Cast Steel Connections in Steel-Timber Hybrid Construction

Jennifer Pazdon Vice President, Cast Connex



CAST STEEL CONNECTIONS IN STEEL-TIMBER HYBRID CONSTRUCTION

23rd May, 2022 | CTBUH Steel-Timber Hybrid Buildings Conference Jennifer Anna Pazdon, PE | Vice President



PRESENTATION OUTLINE

What is a structural steel casting?

Completed Case Studies

UMASS Amherst John W Olver Design Building

Vancouver International Airport (YVR) Pier D Expansion

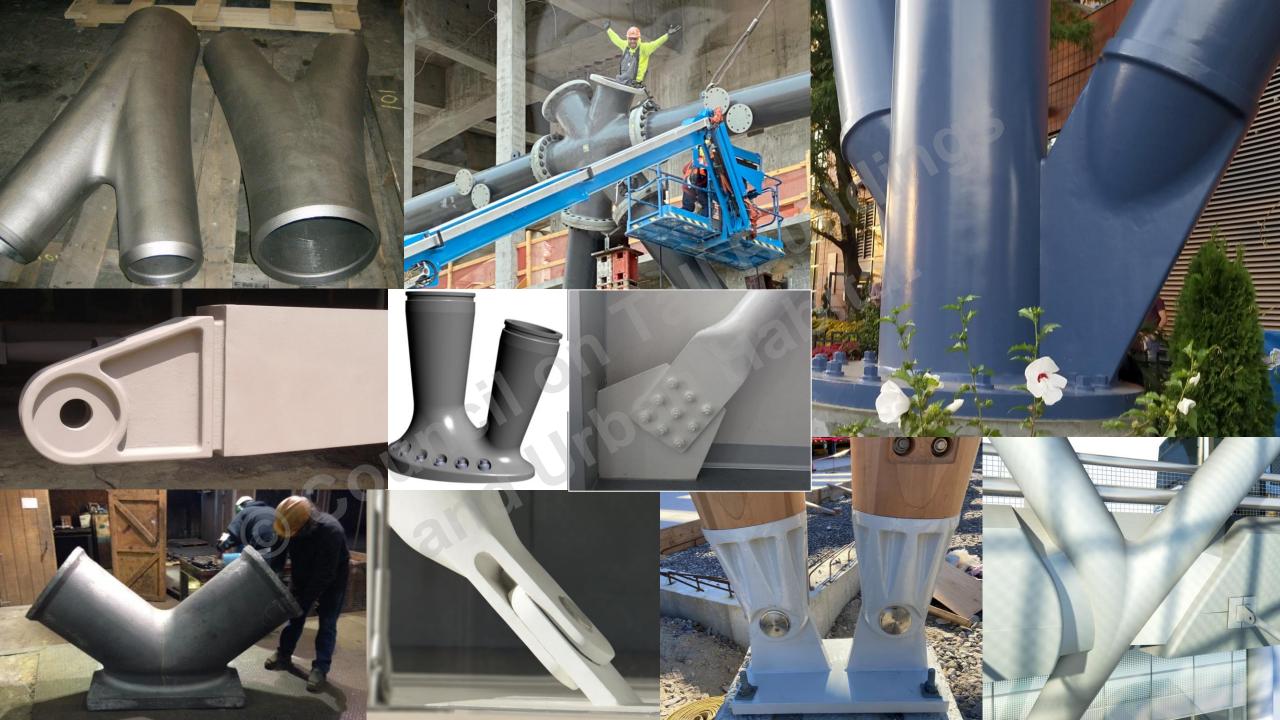
Cast Studies In Construction

University of Victoria Student Housing

843 N Spring Street









STANDARDIZED

CUSTOM



BENEFITS OF CAST STEEL CONNECTIONS FOR STEEL-TIMBER HYBRID CONSTRUCTION

Freeform Geometry

Flexible solutions for new construction typology with material-use efficiency Aesthetic quality for exposed structure unmatched by conventional steel fabrication

Improved Structural Performance

Ductile and efficient LFRS for multi-story buildings

Simplification of Construction

Minimized coordination between trades in shop and field activities

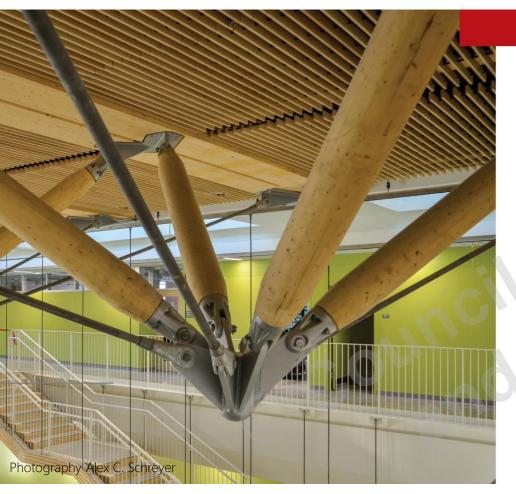
Overall Economy

Turn-key solutions, pre-engineered, modularized and available off the shelf

UMASS AMHERST JOHN W. OLVER DESIGN BUILDING

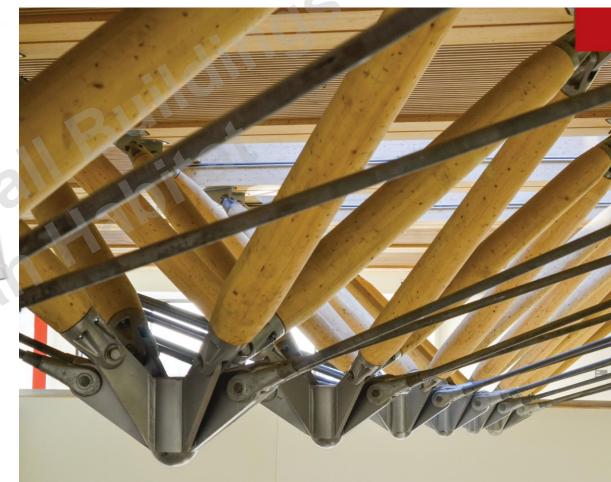
Amherst, MA 2017

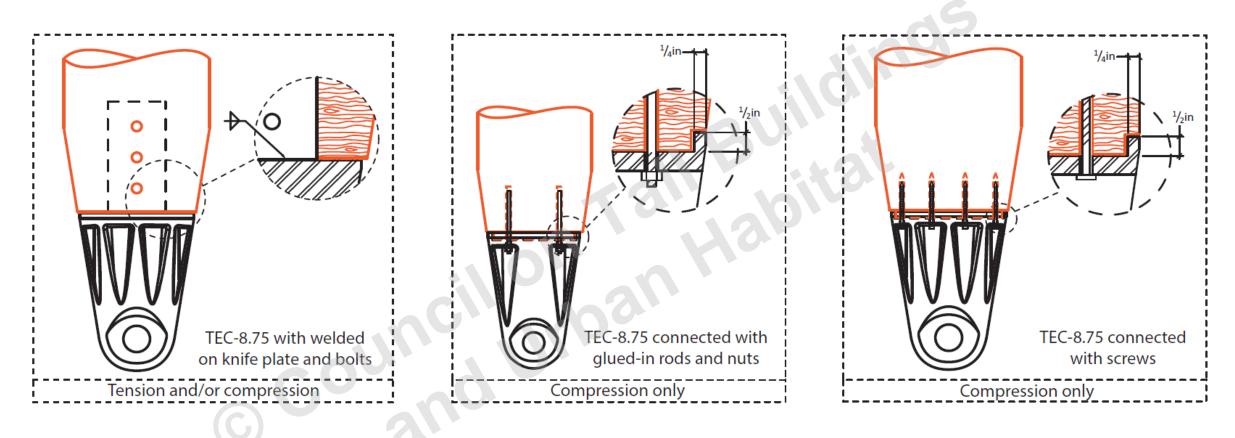
> OWNER: UMASS Amherst
> ARCHITECT: Leers Weinzapfel Associates
> STRUCTURAL ENGINEER: Equilibrium Consulting Inc. and Simpson Gumpertz & Heger, Inc.
> TIMBER SUPPLIER: Nordic Structures
> CONSTRUCTION MANAGER: Suffolk Construction





TIMBER END CONNECTOR™





DETAIL 2: TEC TO TIMBER

VANCOUVER INTERNATIONAL AIRPORT (YVR) PIER D EXPANSION

Richmond, BC

2020



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the party party in the local lines.



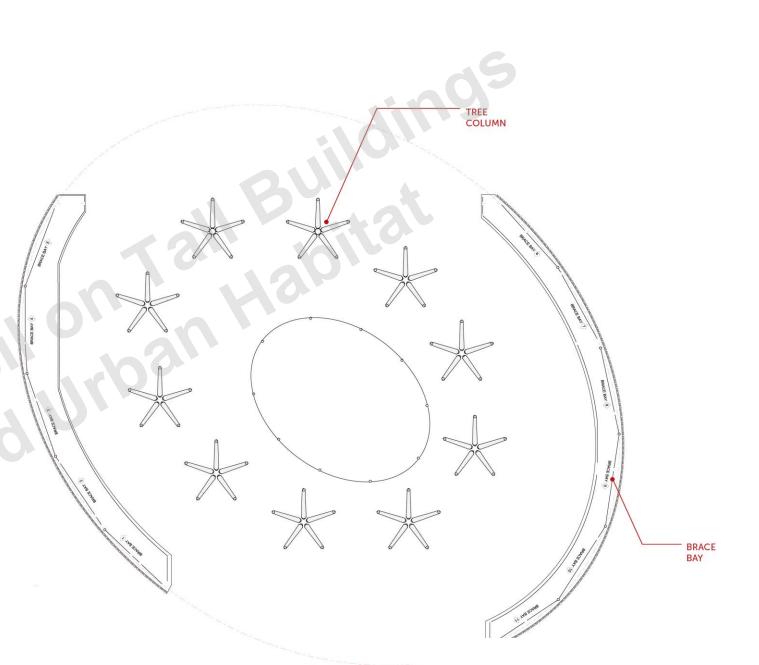
OWNER: YVR Airport Authority ARCHITECT: Kasian Architecture STRUCTURAL ENGINEER: Bush, Bolman & Partners, LLP STEEL FABRICATOR: Whitemud Ironworks Group TIMBER SUPPLIER: FraserWood Industries GENERAL CONTRACTOR: PCL Construction

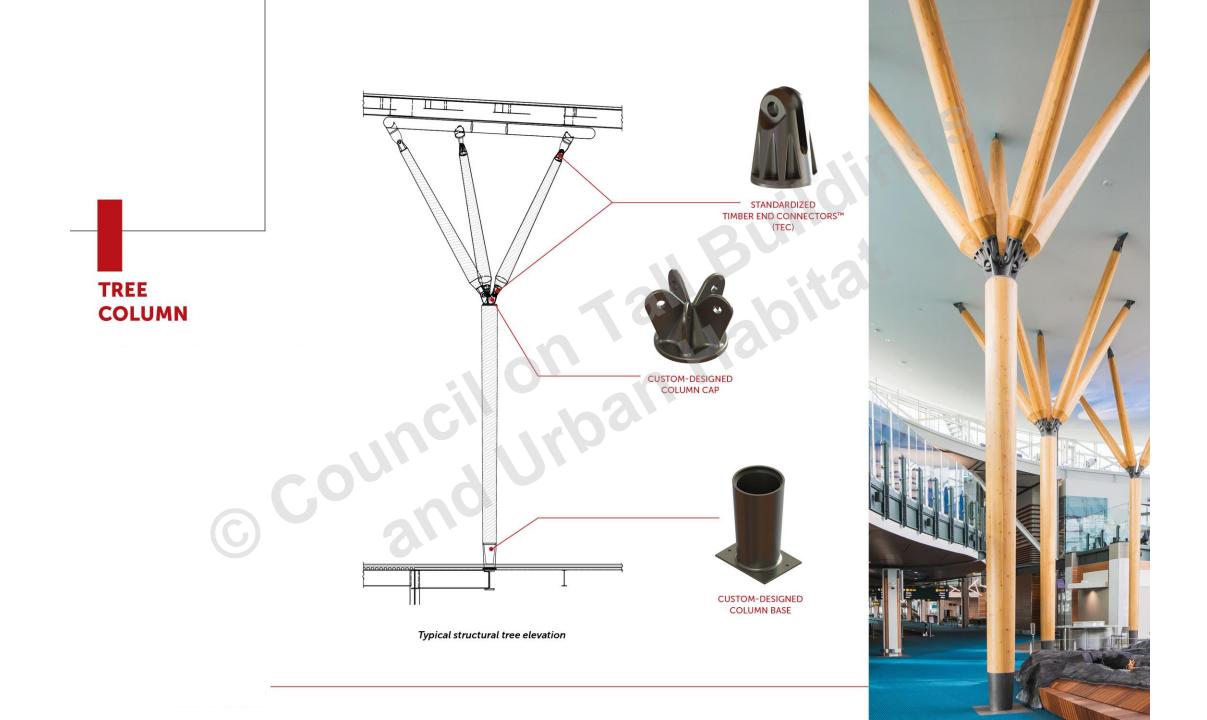


ATRIUM

The atrium roof is supported by ten tree structures characterized by a tapering trunk and 5 branch members. Glued-laminated timber members are framed between stainless steel castings.

The lateral system includes steel moment frames and steel concentric braced frames. Braced frame bays are architecturally exposed structural steel elements that include standardized cast steel components.

















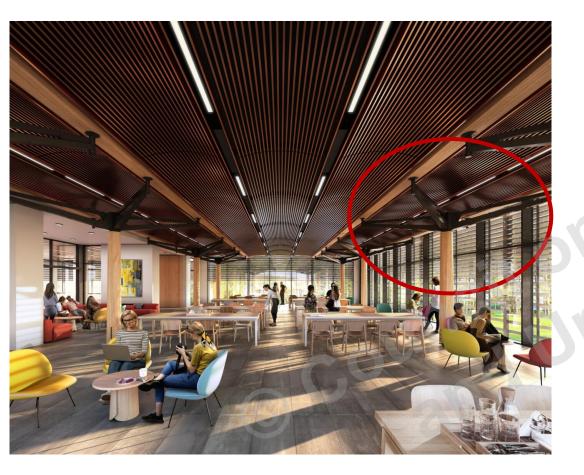
UNIVERSITY OF VICTORIA STUDENT RESIDENCES

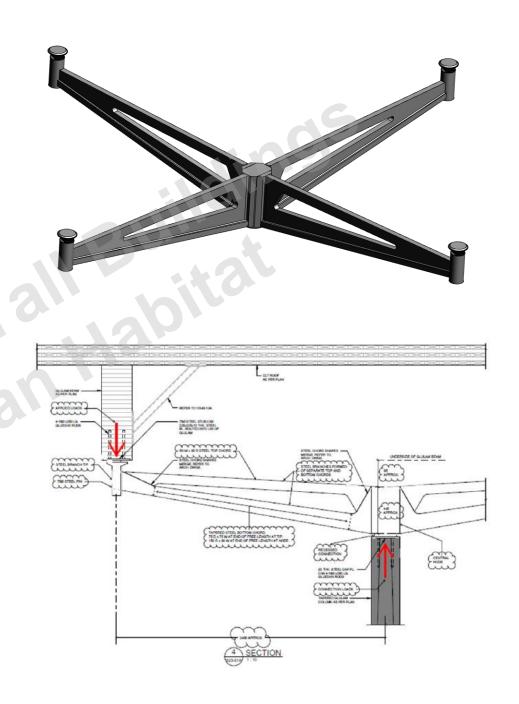
Rendering by Perkins + Will

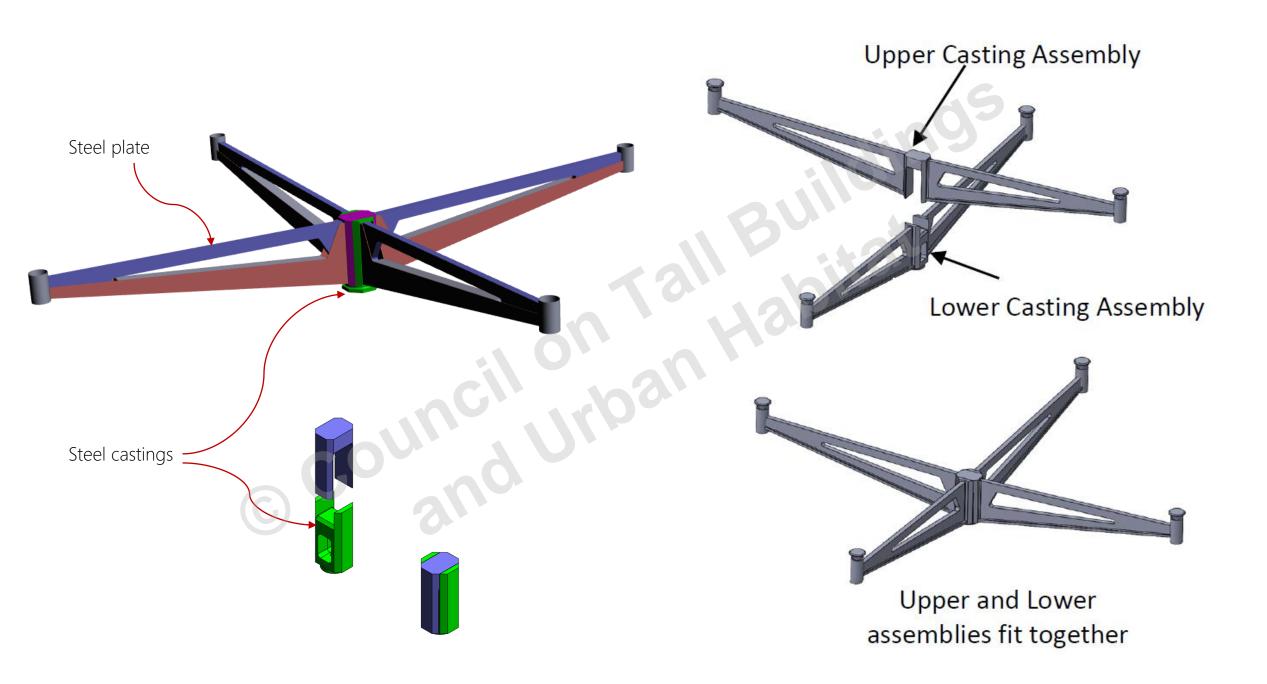
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Victoria, BC 2022 expected

> OWNER: University of Victoria ARCHITECT: Perkins + Will STRUCTURAL ENGINEER: Fast + Epp STEEL FABRICATOR: George Third & Son Ltd. TIMBER SUPPLIER: Seagate Mass Timber GENERAL CONTRACTOR: Kalesnikoff

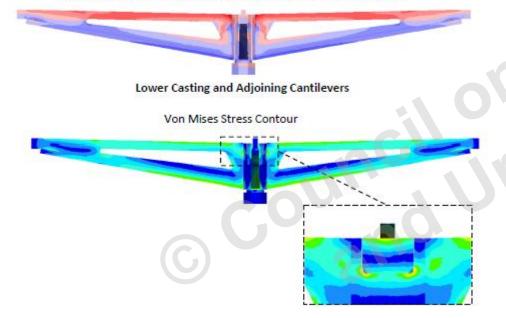






Upper Casting and Adjoining Cantilevers

Signed Von Mises – showing locations of tension and compression



Signed Von Mises – showing locations of tension and compression

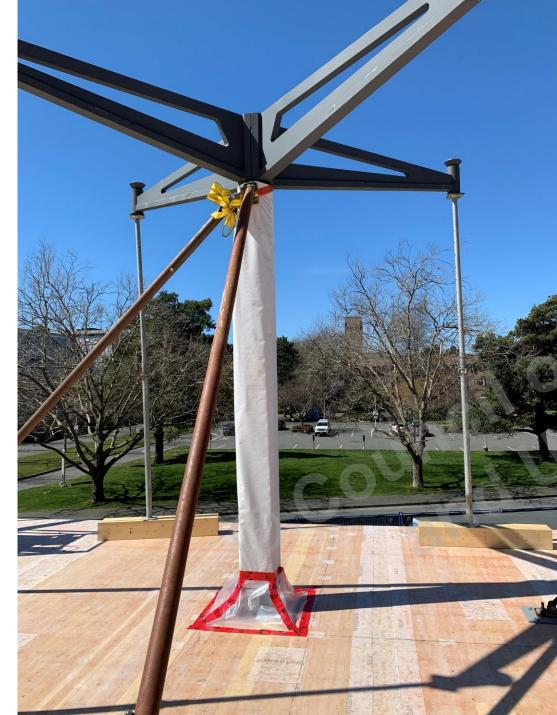






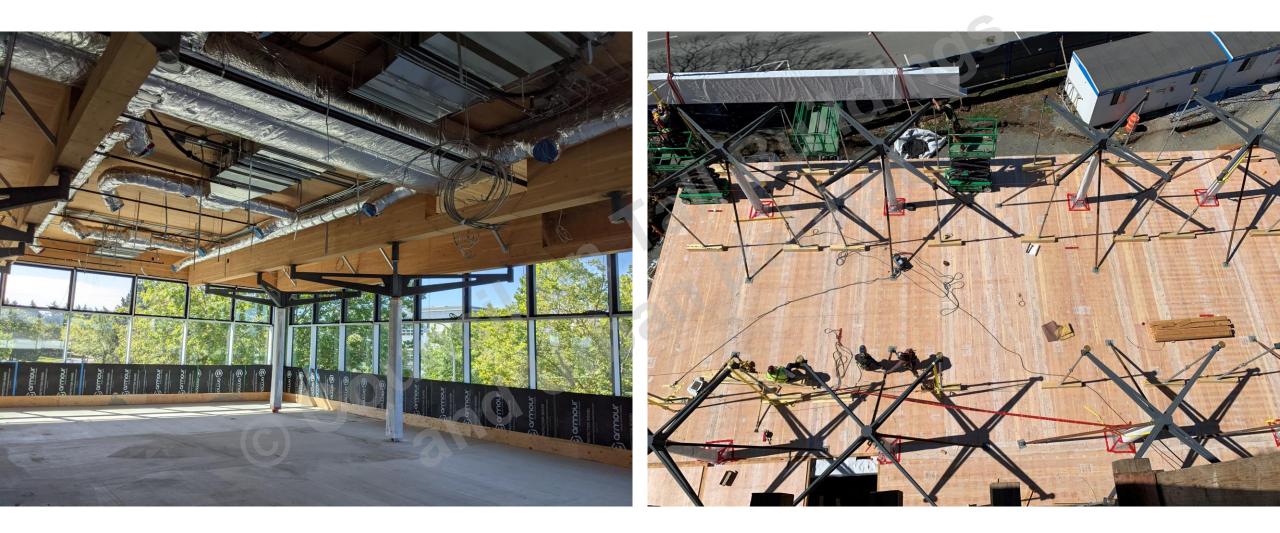


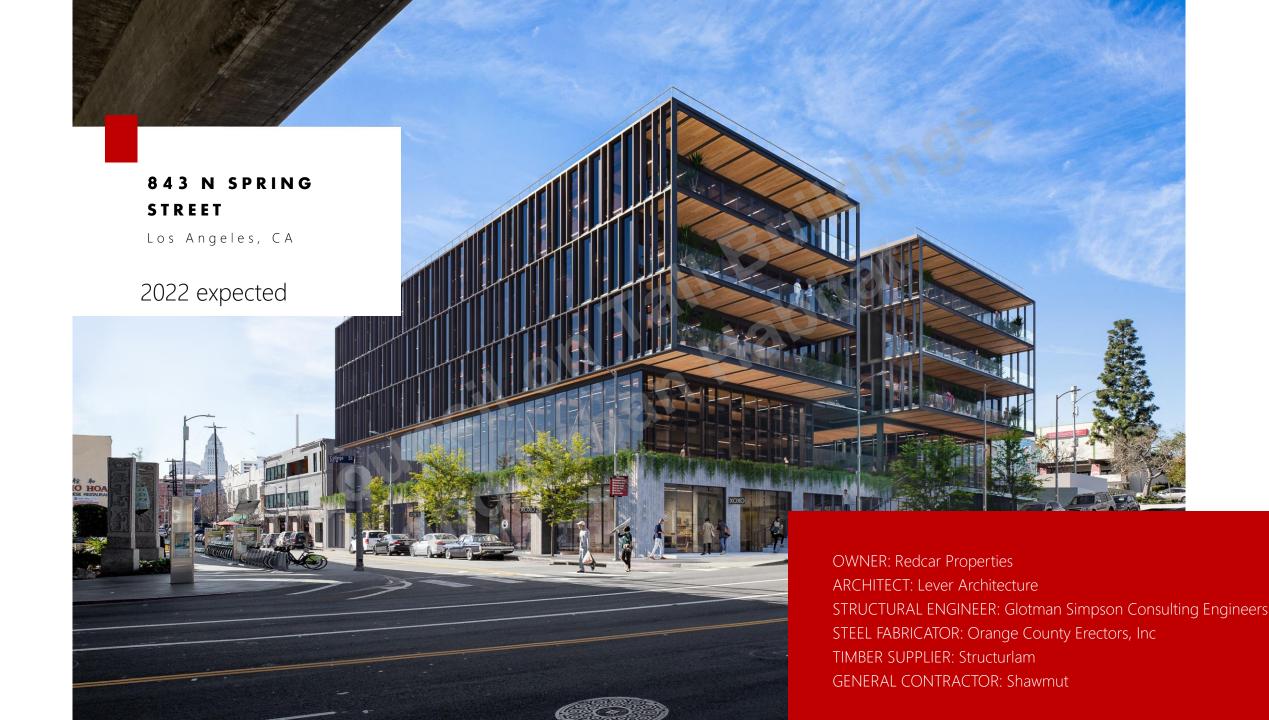




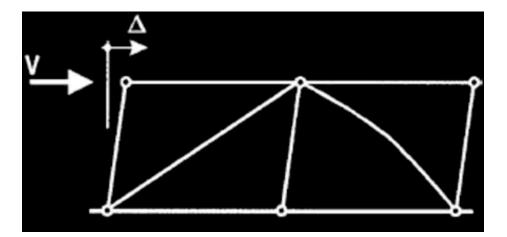


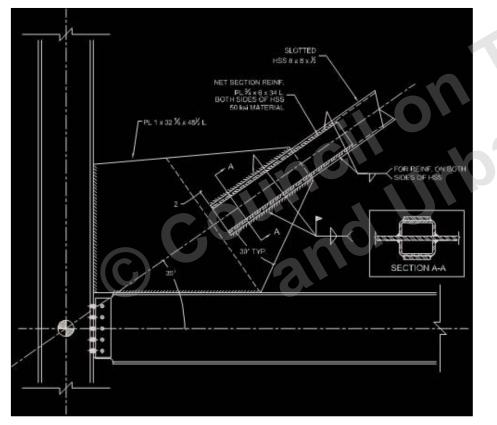












Field welded option

Special Concentric Braced Frame (SCBF) Basics

As a frame deforms beyond its elastic range, its brace members are intended to yield in tension and buckle in compression R = 6

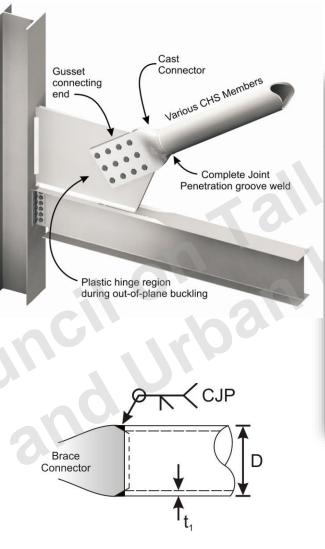


Field bolted option

HIGH STRENGTH CONNECTORS™

CAST CONNEX High Strength Connectors™ simplify and improve connections to round hollow structural section (HSS) brace members in seismic-resistant concentrically braced frames (SCBF, OCBF, MD-CBF or LD-CBF).

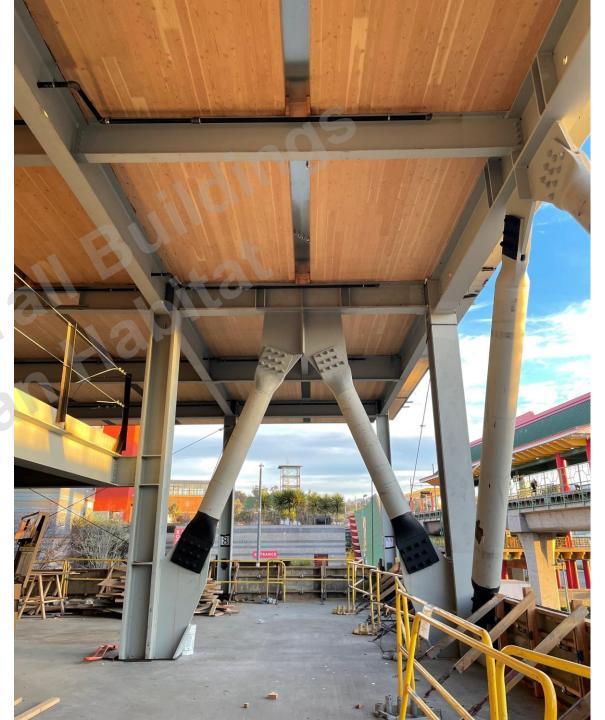














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