The Bombay Salesian Society's
DON BOSCO INSTITUTE OF TECHNOLOGY

Premier Automobiles Road, Kurla West, Mumbai– 400070

IEEE-DBIT SIGHT STUDENT CHAPTER

"Visit to Sustainable Home"

Title: "**Visit to Team Shunya's Sustainable Home**"

Date: 22nd March, 2024

Time: 9:00 am to 12:30 pm

Venue: Team Shunya, IIT Bombay, Mumbai.

Target Audience: TE EXTC

No. of Participants present: 9 IEEE student members including 2 IEEE professional members and 1 non IEEE member

No. of girl participants: 6

No. of boy participants: 7

Resource Person: Mr. Praveen Guguloth

Organization of Resource Person: TEAM SHUNYA

Organizing Department / Committee / Authority:

Faculty Coordinator: Dr. Ashwini Kotrashetti and Prof. Freda Carvalho

Objectives:

- To features that minimize environmental impact, reduce resource consumption, and promote long-term resilience by developing sustainable home:
- To understand techniques to reduce energy consumption and increase water conservation.
- To understand the energy-efficient appliances, LED lighting, and implementation of proper insulation and weather sealing to minimize heating and cooling needs.
- To understand utilisation of renewable energy sources such as solar panels.
- To understand the use of environmentally friendly materials that minimize ecological footprint and also understand options for products with low VOC (volatile organic compound) emissions to promote indoor air quality.

- To ensure a healthy indoor environment by reducing noise pollutants by optimal design of doors and windows.
- Strategies: Use non-toxic paints, sealants, and finishes. Install proper ventilation systems to enhance air circulation and filtration. Incorporate indoor plants to naturally filter air pollutants.

Outcomes:

By setting and achieving these sustainable goals, homeowners can contribute to a healthier environment, reduce their ecological footprint, and create a more resilient and comfortable living space for themselves and future generations.

Detailed Report:

- IEEE-DBIT MTT-S Student chapter organized an "Industrial Visit to IIT Bombay" under the guidance of Dr. Ashwini Kotrashetti. The visit was organized for elective students of Radar Engineering in the sixth semester of EXTC program.
- The students first visited the sustainable home created by Team **SHUNYA,** in IITB campus the students were addressed by Mechanical Lead Mr. Praveen Guguloth.
- Mr. Praveen Guguloth introduced us to the building the team constructed with the idea of sustainability and differentiating themselves from pre-defined norms.
- Mr. Praveen explained the students methods of build in modular way so that they can rebuild it when they were at the competition.
- Team SHUNYA abbreviation was also explained to the students and it stands for "**S**ustainable **H**abitat for **U**rbanizing **N**ations by **Y**oung **A**spirants" and their mission is to "pre-fabricated net zero solar powered houses".
- Mr. Praveen explained to the students of their sustainable goals of achieving net zero energy consumption. This is possible by using Bifacial HJT Photovoltaic Panels.
- The science behind these cells is that they can capture solar energy on both side of the panel which means that if the front side facing the sun directly and some rays are missed the reflection from those rays can captured by the panels again.
- The building that was made on a steel beam structure provides great rigidity and makes the building more modular in nature and can be configured into any geometry fitting for occupancy.
- Rather than sticking to conventional cement-based walls Team SHUNYA opted for ECO board walls made from sugarcane bagasse which are more durable in nature and

are cheaper to mass produce as they are compressed into a block panel 2-5 cm thick and then can be easily applied as walls and when connected together can provide great structural stability.

- Team SHUNYA used metal sheets as base for the ground floor as well as the first floor that was reinforced with cement between them so that they can provide better stability to the structure.
- The entire building was built on the idea of having a centralized HVAC system that provides an even cooling to the building which leads to better power saving and overall electricity savings.
- The overall power that is generated by the solar panels are stored in a separate room where lead acid batteries are stored and the house can provide power upto 4 days until discharged.
- Originally the team simulated the entire structure on a Software simulator so that any fundamental error can be detected and the structure can be perfected.
- The building also has Rain water Harvesting system for saving water and almost achieve net zero consumption rate.
- Mr. Praveen also mentioned that cooling pads were installed in the structure so that the building can be efficiently cooled and power can be saved.
- Mr. Praveen provided the total estimate to make the building as it costed upto to 1.23 Crores with the total area of 1200 sqft.
- The entire building was also equipped with IOT devices for better utilization of power where sensors were placed in the house so that turning on lights and fans can be done automatically and the temperature can be regulated according to the room temperature.
- The project that the students visited was project VIVAAN which they had built in 3 month's timespan and achieved 90% of their projected goals.
- Our visit concluded around 12:30 pm after which the students were taken for a small break at Powai-lake where they could enjoy the scenic beauty of the lake.

Snapshot of the event:

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Praveen Guguloth explaining the team about how the structure was constructed

Q&A session with Praveen Guguloth of team SHUNYA

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Owen & Corning foam insulation panels used

S.No.	Name	Branch
1	Mohd Raza Ansari	TE EXTC
2	Aditya Ajay Jadhav	TE EXTC
3	Mayuri Sanjay Kadam	TE EXTC
4	Girish Vikas Sangare	TE EXTC
5	Shafik Shaikh	TE EXTC
6	Dibyarupa Pradhan	TE EXTC
7	Rutvik Kiran Patil	TE EXTC
8	Premkumar Pradeep Singh	TE EXTC
9	Ann Vincent Chittilappilly	TE EXTC

Overall Feedback from participants
Based on the features provided in the report, here's a summarized feedback analysis from 13 participants:

Positive Response to Sustainability Goals: Overall, participants appreciated the focus on minimizing environmental impact and promoting sustainability in home development.

Interest in Energy Efficiency Techniques: Participants showed interest in learning about techniques to reduce energy consumption and increase water conservation, indicating a recognition of the importance of resource efficiency.

Support for Use of Environmentally Friendly Materials: Participants expressed support for the use of environmentally friendly materials to minimize ecological footprint and improve indoor air quality, indicating a concern for both environmental and occupant health.

Desire for More Detailed Information: Some participants suggested including more detailed information on specific techniques, products, and technologies mentioned in the report to better understand their implementation and effectiveness.

Interest in Cost Considerations: Several participants expressed interest in understanding the cost implications of implementing sustainable features in home development, suggesting a desire for information on affordability and cost-effectiveness.

Overall, the feedback indicates a positive response to the report's focus on sustainability goals and practical strategies, along with a desire for more detailed information and consideration of cost implications.

Report Prepared By: Aditya Ajay Jadhav **Name of the Student:** Aditya Ajay Jadhav **Post of the Student:** Reporting Head IEEEDBIT	**Report Approved By:** **Name of the Faculty:** Ms. Freda Carvalho **Post of the Faculty:** IEEE DBIT SB Counsellor