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Personnel Certification Body

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PQMS/2023/1/12/32

Date: 27/01/2023

To Whom It May Concern

It is to certify that PQMS Quality Services Pvt. Ltd. SCO-21, 4th Floor, Feroze Gandhi Market, Ludhiana-141001 (Punjab) has conducted Energy Audit for Santosh Deemed to be University in January 2023.

Santosh Deemed to be University has been undertaking satisfactory steps towards best practice of Energy Management System. The area of improvement has been identified which has been mentioned in detailed Energy audit report.

Audit Site: Santosh Deemed to be University.

Address: No.1, Santosh Nagar, Ghaziabad, NCR Delhi-201009

Audit Tenure: - 18th Jan 2023 to 25th Jan 2023.

**Gaurav
Prakash**

Digitally signed
by Gaurav
Prakash

Date: 2023.01.27
14:46:17 +05'30'

Prepared By



**Maneet
Deewan**

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Approved By

Energy Audit-Santosh Deemed to be University

Energy Audit Report

January 2022



Santosh Deemed to Be University

No.1, Santosh Nagar, Ghaziabad, NCR Delhi-201009

Audit Conducted By:



Professional Quality Management Services
SCO-21, 4th Floor, Feroze Gandhi Market Rd, Ludhiana,
Punjab 141001.

Energy Audit-Santosh Deemed to be University

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Energy Audit-Santosh Deemed to be University

1. Acknowledgement

We acknowledge the cooperation and support of the management and staff of Santosh Deemed to be University, in particular, the support and disposition of the Dr. Sanjeev Tomar (Faculty, Santosh Deemed to Be University), Mr. Kannan (Admin) & Mr. Arasumani Malaiappan (Assistant Maintenance Manager) Teaching/Supporting Staff of institute has been invaluable to the success of this report. We hereby assure you that, all information obtained in the course of this Audit exercise, as well as those contained in this report, will be remain confidential as per NDA (Non-Disclosure Agreement) clause.



Energy Audit-Santosh Deemed to be University

2. Introduction

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2016–17 onwards that all Higher Educational Institutions should submit an annual Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures. In view of the NAAC circular regarding energy auditing, the Institute Management decided to conduct an external Energy Evaluation by a competent Environment Auditor along with a Environment Audit Assessment Team headed by Dr. Sanjeev Tomar, Mr. Kannan and Mr. Arasumani Malaiappan.

3. Context

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2016–17 onwards that all Higher Educational Institutions should submit an annual Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding energy auditing, the Institute Management decided to conduct an external Energy Evaluation by a competent Environment Auditor along with an Environment Audit Assessment Team headed by Dr. Sanjeev Tomar, Mr. Kannan and Mr. Arasumani Malaiappan.

4. Energy Audit: Types and Methodology

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage

Energy Audit-Santosh Deemed to be University

according to its discrete functions. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management program.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption.

5. Objective & Scope

The broad aims/benefits of the eco-auditing system would be

- Assessing present pattern of energy consumption in different cost centers of operations.
- Relating energy inputs and production output.
- Identifying potential areas of thermal and electrical energy economy.
- Highlighting wastage in major areas.
- Fixing of energy saving potential targets for individual cost centers.
- Implementation of measures of energy conservation and realization of savings.

6. Overview of Organization

In 1995, the Santosh Medical/Dental Colleges and Hospitals came up as one of the top institutions in India to study medicine and dentistry in Ghaziabad. The university has been offering an MBBS course since 1995 with a total intake of around 50 students per year. 2005 onwards, the course was recognized by the Ministry of Health and Family Welfare of the Government of India and the capacity of accepting a particular number of admissions was increased to 100. 20 years after its inception, the institute is considered as the best medical university, India. In the same manner, Santosh Dental College started in 1995 with an aim of imparting a higher-level education in dentistry. The institution offers a foundation course in



Energy Audit-Santosh Deemed to be University

BDS since 1995 by accepting about 40 students annually. But the number of admissions went up higher to 100 per year after 2005. It is now one of the best universities for higher education. The degree offers to develop an understanding of the physical and biological process of oral healthcare. The college runs an MBBS course and undergraduate level and there are post graduate medical courses like MD, MS and M.Sc. and doctoral (PhD) courses. These courses are well-recognized by the Medical Council of India to offer degrees in 17 disciplines. In 2007, the Deemed University Status was conferred on the medical and dental college by the Ministry of HRD of the Government of India on the recommendation of University Grants Commission. Santosh Medical College and Hospital is among the best educational institutions and aims to achieve excellence in medicine practice with prime focus on serving the humanity. Established in 1995, Santosh Medical & Dental College and Hospital provides top class education in the field of medicine and dentistry. The educational institution rose to prominence stand amongst the best medical institute in India.

Following facility available at Santosh Deemed to be University as detailed:

6.1 Administrative Block

The administrative block of Santosh Deemed to be University is located on the 4th floor and houses the offices of the Chancellor, the Vice-Chancellor, the Dean (Medical), Dean (Academics), the Registrar, the Controller of Examination, Finance Controller, Quality Assurance & enhancement cell.

6.2 Central Library

The central library is located on the first and the second floor of the University and is spread over an area of 4000 sq. m. The library is open between 8 a.m. to 9 p.m. It has a huge collection of books, journals, and reference materials. It also offers facilities for photocopying and internet connectivity. There is also a separate room

Energy Audit-Santosh Deemed to be University

for self-reading used by the students, the interns, and the residents of the University.

6.3 Lecture Theaters

Santosh Deemed to be University houses an adequate number of lecture theatres, which are comfortably spaced and equipped with student-lockers, audio-visual (AV) aids, projection microscopes, computers, and internet facilities, required for seamless learning. Most of the lecture theatres are supported by demonstration rooms, seminar rooms, and departmental library.

6.4 Laboratory

All laboratories in the Santosh Deemed to be University are equipped with microscopes, artificial lights, electrical points, washing facilities and preparation rooms. The University also have laboratories that are dedicated to some of the departments, such as Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Microbiology and Forensic Medicine. Apart from the general laboratory facilities, they are also furnished with some special equipment, such as MRI and CT machine, wherever required. The laboratories also have museums with specimens and models related to the different departments along with catalogues for easy referencing.

6.5 Auditorium

Santosh Deemed to be University houses one excellent auditoriums – Maharaja Hall, with a sitting capacity of more than 300 people each. The auditorium hosts various socio-cultural and academic events throughout the year.

6.6 Pharmaco Vigilance Center

The Government of India has identified Santosh Deemed to be University as the regional center for Pharmaco Vigilance Programs, located in the Pharmacology Department at Santosh Medical College.



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6.7 Hostel

Santosh Deemed to be University provides separate hostel accommodations for boys and girls, assuring a high level of security for its residents. Hostel rooms are clean, spacious, and comfortable. The residents are provided with basic amenities such as internet connectivity, recreation rooms, common rooms, and an in-house mess. Students availing hostel facilities are free to interact with the in-house faculty members to create a congenial atmosphere. There is a common dining room with separate areas embarked for boys, girls, staff, and other residents.

6.8 Residential Quarters

There are 179 residential quarters allotted to the teaching and non-teaching staff of Santosh Deemed to be University, 58 quarters are allocated to the teaching faculty and 121 quarters are allocated to the non-teaching staff.

6.9 Canteen

There are two canteens providing food to the students, hospital staffs and visitors. There is also a separate canteen cum mess, which provides meals to the students availing the hostel facilities.

6.10 Medical Facilities

In-house medical facilities are available for the students, faculty, staffs and other members of Santosh Deemed to be University.

6.11 Sports & Recreation

The University conduct several numbers of recreational and sporting activities to keep the students healthy and fit throughout the years. Sports and recreational services include playground for outdoor games, facilities and amenities for indoor games and a gymnasium.

7. Scope of Improvement

- Energy Policy to be adopted by the College Campus.
- Stack height of DG set should be as per DG Rules

Energy Audit-Santosh Deemed to be University

- Display of Energy Saving Awareness posters should be there in the prominent areas of campus.



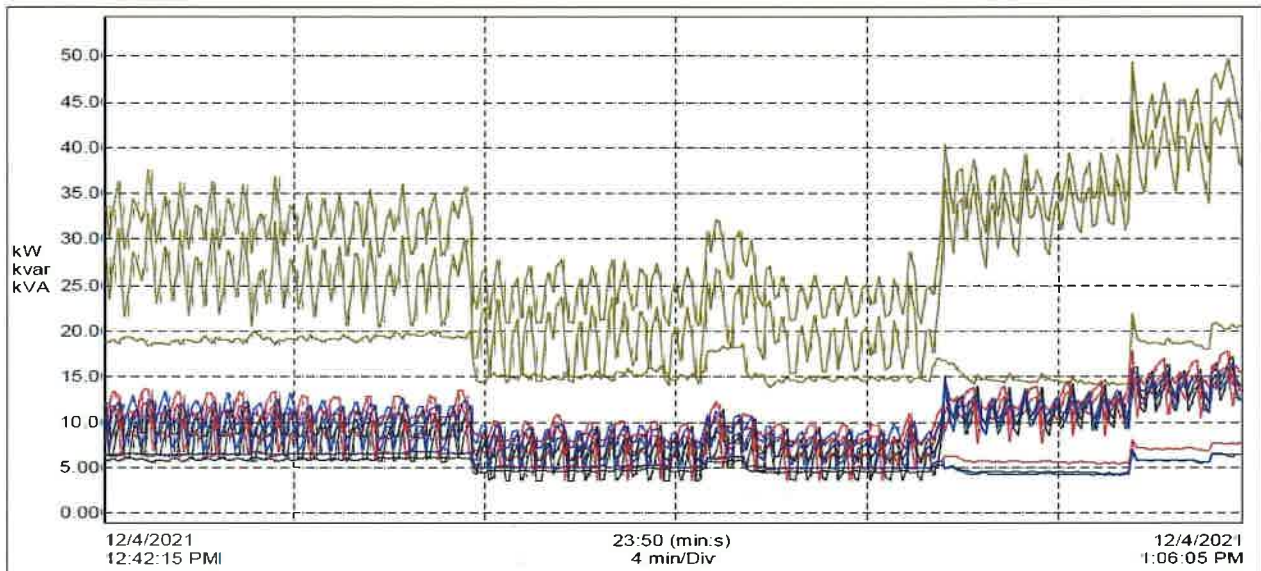
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8. Instruments Used in Energy Audit

Master List Of EA Instruments					
Sr. no.	Instruments	Model	Instrument Number	OEM	Image of Instruments
1	Power Analyzer	ALM 30 ALM 35	00302929	KRYKARD INDIA	
2	Flow Meter	PT878	PT 7 6186 E	GE USA	
3	Thermal Imager	881-2	02214667	TESTO GERMANY	
4	Infrared Thermometer	62 Mini	14841880	FLUKE USA	
5	Digital Thermo Hygrometer	288 ATH	2027386	HTC CHINA	
6	Digital Anemometer	AM 4201	AE.09961	LUTRON CHINA	
7	Digital Lux Meter	LX 101	AE.09143	LUTRON CHINA	
8	Digital Multimeter	801 AUTO	201061078	MECO INDIA	
9	Digital Clampmeter	DT 3150	YC-209634	MECO INDIA	
10	Digital TDS Meter	CD 610	S358236	HANNA ITALY	

Energy Audit-Santosh Deemed to be University

Name	Date	Time	AVG	MIN	MAX	Units	Duration	Units
N1 (var)	12/4/2021	12:42:15 PM	5.182	4.232	6.764	kvar	23:55	(min:s)
N2 (var)	12/4/2021	12:42:15 PM	5.846	4.683	7.993	kvar	23:55	(min:s)
N3 (var)	12/4/2021	12:42:15 PM	5.517	4.138	6.982	kvar	23:55	(min:s)
NT (var)	12/4/2021	12:42:15 PM	16.79	13.81	21.79	kvar	23:55	(min:s)
P1 (W)	12/4/2021	12:42:15 PM	7.922	3.495	15.98	kW	23:55	(min:s)
P2 (W)	12/4/2021	12:42:15 PM	8.925	3.580	16.09	kW	23:55	(min:s)
P3 (W)	12/4/2021	12:42:15 PM	8.823	4.803	15.18	kW	23:55	(min:s)
PT (W)	12/4/2021	12:42:15 PM	25.67	14.05	45.40	kW	23:55	(min:s)



9. Sound Decibel Monitoring 9.1 Dental College

S No.	Location	Sound Level (db)
1.	Basement Library	50
2.	Basement Library UG Section	48
3.	Basement Library PG Section	51
4.	Digital Library	49
5.	LAB Oral Pathology	51
6.	Basement IHC	58
7.	Basement Seminar Room	65
8.	Basement Department Library	56
9.	Ground Floor Billing Area	64



Energy Audit-Santosh Deemed to be University

10.	Ground Floor X-Ray Room	48
11.	Ground Floor Department of OMDR	49
12.	Ground Floor Post Graduate Clinic	59
13.	Ground Floor Post Graduate Seminar Room	66
14.	Ground Floor Facility Room	61
15.	Ground Floor Dean Office	68
16.	Ground Floor Pantry	67
17.	Ground Floor HR Room	54
18.	1st Floor Lecture Theatre-3	50
19.	1st Floor OPG Room	57
20.	1st Floor Clinical PG Section Room	68
21.	1st Floor Paediatric Dentistry Room	62
22.	1st Floor HOD Room (Paediatric& Preventive	60
23.	1st Floor Oral Pathology	56
24.	2nd Floor HOD Room (Conservative Dentistry)	58
25.	Department of Oral Pathology	60
26.	Conservative & Operative Dentistry	53
27.	3rd Floor HOD Room (Department of Prosthodontics)	54
28.	Seminar Room	61
29.	Library	48
30.	UG Clinic (Prosthodontics)	51
31.	Casting Laboratory	54
32.	Post Graduate Clinic	56
33.	PG Lab	51
34.	Plaster Laboratory	54
35.	Mechanical Lab	59
36.	Ceramic Lab	50
37.	Implant Prosthodontic Clinic Facility Room	53

Energy Audit-Santosh Deemed to be University

9.2 Santosh Hospital

Sr. No	Location	Area	Sound Level (db)
1	Ground Floor	Casualty	50
2		Triage	48
3		Reception	51
4		Waiting Lounge	49
5		X-ray room	51
6		CT scan	58
7		Ultrasound	65
8	1st Floor	General medicine OPD	56
9		General surgery OPD	64
10		Pediatric OPD	48
11		Gynecology OPD	49
12		Orthopedic OPD	59
13	2nd Floor	Dental OPD	66
14		ENT OPD	61
15		Pathology Lab	68
16		Microbiology Lab	67
17		Blood Bank	54
18		Ophthalmology OPD	50
19		Psychiatry OPD	57
20	5th Floor	General Ward	68
21		Gynecology OT	62
22		Labor Room	60
23	6th Floor	Private Ward	56
24	7th Floor	Accommodation	58
25	8th Floor	ICU	60
26		Operation Theatre	53



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9.3 Medical College

Sr. No	Location	Area	Sound Level (db)
1	Basement	Kitchen	50
2		Students Mess	48
3		Examination Hall	51
4	Ground Floor	Boys Common Room	49
5		Girls Common Room	51
6		Anatomy Museum	58
7		Histology lab	65
8		Anatomy Dissection hall-1	56
9		Anatomy Dissection hall-2	64
10		Tutor Room	48
11		Anatomy Assistant Professor Room	49
12		HOD Room Anatomy	59
13		Demonstration room	66
14		LT-1	61
15		LT-2	68
16		LT-3	67
17			Santosh Central Library
18	Research Lab		50
19	Departmental Library cum Journal Room		57
20	First Floor	Biochemistry Lab	68
21		Demonstration room	62
22		Professor and HOD Room (Biochemistry)	60

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23		Department of Physiology	56	
24		Department Library cum Seminar Room	58	
25		Mammalian Lab	60	
26		Hematology Lab	53	
27		Demonstration room	50	
28		Clinical Physiology	48	
29	2nd Floor	Associate professor and HOD room (pathology)	51	
30		Tutor room	49	
31		Associate professor (3 room)	51	
32		Clinical pathology lab	58	
33		Research lab	65	
34		Department library cum seminar room	56	
35		Demonstration room (forensic medicine)	64	
36		Museum (forensic medicine)	48	
37		3rd Floor	Clinical pharmacology lab	49
38			Computer assisted lab	59
39	Non-teaching staff room		66	
40	Research lab		61	
41	Departmental library cum seminar room		68	
42	Tutor room		67	
43		Associate professor Room	50	
44		HOD room	48	
45		Tutor room (microbiology)	51	
46		HOD room	49	
47		Assistant professor room	51	



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48		Microbiology lab	58
49		Professor room	65
50		Empty room (3)	56
51		Demonstration room	64
52		Research lab	48
53		Museum	49
54		Library room	59
55		Seminar room	66
56		Staff room	61
57	4th Floor	Administrative offices	68
58		Account department	67
59		Central Research Facility	54
60		IQAC	50

10. Illumination System

10.1 Luminary Details

The building maintenance cell had already changed all the old high energy consuming light with the energy efficient LED lights. We have measured lux area wise for the sample basis.

10.2 Area wise lux level

Dental College

S No.	Location	Lux Level	
		Max.	Min.
1.	Basement Library	126	138
2.	Basement Library UG Section	131	140
3.	Basement Library PG Section	160	171

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4.	Digital Library	152	170
5.	LAB Oral Pathology	158	174
6.	Basement IHC	161	170
7.	Basement Seminar Room	164	174
8.	Basement Department Library	144	150
9.	Ground Floor Billing Area	141	144
10.	Ground Floor X-Ray Room	145	154
11.	Ground Floor Department of OMDR	151	160
12.	Ground Floor Post Graduate Clinic	170	181
13.	Ground Floor Post Graduate Seminar Room	127	138
14.	Ground Floor Facility Room	122	130
15.	Ground Floor Dean Office	134	143
16.	Ground Floor Pantry	160	167
17.	Ground Floor HR Room	159	172
18.	1st Floor Lecture Theatre-3	160	170
19.	1st Floor OPG Room	164	170
20.	1st Floor Clinical PG Section Room	170	180
21.	1st Floor Pediatric Dentistry Room	164	172
22.	1st Floor HOD Room (Pediatric Dentistry)	150	162
23.	1st Floor Oral Pathology	171	183
24.	2nd Floor HOD Room (Conservative Dentistry)	166	171
25.	Department of Oral Pathology	155	160
26.	Conservative & Operative Dentistry	143	168
27.	3rd Floor HOD Room (Department of Prosthodontics)	150	165
28.	Seminar Room	149	160
29.	Library	146	158
30.	UG Clinic (Prosthodontics)	120	125
31.	Casting Laboratory	152	160
32.	Post Graduate Clinic	128	144
33.	PG Lab	121	129
34.	Plaster Laboratory	161	174



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35.	Mechanical Lab	17 0	180
36.	Ceramic Lab	16 4	174
37.	Implant Prosthodontics Clinic Facility Room	15 0	163

Santosh Hospital

S No	Location	Area	Lux	
			Min.	Max.
1	Ground Floor	Casualty	124	142
2		Triage	123	138
3		Reception	135	147
4		Waiting Lounge	139	145
5		X-ray room	121	140
6		CT scan	127	138
7		Ultrasound	124	136
8	1st Floor	General medicine OPD	139	145
9		General surgery OPD	142	150
10		Pediatric OPD	145	154
11		Gynecology OPD	142	153
12		Orthopedic OPD	148	160
13	2nd Floor	Dental OPD	147	162
14		ENT OPD	142	168
15		Pathology Lab	142	152
16		Microbiology Lab	137	151
17		Blood Bank	134	159
18		Ophthalmology OPD	139	150
19	Psychiatry OPD	140	157	
20	5th Floor	General Ward	137	154
21		Gynecology OT	134	157
22		Labor Room	142	167
23	6th Floor	Private Ward	143	168

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24	7th Floor	Accommodation	138	150
25	8th Floor	ICU	129	151
26		Operation Theatre	130	155

Medical College

SNo	Location	Area	Lux	
			Min.	Max.
1	Basement	Kitchen	128	140
2		Students Mess	130	145
3		Examination Hall	131	147
4	Ground Floor	Boys Common Room	138	148
5		Girls Common Room	135	147
6		Anatomy Museum	129	138
7		Histology lab	125	140
8		Anatomy Dissection hall-1	147	164
9		Anatomy Dissection hall-2	146	167
10		Tutor Room	137	150
11		Anatomy Assistant Professor Room	144	158
12		HOD Room Anatomy	146	164
13		Demonstration room	144	163
14		LT-1	153	169
15		LT-2	158	172
16		LT-3	152	170
17		Santosh Central Library	155	174
18		Research Lab	154	171
19		Departmental Library cum Journal Room	158	178
20	Biochemistry Lab	149	173	



Energy Audit-Santosh Deemed to be University

21	First Floor	Demonstration room	150	180
22		Professor and HOD Room (Biochemistry)	147	164
23		Department of Physiology	144	165
24		Department Library cum Seminar Room	146	160
25		Mammalian Lab	144	158
26		Hematology Lab	141	152
27		Demonstration room	149	161
28		Clinical Physiology	149	174
29	2nd Floor	Associate professor and HOD room (pathology)	142	158
30		Tutor room	145	155
31		Associate professor (3 room)	150	171
32		Clinical pathology lab	138	147
33		Research lab	135	146
34		Department library cum seminar room	158	164
35		Demonstration room (forensic medicine)	141	149
36		Museum (forensic medicine)	137	144
37	3rd Floor	Clinical pharmacology lab	144	149
38		Computer assisted lab	150	154
39		Non-teaching staff room	148	160
40		Research lab	142	152
41		Departmental library cum seminar room	148	162
42		Tutor room	151	170
43		Associate professor Room	143	172
44			HOD room	146

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45		Tutor room (microbiology)	142	153
46		HOD room	142	159
47		Assistant professor room	143	157
48		Microbiology lab	137	145
49		Professor room	142	150
50		Empty room (3)	151	156
51		Demonstration room	153	160
52		Research lab	147	152
53		Museum	134	147
54		Library room	141	153
55		Seminar room	142	154
56		Staff room	147	158
57	4th Floor	Administrative offices	138	149
58		Account department	139	153
59		Central Research Facility	142	151
60		IQAC	136	147

11. DG Sets

SN	Description	Capacity	Location
1	DG NO 1	320	College
2	DG No 2	320	College
3	DG No 3	300	Hospital
4	DG No 4	300	Hospital
5	DG No 5	1000	Hospital



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12. Air Conditioning

The building is having the Ceiling fans, AC, AHU and FCU for air circulation and Air coolers to get Comfort and also having window and split ACs for air conditioning

List of Fan:

SN.	Type	Location	Qty.
1	Ceiling Fan (60 W)	SANTOSH MEDICAL & DENTAL COLLEGE	300
2	Ceiling Fan (28 W)	HOSPITAL	300
Total			600

Ceiling fan replacement by energy-efficient ceiling fans		
Average power consumption of the ceiling fan at present	Watt	60
Average power consumption of energy-efficient star rated (BLDC) fans	Watt	28
Equivalent Power saving per fan	Watt	32
Numbers of fans to be replaced	Nos.	580
Working Hours Per annum	Hr.	6000
Overall electric Power Cost	Rs./KWH	9
Annual Energy Saving	KWH	115200
Monetary saving	Rs./Year	1036800
Investment	Rs.	1800000
Payback	Month	20.83

13. Area of Improvement

Energy Management has become crucial to the competitors of the facility. Rising fuel costs coupled with increased global competition is forcing industries/buildings and other facilities to slash energy costs. It was aimed at obtaining a detailed idea about the various end use energy consumption activities and identifying, enumerating and evaluating the possible energy savings opportunities. However, Energy conservation is a continuous process and there is always scope for further improvements. With this objective the

Energy Audit-Santosh Deemed to be University

Energy Audit team with the active involvement of office we have identified the following Energy Conservation Opportunities (ECO's). Implementation of the ECO's can further help improve the energy consumption.

List of Energy saving / conservation recommendations

- PF improvement by installing APFC panel
- Replace the ceiling fan with BLDC fan
- It is recommended to install occupancy sensor in office cabins and toilets to save energy
- It is recommended to install the day light sensor on the outdoor lights for automation and control of the lights and this will also help us reduce the unwanted running hours of the lights.



Energy Audit-Santosh Deemed to be University

14. Auditor Credentials

Certificate 32331810 / 4538792345

CQI / IRCA 30498

Gaurav Prakash

has been awarded a Certificate of Achievement for

ISO 50001:2018 - Lead Auditor Course

Energy Management System

by passing the written examination and continuous assessment

Held at

Delhi, India

Completed on

18 Sep 2020

This course meets the formal training requirements for individuals seeking certification under the IRCA Auditor Certification Scheme and for this purpose is valid for five years from the date of completion

Course Number 2000 - PT

254 Certified by the International Register of Certified Auditors (IRCA)

Heather Crick
UK Business Manager

Amanda Mangan
Global Training Manager

Issued by SGS United Kingdom Ltd. Registered in England No 1193985 Registered Office SGS United Kingdom Ltd. Rossmore Business Park
Ellesmere Port, Cheshire, CH65
3EN SGS United Kingdom Ltd. Certification and Business Enhancement SGS House, 217-221 London Road, Camberley, Surrey, GU15 3EY t +44(0) 1276 697 777 f +44(0) 1276 697 696



022464



The Institution of Engineers (India)

By virtue of Qualification, Professional
training and Corporate Membership
of this Institution

GAURAV PRAKASH

OF

ENVIRONMENTAL ENGINEERING DIVISION

is hereby authorised to use the style and title of

Chartered Engineer [India]



M-1718236

Dated 23-04-2021

Secretary and Director General



