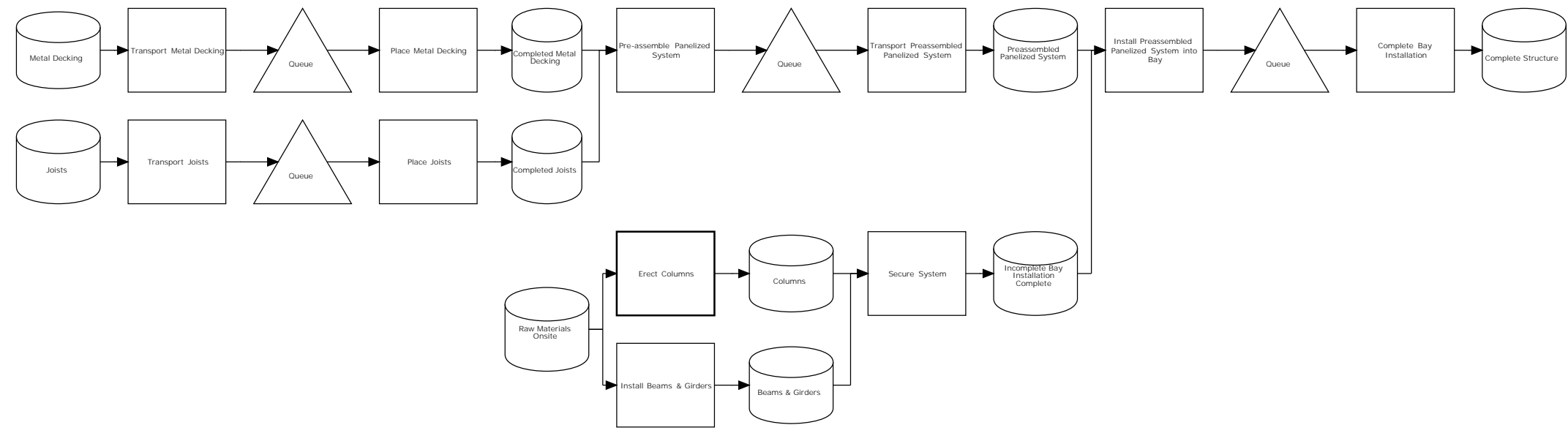
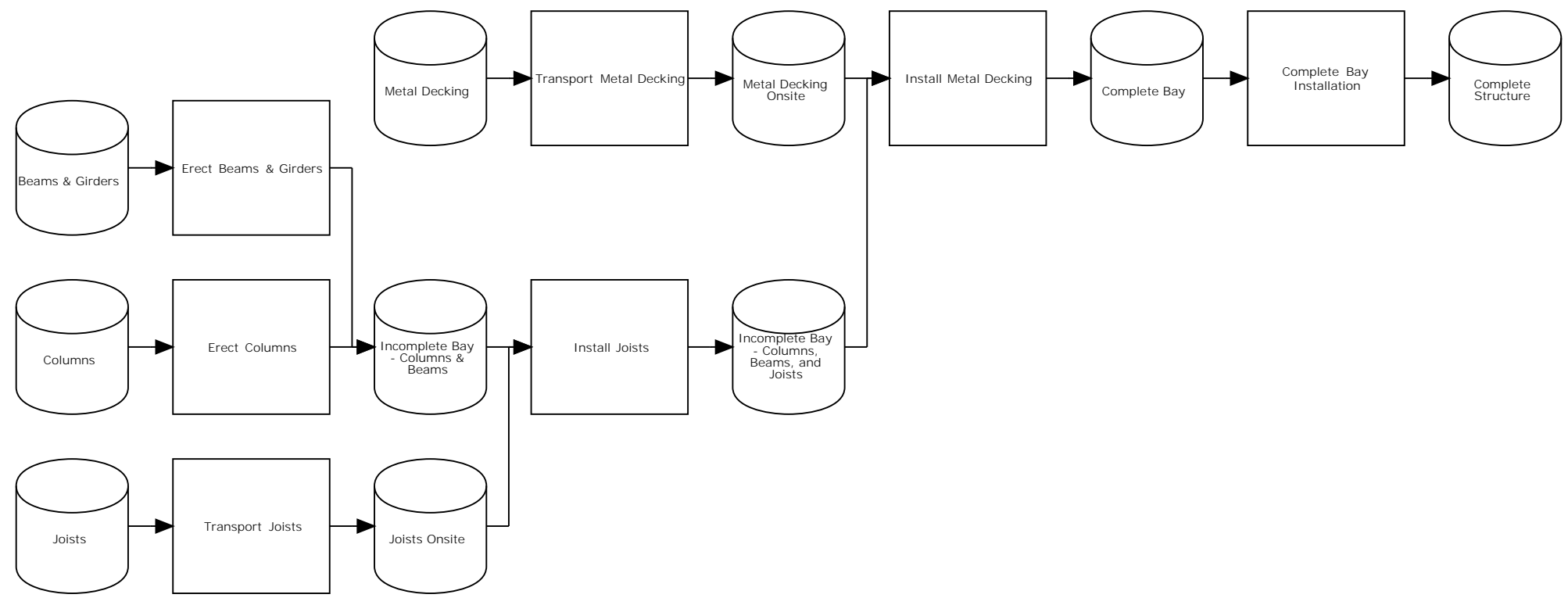


Using Project Production Methodology to Compare Onsite Prefabrication Steel Erection to Traditional Stick-Built



The Process Mapper model above is of the onsite prefabrication steel erection method



The Process Mapper model above is of the traditional stick-built steel erection method

Methodology

- Design a standard, commercial warehouse that can be built by both methods of steel erection
- Model the two different processes by using the Process Mapper (as seen above)
- Conduct interviews and research to determine the duration of operations
- Input collected data into the modeled steel erection methods
- Compare the capacity utilization of the process centers of each method

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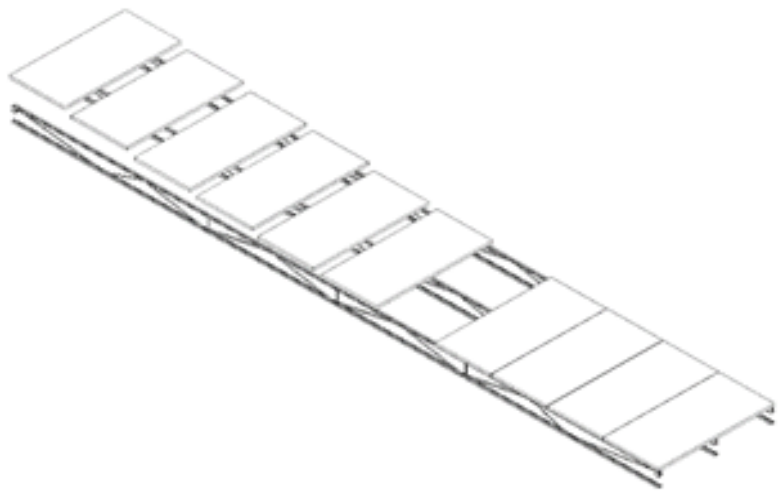
Abstract

Project production management provides continuity, predictability, and optimization of a process in comparison to the traditional approach of project management. Prefabrication is an example of project production management in which there is continuity of the product, reduced variability, and the assembly process can be altered for best results. This research will examine the benefits of project production management and compare two methods of steel erection in which one approach performs an onsite prefabrication process while the other approach employs the traditional stick-built process. The two methods will be modeled by the Process Mapper tool that replicates a repetitive process like a production system or assembly through the use of symbols. This tool also enables data like the duration of tasks, the required demand of the system or assembly, the amount of inventory available, and capacity utilization of machinery or crews working to be inputted and calculated. The two different methods will be analyzed through the scope of project production management using the tool. The resulting conclusion will be that the onsite prefabrication method will be shown to better utilize labor resources and be a safer approach in comparison to the traditional method.

Key Words: Project Production Management, Prefabrication, Steel Erection, Optimization, Capacity Utilization



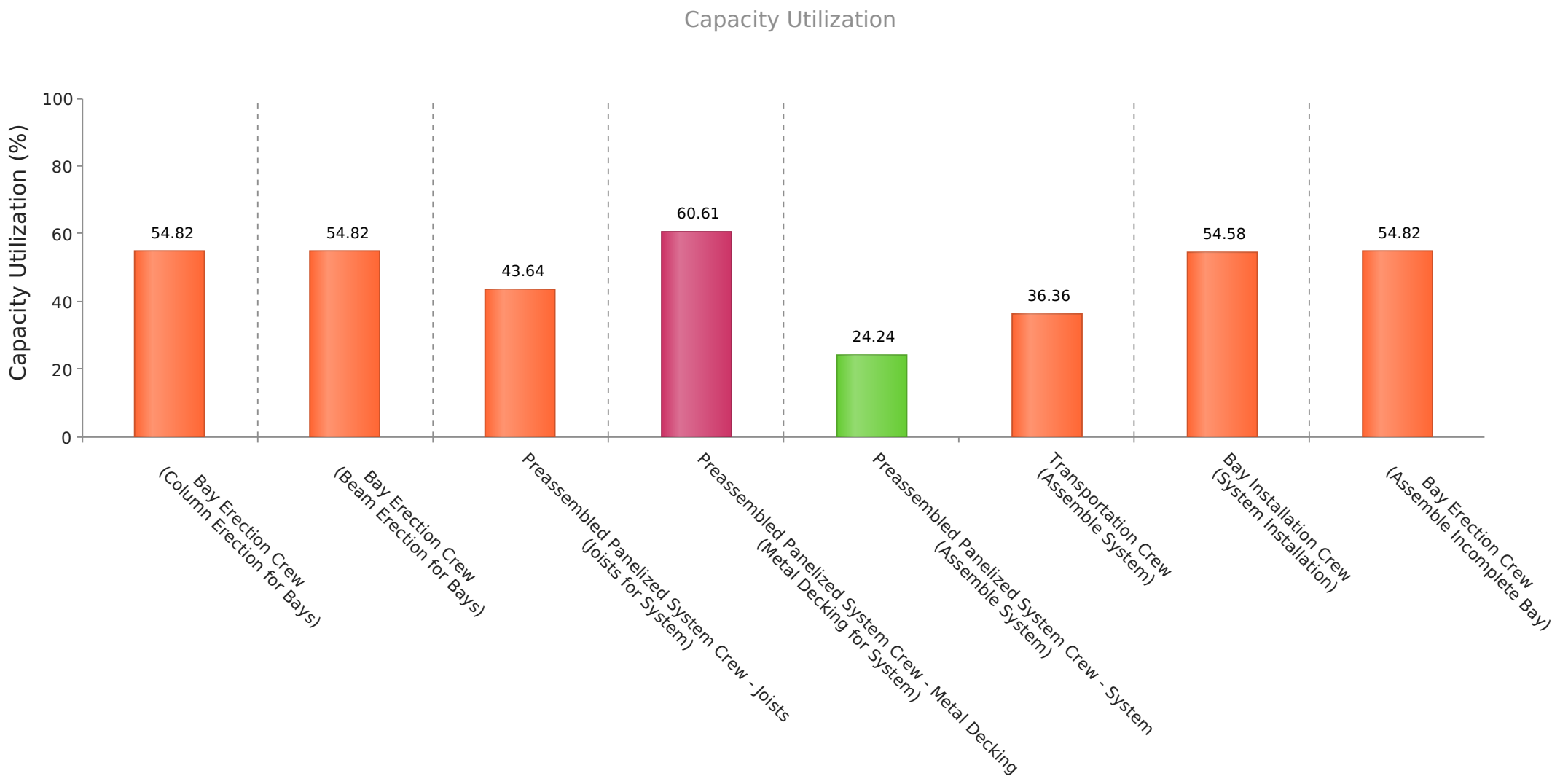
Onsite Prefabrication: Building Zone Industries's Innovatech Panelization Equipment creating the panelized systems
Source: Building Zone Industries



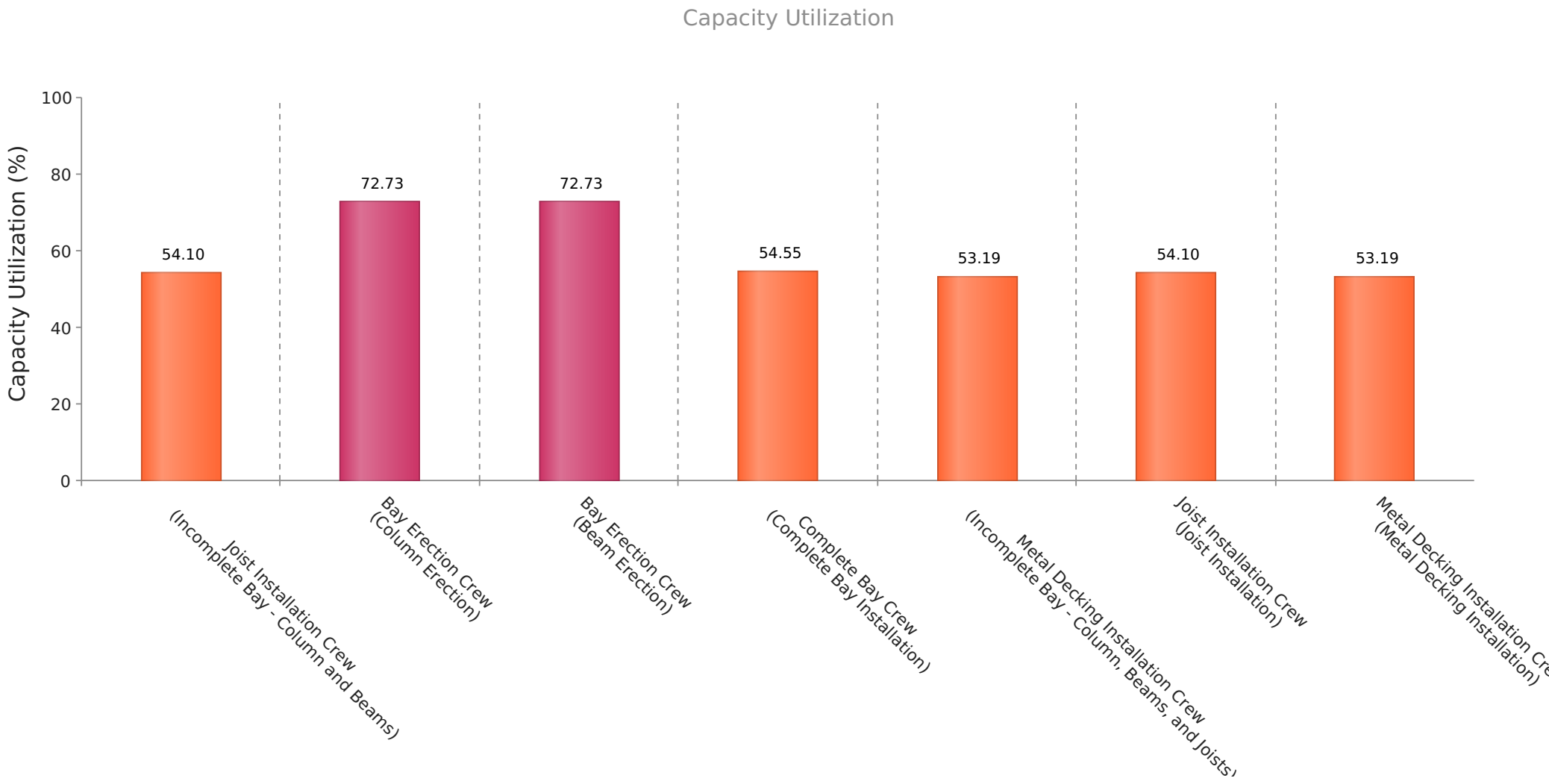
Beside is a Revit model of panelized system produced by the Innovatech Panelization Equipment. The panelized system is composed of three joists and 16 metal decking sheets.

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Thank you!



Above is a graph of the capacity utilization of the crews using the onsite prefabrication method



Above is a graph of the capacity utilization of the crews using the traditional stick-built method

Results

- Process Mapper enabled the two methods of steel erection to be quantitatively comparable
- The onsite prefabrication method displayed reduced utilization of resources in the areas of transportation, joist installation, and complete bay erection
- The onsite prefabrication required less crews to complete the similar operations at the same demand
- The onsite prefabrication method provided a safer work environment