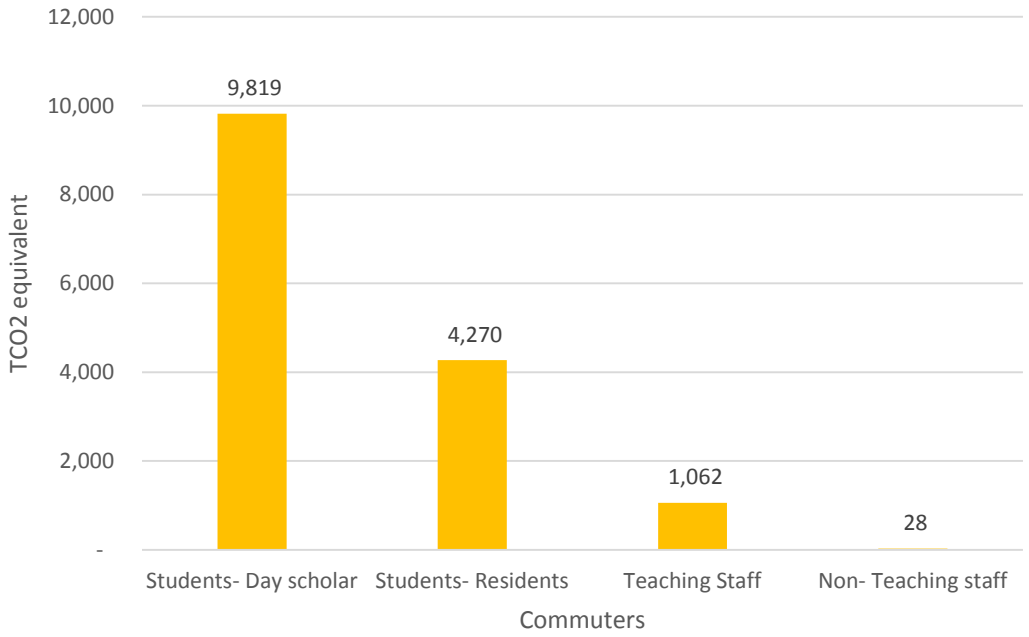
Calculations:

- Once the total distance travelled was calculated, the vehicle fuel type data was segregated wrt to commuters.
- As many commuters use different type of fuel such as diesel, petrol or CNG and each of these fuel have different associated emission factor.
- With these emission factors per day total tonne of CO2 was calculated for individual commuter category.
- Total CO2 emission per day from different mode of transport/ total no of responses received= TCO2 equivalent per capita per day
- This TCO2 equivalent per capita per day is then multiplied with total strength of each commuters category.

Criteria - Mobility

Mobility Analysis : Short distance travel

No of working days for Students day scholar - 210 days
No of working days for students residents - 100 days
No of working days for teaching staff - 300 days
No of working days for non- teaching staff - 365 days



Recommendations-
All majority of day scholar students travel using cab service, this can be replaced with college bus transport.
All the petrol and diesel fuel consumption can be replaced with CNG as the emission factor is comparatively less.
As the distance travelled cannot be reduced opting for car pooling or college bus is the next best option

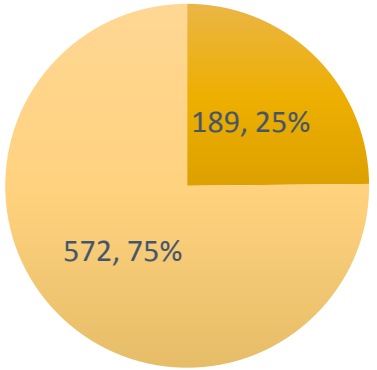
Calculations:

- After under standing the cumulative TCO2 emission for one day which includes both 2 way trip we need to understand the annual carbon emission causing due to mobility.
- TCO2 equivalent per capita per day X individual commuters working day = Total tonne of CO2 emission from mobility for MUJ

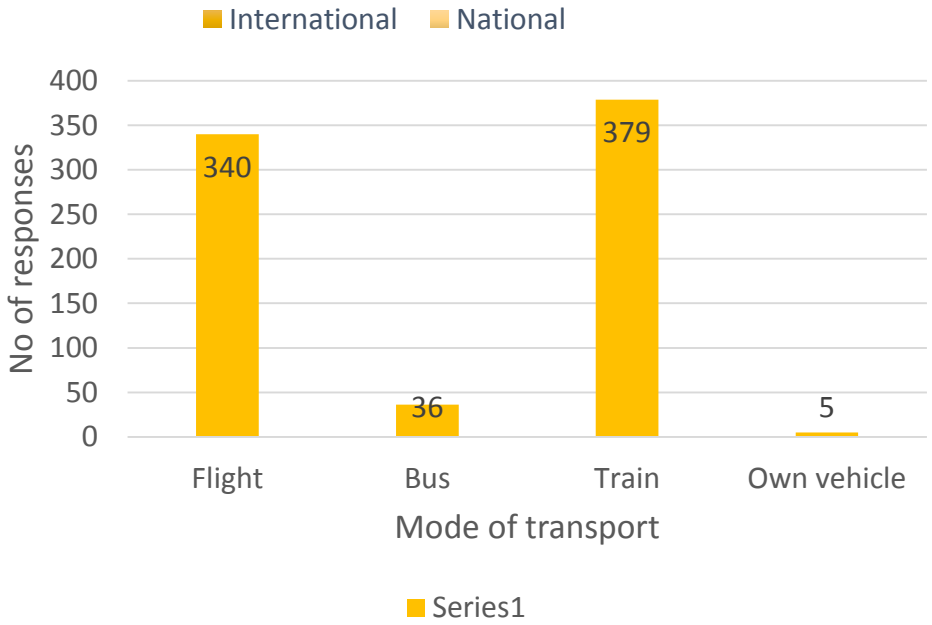
Criteria - Mobility

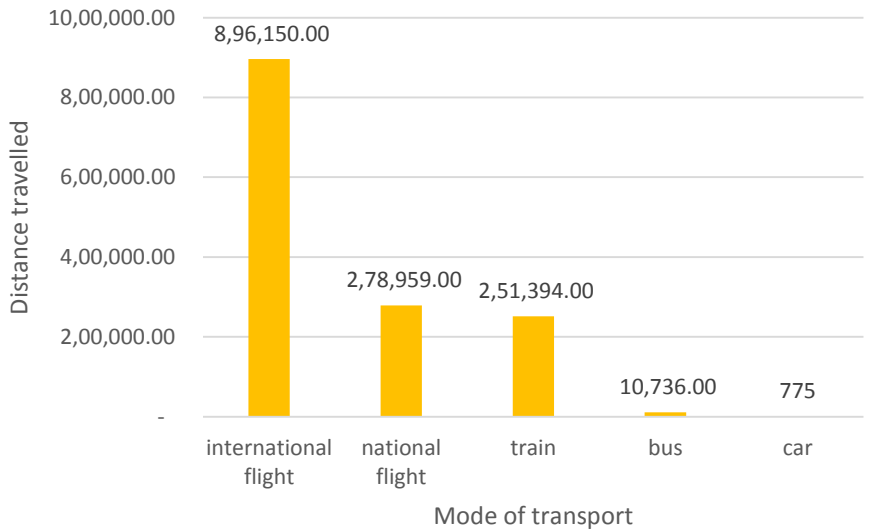
Mobility Analysis : Out station travel

National and International Trips-761



From the national and international trips held by MUJ staff and faculty members, majority of mode of transport is by flight and train.
Trips held in flight have a travel distance range between 800 to 12,000 kms whereas, trips held in train have a travel distance range between 400 to 700 kms. Trips held in bus and own vehicle are below 400 kms.



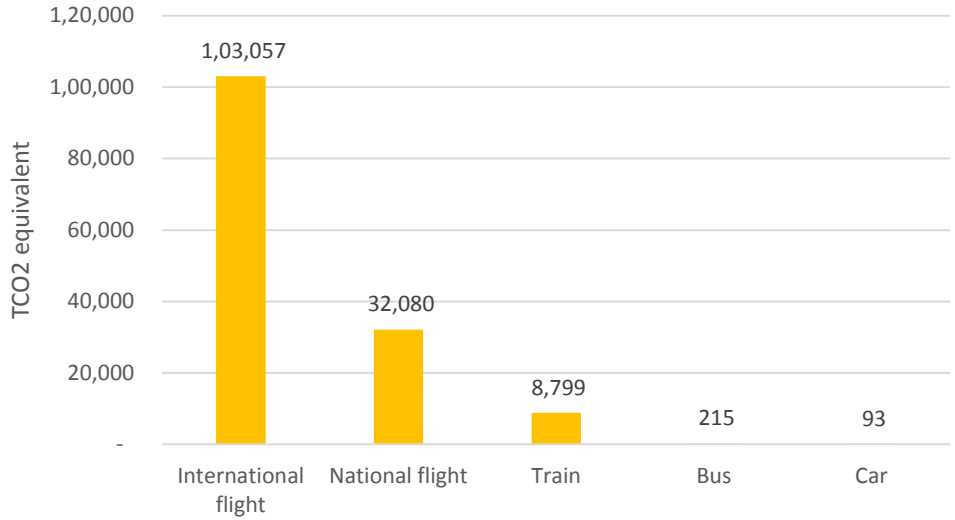


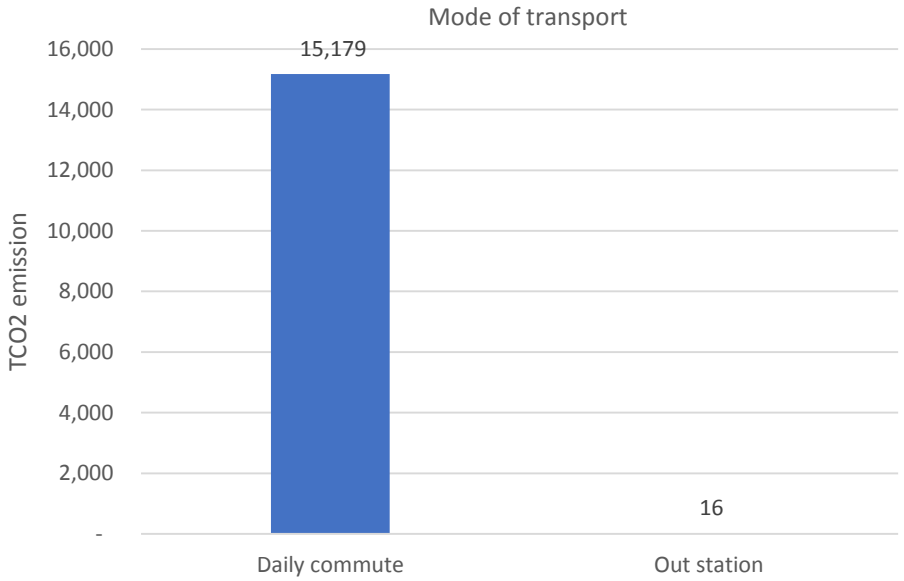
Observations:

- From the data received for both national and international trips includes different mode of transport and distance travelled.
- From the details provided, travel within 500 kms- bus and train, travel within 1200 kms- train and travel above 1200 kms- flight for national trips.
- From the data provided by MUJ, all the national and international trips are segregated.
- No of responses for each mode of travel is diverted. From this individual distance travelled is accumulated.

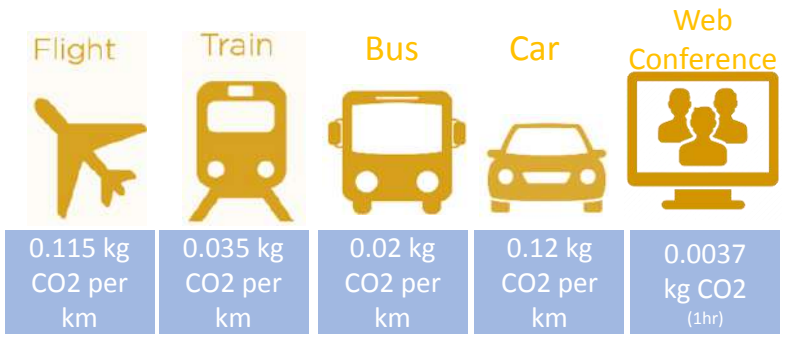
Criteria - Mobility

Mobility Analysis : Out station travel





Emission factor for different mode of travel



Inference-
Daily commute has a predominantly high value because it involves everyday commute for 4165 students and 4978 occasional travel and 1000 staff everyday travel.

Total MUJ CO2 emission in 2019- **15,195 TCO2 per student**

Inference & Calculations

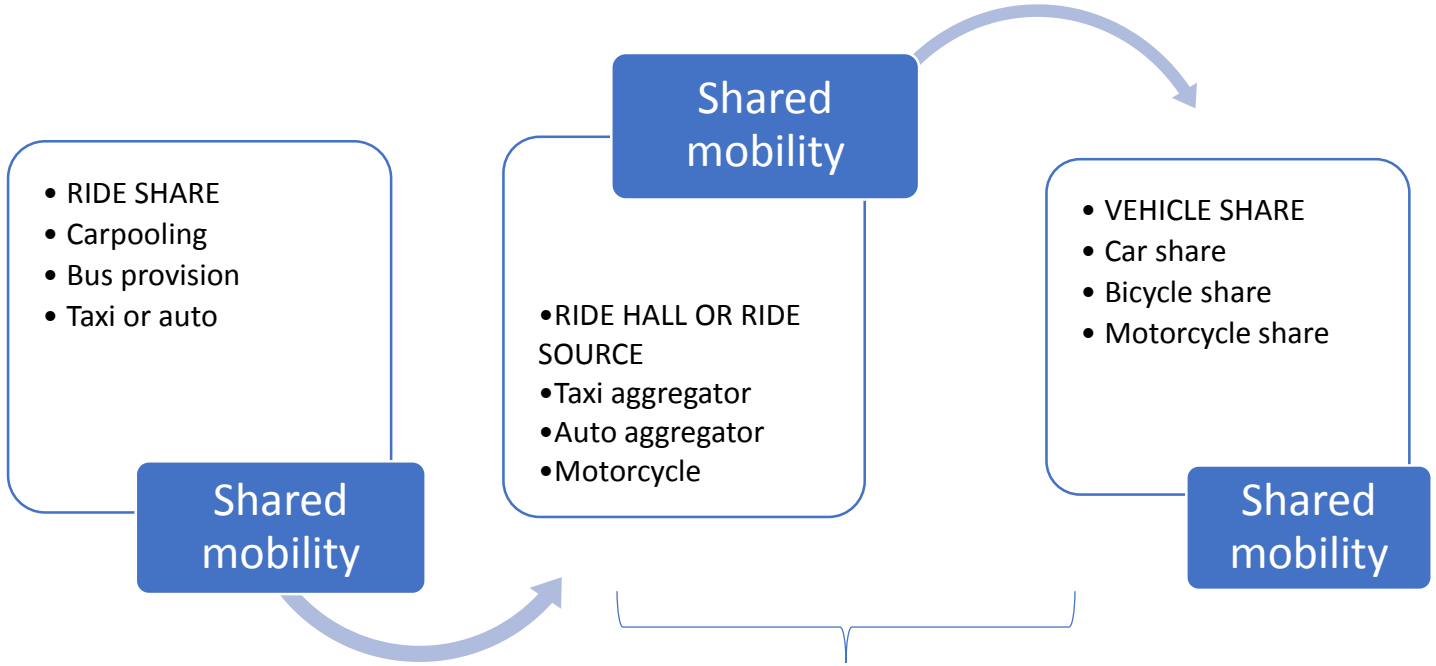
Even thought the number of international trips are comparatively less to national trips but CO2 emission from international trips are very high.
To reduce this excess emission in near future, majority of the trips can be converted to web based meeting or conference.
As far as possible all the national trips can be by shifted from flights to trains.

Calculations:
total TCO2 equivalent for all the different mode of transport/ total no of student= Tonne of CO2 emission per student

Recommendations:

Following are the recommendations are suggested to manage waste in a sustainable manner:

- Identifying the major pockets students and staff are commuting from and initiate the university bus facilities.
- Introducing paid parking policies for 4-wheelers
- Consider the use of tele- or video-conferencing for meetings where feasible.
- Development of a roadmap to shift for using e-vehicles for the entire campus users



College bus facility

Alternate engine and fuels

Multiple trips of college buses or government buses

Criteria - Wellness

Drinking WATER TEST REPORT

5473

AQUACHEK
THE WATER TESTING FACILITY
FROM EUREKA FORBES LTD.

TEST REPORT - G1

Report No. : WL/Jan/2014
Sample Code No : 1082
Sample Source : *Drinking Water (Eng. Dept. 3rd Floor) G1
Customer's Name : M/S Sikkim Manipal University
Address : Dahmi kalan, Near GVK Toll Plaza Ajmer Express Highway, Jaipur
Mob No. : 7727006789

Date of Report : 23.01.2014
Collected on : 18.01.2014

S.NO.	PARAMETER TESTED		RESULT	IS: 10500.2012-DRINKING WATER SPECIFICATION (Second Revision)	
				Requirement (Acceptable limit)	Maximum Permissible limit
	Physico-chemical Analysis				
1.	Odour		Agreeable	Agreeable	-
2.	Taste		Agreeable	Agreeable	-
3.	Turbidity,	NTU	0.4	1	5
4.	pH value		8.01	6.5-8.50	No relaxation
5.	Total Dissolved Solids	mg/l	267	500	2000
6.	Total alkalinity as CaCO3,	mg/l	197	200	600
7.	Total Hardness as CaCO3,	mg/l	162	200	600
8.	Calcium as Ca^{++}	mg/l	25	75	200
9.	Magnesium as Mg^{++}	mg/l	23.8	30	100
10.	Chloride as Cl^-	mg/l	42	250	1000
11.	Sulphate as SO4	mg/l	7.3	200	400
12.	Nitrate as $NO3^-$	mg/l	4.1	45	No relaxation
13.	Total Iron as Fe,	mg/l	0.1	0.3	No relaxation
14.	Residual Free Chlorine	mg/l	Nil	0.2	1
15.	Fluoride as F^-	mg/l	Nil	1.0	1.5
	Bacteriological Analysis				
16.	Total Coli forms /100ml		Zero	Zero	No relaxation
17.	Faecal Coli forms /100ml		Zero	Zero	No relaxation
18.	E.coli presence/ absence in 100ml		Absent	Absent	No relaxation

* The above sample Collected by Lab.
Remarks: The above sample conforms to IS: 10500-2012 – Drinking Water specification (Second Revision) with respect to test conducted

Lab Address :
51/1, Ground Floor
Shipra Path, Mansarovar, Jaipur
Tel. 0141- 5130002

Authorised Signatory

Corporation Office: Bhupesh Gupta Bhavan 1st Floor, 85, Sayani Road Prabhadevi, Mumbai 400 025 (INDIA) | Phone: 91-22-430 1725 (8 Lines) | Telefax: 91-22-422 2703 | E-Mail: eftpho@bom2.vsnl.net.in | Cable: "Aquaguard" Fort, Mumbai | Mailing Address: 143-C/4, Bommasandra Indl. Area Off. Hosur Rd., Bangalore 562 158. | Regd. Office: 7, Chakraberia Road (South) Kolkata 700 025.

STP treated Water Test reports

1405

AQUACHEK
THE WATER TESTING FACILITY
FROM EUREKA FORBES LTD.

TEST REPORT

Report No. : WL/Jan/2014
Sample Code No : 1108
Sample Source : * Treated Water (STP) MIS
Customer's Name : M/S Sikkim Manipal University
Address : Dahmi kalan, Near GVK Toll Plaza Ajmer Express Highway, Jaipur
Mob No. : 7727006789

Date of Report : 04.02.2014
Collected on : 22.01.2014

S.NO.	PARAMETER TESTED		RESULT	Method of Testing IS:3025
				Requirement (Acceptable limit)
	Physico-chemical Analysis			
1.	pH Value		7.25	5.5-9.0
2.	Total Suspended Solids	mg/l	14.76	100 mg/l
3.	Biological Oxygen Demand	mg/l	21.43	30 mg/l
4.	Chemical Oxygen Demand	mg/l	81.59	250 mg/l
5.	Oil & Grease	mg/l	0.761	10 mg/l

* The above sample Collected by Lab.
Remarks: The above sample conform to Indian Standard: 3025

Lab Address :
51/1, Ground Floor
Shipra Path, Mansarovar, Jaipur
Tel. 0141- 5130002

Authorised Signatory

Corporation Office: Bhupesh Gupta Bhavan 1st Floor, 85, Sayani Road Prabhadevi, Mumbai 400 025 (INDIA) | Phone: 91-22-430 1725 (8 Lines) | Telefax: 91-22-422 2703 | E-Mail: eftpho@bom2.vsnl.net.in | Cable: "Aquaguard" Fort, Mumbai | Mailing Address: 143-C/4, Bommasandra Indl. Area Off. Hosur Rd., Bangalore 562 158. | Regd. Office: 7, Chakraberia Road (South) Kolkata 700 025.

Observations:

From the **Drinking Water test report**, we can understand all the physico-chemical analysis are in between the required acceptable limit. All the drinking water (RO water) available in the campus is perfectly safe for students and staff members to consume.

From the **STP water test report**, we can understand all the physico-chemical analysis are in between the required acceptable limit. This water can be later reused for landscape or flushing purpose.
Currently, MUJ is reusing this treated water for landscape and flushing purpose. All the buildings have dual plumbing system to cater to this measure. Because of this method, MUJ is consuming less potable water and ground water.

Action Plan:

Way Forward to Develop the Roadmap

Priority	Timeline	Actions
Immediate	4-6 Months	Add list of actions
Short term goal	2-5 years	Add list of actions
Mid term goal	6-10 years	Add list of actions
Long term goal	10- 15 years	Add list of actions

EC for Academic Block — Copy

State Level Environment Impact Assessment Authority. Rajasthan

4, Institutional Area, Jhalana Doongri, Jaipur-302004
Phone: 0141-2705633, 2711329 Ext. 361

No: F1(4)/SEIAA/SEAC-Raj/Sectt/Project/Cat 8(a)B1 (194) /08-09 Jaipur, Dated: 27-12-09

To,

M/s Manipal Universal Learning P. Ltd.,
Manipal Towers,
14-HAL Airport Road,
Bangalore

Sub: EC for proposed Manipal Education Project village Dehmi Kalan, Teh. Sanganer, Jaipur by Mr. R.Shankar, V.P. (Project), Manipal Universal Learning P. Ltd., Manipal Towers, 14-HAL Airport Road, Bangalore.

Sir,

This has reference to your application No Nil dated 12-06-09 seeking environmental clearances for the above project under EIA Notification 2006. The proposal has been appraised as per prescribed procedure in the light of provisions under the EIA Notification 2006 on the basis of the mandatory documents enclosed with the application viz. the questionnaire, EIA EMP and additional clarifications furnished in response to the observation of the State Level Expert Committee Rajasthan, in its meetings held on 18/19.11.09.

2. **Brief details of the Project:**

1.	Category: -	"B"
2.	Item No (in the Schedule):	8(a)
3.	Purpose	Educational Project
4.	Location	Village-Dehmi Kalan, Tehsil-Sanganer, Distt.-Jaipur.
5.	Total Plot area	2, 69,801.80 M^2. (66.67 Acres / 26.98Ha)
6.	Built Up Area	2, 31,242.75 M^2.
7.	Utilized ground coverage:	14.48 %.
8.	FAR	Achieved FAR 68%
9.	Maximum Building Height	Not Provided
10.	No. of Floors	Not Provided.
11.	Total Parking Area	40,000 M^2 under surface parking. Parking provided for 670 Cars, 536 Two Wheelers, 135 Cycles.
12.	Expected Cost: -	Rs. 583 Crores - Development Cost; Rs. 36.1944 Crores - Land Cost
13.	Power Requirement	8 MVA during I-Phase through RSEB. Installation of 4 DG Sets proposed (2x2000 KVA, 2x1000 KVA; Diesel Consumption @ 5.4 ltr/hour).
14.	Water Requirement & Source	923 KLD. Source: Tube Wells. A letter dt. 08.10.2009 has been sent by the P.P. to the Central Ground Water Authority for permission to install the required 6 nos. of tube wells.
15.	Environmental Management Plan	1) 62018.50 M^2 (approx. 23 %) is available under parks and green belt. 2) 40,000 Sq. M. is available for surface parking. 3) Rain Water Harvesting 4) A STP of 1075 KLD capacity.

3. The SEAC Rajasthan after due considerations of the relevant documents submitted by the project proponent and additional clarifications/documents furnished to it have recommended for Environmental Clearance with certain stipulations. The SEIAA Rajasthan after considering the proposal and recommendations of the SEAC Rajasthan hereby accord Environmental Clearance to the project as per the provisions of Environmental Impact Assessment Notification 2006 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

PART A: SPECIFIC CONDITIONS

I. CONSTRUCTION PHASE

i. "Consent to Establish" shall be obtained from Rajasthan State Pollution Control Board and a copy shall be submitted to the SEIAA, Rajasthan before start of any construction work at the site and submit the following documents to RPCB at the time of applying for CTE:
   - ✓ Identification of re-cycling plant with its process.

ii. For conservation of electricity and to reduce energy losses the management should ensure that the electrical voltage is stepped down from 33 KV to 11 KV and distributed at this level and finally brought to 440 volts.

iii. Provision shall be made for the housing of construction labor 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.

iv. All required sanitary and hygienic measures shall be in place before starting construction activities. The safe disposal of waste water and solid waste generated during the contraction phase should be ensured.

v. Adequate drinking water facilities shall be provided for construction workers at the site.

vi. Provisions should be made for the supply of fuel (kerosene or cooking gas); utensils such as pressure cookers etc. to the labourers.

vii. All the labourers engaged for construction should be screened for health and adequately treated before engaging them to work at the site.

viii. For disinfection of waste water, appropriate tertiary treatment may be given.

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

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

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

xii. Construction spoils, including bituminous material and other hazardous materials must not be allowed to contaminate water courses and the dump sites for such material must be secured so that they do not leach into the ground water.

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

xiv. Vehicles hired for bringing construction material and labourers to the site should be in good conditions and should conform to applicable air and noise emission standards and should be operated during non-peak/approved hours.

xv. Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase.

xvi. Fly ash should be used as building material in the construction as per the provisions of Fly Ash notification of September, 1999 and amended as on August, 2003 (The above condition is applicable only if the project is within 100 km of Thermal Power Station).

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

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

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

xx. Permission to draw ground water shall be obtained from the CGWA/CGWB prior to construction/operation of the project.

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

xxii. Treatment of 100% grey water by decentralized treatment should be done.

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

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

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

xxv. Adequate measures shall be taken to reduce air and noise pollution during construction keeping in mind CPCB norms on noise limits.

xxvi. Opaque walls should meet prescriptive requirement as per Energy Conservation Building Code for all air-conditioned spaces, whereas, for non- air-conditioned spaces, by use of appropriate thermal insulation material to fulfill the requirement.

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

xxix. Any hazardous waste generated during construction phase should be disposed off as per applicable rules and norms with necessary authorization of the Rajasthan Pollution Control Board.

xxx. The approval of the competent authority shall be obtained for structural safety of the building due to earthquake, adequacy of fire fighting equipments, etc as per National Building Code 2005 including protection measures from lightening etc.

xxxi. Regular supervision of the above and other measures for monitoring should be in place throughout the construction phase, so as to avoid nuisance to the surroundings.

xxxii. Approved plan from competent Authority and position with reference to Master Plan.

xxxiii. Copy of guidelines issued by concerned ministry for water scarce area is provided.

xxxiv. Ground water table to be shown along with source. Besides, permission of competent authority is obtained for withdrawal of ground water.

xxxv. Recalculate MSW quantity and revise disposal proposal.

xxxvi. Composting of biodegradable waste shall be carried out with in the campus.

xxxvii. Provision of solar water heating /chilling etc shall be explored.

xxxviii. Review and revise the requirement of DG set capacities for 100% power back up through to optimization of power back up in case of power failure and emergency.

(B)

II OPERATION PHASE

i. An independent expert shall certify the installation of the Sewage Treatment Plant (STP) and a report in this regard shall be submitted to the RPCB, before the project is commissioned for operation. Discharge of treated sewage shall conform to the norms & standards of the Rajasthan State Pollution Control Board.

ii. For conservation of electricity and to reduce energy losses the management should ensure that the electrical voltage is stepped down from 33 KV to 11 KV and distributed at this level and finally brought to 440 volts.

iii. Rain Water harvesting (RWH) for roof run-off and surface run-off, as plan submitted shall be implemented. Before recharging the surface run off, pre-treatment must be done to remove suspended matter, oil and grease. The RWH plan should as per GOI manual

iv. The solid waste generated should be properly collected & segregated before disposal to the City Municipal Facility. The in-vessel bio-conversion technique may be used for composting the organic waste.

v. Any hazardous waste including biomedical waste should be disposed of as per applicable Rules & norms with necessary approvals of the Rajasthan State Pollution Control Board.

vi. The green belt design along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential land use. The open space inside the plot should be suitably landscaped and covered with vegetation of indigenous variety.

vii. The D. G. sets to be operated with stack height as per RPCB norms.

viii. Incremental pollution loads on the ambient air quality noise and water quality shall be periodically monitored after commissioning of the project.

ix. Application of solar energy should be incorporated to illumination of common areas, lighting for gardens and street lighting in addition to provision for solar water heating. A hybrid system or fully solar system for a portion of the apartments should be provided.

x. 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.

xi. A Report on the energy conservation measures confirming to energy conservation norms finalize by Bureau of Energy Efficiency should be prepared incorporating details about building materials & technology, R & U Factors etc. Quantify energy saving measures.

xii. Proper system of channelizing excess storm water shall be provided.

xiii. The power factor should be maintained near unity.

xiv. Trees and shrubs of local species should be planted to allow habitat for birds with appropriate distance from the boundary.

xv. No puzzle parking shall be allowed.

xvi. Re-cycled water to match standards for cooling water system.

xvii. Adequate measures should be taken to prevent odor from solid waste processing and STP.

PART - B. GENERAL CONDITIONS:

1. The environmental safeguards contained in Form 1-A should be implemented in letter and spirit.
2. Six monthly monitoring reports should be submitted to Rajasthan and Rajasthan State Pollution Control Board.
3. Officials of the RPCB, who would be monitoring the implementation of environmental safeguards, should be given full cooperation facilities and documents/data by the PP during their inspection. A complete set of all the documents submitted to SEIAA, Rajasthan should be forwarded to the DoE, Rajasthan and Rajasthan State Pollution Control Board.
4. In case of any change(s) in the scope of the project, the PP requires a fresh appraisal by SEIAA/SEAC, Rajasthan.
5. The SEIAA/SEAC, Rajasthan reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environmental 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.
6. All the other statutory clearances such as the approvals for storage of diesel from the Chief Controller of Explosives, Fire department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (protection) Act,1972 etc. shall be obtained, as may be applicable, by PP from the competent authority.
7. The PP should ensure advertising in at least two local news papers widely circulated in the region, one of which shall be in vernacular language that, the project has been accorded environmental clearance and copies of the clearance letters are available with SEIAA, Rajasthan and the Rajasthan State Pollution Control Board and may also be seen on the website of the Board at www.rpcb.nic.in. The advertisement should be made within 7(seven) days from the date of issue of the environmental clearance and a copy should also be forwarded to the SEIAA, Rajasthan and Regional Office, Jaipur(S) of the Board.
8. These stipulations would also be enforced amongst the others under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006.
9. Environment 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 the year 2004 as may be applicable to this project.

Yours faithfully,

Sd/-

(Sankatha Prasad)
Member Secretary
SEIAA Rajasthan

Copy to following for information and necessary action:

1. Secretary, Ministry of Environment and Forest, Govt. of India, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi.
2. Principal Secretary, Environment Department, Rajasthan, Jaipur.
3. Shri S.C. Derashri, Chairman, SEIAA Rajasthan, 90, Geejgarh Vihar, Hawa Sarak, Jaipur.
4. Shri R.S. Bhandari, Member, SEIAA Rajasthan, 2- Museum Road, Ram Niwas Bagh, Jaipur.
5. Member Secretary, Rajasthan State Pollution Control Board, Jaipur.
6. Member Secretary, SEAC Rajasthan.
7. The CCF, Regional Office, Ministry of Environment & Forests, RO(CZ), Kendriya Bhawan, 5th Floor, Sector 'H', Aliganj, Lucknow-226 020.
8. IA- Division, Monitoring Cell, MoEF, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi-110003.

M.S. SEIAA (Rajasthan)

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Ointwise
mplience report of the EC (B8) Red Category

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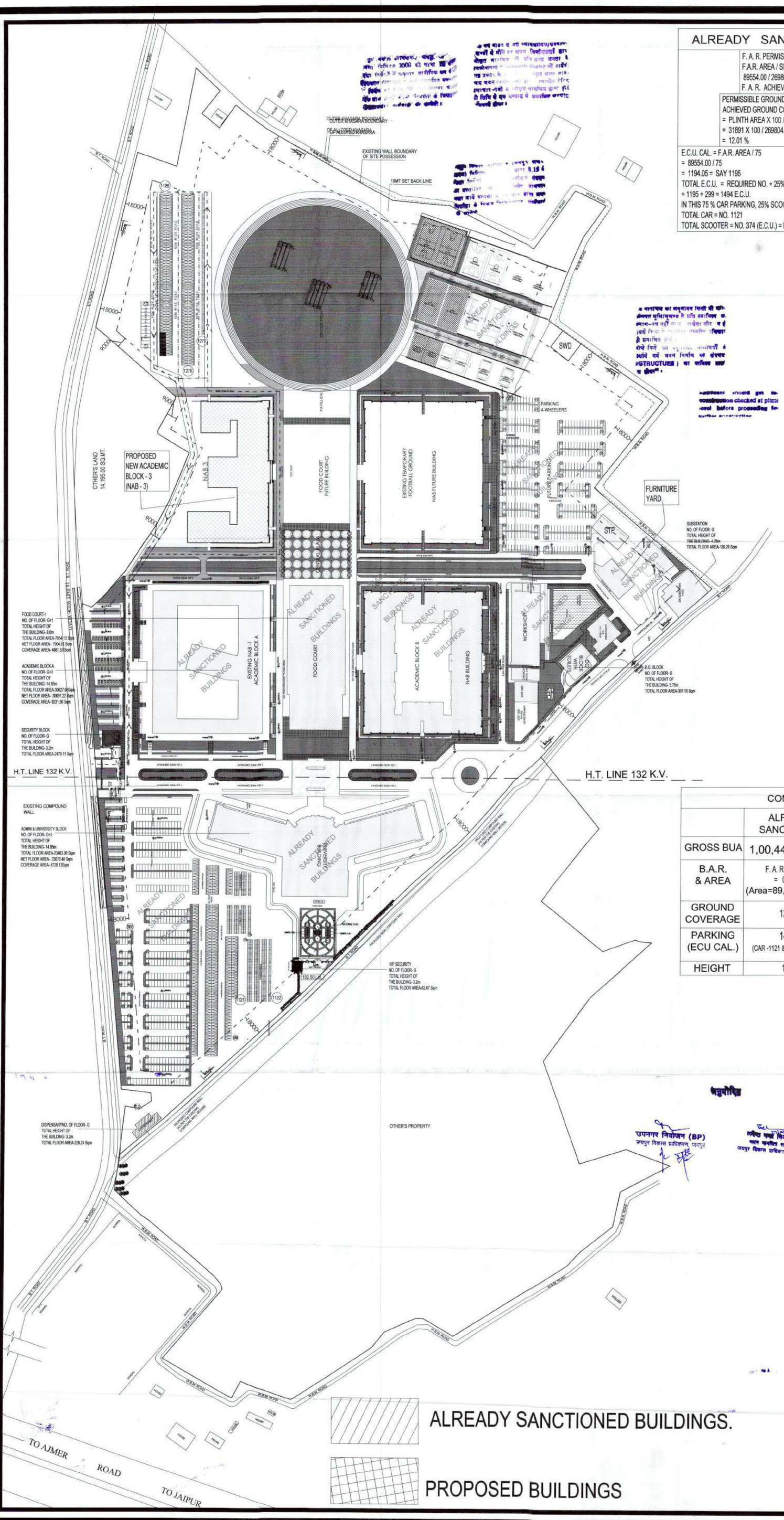
4

RPCB.NIC.in; Small letter concent to Establish - Water - Air

Air



ALREADY SANCTIONED BUILDINGS (AREA STATEMENT)

F. A. R. PERMISSIBLE = 1
F.A.R. AREA / SITE AREA = 89554.00 / 269804.00
F. A. R. ACHIEVED = 0.331<1

PERMISSIBLE GROUND COVERAGE = 35%
ACHIEVED GROUND COVERAGE
= PLINTH AREA X 100 / SITE AREA
= 31891 X 100 / 269804.00
= 12.01 %

E.C.U. CAL. = F.A.R. AREA / 75
= 89554.00 / 75
= 1194.05 = SAY 1195
TOTAL E.C.U. = REQUIRED NO. + 25% VISITOR PARKING
= 1195 + 299 = 1494 E.C.U.
IN THIS 75 % CAR PARKING, 25% SCOOTER PARKING.
TOTAL CAR = NO. 1121
TOTAL SCOOTER = NO. 374 (E.C.U.) = NO. 1122

TOTAL PLOT AREA - 2,69,804.00 SQM(66.67 ACRES)

SL NO	PARTICULARS	GROSS BUILT UP AREA (SQ.MT.)	F.A.R. AREA (SQ.MT.)
1	UNIVERSITY ADMIN & LIBRARY BUILDING	23463	23076
2	ACADEMIC BLOCK-A	30628	30097
3	FOOD COURT	7954	7905
4	SECURITY	230	230
5	WORKSHOP (GROUND FLOOR)	1388	1388
6	SUBSTATION	120	120
7	D.G.BLOCK	307	307
8	DISPENSARY	228	228
9	VIP SECURITY BLOCK	62	62
	TOTAL	64380	63413
10	NEW ACADEMIC BLOCK	31952	22865
11	AUTOMOBILE SHED	1050	830
12	FIRST FLOOR WORK SHOP BUILDING.	1542	1225
13	CHEMICAL ENGINEERING LAB - 3	369	291
14	CHEMICAL ENGINEERING RESEARCH LAB.	100	100
	TOTAL	99,393	88,724
15	FURNITURE YARD	1050	830
ALREADY APPROVED AREA (TOTAL)		1,00,443	89,554

EXTENSION (NEW SUBMISSIONS)

	PARTICULARS	GROSS BUILT UP AREA (SQ.MT.)	B.A.R. AREA (SQ.MT.)
1	NEW ACADEMIC BLOCK - 3	21,525.00	21,525.00

B.A.R. IN TOTALITY

ALREADY APPROVED (ACHIEVED) FAR = 0.331
CONVERTED INTO B.A.R. (BUILT AREA RATIO)
- F A R X 1.5 = 0.331 X 1.5 = 0.4965

PERMISSIBLE B A R
(AS PER 2020 BUILDING BYLAWS)= 2.00

B A R OF THE PROPOSED
NEW ACADEMIC BLOCK - 3 (NAB-3)
= B.A.R. AREA / SITE AREA
= 21525.00 / 269804.00
= 0.079
TOTAL BAR OF THE PLOT
= 0.4965 + 0.079 = 0.5755 < 2

COMPRESHENSIVE TABLE

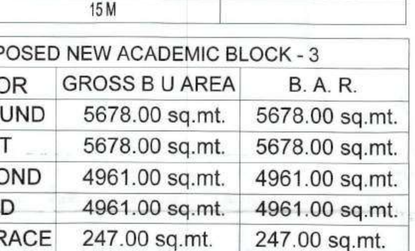
	ALREADY SANCTIONED	NEW PROPOSAL	TOTAL
GROSS BUA	1,00,443 Sq.mt.	21,525.00 sq.mt.	1,21,968 Sq.mt.
B.A.R. & AREA	F.A.R. ACHIEVED = 0.331<1 (Area=89,554 Sq.mt.)	(CONVERTED BAR) +(NAB-3) 0.4965 + 0.079 (21,525 sq.mt.)	= 0.5755 < 2 (1,11,079 sq.mt.)
GROUND COVERAGE	12.01 %	1.91 %	13.92 %
PARKING (ECU CAL.)	1494 (CAR -1121 & SCOOTER-1122)	206 (BUSES - 13, CAR -116 & SCOOTER-153)	1700 (BUSES - 13, CAR -1237 & SCOOTER-1275)
HEIGHT	15 M	15 M	

PROPOSED NEW ACADEMIC BLOCK - 3		
FLOOR	GROSS B U AREA	B. A. R.
GROUND	5678.00 sq.mt.	5678.00 sq.mt.
FIRST	5678.00 sq.mt.	5678.00 sq.mt.
SECOND	4961.00 sq.mt.	4961.00 sq.mt.
THIRD	4961.00 sq.mt.	4961.00 sq.mt.
TERRACE	247.00 sq.mt.	247.00 sq.mt.
TOTAL	21,525.00 sq.mt.	21,525.00 sq.mt.

REQUIRED E.C.U. CALCULATIONS
= B.A.R. / 115
= 21525.00 / 115
= 187.17
TOTAL E.C.U. = REQUIRED NO. + 10% VISITOR PARKING
= 187.17 + 18.70 = 205.87 = 206 E.C.U.
IN THIS 75 % BUSES & CARS, 25% SCOOTER PARKING.
TOTAL BUSES = (39 E.C.U. / 3) = NO. 13
TOTAL CARS = NO. 116
TOTAL SCOOTERS = (51 E.C.U. X 3) = NO. 153

OVERALL TOTAL BUSES = 13
OVERALL TOTAL CARS = 1121 + 116 = 1237
OVERALL TOTAL SCOOTERS = 1122 + 153 = 1275

PERMISSIBLE GROUND COVERAGE = 40%
ACHIEVED GROUND COVERAGE
= PLINTH AREA X 100 / SITE AREA
= 37569 X 100 / 2,69,804.00
= 13.92 %



DRG NO. NAB-3-(01 & 02)

NOTES

THIS DEVELOPMENT HAVE BEEN CONCEIVED,DESIGNED AND DRAFTED ON THE BASIS OF THE FOLLOWING PARAMETERS:

1. ANY DISCREPANCY IN THE DRAWING IS TO BE BROUGHT TO THE NOTICE OF THE ARCHITECT IMMEDIATELY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE FROM UNFINISHED TO UNFINISHED SURFACES UNLESS OTHERWISE SPECIFIED.
4. DRAWING NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
5. DRAWING MUST BE READ IN CONJUNCTION WITH STRUCTURAL DRAWINGS.
6. THE SIZES OF ALL THE STRUCTURAL MEMBERS TO BE REFEREED FROM DRAWINGS OF STRUCTURAL CONSULTANT.
7. ALL CENTER LINE DIMENSIONS ARE WITH REFERENCE TO (0,0).

REVISIONS	DATE	DESCRIPTION	BY
0			
1	01-05-2013	ADDITION OF LIFT LOBBY AND STAIRCASE PRESSURIZATION SHAFT	DUE TO C.F.O. N.O.C.
2			
3			
4			
5			
6			
7			
8			
9			
10			

PROJECT MANAGEMENT CONSULTANT
DILLIGENT PMC

STRUCTURAL CONSULTANT
TRC Engineering (I) Pvt. Ltd.,

SERVICES CONSULTANT
MEP CONSULTING ENGINEERS

PROJECT:
PROPOSED ACADEMIC BLOCK, MANIPAL UNIVERSITY JAIPUR
KHASRA. 467,469,474,468/1,473,475,542,544
GRAM: DEHMI KALAN
TEHSIL: SANGANEER
JAIPUR, RAJASTHAN

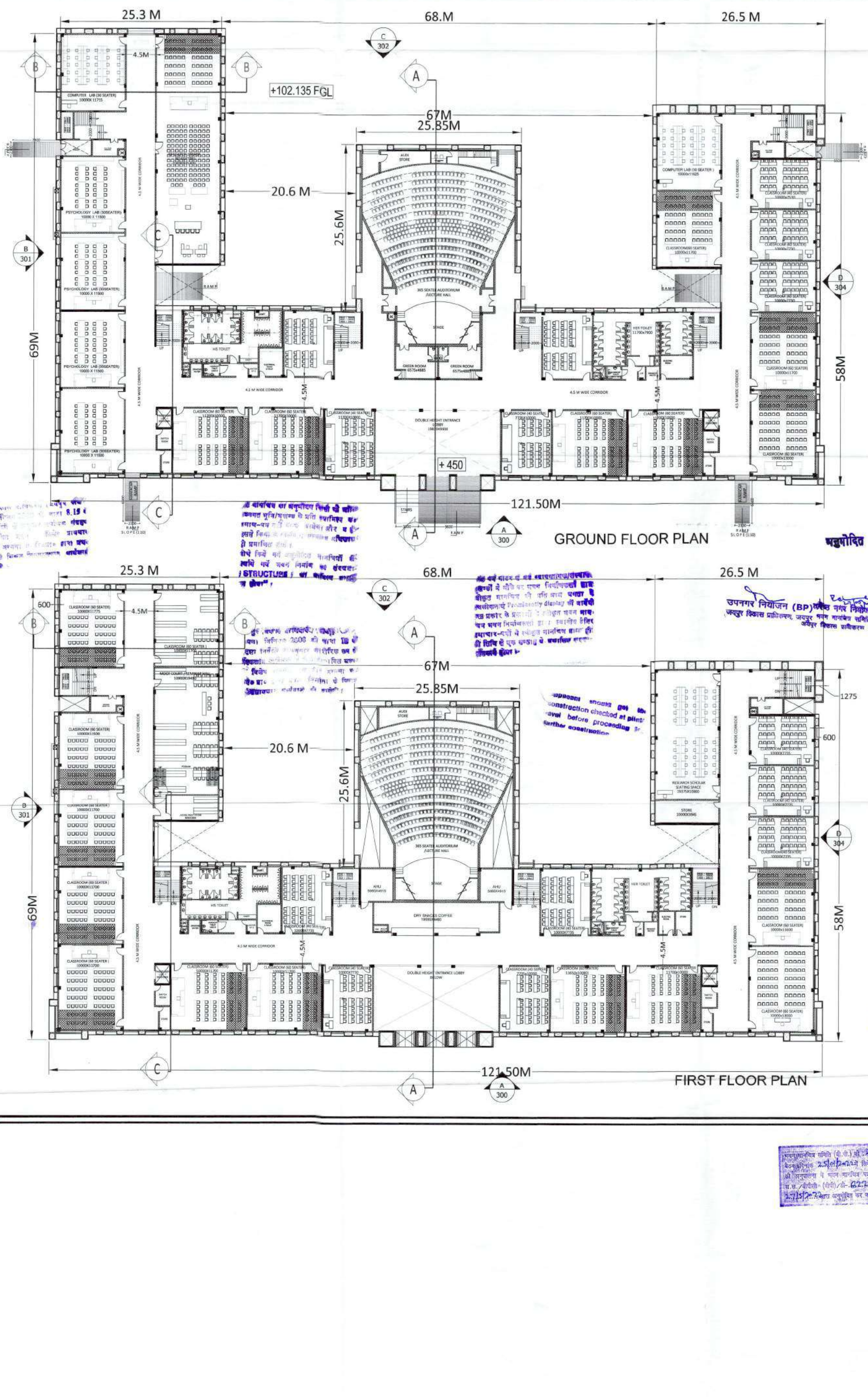
DRG.TITLE:
MASTER PLAN

REVISION	JOB NO.: 4401	DRG NO.:	NORTH:
	SCALE: A1: 1:100	DATE:	
FILE:	DEALT BY:	CHECKED BY:	APPROVED BY:

SIGNATURE & SEAL OF ARCHITECT
Subhash Chandra Devrath Architect CA/2012/56584

SIGNATURE & SEAL OF OWNER

Architect Hafeez Contractor
29 Bank Street, Bombay 400 023. Tel:2661920



DRG NO.	NAB -3 -(03)

NOTES

THIS DEVELOPMENT HAVE BEEN CONCEIVED DESIGNED AND DRAFTED ON THE BASIS OF THE FOLLOWING PARAMETERS:

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2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE FROM UNFINISHED TO UNFINISHED SURFACES UNLESS OTHERWISE SPECIFIED.
4. DRAWING NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
5. DRAWING MUST BE READ IN CONJUNCTION WITH STRUCTURAL DRAWINGS.
6. THE SIZES OF ALL THE STRUCTURAL MEMBERS TO BE REFERRED FROM DRAWINGS OF STRUCTURAL CONSULTANT.
7. ALL CENTER LINE DIMENSIONS ARE WITH REFERENCE TO (0,0).

REVISIONS	DATE	DESCRIPTION	BY
5			
4	01-05-2013	ADDITION OF LIFT LOBBY AND STAIRCASE PROJECTION IN WEST	DUE TO C.F.O. NOC.
3			
2			
1			

PROJECT MANAGEMENT CONSULTANT: DILLIGENT PMC

STRUCTURAL CONSULTANT: TRC Engineering (I) Pvt. Ltd.

SERVICES CONSULTANT: MEP — MEP CONSULTING ENGINEERS

PROJECT:

PROPOSED 'NEW ACADEMIC BLOCK - 3'

MANIPAL UNIVERSITY JAIPUR
KHASRA. 467,469,474,468/1,473,475,542,544
GRAM: DEHMI KALAN
TEHSIL: SANGANEER
JAIPUR, RAJASTHAN

DRG.TITLE:

GROUND FLOOR PLAN & FIRST FLOOR PLAN

REVISION	JOB NO.: 4401	DRG NO.:	NORTH:
	SCALE: A1: 1:100	DATE:	
FILE:	DEALT BY:	CHECKED BY:	APPROVED BY:

SIGNATURE & SEAL OF ARCHITECT — Subhash Chandra Devrath, Architect

SIGNATURE & SEAL OF OWNER — MANIPAL UNIVERSITY JAIPUR

Architect Hafeez Contractor
29 Bank Street, Bombay 400 023.
Tel:2661920

उपनगर नियोजन (BP) उपनगर नियोजक
जयपुर विकास प्राधिकरण, जयपुर नगर नियोजन समिति
जयपुर विकास प्राधिकरण जयपुर

भवन मानचित्र समिति (बी.पी.) की 25.4 वी बैठक दिनांक 25/07/2013 में लिये गये निर्णय की अनुपालना में भवन मानचित्र पत्रांक परिवर्तन/ स.स./बीपीसी (बीपी)/डी-827 दिनांक 1/7/5/2022 द्वारा अनुमोदित कर जारी किये गये।

DRG NO. **NAB -3 -(04)**

NOTES

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7. ALL CENTER LINE DIMENSIONS ARE WITH REFERENCE TO (0,0).

REVISIONS	DATE	DESCRIPTION	BY
5			
4	01-05-2013	ADDITION OF LIFT CORE, STAIR CASE PRESSURIZATION, FIRE BOARD	DUE TO C.O. NOC
3			
2			
1			

PROJECT MANAGEMENT CONSULTANT
DILLIGENT PMC
STRUCTURAL CONSULTANT
TRC Engineering (I) Pvt. Ltd.
SERVICES CONSULTANT
MEP CONSULTING ENGINEERS

PROJECT:
PROPOSED
'NEW ACADEMIC BLOCK - 3'
MANIPAL UNIVERSITY JAIPUR
KHASRA: 467,469,474,468/1,473,475,542,544
GRAM: DEHMI KALAN
TEHSIL: SANGANEER
JAIPUR, RAJASTHAN

DRG.TITLE:
SECOND FLOOR PLAN
&
THIRD FLOOR PLAN

REVISION	JOB NO.: 4401	DRG NO.:	NORTH:
	SCALE: A1:1:100	DATE:	
FILE:	DEALT BY:	CHECKED BY:	APPROVED BY:

SIGNATURE & SEAL OF ARCHITECT
Subhash Chandra Devrath Architect
CA 2012/56084

SIGNATURE & SEAL OF OWNER

Architect Hafeez Contractor
29 Bank Street, Bombay 400 023.
Tel:2661920

अनुमोदित
उपनगर नियोजक (BP)
जयपुर विकास प्राधिकरण, जयपुर
भवन मानचित्र समिति
जयपुर विकास प्राधिकरण

भवन मानचित्र समिति (बी.पी.) की 254 वीं बैठक दिनांक 25/01/2024 लिये गये निर्णय की अनुपालना में भवन मानचित्र पत्रांक जविप्रा/स.त./बीपीसी (बीपी)/डी-822 दिनांक 27/5/2024 द्वारा अनुमोदित कर जारी किये गये।

Unnat Bharat Abhiyan (UBA)

- MUJ is selected under Unnat Bharat Abhiyan (a flagship program of MHRD, Government of India) with a vision to involve professional and other higher educational institutions of the country to enable village cluster towards achievement sustainable development through Gram Panchayat(s).
- Under this programme, Near by villages (Dehmi Kalan, Dehmi Khurd, Begus, Theekirya, Sanjhariya etc.) are adopted by MUJ for upliftment.

MANIPAL UNIVERSITY JAIPUR

MUJ: Awards & Achievements

GRIHA AWARD

First University in the country to be awarded GRIHA award for integrated Water Management.

LEED INDIA PLATINUM Award .

Manipal University has been conferred with this award being the first campus in the country to do so for Green Building . Based on review done by IGBC on the credits submitted by the university, which were evaluated against the rating system for certifying Green Buildings.

GRIHA FIVE STAR RATING

The first University in the country to receive this award for Energy Conservation and Environment Friendly Design.

MANIPAL UNIVERSITY
JAIPUR

MUJ: Awards & Achievements

'Swachhta' Ranking
Award 2017 by **Ministry of HRD**

MANIPAL UNIVERSITY JAIPUR

MUJ: SALIENT FEATURES OF GREEN & ENERGY EFFICIENT INITIATIVES

- The University is a **'Zero Discharge Campus'**, with Rain Water Harvesting, Waste water recycling and reuse and Ground Water recharging in place. Water conservation through campus wide drains and ponds for water collection.
- Solar Power Plant of 1.5 MWp is installed on roof-top of the buildings in the Campus – one of the largest roof-top Solar Power Plant in India for any Private University.
- Sewage treatment plants on both sides of the campus.
- All buildings are optimally designed to maximize daylight and minimize heat gains.
- Campus greening through extensive tree plantation.
- The University has a Bio-Gas generation system using Kitchen waste.

Infrastructure

Type of Buildings	Number
a. Academic	02
b Administrative	01
c Residential	01
d Hostels	11
e Commercial	30
f. Food court	02
g. Workshop	02

Academic Building

Academic Block 1

Number of Floors: G+3

Classrooms: 57

Laboratories: 46

Conference Rooms: 05

Faculty Cabins: 85

Faculty workstations: 104

Academic Building

Academic Block 2

Number of Floors: G+3

Classrooms: 89

Laboratories: 40

Conference Rooms: 09

Faculty Cabins:104

Faculty workstations : 172

Administrative Building

Admin Building

Number of Floors: G+3

Offices / cabins: 80

Classroom :32

Conference Rooms:05

MANIPAL UNIVERSITY JAIPUR

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Hostel & Residential

Name: B-1 & G -1Block
Number of Floors: 2 Floors
Accommodations: 45

Boys Hostels : 7

Room Type :

Single Seater – 167
Twin Sharing- 2143

Girls Hostels : 4

Room Type :

Single Seater – 47
Twin Sharing- 631

Commercial

Block	Floor	Firm name
B1	Ground Floor	Coffee House
B1	Ground Floor	Devyani International Ltd/Dialogue the café
B1	Ground Floor	Chatkara Coffee House
B1	Ground Floor	South indian food
B1	Ground Floor	GOUTTAM SHOPPING CENTRE
B1	Ground Floor	Dev Pari tour &Travels
B1	Ground Floor	Jaipur car Taxi
B1	First Floor	Indian Rasoi
G1	Ground Floor	Indian Rasoi
G1	Ground Floor	Jaipur Dairy
G1	Ground Floor	Kabab Nation
G1	Ground Floor	Sharma Communcation
G1	Ground Floor	Poonam Creation

Commercial

Block	Floor	Firm name
G1	Ground Floor	Pink City Super store
G1	First Floor	Macro Integared services
G1	First Floor	Delight Enterprizes
G1	First Floor	M/s Mohan's Scissors & Cut
G2	Ground Floor	Servizone Integrated Services Pvt Ltd
B4	Ground Floor	Chilling Point
B4	Ground Floor	Tea tradition Hospitality Pvt.Ltd
B4	Ground Floor	Dev Sweet & Snacks
B4	Ground Floor	Parth Publishers
G4	Ground Floor	Neha Enterprizes
G4	Ground Floor	Servizone Integrated Services Pvt Ltd
G4	Ground Floor	
Food court	First Floor	Green Enterprizes
B1	First Floor	FIRST ORDER HOSPITALITY SERVICES
B3	Ground Floor	Affordable medical store

MANIPAL UNIVERSITY JAIPUR

स्वच्छ भारत
एक कदम स्वच्छता की ओर

MUJ Toilet Details

Sl. No.	Description	EWC				Washbasin					Urinals
		Gents	Ladies	Disabled	Total	Gents	Ladies	Disabled	Common	Total	Gents
1	Academic Block 1	64	88	16	168	48	64	16		128	160
2	Admin Block	25	41	8	74	25	25	8	3	61	82
3	Food Court	10	13	-	23	10	12	-	67	89	12
4	Academic Block 2	88	105	15	208	72	74	15		161	140
5	Workshop	3	4		7	2	4			6	4
6	Security Block - VIP Gate	1			1	1				1	-
7	Security Block - Student Gate	2	2		4	1	2			3	1
8	Estate Office	2	2		4	2	2			4	2
9	Dispensary	4	3		7	4	3			7	2
	Total	199	258	39	496	165	186	39	70	460	403

Disabled-Friendly Toilets

Number of Restrooms in University Campus			
	Academic block 1	Academic Block 2	Admin Building 1
Ground Floor	4	4	2
1st Floor	4	4	2
2nd Floor	4	4	2
3rd Floor	4	3	2
Total	16	15	08

Adequacy of Toilets - MUJ				
Description	Unit	Qty.	Student strength	Ratio
Male - EWC & Urinals	Nos.	602	6178	1:10
Female - EWC	Nos.	258	2322	1:9
Disabled	Nos.	39		

Adequacy of Toilets - HOSTEL

Name	Number of Toilet
B-1	474
B-2	430
B-3	208
B-4	242
B-5	188
B-6	276
B-7	332
G-1	334
G-2	163
G-3	174
G-4	173
Commerical Area B-1	6
Commerical Area G-1	6
New Food Court	6
Total	3012

Availability of Running Water

University Campus & Hostel : Availability (24x7)

Name	Taps For Handwash	RO Water Dispensers
Academic Block 1	131	16
Academic Block 2	161	15
Admin Building 1	57	8
Workshop	08	2
Food Court	83	10
Hostel	3012	212

Overall Quality of Toilets – Type of Equipment

Features : Equipment & Maintenance Schedule

1. Jaguar Bath Fittings
2. Guaranteed treatment of leakage
3. 100% temper proof and leak proof fittings
4. Automated sensor activated taps and Pressmatic button taps for saving water.
5. Cleaned twice a day

Overall Quality of Toilets – Type of Equipment

Garbage In Campus, Hostel Areas, Frequency & Procedure of Disposal

University strives for efficient house-keeping and had incurred an expense of Rs. 3.83 cr. during 2017-18 and proposes to spend Rs. 4.51 cr. during the current financial year.

Major features ; Garbage Disposal

- Dustbin in all common area (Corridors, Walk ways, Gardens, Cafe, Mess)
- Dustbin in all Classrooms, Conference Halls, Laboratories, Offices, Faculty Cabins, Faculty workstations, Hostel Rooms, Hostel Common Rooms
- Dustbin in all Security Guards' rooms, Hostel Kitchens, Vendors, Shops, Visitors' waiting room, Food Courts. Garbage disposed twice daily.

Garbage in Campus, Hostel Areas, Frequency & Procedure of Disposal

Dustbins Placed At Strategic Places

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

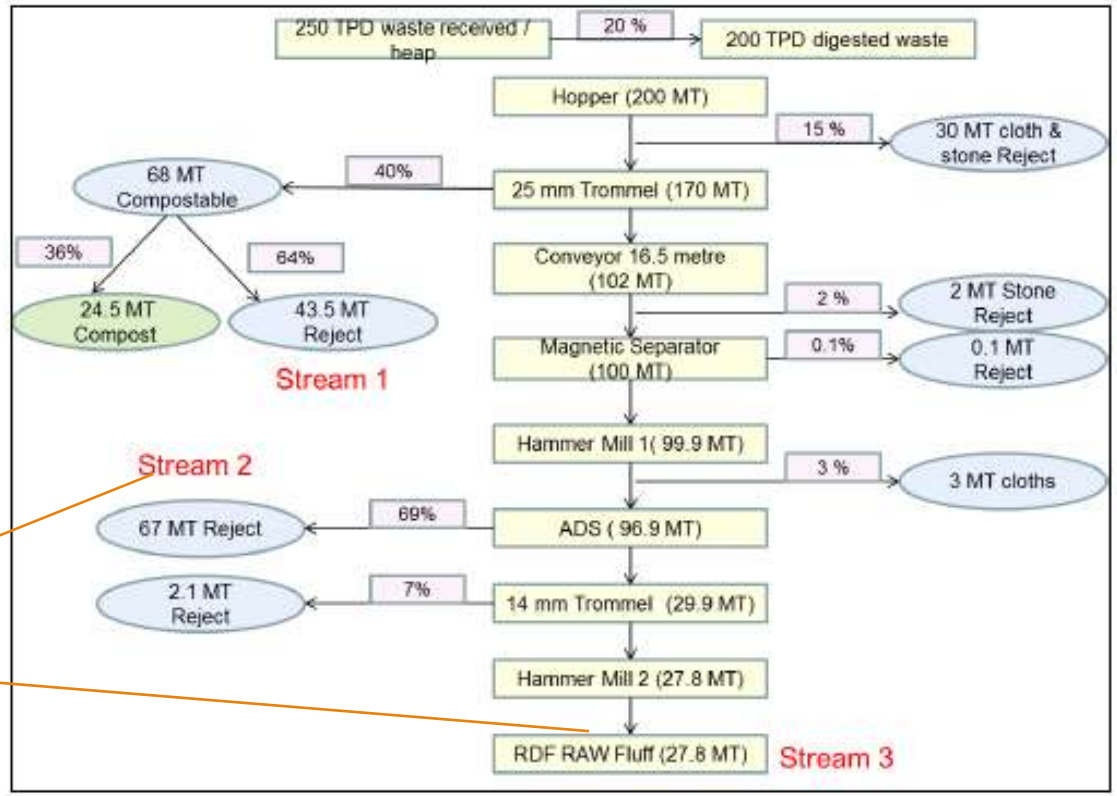
Solid Waste Management

1. Organic waste from kitchen and horticulture used in **Biogas Plant** which supplies fuel to Food Court.
2. Recyclable solid waste **collected separately**
3. Pilot project with BEIL (Bharuch Enviro Infrastructure Ltd) for converting MSW to Fuel / Energy.
4. Bio Medical waste is collected separately and Disposed
5. Papers printed on one side are not discarded but reused.

BEIL Project: MSW to Fuel/Energy

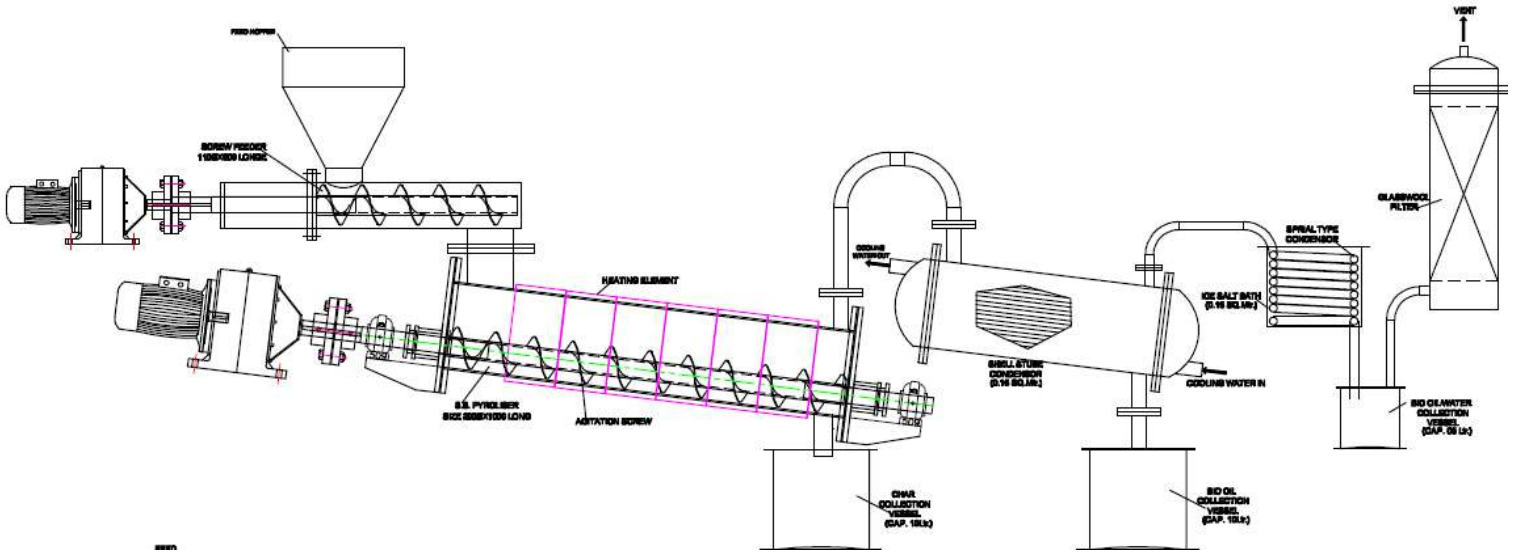
Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Relevant Streams



Project Facility

Innovative Technology Used for Solid and Liquid Waste Disposal & Management



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एक कदम स्वच्छता की ओर

Research & Consultancy in Waste Management

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

MUJ assisting Greater Visakhapatnam Municipal Corporation (GVMC), of Andhra Pradesh under SBM program , supported by USAID/WSUP UK, this includes

a) Solid Waste Management in Visakhapatnam city
b) Retrofitting of public toilets
c) Preparing DPRs for public & community toilets
d) Assisting GVMC in FSM (Faecal Sludge Management)
e) Assisting in OSS (On Site Sanitation systems), Underground sewerage system, septic tanks etc.
f) Preparing manuals for Engineers

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Research & Consultancy in Waste Management

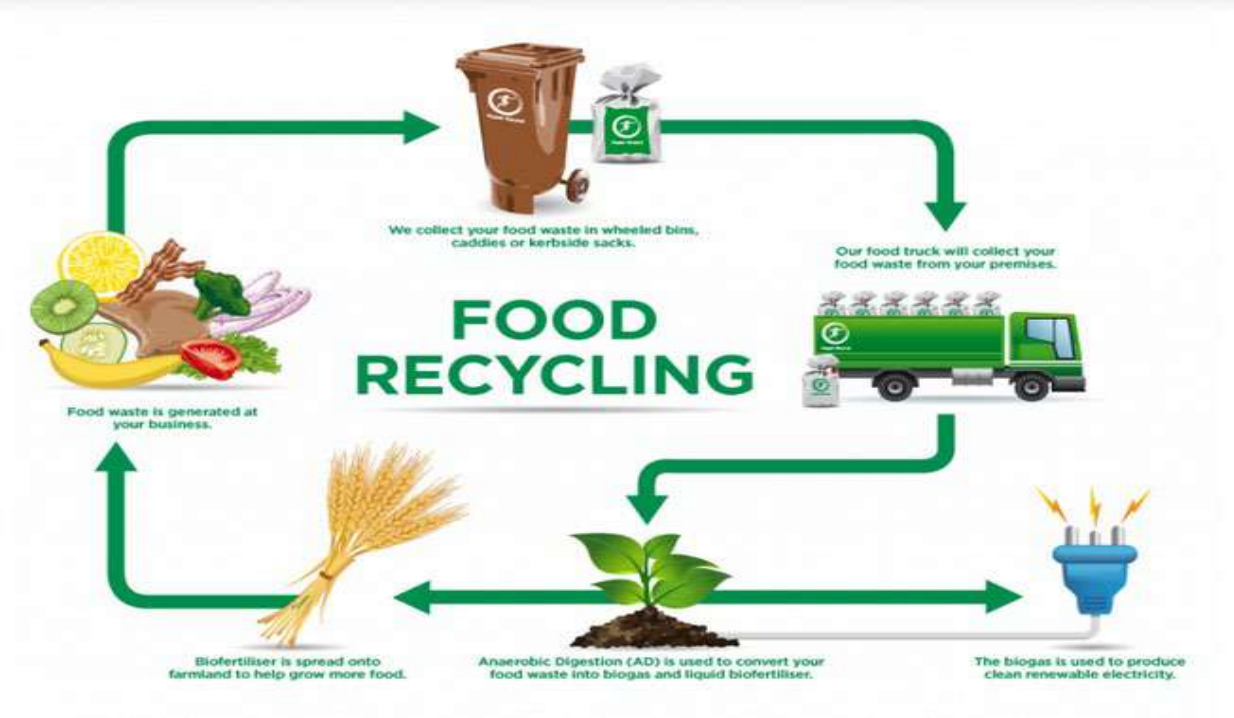
Innovative Technology Used for Solid and Liquid Waste Disposal & Management

- MUJ is assisting towns & cities under SBM in FSM (Faecal Sludge Management) funded by BMGF (Bill & Melinda Gates Foundation),contracted by Athena Infonomics India.
- MUJ is authorized to conduct MOOC/online course on FSM by BMGF .
- MUJ to conduct awareness programs in FSM in academic institutions across towns & cities by BMGF.
- MUJ is part of consultancy team to review mid term progress in towns & cities across Rajasthan on Water & Sanitation, funded by ADB & coordinated by RUIDP.

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Food Waste

We are generating biogas by using Organic solid food waste and main part of a biogas system is a digester. Inside this tank, bacteria convert food waste into methane gas through the process of anaerobic digestion (35 kg of methane gas produced from 500 kg of food waste)



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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Solid Waste: Bio Gas Plant

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

In-House Compost Preparation

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste: Management

STP – 4Nos / 1850 KLD

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Rain Water Harvesting

- Rain Water Harvesting Ponds – 04 Nos / 16625 KL
- Rain Water Harvesting UGR – 06 Nos / 1415 KL
- No. of Bore-wells: 09

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste Management

- Zero Water Discharge Campus (Water Recycling)
- STP Treated Water Being Used For Flushing & Horticulture
- Sludge From STP Used As Manure For Landscaping. Reusing the debris waste for the pathways and road areas base compaction
- Electronic Sensor Based Urinals

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste Management:

Sewage Waste : Sewage treatment removes contaminants from wastewater, which includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safer treated water (it has been used for flushing and gardening). We are producing 1400KL treated water per day.

Water Storage, pipe line & Water purifier.

Overall storage capacity : Under Ground Reservoir	
Raw Water	- 2936 KL
Treated Water	- 1458 KL
Water Purifiers RO	- 277 Nos. 80 Litre Capacity

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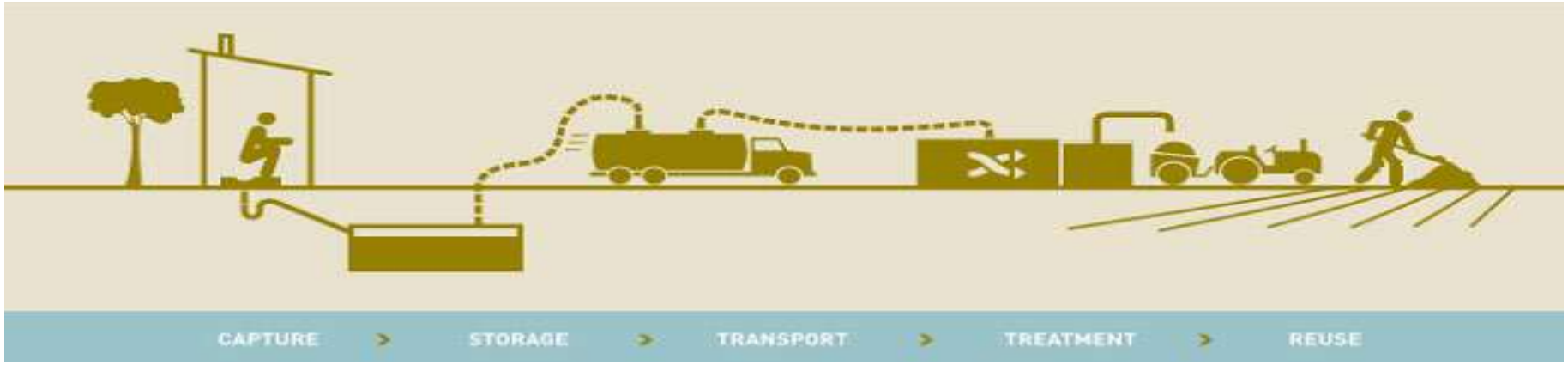
एक कदम स्वच्छता की ओर

Journey in Sanitation Sector MUJ



Host institute

MANIPAL UNIVERSITY JAIPUR

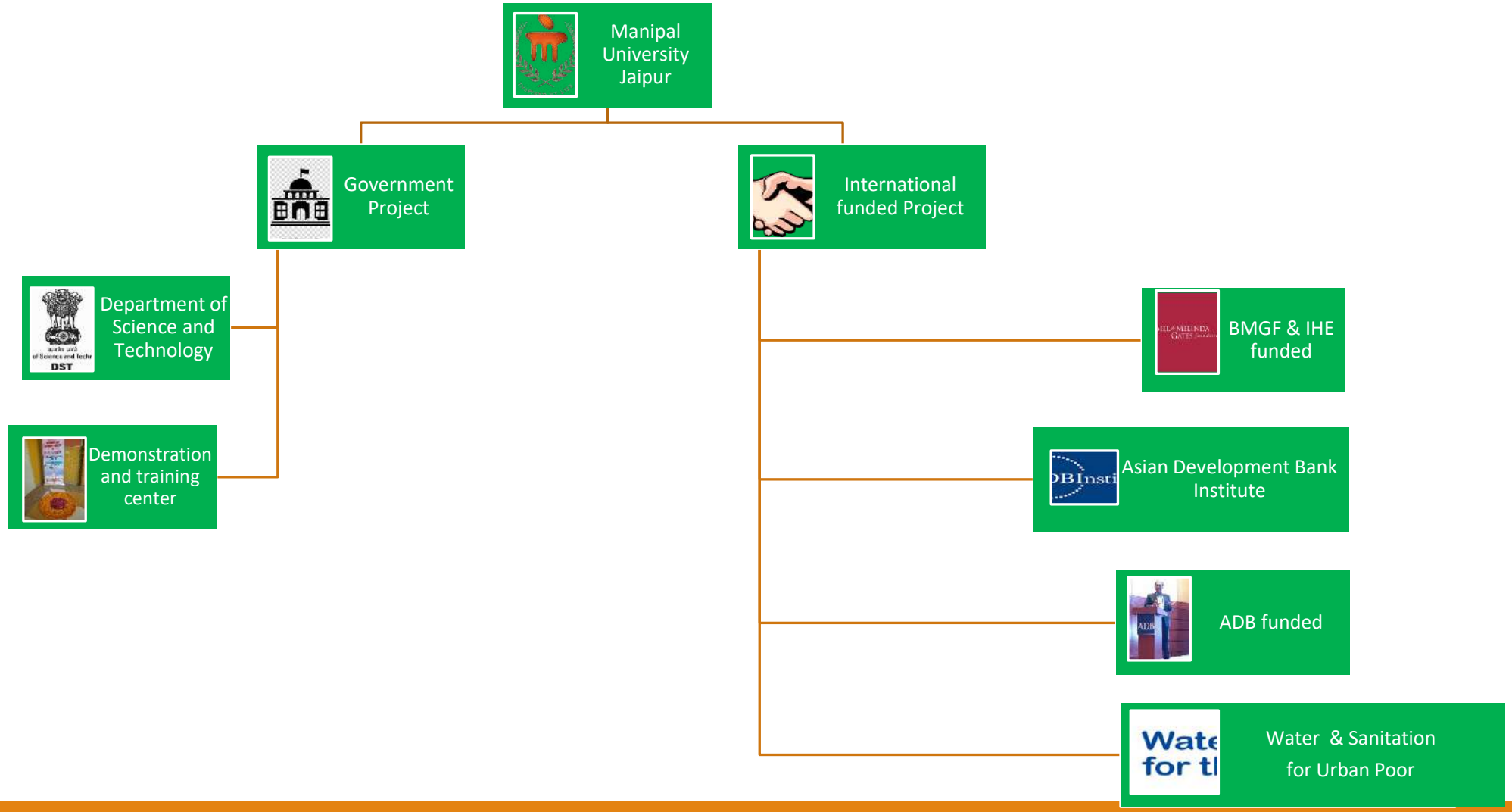
In Association and Supported By

UNESCO IHE DELFT

BILL & MELINDA GATES foundation

Manipal University Jaipur (MUJ)
Dehmikalan, Jaipur-303007, Rajasthan, India
mujfsm-nss.org

UNESCO/IHE DELFT
and
BILL & MELINDA GATES FOUNDATION


Manipal University Jaipur
Government Project
International funded Project
Department of Science and Technology
Demonstration and training center
BMGF & IHE funded
Asian Development Bank Institute
ADB funded
Water & Sanitation for Urban Poor

MANIPAL UNIVERSITY
JAIPUR

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Manipal University Jaipur, part of the Global Sanitation Learning Alliance a project by UNESCO-IHE & Bill & Melinda Gates Foundation

MUJ received an approved grant of 363,000=00 USD (2.6 Crores) from Bill & Melinda Gates Foundation through top Global Institute , IHE Delft Netherlands to run

a) On Line course in Non Sewered sanitation
b) Diploma Courses in Non Sewered Sanitation
c) MTech in Non Sewered Sanitation

Principal Investigator : Prof A D Vyas
Co PI : Dr Meena Kumari Sharma
Dr Monika Sogani
Mr Sagar Gupta

Duration: Aug 2019- Dec 2023

MANIPAL UNIVERSITY
JAIPUR

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

S.No.	Lead/Principal Investigator (PI)	Co-PI (If any)	Title of Project	Funding Agency	Sanction Order/Reference	Sanction Date/Project Period	Amount of Financial Assistance Received in INR	Current Status
1	**Dr Monika Sogani**	Prof A D Vyas, Meena Kumari, Sagar Gupta	Delawas STP & its impact on socio economic conditions	Asian Development Bank Institute, Japan		May 2018	3,35,000	Approved 5000 USD
2	**Prof A D Vyas**	Dr. Monika Sogani, Dr Meena Kumari Sharma and Mr Sagar Gupta	Short term actions in FSM, awareness in academic institutions	UNESCO/IHE Delft, Netherlands and Bill and Melinda Gates Foundation		Feb18-Jun 18	16,00,000	Approval Granted for 50,000 USD in coordination with CDD (MUJ to receive 25000 USD)
3	**Dr. Meena Kumari Sharma**	Prof. A.D. Vyas & Mr. Sagar Gupta	Performance of low cost community based onsite sanitation system in Ambient Environment	DST, Rajasthan	P.8(9) V.PRO./S.S.D./2016/PART-1/3809	Jan 18-Mar 18	**21,21,000**	Approved, Granted
4	**Prof. A D Vyas**	Dr. Meena Kumari Sharma, Dr Monika Sogani, Mr. Sagar Gupta	On line course on Faecal Sludge Management	UNESCO/IHE, Delft, Netherlands and Bill and Melinda Gates		Dec-17	**10,00,000**	Approved, Granted for 15000 USD

S.No.	Lead/Principal Investigator (PI)	Co-PI (If any)	Title of Project	Funding Agency	Sanction Order/Reference	Sanction Date/Project Period	Amount of Financial Assistance Received in INR	Current Status
5	**Dr Monika Sogani**	Dr Meena Kumari Sharma & Prof. A. D. Vyas	Enhanced biodegradation of organic pollutants as well as micro-pollutants	Science and Engineering Research Board (SERB), DST, Govt. of India	ECR/2016/000271	2017-2020	**30,09,600**	Approved, Granted
6	**Prof Lalita Ledwani,**	Prof. A D Vyas, Dr Pushpendra Kr	Water sector Grant	Kurita Water Environment Fund, Japan		2015-2016	**1,77,000**	Approved, Granted for 300,000 YEN

S. No.	Funding Agency	Details	Amount (INR)	Duration	Status
1	WSUP, **UK**	Water /Sanitation & retrofitting of toilets in Visakhapatnam, AP. The major focus was to prepare guidelines for government of Andhra Pradesh on rehabilitation of various community toilets. Also prepared a detailed project report on different aspects of toilet designs, models which are defunct, preparing a manual for engineers. This was as per SBM guidelines.	3.5 lacs	6 months	**Completed,** **A D Vyas & Dr Gaurav Sancheti**
2	OFDA/**USAID** (United States Agency for International Development), through MSI,USA (Sudan Humaid)	Water & Sanitation in Sudan, Africa.The major focus besides reviewing various technical documents, reviewing M & E tools, training of trainers of IOM participants for Darfur area in WASH sector	25 lacs	Feb,2015 to April,2016	**Completed,** **A D Vyas**
3	**French & Italian government agencies** & EIB (European Investment Bank)	Feasibility Study for an urban water supply and sanitation program in small and medium towns in Ethiopia, Africa.	10 lacs	June,2014 to Nov, 2014	**Completed,** **A D Vyas**
4	Athena Infocom via **Bill & Melinda Gates Foundation**	Non Sewered Sanitation/Faecal Sludge Management studies in various towns of India.	30 Lacs	Indefinite	On Halt A D Vyas
5	**Asian Development Bank** for RUIDP (Rajasthan Urban Infrastructure Development Program)	Study of Water & Sanitation in 15 towns of Rajasthan, India. The focus was on mid-term review of water & sanitation interventions done by Asian Development Bank in coordination with RUIDP & the impact of these interventions on end users & beneficiaries.	50 lacs	March 16-July 2017	On Halt A D Vyas & Team Civil

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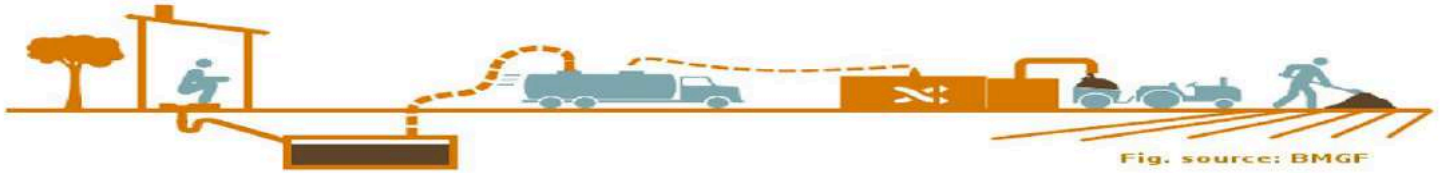
UNESCO | IHE DELFT

Online Learning Course on Faecal Sludge Management

Supported by a grant from
Bill and Melinda Gates Foundation



Scholarship worth **Rs. 125,000** available for **25** best participants*
Target Audience: Student, Professional & Researcher

Highlights:

1. Six well defined modules
2. Delivered by esteemed experts
3. Online interaction with experts

REGISTER NOW! at
http://mujfsm-nss.org/

*Contact: **+91 7229964243**
contact@mujfsm-nss.org
www.mujfsm-nss.org

Department of Civil Engineering
Manipal University Jaipur
VPO Dehmikalan, Jaipur, Rajasthan
303007, India

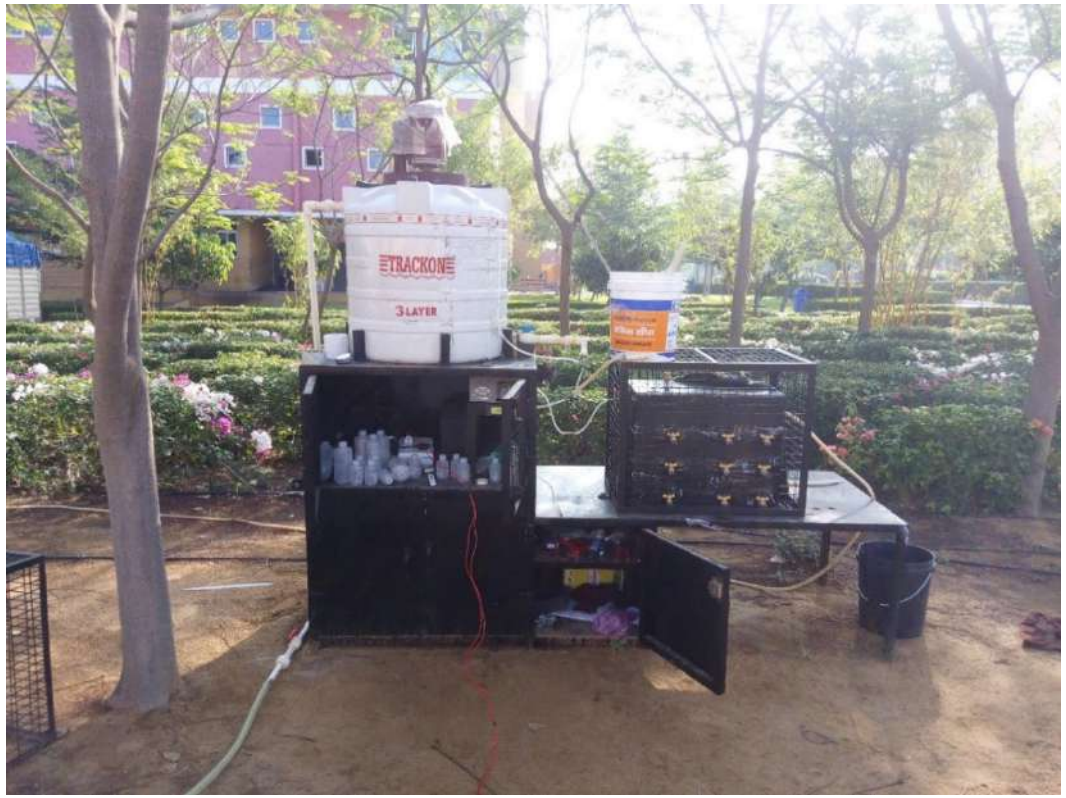
ONLINE COURSE ON FSM

- Conducted from 26th February to 6th April, 2018, totally free of cost,
- Target audience was at least 250 students, practitioners, corporate staff, ULB staff, JMC & so on.
- Total 6 weeks course with 6 detailed modules, around 50 lectures.
- Total 362 students & participants registered for the course mainly from India, Bangladesh, Nepal, Pakistan, Uganda, Tanzania, Singapore & so on.
- 123 completed the full course that is 34 % of total registered.
- Scholarship granted to 28 toppers with 5000 INR based on online quizzes.
- Resource materials used from UNESCO/IHE, preparing local resource materials & case studies.
- Faculty , M. Tech. and B.Tech students worked on case studies from Jaipur in inaccessible areas
- Certificates were given to all participants who successfully completed the course

President
MUJ Prof G K Prabhu with scholarship winners of FSM/OLC

Low-cost Community Based Onsite Sanitation Systems in Ambient Environment of Jaipur City

Lab-scale reactor in actual field condition



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Creating awareness on fsm/non sewered sanitation- Academic institutions

Conducted half day workshop at lead academic institutions benefitting 800 students

- IIT, Tirupati
- MNIT Jaipur
- MIT, Manipal
- MUJ,Jaipur
- S.R.M, Chennai
- R.T.U, Kota
- Poornima University, Jaipur
- SKIT, Jaipur
- IIT, Bombay

Three Days workshop/TOT for academia from various institutes ,25 participants

- MIT, Manipal, Karnataka
- SKIT,Jaipur
- Poornima University, Jaipur
- Manipal University Jaipur
- Research Scholars, MTech/PhD

Quality of wastewater after treatment using anaerobic treatment plant

Pilot-scale reactor in Dehmi Kalan Village

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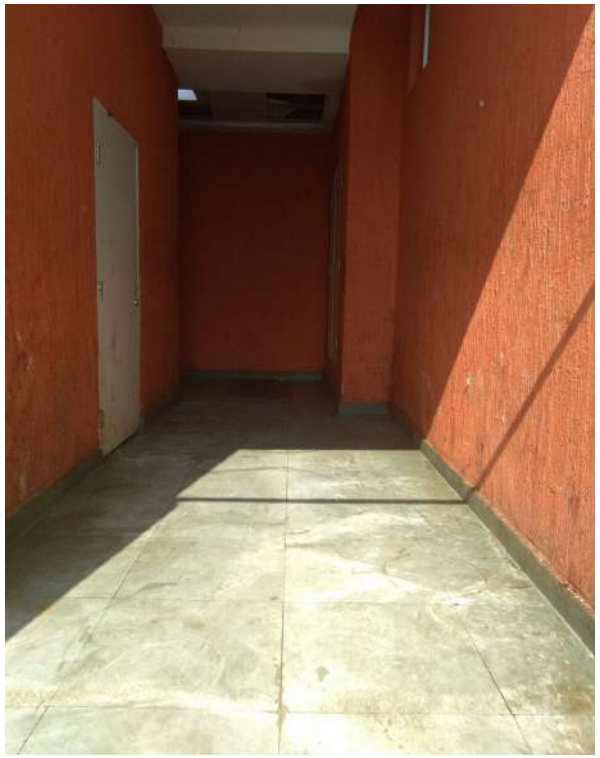
Garbage in Campus, Hostel Areas, Frequency & Procedure of Disposal

Collection frequency & clearance: Twice a day

Time: 9:00 AM & 4:00 PM



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Hostel Kitchen Hygiene

Mechanised Food Preparation : Summary

- Gloves, Head gears and Aprons are mandatory while cooking/serving food
- Hand wash soap dispensers are placed in adequate numbers
- Maximum possible usage of machines is practised.
- Chapatis are made with machine.
- Machine choppers and food processors are used.
- Surprise Inspections are done to ensure adherence to hygiene measures
- Spacious & well ventilated kitchen
- Periodic Health Check up of Staff
- Integrated Pest Control
- Well Trained & Groomed Staff
- Two Food Courts With 3600 Seating Capacity

Hostel Kitchen Hygiene

Mechanised Food Preparation

Hostel Kitchen Hygiene

Cooking Equipment

Hostel Kitchen Hygiene

Availability Of Cooking Gas, Chimney Etc

1. Biogas is used for cooking.
2. LPG through pipelines is used as back-up/Plan-B
3. Chimney and Powerful Exhaust fans are used.

Hostel Kitchen : Mess Sessions

Working Day's		
Session Name	Start Time	End Time
Breakfast	07:30:00	09:30:00
Lunch	12:00:00	14:30:00
Hi Tea	17:00:00	18:00:00
Dinner	19:30:00	21:30:00

Holiday's		
Session Name	Start Time	End Time
Breakfast	08:00:00	10:00:00
Lunch	01:00:00	15:00:00
HiTea	17:00:00	18:00:00
Dinner	19:30:00	21:30:00

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Hostel Kitchen

Chef on Wheels

Well Groomed & Trained Team

Automatic Sanitary Napkin Vending Machine Installed in All Girls Blocks.

Sanitary pads bin placed in all the girls rooms.
In all the girls block.

Water Pots for Birds

Medical Centre / Waste disposal dustbin

Solar Tube installed for hot water

Water Pond behind B-2 Hostel

Water Aerator installed in all hostel block

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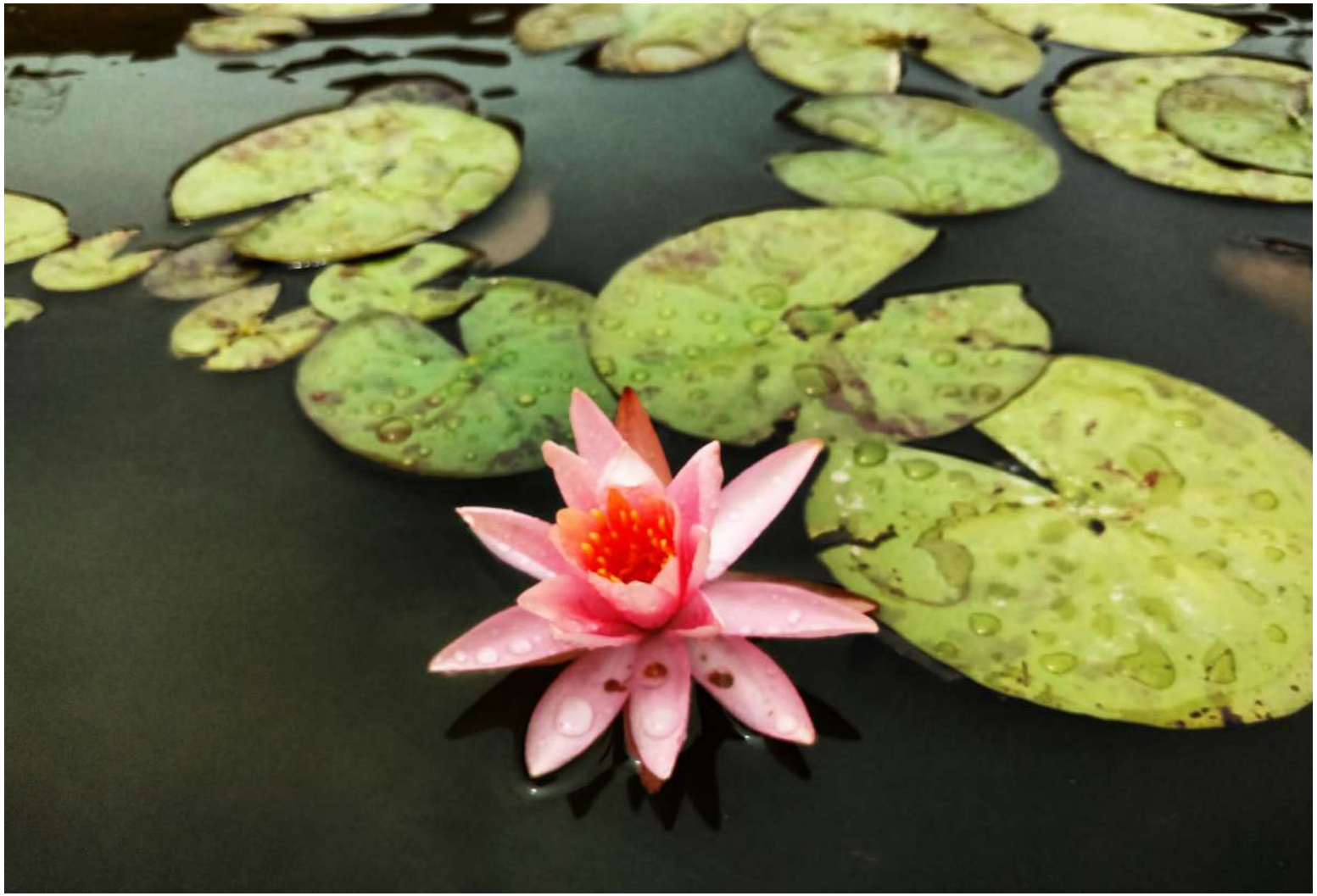
Manipal University Jaipur intends to take lead in practicing more of sustainable development through introducing

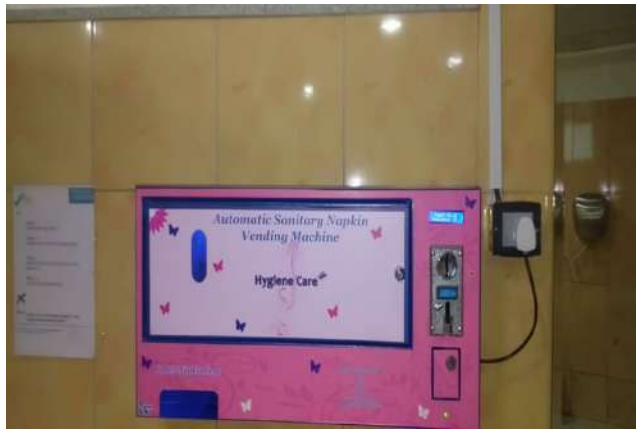
Forest Gardening, a holistic way of planting flora, which significantly enhances the Biodiversity besides attenuating the effects of climate change.



Green Campus

Salient Feature

- Drip Irrigation
- Sprinkler System
- Green House
- Heat Resistance Building (External)
- Weather Proof External Paints



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Greenery In Campus

Greenery In Campus

Green area				
Description	Unit	Qty.		Total
		MUJ	Hostel	
Area under green cover	Sq. Ft	335975.00	144139.42	480114.42

Sl. No.	Name of the Trees
1	Delbergia Sisoo
2	Terminalia Arjuna
3	Allestonia
4	Bhuhania Balkenia
5	Silver Oak
6	Jcaranda memumsfolia
7	Chakresic
8	Karanj
9	Ficus Verins
10	Delonix Regia
11	Terminalia Chattapa
12	Azadrichta Indica
13	Dates palm
14	Lagerstromia Indica
15	Golden Bamboo
16	Ficus Benjamina
17	Mimusops elengi
18	Mango
19	Jamun
20	Terminalia mantaly
21	Cassia fistula
22	Lagerstromia flosreginae
23	Tecoma gouri chori

	Name of the Plants
1.	Murraya Exotica
2	Nerum Oleander Dwarf
3	Vernonia Elengifolia
4	Clerodenrum inermie
5	Bougainvillea subra white
6	Euphorbia milli pink
7	Ficus panda
8	Alamanda dwarf - Yellow
9	Ixora dwarf - Pink
10	Plumeria alba
11	Cycas revoluta
12	Rhoeo discolour
13	Raphes palm

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Greenery In Campus

Extent of Greenery : Overview

- Lush Green Sprawling Campus
- Efforts are to keep every corner and walkway green
- Regular plantation drives in campus

Greenery In Campus

Tree Plantation Drive

Greenery In Campus

Maintenance; Garden, Lawns & Trees

Well maintained and healthy greenery

34 well trained horticulture staff members

Ever green climate friendly (arid zone) plants are given more preference

STP water used for horticulture

Overall Cleanliness In Institute

Green & Clean Campus : Highlights

- Drip Irrigation System
- Color & Orientation of The Building For Energy Conservation
- Double Glazed Glass Panel Windows
- 80 % of AC Load is met by Solar Power during office / peak timings
- LED Lighting in Whole Campus
- We are maintaining power factor from 0.972 to 0.995. For maintaining power factor above 0.95, we are getting rebate from JVVNL each month
- Timer Controlled External Area Lighting
- No Vehicles Inside the Campus
- Regular Pest Control & Fumigation with Environment Friendly substances
- Well trained House Keeping Staff – 350 in all for effective and error free cleaning

Nearby Village, Locality / Area Taken Up For Promoting Swachhta

Names of places, villages : 6 Villages, Jaipur Railway Station and Mansarovar residential colony are taken up for promoting Swachhta

- Dehmi Kalan
- Dehmi Khurd
- Sanjharia
- Thikaria
- Begus
- Devaliya

- **Major initiatives taken :**
  - Tree Plantation
  - Cleanliness Drives
  - Awareness Camps
  - Maintenance of School at Dehmi Kalan

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Clean Environment, Healthy Environment' – Cleanliness Drive at Mansarovar, Jaipur

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Cleanliness Drive at Jaipur Railway Station

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Swachh Pakhwada celebrated at Manipal University Jaipur

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Social activity - Cleanliness Drive in Dehmi Kalan Jaipur

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Social activity – Created the toilet facility in Bagru Police station, Jaipur






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Cleanliness Drive in near by Villages

Awareness at Govt School Dehmi Khurd

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MUJ students are actively involved in NGO GRAMIKSHA for their awareness programs and drives.

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Cleanliness & Health Awareness Drive at Begus, Jaipur

Awareness Camps

Awareness Camps

Legal Aid

महिलाओं को सामाजिक एवं आर्थिक न्याय दिलाने में मदद

जयपुर (कासं)। मणिपाल विश्वविद्यालय, जयपुर की ओर से विश्वविद्यालय परिसर के पास स्थित पानी की टंकी से सटी डिस्पेंसरी में लीगल एंड क्लिनिक की स्थापना की गई। क्लिनिक का उद्घाटन मुख्य अतिथि डिस्ट्रिक्ट एवं सेशन जज, अशोक व्यास, विशिष्ट अतिथि एसीजेएम विनोद कुमार बागड़ी, दहमी कला ग्राम के सरपंच पुष्पेंद्र सिंह ने फीता काटकर किया। इस अवसर पर मुख्य अतिथि डिस्ट्रिक्ट एवं सेशन जज अशोक व्यास ने इस लीगल एंड क्लिनिक के माध्यम से गांव की महिलाओं, ग्रामीणों को सामाजिक एवं आर्थिक न्याय दिलाने के लिए सामंजस्य स्थापित करने की बात कही। साथ ही महिलाओं एवं ग्रामीणों का कार्यक्रम में आने का आभार जताया व मणिपाल विश्वविद्यालय, जयपुर की ओर से इस लीगल एंड क्लिनिक को स्थापित करने पर प्रसन्नता व्यक्त की एवं धन्यवाद दिया। कार्यक्रम के आरंभ में विश्वविद्यालय के प्रो. प्रेसिडेंट, प्रो. एनएन.शर्मा, रजिस्ट्रार, प्रो. वंदना सुहाग, डीन, फेकल्टी ऑफ आर्ट एंड लॉ. प्रो. मृदुल श्रीवास्तव ने अतिथियों का बुके देकर स्वागत किया एवं स्मृति चिन्ह देकर आभार जताया। साथ ही ग्रामीणों को सम्बोधित करते हुए इस लीगल एंड क्लिनक से जुड़कर लाभ लेने का आह्वान किया। इस अवसर पर प्रो. एन.डी. माथुर, चीफ एडमिनिस्ट्रेटिव ऑफिसर कर्नल विरेंद्र सिंह, हैड एच आर, देव आशीष, डिपार्टमेंट ऑफ लॉ की विभागाध्यक्ष, डॉ. विजय लक्ष्मी सहित विश्वविद्यालय के फेकल्टी सदस्य, डिपार्टमेंट ऑफ लॉ के फेकल्टी सदस्य एवं विद्यार्थी मौजूद थे।

विधिक सह सामाजिक अनुसंधान परियोजना

(VSSAP)

Awareness Program-Substance Abuse and its ill-Effects on Society

Drug Awareness Camp

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Awareness Camps

Renewable Energy

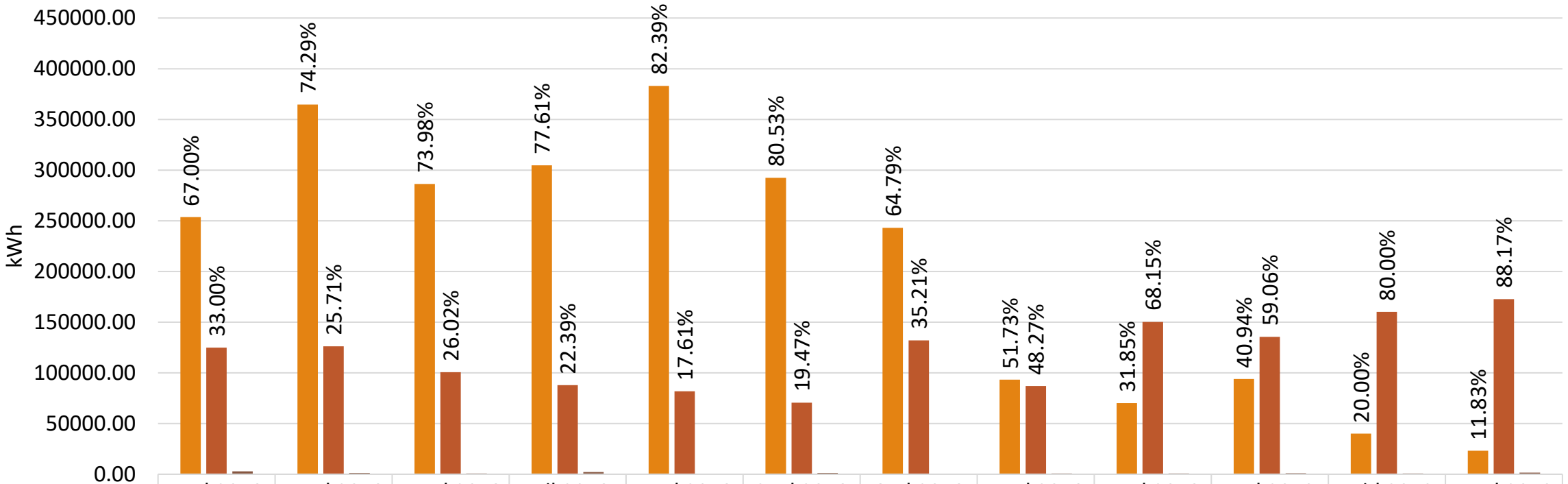
1. Solar power : 1.50 mWp - We have installed solar power panels of 1.5 mWp capacity in the campus and the same is being used for captive use.
2. Solar water heating: 550 KL per day

Renewable Energy Aerial View using Google Earth

Energy Consumption 2018 - 19

Sl. No.	Description	kWh		Total - kWh
		Academic	Hostel	
1	Grid Consumption	2448420.71	8969612.29	11418033.00
2	Solar Consumption	1430029.70		1430029.70
	Total	3878450.41	8969612.29	12848062.70

Energy Consumption (Apr'18 - Mar'19) - MUJ



	Apr' 2018	May' 2018	June' 2018	Jul' 2018	Aug' 2018	Sep' 2018	Oct' 2018	Nov' 2018	Dec' 2018	Jan' 2019	Feb' 2019	Mar' 2019
Grid-kWh	253624.34	364618.85	286372.73	304714.17	383060.83	292384.03	243018.04	93241.98	70249.05	93894.45	40069.47	23172.77
Solar-kWh	124909.00	126206.00	100725.00	87894.00	81891.00	70677.00	132045.60	86990.60	150324.30	135468.30	160251.10	172647.80
DG-kWh	2828	1218	670	2357	96	1186	100	824	734	1026	644	1680

The avg. energy consumption of academic blocks through solar energy is 44.0% per month

Plantation drive at Bagru Police Station

Fire Fighting Training

Fire Control Room

Plantation On Roadside

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Naye Bharat Ka Sankalp on September 11, 2017

On the Occasion of Pandit Deendayal Upadhyaya's Cenetenary Celebration and 125th Anniversary of Swami Vivekananda's Address at the Chicago World Parliament of Religions.

Theme **" Young India, New India – A resurgent Nation : from Sankalp to Sidhhi"**

Efficient and Alert Guards for ensuring Cleanliness

- Round the clock security
- Total Campus Under Electronic Surveillance
- Two tier security
- Total 134 guards on 8 hourly duty.

Environment Friendly Measures

1. Digital Management System(DMS)
2. All communication through Microsoft Outlook
3. Employee Management System (EMS)
4. Biometric Attendance for faculty members
5. Emphasis on online test modules
6. Collection and allotment of students' Open Elective Choices online.
7. Data collection of all kinds through Google Forms

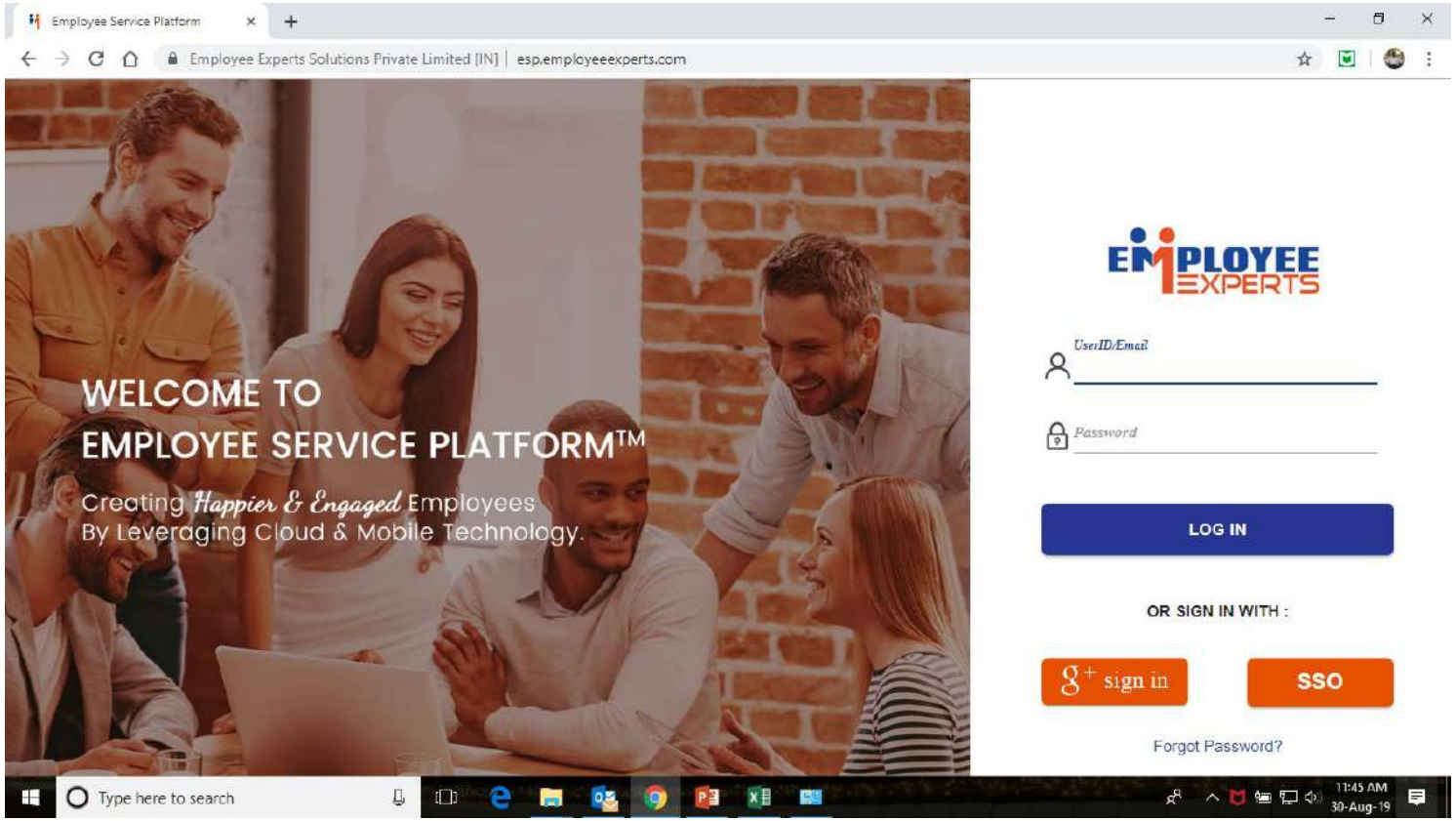
1. Digital Management System(DMS)

- All modules starting from registration of students to conferring degree are online.
- Separate student, teacher and parent interfaces (https://dms.jaipur.manipal.edu/loginForm.aspx)
- Complete monitoring of academic events including attendance, marks, laboratory performance, assessments, personal details, fee etc

2. **All communication through Microsoft Outlook**
    1. From top-management downwards everyone; communicates and authenticates email communication done via Microsoft Outlook to save paper, electricity, printing and circulation cost
    2. Student interaction also done using outlook where every student is issued user id/password on MUJ domain

3. Employee Service Platform (ESP)

1. Online system for leave application, salary details, attendance details, Form 16, contact details etc

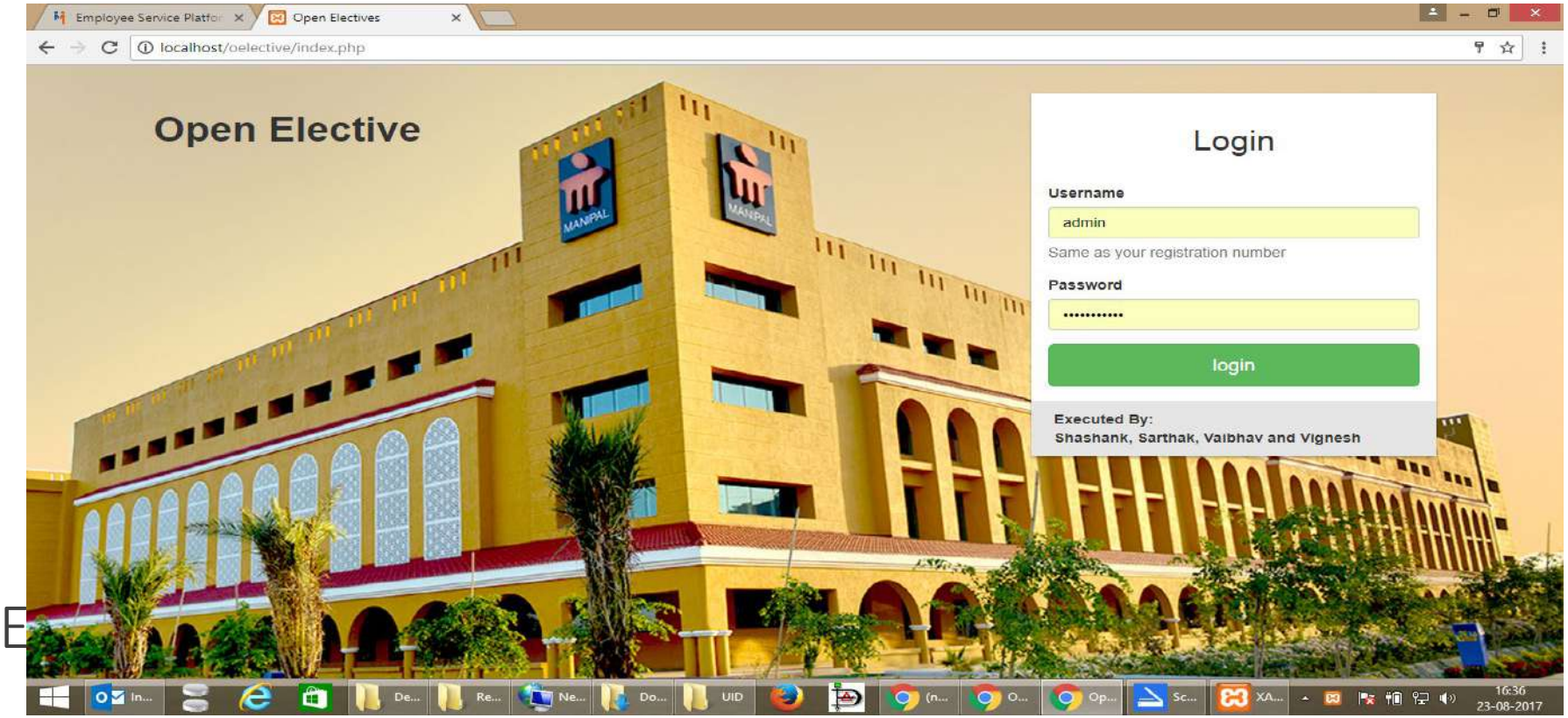


Environment Friendly Measures

4. **Biometric Attendance**

5. Practice of signing in register is discontinued for all MUJ employees to save paper

5. Collection and allotment of students' Open Elective Choices through automated online system



Way Forward…..

- MUJ has been recognized as Technology Demonstration And Training Centre (TDTC) by DST- Rajasthan to conduct skill and training programmes for social upliftment of rural population of Rajasthan.
- Continue to contribute in the Swachhta Abhiyan
- Make the campus and surroundings cleaner and greener.
- Conserve water and Electricity
- Recharge ground water level.

… and the efforts continue

Unnat Bharat Abhiyan (UBA)

- MUJ is selected under Unnat Bharat Abhiyan (a flagship program of MHRD, Government of India) with a vision to involve professional and other higher educational institutions of the country to enable village cluster towards achievement sustainable development through Gram Panchayat(s).
- Under this programme, Near by villages (Dehmi Kalan, Dehmi Khurd, Begus, Theekirya, Sanjhariya etc.) are adopted by MUJ for upliftment.

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MUJ: Awards & Achievements

GRIHA AWARD

First University in the country to be awarded GRIHA award for integrated Water Management.

LEED INDIA PLATINUM Award .

Manipal University has been conferred with this award being the first campus in the country to do so for Green Building . Based on review done by IGBC on the credits submitted by the university, which were evaluated against the rating system for certifying Green Buildings.

GRIHA FIVE STAR RATING

The first University in the country to receive this award for Energy Conservation and Environment Friendly Design.

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MUJ: Awards & Achievements

'Swachhta' Ranking
Award 2017 by **Ministry of HRD**

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MUJ: SALIENT FEATURES OF GREEN & ENERGY EFFICIENT INITIATIVES

- The University is a **'Zero Discharge Campus'**, with Rain Water Harvesting, Waste water recycling and reuse and Ground Water recharging in place. Water conservation through campus wide drains and ponds for water collection.
- Solar Power Plant of 1.5 MWp is installed on roof-top of the buildings in the Campus – one of the largest roof-top Solar Power Plant in India for any Private University.
- Sewage treatment plants on both sides of the campus.
- All buildings are optimally designed to maximize daylight and minimize heat gains.
- Campus greening through extensive tree plantation.
- The University has a Bio-Gas generation system using Kitchen waste.

Infrastructure

Type of Buildings	Number
a. Academic	02
b Administrative	01
c Residential	01
d Hostels	11
e Commercial	30
f. Food court	02
g. Workshop	02

Academic Building

Academic Block 1

Number of Floors: G+3

Classrooms: 57

Laboratories: 46

Conference Rooms: 05

Faculty Cabins: 85

Faculty workstations: 104

Academic Building

Academic Block 2

Number of Floors: G+3

Classrooms: 89

Laboratories: 40

Conference Rooms: 09

Faculty Cabins:104

Faculty workstations : 172

Administrative Building

Admin Building

Number of Floors: G+3

Offices / cabins: 80

Classroom :32

Conference Rooms:05

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Hostel & Residential

Name: B-1 & G -1Block
Number of Floors: 2 Floors
Accommodations: 45

Boys Hostels : 7

Room Type :

Single Seater – 167
Twin Sharing- 2143

Girls Hostels : 4

Room Type :

Single Seater – 47
Twin Sharing- 631

Commercial

Block	Floor	Firm name
B1	Ground Floor	Coffee House
B1	Ground Floor	Devyani International Ltd/Dialogue the café
B1	Ground Floor	Chatkara Coffee House
B1	Ground Floor	South indian food
B1	Ground Floor	GOUTTAM SHOPPING CENTRE
B1	Ground Floor	Dev Pari tour &Travels
B1	Ground Floor	Jaipur car Taxi
B1	First Floor	Indian Rasoi
G1	Ground Floor	Indian Rasoi
G1	Ground Floor	Jaipur Dairy
G1	Ground Floor	Kabab Nation
G1	Ground Floor	Sharma Communcation
G1	Ground Floor	Poonam Creation

Commercial

Block	Floor	Firm name
G1	Ground Floor	Pink City Super store
G1	First Floor	Macro Integared services
G1	First Floor	Delight Enterprizes
G1	First Floor	M/s Mohan's Scissors & Cut
G2	Ground Floor	Servizone Integrated Services Pvt Ltd
B4	Ground Floor	Chilling Point
B4	Ground Floor	Tea tradition Hospitality Pvt.Ltd
B4	Ground Floor	Dev Sweet & Snacks
B4	Ground Floor	Parth Publishers
G4	Ground Floor	Neha Enterprizes
G4	Ground Floor	Servizone Integrated Services Pvt Ltd
G4	Ground Floor	
Food court	First Floor	Green Enterprizes
B1	First Floor	FIRST ORDER HOSPITALITY SERVICES
B3	Ground Floor	Affordable medical store

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MUJ Toilet Details

Sl. No.	Description	EWC				Washbasin					Urinals
		Gents	Ladies	Disabled	Total	Gents	Ladies	Disabled	Common	Total	Gents
1	Academic Block 1	64	88	16	168	48	64	16		128	160
2	Admin Block	25	41	8	74	25	25	8	3	61	82
3	Food Court	10	13	-	23	10	12	-	67	89	12
4	Academic Block 2	88	105	15	208	72	74	15		161	140
5	Workshop	3	4		7	2	4			6	4
6	Security Block - VIP Gate	1			1	1				1	-
7	Security Block - Student Gate	2	2		4	1	2			3	1
8	Estate Office	2	2		4	2	2			4	2
9	Dispensary	4	3		7	4	3			7	2
	Total	199	258	39	496	165	186	39	70	460	403

Disabled-Friendly Toilets

Number of Restrooms in University Campus			
	Academic block 1	Academic Block 2	Admin Building 1
Ground Floor	4	4	2
1st Floor	4	4	2
2nd Floor	4	4	2
3rd Floor	4	3	2
Total	16	15	08

Adequacy of Toilets - MUJ				
Description	Unit	Qty.	Student strength	Ratio
Male - EWC & Urinals	Nos.	602	6178	1:10
Female - EWC	Nos.	258	2322	1:9
Disabled	Nos.	39		

Adequacy of Toilets - HOSTEL

Name	Number of Toilet
B-1	474
B-2	430
B-3	208
B-4	242
B-5	188
B-6	276
B-7	332
G-1	334
G-2	163
G-3	174
G-4	173
Commerical Area B-1	6
Commerical Area G-1	6
New Food Court	6
Total	3012

Availability of Running Water

University Campus & Hostel : Availability (24x7)

Name	Taps For Handwash	RO Water Dispensers
Academic Block 1	131	16
Academic Block 2	161	15
Admin Building 1	57	8
Workshop	08	2
Food Court	83	10
Hostel	3012	212

Overall Quality of Toilets – Type of Equipment

Features : Equipment & Maintenance Schedule

1. Jaguar Bath Fittings
2. Guaranteed treatment of leakage
3. 100% temper proof and leak proof fittings
4. Automated sensor activated taps and Pressmatic button taps for saving water.
5. Cleaned twice a day

Overall Quality of Toilets – Type of Equipment

Garbage In Campus, Hostel Areas, Frequency & Procedure of Disposal

University strives for efficient house-keeping and had incurred an expense of Rs. 3.83 cr. during 2017-18 and proposes to spend Rs. 4.51 cr. during the current financial year.

Major features ; Garbage Disposal

- Dustbin in all common area (Corridors, Walk ways, Gardens, Cafe, Mess)
- Dustbin in all Classrooms, Conference Halls, Laboratories, Offices, Faculty Cabins, Faculty workstations, Hostel Rooms, Hostel Common Rooms
- Dustbin in all Security Guards' rooms, Hostel Kitchens, Vendors, Shops, Visitors' waiting room, Food Courts. Garbage disposed twice daily.

Garbage in Campus, Hostel Areas, Frequency & Procedure of Disposal

Dustbins Placed At Strategic Places

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

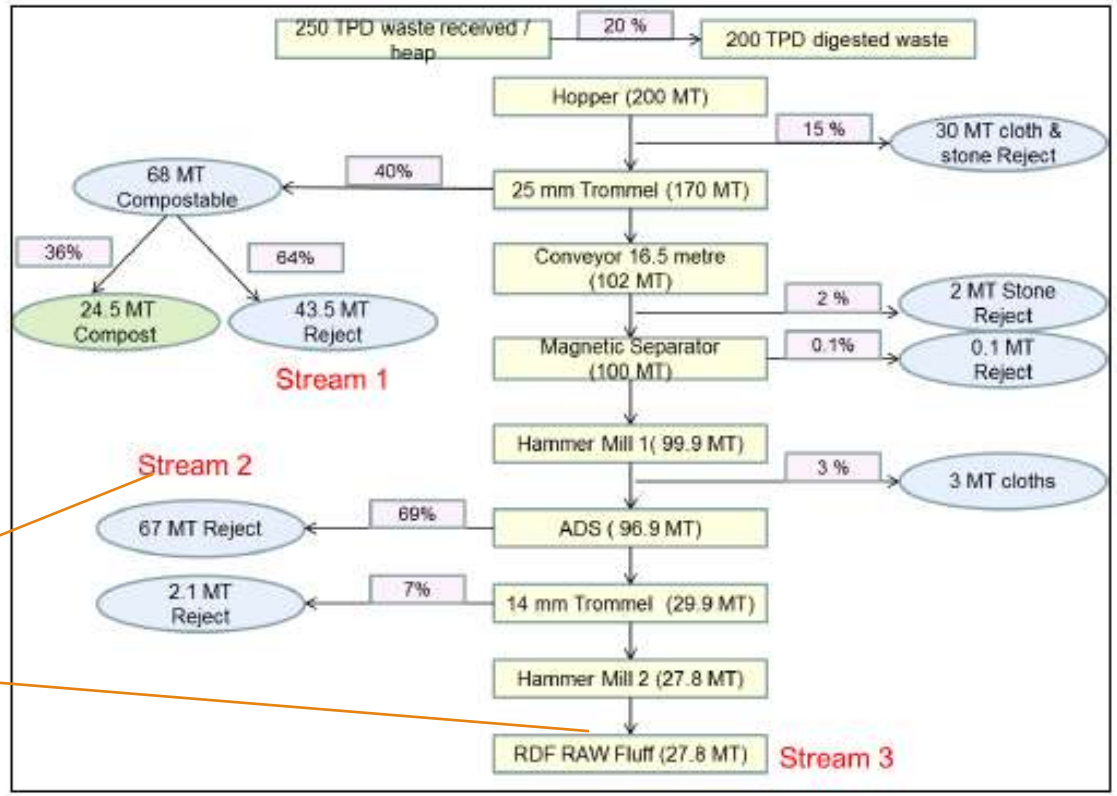
Solid Waste Management

1. Organic waste from kitchen and horticulture used in **Biogas Plant** which supplies fuel to Food Court.
2. Recyclable solid waste **collected separately**
3. Pilot project with BEIL (Bharuch Enviro Infrastructure Ltd) for converting MSW to Fuel / Energy.
4. Bio Medical waste is collected separately and Disposed
5. Papers printed on one side are not discarded but reused.

BEIL Project: MSW to Fuel/Energy

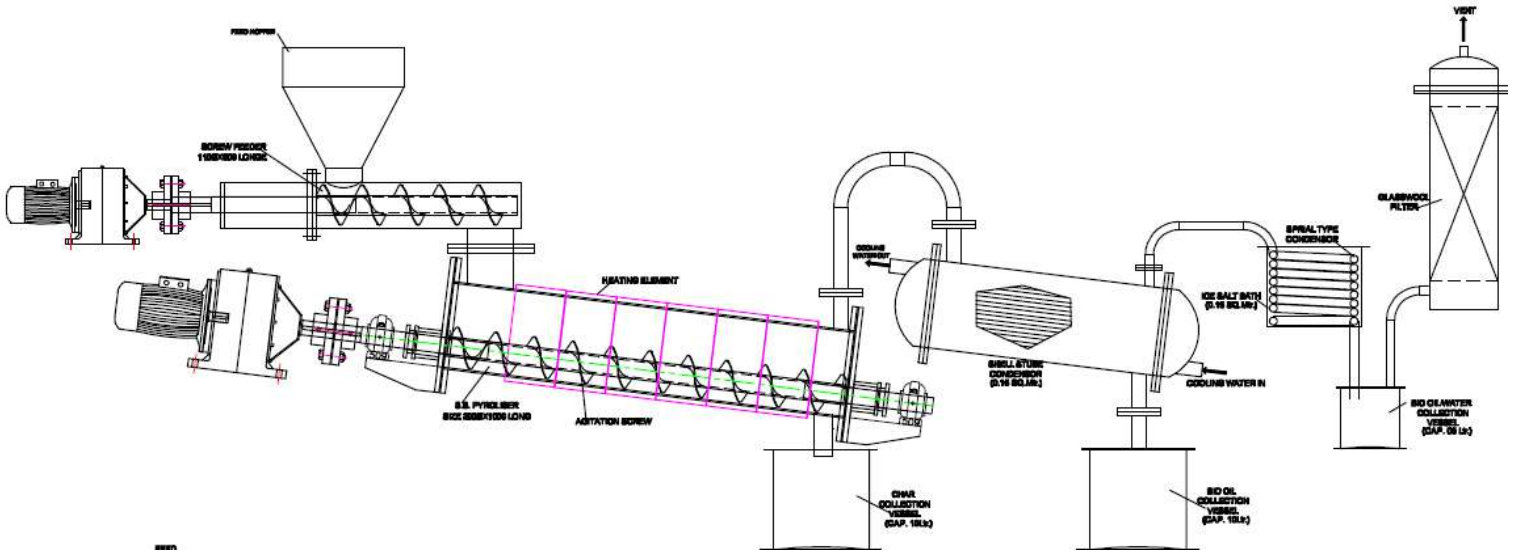
Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Relevant Streams



Project Facility

Innovative Technology Used for Solid and Liquid Waste Disposal & Management



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Research & Consultancy in Waste Management

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

MUJ assisting Greater Visakhapatnam Municipal Corporation (GVMC), of Andhra Pradesh under SBM program , supported by USAID/WSUP UK, this includes

a) Solid Waste Management in Visakhapatnam city
b) Retrofitting of public toilets
c) Preparing DPRs for public & community toilets
d) Assisting GVMC in FSM (Faecal Sludge Management)
e) Assisting in OSS (On Site Sanitation systems), Underground sewerage system, septic tanks etc.
f) Preparing manuals for Engineers

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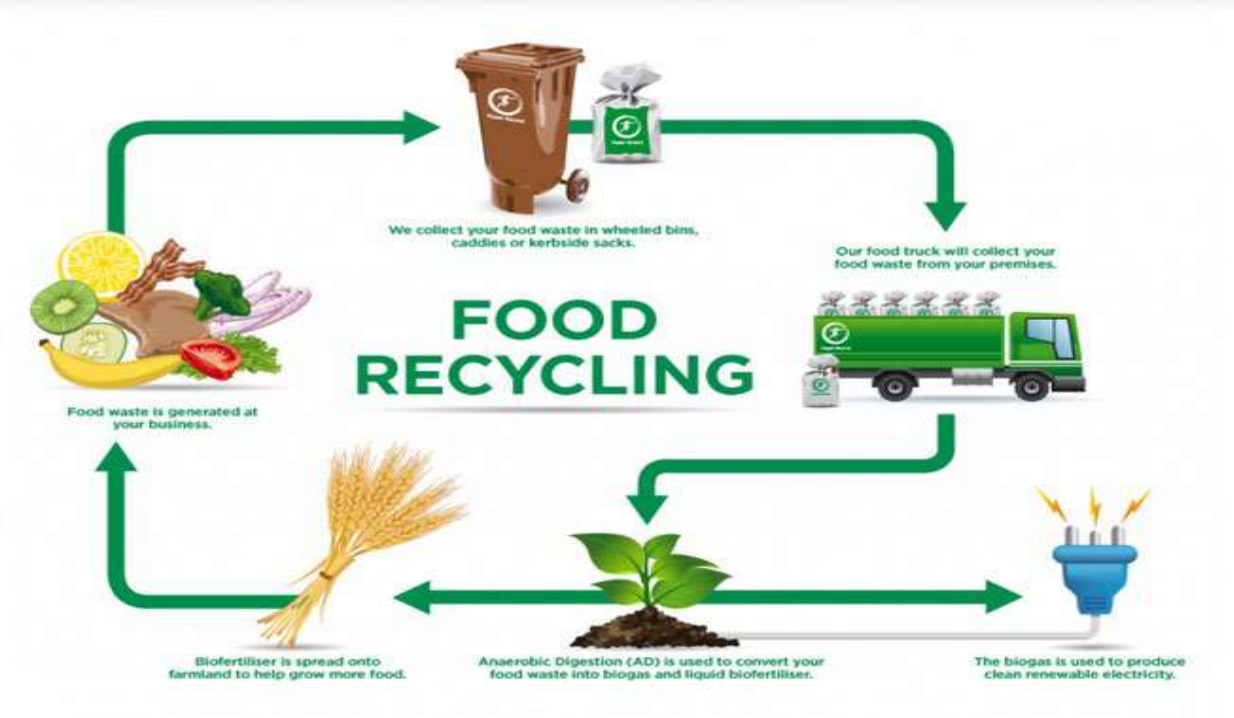
Innovative Technology Used for Solid and Liquid Waste Disposal & Management

- MUJ is assisting towns & cities under SBM in FSM (Faecal Sludge Management) funded by BMGF (Bill & Melinda Gates Foundation),contracted by Athena Infonomics India.
- MUJ is authorized to conduct MOOC/online course on FSM by BMGF .
- MUJ to conduct awareness programs in FSM in academic institutions across towns & cities by BMGF.
- MUJ is part of consultancy team to review mid term progress in towns & cities across Rajasthan on Water & Sanitation, funded by ADB & coordinated by RUIDP.

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Food Waste

We are generating biogas by using Organic solid food waste and main part of a biogas system is a digester. Inside this tank, bacteria convert food waste into methane gas through the process of anaerobic digestion (35 kg of methane gas produced from 500 kg of food waste)



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Solid Waste: Bio Gas Plant

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

In-House Compost Preparation

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste: Management

STP – 4Nos / 1850 KLD

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Rain Water Harvesting

- Rain Water Harvesting Ponds – 04 Nos / 16625 KL
- Rain Water Harvesting UGR – 06 Nos / 1415 KL
- No. of Bore-wells: 09

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste Management

- Zero Water Discharge Campus (Water Recycling)
- STP Treated Water Being Used For Flushing & Horticulture
- Sludge From STP Used As Manure For Landscaping. Reusing the debris waste for the pathways and road areas base compaction
- Electronic Sensor Based Urinals

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Liquid Waste Management:

Sewage Waste : Sewage treatment removes contaminants from wastewater, which includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safer treated water (it has been used for flushing and gardening). We are producing 1400KL treated water per day.

Water Storage, pipe line & Water purifier.

Overall storage capacity : Under Ground Reservoir	
Raw Water	- 2936 KL
Treated Water	- 1458 KL
Water Purifiers RO	- 277 Nos. 80 Litre Capacity

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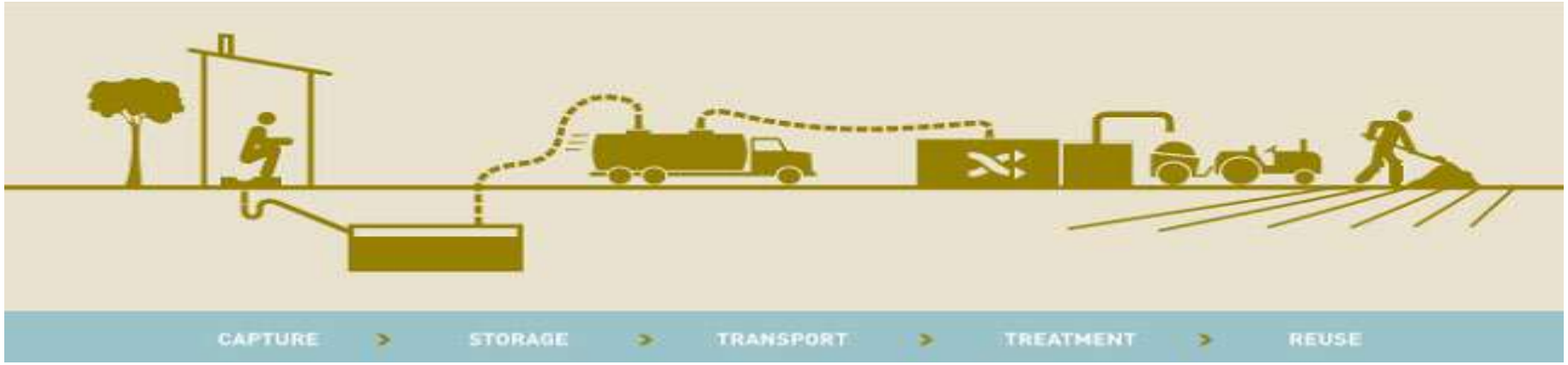
Journey in Sanitation Sector MUJ



Host institute

MANIPAL UNIVERSITY JAIPUR

Manipal University Jaipur (MUJ)
Dehmikalan, Jaipur-303007, Rajasthan, India
mujfsm-nss.org

In Association and Supported By

UNESCO IHE DELFT

BILL & MELINDA GATES foundation

UNESCO/IHE DELFT

and

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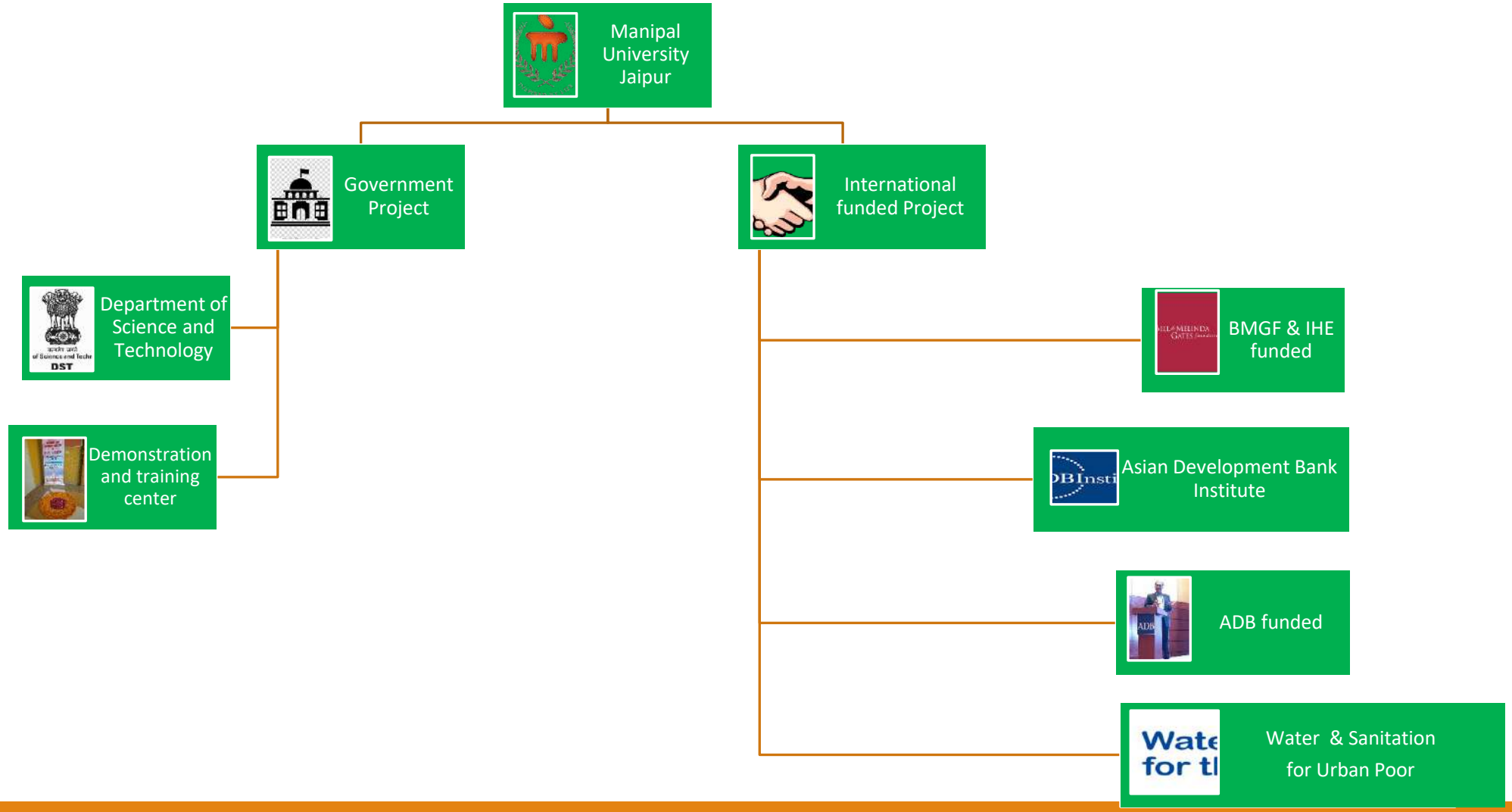
Manipal University Jaipur
Government Project
International funded Project
Department of Science and Technology
Demonstration and training center
BMGF & IHE funded
Asian Development Bank Institute
ADB funded
Water & Sanitation for Urban Poor

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Manipal University Jaipur, part of the Global Sanitation Learning Alliance a project by UNESCO-IHE & Bill & Melinda Gates Foundation

MUJ received an approved grant of 363,000=00 USD (2.6 Crores) from Bill & Melinda Gates Foundation through top Global Institute , IHE Delft Netherlands to run

a) On Line course in Non Sewered sanitation
b) Diploma Courses in Non Sewered Sanitation
c) MTech in Non Sewered Sanitation

Principal Investigator : Prof A D Vyas
Co PI : Dr Meena Kumari Sharma
Dr Monika Sogani
Mr Sagar Gupta

Duration: Aug 2019- Dec 2023

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Innovative Technology Used for Solid and Liquid Waste Disposal & Management

S.No.	Lead/Principal Investigator (PI)	Co-PI (If any)	Title of Project	Funding Agency	Sanction Order/Reference	Sanction Date/Project Period	Amount of Financial Assistance Received in INR	Current Status
1	**Dr Monika Sogani**	Prof A D Vyas, Meena Kumari, Sagar Gupta	Delawas STP & its impact on socio economic conditions	Asian Development Bank Institute, Japan		May 2018	3,35,000	Approved 5000 USD
2	**Prof A D Vyas**	Dr. Monika Sogani, Dr Meena Kumari Sharma and Mr Sagar Gupta	Short term actions in FSM, awareness in academic institutions	UNESCO/IHE Delft, Netherlands and Bill and Melinda Gates Foundation		Feb18-Jun 18	16,00,000	Approval Granted for 50,000 USD in coordination with CDD (MUJ to receive 25000 USD)
3	**Dr. Meena Kumari Sharma**	Prof. A.D. Vyas & Mr. Sagar Gupta	Performance of low cost community based onsite sanitation system in Ambient Environment	DST, Rajasthan	P.8(9) V.PRO./S.S.D./2016/PART-1/3809	Jan 18-Mar 18	**21,21,000**	Approved, Granted
4	**Prof. A D Vyas**	Dr. Meena Kumari Sharma, Dr Monika Sogani, Mr. Sagar Gupta	On line course on Faecal Sludge Management	UNESCO/IHE, Delft, Netherlands and Bill and Melinda Gates		Dec-17	**10,00,000**	Approved, Granted for 15000 USD

S.No.	Lead/Principal Investigator (PI)	Co-PI (If any)	Title of Project	Funding Agency	Sanction Order/Reference	Sanction Date/Project Period	Amount of Financial Assistance Received in INR	Current Status
5	**Dr Monika Sogani**	Dr Meena Kumari Sharma & Prof. A. D. Vyas	Enhanced biodegradation of organic pollutants as well as micro-pollutants	Science and Engineering Research Board (SERB), DST, Govt. of India	ECR/2016/000271	2017-2020	**30,09,600**	Approved, Granted
6	**Prof Lalita Ledwani,**	Prof. A D Vyas, Dr Pushpendra Kr	Water sector Grant	Kurita Water Environment Fund, Japan		2015-2016	**1,77,000**	Approved, Granted for 300,000 YEN

S. No.	Funding Agency	Details	Amount (INR)	Duration	Status
1	WSUP, **UK**	Water /Sanitation & retrofitting of toilets in Visakhapatnam, AP. The major focus was to prepare guidelines for government of Andhra Pradesh on rehabilitation of various community toilets. Also prepared a detailed project report on different aspects of toilet designs, models which are defunct, preparing a manual for engineers. This was as per SBM guidelines.	3.5 lacs	6 months	**Completed,** **A D Vyas & Dr Gaurav Sancheti**
2	OFDA/**USAID** (United States Agency for International Development), through MSI,USA (Sudan Humaid)	Water & Sanitation in Sudan, Africa.The major focus besides reviewing various technical documents, reviewing M & E tools, training of trainers of IOM participants for Darfur area in WASH sector	25 lacs	Feb,2015 to April,2016	**Completed,** **A D Vyas**
3	**French & Italian government agencies** & EIB (European Investment Bank)	Feasibility Study for an urban water supply and sanitation program in small and medium towns in Ethiopia, Africa.	10 lacs	June,2014 to Nov, 2014	**Completed,** **A D Vyas**
4	Athena Infocom via **Bill & Melinda Gates Foundation**	Non Sewered Sanitation/Faecal Sludge Management studies in various towns of India.	30 Lacs	Indefinite	On Halt A D Vyas
5	**Asian Development Bank** for RUIDP (Rajasthan Urban Infrastructure Development Program)	Study of Water & Sanitation in 15 towns of Rajasthan, India. The focus was on mid-term review of water & sanitation interventions done by Asian Development Bank in coordination with RUIDP & the impact of these interventions on end users & beneficiaries.	50 lacs	March 16-July 2017	On Halt A D Vyas & Team Civil

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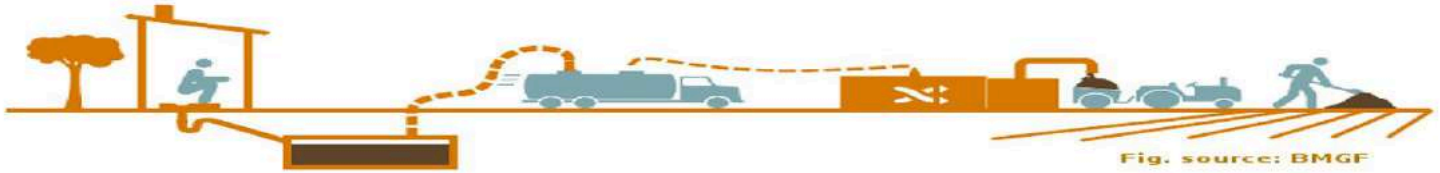
UNESCO | IHE DELFT

Online Learning Course on Faecal Sludge Management

Supported by a grant from
Bill and Melinda Gates Foundation



Scholarship worth **Rs. 125,000** available for **25** best participants*
Target Audience: Student, Professional & Researcher

Highlights:

1. Six well defined modules
2. Delivered by esteemed experts
3. Online interaction with experts

REGISTER NOW! at
http://mujfsm-nss.org/

*Contact: **+91 7229964243**
contact@mujfsm-nss.org
www.mujfsm-nss.org

Department of Civil Engineering
Manipal University Jaipur
VPO Dehmikalan, Jaipur, Rajasthan
303007, India

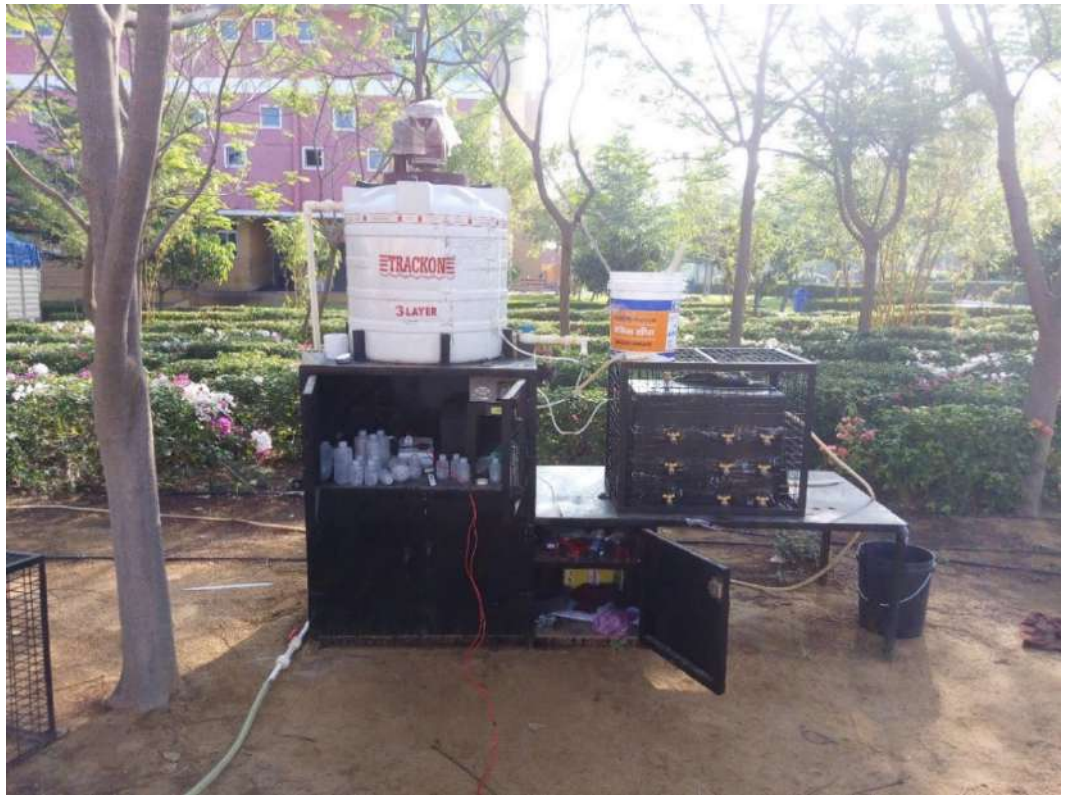
ONLINE COURSE ON FSM

- Conducted from 26th February to 6th April, 2018, totally free of cost,
- Target audience was at least 250 students, practitioners, corporate staff, ULB staff, JMC & so on.
- Total 6 weeks course with 6 detailed modules, around 50 lectures.
- Total 362 students & participants registered for the course mainly from India, Bangladesh, Nepal, Pakistan, Uganda, Tanzania, Singapore & so on.
- 123 completed the full course that is 34 % of total registered.
- Scholarship granted to 28 toppers with 5000 INR based on online quizzes.
- Resource materials used from UNESCO/IHE, preparing local resource materials & case studies.
- Faculty , M. Tech. and B.Tech students worked on case studies from Jaipur in inaccessible areas
- Certificates were given to all participants who successfully completed the course

President
MUJ Prof G K Prabhu with scholarship winners of FSM/OLC

Low-cost Community Based Onsite Sanitation Systems in Ambient Environment of Jaipur City

Lab-scale reactor in actual field condition



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Creating awareness on fsm/non sewered sanitation- Academic institutions

Conducted half day workshop at lead academic institutions benefitting 800 students

- IIT, Tirupati
- MNIT Jaipur
- MIT, Manipal
- MUJ,Jaipur
- S.R.M, Chennai
- R.T.U, Kota
- Poornima University, Jaipur
- SKIT, Jaipur
- IIT, Bombay

Three Days workshop/TOT for academia from various institutes ,25 participants

- MIT, Manipal, Karnataka
- SKIT,Jaipur
- Poornima University, Jaipur
- Manipal University Jaipur
- Research Scholars, MTech/PhD

Quality of wastewater after treatment using anaerobic treatment plant

Pilot-scale reactor in Dehmi Kalan Village

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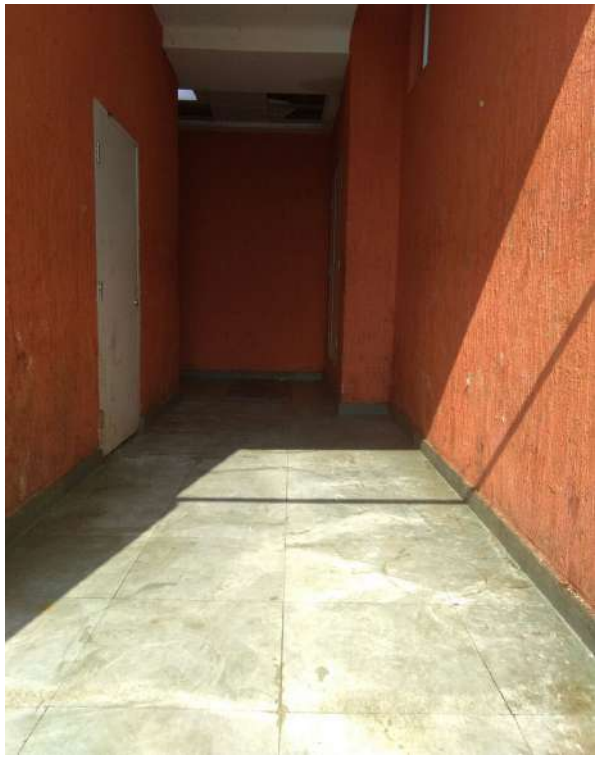
Garbage in Campus, Hostel Areas, Frequency & Procedure of Disposal

Collection frequency & clearance: Twice a day

Time: 9:00 AM & 4:00 PM



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Hostel Kitchen Hygiene

Mechanised Food Preparation : Summary

- Gloves, Head gears and Aprons are mandatory while cooking/serving food
- Hand wash soap dispensers are placed in adequate numbers
- Maximum possible usage of machines is practised.
- Chapatis are made with machine.
- Machine choppers and food processors are used.
- Surprise Inspections are done to ensure adherence to hygiene measures
- Spacious & well ventilated kitchen
- Periodic Health Check up of Staff
- Integrated Pest Control
- Well Trained & Groomed Staff
- Two Food Courts With 3600 Seating Capacity

Hostel Kitchen Hygiene

Mechanised Food Preparation

Hostel Kitchen Hygiene

Cooking Equipment

Hostel Kitchen Hygiene

Availability Of Cooking Gas, Chimney Etc

1. Biogas is used for cooking.
2. LPG through pipelines is used as back-up/Plan-B
3. Chimney and Powerful Exhaust fans are used.

Hostel Kitchen : Mess Sessions

Working Day's		
Session Name	Start Time	End Time
Breakfast	07:30:00	09:30:00
Lunch	12:00:00	14:30:00
Hi Tea	17:00:00	18:00:00
Dinner	19:30:00	21:30:00

Holiday's		
Session Name	Start Time	End Time
Breakfast	08:00:00	10:00:00
Lunch	01:00:00	15:00:00
HiTea	17:00:00	18:00:00
Dinner	19:30:00	21:30:00

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Hostel Kitchen

Chef on Wheels

Well Groomed & Trained Team

Automatic Sanitary Napkin Vending Machine Installed in All Girls Blocks.

Sanitary pads bin placed in all the girls rooms.
In all the girls block.

Water Pots for Birds

Medical Centre / Waste disposal dustbin

Solar Tube installed for hot water

Water Pond behind B-2 Hostel

Water Aerator installed in all hostel block

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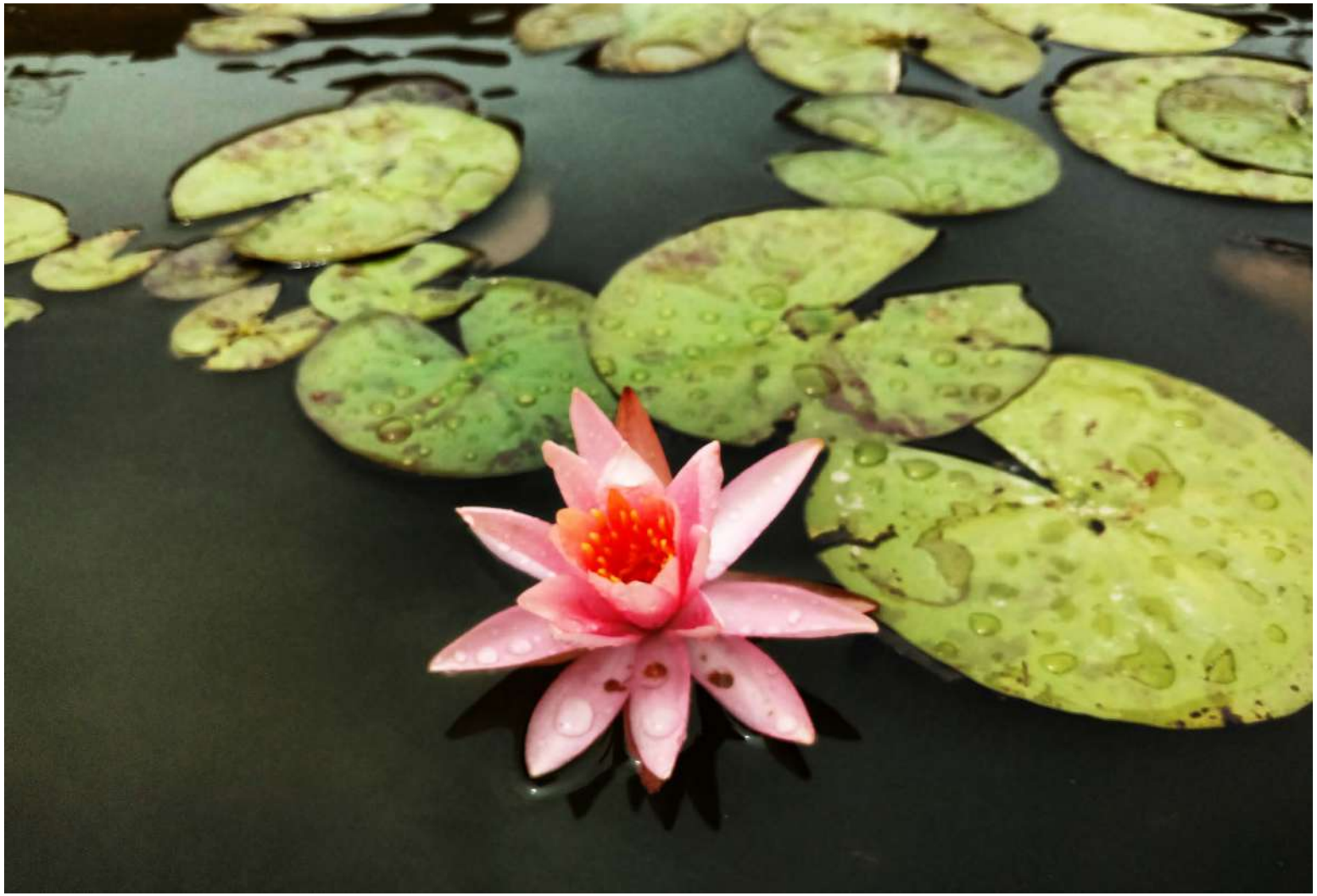
Manipal University Jaipur intends to take lead in practicing more of sustainable development through introducing

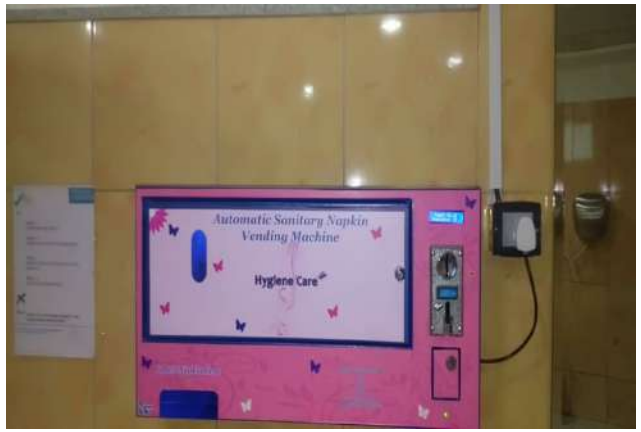
Forest Gardening, a holistic way of planting flora, which significantly enhances the Biodiversity besides attenuating the effects of climate change.



Green Campus

Salient Feature

- Drip Irrigation
- Sprinkler System
- Green House
- Heat Resistance Building (External)
- Weather Proof External Paints



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Greenery In Campus

Greenery In Campus

Green area				
Description	Unit	Qty.		Total
		MUJ	Hostel	
Area under green cover	Sq. Ft	335975.00	144139.42	480114.42

Sl. No.	Name of the Trees
1	Delbergia Sisoo
2	Terminalia Arjuna
3	Allestonia
4	Bhuhania Balkenia
5	Silver Oak
6	Jcaranda memumsfolia
7	Chakresic
8	Karanj
9	Ficus Verins
10	Delonix Regia
11	Terminalia Chattapa
12	Azadrichta Indica
13	Dates palm
14	Lagerstromia Indica
15	Golden Bamboo
16	Ficus Benjamina
17	Mimusops elengi
18	Mango
19	Jamun
20	Terminalia mantaly
21	Cassia fistula
22	Lagerstromia flosreginae
23	Tecoma gouri chori

	Name of the Plants
1.	Murraya Exotica
2	Nerum Oleander Dwarf
3	Vernonia Elengifolia
4	Clerodenrum inermie
5	Bougainvillea subra white
6	Euphorbia milli pink
7	Ficus panda
8	Alamanda dwarf - Yellow
9	Ixora dwarf - Pink
10	Plumeria alba
11	Cycas revoluta
12	Rhoeo discolour
13	Raphes palm

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Greenery In Campus

Extent of Greenery : Overview

- Lush Green Sprawling Campus
- Efforts are to keep every corner and walkway green
- Regular plantation drives in campus

Greenery In Campus

Tree Plantation Drive

Greenery In Campus

Maintenance; Garden, Lawns & Trees

Well maintained and healthy greenery

34 well trained horticulture staff members

Ever green climate friendly (arid zone) plants are given more preference

STP water used for horticulture

Overall Cleanliness In Institute

Green & Clean Campus : Highlights

- Drip Irrigation System
- Color & Orientation of The Building For Energy Conservation
- Double Glazed Glass Panel Windows
- 80 % of AC Load is met by Solar Power during office / peak timings
- LED Lighting in Whole Campus
- We are maintaining power factor from 0.972 to 0.995. For maintaining power factor above 0.95, we are getting rebate from JVVNL each month
- Timer Controlled External Area Lighting
- No Vehicles Inside the Campus
- Regular Pest Control & Fumigation with Environment Friendly substances
- Well trained House Keeping Staff – 350 in all for effective and error free cleaning

Nearby Village, Locality / Area Taken Up For Promoting Swachhta

Names of places, villages : 6 Villages, Jaipur Railway Station and Mansarovar residential colony are taken up for promoting Swachhta

- Dehmi Kalan
- Dehmi Khurd
- Sanjharia
- Thikaria
- Begus
- Devaliya

- **Major initiatives taken :**
  - Tree Plantation
  - Cleanliness Drives
  - Awareness Camps
  - Maintenance of School at Dehmi Kalan

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Clean Environment, Healthy Environment' – Cleanliness Drive at Mansarovar, Jaipur

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Cleanliness Drive at Jaipur Railway Station

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Swachh Pakhwada celebrated at Manipal University Jaipur

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Social activity - Cleanliness Drive in Dehmi Kalan Jaipur

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Social activity – Created the toilet facility in Bagru Police station, Jaipur






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Cleanliness Drive in near by Villages

Awareness at Govt School Dehmi Khurd

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MUJ students are actively involved in NGO GRAMIKSHA for their awareness programs and drives.

MANIPAL UNIVERSITY
JAIPUR

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एक कदम स्वच्छता की ओर

Cleanliness & Health Awareness Drive at Begus, Jaipur

Awareness Camps

Awareness Camps

Legal Aid

महिलाओं को सामाजिक एवं आर्थिक न्याय दिलाने में मदद

जयपुर (कासं)। मणिपाल विश्वविद्यालय, जयपुर की ओर से विश्वविद्यालय परिसर के पास स्थित पानी की टंकी से सटी डिस्पेंसरी में लीगल एंड क्लिनिक की स्थापना की गई। क्लिनिक का उद्घाटन मुख्य अतिथि डिस्ट्रिक्ट एवं सेशन जज, अशोक व्यास, विशिष्ट अतिथि एसीजेएम विनोद कुमार बागड़ी, दहमी कला ग्राम के सरपंच पुष्पेंद्र सिंह ने फीता काटकर किया। इस अवसर पर मुख्य अतिथि डिस्ट्रिक्ट एवं सेशन जज अशोक व्यास ने इस लीगल एंड क्लिनिक के माध्यम से गांव की महिलाओं, ग्रामीणों को सामाजिक एवं आर्थिक न्याय दिलाने के लिए सामंजस्य स्थापित करने की बात कही। साथ ही महिलाओं एवं ग्रामीणों का कार्यक्रम में आने का आभार जताया व मणिपाल विश्वविद्यालय, जयपुर की ओर से इस लीगल एंड क्लिनिक को स्थापित करने पर प्रसन्नता व्यक्त की एवं धन्यवाद दिया। कार्यक्रम के आरंभ में विश्वविद्यालय के प्रो. प्रेसिडेंट, प्रो. एनएन.शर्मा, रजिस्ट्रार, प्रो. वंदना सुहाग, डीन, फेकल्टी ऑफ आर्ट एंड लॉ. प्रो. मृदुल श्रीवास्तव ने अतिथियों का बुके देकर स्वागत किया एवं स्मृति चिन्ह देकर आभार जताया। साथ ही ग्रामीणों को सम्बोधित करते हुए इस लीगल एंड क्लिनक से जुड़कर लाभ लेने का आह्वान किया। इस अवसर पर प्रो. एन.डी. माथुर, चीफ एडमिनिस्ट्रेटिव ऑफिसर कर्नल विरेंद्र सिंह, हैड एच आर, देव आशीष, डिपार्टमेंट ऑफ लॉ की विभागाध्यक्ष, डॉ. विजय लक्ष्मी सहित विश्वविद्यालय के फेकल्टी सदस्य, डिपार्टमेंट ऑफ लॉ के फेकल्टी सदस्य एवं विद्यार्थी मौजूद थे।

विधिक सह सामाजिक अनुसंधान परियोजना

(VSSAP)

Awareness Program-Substance Abuse and its ill-Effects on Society

Drug Awareness Camp

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Awareness Camps

Renewable Energy

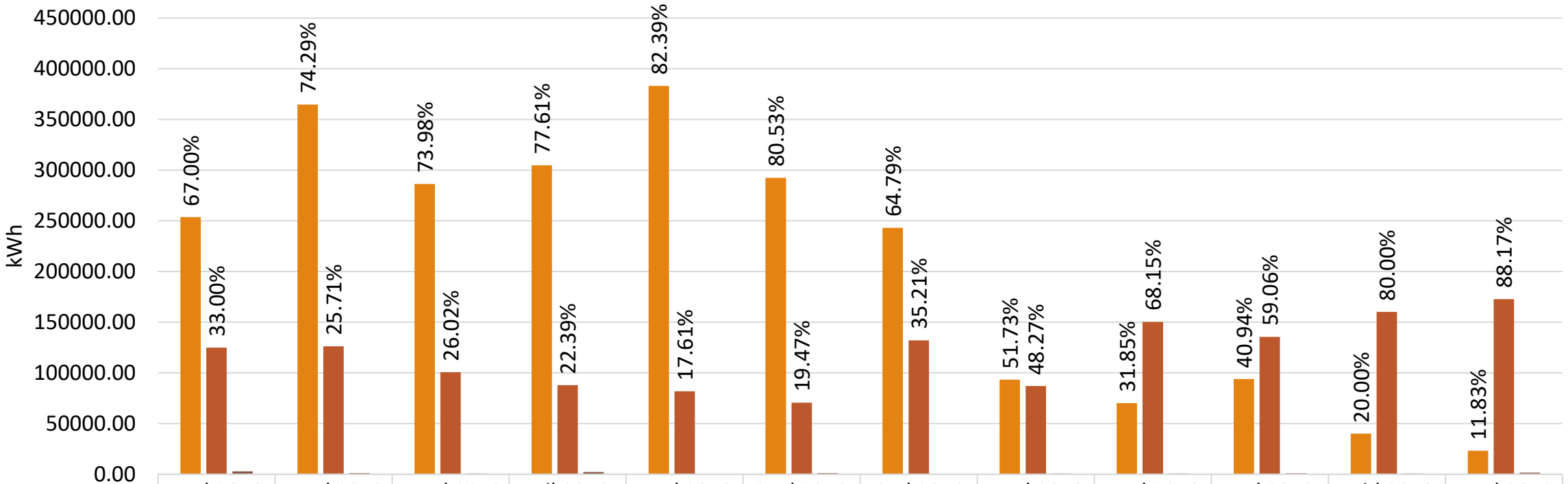
1. Solar power : 1.50 mWp - We have installed solar power panels of 1.5 mWp capacity in the campus and the same is being used for captive use.
2. Solar water heating: 550 KL per day

Renewable Energy Aerial View using Google Earth

Energy Consumption 2018 - 19

Sl. No.	Description	kWh		Total - kWh
		Academic	Hostel	
1	Grid Consumption	2448420.71	8969612.29	11418033.00
2	Solar Consumption	1430029.70		1430029.70
	Total	3878450.41	8969612.29	12848062.70

Energy Consumption (Apr'18 - Mar'19) - MUJ



	Apr' 2018	May' 2018	June' 2018	Jul' 2018	Aug' 2018	Sep' 2018	Oct' 2018	Nov' 2018	Dec' 2018	Jan' 2019	Feb' 2019	Mar' 2019
Grid-kWh	253624.34	364618.85	286372.73	304714.17	383060.83	292384.03	243018.04	93241.98	70249.05	93894.45	40069.47	23172.77
Solar-kWh	124909.00	126206.00	100725.00	87894.00	81891.00	70677.00	132045.60	86990.60	150324.30	135468.30	160251.10	172647.80
DG-kWh	2828	1218	670	2357	96	1186	100	824	734	1026	644	1680

The avg. energy consumption of academic blocks through solar energy is 44.0% per month

Plantation drive at Bagru Police Station

Fire Fighting Training

Fire Control Room

Plantation On Roadside

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Naye Bharat Ka Sankalp on September 11, 2017

On the Occasion of Pandit Deendayal Upadhyaya's Cenetenary Celebration and 125th Anniversary of Swami Vivekananda's Address at the Chicago World Parliament of Religions.

Theme **" Young India, New India – A resurgent Nation : from Sankalp to Sidhhi"**

Efficient and Alert Guards for ensuring Cleanliness

- Round the clock security
- Total Campus Under Electronic Surveillance
- Two tier security
- Total 134 guards on 8 hourly duty.

Environment Friendly Measures

1. Digital Management System(DMS)
2. All communication through Microsoft Outlook
3. Employee Management System (EMS)
4. Biometric Attendance for faculty members
5. Emphasis on online test modules
6. Collection and allotment of students' Open Elective Choices online.
7. Data collection of all kinds through Google Forms

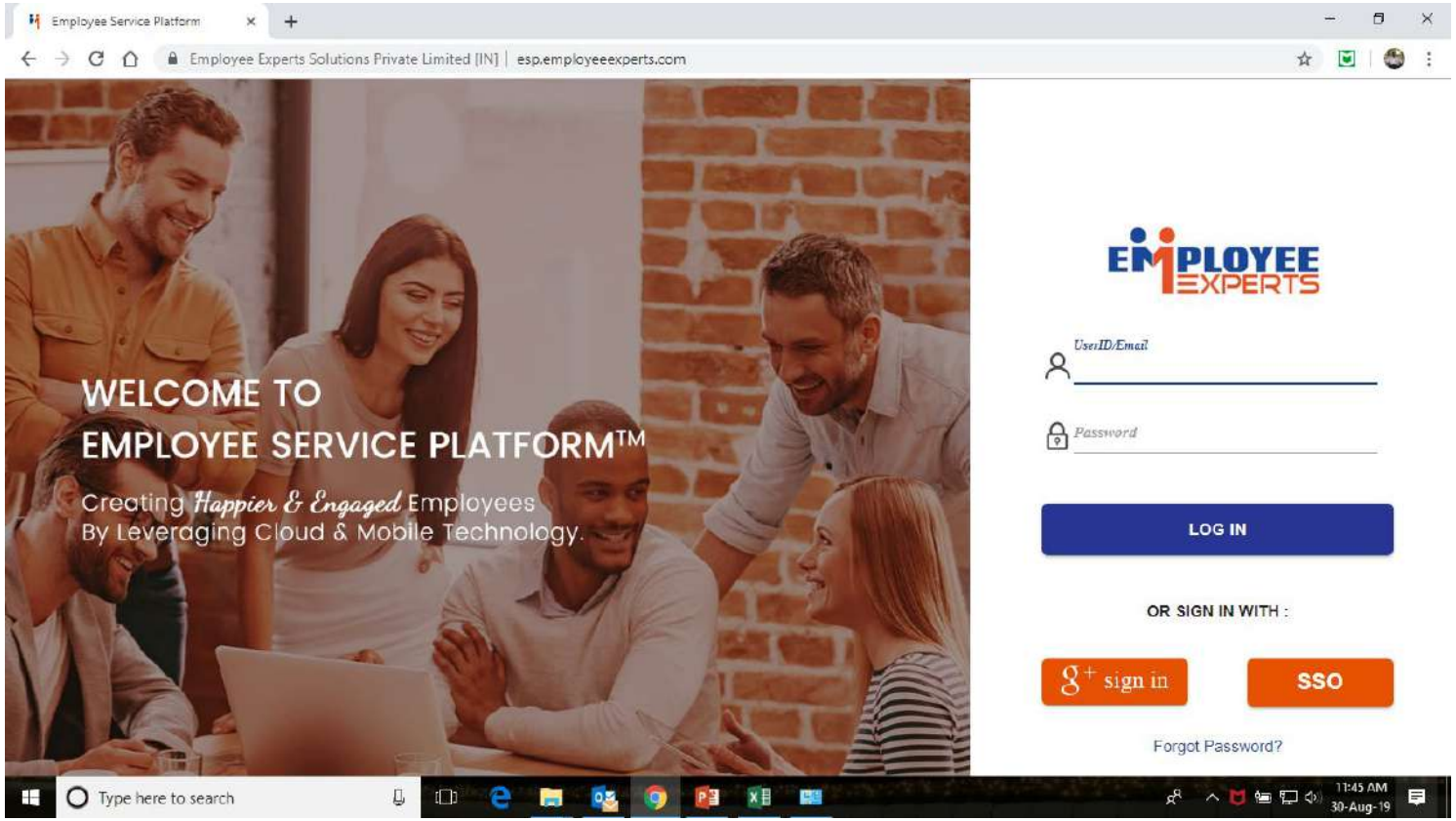
1. Digital Management System(DMS)

- All modules starting from registration of students to conferring degree are online.
- Separate student, teacher and parent interfaces (https://dms.jaipur.manipal.edu/loginForm.aspx)
- Complete monitoring of academic events including attendance, marks, laboratory performance, assessments, personal details, fee etc

2. **All communication through Microsoft Outlook**
    1. From top-management downwards everyone; communicates and authenticates email communication done via Microsoft Outlook to save paper, electricity, printing and circulation cost
    2. Student interaction also done using outlook where every student is issued user id/password on MUJ domain

3. Employee Service Platform (ESP)

1. Online system for leave application, salary details, attendance details, Form 16, contact details etc

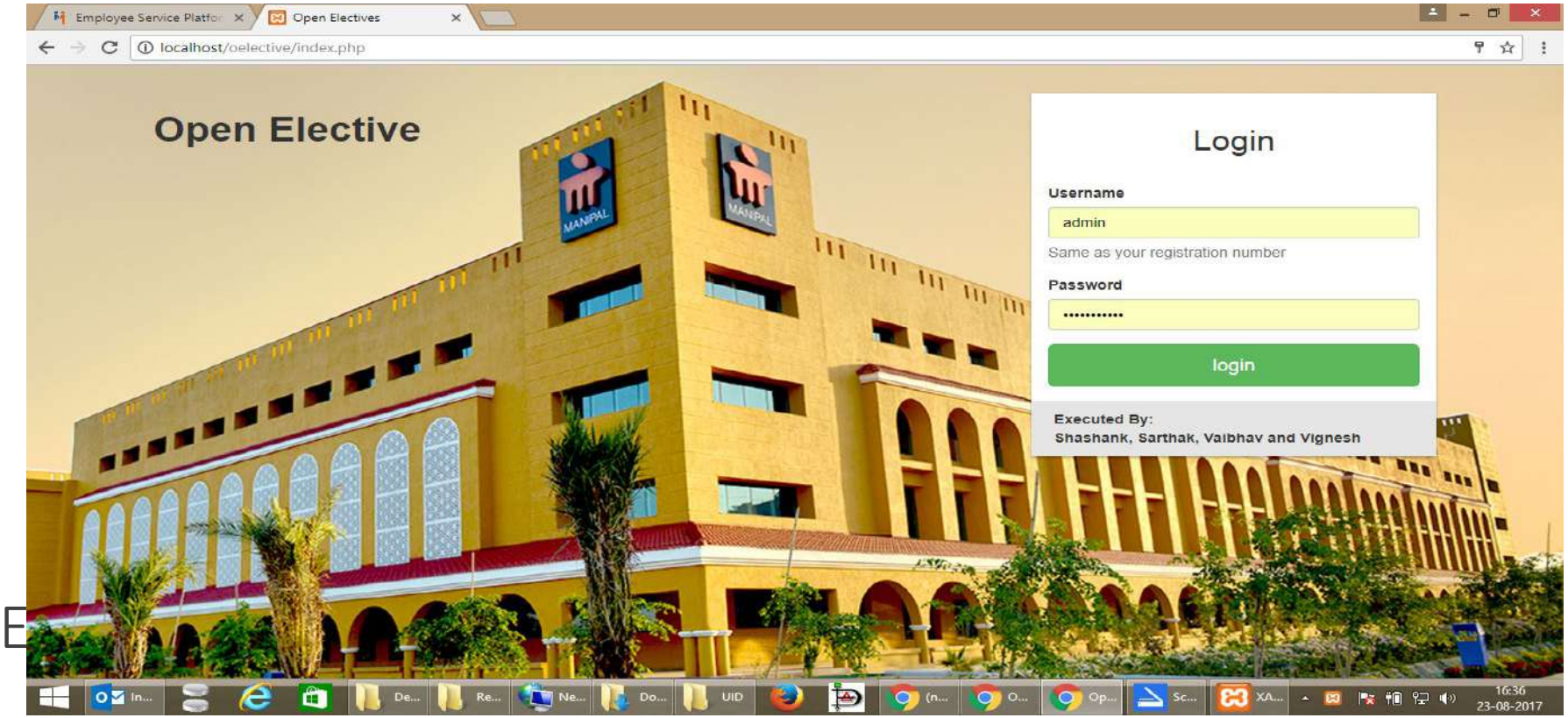


Environment Friendly Measures

4. **Biometric Attendance**

5. Practice of signing in register is discontinued for all MUJ employees to save paper

5. Collection and allotment of students' Open Elective Choices through automated online system



Way Forward…..

- MUJ has been recognized as Technology Demonstration And Training Centre (TDTC) by DST- Rajasthan to conduct skill and training programmes for social upliftment of rural population of Rajasthan.
- Continue to contribute in the Swachhta Abhiyan
- Make the campus and surroundings cleaner and greener.
- Conserve water and Electricity
- Recharge ground water level.

… and the efforts continue

	Manipal University Jaipur - Academic Block 3
	Project Name – Manipal University Jaipur - Academic Block 3
	Project Code – 22GR0118
	Address: - Jaipur, Rajasthan
	Site area: - **14,809 m²** (As per online panel)
	Total built-up – **21,525 m²** (As per online panel)
	No. of buildings – 1 Building (Institutional)
	Compiled by GRIHA Council

General Comments:	

Criterion	Appraisal	Feedback Comments
Criterion 4	**Air and Soil Pollution Control**	
	Partly Mandatory – **4.2.1** Adopt at least six measures to minimize air and soil pollution during construction, with the first three strategies being mandatory. • **Provide 3m high continuous barricading along the site boundary/virtual boundary.** • **Provide wheel washing facility/gravel bed at all vehicular entrances and exits of the site.** • **Ensure DG sets have an exhaust with stack height of at least 2m from the top of the generator with a cowl.** • Ensure DGs are in compliance with CPCB norms.	**4.2.1 Submittal has been provided consisting of the following documents-** - Narrative, site visit reports, and compliance report have been submitted stating that the following strategies were adopted in the project to minimize air and soil pollution during construction: • Provision of 3 m high continuous barricading is provided along the site boundary. • Wheel washing facility is provided at the vehicular entry and exit of the site. • DG sets were not used on site. The demand is being met through campus level facility. Hence this measure is not applicable for the project.

	• Implement a spill prevention plan for storage of diesel, admixtures, curing compounds, bitumen, and other hazardous materials. • Ensure that fine aggregate, excavated earth, and other construction materials with a tendency to get airborne are covered or are sprinkled regularly with non-potable water. • Ensure sprinkling of water on unpaved pathways on the site with non-potable water. • Limit the speed of vehicular movement on-site to 10km/hr. • Ensure that vehicles carrying waste materials out of the site are covered	• Hazardous materials were stored in an enclosed space on an impervious surface. • Fine aggregate, excavated earth, and other construction materials with a tendency to get airborne were covered. • Speed limit on site has been restricted to 10km/hr. Signages for the same were displayed onsite. • Vehicles carrying waste materials out of the site were covered. - Photographs of the measures implemented onsite have been submitted. - Site management plan has been submitted in Criteria 6. However, location of wheel washing facility, Diesel storage and storage of fine aggregate, excavated earth, and other construction materials were not highlighted in the same. **Required:** • Submit site management plan (during construction stage) highlighting location of DG, wheel washing facility, Diesel storage, soil erosion channels, sedimentation tank, storage of fine aggregate, excavated earth, and other construction materials.
	4.2.2 Ensure that the soil erosion channels are constructed, and they are connected to a sedimentation tank in order to reduce movement of soil outside the site throughout the construction phase of the project.	**4.2.2 Submittal has been provided consisting of the following documents-** - As per the site visit reports, and compliance report, soil erosion channels and sedimentation tanks were provided on site. Photographs of the soil erosion channels & sedimentation tank have been submitted in due diligence I & II compliance documents. Site management plan highlighting location of soil erosion channels and sedimentation tanks provided on site has been submitted. **The documentation is complete.**
Criterion 5	**Topsoil Preservation**	

	5.1.1 Ensure that topsoil from disturbed areas on the site is preserved, stabilized, and its fertility is maintained throughout the construction period. Additionally, ensure that 100% of the soil requirement for landscaping including roof garden(s) is met through this preserved soil.	**5.1.1 Submittal has been provided consisting of the following documents-** - Narrative has been submitted stating the topsoil from the disturbed areas on-site is preserved and 100% of the soil requirement for project landscaping is met through this preserved soil. - Images of topsoil preservation have been submitted. - Calculation have been submitted in the online panel indicating the following: ▪ Total topsoil preserved – 1,135.6 m^3. ▪ Soil requirement for project landscaping – 572.6 m^3. ▪ Total area from where topsoil was excavated – 5,678 m^2. However, the same has not been highlighted in the site management plan. ▪ Percentage of fertile soil used in landscape – 198.32 %. - Soil fertility test report of the project from state level soil testing laboratory has been submitted. - A site management plan highlighting location of topsoil preservation area has been submitted. However, location of topsoil excavation area has not been highlighted. **Required:** • Submit a site management plan in .dwg format highlighting location of topsoil excavation/disturbed area for the project.
Criterion 6	**Construction Management Practices**	
	6.1.1 Adopt construction management practices (e.g., stacking and storage of construction materials at different stages of construction) and ensure safe disposal of waste generated during construction.	**6.1.1 Submittal has been provided consisting of the following documents-** - Narrative has been submitted stating that construction management practices such as stacking and storage of construction materials at different stages of construction were adopted on site and all the construction waste is safely disposed of through agreements with waste haulers and recyclers. - As per the site visit reports compiled by GRIHA officials, staging was adopted on site.

		- Photographs of construction management practices adopted on-site have been submitted. - Site management plan has been submitted highlighting the locations of different material & waste storage. - Log sheets of total quantities of waste generated on site as steel, wood, packaging materials, cement bags etc. have not been submitted. - Challans/Sell invoices reflecting full quantities of waste such as MS scrap, wood, packaging materials, cement bags etc. sold to recyclers have not been submitted. **Required:** • Submit detailed narrative about quantum of waste generated during construction, storage facilities for inert and hazardous wastes and measures employed for its safe disposal/recycling. • Submit Log sheets of total quantities of waste generated on site as steel, wood, packaging materials, cement bags etc. • Submit challans reflecting full quantities of waste such as steel, wood, packaging materials, cement bags etc. sold to recyclers.
	6.1.2 Adopt at least two strategies from the list, as given below, to minimize water consumption during construction, with the first strategy being mandatory. **Mandatory –** ○ **Use gunny bags, ponding technique, or curing compound.** ○ Meter and monitor the consumption of water during construction. ○ Use water-reducing admixtures in concrete mix. ○ Use treated wastewater and/or captured storm water	**6.1.2 Submittal has been provided consisting of the following documents-** - As per the site visit reports compiled by GRIHA officials, the following measures were adopted in the project: • Use of gunny bags and ponding technique for curing of columns and slabs, respectively. Photographs of the same has been submitted. • Use of water reducing admixtures (SAINT GOBAIN CHRYSO Delta G6541C-ADS) in concrete. Batch mix report of M25, M30 & M40 concrete grades were shared during the visit indicating the use of admixture was submitted. However, purchase order and technical specification sheet of the admixture was not submitted which confirms water reducing properties. Further, design mix reports for M25, M30 & M40 concrete grades have not been submitted.

		Required: • Submit purchase order and technical specification sheet of SAINT GOBAIN CHRYSO Delta G6541C-ADS confirming it's water reducing properties. • Submit design mix reports for M25, M30 & m40 concrete grades highlighting the make and name of admixtures used in the concrete grades.
Criterion 23	**Safety and Sanitation for Construction Workers**	
	Mandatory – **23.1.1** Ensure compliance with the requirements of NBC 2016 for all the following: Part 1: Provision of necessary safety equipment and safety measures for construction workers. Part 2: Provision of clean drinking water, hygienic working and living conditions, and sanitation facilities for the workers. Part 3: Provision of crèche facility for children of construction workers in case their families are allowed to work/live at the construction site. *Applicability check: If there are only male workers employed and residing on site, the project is exempt from Appraisal 23.1.1 - Part 3*	**23.1.1 Submittal has been provided consisting of the following documents-** - Narrative, drinking water test report and date stamped photographs have been submitted indicating the following: • Construction workers were wearing hard-hats and safety boots. • Temporary railings were provided on the staircases. • Safety nets were provided in accident-prone areas as well as adjacent to the scaffolding. • Safety equipment such as gloves and safety harnesses were provided to workers depending on the nature of their work. • Safety signage in local languages were displayed at multiple locations on site. • First aid facility was provided on site. • Drinking water facility was provided on site and in the labour accommodation area. Drinking water test report was submitted by the project team along with the compliance report. • Clean and hygienic toilets were provided for the construction workers on site and in the labour accommodation area. • Clean and hygienic bathing area was provided at the labour accommodation area. • Clean and hygienic labour accommodation was provided for the construction workers. The hutments were made of GI sheets and sharp edges of the same were secured.

		• The hutments had provision for daylight and ventilation. General cleanliness was maintained in the area surrounding the labour accommodation. • Dustbins were provided in the labour accommodation area. • Creche facility was provided near the labour accommodation. Site visit reports confirm the same. **The documentation is complete.**
	23.1.2 Adopt one alternative out of the following for the construction workers on-site. Alternative 1: Provide a grocery store/canteen within the site premises and/or labour accommodation. Alternative 2: Organize at least two events during the entire construction phase to create environmental awareness among the construction workers.	**23.1.2 Submittal has been provided consisting of the following documents-** - As per the due diligence II site visit, two environmental awareness programs were conducted for the construction workers during the construction phase. The photographs have been submitted highlighting awareness programs have been conducted among the construction workers. **The documentation is complete.**

Criterion 26	**Positive Social Impact**	
	Mandatory – **26.1.4** Ensure that tobacco smoking is prohibited on-site during the entire construction phase.	**26.1.4 Submittal has been provided consisting of the following documents-** - Photographs have been submitted indicating that tobacco is prohibited on site and 'no smoking' signages were displayed in multiple locations. Site visit report compiled by GRIHA Council officials and the compliance report submitted by the project team confirms the same. A non-smoking policy document highlighting prohibition of tobacco smoking within the site premises during the construction phase has been submitted. **The documentation is complete.**