UNB | Off-site Construction Research Centre
UNIVERSITY OF NEW BRUNSWICK | EST. 1785

PROJECT PROFILE

PRESTIGE HOMES

The University of New Brunswick Off-site Construction Research Centre (OCRC) partnered with Prestige Homes to advance productivity in modular construction by integrating Design for Manufacture and Assembly (DfMA) principles. This initiative aimed to streamline workflows, reduce inefficiencies, and improve overall product quality through innovative frameworks and technology adoption.

PROJECT BACKGROUND
Modular construction faces challenges such as production bottlenecks and inefficiencies in translating design to manufacturing. This project developed a tailored DfMA framework to address these challenges at Prestige Homes, focusing on bottleneck analysis and the enhancement of design processes using a hybrid of 2D CAD and 3D BIM technology.

METHODOLOGY
The project followed a systematic approach:

1. **Data Collection:** Baseline data was gathered from design and production processes via manual tracking, video analysis, and worker interviews.

2. **Analysis:** Bottlenecks, particularly at Station 3 in the production line, were identified. Tasks were classified into value-added and non-value-added categories.

3. **DfMA Implementation:** A hybrid approach using 2D CAD and 3D BIM technology was evaluated for optimizing design and production workflows.

4. **Framework Development:** A step-by-step DfMA framework was formulated to enhance productivity through iterative feedback and process improvements.

RESULTS AND RECOMMENDATIONS

Key Achievements:

- Developed a robust framework for bottleneck identification and resolution.
- Implemented a hybrid 2D CAD and 3D BIM technology workflow, significantly reducing design times and enhancing quality control.
- Created customized shop drawings incorporating DfMA principles, addressing worker feedback and improving clarity.
- Validated the potential of the hybrid technology approach for automating shop drawings and supporting modular design.

Recommendations:

- Fully validate the drawings generated through the hybrid 2D CAD and 3D BIM workflow in the production environment to assess practicality.
- Expand worker training on new design workflows and tools.
- Regularly revisit the framework to adapt to evolving production needs and technological advancements.

CONCLUSIONS

The project successfully demonstrated how integrating DfMA principles can transform modular construction processes, addressing inefficiencies and improving productivity. The developed framework and digital tools provide Prestige Homes with a foundation for ongoing innovation and scalability. Further research is recommended to refine these solutions and explore their application in broader contexts.