



**MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE**

363, Arcot Road, Kodambakkam, Chennai – 24  
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## **Criterion VII – Institutional Values and Best Practices**

### **7.1.2 Institution has facilities for alternate sources of energy**

# **SOLAR POWER PLANT SENSOR BASED LIGHTS & LED BULBS**

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363, ARCOT ROAD, KODAMBAKKAM  
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363, Arcot Road, Kodambakkam, Chennai – 600 024, Tamil Nadu, India

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## 7.1.2 The Institution has facilities for alternate sources of energy and energy conservation measures

### 1. Solar Power Plant

MSEC installed an off grid 200 kW Photovoltaic (PV) system as a part of a grand initiated by the Ministry of New and Renewable Energy (MNRE) for renewable power source with solar power generation.

The PV system installed has three types of solar panels, namely, Monocrystalline (200kW). We generated an exhaustive database of solar panels at varying operational conditions and supplying various types of loads at one site. These data lead us to the development of a useful process model of solar energy utilization and the same was implemented in the project.

The installed monocrystalline PV of 200 kW, feed energy to the loads connected in the Main Block load and Civil Engineering Block load.

We On average it is generates an instantaneous power of 35.36 kW and it generates 851.12kWh (average) per day.

**Table I** - the *energy meter readings* recorded during August 14 and September 2 by the Mono PV systems.

Date	Mono: Generated Units
14 August 2024	845
15 August 2024	851
16 August 2024	856
17 August 2024	852
18 August 2024	848
19 August 2024	845
20 August 2024	849
21 August 2024	845
22 August 2024	851
23 August 2024	854

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24 August 2024	848
25 August 2024	847
26 August 2024	845
27 August 2024	847
28 August 2024	848
29 August 2024	849
30 August 2024	850
31 August 2024	847
01 September 2024	845
02 September 2024	852
<b>Total Units Generated</b>	16974
<b>Money in Rupees</b>	1,23,061



Figure 1. Installed Solar Panels in Main Block

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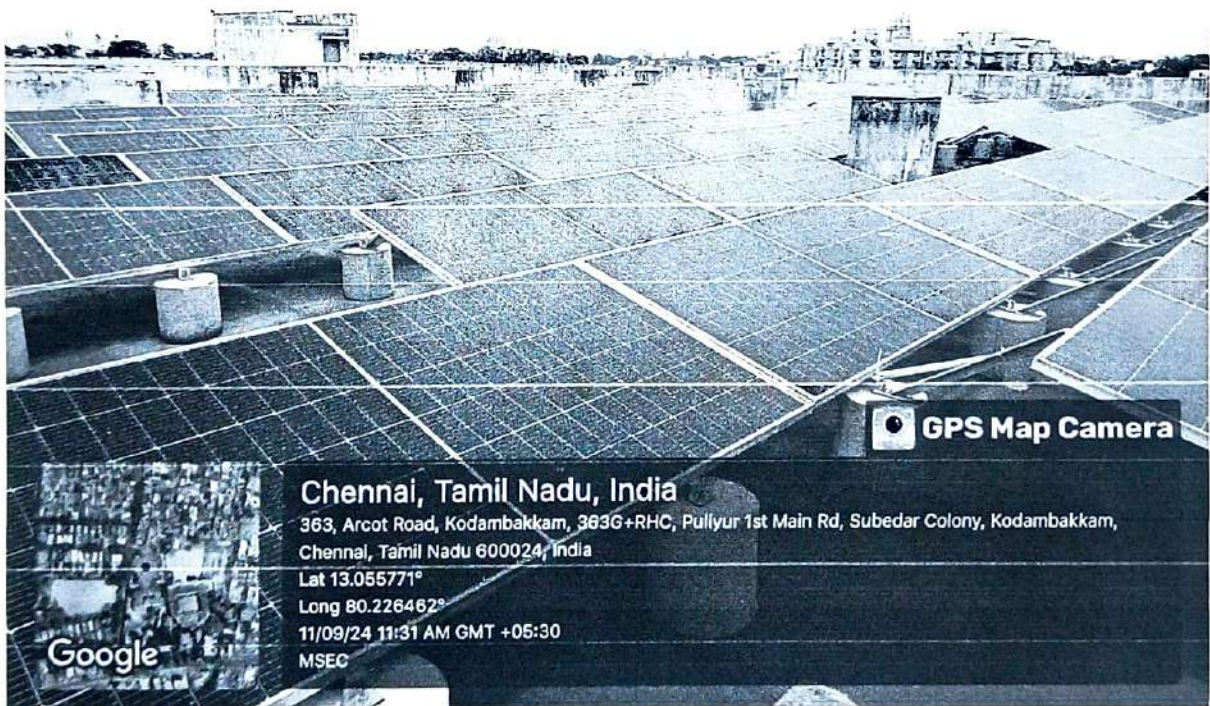


Figure 2. Installed solar panels in Main Block

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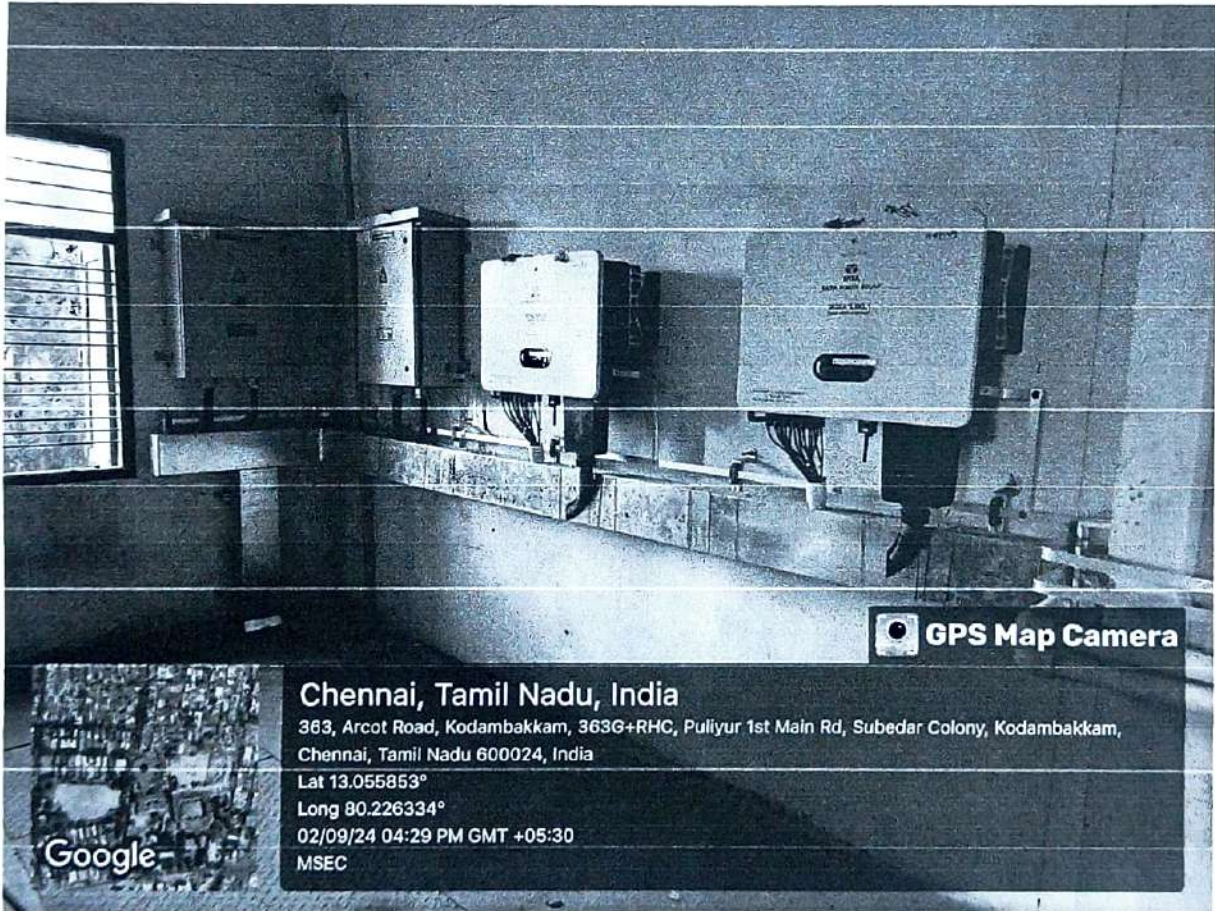


Figure 3. Solar Inverters

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## 2. LED Bulbs

To reduce the harmful effects of conventional lamps and to save the energy, Ministry of New and Renewable Energy (MNRE) insist the educational institutions to switch from conventional lamps to light emitting diode (LED) and compact fluorescent lamp.

LED lights can reduce energy consumption because it has much lower power level and less maintenance cost. Since LED bulbs emit low heat, they are much safer for environment than conventional incandescent lamps.

**Table 1. Common lighting loads installed in each department**

S. No.	Area installed	Fluorescent Lamp (FL) (36 watt)	Compact Fluorescent Lamp (CFL) (20 watt)	LED (36 watt)
<b>Main building block</b>				
<b>KRS seminar hall</b>				
1	KRS seminar hall	0	42	21
<b>CSE</b>				
1	Lab 1 & 2	0	21	18
2	Project and research lab	0	21	18
3	Lab 6	0	10	8
4	Lab 7	0	12	8
5	Lab 8	0	12	10
<b>ECE</b>				
6	Lab 1 & 2	20	0	0
7	Lab 3 & 4	34	0	0
8	Simulation lab	0	24	18
9	Digital signal processing and microprocessor lab	0	24	18
<b>CSE &amp; ECE SEMINAR HALL</b>				

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10	Seminar hall	0	18	21
EEE				
11	Lab 1 & 2 (Electrical machines lab 1&2)	72	0	0
12	Lab 3, 4 & 5	31	0	0
13	Lab 7 (Power Electronics lab)	28	0	0
14	Lab 8 (Power System Simulation lab)	28	1	0
IT				
15	Lab 1 to 6	0	72	54
<b>Mechanical &amp; Civil building block</b>				
MECHANICAL				
16	CAD lab	0	36	0
17	Lab 3, 4, 5 (28 watt FL)	42	0	0
CIVIL				
18	CAD lab (First floor)	0	20	0
19	Lab 1, 2, 3 (SM Lab - Ground floor)	30	0	0
20	Lab 4	8	0	0
21	Lab 5	48	0	0
22	Soil lab	8	0	0
23	Lab 7 (Geology lab - First floor)	8	0	0

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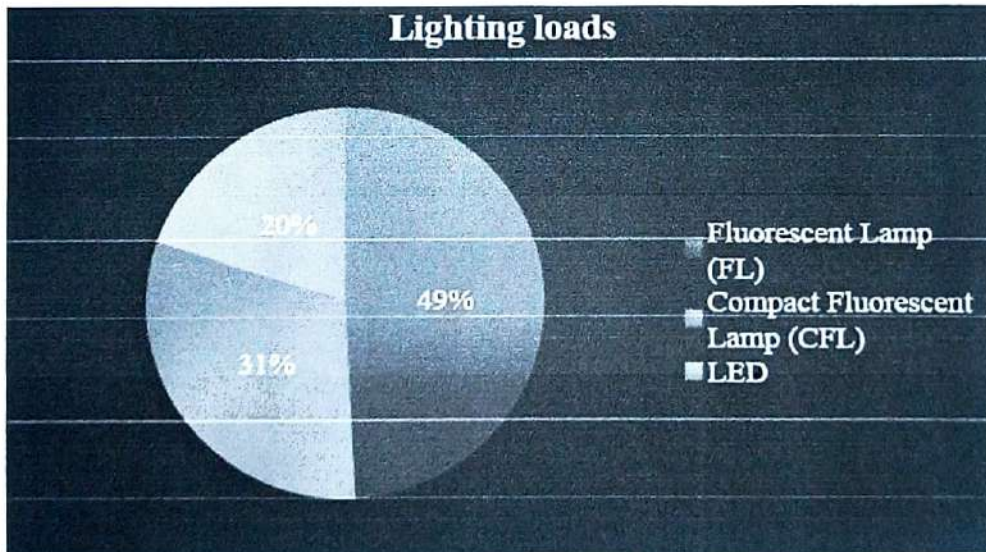
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24	Lab 8, 9 (Environment lab)	24	0	0
25	Lab 11	17	0	0
<b>IET building block</b>				
26	Chemistry lab (Ground floor)	16	0	0
27	Physics lab (First floor)	10	0	0
28	Communication lab (Second floor)	6	0	0
<b>Total</b>		<b>430</b>	<b>271</b>	<b>174</b>



**Figure. 1**

### Details of light loads in our campus:

Total Power requirement for 174 LED Lights = 6264 kWhr

$$\frac{\% \text{ of annual lighting power requirement through LED bulbs}}{\text{Annual lighting power requirement}} \times 100$$

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**Table 2. Amount of Power consumption through LED**

Year	Fluorescent lamps (36 watt) (a)	CFL (20 watt) (b)	LED Lights (36 watt) (c)	Total No. of Lights (d)	Annual lighting power requirement for LED Lights (e)	Total power (Annual lighting power requirement) (f)	% of annual lighting power requirement through LED bulbs (e)/(f)
2023	430	271	174	875	6264	27164	23.06
2024	430	271	174	875	6264	27164	23.06

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Figure 1. CSE Lab 1

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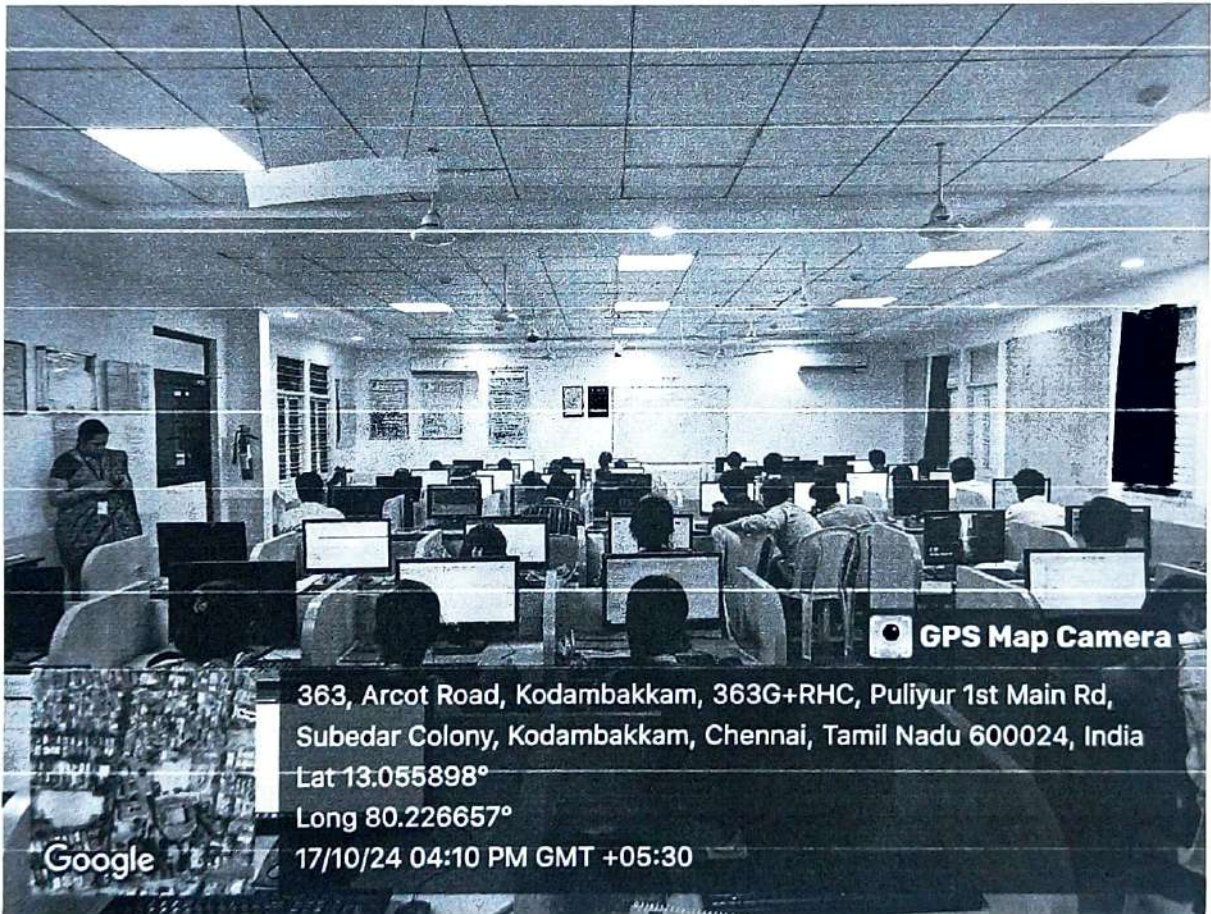


Figure 2. CSE Lab 2

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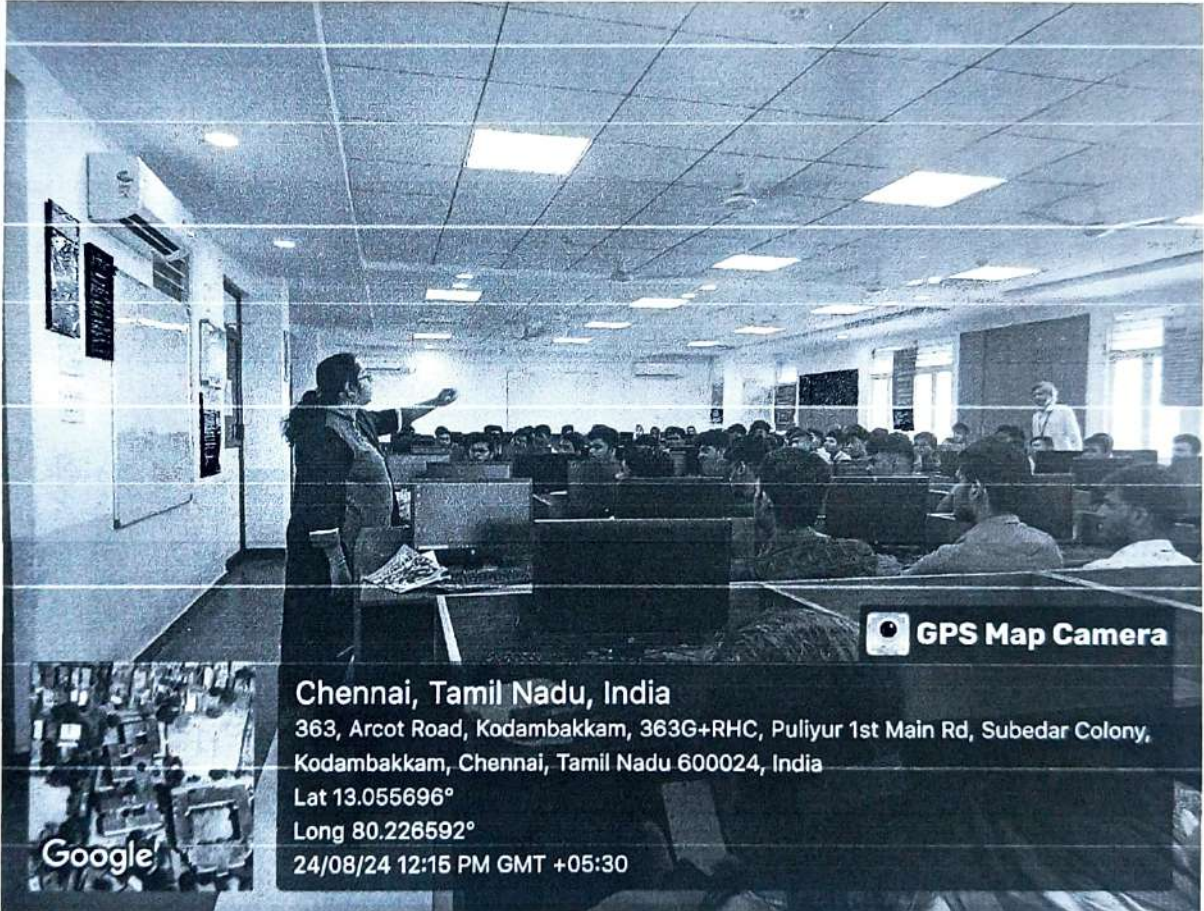


Figure 3. IT LAB

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Figure 4. Seminar Hall (ECE)

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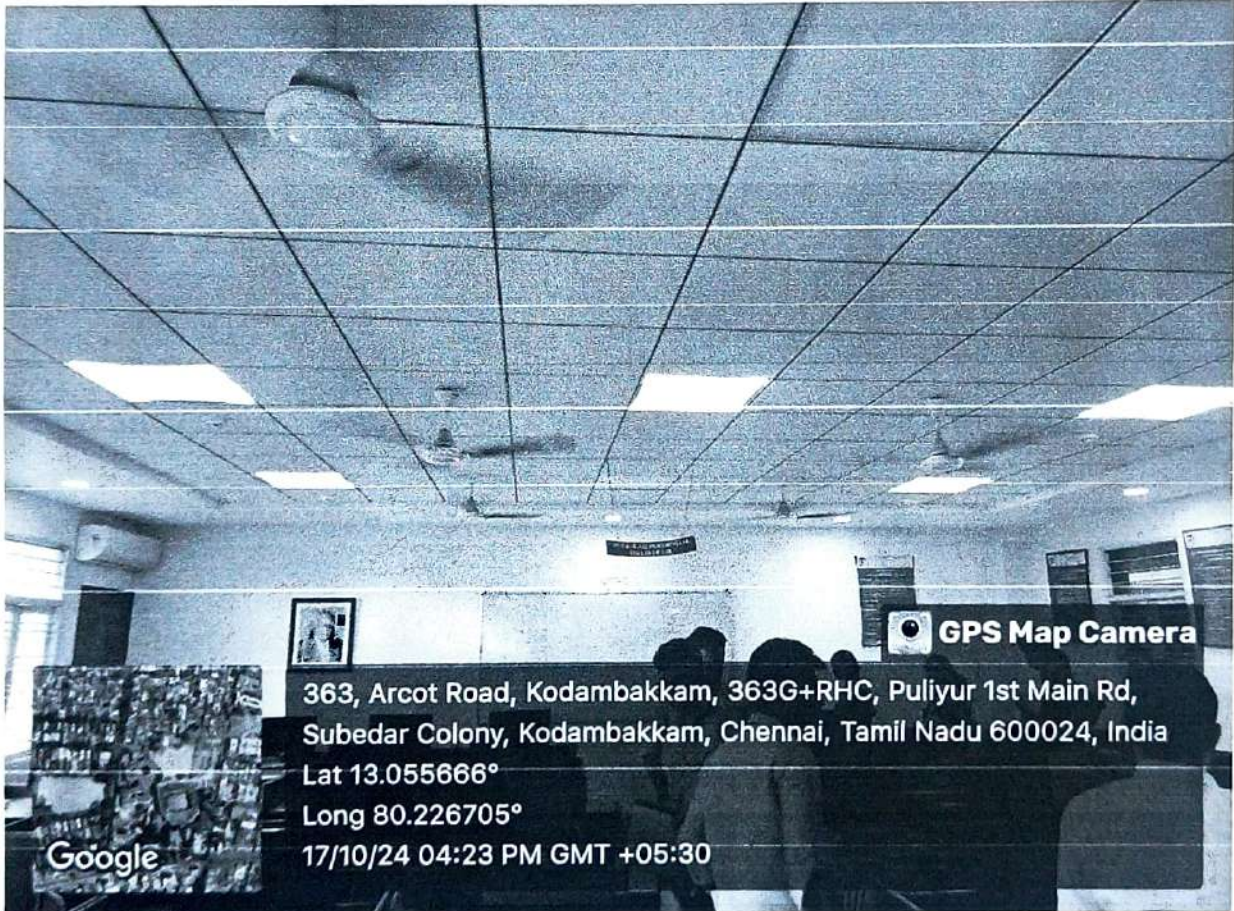


Figure 5. Digital Signal Processing Lab (ECE)

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Figure 6. KRS Seminar Hall

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## 3. Sensor Based Lights

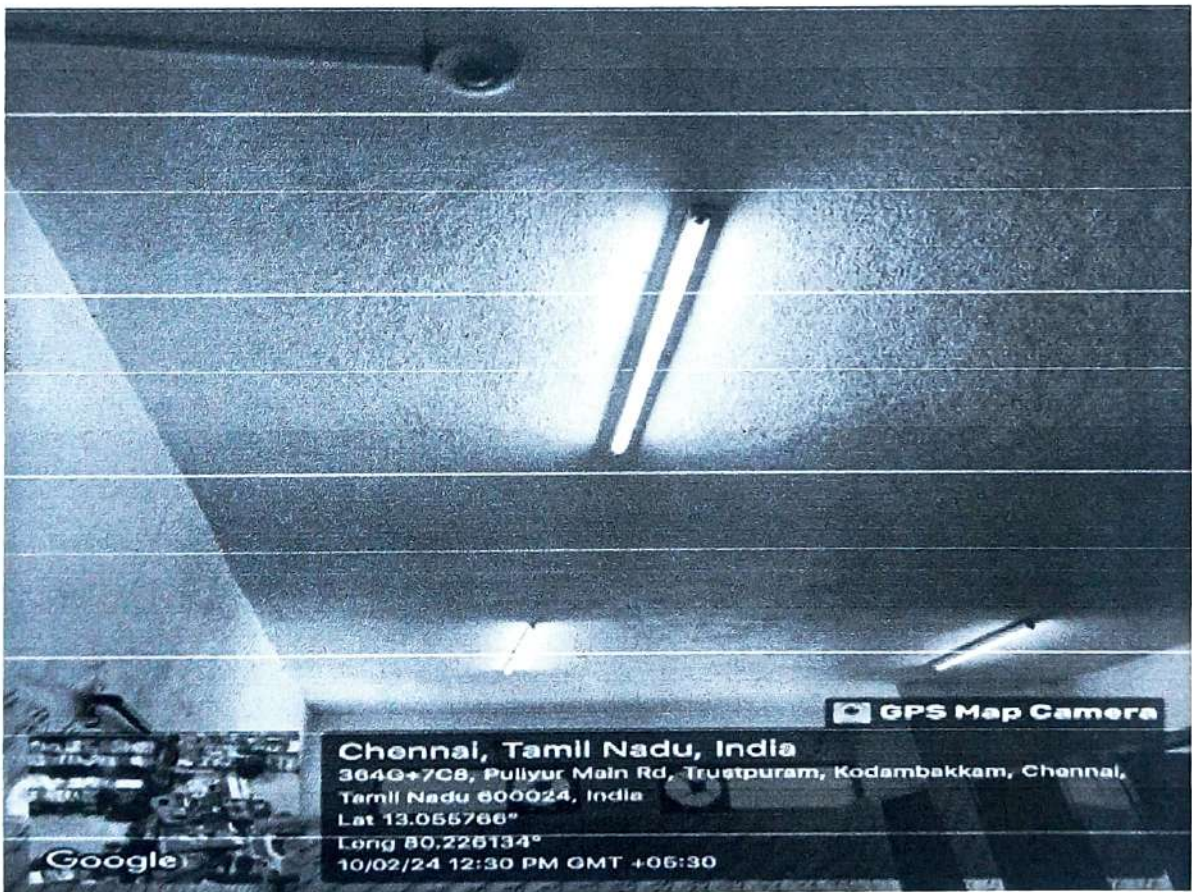


Figure 1. Installed Sensor based Lights in Restrooms(Main block)

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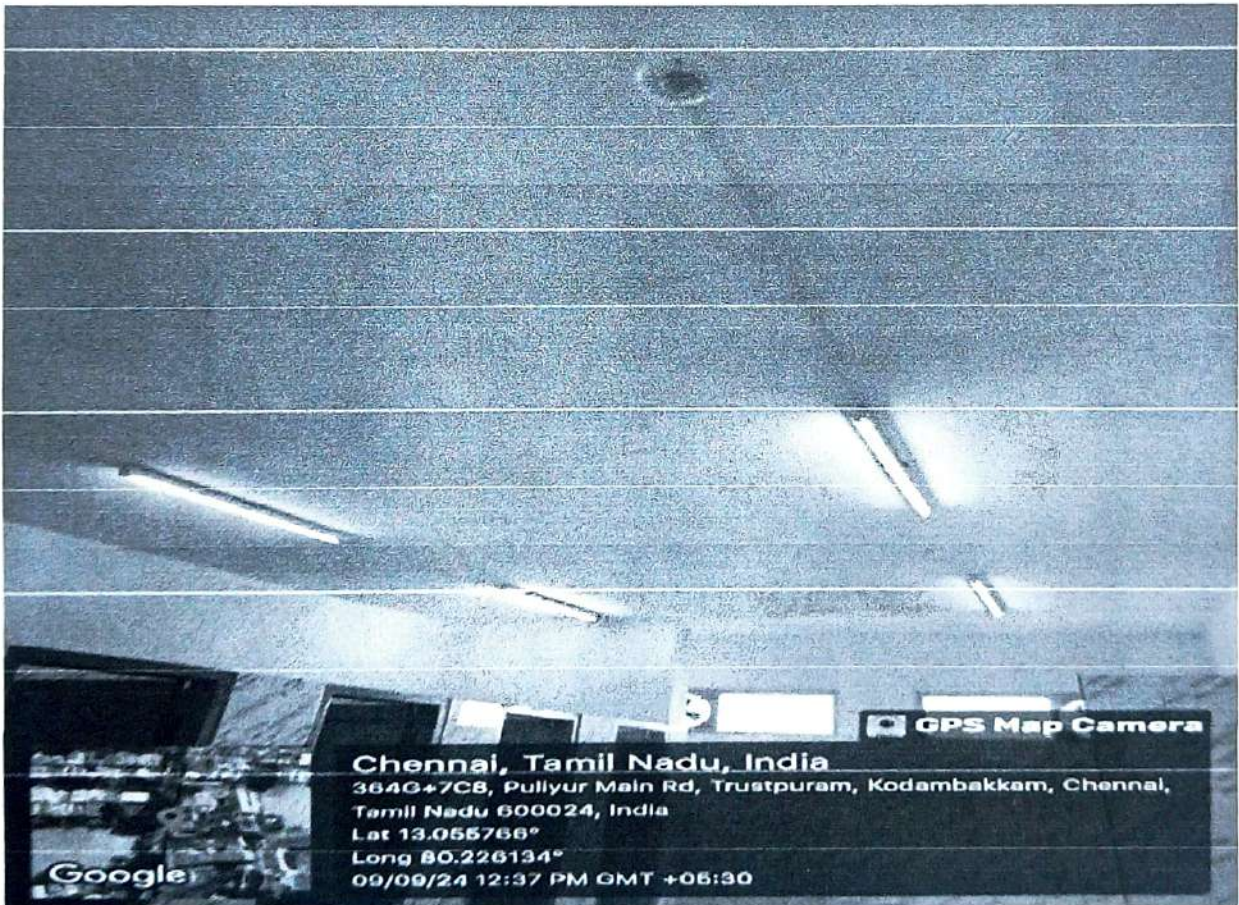


Figure 2. Installed Sensor based Lights in Restroom(Main block)

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Figure 3. Installed Sensor based Lights in Restrooms(Civil block)

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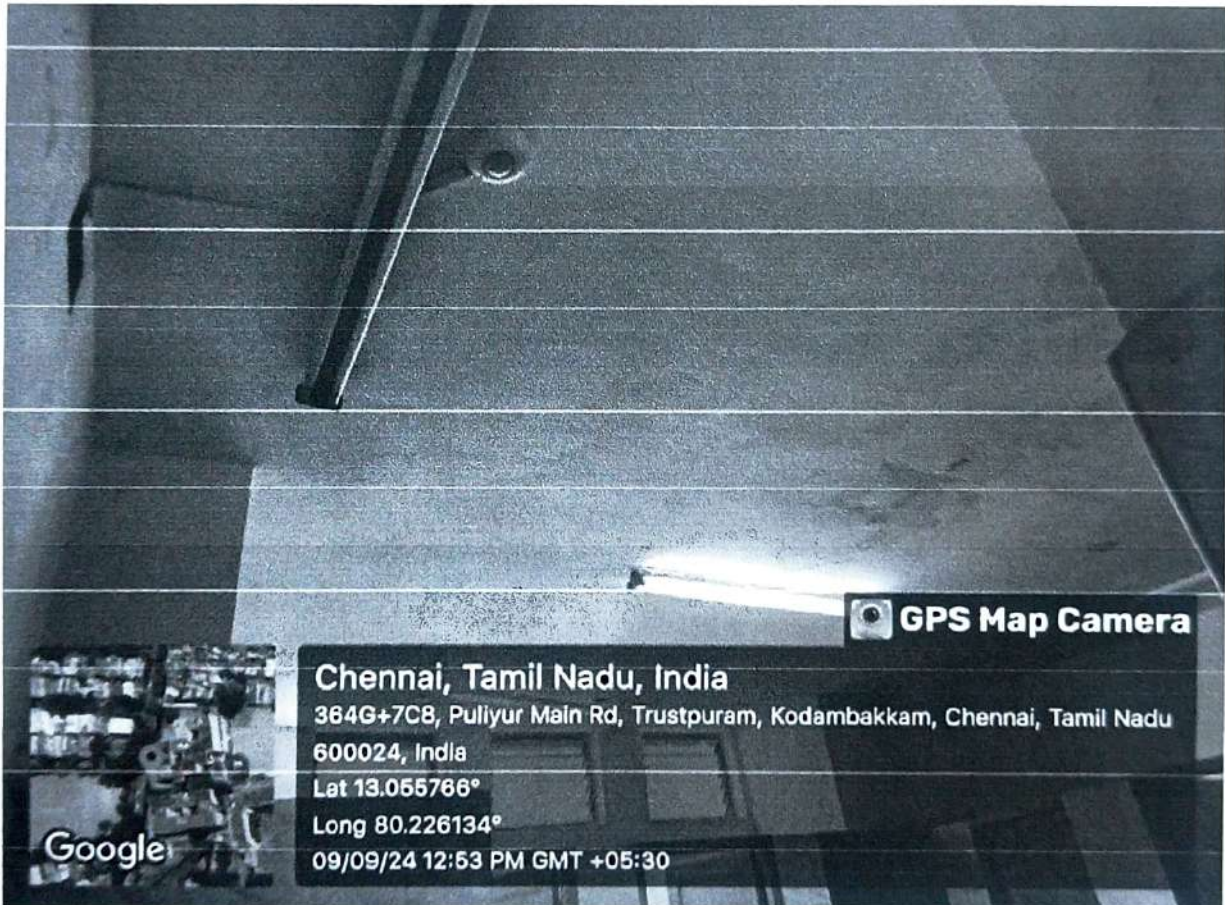


Figure 4. Installed Sensor based Lights in Restrooms(Civil block)

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Figure5. Installed Sensor based Lights in Restrooms(Mech block)

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