

Energy Audit Report



Date : 14.08.2020

From
The Principal,
Dr. N.S.A.M. First Grade College
Bangalore

To
The Principal
Nitte Meenakshi Institute of Technology
Bangalore

Respected Sir,

Subject: Request to conduct energy audit

There is need to conduct energy audit in Dr. N.S.A.M First Grade College, Krishnarajapura Campus. I understand that the Electrical department conducted energy audit at NMIT campus already. In this regard, I request you to kindly help us getting it done by the electrical department of NMIT.

I request you once again to help us in this regard.

Thanking You

Received &

Accepted

[Signature] 14/08/2020

PRINCIPAL
PRINCIPAL

Dr.N.S.A.M. First Grade College
Sy No..21, Krishnarajapura Village
Shivakote (P) Hesaraghatta Hobli,
Yelahanka, Bangalore-560 089

[Signature]
Principal

Nitte Meenakshi Institute of Technology
Govindapura, Yelahanka,
BANGALORE 560 084

14/08/2020





Energy Audit Report

Prepared and Submitted

By

**NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING**

AUDIT TEAM:

Dr V Ranganathan Prof. & HoD, EEE, NMIT, Bangalore
Dr J Shefali Assistant Prof. EEE, NMIT Bangalore
Mr. Vinay M K, Lab Assistant, EEE, NMIT, Bangalore

V. Ranganathan 7/9/2020
J. Shefali
Mr. Vinay M K

Date of Audit:

17-08-2020

Date of submission of Report:

25-08-2020



Date Revision : 3/9/2020 to include transport fire safety, biometric and sanitizers

Audit Report Approved By:

Principal, Nitte Meenakshi Institute of Technology:

[Signature]

PRINCIPAL
NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY
P.B. 6429, GOVINDAPURA, GOLLAHALLI
YELAHANKA, BENGALURU - 560 064

Principal, Dr NSAM First Grade Degree College;

PRINCIPAL
Dr. N.S.A.M. First Grade College
Sy No. 21, Krishnarajapura Village
Shivakote (P) Hesaraghatta Hobli,
Yelahanka, Bangalore-560 089



Table of Contents

Contents

| | |
|---|----|
| Introduction: | 2 |
| Details of Energy Installations: | 2 |
| Energy Installation Details | 3 |
| Energy Consumption Details | 4 |
| Photographs of important installations | 5 |
| Geo tagged images of Business Lab | 5 |
| COMPUTER LAB | 6 |
| LANGUAGE LAB..... | 7 |
| Geo Tagged Images- Classrooms | 8 |
| Geo Tagged Images- Staff Rooms | 9 |
| Seminar Halls with ICT facility | 12 |
| RAIN WATER HARVESTING | 14 |
| SEWAGE TREATMENT PLANT | 14 |
| RO PLANT | 15 |
| LIFT SPECIFICATION AND INSTALLATION | 17 |
| GYMNASIUM | 18 |
| PRINTERS AND XEROX MACHINES | 20 |
| Transport, Fire Safety, Biometrics and Sanitization Details | 23 |
| Observations | 25 |
| APPENDIX A SINGLE LINE DIAGRAM..... | 26 |



Introduction:

Dr N S A M First Grade College approached NMIT to conduct the energy audit as per need of NAAC process and Principal, NMIT deployed a team consisting of Dr. V Ranganathan HOD EEE NMIT, Dr J Shefali Assistant Prof. EEE NMIT and Mr. M K Vinay lab assistant to conduct the energy audit for Dr N S A M First Grade college and the team visited the college on 17th August 2020. The team interacted with Principal, NAAC Coordinator, and other personnel to collect the data needed and inspected the premises to collect various information to affect the audit.

Details of Energy Installations:

The College has an installed capacity 40KW from BESCOM and also supports diesel backup with a capacity of 40 to 50KW. Thus, one to one backup support is provided. This enables the institute to have monthly installed capacity of 12000 units considering the institution works for 10 hours per day. However, utilized capacity is ranges from 2500 Units to 4000 Units with the current installations. The backup diesel generator has an installed capacity of 40KW to 50KW thus providing 1:1 power back up at instance of time. The generator has a diesel capacity of 150liters and at any point of 200 liters of diesel stored in the campus. Being the rural area power interruptions are inevitable and on an average one third of the daily consumption is provided by the diesel generator back up. There are many best practices that need to be mentioned.

- One to one back up
- All lighting is through 20W LED bulbs
- Minimal air conditioning consisting of only three 1.5-ton installations
- UPS Back up for all critical installations with minimal back up as Gen set will be up within 5 to 10 min of power interruptions.
- There are around 411 20W LED tube lights
- There are around 236 fans all of same types consuming around 60-80W
- Mostly Tubular batteries are used in UPS and smaller requirements are using maintenance free batteries.



Survey No.21, Krishnarajapura Village, Shivakote Post, HesaraghattaHobli, Yelahanka, Bangalore-560 089

- All batteries are well maintained and good condition.
- Institute has all needed installations like Seminar Hall, Board Room, Open Air Theatre, Gymnasium with only mechanical installations, Computer Lab, Language Lab, Rain water Harvesting, and Sewerage treatment plant.
- Incoming power is 415V three phase with proper switch gear installation.
- Both Main transformer from BESCOM and Diesel Generator are housed next to each other with proper ergonomics and ventilations needed for such purpose and maintained well.
- College has a park consisting of endangered vegetations which unique of its nature.
- College does not have any hostel facility thus there is minimal requirement of power after office hours
- College has one 5 HP pump and HP submersible pump for water pumping with adequate storage capacity.
- There are totally 23 class rooms, 3 labs, 3 faculty rooms, 2 seminar halls and office space to the tune of 624 sq. mts.
- The college has RO plant for drinking water needs.
- There is no non-LED Lamps
- College has sufficient ICT enabled Class Rooms as per needs.
- The college also an Electric Lift to be used by differently abled and other needy personnel

Energy Installation Details

- 7.5 KVA UPS- 2Nos.
- 5 KVA UPS – 1 No.
- 1 KVA UPS – 6Nos.
- BOARD AC -1.5X2 tons
- Administrator ROOM AC-1.5 Tons
- Borewell Motor Pump - 5 HP
- Submersible Motor Pump- 6HP
- Sewerage treatment – 3.7 – 5 KW
- Lights 20W LED -411
- Fans – 236
- RO Plant
- Rain Water Harvesting
- Gymnasium (mechanical)

Dr. R.N. Sathyanarayana Ph. D. (Landon)
Formerly,
Professor and University Head of Horticulture
Dean – postgraduate studies

Presently
Scientist Emeritus,
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Dated 19th February 2021

To Whomsoever concerned

A Report on Green Initiatives at Dr. N.S.A.M. First Grade College Campus

I was invited by the principal of Dr. N.S.A.M First Grade College to give a report on the green initiatives taken up by the institute. It was a pleasurable visit for me in many ways. As soon as I arrived, I was sweetly mesmerised by the sylvan surroundings of the institute. I found that the institute is nestled amidst an enchanting wooded area and I could not really take my eyes off the beauty and tranquillity surrounding the campus. Blessed are those students who spend their time learning in what ever subjects they enrolled them self for. Entering the inside the corridor was another serene experience. The corridor leading to Departments of Administration and Laboratories was highly peaceful in nature which had a soothing effect on me. I went along the Principal, Dr. R Shanti Iyer, to have a first-hand experience on the green initiatives taken up by the institution. At the entrance of the college, I found neat patches of landscaped garden. The choices of plants seen in green patches were found deliberately picked for creating aesthetic space. Aesthetic spaces are as much sacrosanctum as activity of teaching instruction which goes on inside the portals of institute itself. I found a very interesting landscape showing collection of endangered plant which are very precious. There is certainly a hand of a compassionate botanist in creating such a space. A short distance towards the left-hand façade of the institute I found a unique stone garden. In clear terms it is unique rockery. It is unique because of a spell binding element which is a

naturally moulded, in creation of these space, is a very big natural rock formation that took me on a time travel. This rock may have been a gneiss formation probably dating back to millions of years. It is ingenious on part of the institute to have conserved it and designed a fantastic xerophytic plant garden and this apart a host of water plants which drew my eye's attention. It is a loveliest of corners where I spent quite an amount of time going to all precious design elements there- of. Further, a beautiful board caught my attention which contained a list of plants incorporated in the garden.

I ventured into another side to the outside right wing of the college. It was a very strange experience for me to witness a lovely medicinal and aromatic plants serenade which included herbs, shrubs and trees as well. I was happy to see a listing of plants maintained in the form beautiful eye-catching boards carrying the names and the economic uses of the plants. I spent quite an amount of time discovering each and every plant. I wished even the trees lining the path all along leading toward the back of the college building and canteen along the shrubbery path of medicinal plants labelled. These plants were by no means alien to me as myself is a horticulturalist by profession. What struck me was the neat hand work of people involved in picking the most interesting plants and arranging them in that space. I was truly impressed by the maintenance of this space too. Kudos to the staff involved in creating such a space. Adjacent to these, on the opposite side, included a large space utilised to create a sporting arena. I wondered through and around the sports arena surrounded by the greenery of wooded horizon as far and wide as my eyes could catch. Off course, I missed a basketball court conspicuously by its absence. But this remark does not mean to be a negative one as myself is a basketball player. To play my game in this surrounding would have been an exhilarating experience. Hence, I missed it. Blessed are these students here who spent a good amount of time playing in these great surroundings.

In addition to these green spaces, other green initiatives included an STP unit which serves a good purpose recycling waste water, a bio compost unit, a rain water catchment plan for recharging the ground water, a methodical waste segregation unit and of course energy saving initiatives of using LED Blubs.

Having wondered through all the above green initiatives, I was hugely impressed to learn that students are also involved in many of the initiatives. I wish this institute encourages students allotting green credits from the beginning of the academic year to the end of the academic year.

With my large experience of professional teaching career of nearly four decades I can visualise the impact of these green spaces and initiatives that may have on the physical and mental wellbeing of students adding to their overall personality development.

This institute in my opinion course with distinction on its efforts on creating and crediting green spaces. This does not mean that this could entirely suffice, as changes are a continuous dogma in the Universe. The institute should always be on progressive front taking initiatives as an when required to keep the nature well protected.



Dr. B. N. SATHYANARAYANA
Emeritus Scientist (ICAR)
UAS, GKVK, Bengaluru - 65

Survey No.21, Krishnarajapura Village, Shivakote Post, HesaraghattaHobli, Yelahanka, Bangalore-560 089

- Indoor Sports
- Auditorium
- Seminar Hall, language lab, computer lab and business lab
- Diesel Generator
- 27 computers in computer lab supported 5 KVA.
- Most of the office, administrator, and faculty needs are provided with UPS support
- 13 different printers
 - HP Laser Jet 1020 -4
 - Dot Matrix – 3
 - HP Laser Jet 1007-2
 - ID Card Printer – 1
 - Brother Printer cum scanner – 1
 - Cannon printer -1
 - Epson colour printer -1
- Xerox Machine -Canon - 1

Energy Consumption Details

Diesel consumption – in a month for example 1-6-2020 is 190 Litres @ Rs.65.74 per liter amounting to Rs. 12528.60 only

Another month consumption is 189.8 Litres @ Rs.73.26 per litre amounting to Rs.13905.00.

This is roughly one third of monthly consumption being located in the rural area.

BESCOM RR No MSYEH 91687

Account No: 9220455281

Consumption History

| S.No | From Date | To Date | Amount Consumed | Remarks |
|------|-------------|----------|-----------------|---------------------------------|
| 1. | Jul 2020 | Aug 2020 | 29763 | 3180 units 2020 subsidy Rs.7630 |
| 2. | Jun 2020 | Jul 2020 | 31430 | |
| 3. | May 2020 | Jun 2020 | 28650 | |
| 4. | Apr 2020 | May 2020 | 27574 | |
| 5. | Mar 2020 | Apr 2020 | 46597 | |
| 6. | Feb 2020 | Mar 2020 | 49971 | Peak Consumption |
| 7. | Jan 2020 | Feb 2020 | 49938 | |
| 8. | Dec 2019 | Jan 2020 | 40238 | |
| 9. | Nov 2019 | Dec 2019 | 41070 | |
| 10. | Oct 2019 | Nov 2019 | 41463 | |
| 11. | Sep 2019 | Oct 2019 | 39239 | |
| 12. | Aug 2019 | Sep 2019 | 35765 | |
| 13. | 16 Feb 2019 | Aug 2019 | 209890 | |

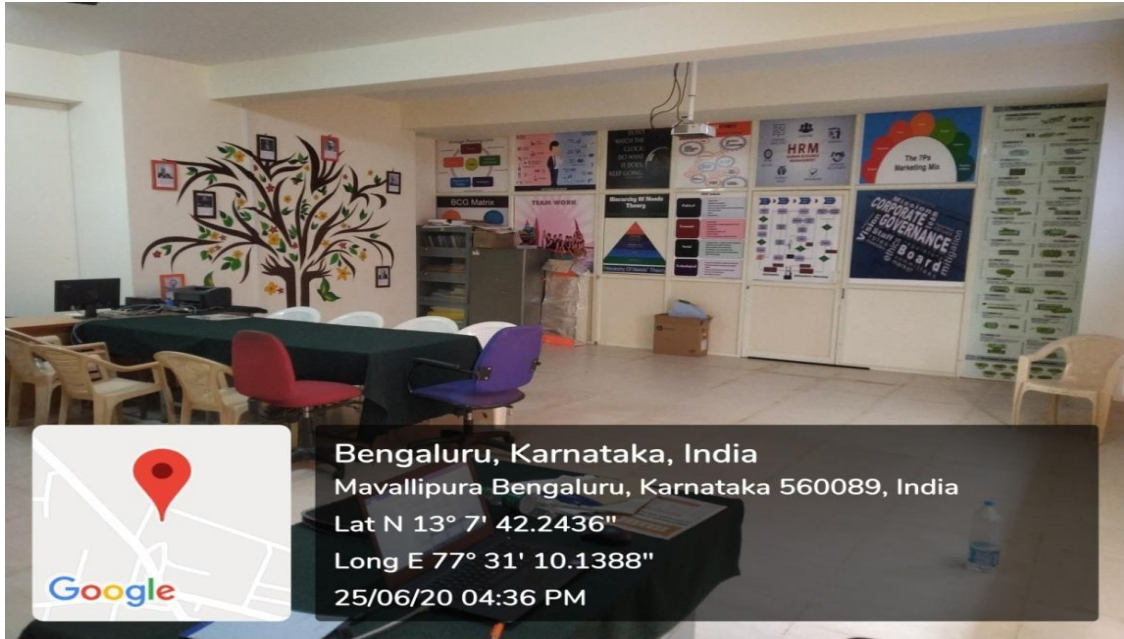
Thus, we see the college consumes only one-third of installed capacity at any point time. Thus, there is a well planned provision for future expansions of the premises for next 5 years.

Photographs of important installations

Geo tagged images of Business Lab



Geo tagged images of Business Lab



COMPUTER LAB



LANGUAGE LAB



Geo Tagged Images- Classrooms

Room No.- LH 102



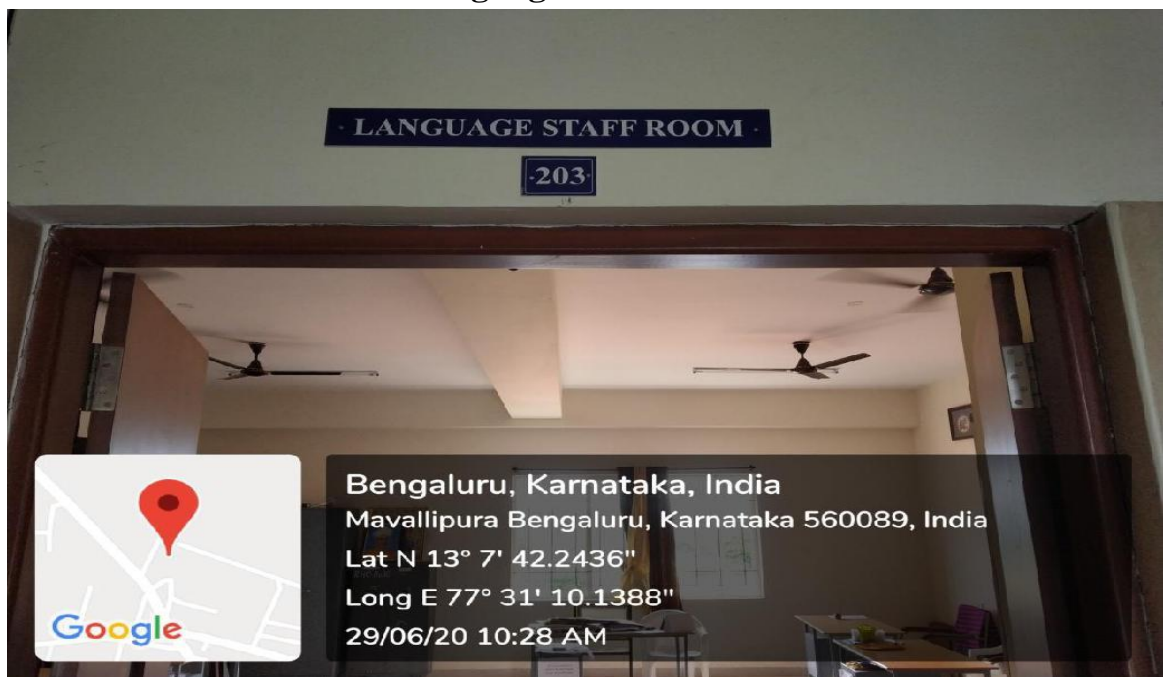
Room No. LH 107





Geo Tagged Images- Staff Rooms

Languages Staff Room



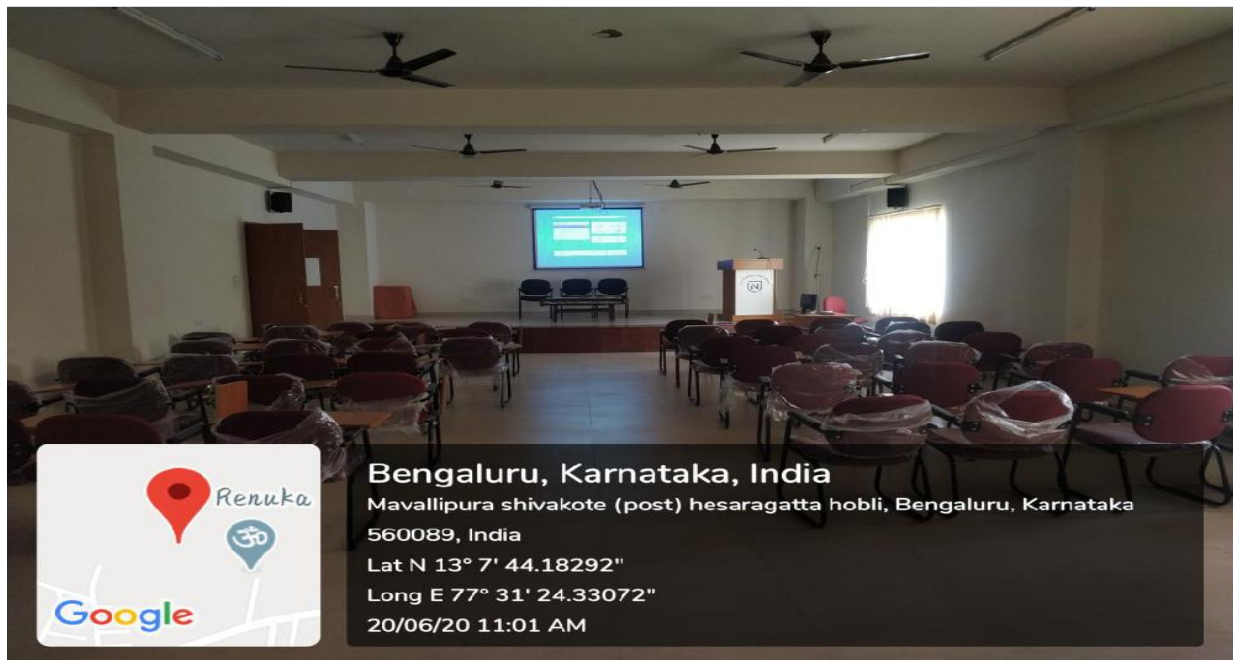


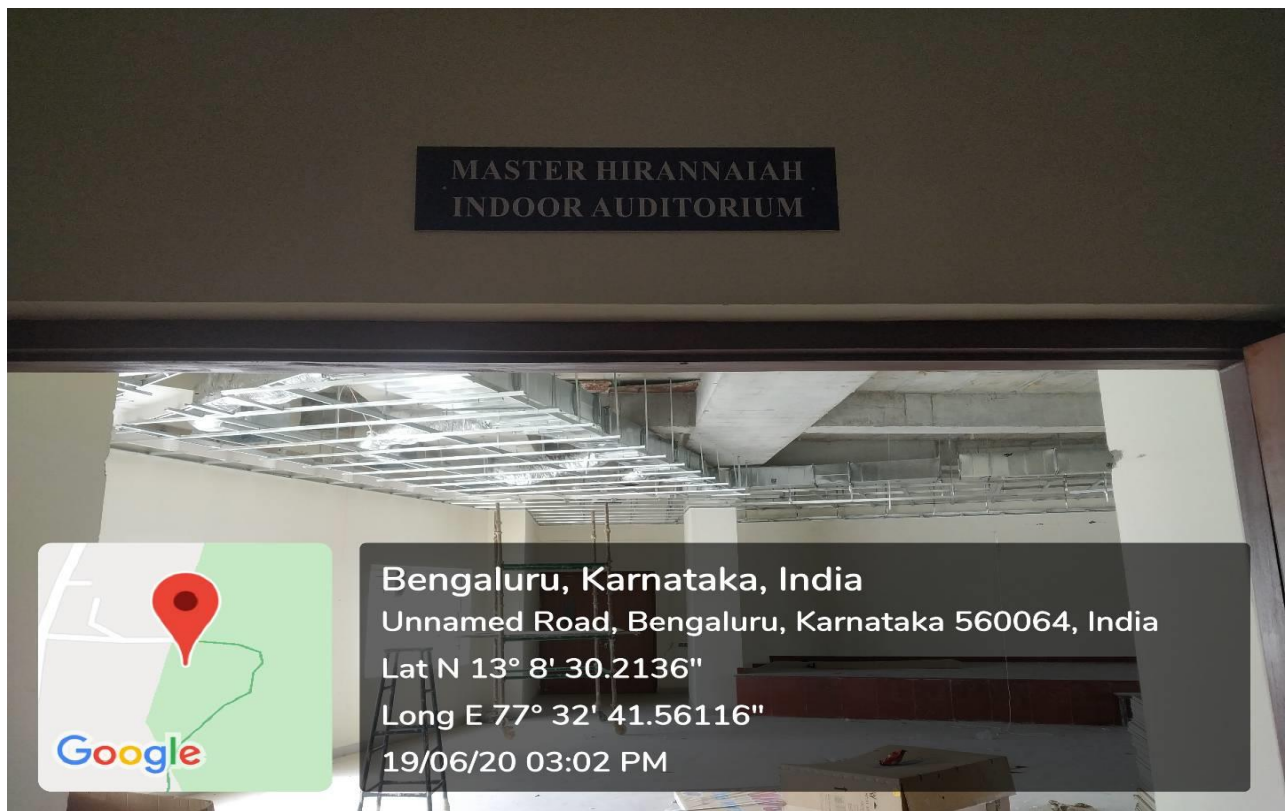


Seminar Halls with ICT facility

Room No 312- Dr. Sarvepalli Radhakrishnan Seminar Hall And Seminar Halls with ICT facility

Room No 210- B.S. Raman Seminar Hall





RAIN WATER HARVESTING



SEWAGE TREATMENT PLANT

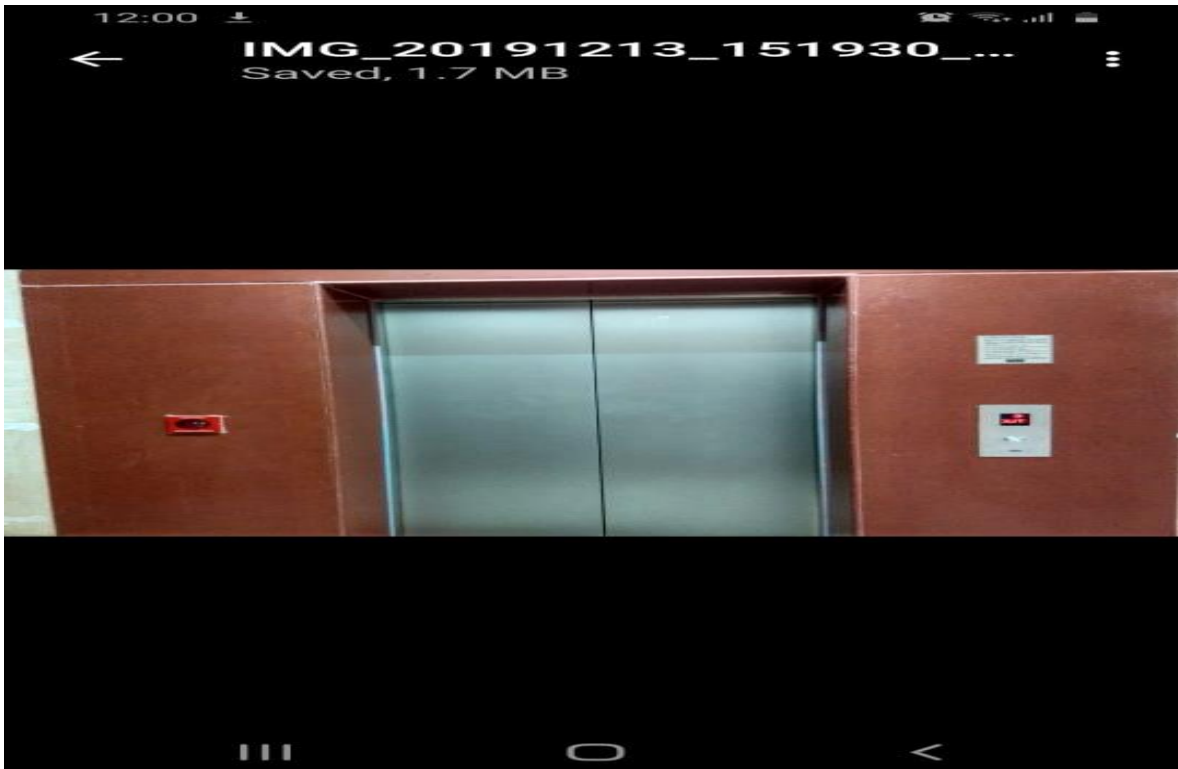
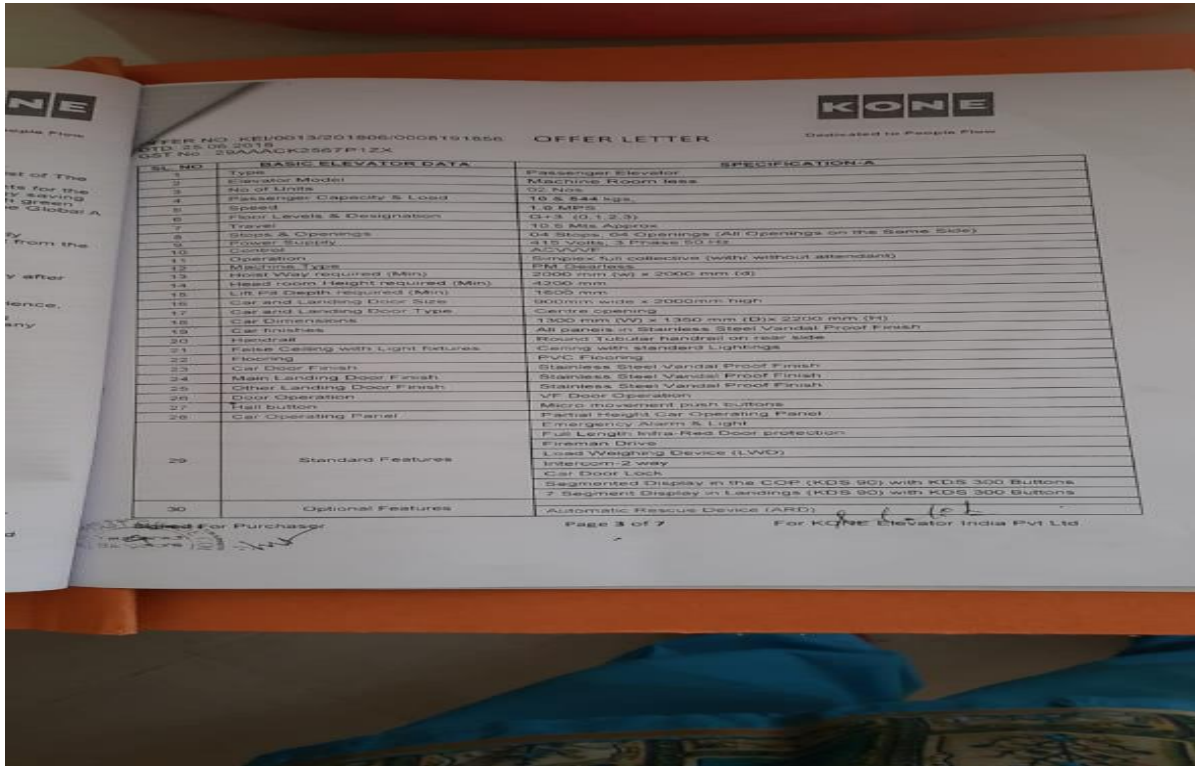


RO PLANT





LIFT SPECIFICATION AND INSTALLATION



GYMNASIUM



Bengaluru, Karnataka, India
 Unnamed Road, Bengaluru, Karnataka 560064, India
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 Long E 77° 32' 42.00072"
 19/06/20 02:38 PM



NITTE
EDUCATION TRUST

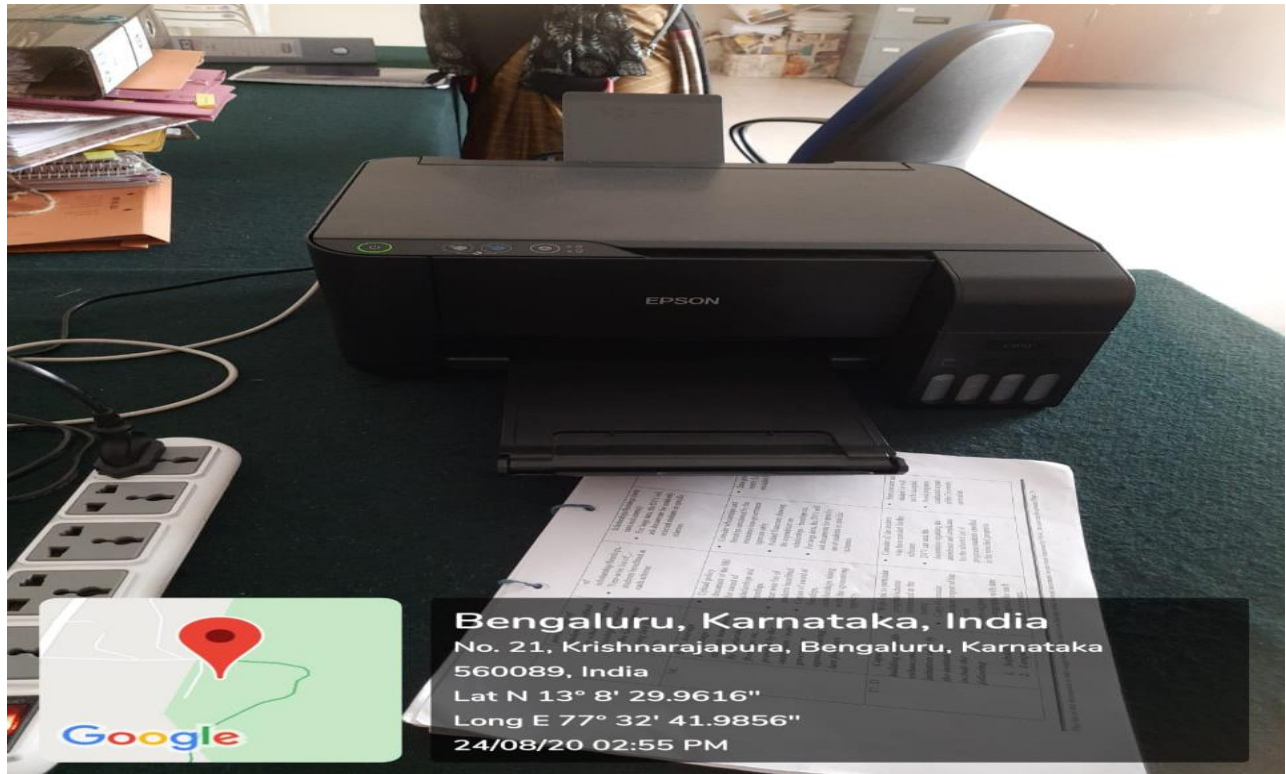
Endangered Species Garden

| | |
|----------------------------|-------------------------------|
| 1. Decalepis hamiltonii | 19. Oroxyllum indicum |
| 2. Calcestrus paniculatus | 20. Placodermis venenocoides |
| 3. Pilea macrocarpa | 21. Anicurus biphyllus |
| 4. Embelia taylorii-coctam | 22. Rauvolfia serpentina |
| 5. Rhabdodaphne purata | 23. Raflosporium montanum |
| 6. Nephrolepis nimmiana | 24. Cholorophytum borvilianum |
| 7. Clacidiaria fenestratum | 25. Phoroparus sandilius |
| 8. Adiantum beddomei | 26. Dalbergia latifolia |
| 9. Chonemorpha fragrans | 27. Caricoma acedera |
| 10. Adonia hirsuta | 28. Hirtogardia populifolia |
| 11. Cycas circinalis | 29. Urtica saccolata |
| 12. Salacia oblonga | 30. Messia fortis |
| 13. Canarium strictum | 31. Operculina turpethum |
| 14. Vitex indica | 32. Syzygium transcoricum |
| 15. Garcinia indica | 33. Toona ciliata |
| 16. Garcinia guineo-gutta | 34. Stereopermium cordata |
| 17. Garcinia xanthochymus | 35. Nilgiritanthus ciliatus |
| 18. Aphanmixia polystachya | |





PRINTERS AND XEROX MACHINES





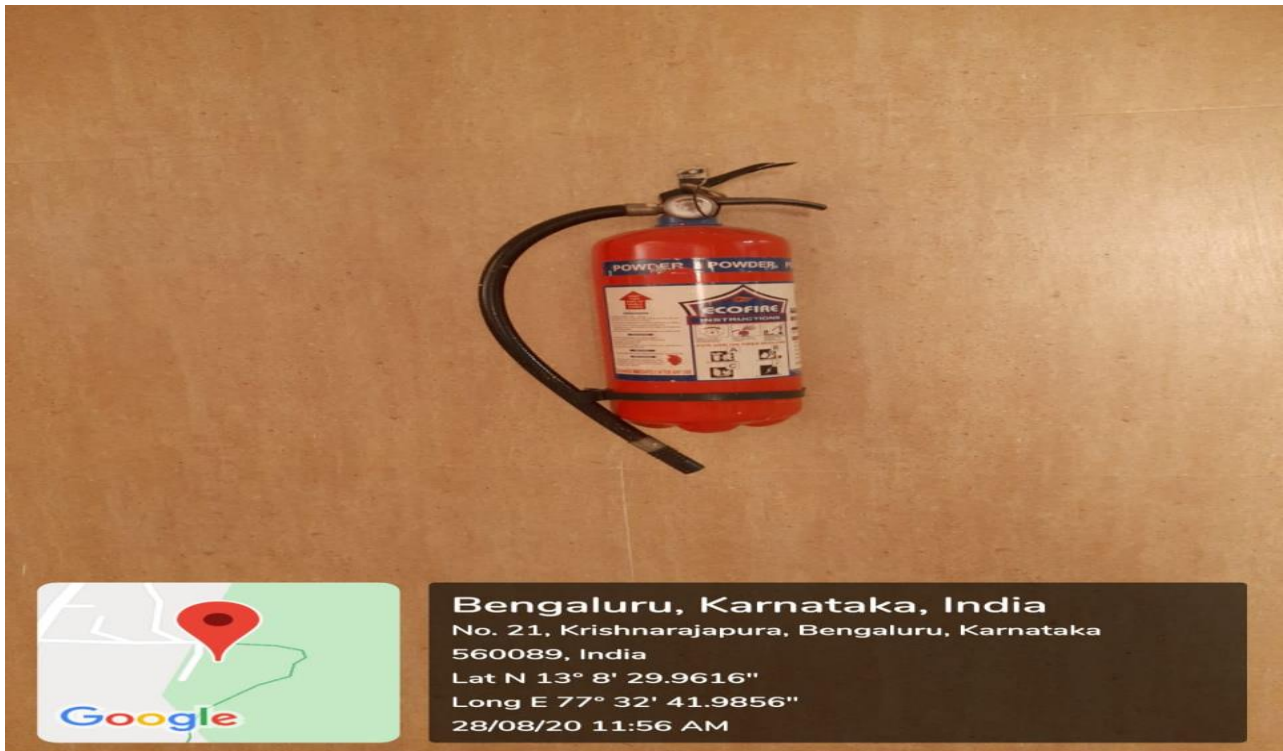


Bengaluru, Karnataka, India
No. 21, Krishnarajapura, Bengaluru, Karnataka
560089, India
Lat N 13° 8' 29.9616"
Long E 77° 32' 41.9856"
24/08/20 02:51 PM



Bengaluru, Karnataka, India
No. 21, Krishnarajapura, Bengaluru, Karnataka
560089, India
Lat N 13° 8' 29.9616"
Long E 77° 32' 41.9856"
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Transport, Fire Safety, Biometrics and Sanitization Details







Transport Expenses

There are one staff bus and one principal car as maintain transportation system apart from this seven-private bus through contract and one tempo traveler makes the transportation fleet.

| S.No | Month | Transport Expenses (Rs.) | Remark |
|------|----------|--------------------------|------------------------|
| 1. | Jan 2020 | 33347 | Bus plus principal car |
| 2. | Feb 2020 | 36226 | |
| 3. | Mar 2020 | 20316 | |
| 4. | May 2020 | 22327 | |
| 5. | Jun 2020 | 40509 | |
| 6. | Jul 2020 | 06414 | Vacation Period |

Maintenance charge of Rs.1860 spent in last six month for transport system owned.

There is one biometric system, Inclinator one, Sanatory Pad dispenser one,

Observations

- Campus has self-contained energy system
- Maintained well and has many best practices observed earlier
- We can improve the energy efficiency by following actions
 - Convert all fans with BLDC fans to bring down energy level by 60% of already consumed
 - Put energy saver for Airconditioned Units to save 20% of power consumed
- Effort of solarization not carried out hence roof top solarization will make the Institute self sufficient and also can connect gird to generate revenue for the institution in the long run.
- As CSR excess power can be supplied nearby villages.



APPENDIX A SINGLE LINE DIAGRAM

