Modular Connector System for Geopolymer Panels in Wet Areas

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About this Project :

The Wet Cell Project develops water-resistant paneling for wet areas like bathrooms and showers using sustainable materials. It tackles the environmental impact of concrete by exploring eco-friendly alternatives, such as geopolymers made from industrial waste like blast furnace slag. The panels are designed with a modular connection system, allowing for easy assembly, disassembly, and reuse, enhancing both sustainability and flexibility in construction.

INTRODUCTION

The construction industry is shifting towards more sustainable solutions to reduce its environmental impact and the carbon emission. This research focuses on designing a modular connector system that enables efficient assembly and disassembly of sustainable panels in wet areas. A well-designed connection system is crucial for ensuring the structural integrity, durability, and reusability of these panels. By addressing the challenges of modular construction in moisture-prone environments, this study supports the development of circular building practices and contributes to the advancement of sustainable architecture.





RESULTS

- Innovative Modular Connector System: Easy assembly, disassembly, and reusability of sustainable panels for wet areas.
- Waste Reduction: Reduces construction waste through material reuse, supporting sustainable practices.
- **Circular Construction**: Promotes circular construction with eco-friendly, reusable materials for sustainability.





METHODOLOGY

Literature Research

Conduct a thorough research on existing sustainable materials and connectors.
Identify gaps in current knowledge and evaluate the performance of similar systems in real-world conditions.

Material Selection

- Explore cork for isolation
- Selection of materials for the connector system

Connection design

- Develop a modular system for easy assemble and disassemble
- Ensure structural stability and water resistance

DESIGN VARIANTS

- Horizontal Modular System
 - Aluminum profiles, 8-10 mm panels.
 - Rubber joints for water resistance.
 - Quick assembly with screw-based system.
- Horizontal Interlocking Panel System
 - Interlocking 1000x240 mm panels.
 - Slight slope for water runoff.
 - Efficient modular design for easy installation.
- Glue-Based System (Conventional)
 - $\circ\,$ Adhesive bonding for permanent installation.
 - Less sustainable due to waste during disassembly





CONCLUSION

Modularity & Reusability:

 Why It Matters: Modular designs allow for easy reconfiguration and reuse of components, promoting sustainability and reducing material waste in construction.

Sustainability:

 Why It Matters: Adopting modular systems over traditional glue-based methods aligns with circular economy principles, helping minimize environmental impact and support sustainable construction practices.

Water Resistance:

 Why It Matters: Ensuring durability in wet areas is critical for long-term performance, reducing maintenance costs and extending the lifespan of building materials.



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