A Case Study of an Eco- Friendly Construction

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***Abstract* - - The idea ecofriendly construction has made a tremendous significance in a crating nation like INDIA. The hypothesis suggests of minimizing the wastage and the disbursal of development. with expansion in urbanization the normal assets were utilized as a part of ill-advised ways which drives us towards the usage of ecofriendly construction and the idea helps in making ideal utilization of regular assets. The construction is an ecofriendly segment since it depends on the essential tenet. Reduce reuse and recycle in the long run, the green structures manage the cost of an abnormal state of financial and building execution, which drives us to the advancement of future era. The point of a green building configuration is to minimize the interest on non-renewable assets, amplify the use**

Utilizes productive gear to meet its lighting, aerating; cooling and different needs; boosts the utilization of renewable wellspring of vitally; uses proficient waste.

***Index Terms* - Green Building, Reduce, Reuse, Recycles**

I.INTRODUCTION

Eco friendly construction is the process of creating a new building or structural by using natural and artificial resources in combination with manual labor. The main aim of any construction must be to protect its natural surrounding and not harm the environment by releasing harmful gases or in any other way. With the increase in global warming there is a strict need to address the challenges like resources depletion climatic change, peak oil production and pollution. taking the seriousness of global warming and pollution into account, many new construction methods and techniques have introduced that are environmentally friendly.

A green building is one whose development and lifetime of operation guarantees the most beneficial conceivable environment while speaking to the most productive and slightest problematic utilization of land, water, vitality, and different asset. Markers, developers, originators, and buyers are making a growing business sector for lodging and home items and practices, our homes can be solid and agreeable additional earth well- disposed and cost proficient. By utilization green items and practices, our homes can be solid and arable additionally earth well- disposed and cost proficient.

Green building construction methods not only reduces the cost of construction, but also saves natural resources. Green buildings involve those construction techniques and materials which are eco-friendly

II. METHODOLOGY

We will adopt following steps:

- Surfing the net for information
- Collecting literature
- Visit the eco-friendly building
- Cost analysis of eco-friendly techniques
- Prepare sample model.

A. Objectives

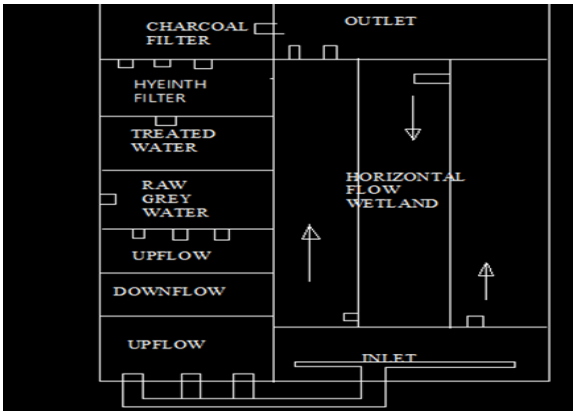
1. Understand concept of green building construction.
2. Benefits of eco-friendly materials after used in a construction.
3. Cost analysis of eco-friendly materials used in construction.
4. List eco-friendly materials suitable on our area

B. Eco-friendly technics in construction:

1. Low cost grey water treatment system:

a. Location: Rit Boys Hostel, Rajaramnager

b. Plan of low-cost grey water treatment plant:



c. Plan detailing:

- Pilot plant capacity - 4500 lit/day
- Design period - 10 years
- Equalization tank - 1500 lit (750x2)
- Up flow/down flow filter
- Construction wet land of size - 10m x 2.5m
- Tertiary treatment unit of size - 1.5m x 1.5m x 0.6m
- Treated wastewater tank of capacity- 4500 lit.
- Year of Construction -2010

d. Benefits of grey water Treatment

Recycling grey water not only reduces the consumption of water it also reduces the volume of water discharged into sewerage system consumer with water meters therefore could save money on both their water supply and wastewater bills

e. Observation:

December 2019					
Date	Time (am)	Tank Measurement			Quantity (lit)
		L	B	D	
12/12/19	10:30	2.50	1.50	0.67	2512
13/12/19	10:30	2.50	1.50	0.68	2550
14/12/19	10:35	2.50	1.50	0.70	2625
15/12/19	10:30	2.50	1.50	0.65	2437
16/12/19	10:20	2.50	1.50	0.63	2362
18/12/19	10:30	2.50	1.50	0.67	2512
19/12/19	10:35	2.50	1.50	0.50	1875
25/12/19	10:25	2.50	1.50	0.47	1762
26/12/19	10:30	2.50	1.50	0.45	1687
27/12/19	10:35	2.50	1.50	0.49	1837
28/12/19	10:30	2.50	1.50	0.45	1687
29/12/19	10:30	2.50	1.50	0.51	1912
30/12/19	10:30	2.50	1.50	0.46	

January 2020					
Date	Time(am)	Tank Measurement			Quantity (Lit)
		L	B	D	
1/1/20	10:30	2.50	1.50	0.41	1537
2/1/20	10:30	2.50	1.50	0.40	1500
3/1/20	10:35	2.50	1.50	0.37	1387
4/1/20	10:30	2.50	1.50	0.42	1575
5/1/20	10:20	2.50	1.50	0.45	1687
6/1/20	10:30	2.50	1.50	0.47	1762
8/1/20	10:35	2.50	1.50	0.49	1837
9/1/20	10:25	2.50	1.50	0.53	1987

f. Advantages

- Reduces freshwater requirement.
- Prevent grey water stagnation.
- Prevents vector breeding.
- Use in flushing toilets to make toilets functional.
- Use of grey water in gardening.
- Minimal risk to users of grey water as it incorporates principles of water safety.

g. Disadvantages:

- The reuse of grey water system can diminish the flow of sewage in the area. This is because less wastewater is dumped in the sewage system.
- If the grey water is not filtered properly, the harmful chemicals in the wastewater can cause disease and contamination.
- It is not advisable to store the grey water for more than 24 hours.
- Grey water is made up of harmful chemicals such as fats, oils, hairs, cleansers etc. These dangerous chemicals can cause diseases.
- Soil does not stay fit and suitable for irrigation throughout the year, especially during winters.
- The cost of a grey water system can be expensive initially.

h. Precautions:

- Use only grey water that is fairly clean to start with – Grey water containing water used to launder diapers or generated by anyone with an infectious disease should be diverted to a sewer or septic system. Do not store grey water; use it within 24 hours before bacteria multiply. After 24 hours it goes its way to become black water.
- Do not overload your system. If you are having company and your system is designed for 2 peoples, divert the grey water to the sewer.
- Divert grey water containing harmful chemicals to the sewer or septic system.
- Prevent contamination of surface water. Discharge grey water underground or into a much-filled basin.
- Do not apply grey water to saturated soils.

2. Utilization of biogas fuel generated using food waste:

a. Location: Rit Boys Hostel, Rajaramnager

b. Observation

January 2020			
Sr. No.	Date	Food waste quantity	Water quantity
1	1/1/2020	35 kg	35lit
2	2/1/2020	30 kg	30 lit
3	3/1/2020	40 kg	40 lit
4	4/1/2020	43 kg	45 lit
5	5/1/2020	39 kg	40 lit
6	6/1/2020		30 lit
7	8/1/2020	35 kg	35 lit
8	9/1/2020	42 kg	40 lit
9	10/1/2020	30 kg	30 lit
10	11/1/2020	39 kg	40 lit
11	12/1/2020	29 kg	30 lit
12	13/1/2020	33 kg	35 lit
13	15/12020	40 kg	40 lit
14	16/1/2020	43 kg	45 lit
15	17/1/2020	46 g	45

December 2019			
Sr. No.	Date	Food waste Quantity	Water quantity
1	1/12/2019	50 kg	50 lit
2	2/12/2019	40 kg	40 lit
3	4/12/2019	42 kg	45 lit
4	5/12/2019	35 kg	35 lit
5	6/12/2019	39 kg	40 lit
6	7/12/2019	42 kg	45 lit
7	8/12/2019	35 kg	35 lit
8	9/12/2019	38 kg	30 lit
9	11/12/2019	45 kg	45 lit
10	12/12/2019	43 kg	45 lit
11	13/12/2019	36 kg	35 lit
12	14/12/2019	38 kg	40 lit
13	15/12/2019	33 kg	35 lit
14	16/12/2019	39kg	40lit
15	18/12/2019	41kg	40lit

III.RESULT AND DISCUSSION

Food waste used in this study was obtained from RIT boy's hostel mess, food waste collected from four messes having each mess capacity of 250 students to provide food facility, as per survey carried out in the boy's hostel mess, it was found that 110kg of food waste generated in mess, this Biogas replace about 50% of LPG used, or about 1kg per day, saving the about Rs. 60 per day. This means that the family can pay back their contribution to the cost of the plant in about 3 years and more quickly if they collect extra food waste from outside agencies e.g. Shops to increase their biogas.

3. Solar Heating Panel:

a. Location: Rit Boys Hostel, Rajaramnager

b. How do Solar Water Heating Panels work?

Solar heating systems used for heating water implement collectors for capturing the sun's rays. These collectors or solar panels are fitted on to the roofs of residential or commercial establishments. The heat thus captured is utilized for heating water that is stored in hot water cylinders. Immersion heaters or boilers are optionally used for further heating the water to achieve the desired temperature.

c. Observation:

Sr. No.	Particulars	Quantity	Rate Per No.	Amount
1	Sudarshan Saur Water Heating 500 LPD wonder standard G.I. (500LPD x 25 Nos.=12500LPD)	25 Nos.	37800	9,45,000
Cost of New System				9,45,000
COST of Old System				2,90,000
GST				Including
Final cost after Exchange				6,55,000

d. Results:

Total No: 100 No's

Total No of Liters Per Day Capacity: 100 x125 liter per day

Cost of New System: Rs 945000/- inclusive of GST (500LPD X 25 NO.)

Sudarshan Saur embossed – 34nos. Tubes. / 2100mm Lengths x 58 diameters.

Total Stand and cover: Aluminum Galva to withstanding at external climatic conditions.

IV. CONCLUSION

1. How to apply grey water harvesting treatment plant in construction and its benefits for garden as well as cleaning purposes.

2. How to generate biogas by using food waste and also its advantages for a structure and surrounding areas.
3. How to generate energy by using solar panels and its price details.

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