



Government of Assam  
**ASSAM ENGINEERING COLLEGE**



JALUKBARI :: GUWAHATI - 781013  
Department of Electrical Engineering

*Dr. Bimal Chandra Deka*  
Professor

*Email: bimaldeka1205@gmail.com*  
*Contact: 9859180023*

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**To Whom It May Concern**

This is to certify that the undersigned has successfully completed the audit of energy utilization of Chhaygaon College, Chhaygaon, Dist. Kamrup, Assam for the year 2022-2023.

The college has been taking lot of initiative to create awareness amongst the students, teachers and other stakeholders to make the college campus an energy efficient campus. Effort has been made to replace conventional electrical gadgets with energy efficient devices in a phased manner. The college has been taking initiative to install roof-top solar plant as an alternative source of energy for producing electricity to meet certain demand in the near future.

I wish that Chhaygaon College will emerge as an institute of Green Campus in the near future.

*Dr. Bimal Ch. Deka*  
Professor  
Electrical Engg. Dept.  
Assam Engineering College  
Jalukbari, Guwahati-13

# ENERGY AUDIT REPORT

2022 - 2023


## CHHAYGAON COLLEGE

DISTRICT: KAMRUP (Rural)

ASSAM

*Audited by*

**Dr. Bimal Ch. Deka**  
**Professor**  
**Electrical Engineering Department**  
**Assam Engineering College**  
**Jalukbari, Guwahati-781013**  
**Assam**

  
**Dr. Bimal Ch. Deka**  
**Professor**  
**Electrical Engg. Dept.**  
**Assam Engineering College**  
**Jalukbari, Guwahati-13**

## I. Introduction:

Chhaygaon College was established in the year 1974 and one of the pioneer institutes in the district of Kamrup, Assam. The college is located at a distance of around 40 km to the west of the Guwahati City.

Energy Auditing is a routine procedure of monitoring energy consumption and conservation of industry/organization/institute and its analysis.

This report presents the energy audit of the Chaygaon College after verifying all electrical loads, its connections, protection schemes and optimal utilization of electricity.

## II. Electrical Load of the Campus:

The electricity supply to the college is provided by the Assam Power Distribution Company Limited. A 3-phase transformer was installed to transfer power to the college.

Consumer No.: 028000006273

Connected Load: 19 kW

Contracted Demand: 19 kVA

Tariff Category: LT V (B) General Purpose (Education)

Supply Voltage Level: HT                      Average Power Factor: 0.98

The following sections give details of electrical gadgets used by different academic and administrative blocks of the college.

### 1. ACADEMIC BLOCK:

#### (a) Department:

Sl No	Department	Fan	Light	Computer	Printer	UPS
1	Assamese	5	4	2	1	2
2	English	5	2	1	1	1
3	Economics	5	6	1	1	1
4	History	5	9	1	1	1
5	Hindi	5	2	1	1	1
6	Philosophy	3	5	1	1	1
7	Political Science	4	6	1	1	1
8	Education	2	2	1	1	1
9	Accountancy	2	2	1	1	1
10	Management & Finance	5	3	2	1	1
11	Business Statistics	2	1	1	1	1
12	Information Technology	1	2	1	1	1



**(b) Class Rooms:**

Sl No	Class Rooms	Fan	Light	Digital Board	Audio syst	UPS
1	Room 1	4	4			
2	Room 2	7	2			
3	Room 3	5	2			
4	Room 4	5	2			
5	Room 5	7	5			
6	Room 6	16	8			
7	Room 7	4	6			
8	Room 9	5	5			
9	Room 11	6	7			
10	Room 13	4		Digital class room (Work in progress)		
11	MA (Ground)	1	2			
12	Room 110	16	4			
13	MA (1 <sup>st</sup> floor)	1	2			
14	Room 111	6	4			
15	Room 217	15	15			
16	History (attached)	2	4			
17	Room 218	7	8			
18	Room 107	6	4			
19	Room 108	6	4			
20	Room 109	8	3	Digital class room (Work in progress)		
21	Room 213	8	4			
22	Room 18	7	8			
23	Room 17	1	1			
24	Room 16	1	1			
25	Room 101	5	4			
26	Room 103	6	2	Digital class room (Work in progress)		
27	Room 104	4	3			
28	Room 105	4	2			
29	Room H1	6				
30	Room H2	5	5			
31	Room H3	8				
32	Room 206	2				
33	Room 205	2				
34	Room 204	5	1			
35	Room 203	7	3			
36	Room 201	13	5			
37	Room 208	2				
38	Room 210	2	1			
39	Room 212	12	4			
40	Room 202	7	2	Digital class room (Work in progress)		

(c) Laboratory:

Sl No	Laboratory	Fan	Light	Computer	Printer/Projector	UPS
1	Education Lab	2	3			
2	Computer Lab	8	6	32		1
3	Language Lab		3	28		

2. ADMINISTRATIVE BLOCK:

Sl No	Type	Fan	Light	Computer	Printer	UPS
1	Principal's office	2	15	2		1
2	Library	17	20	3		3
3	IQAC	4	5	4		
4	General office 1	7	4	7		3
5	General office 2	3	9	4		1
6	Examination Cell	7	4			
7	KKSHOU	2	3	1		
8	Women Cell		2			
9	NSS	2	2			
10	Sports Cell	2	2			
11	Medical & Health	1	2	1		
12	Vice Principal's office	2	3			
13	Alumni Cell	1	2			
14	IDOL	1	2			
15	Eco-club	1	2			

3. OTHERS:

Sl No	Type	Fan	Light	Computer	Printer	UPS
1	Teachers' common room	5	2			
2	Students' union room	2	2			
3	Boys' common room	3	2			
4	Girls' common room	5	5			
5	Canteen	4	4			
6	Gymnasium	4	2			
7	Auditorium	48	56			
8	Indoor stadium	Electrification in progress				
9	Drinking water zone		3			
10	Washrooms & Toilets		24			
11	Folklore	7	3			
12	Guest room	1	4			
14	Press	2	2			
15	Corridors	2	49			

In addition to all the above gadgets, the following electrical appliances are also available in the college:

Sl No	Electrical Items	Rating	Quantity
1	Photocopy Machine	Normal	5
2	Air Conditioner	1 to 1.5 Ton	8
3	CC Camera		60
4	DG Set	40 kVA	1
5	Water Pump with motor	1 to 3 HP	3
6	Outdoor LED lighting		11
7	Wi-fi port		10
8	Printing Machine		1
9	Public address system (Auditorium)		1
10	Voltage Stabilizer	1-phase	4
11	Refrigerator	Household	2
12	LCD Projector	Normal	4

#### 4. Proposed electrical connections in the near future:

- Four normal class rooms are to be converted into digital class rooms.
- Electrification work of indoor stadium is pending.

#### Switches:

There are appropriate and sufficient numbers of MCBs and Isolators for maintaining and protecting the equipments.

#### Outdoor Lighting:

There are sufficient number of LED bulbs for outdoor lighting during night. It covers the entire college campus.

### III. ENERGY CONSUMPTION DATA AND ANALYSIS:

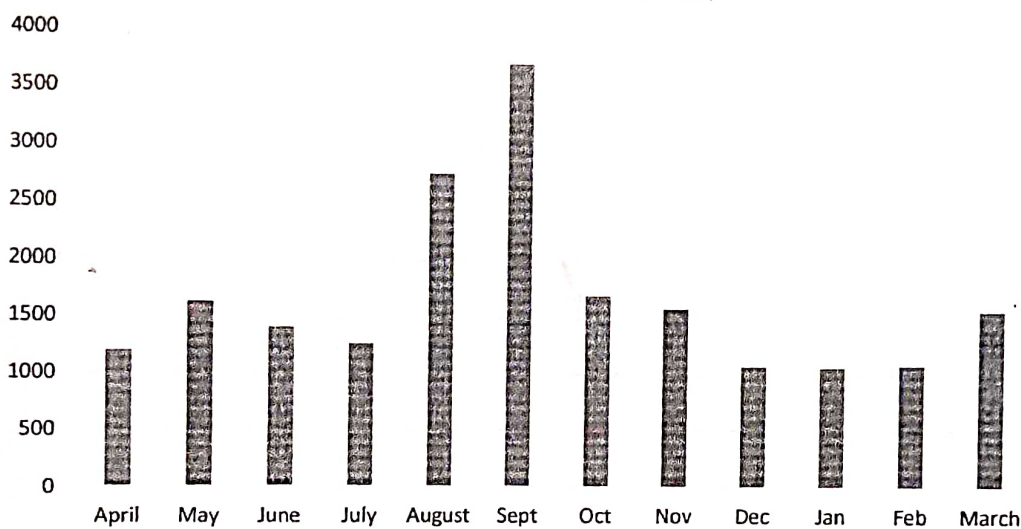
The trend of utilization of electrical gadgets and other appliances are reflected in the monthly bills of energy consumption. The energy consumption data are presented below for twelve months from April 2022 to March 2023. The trend is also illustrated pictorially.

Month	Energy consumption (kWh)	Avg. PF	Maximum Demand (kVA)	PF Penalty /Rebate (in kWh)	Tariff (in Rs.)	Monthly bills (in rupees)
April 22	1187.00	0.99	19	-37.00	6.45	9666.00
May 22	1625.00	0.99	19	-50.00		12556.00
June 22	1403.00	0.85	19			11006.00



July 22	1264.00	0.85	19			10183.00
Aug 22	2776.00	0.99	19	-86.00		21365.00
Sept 22	3730.00	0.99	19	-115.00		26000.00
Oct 22	1697.00	0.99	19	-53.00		13374.00
Nov22	1589.00	0.99	19	-49.00		12812.00
Dec 22	1070.00	0.99	19	-33.00		9194.00
Jan 23	1059.00	0.99	19	-33.00		9328.00
Feb 23	1072.00	0.99	19	-33.00		9265.00
March 23	1556.00	0.98	19	-48.00		13029.00
<b>Total</b>	<b>20028.00</b>			<b>-537.00</b>		<b>157778.00</b>

Trend of Energy Consumption(kWh)  
(April 2022 - March 2023)



From the above data, it is found that total energy consumption for the 12 month period from April 2022 to March 2023 is 20028.00 kWh after deducting rebate. The amount of tariff paid during the period is Rs. 157778.00 and the rebate amount for the above 12 month period is Rs. 3463.65.

#### IV. CONCLUSION

This report presents a detail of electrical gadgets used in the college and its energy consumption. The location of many class rooms, departments and rooms for other academic purposes are such that sufficient natural light and air available during day time and as a result significant amount of electricity is saved, however, the corridors of main building need extra lighting even in the day time due to existing building design. The college has replaced almost all conventional electric bulbs with LED bulbs to save energy. The average power factor is 0.98 which is very much satisfactory. The college is also planning to erect roof-top solar PV plant as an alternative to save electricity as well as reduction of carbon emission in the near future.

The college has been taking lot of initiative to create awareness among the students, teachers and other stakeholders to make the college campus an energy efficient campus. The effort taken by existing Eco-club is commendable in this regard. The Green Energy Initiative is another sincere effort of the college for carbon neutrality. With the rising awareness on the necessity to save energy, the college has resorted to ways and means for saving electricity. Efforts have been made to shift to renewable energy phase wise. The e-waste of the college has been disposed as scrap and given away to concerned agencies for recycling.



# Sample Electricity Bill of Chhaygaon College



## Assam Power Distribution Company Limited

NAME OF ELECTRICAL SUB-DIVISION / IRCA : CHAYGAON

CIN: U40106AS2003SGC007242

GSTIN: 18AABCL135A112J

ELECTRICITY BILL

Website: www.apdcl.org

Centralized Customer Care Number: 1912

Consumer Name: PRINCIPAL CHAYGAON COLLEGE Address: CHAYGAON Contact Number : 9864422630 Email : Tariff Category: LT V(B) GENERAL PURPOSE (EDUCA) Supply Voltage Level: LT	Consumer Number: 02800006273 Old Consumer Number: GENB-4 DTR Number: 020 Pole Number :000 Connected Load in KW: 19.0 Contracted Demand in KVA: 19.0 Load Security:26412.0 Meter Number: Y0581798	Bill Amount: 12556.0 Due Date: 22-Jun-2022 Bill Number:901329120 Bill Period: 02-May-2022 To 01-Jun-2022 Bill Date : 07-Jun-2022 Number of Days: 31 Meter Status: RUNNING Billing Status: NORMAL
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02800006273

### Meter Reading Details

Reading Type	Meter Number	MF	Previous Reading in KWh	Previous Export in KWh	Current Reading in KWh	Current Export in KWh	Difference Reading in KWh	Difference Export in KWh
KWh(Normal)	Y0581798	1.0	60814.0	0.0	62489.0	0.0	1675.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0

Units Consumed	PF Penalty/Rebate	LT Metering Penalty @ 3%	DTR Penalty @ 10%	HT Rebate @ 3%	Billable Units in KWh
1675.0	50.0				1625.0
0.0	0.0				0.0
Recorded Demand (in KVA)	0.0	Maximum Demand (in KVA)	0.0	Billing Demand (in KVA)	19.0
Power on Hours	0.0	Freeze Amount	0.0	Availability Percentage	Average Power Factor
					99.0

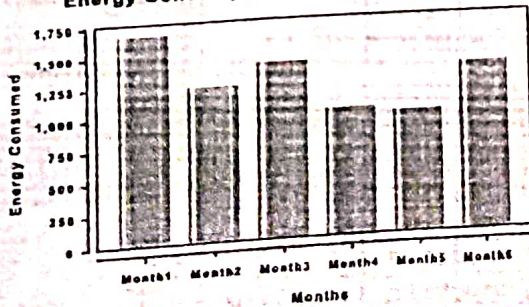
### Billing Details

Current Demand	Outstanding Amount	Adjustment Amount	Government Subsidy	Solar Rebate	Net Bill Amount
Rs. 12550.75	Rs. 5.56	Rs. 0.00	Rs. 0.0	0.0	Rs. 12556.0

In Words: Rupees Twelve Thousands Five Hundred Fifty Six Only

PLEASE PAY YOUR BILL ON TIME AND HELP US TO SERVE YOU BETTER

Energy Consumption (Last Month's Bill)



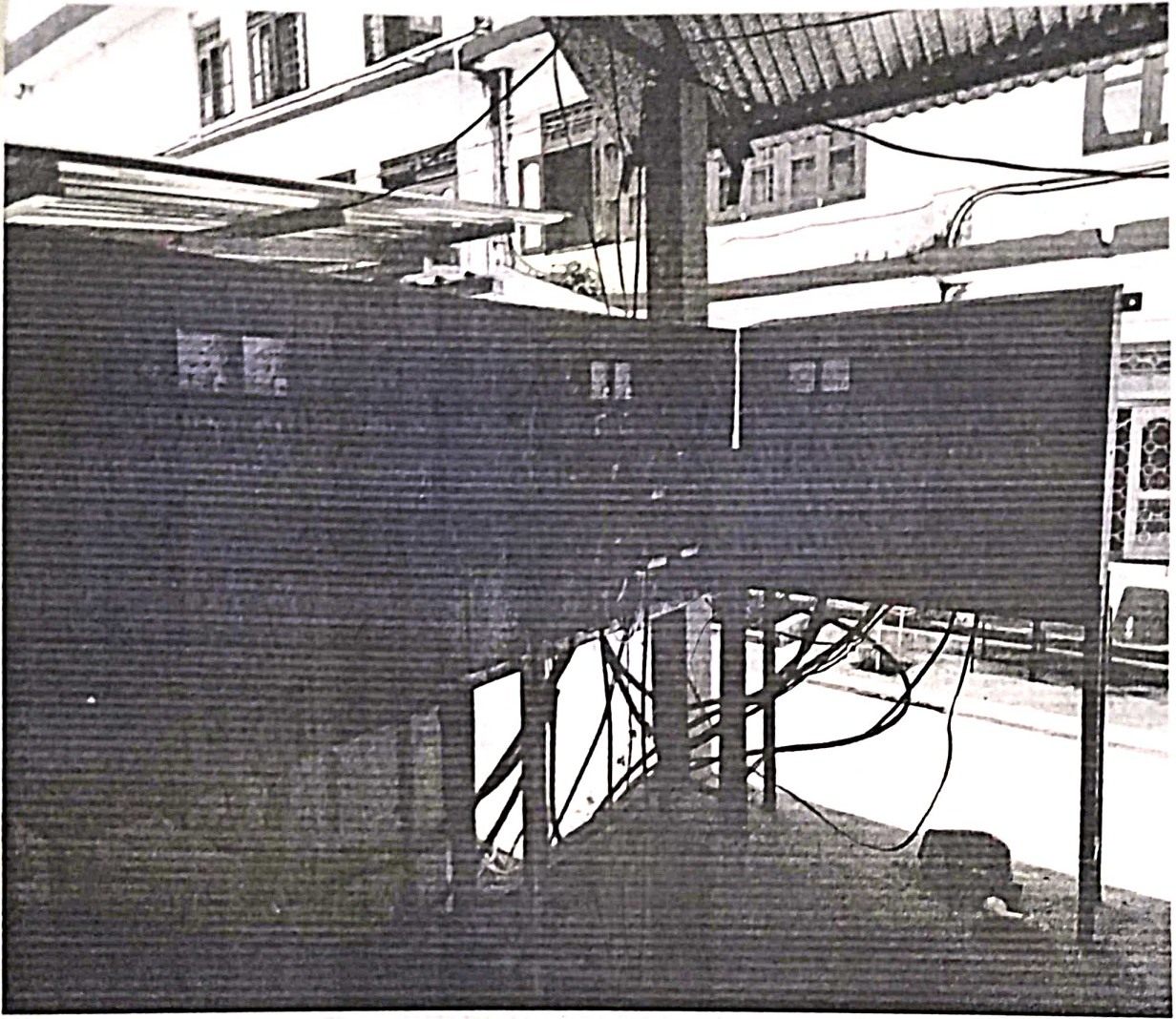
Charges Breakup	Units	Rate	Amount
Energy Charge	1625.0	6.45	10481.25
	0.0	0.0	0.00
	0.0	0.0	0.00
Total Energy Charge			10481.25
Energy Charge Re-estimated			0.00
Demand/Fixed Charge	19.0	80.0	1548.16
PPPPA Charge		0.050000000000000044	-81.25
Electricity Duty		5.0	601.52
Govt. Subsidy		0.0	0.0
Meter Rent		20.0	0.0
Transformer M.D. Charge			0.0
Overdrawal Penalty			0.0
Adjustment Amount			0.0
Charges for dishonoured cheque			0.0
Arrear Principal			5.56
Arrear Exchange			0.0
Current Surcharge			0.00
Misc. Arrear			0.0
Rebate if paid before due date			0.0
Payable amount before due date			12556.0
Payable amount after due date			12556.0

Checked by E&OE:

Prepared by: eSuvidha

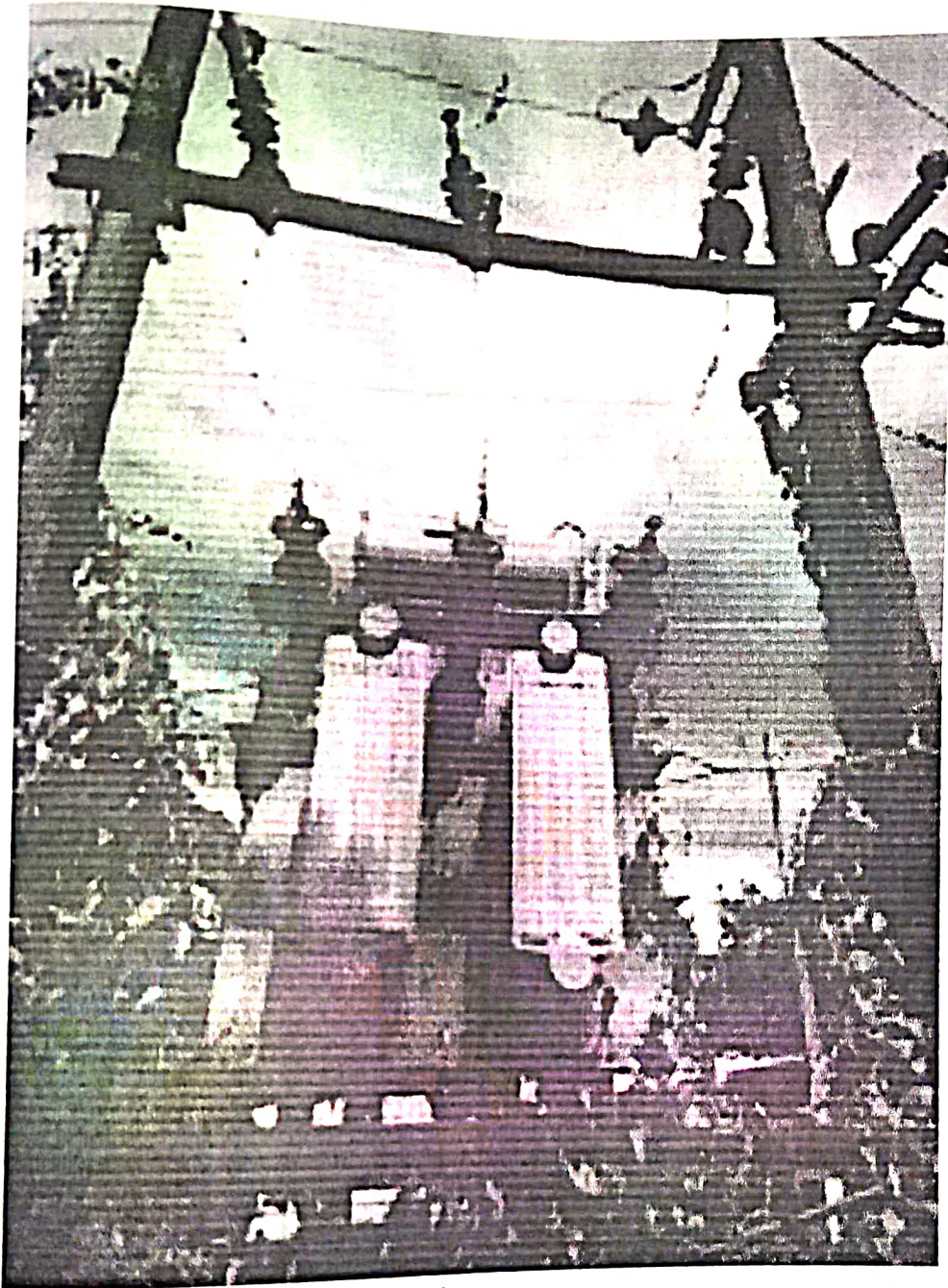
Signature with seal  
Sub-Divisional Engineer  
Chhaygaon Elect. Sub. Division  
APDCL (LAR), Chhaygaon





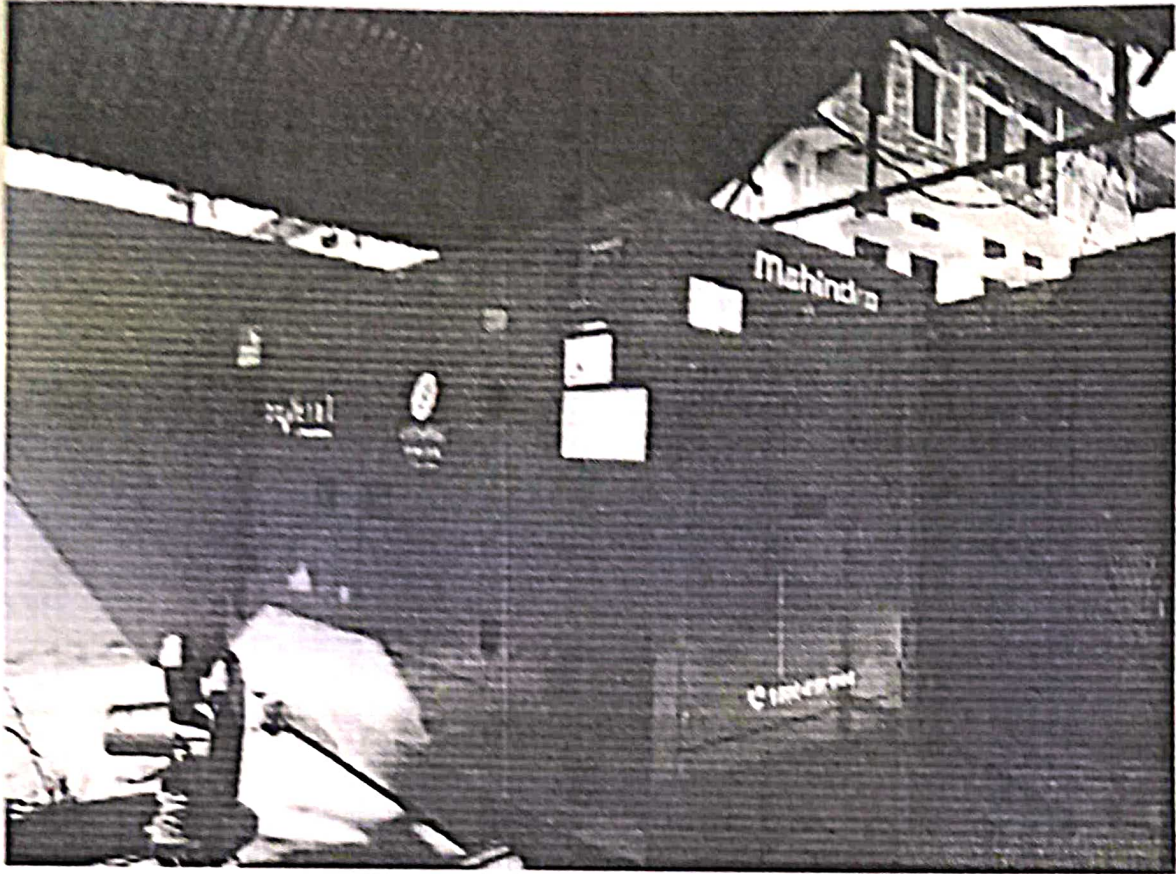
**Control Panel**





**Roadside Transformer from where power received by the college**





DG Set of the College

*bc.*

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Jalukbari, Guwahati-13