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

PROJECT PROFILE

ARCTIC MODULAR HOMES FACTORY CORP.

Arctic Modular Homes, a leader in prefabricated modular construction tailored for Arctic environments, has collaborated with the University of New Brunswick Off-site Construction Research Centre (UNB OCRC) to establish an efficient manufacturing workflow. This collaboration aims to address the unique challenges posed by extreme weather conditions and remote locations, ensuring that their modular homes meet the stringent demands of Arctic climates.

PROJECT BACKGROUND

The primary objectives of this project were to design an optimized factory layout, develop streamlined production processes, manage complex logistics for transporting modules to remote sites, and implement effective management systems. Key activities included developing a comprehensive Work Breakdown Structure (WBS) for modular homes, designing a factory layout based on the WBS, and creating a detailed Gantt chart to outline the total manufacturing time for each unit.

METHODOLOGY

The project methodology involved:

1. **Work Breakdown Structure (WBS) Development:** Analyzing architectural and engineering designs to identify all components and subcomponents, detailing manufacturing requirements, and assigning manufacturing tasks and resources.

2. **Factory Layout Design:** Translating the WBS into practical stations within the manufacturing plant, considering space limitations, equipment placement, and workflow paths.

3. **Gantt Chart Creation:** Using Primavera to visualize the manufacturing process, incorporating resource estimation, task duration assessment, and process visualization.

RESULTS AND RECOMMENDATIONS

1.WBS Development: Provided a detailed breakdown of design components and manufacturing tasks, aiding in resource allocation, productivity assessment, and lead time identification.
Recommendations: Continuous update and refinement as information on designs or manufacturing facility layout develops; integration of real-time productivity data to improve accuracy.

2. Factory Layout Design: Optimized spatial arrangements and workflow paths, enhancing productivity and efficiency.
Recommendations: Mapping sub-assembly areas, planning material storage areas, and allowing for continuous updates and improvements.

3. Gantt Chart Creation: Depicted the sequence of tasks and their dependencies, aiding in efficient project planning and execution.
Findings: The takt time for the defined process is 36 hours, meeting the demand requirement of 60 hours; total cycle time for module completion is 153.5 hours.
Recommendations: Regular updates and integration of real-time productivity data to enhance project planning accuracy.

CONCLUSIONS

Moving forward, continuous development of the manufacturing facility sequence, and ongoing improvements based on project recommendations will contribute to sustained productivity gains and operational optimization. This collaborative effort has laid a strong foundation for Arctic Modular Homes' manufacturing operations, setting the stage for scalable growth, enhanced productivity, and continued innovation in delivering homes to the Arctic.

If you are interested in getting involved in this initiative or other research and development projects, please contact the Off-site Construction Research Centre at: **offsiteconstruction@unb.ca**

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