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Mookambigai College of Engineering, Keeranur, Tamil Nadu, India

Sustainable Structural Panel Element using Enviro Board

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ABSTRACT: Enviro Boards are sustainable structural panel elements made primarily from agricultural waste such as wheat straw,rice straw, providing an affordable and environmentally friendly building solution. These strawboard panel s reduce agricultural waste and carbon emissions by reutilizing renewable, plentiful materials like straw. Their production consumes less water and energy compared to conventional panels, and they offer beneficial thermal and acoustic insulation properties that enhance interior comfort and energy efficiency. Enviro Boards are lightweight, easy to transport and install, lowering construction costs and associated emissions. The panels are versatile for various interior uses including furniture, wall cladding, and ceiling panels and promote sustainability across social, economic, and environmental domains by supporting rural livelihoods and healthier building environments.

I. INTRODUCTION

Enviro Boards are innovative structural panel elements that respond to the increasing demand for eco-friendly construction materials driven by sustainability concerns, regulatory requirements, and a need to reduce the environmental impact of buildings. These panels are manufactured by converting agricultural waste fibers—such as rice straw, wheat straw, elephant grass, and sugar cane—into durable, low-cost building panels, utilizing a patented milling process. By offering an alternative to conventional construction materials, Enviro Boards create opportunities to lower building costs, minimize energy consumption in manufacturing, and provide healthy indoor environments. Their uses are diverse, including applications in walls, roofs, floors, partitions, insulation, and sound-proofing

II. SCOPE OF PROJECT

Sustainable structural panel elements made with Enviro Boards encompasses designing and constructing buildings with panels that balance structural integrity and environmental responsibility. Enviro Boards such as strawboard panels or mineral-based MGO boards—are engineered from recycled agricultural residues or abundant minerals, making them highly environmentally friendly. Their application can contribute to significant reductions in embodied carbon, waste, and energy consumptions throughout the building lifecycle. The project focuses on utilizing Enviro Boards, which are sustainable panels created from renewable resources like straw, bamboo, or magnesium oxide, ensuring minimal resource depletion and a low carbon foot principle.

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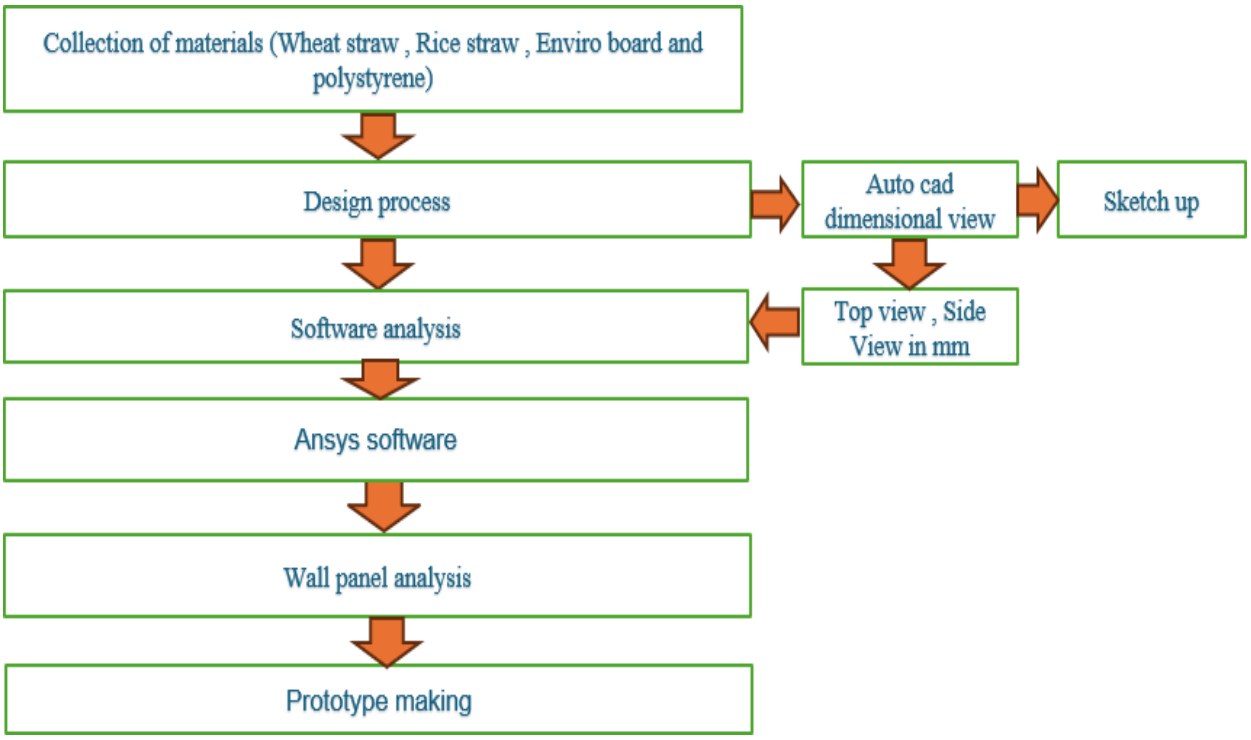
III. METHODOLOGY



IV. ANALYSIS OF ESTIMATION COST

Data Extraction Process

SI NO	DESCRIPTION	APPROX QUANTITY (Sq m) (Kg)	RATE
1)	WHEAT STRAW	100 g	Rs 24
2)	SILICAGEL	10 g	Rs 16
3)	BOARD (THICKNESS)	(25mm) 2*105	Rs 210
4)	POLYSTRENE FOAM	75mm	Rs 325
			TOTAL=575

Sustainable structural panel projects using enviro boards involves systematically gathering and organizing information relevant to material properties, environmental impact, structural performance, and construction efficiency. This ensures

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that the panels are suitable for their intended application and supports compliance with green building standards. Establish what information is needed (e.g., mechanical strength, fire resistance, moisture stability, life cycle assessment data) to address the project's synthesis questions. Create standardized data extraction forms or tables, often using spreadsheets, to organize data from literature, technical sheets, and test reports. Gather all essential material data such as compressive strength, thermal conductivity, fire ratings, and environmental certifications from product documentation and studies. Use automated tools or manual review to extract life cycle analysis, recycled content proportions, and end-of-life recyclability figures.

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