ST. CLAIR COLLEGE
RESEARCH AND INNOVATION

AT A GLANCE

1 Researcher conducted the research elements focusing on using three different adhesive materials. 3 Student Researchers coordinated the research study efforts to assist the Researcher in the developmental phase. Software developing team: the three-dimensional finite element (FE) model of the new intermodular connection was developed using commercially available general-purpose FR software.

Vertical Connections using Mesh Adhesives Phase II

Project Overview

The project aimed to show a numerical analysis within a new beam column and intermodular connection model developed by Z Modular and the experimental testing for a simplified model. The project also showed an alternative method of performing vertical connections using adhesives. Three different adhesive material was used and tested for this project based on mesh convergence. The best choice of the adhesive was determined based on the experimental results.

Purpose/ Objectives

The St. Clair College Research and Innovation department partnered with Z modular to the demonstrate alternative methods of performing vertical connections using mesh adhesives instead of the main and smaller screws. Additionally, the University of Windsor partnered with this research project to conduct the experimental portion demonstrating how the adhesive component can enhance strength of the model on the VectorBlocs and other components of the intermodular connection.

Company Information

St. Clair College Research and Innovation in collaboration with Z Modular are known for providing researcher-based solutions into educational and applicational practices. Z Modular is a proud division of Zekelman Industries, the largest independent steel pipe and tube manufacturer in North America. Z Modular is the one-stop shop for modular buildings and services, offering a more complete factory solution than other offsite construction systems. The University of Windsor also partnered on the project for experimental application purposes.

Deliverables

- **Simulation and Analysis Tool:** FE software along with ANSYS Mechanics were utilized to fully understand the structural behaviour of the connection under axial loads.
- **Three-dimensional finite element (FE) model:** A new intermodular connection developed using commercially available FE software's to fully understand the structural behaviour of the connection under axial tension loads

Technologies

- **CAD Design modeling:** A three-dimensional CAD model for the new intermodular connection was simplified and used in this project for the stress analysis.
- **CNC Machining:** A simplified FE model for the experiment was manufactured using a CNC machine.

ST. CLAIR COLLEGE
RESEARCH AND INNOVATION