



# HEAVY TIMBER CONSTRUCTION IN CANADA

11/21/2008



**EQUILIBRIUM**

Vancouver

Toronto

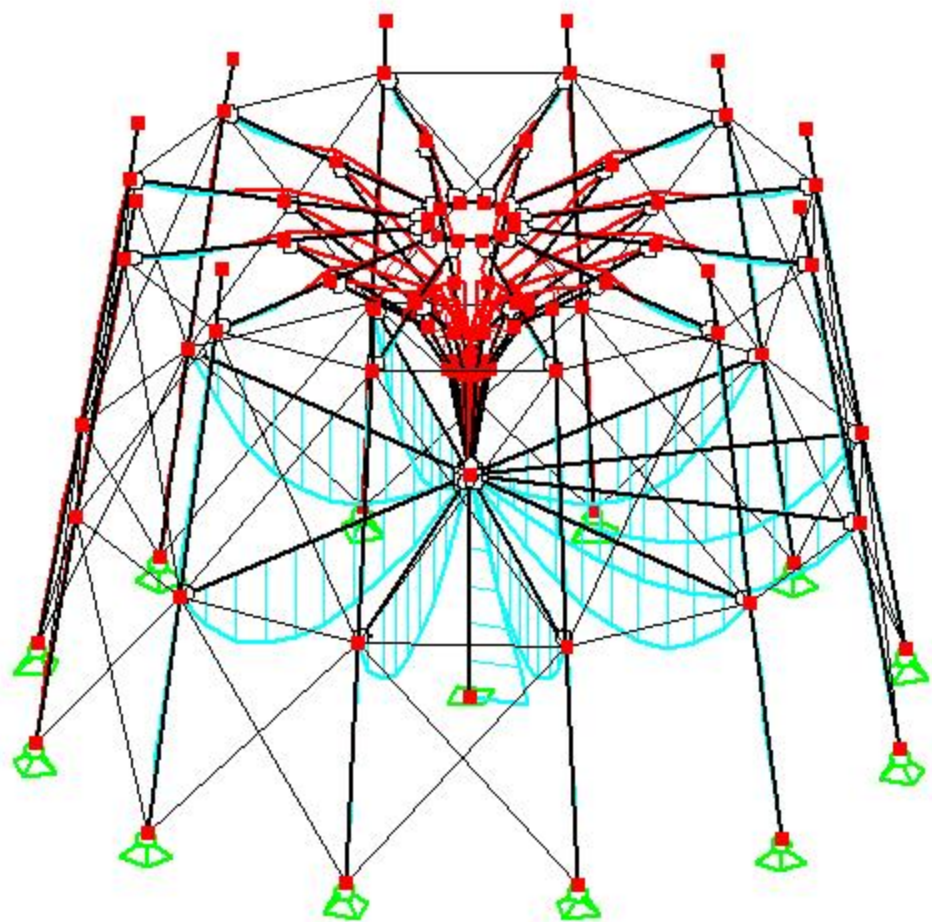
CONSULTING INC.  
CONSULTING STRUCTURAL ENGINEERS

# Outline

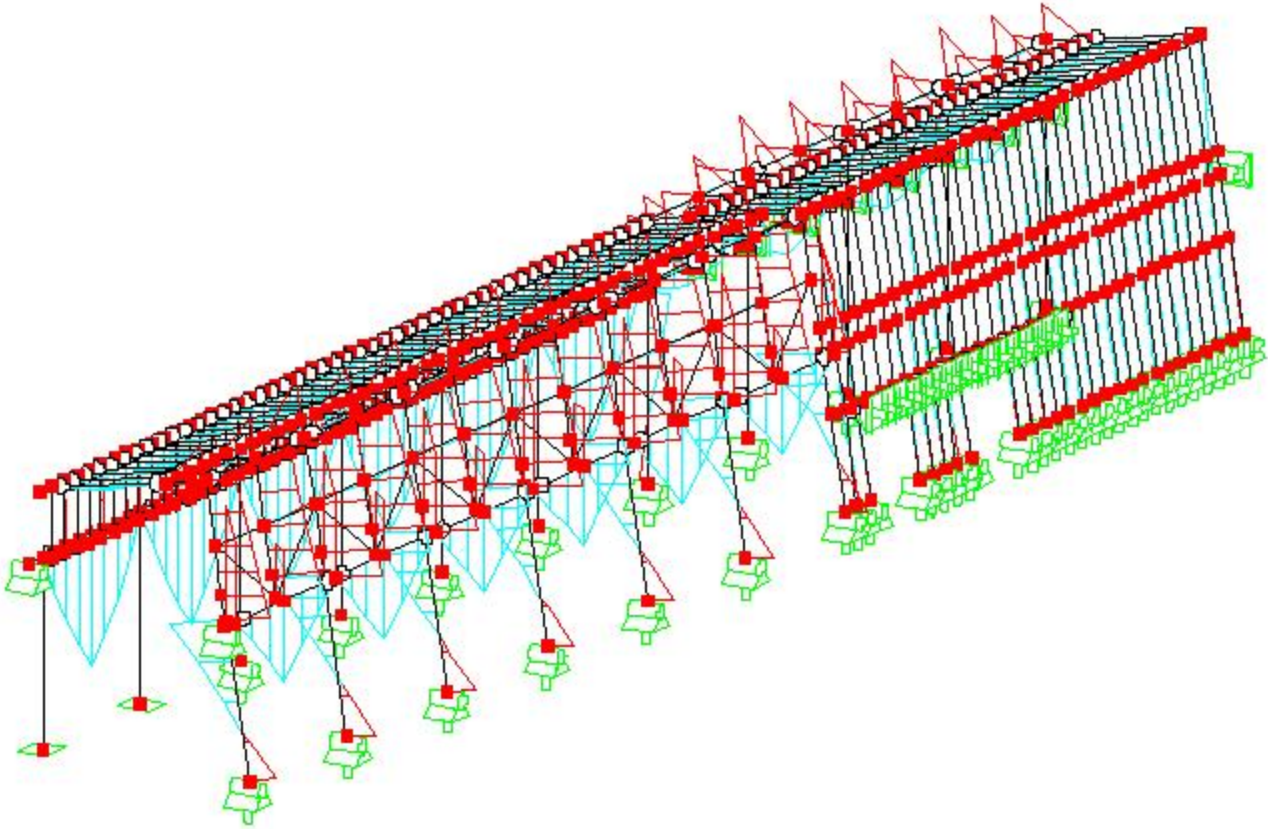
- Design
- Detailing
- Manufacturing
- Erection
- Project Examples

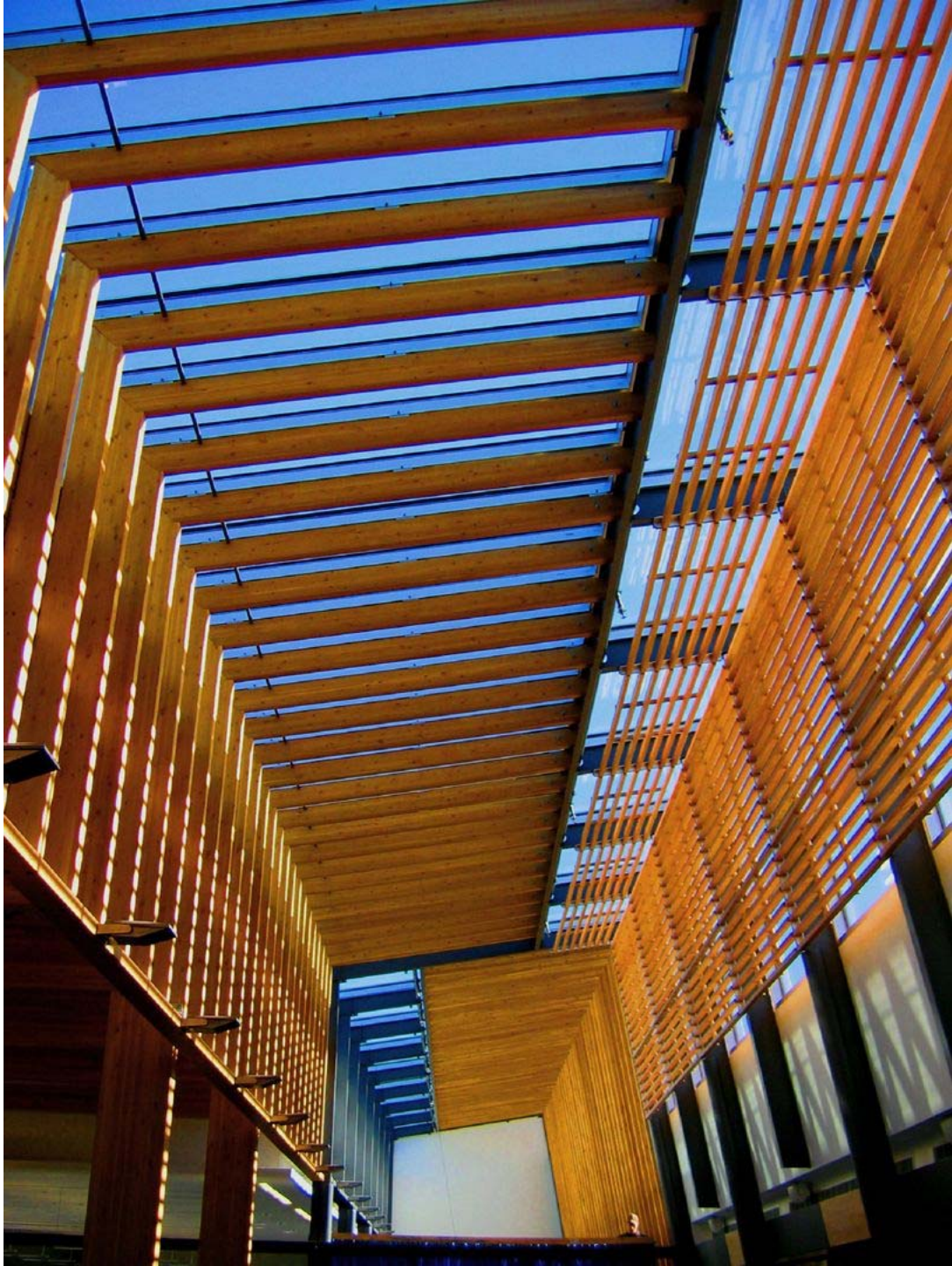
# Design

- Analysis
- Design Codes
- Connection Systems
  - Bertsche
  - SFS
  - Others: pins, notches
- Coordination with Detailing







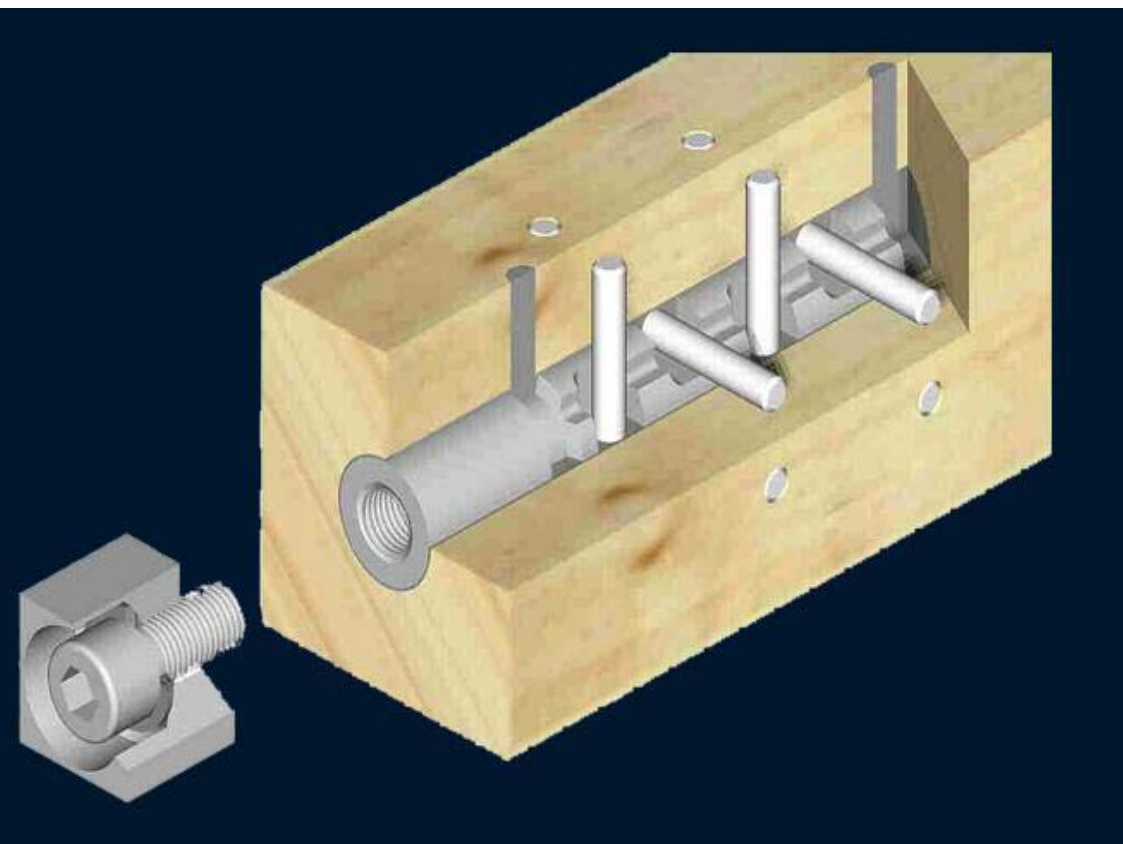
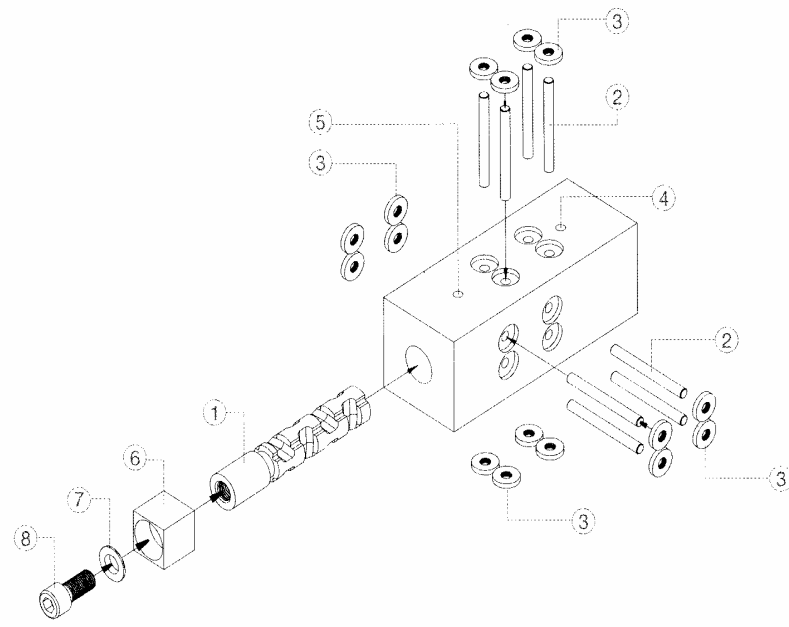


# Connection Systems

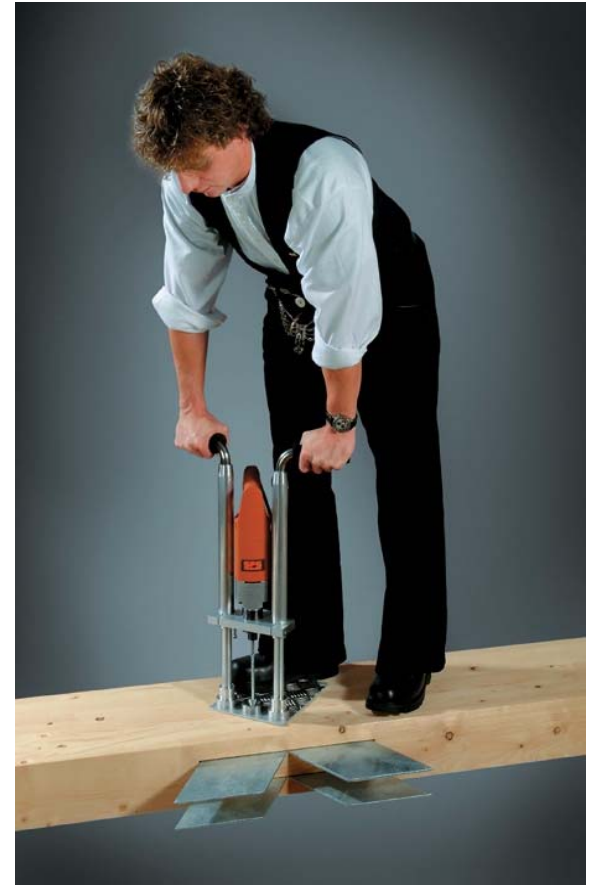
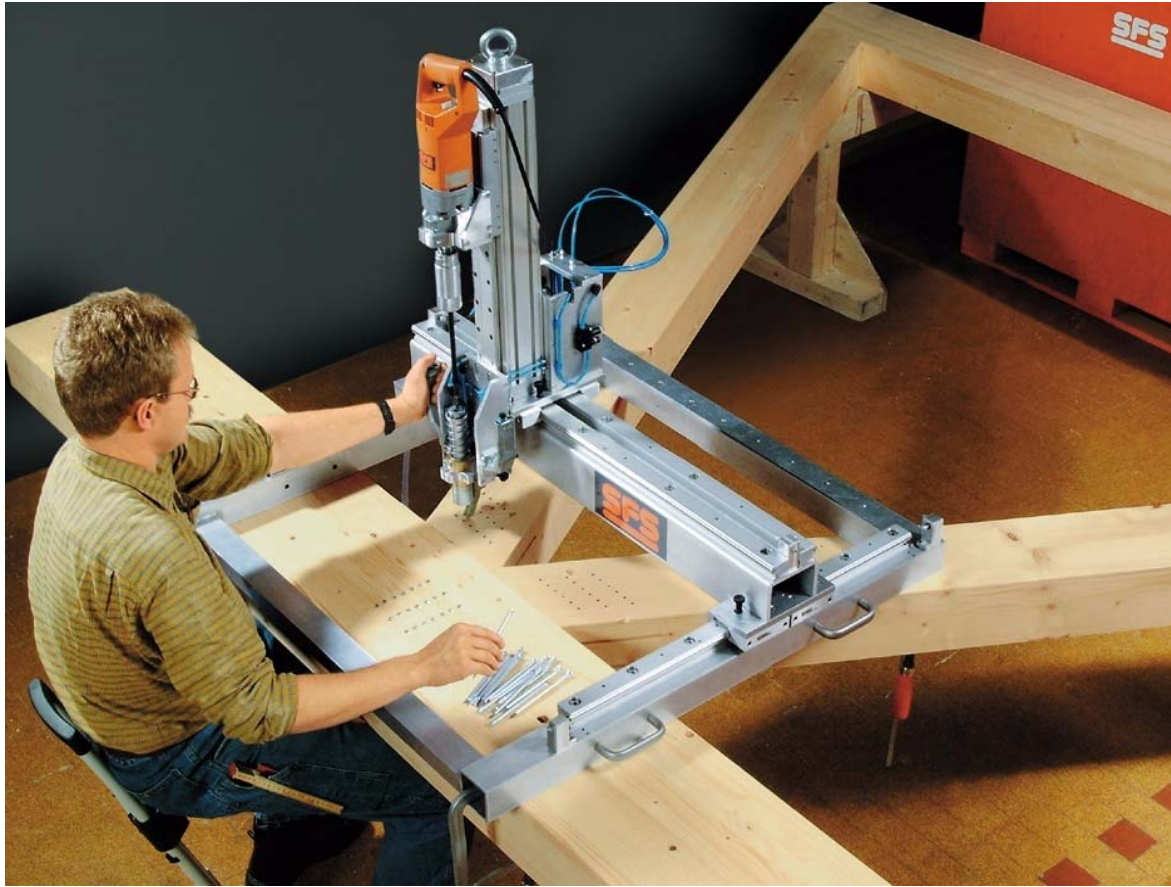
- Bertsche System
- SFS System
- Castings
- Notches



# Bertsche System

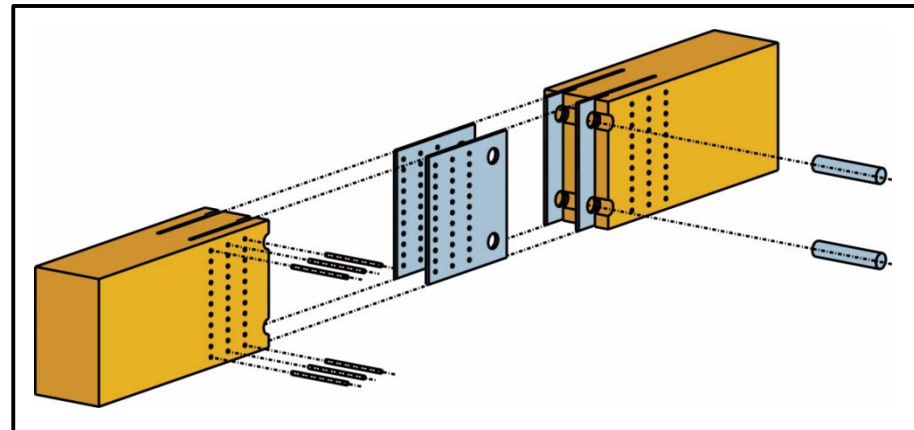
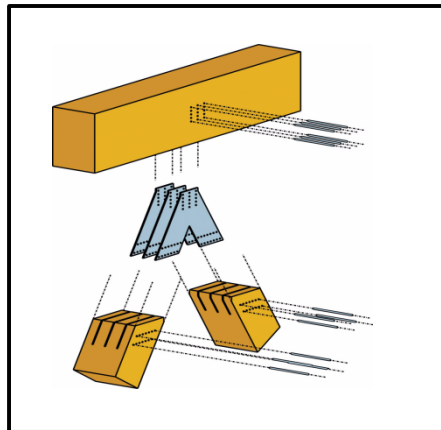
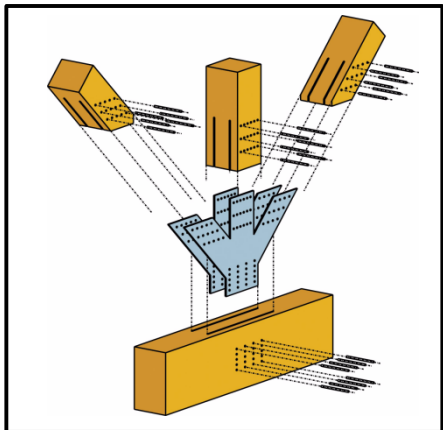
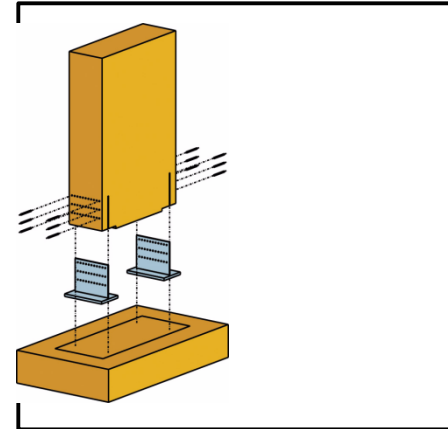
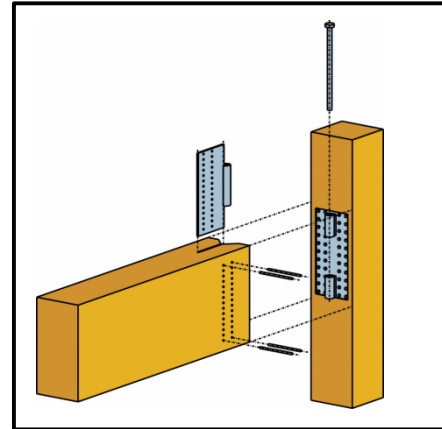
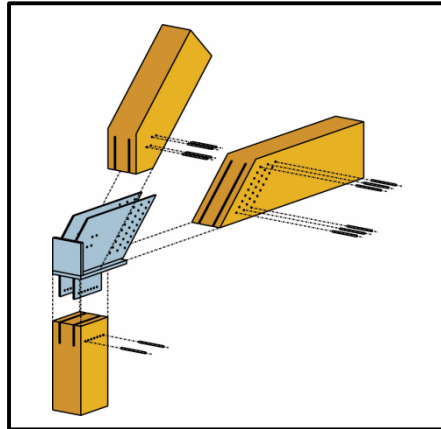
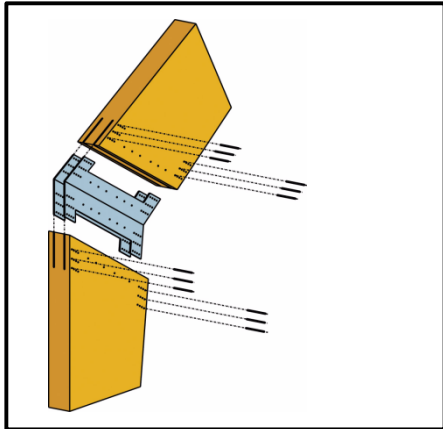


# SFS System



**SFS** intec

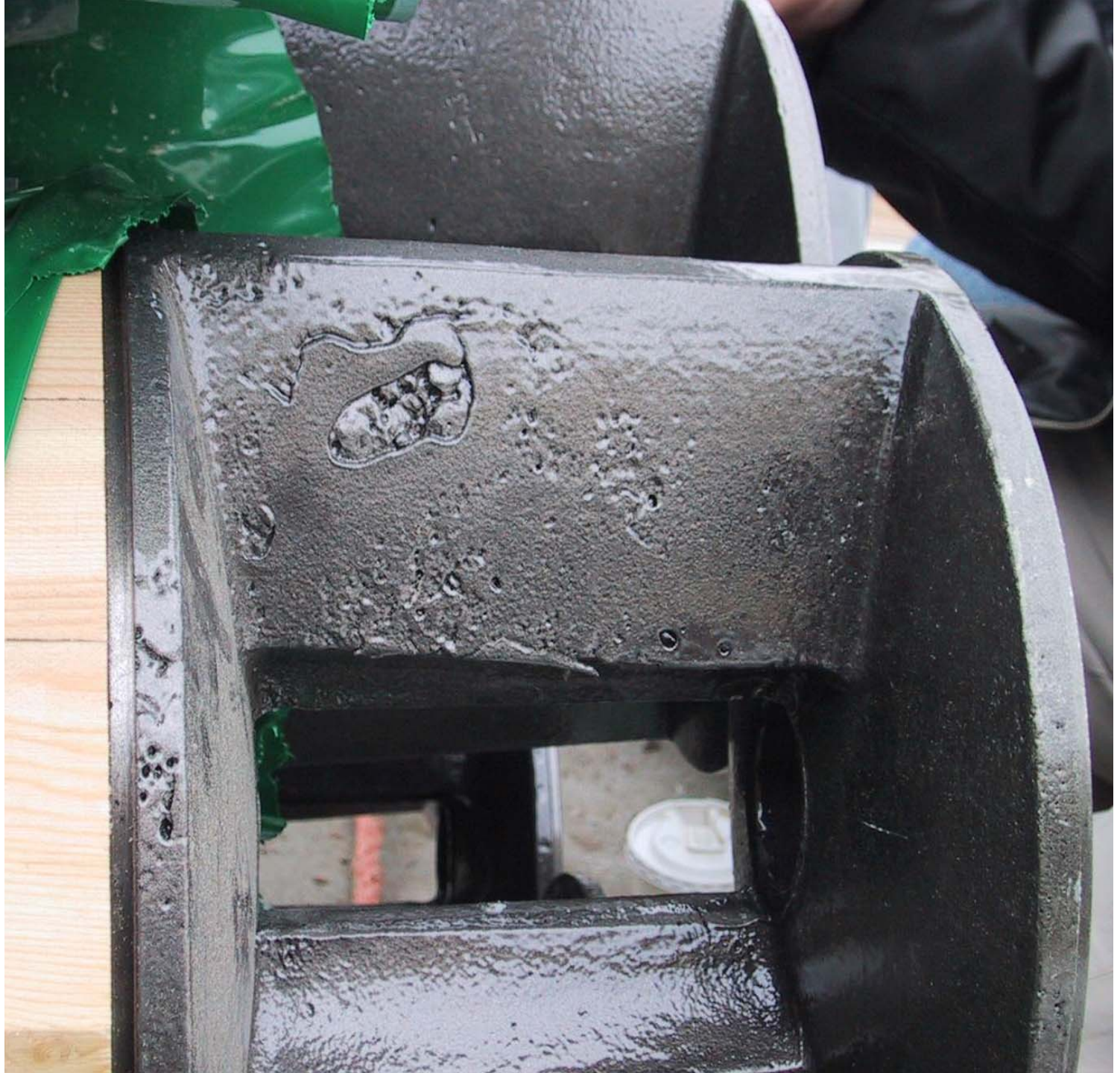
# Applications





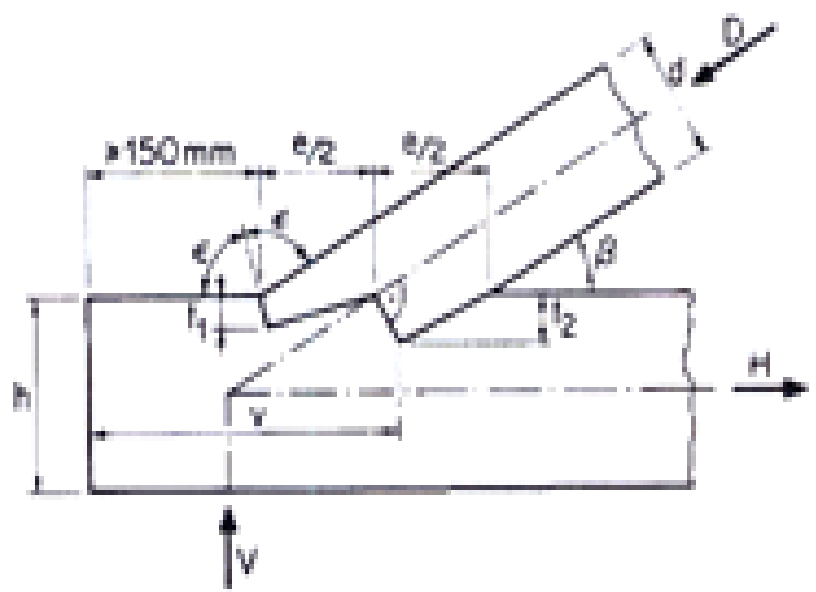
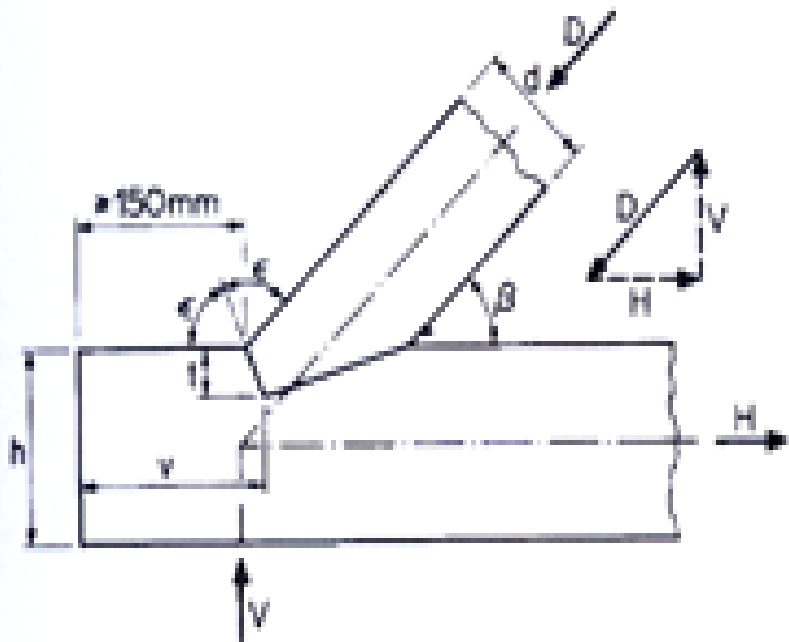
**SFS**

# Castings



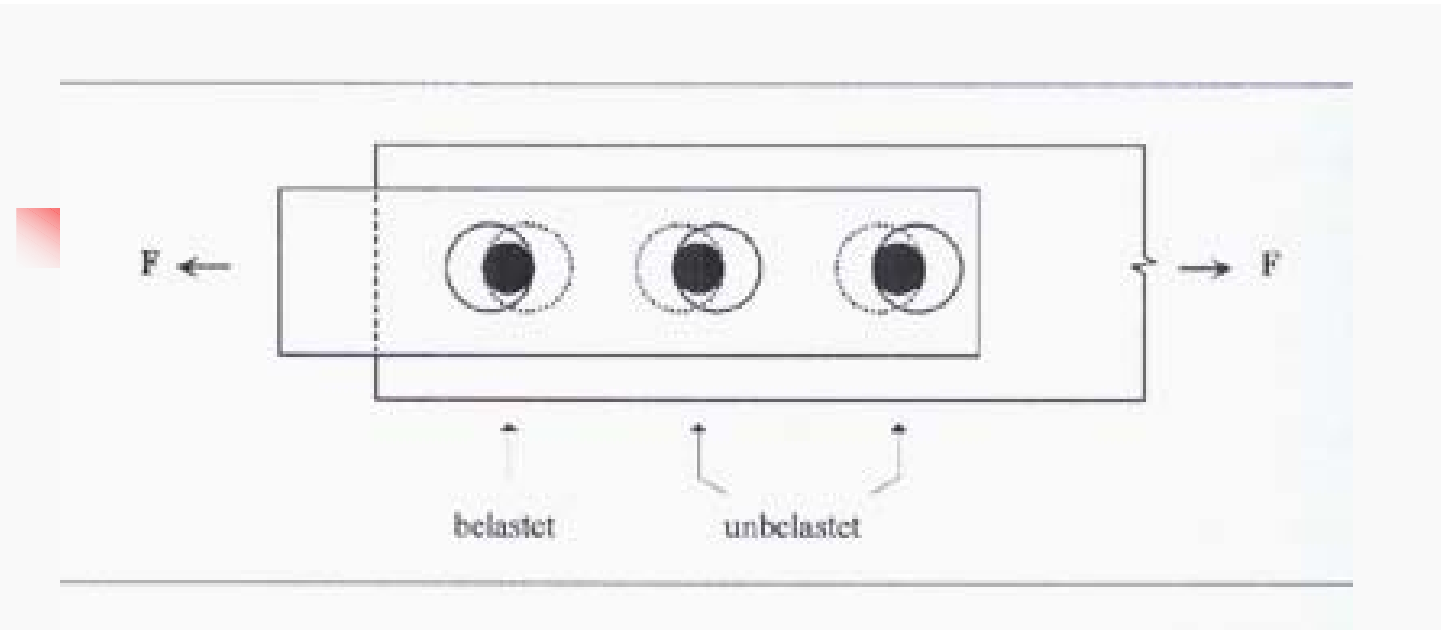


# Notches



$t = t_1 + t_2$  mit  $t_1 < t_2 - 10 \text{ mm}$

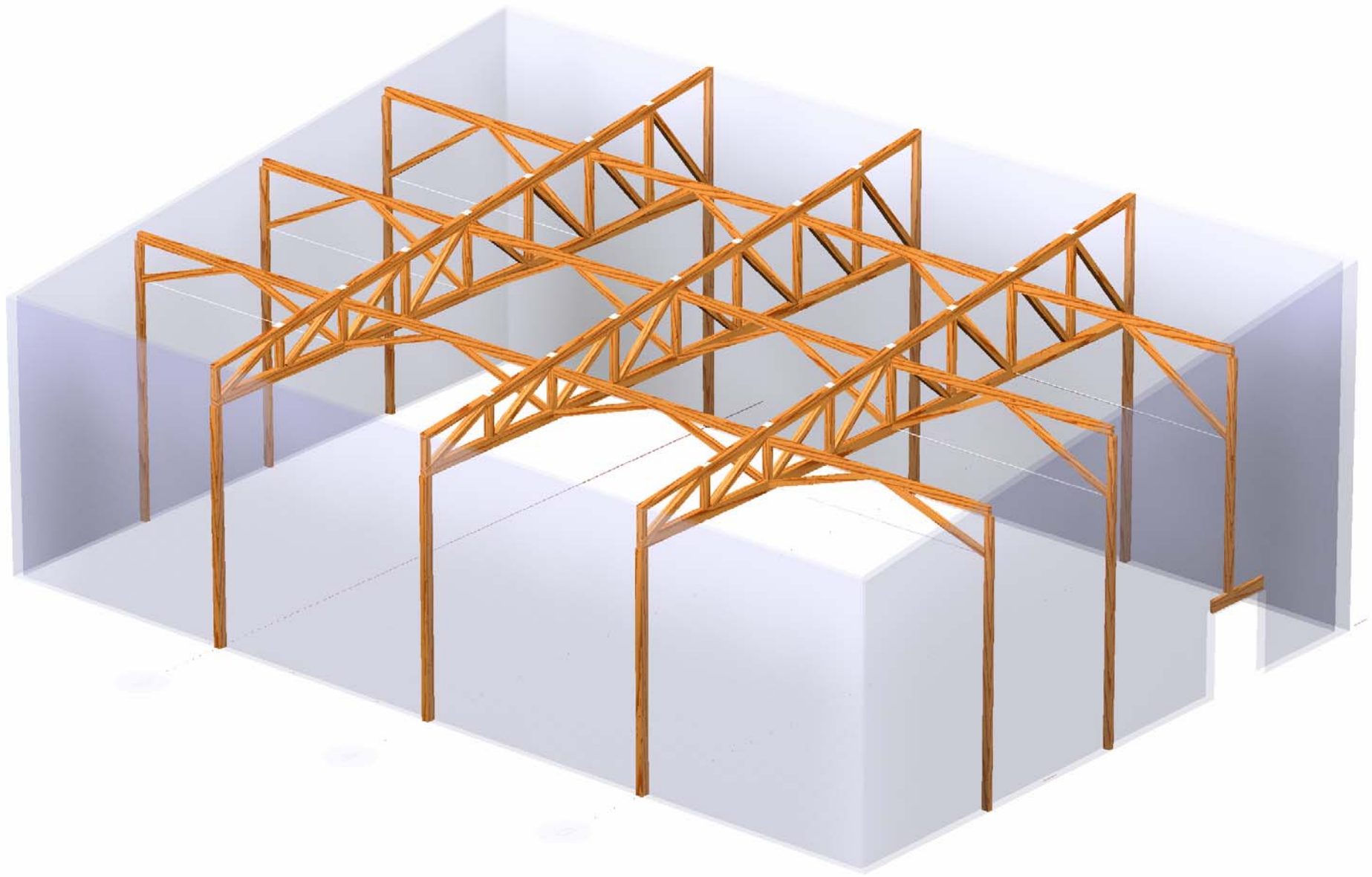
# Bolts vs Pins



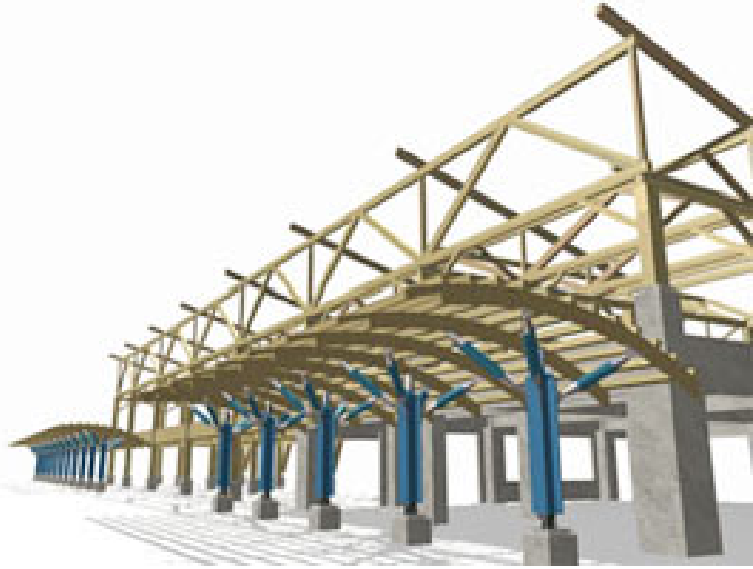
Unequally loaded bolts in a bolt group.

# Detailing

- Models
- Software
  - CadWork
  - Dietrich
  - Digital Project
  - AutoCad









# Manufacturing

- Construction Site Cutting
- Hundegger K2
- Creno









K2

K2

**WARNING**  
WARNING OF MOVING  
PARTS AND HOT SURFACES  
KEEP AWAY FROM MOVING  
PARTS AND HOT SURFACES  
DO NOT TOUCH MOVING  
PARTS

CHAIN  
←

002







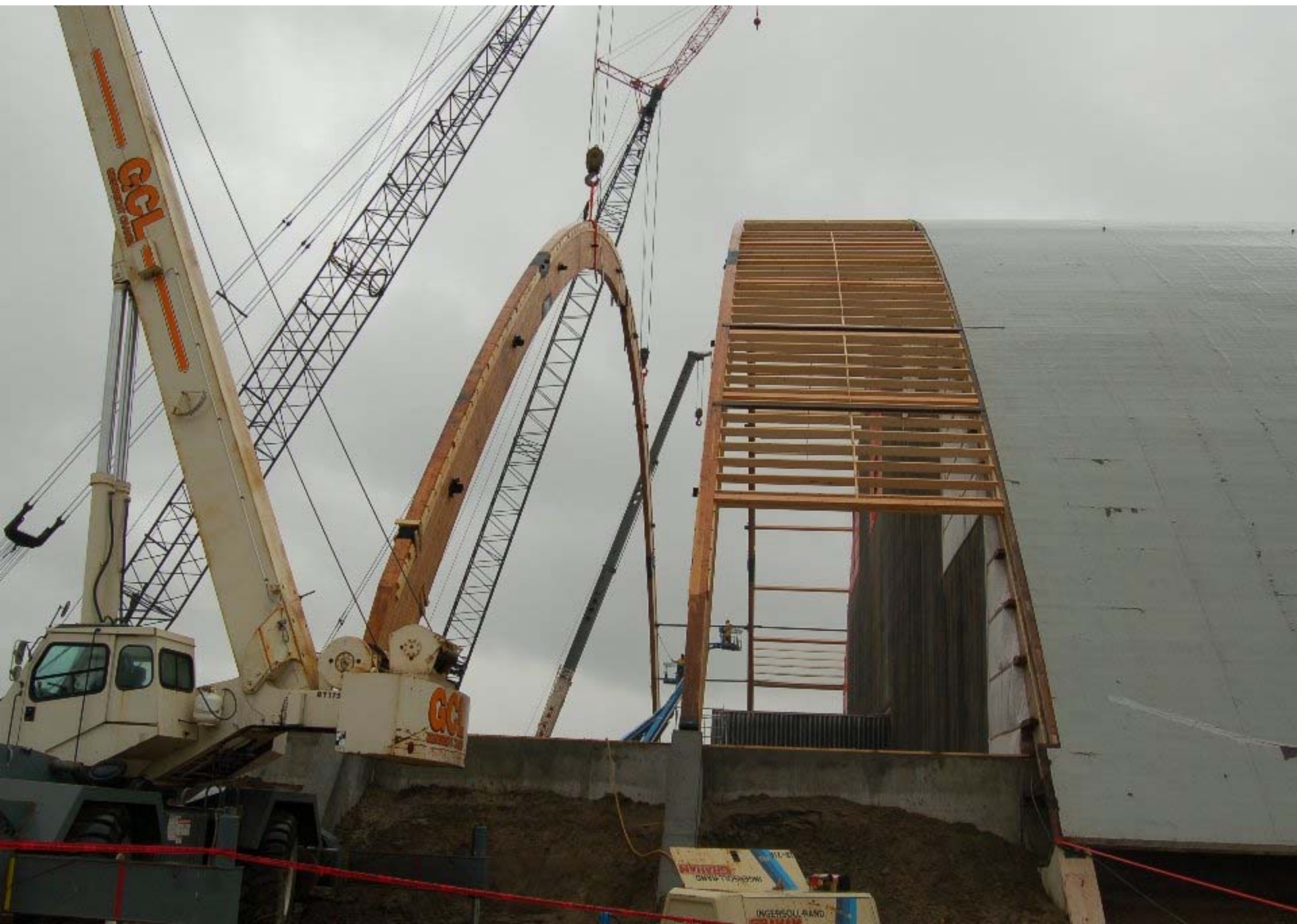






# Erection

- Erection Engineer
- Crane availability
- Coordination with other materials



# Project Examples

- Private Residences
- Schools, Community Centers
- Airports, Galleries, Industrial Buildings

# Residences

# Groves 2 Residence

Whistler, BC

Resort Plan International

Trusses, pyramids, post and beam























# Blueberry Residence

Whistler, BC

Resort Plan International

Trusses, trees









# West 8<sup>th</sup> Residence

- Javier Campos Architect
- Trusses, beams, detailing

















# Hooded Merganser Restaurant Penticton, BC

Nick Bevanda Architects

Curved glulam beams











# Driving Range

## Langley, BC

Structurlam Products







# Ditidaht First Nation School

## Malachan, BC

Marceau Evans Architects

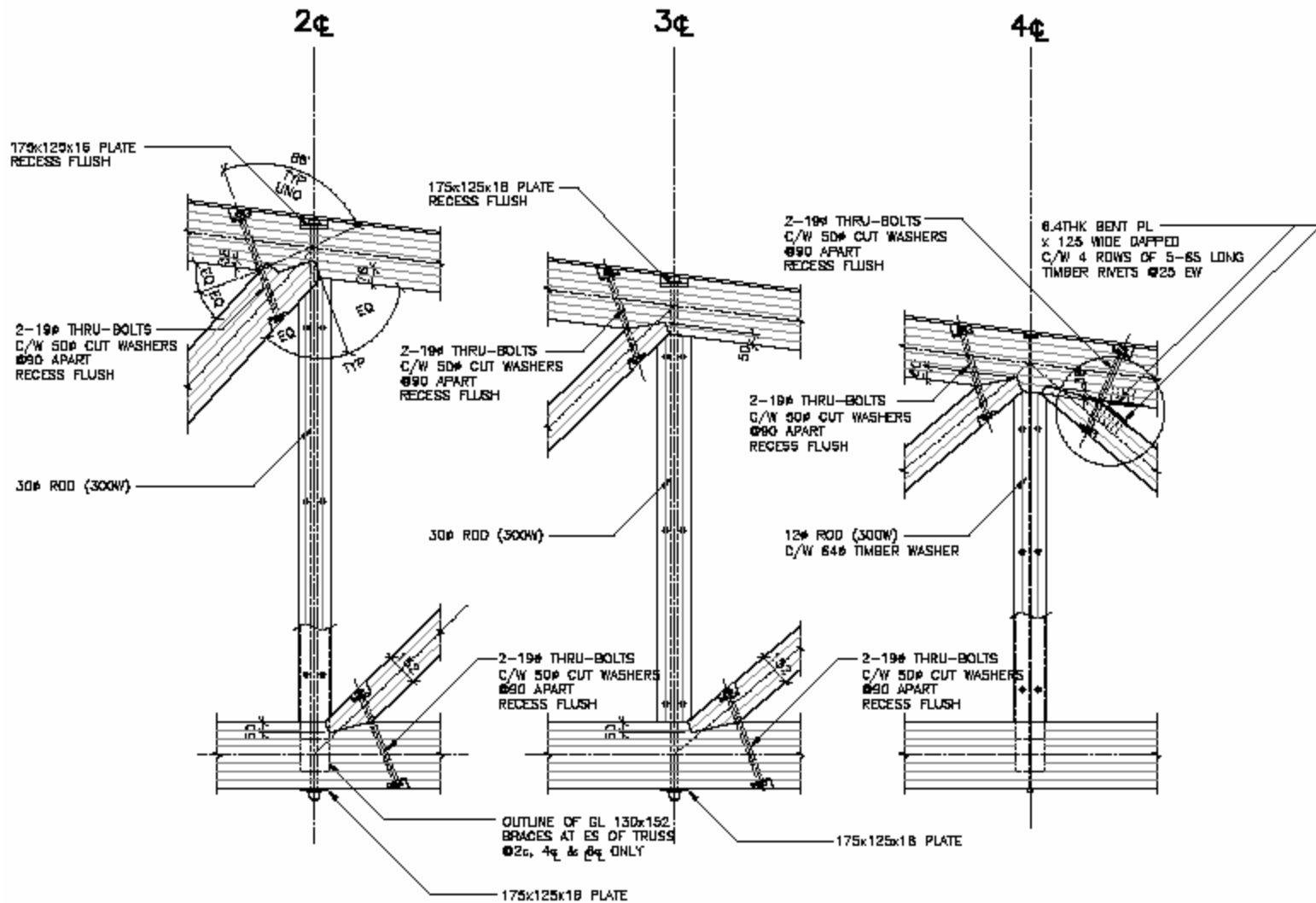














# Saulteau Community Centre

## Moberly Lake , BC







METAL FLASHING CAP ON  
 3/4" PT PLYWOOD BACK-UP ON  
 3x6 @2'-0" FRAMING

DOUBLE BEVEL T/O BEAM  
 ABOUT CL BEYOND INTERSECTION

RIDGE LINE

OVERLAPED BEAM CONNECTION  
 (TD HALF DEPTH) 1/8 MAX OVERSIZE  
 C/W 2-3/4" x 15" LAG BOLTS

3/4" THREADED ROD  
 C/W NUT & WASHER  
 WELD TO PIPE BELOW

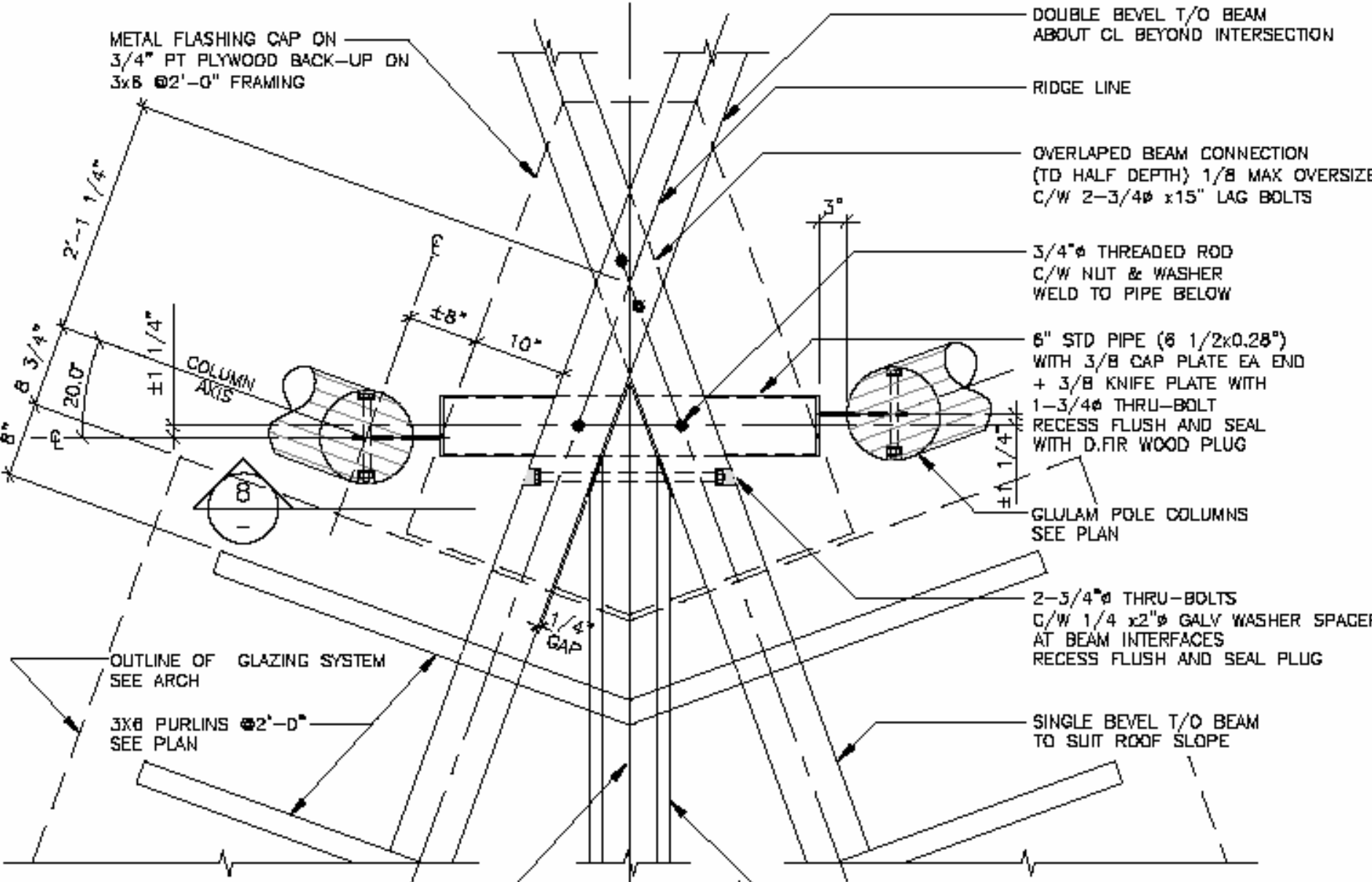
6" STD PIPE (Ø 1/2x0.28")  
 WITH 3/8 CAP PLATE EA END  
 + 3/8 KNIFE PLATE WITH  
 1-3/4" THRU-BOLT  
 RECESS FLUSH AND SEAL  
 WITH D.FIR WOOD PLUG

GLULAM POLE COLUMNS  
 SEE PLAN

2-3/4" THRU-BOLTS  
 C/W 1/4 x 2" GALV WASHER SPACERS  
 AT BEAM INTERFACES  
 RECESS FLUSH AND SEAL PLUG

SINGLE BEVEL T/O BEAM  
 TO SUIT ROOF SLOPE

SHAPED BEAM  
 SEE SECT. 6/-  
 THIS DRAWING



OUTLINE OF GLAZING SYSTEM  
 SEE ARCH

3x6 PURLINS @2'-0"  
 SEE PLAN

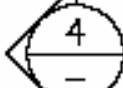
RIDGE LINE

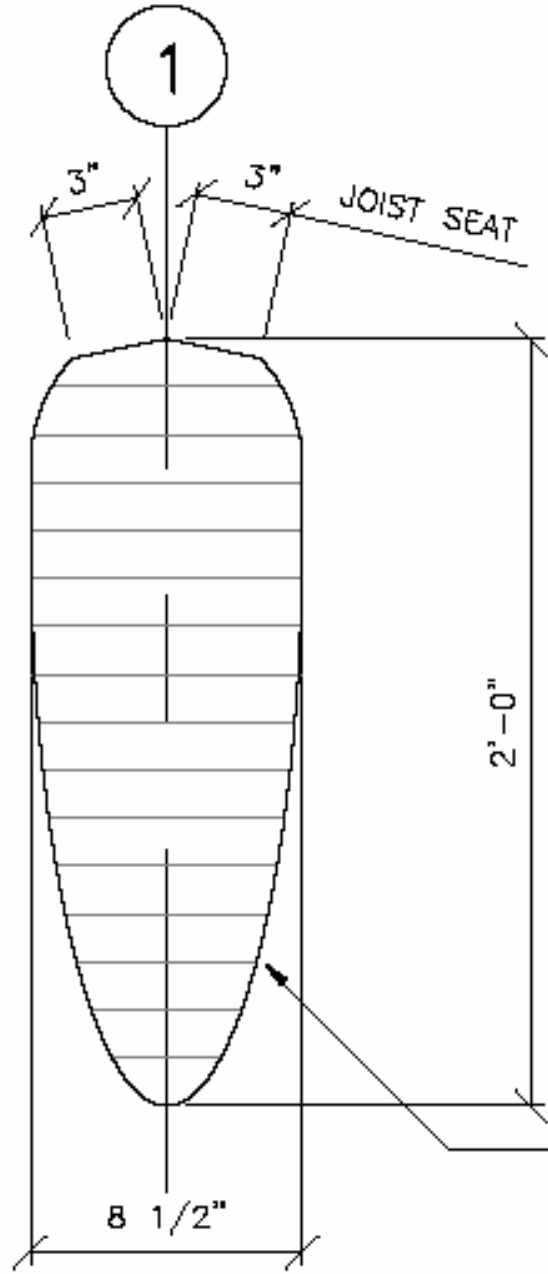
COLUMN  
 AXIS

1/4"  
 GAP



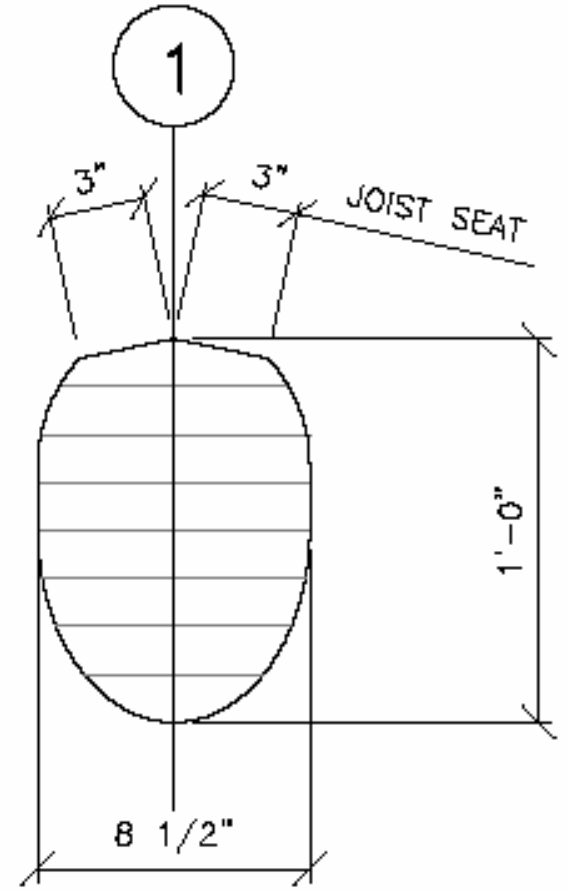
**DETAIL**  
 3/4"=1'-0"



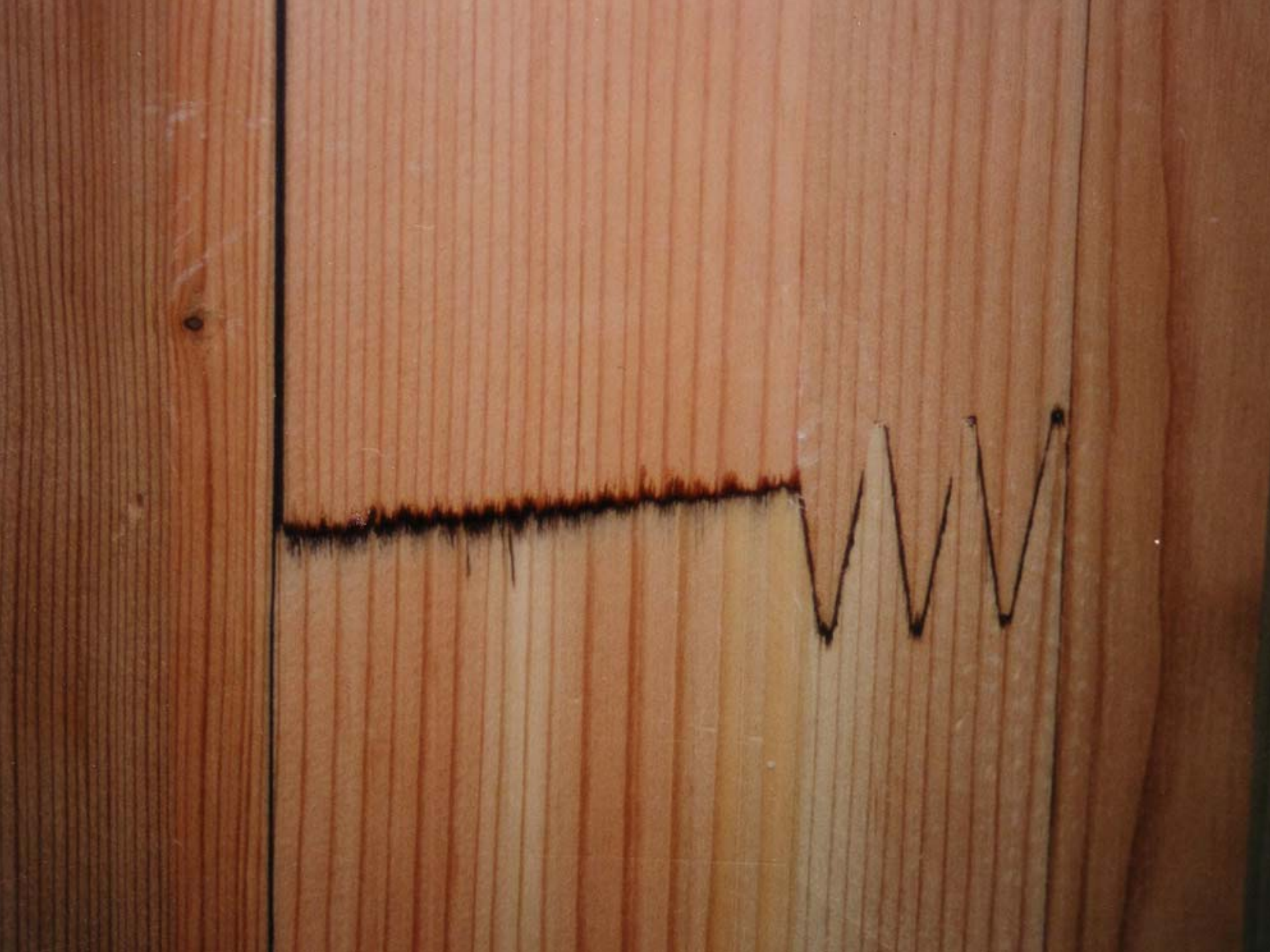


8 1/2 x 24 GL BEAM  
 SHAPED AS SHOWN  
 SEE BEAM ELEVATION  
 THIS DRAWING

6 SECTION  
 1 1/2" = 1'-0"



7 SECTION  
 1 1/2" = 1'-0"

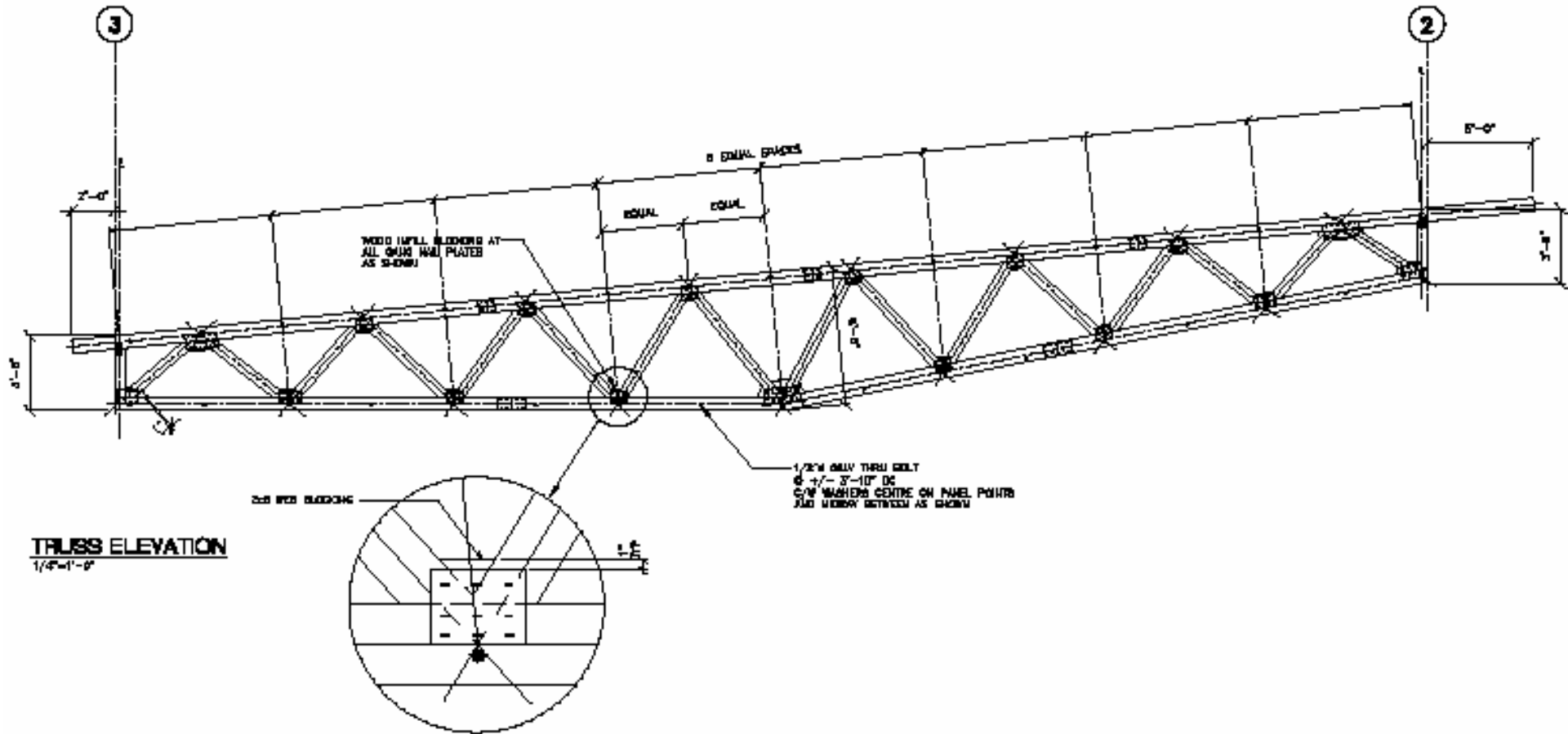












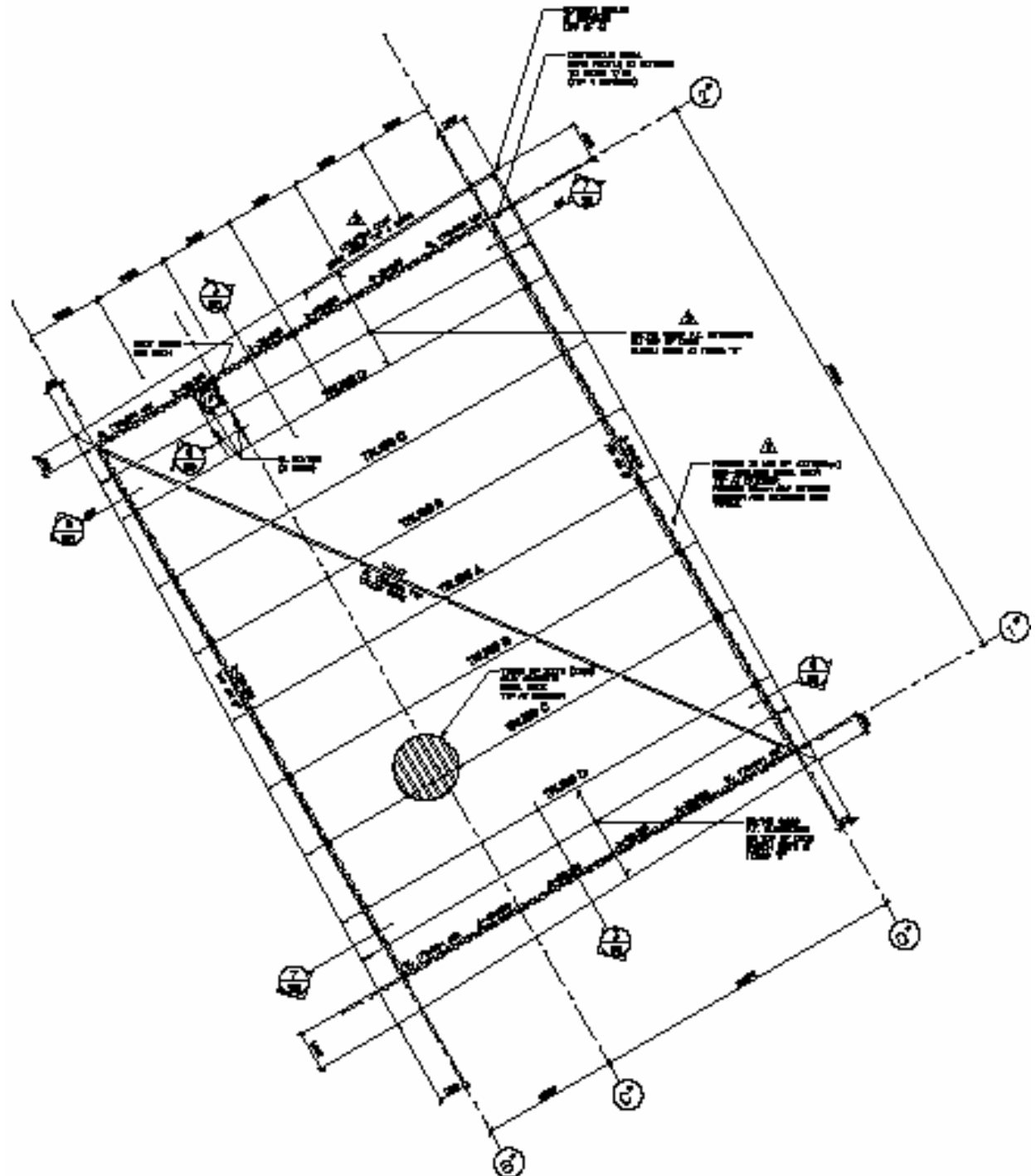


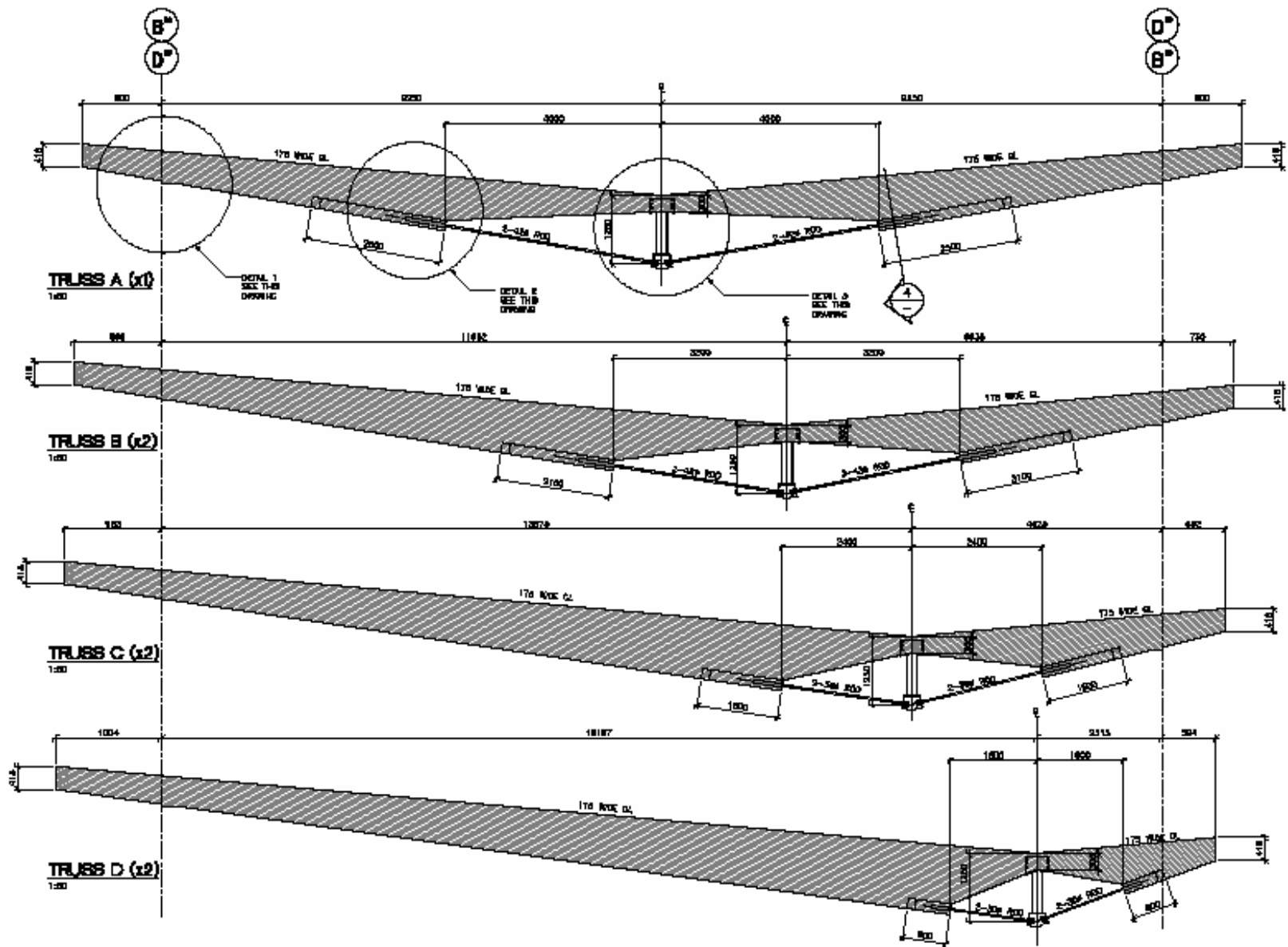


# Doig River Band Community Center

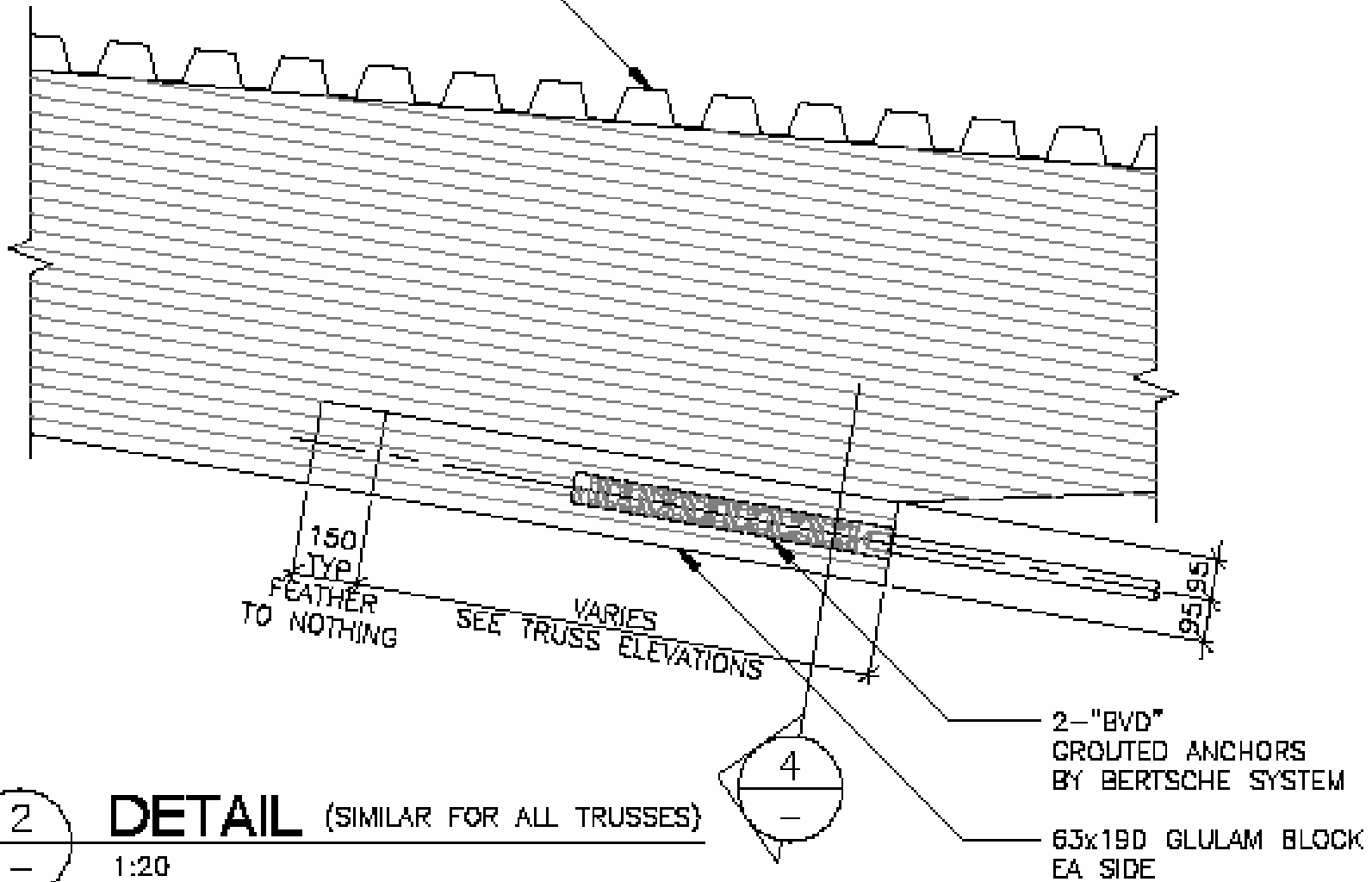
Rose Prairie, BC

Ib G Hansen Architect





ACOUSTIC STEEL DECK  
SEE PLAN















# Sk'Lep School Kamloops, BC

Ib G. Hansen Architect











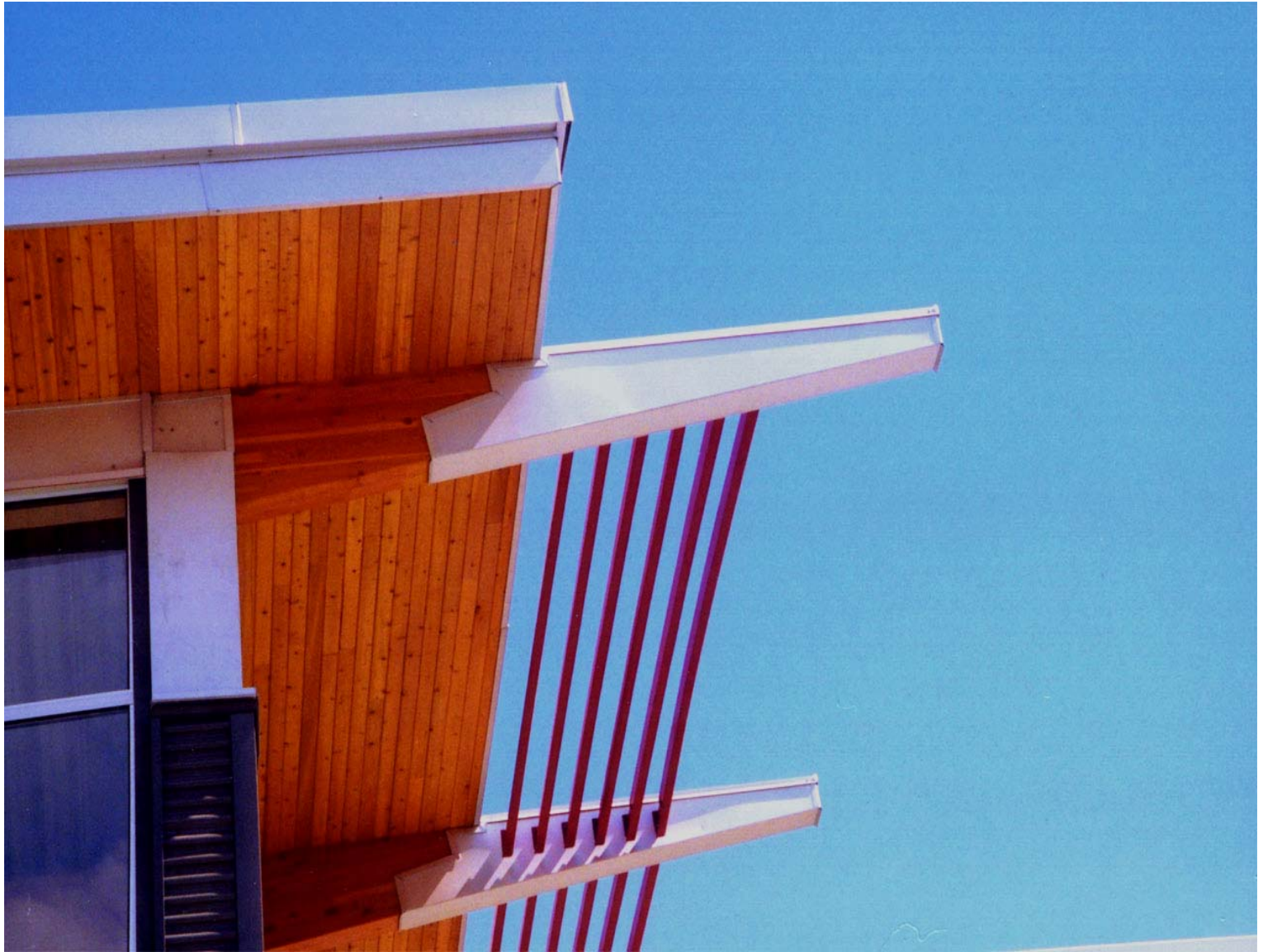










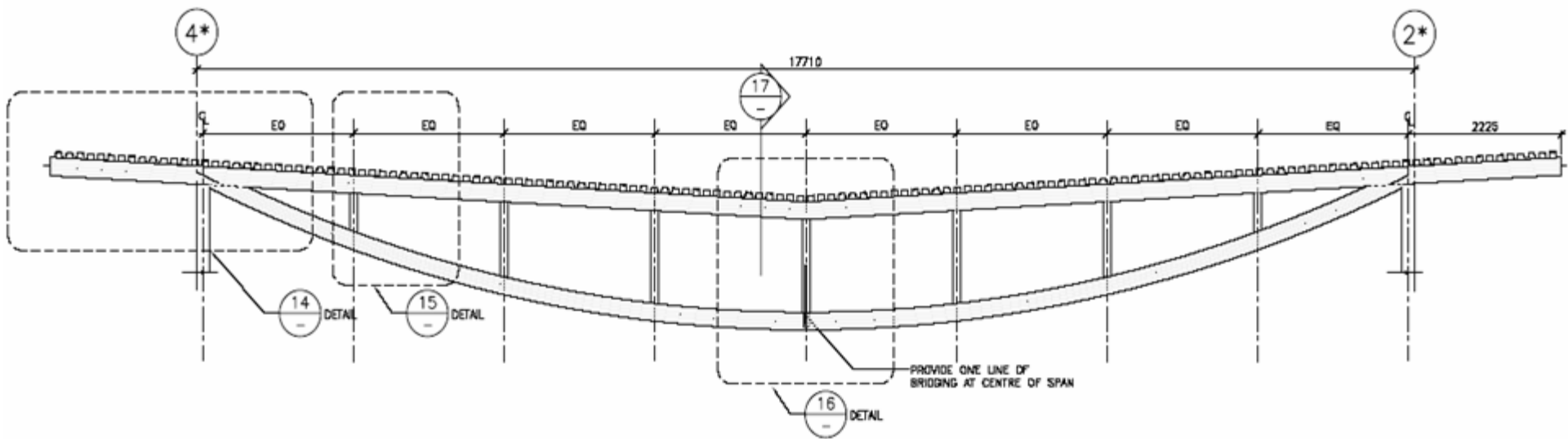


# Skeetchestn School

## Chase, BC

Ib G Hansen Architect

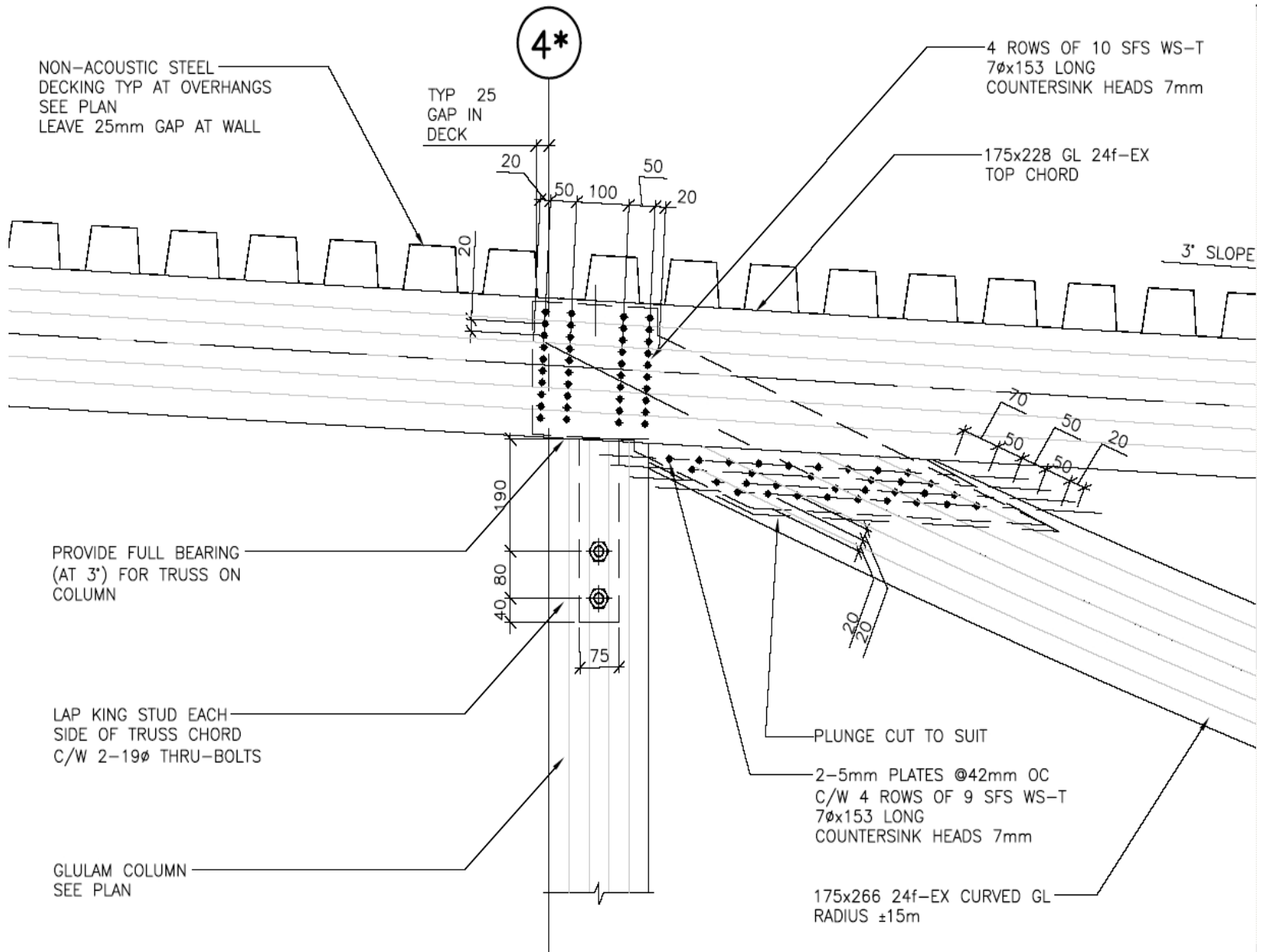




**GYM TRUSS ELEVATION**

SCALE 1:50





4\*

NON-ACOUSTIC STEEL  
DECKING TYP AT OVERHANGS  
SEE PLAN  
LEAVE 25mm GAP AT WALL

TYP 25  
GAP IN  
DECK

4 ROWS OF 10 SFS WS-T  
7φx153 LONG  
COUNTERSINK HEADS 7mm

175x228 GL 24f-EX  
TOP CHORD

3' SLOPE

PROVIDE FULL BEARING  
(AT 3') FOR TRUSS ON  
COLUMN

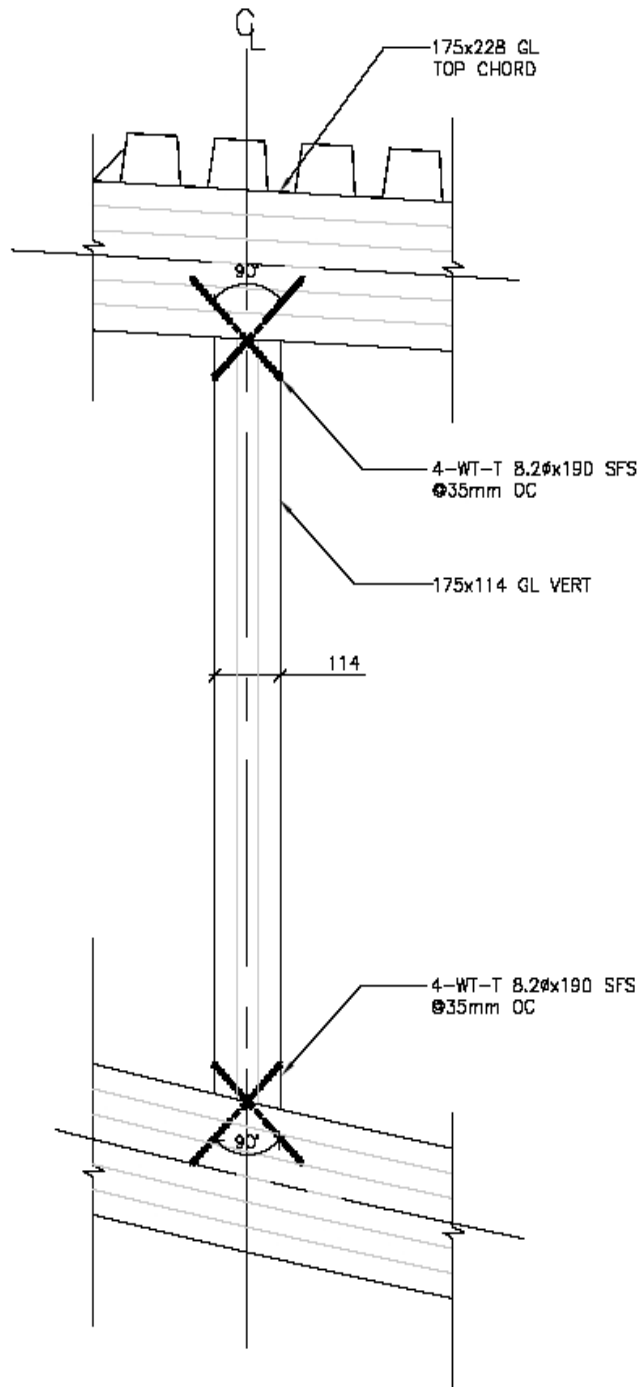
LAP KING STUD EACH  
SIDE OF TRUSS CHORD  
C/W 2-19φ THRU-BOLTS

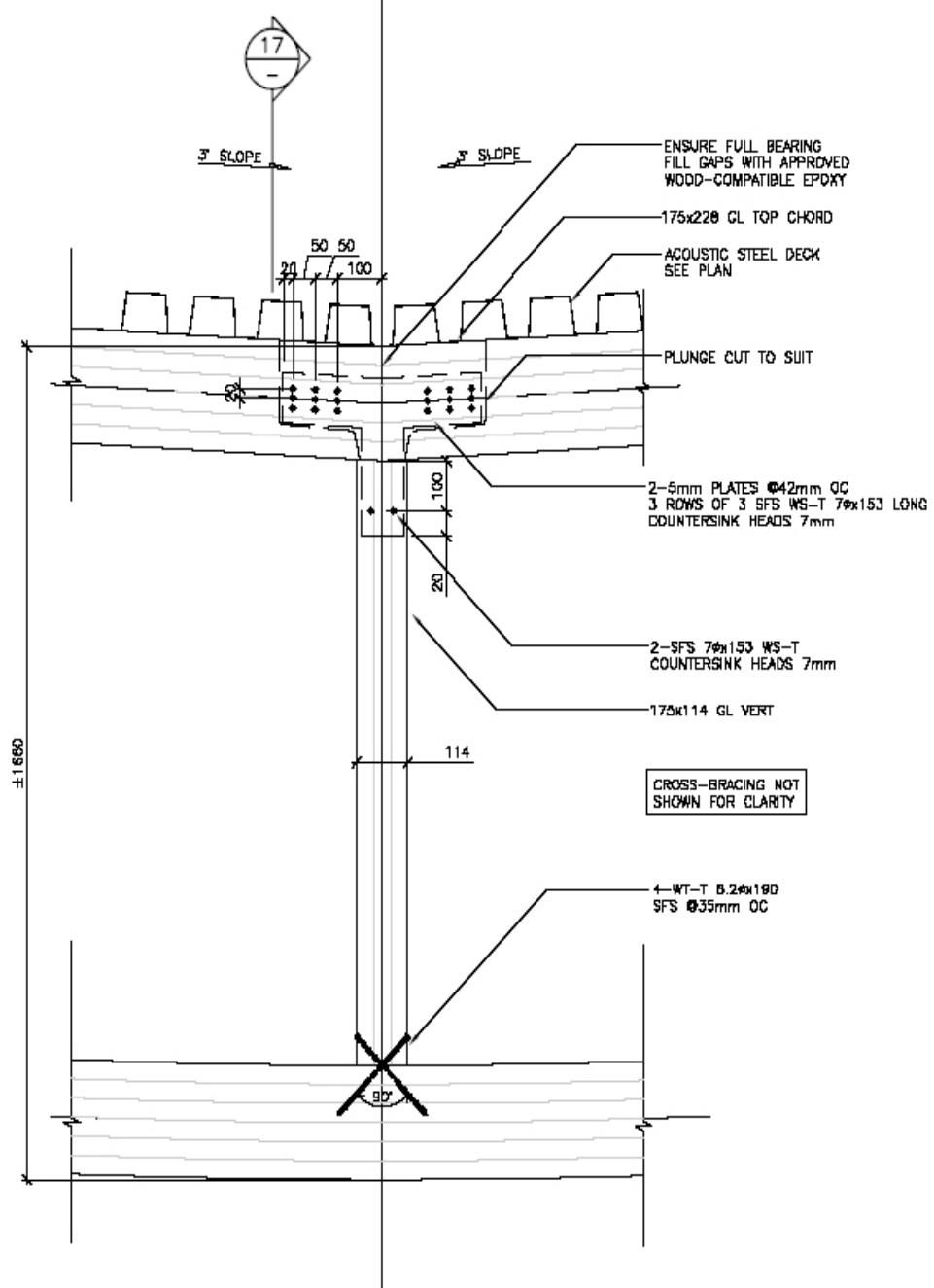
GLULAM COLUMN  
SEE PLAN

PLUNGE CUT TO SUIT

2-5mm PLATES @42mm OC  
C/W 4 ROWS OF 9 SFS WS-T  
7φx153 LONG  
COUNTERSINK HEADS 7mm

175x266 24f-EX CURVED GL  
RADIUS ±15m





16 DETAIL  
1:10















# Alishan Train Station

## Taiwan

Structurlam | EQ

Heavy Timber Group Inc







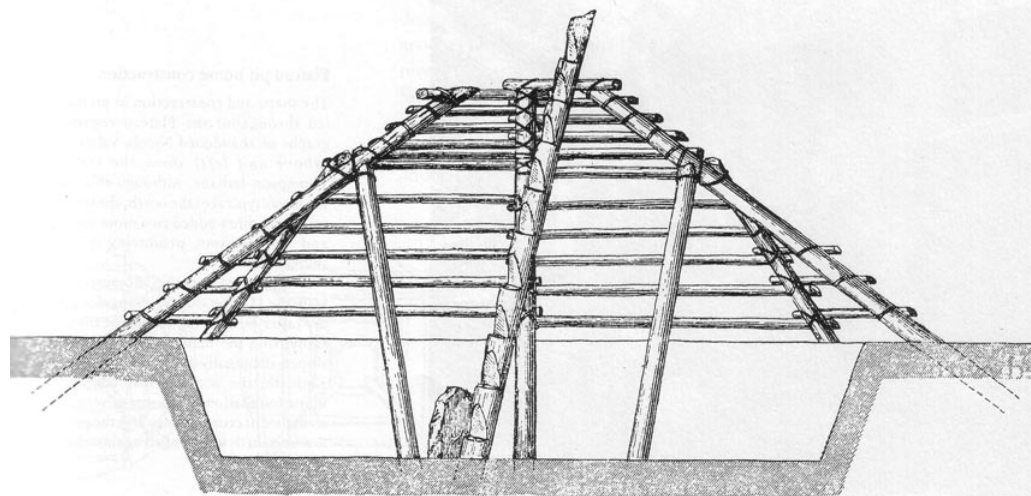
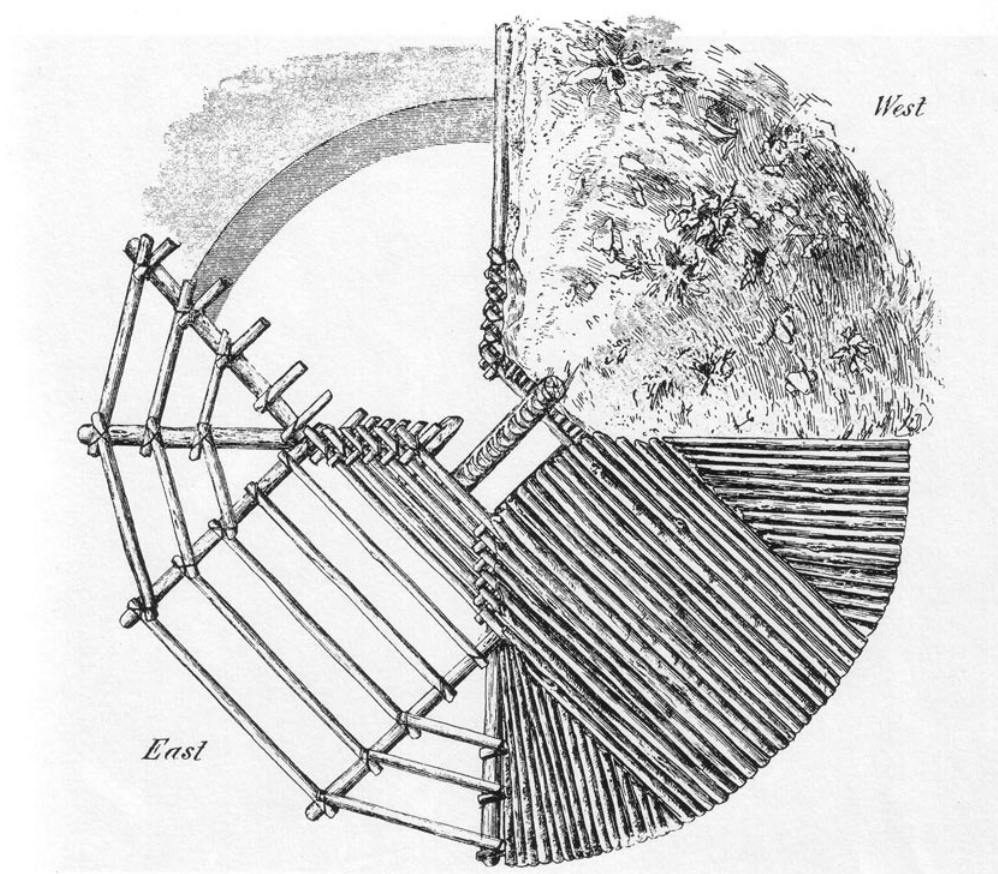








Nicola Valley Institute of  
Technology  
Merritt, BC



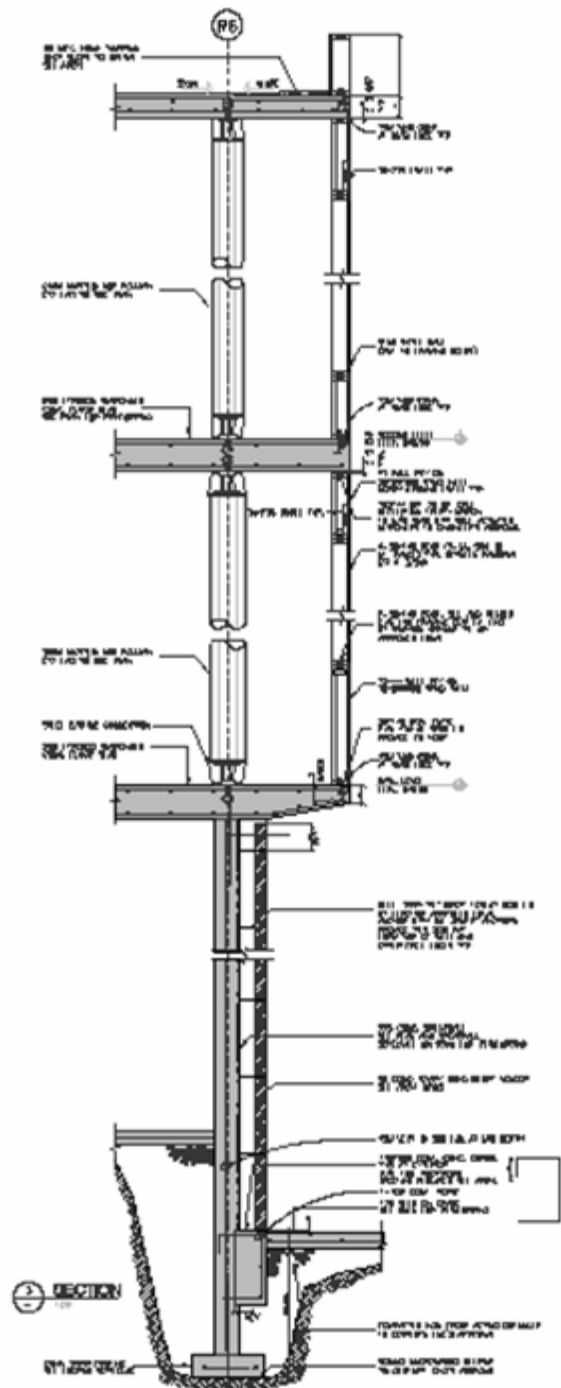




























GOVERNMENT  
PUBLICATION

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

RC 351 -

SD 411

CONSOLIDATED  
REGULATIONS  
OF  
BOTH COLLEGES

CONSOLIDATED  
REGULATIONS  
OF  
BOTH COLLEGES











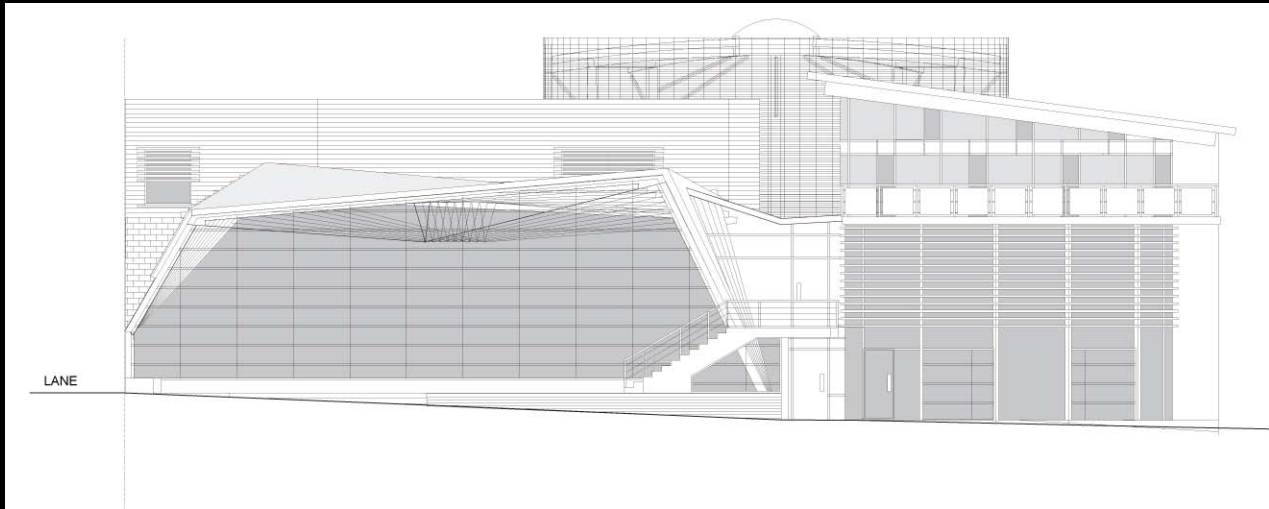
# Native Youth Centre Vancouver, BC

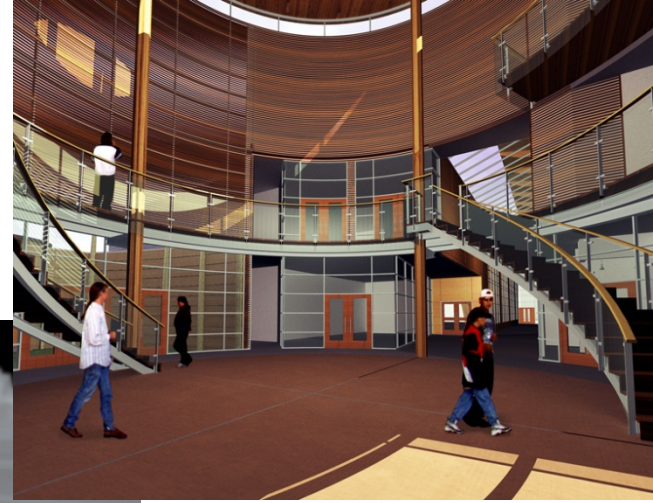
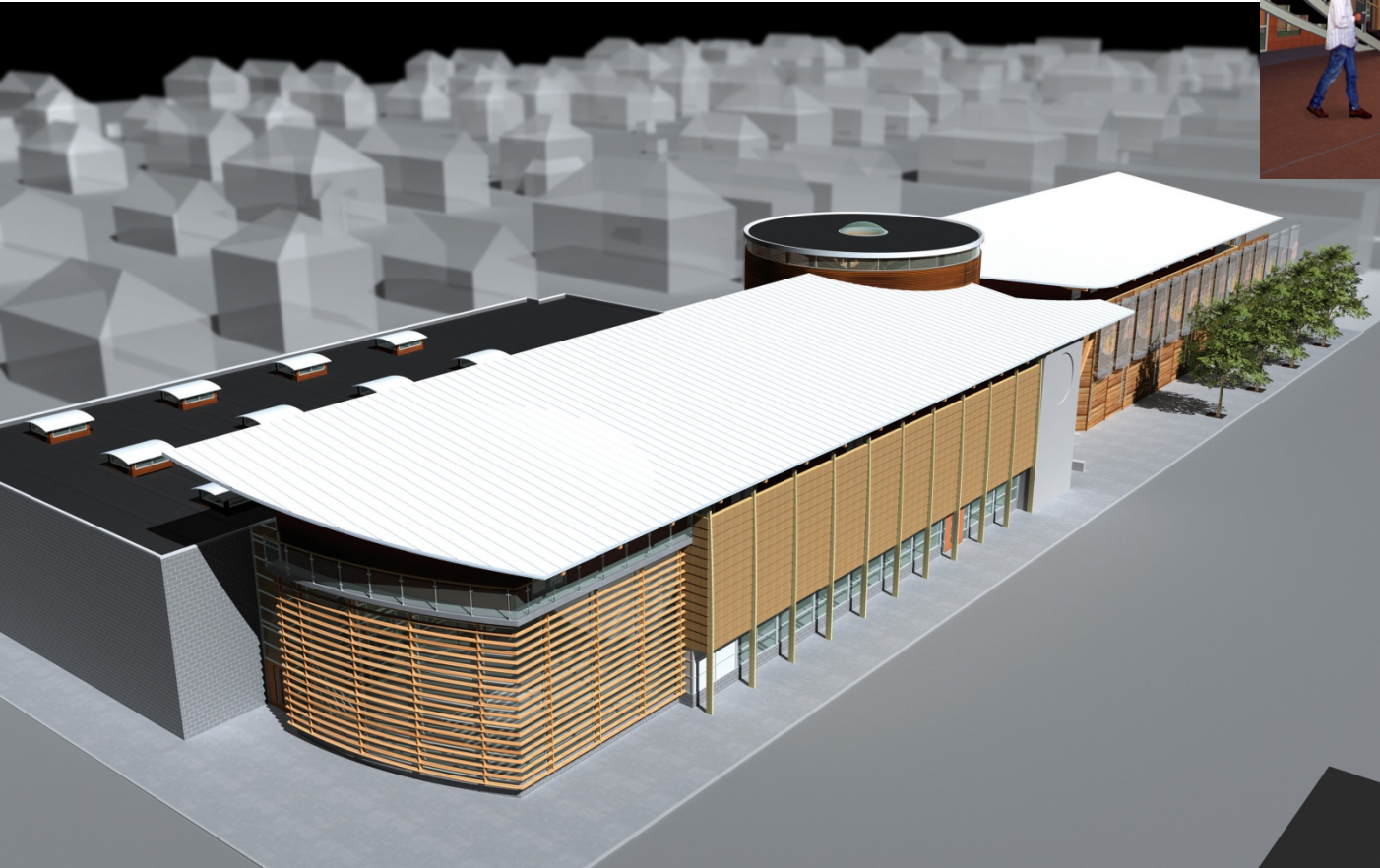
Larry McFarland Architects

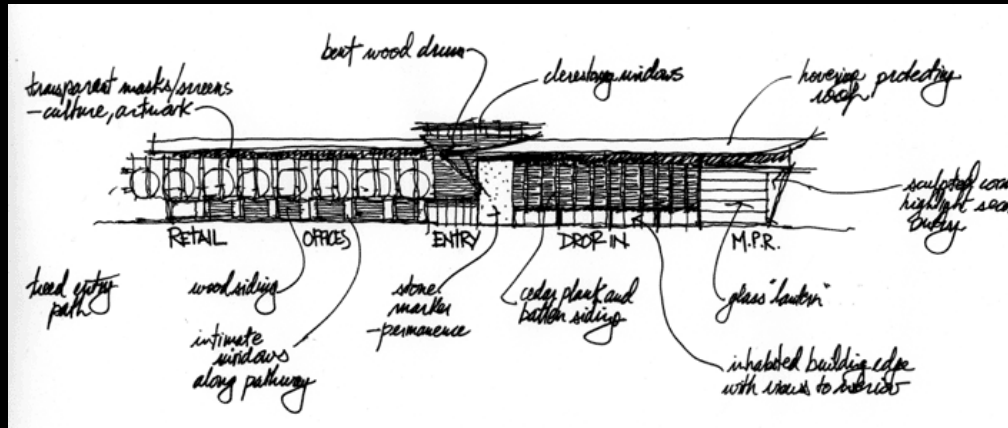


COMMERCIAL DRIVE

1 NORTH ELEVATION  
Scale: 1/100





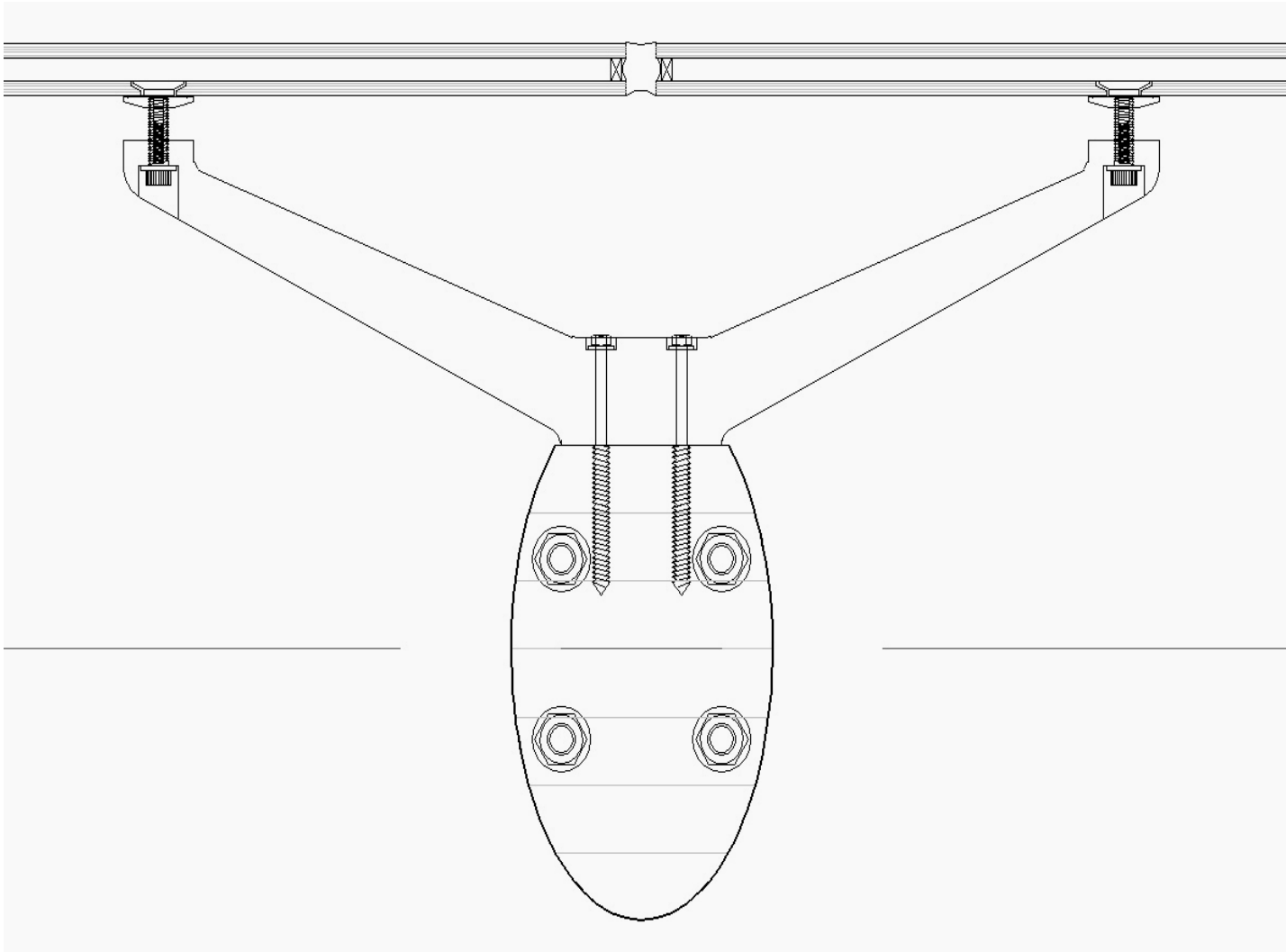


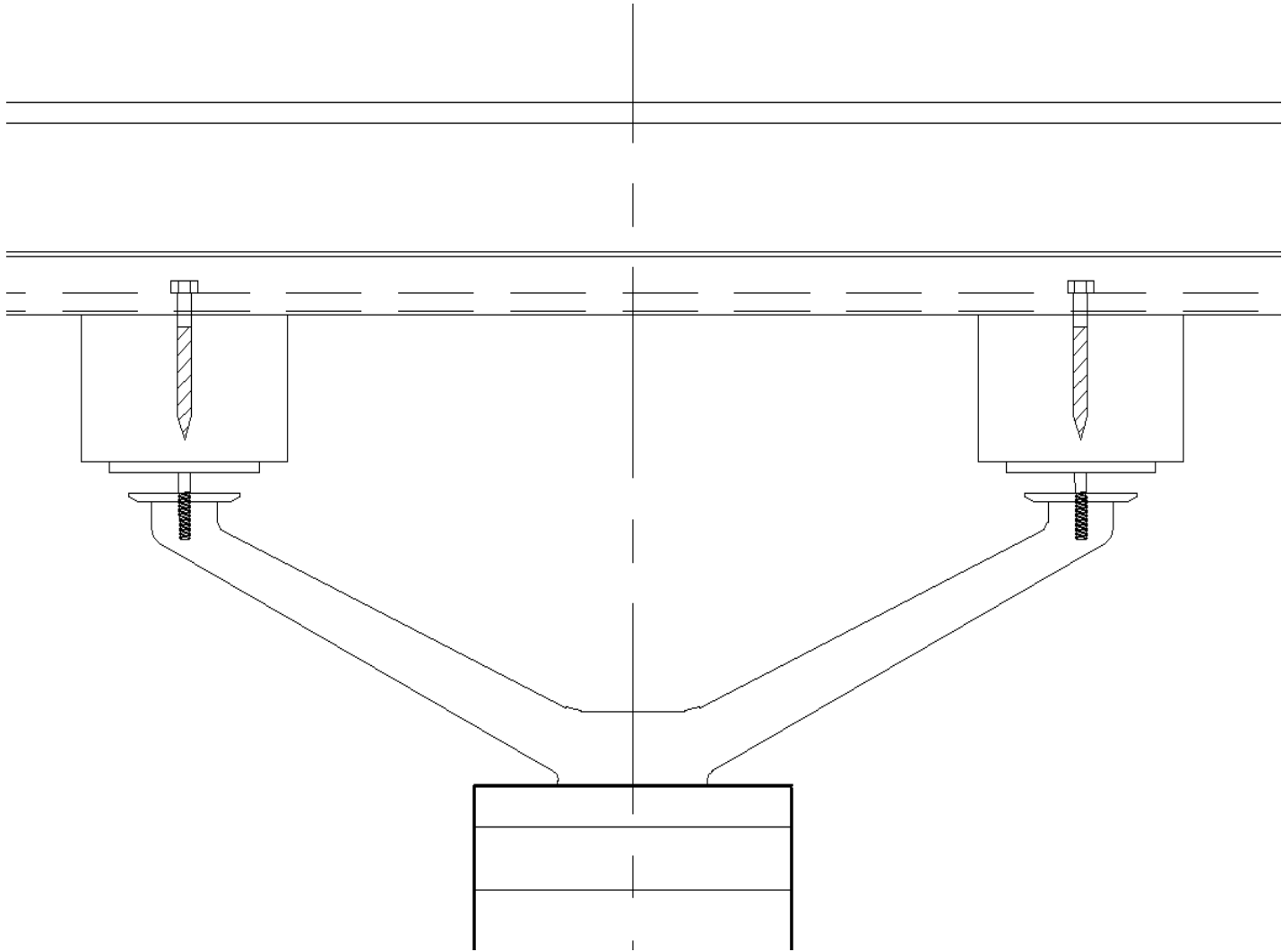


# Prince George Airport Expansion

## Prince George, BC

McFarlane Green Architects + Design







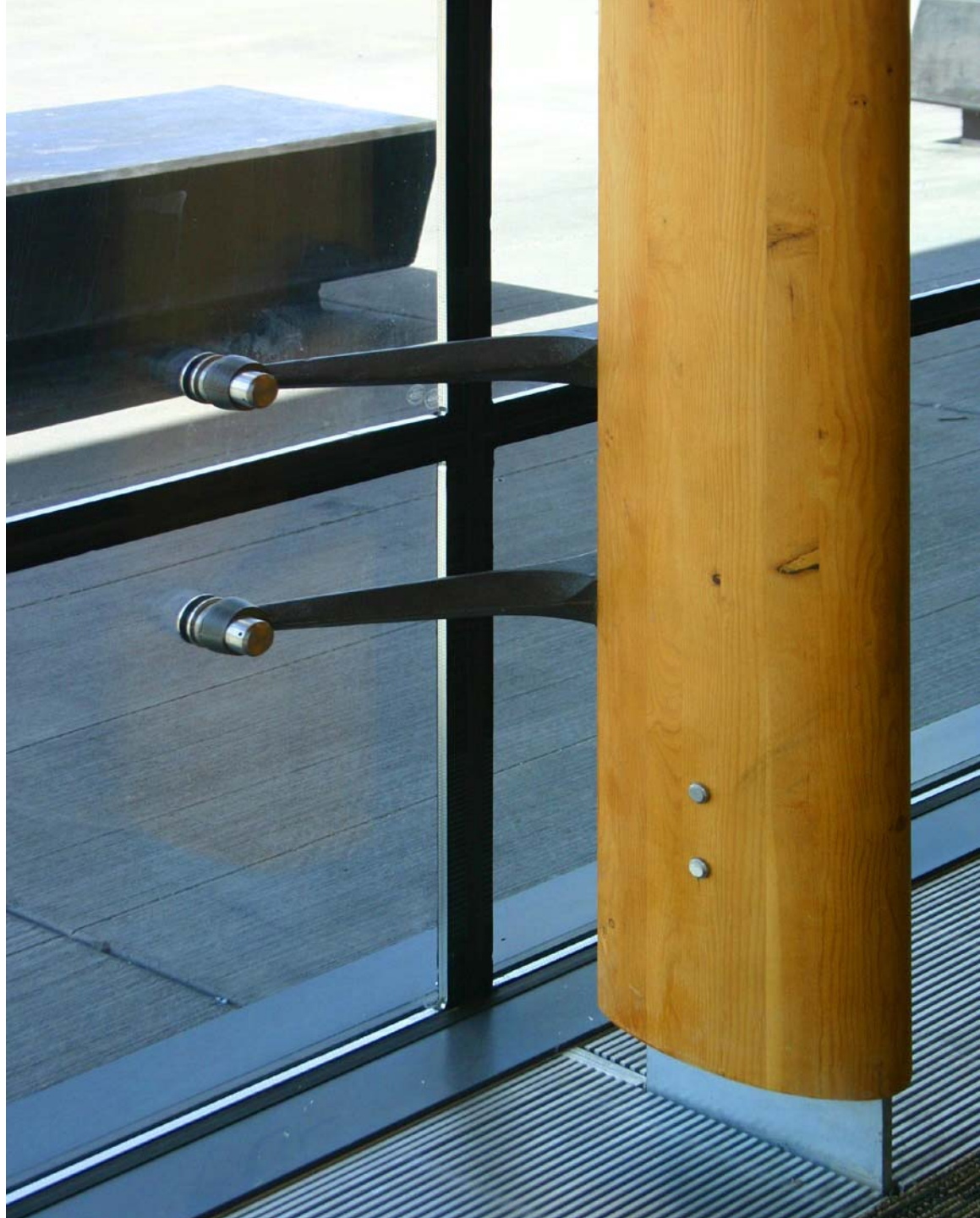


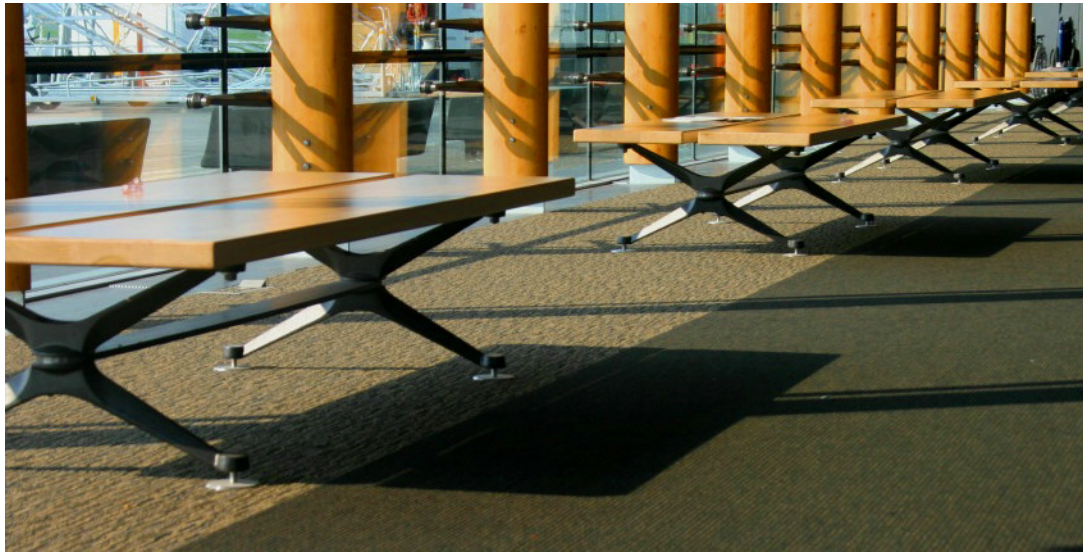








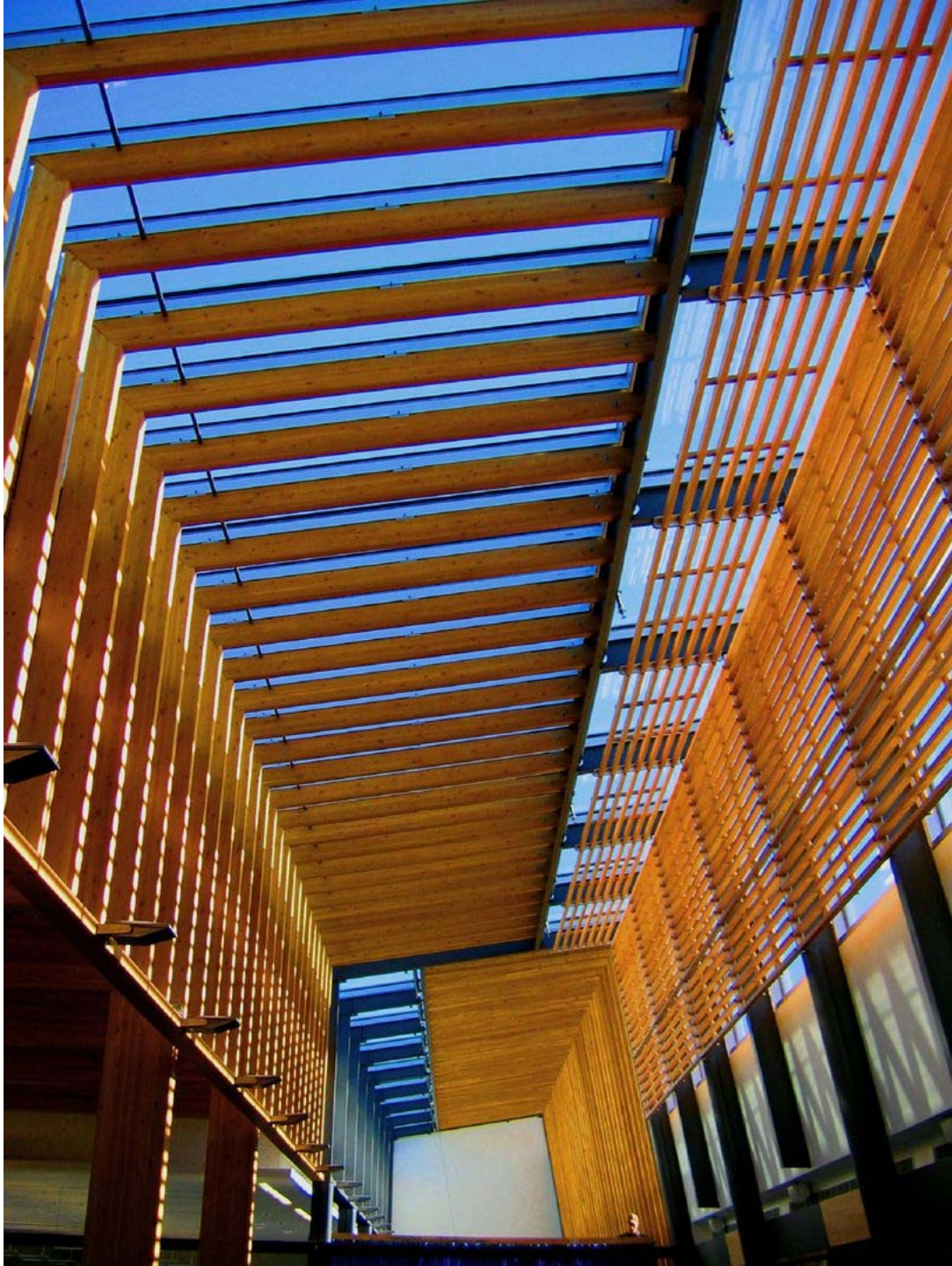


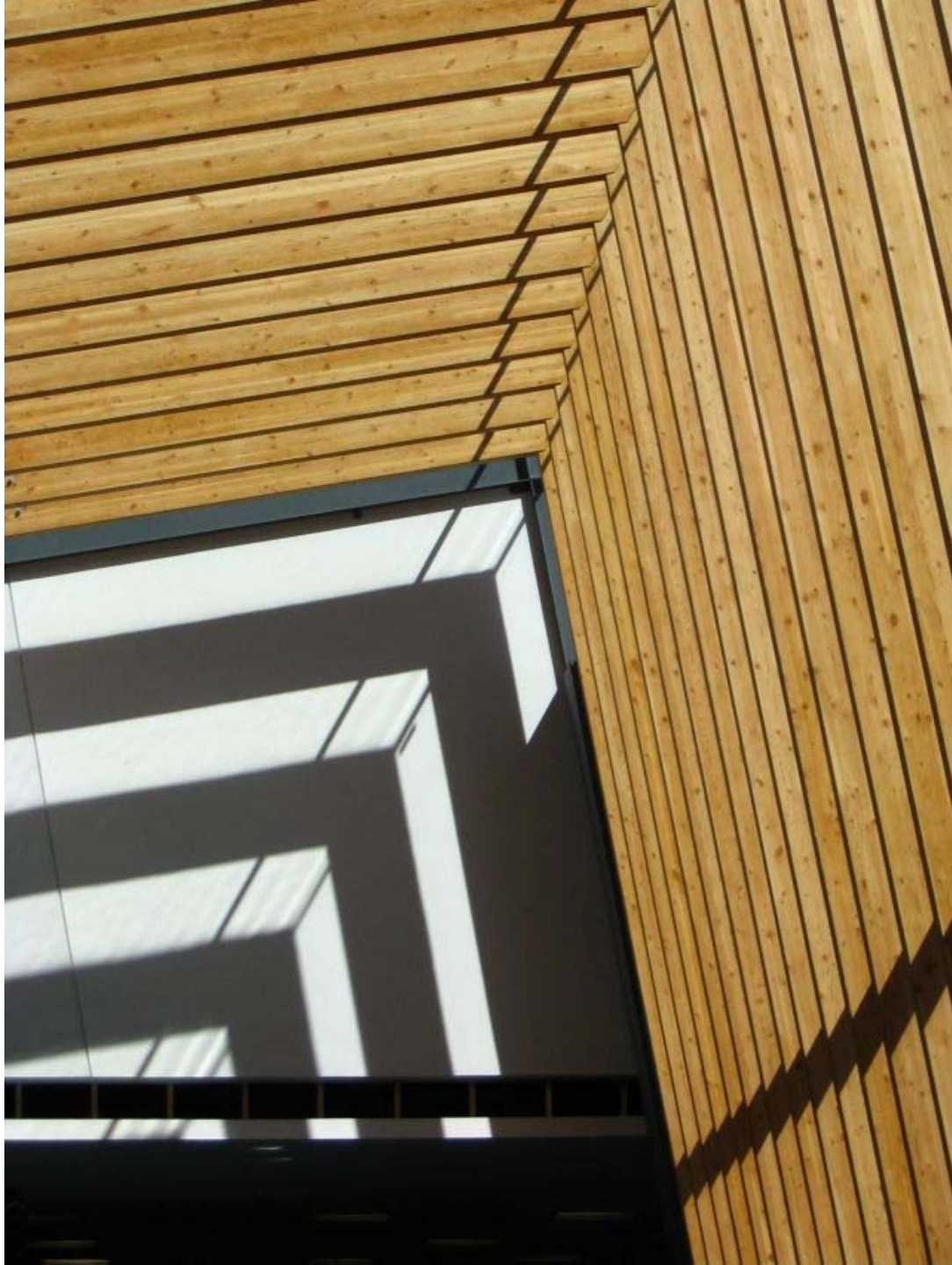


















# AGRIUM

## Saskatoon, Sask.

Structurlam Products











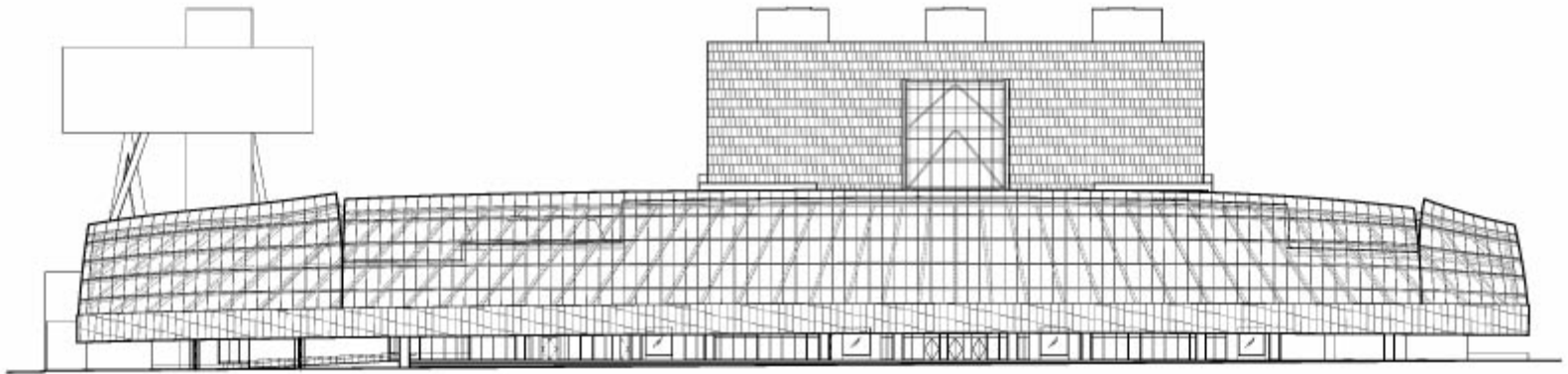




ART GALLERY OF ONTARIO –  
FEATURE WALL CONNECTIONS  
Toronto, Ont

Structurlam Products

Gerhy International Inc



⤵ NORTH ELEVATION TO DUNDAS STREET









# RALEIGH DURHAM AIRPORT

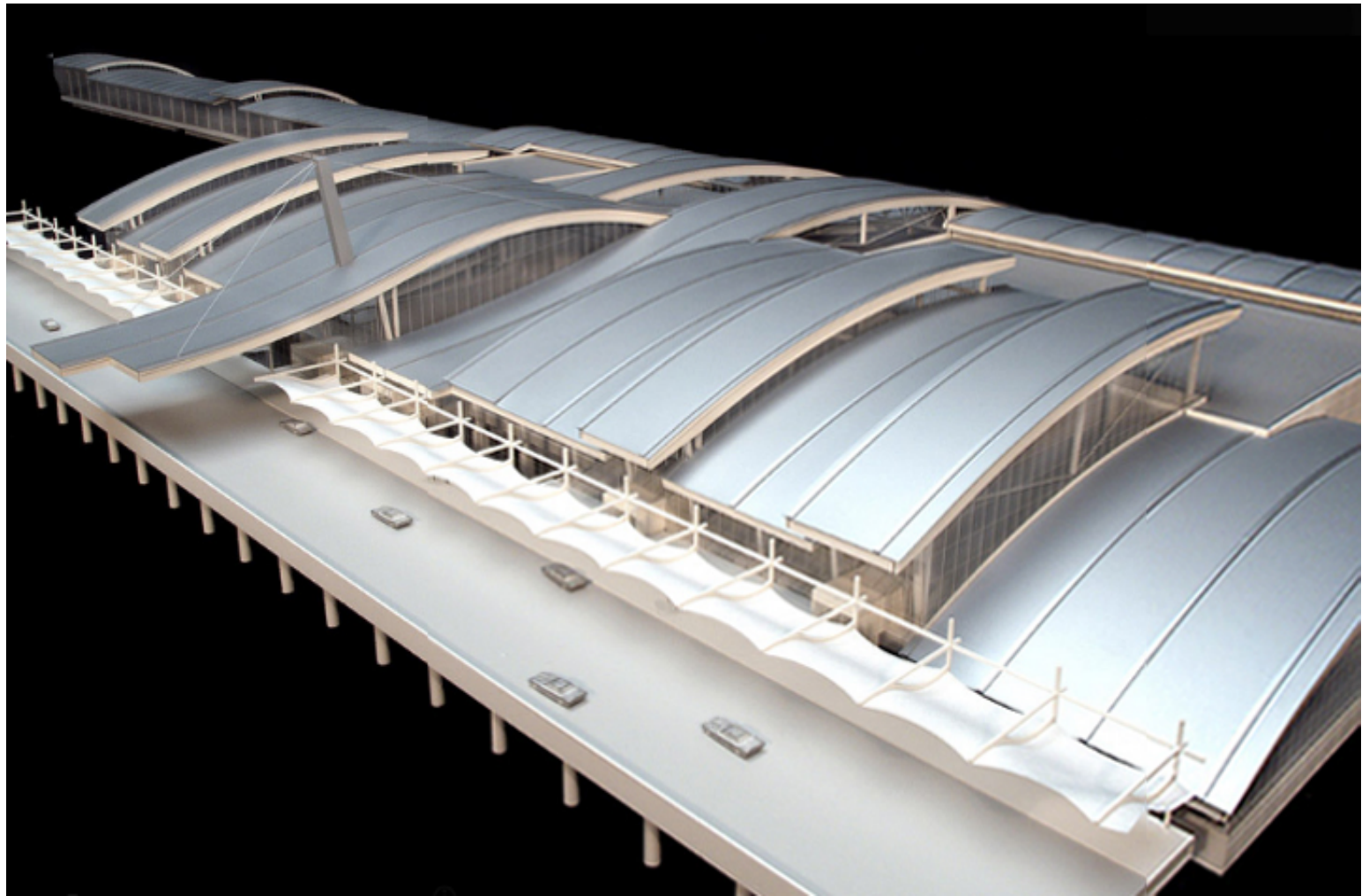
## Raleigh, North Carolina

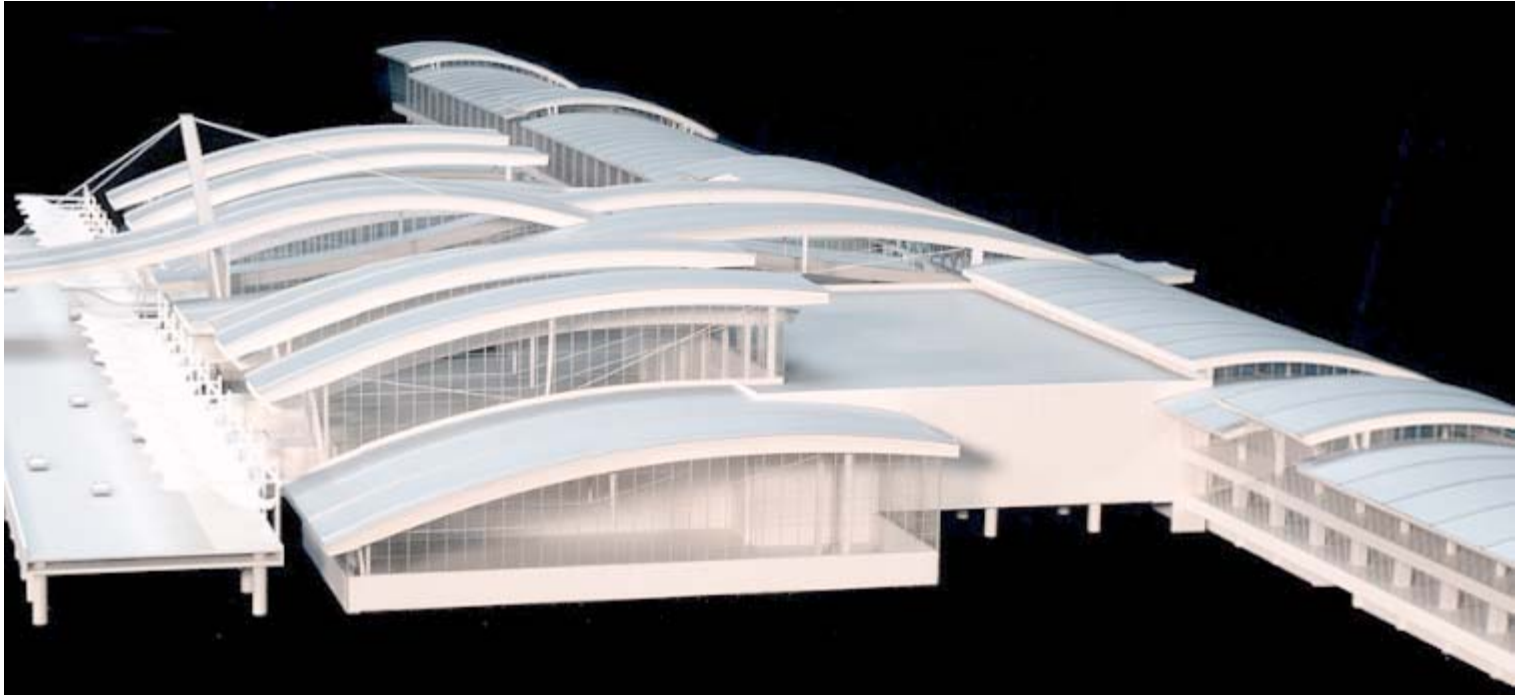
Structurlam Products

Fentress Bradburn Architects

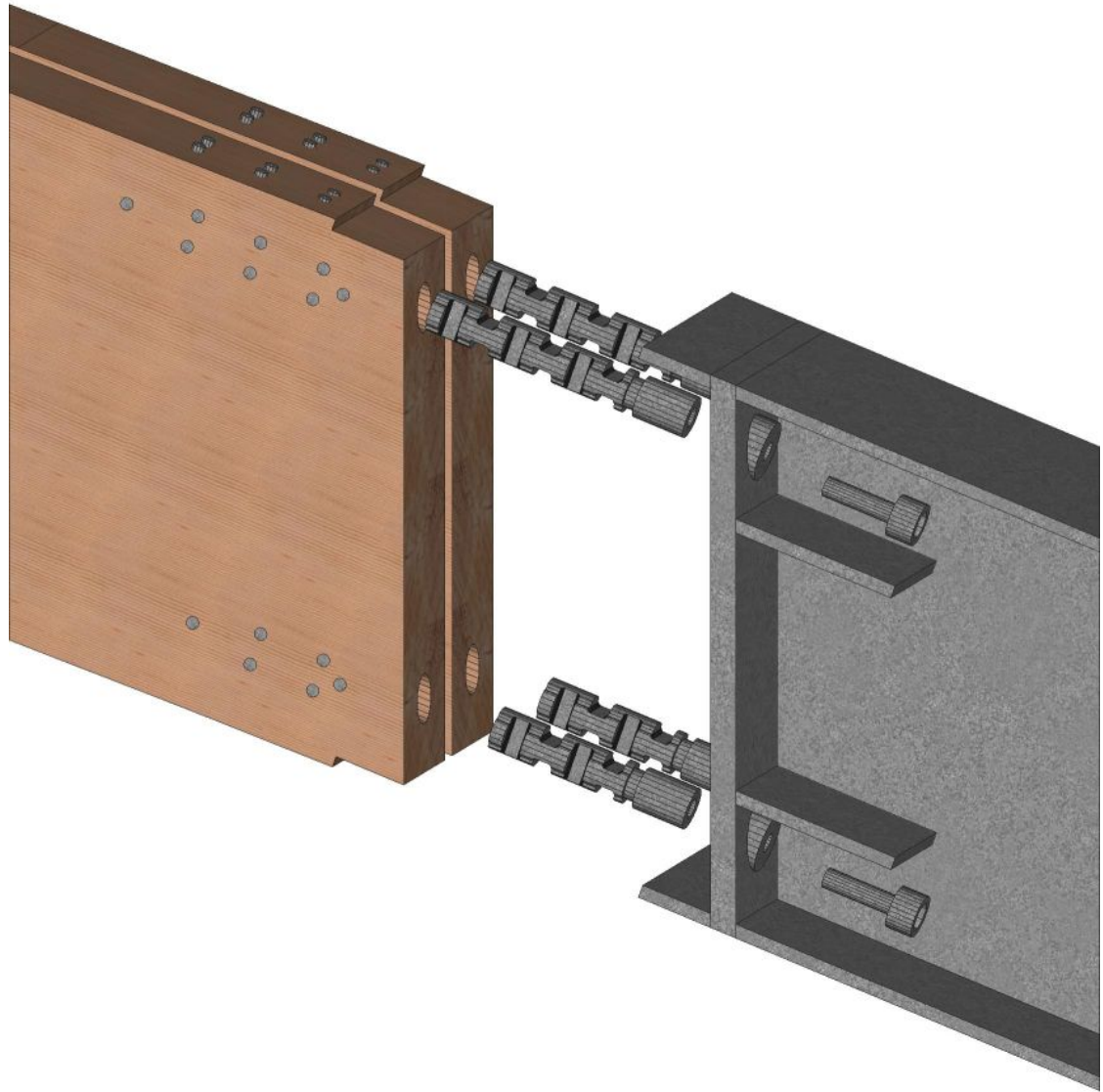


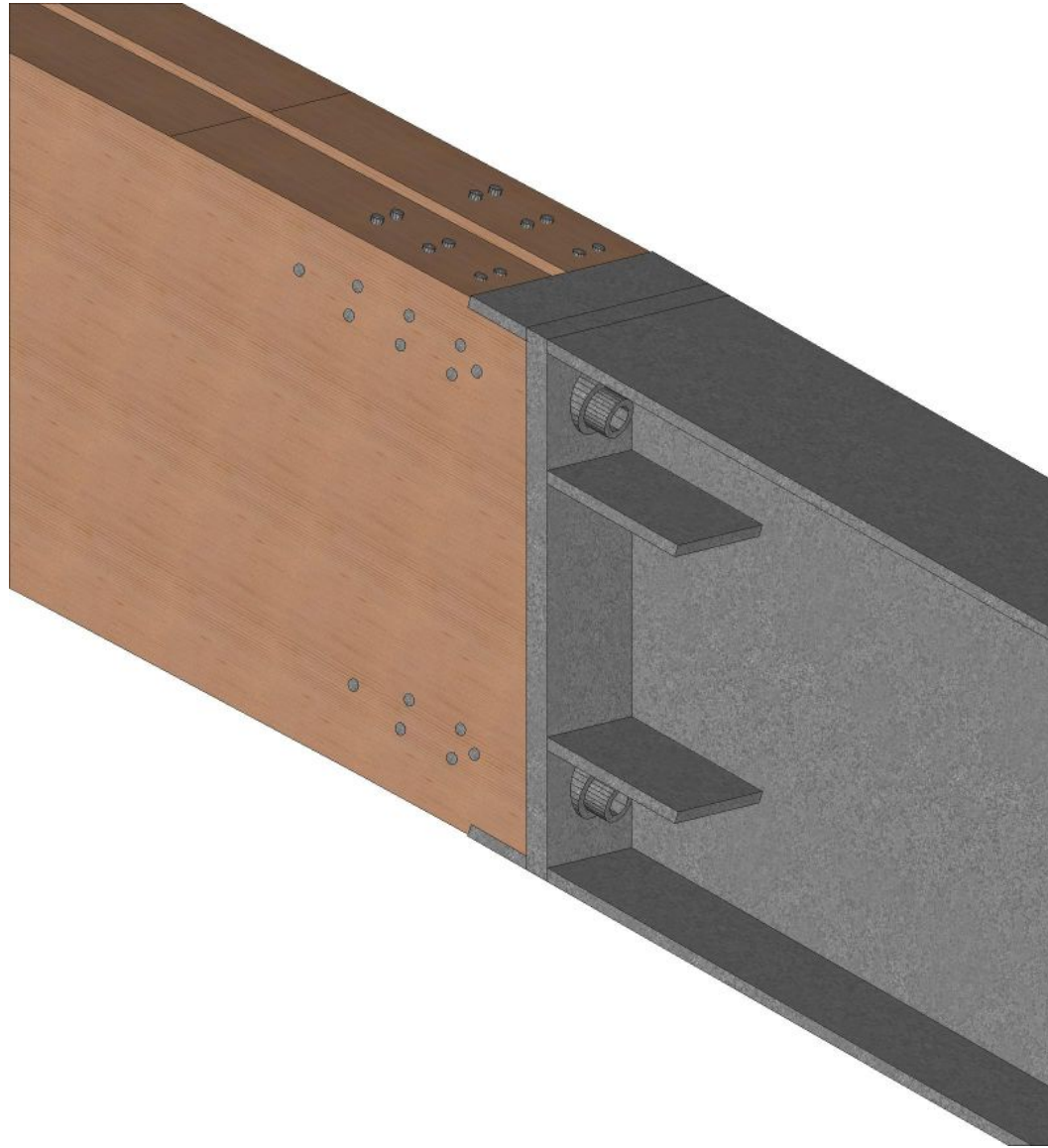


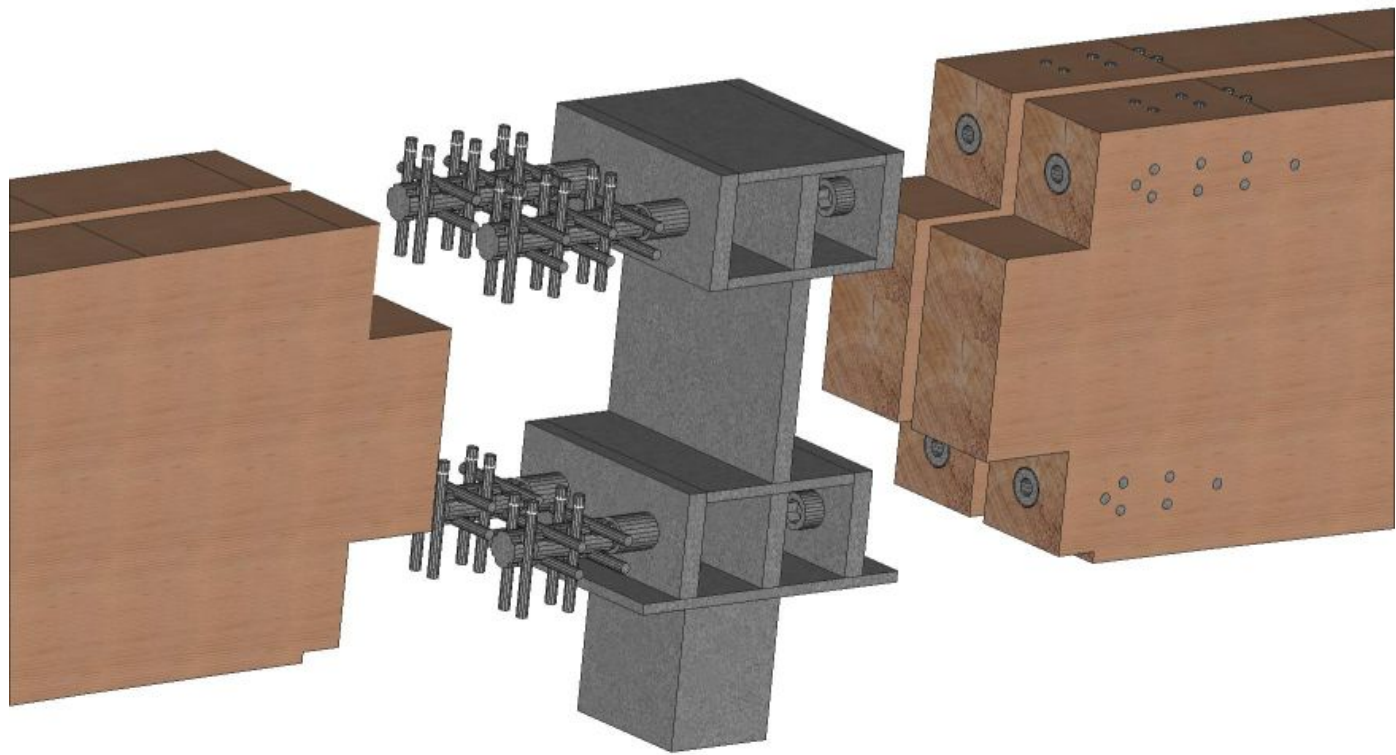


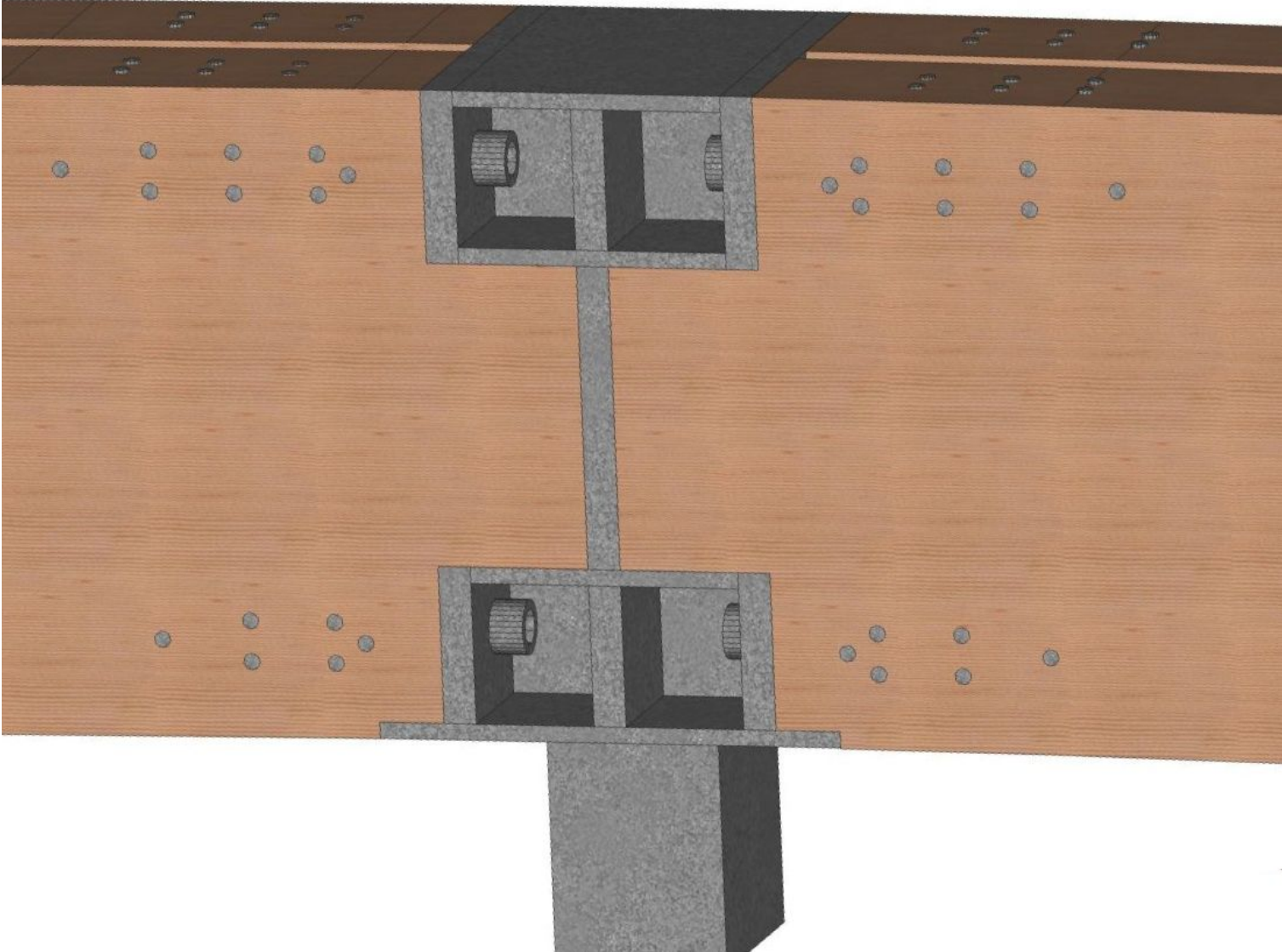


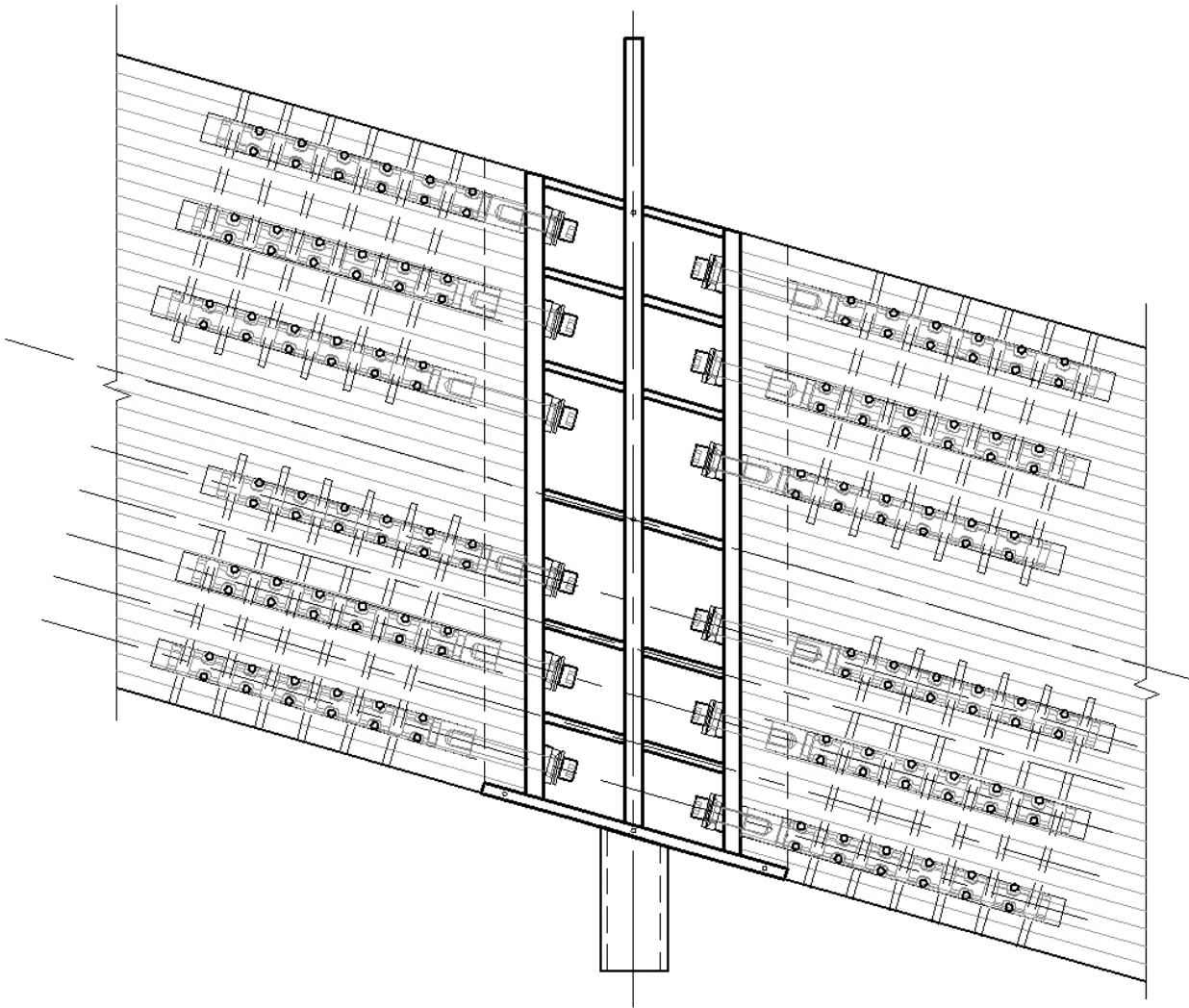














# Steps to Progress

- Educate Industry Pioneers
  - Trade shows and project trips to Europe
- Provide education to Architects and Engineers
- University Programs
- Awards for outstanding projects

Thank You !

Questions ?



**EQUILIBRIUM**

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CONSULTING STRUCTURAL ENGINEERS