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**Art Gallery Ontario
Toronto, Ontario, Canada**

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Dokument in English

Art Gallery Ontario - Toronto, Ontario, Canada

The 180 meter long, 14 meter high glass and glulam façade wall is the main feature in Architect Frank Gehry's rejuvenation of the Art Gallery of Ontario. Equilibrium Consulting was retained by Structurlam Products, the glulam supplier, to carry out the detailed design and engineering for the hundreds of geometrically different and complex connections. The contract required that all connection be essentially concealed from view. In addition to the considerable challenges in geometry, many connections are also required to carry large axial and bending forces along multiple axes in combination, while accommodating stringent tolerances and aesthetic requirements.

The presentation will illustrate the design, modelling, fabrication and erection challenges our team encountered during the last 3 years of work on this project. Different parts of this large scope project will be presented with the emphasis on the coordination of work done by many different consultants and subcontractors. Special attention will be directed to the glulam to glulam and glulam to steel connections. The very demanding geometry together with the large forces resulted in very challenging connection design, manufacturing and erection.

The use of computer modelling in solving complicated design issues combined with on line meetings with consultants in different regions of North America will be presented as a model of cooperation. This project was only possible thanks to the extraordinary team work between the Architect, Engineer of Record, General Contractor, Specialty Engineers, Fabricators and Erectors and their dedication to the final success.

1 Transformation

ARCHITECT: Gehry International

ENGINEER OF RECORD: Hallcraw Yolles

SPECIALTY TIMBER ENGINEER: Equilibrium Consulting

GLULAM MANUFACTURER: Structurlam Products

1.1 Glulam Areas

- Dundas Façade
- South Tower
- Walker Court

1.2 Main Parts

- Radials
- Louver Headers
- Top Chord
- Bottom Chord
- Mullion Grid





2 Fabrication

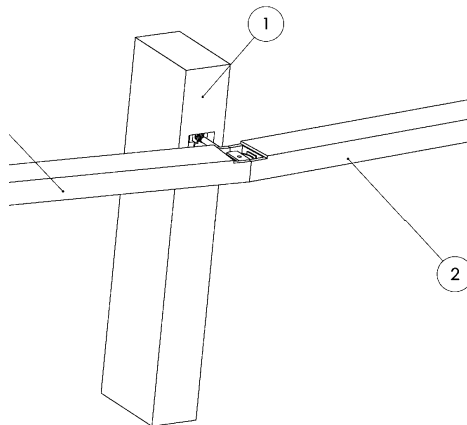
- Creno
- Hundegger K2

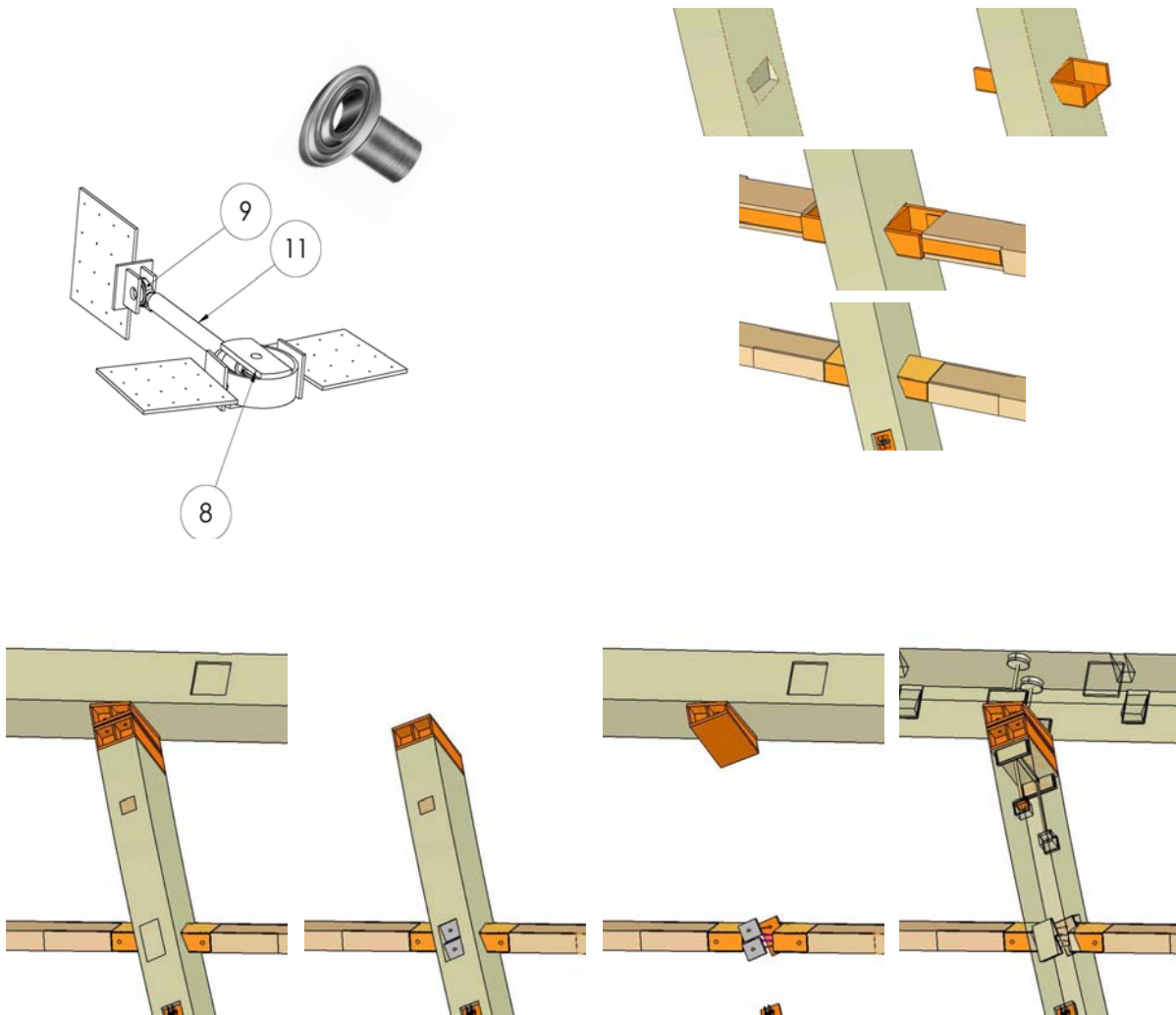




2.1 Modelling – shop drawings

- Katija
- Cadwork





3 Erection

- Existing Buildings
- Steel – Glulam Coordination
- Site Restraints

3.1 Overview

- Existing Buildings
- Dundas Street



3.2 First Radials - Erection

- Bottom Steel Beam Connection
- Top Steel Outriggers Connection



3.3 Radials Assembly - Continued

- Increase in Slope
- Connections to edge steel beams





3.4 Top Chord

- No Bending Moment from Radial to Top Chord
- Top Chord Splice



3.5 Box Beam

- Steel Fabricator - Coordination
- Glulam to Steel Connections



3.6 Louver Headers

- Moment Connections
- 1 side moment changed to 2 side moment



4 Mullion Grid

- Sample
- Testing in Florida



4.1 Temporary Bracing

- Bottom to steel beam
- Top to outriggers



5 Transport

- BC to Ontario
- Accident





6 Walker Court – South Tower

- Simple Geometry
- Existing Buildings



7 Summary

- Complicated Geometry
- Very High Loads
- Coordination Required
- Most Challenging Project

