Connect 1:1

Engineered Timber Beam Column Junction

Initial Research

3 Types of Engineered timber were researched

- Glue Laminated Timber
- Cross Laminated Timber
- Laminated Veneer Lumber

Other areas of research

- Architectural Features
- Beams and Columns
- Architects

Glue Laminated Timber

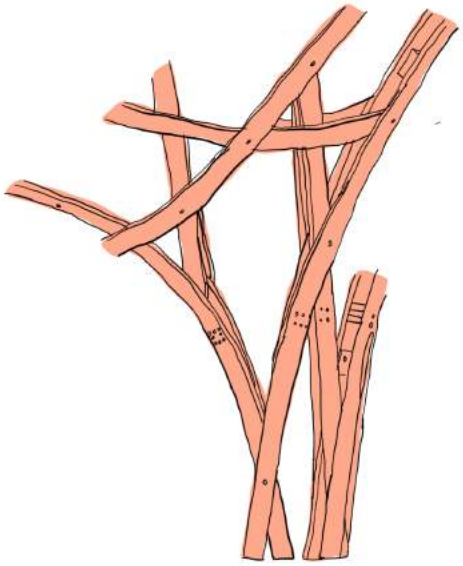
Initial Research

Characteristics of Glulam

- Ability to create large spans
- Ability to incorporate laminations into connection
- Freedom to select highest grade of wood from tree

Shigeru Ban

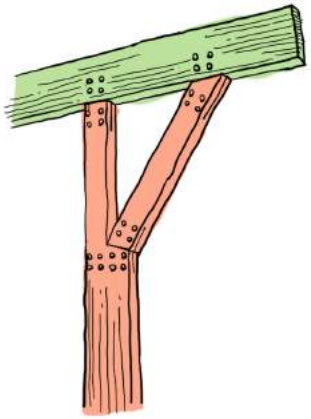
Tamedia Office, Shigeru Ban

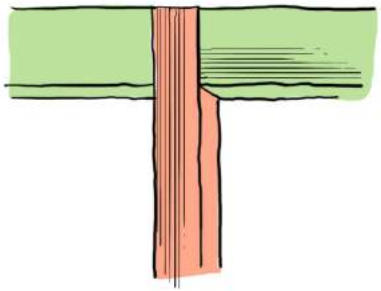


Centre Pompidou Metz, Shigeru Ban

Beam Column Connections

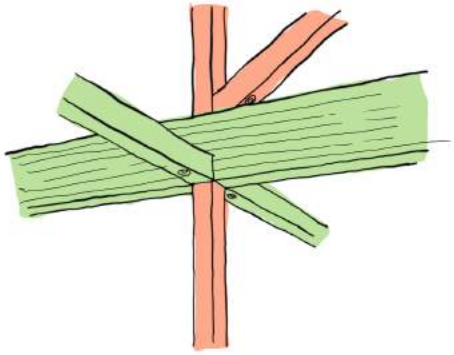
Tualatin River National
Wildlife Refuge Centre





Wood Innovation and Design Centre,
British Columbia

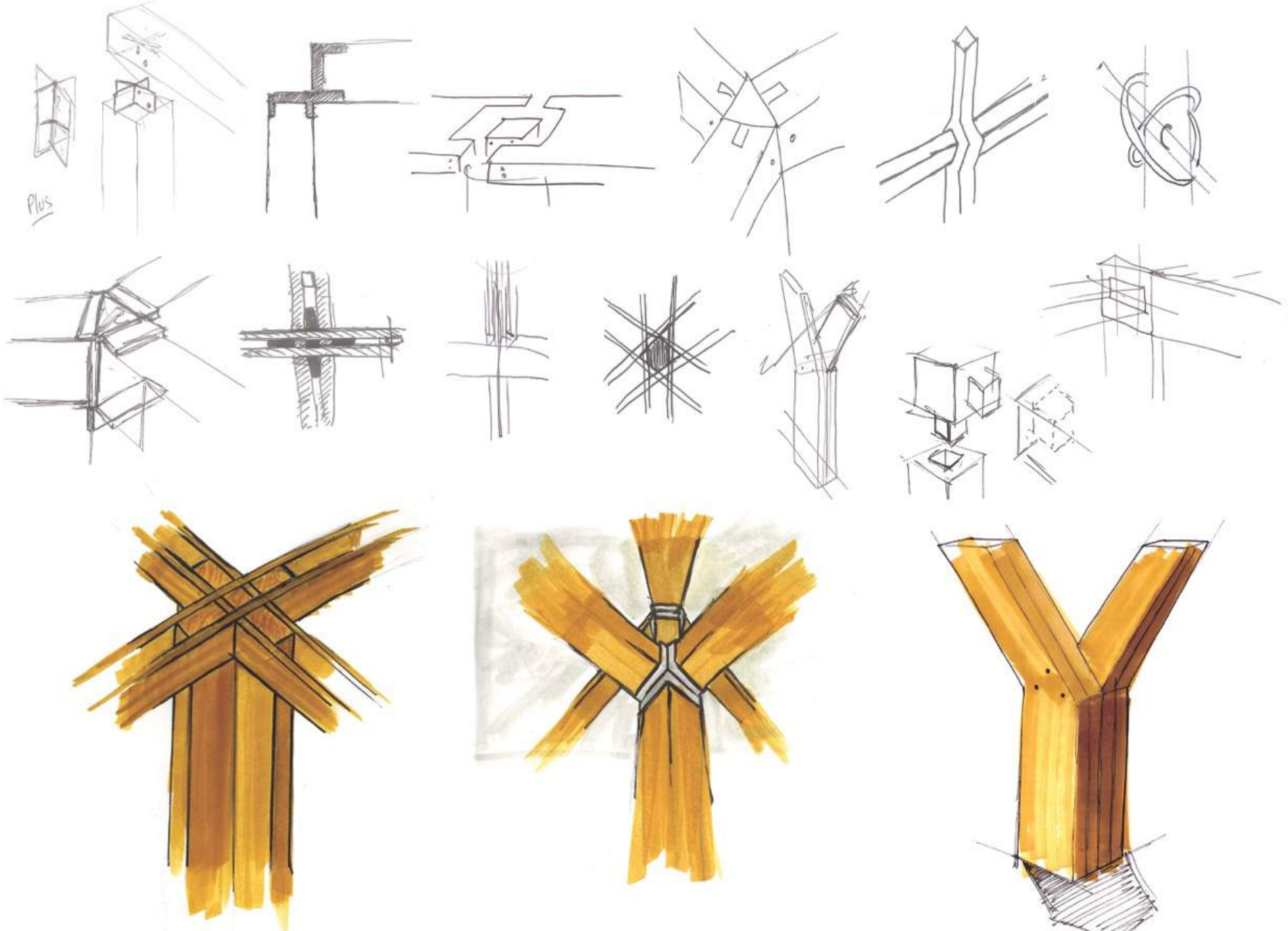
House in Shinkawa, Yoshichika Takagi



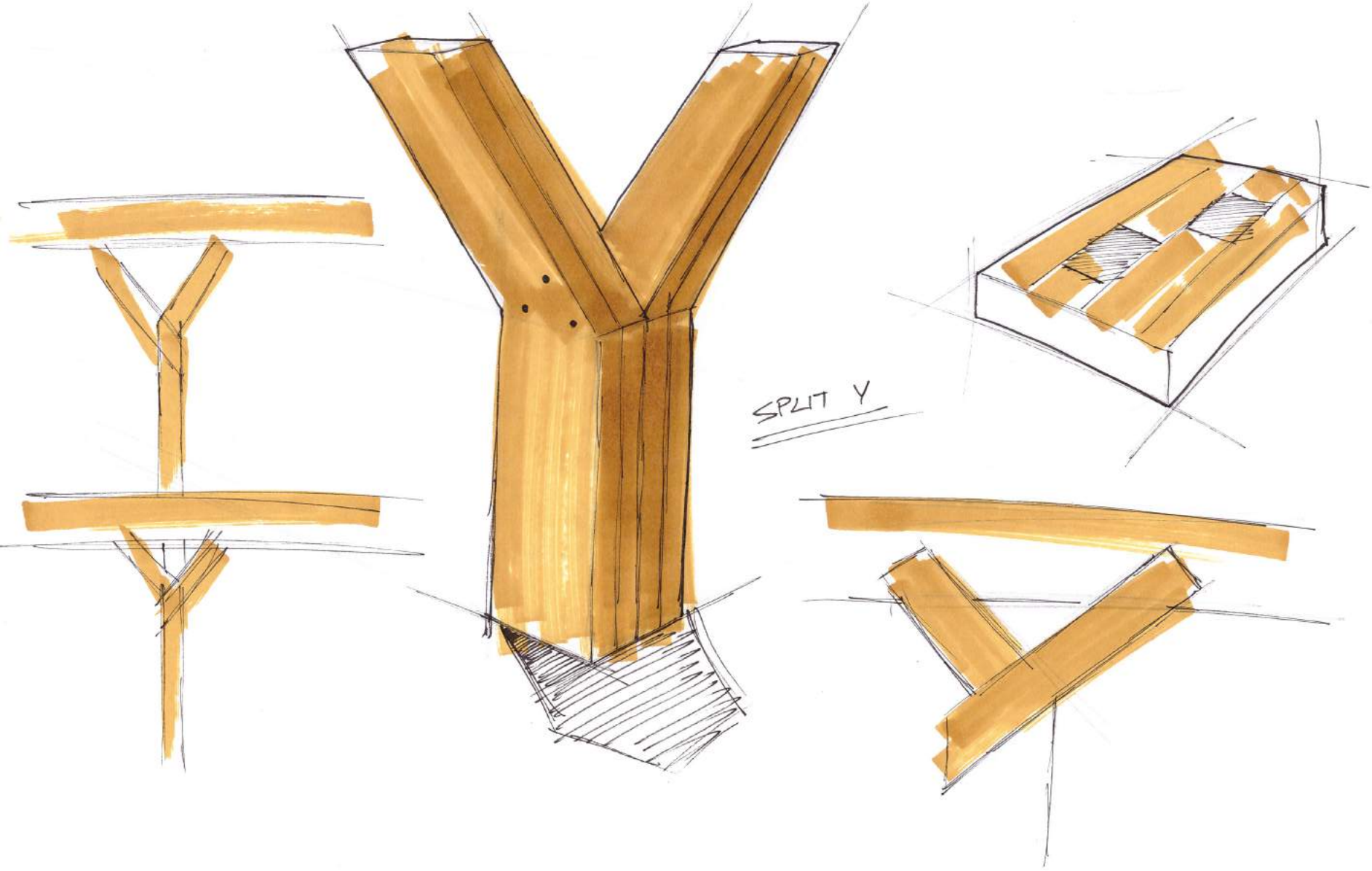
Idea Generation

Compiling Research

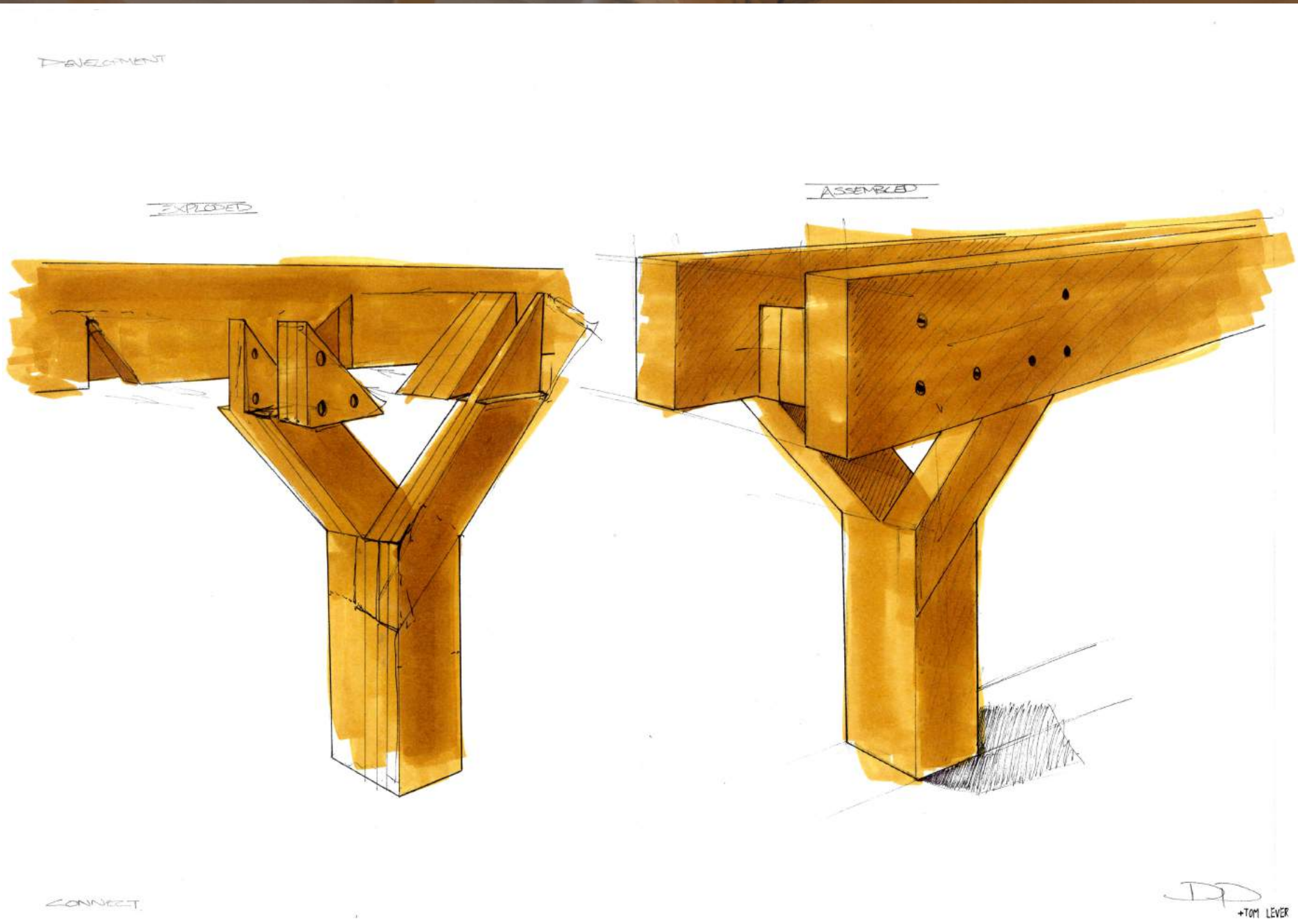
Brainstorming



Concept Selection



Concept Development



Y Junction

Concept Development

Points of Focus

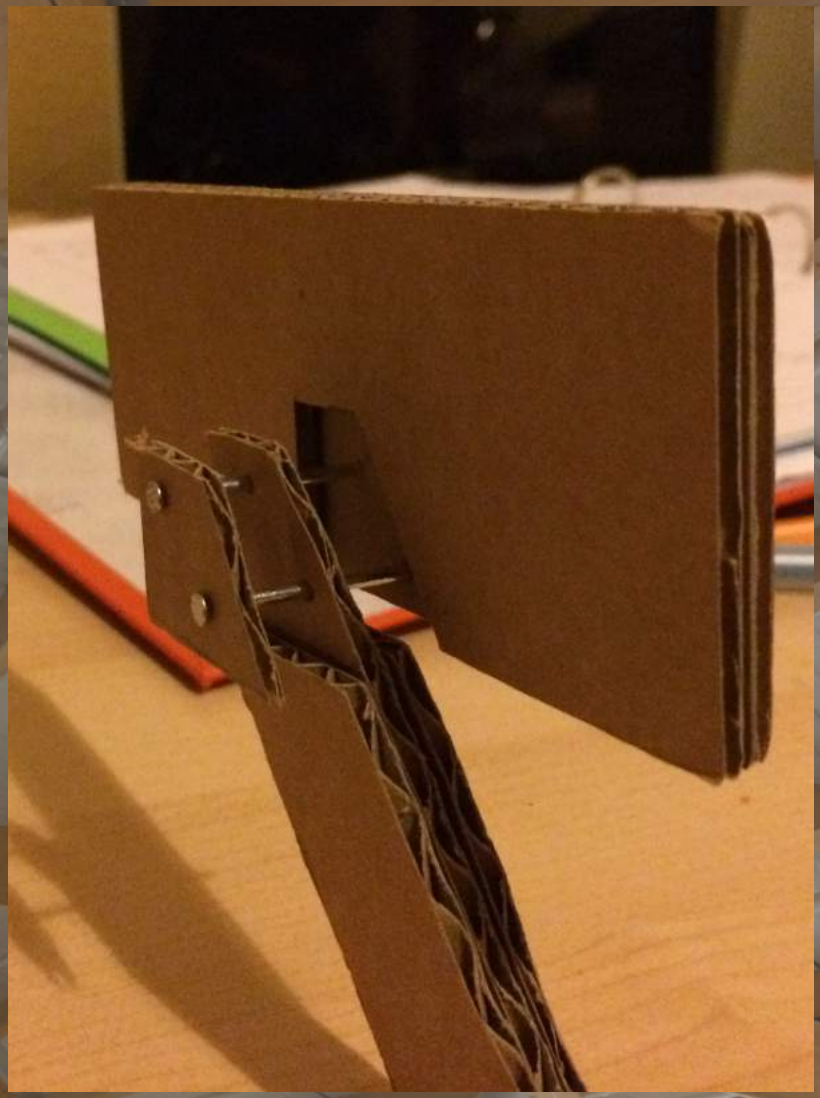
- Incorporate laminations into the design
- Maximise contact between surfaces
- Constrain movement
- Consideration to manufacturing

Beam Junction

Concept Development

Points of Focus

- **Disguise the connection**
- **Ease of Assembly**
- **Reduce the material**
- **Optimise Stiffness**



Standardisation

Concept Development

Expert Opinion

- **Minimum of 4 laminations**
- **Laminations are 45mm thick**
- **Using standard widths to reduce cost**
- **Horizontal laminations to achieve beam depth**

Full Size Drawing

Concept Development

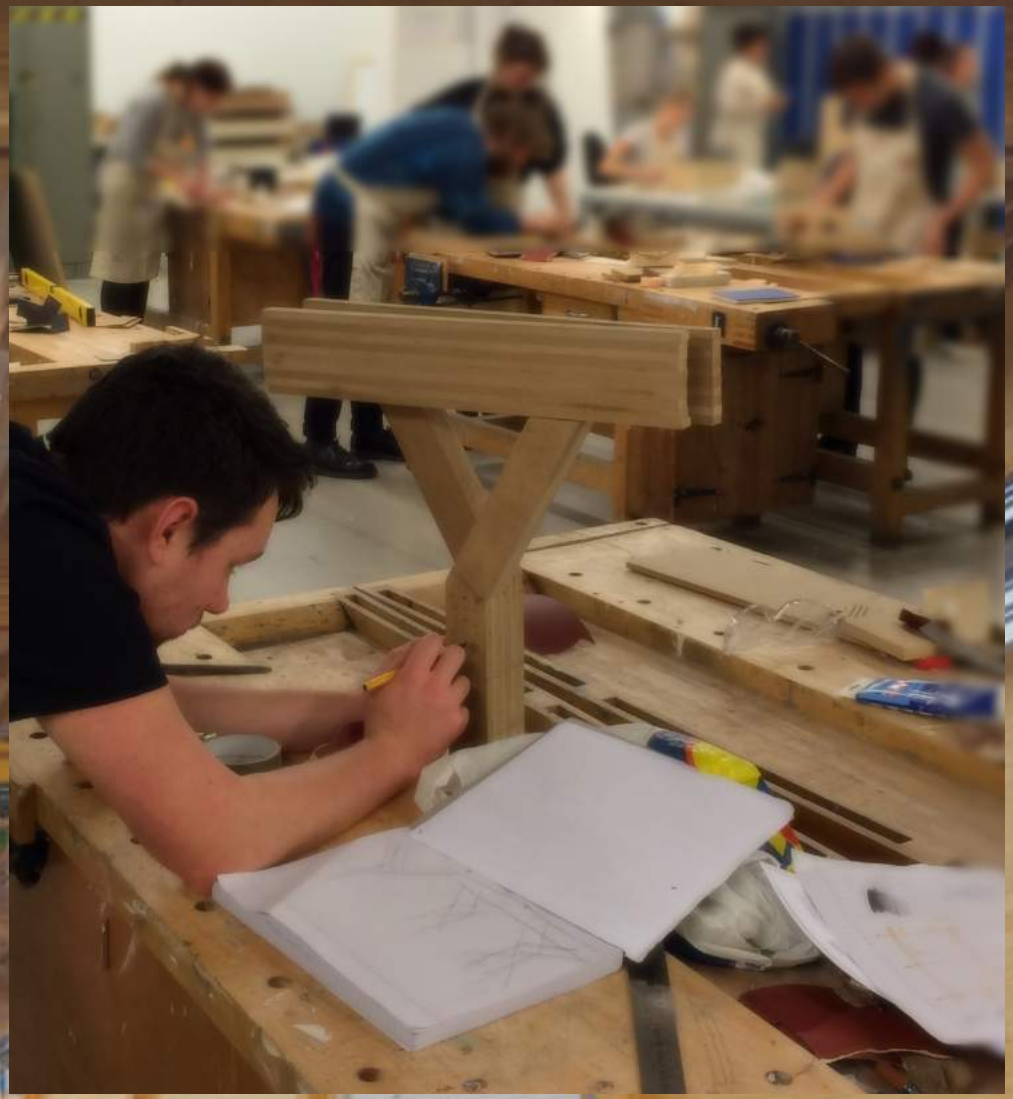
Developments

- Identified small discrepancies
- Ability to sketch alterations
- Appreciation, and resultant change of scale
- Full team involvement, useful in discussion

Construction

Defining Stages

- **Realistic Manufacture**
- **Y Junction**
- **Assembly**



Realistic Manufacture

Construction

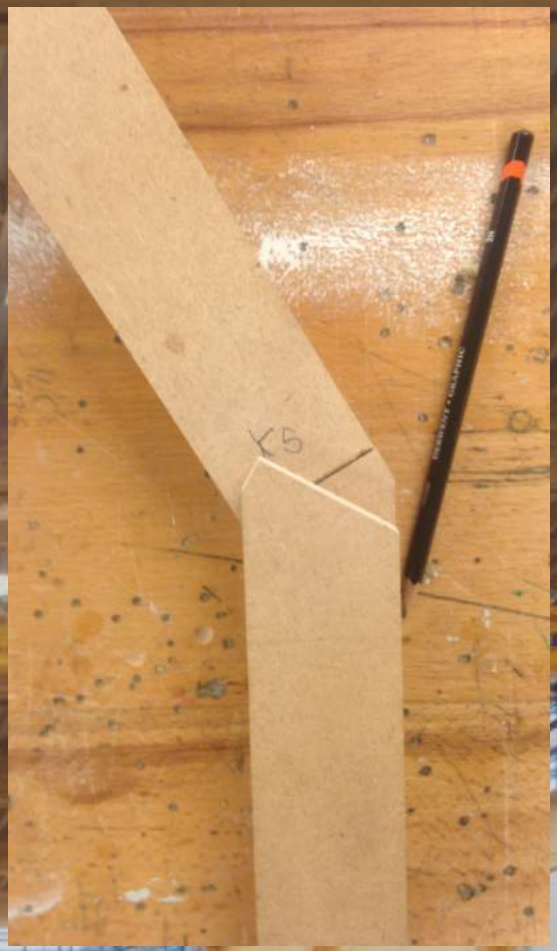
Points of Focus

- Timber finger jointed in preparation
- Begin each stage with timber strips
- Geometry cut primarily from whole laminations
- Shipped as fairly regular glulam beam sections

Y Junction

Construction

Adjusting angle of cut to improve structure and elegance



Final Concept

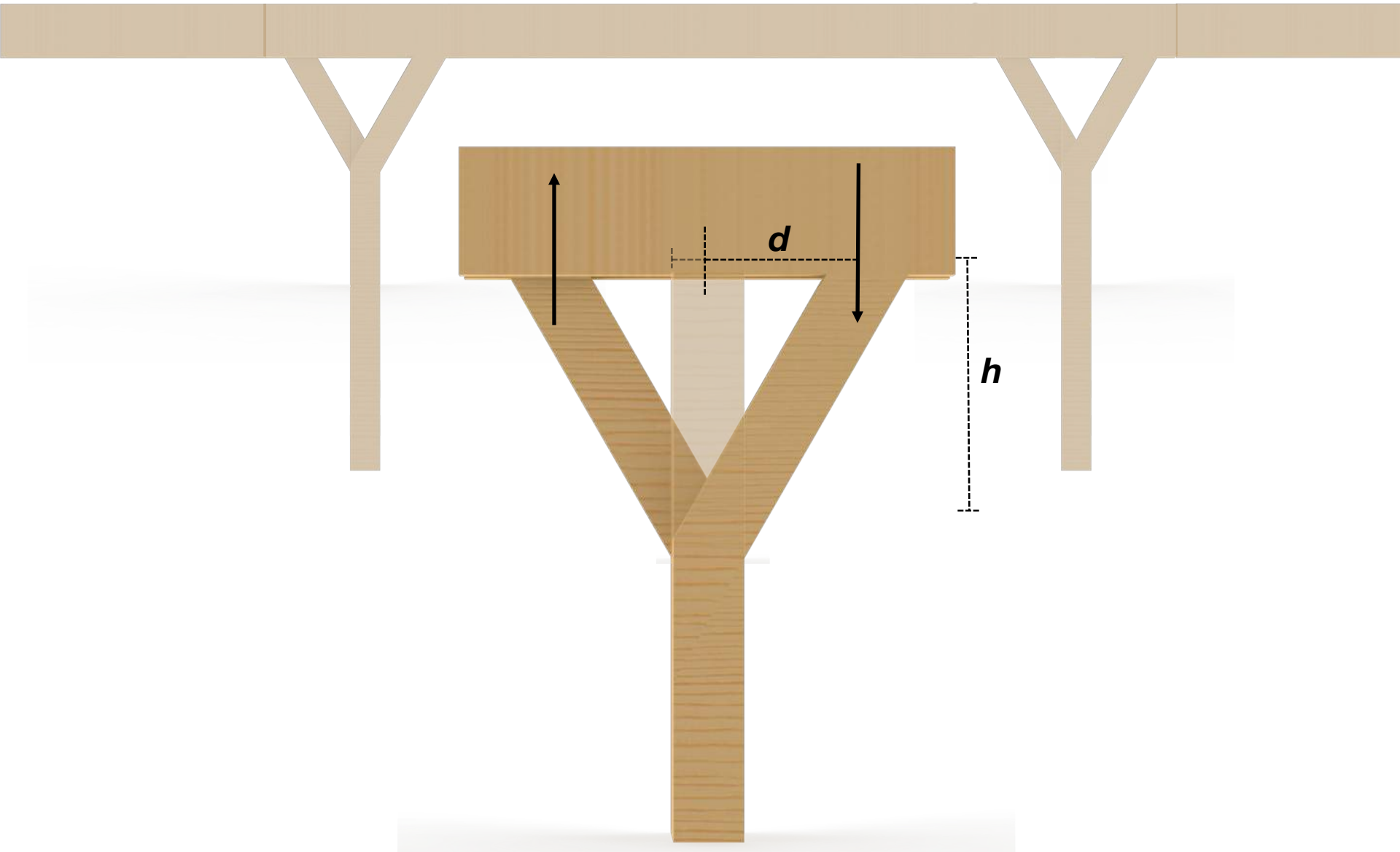
Size and Form

Specification

Key Points

- 8 meter span
- Roof height of 4m
- Elegant form

Structural Performance



Material & Environment

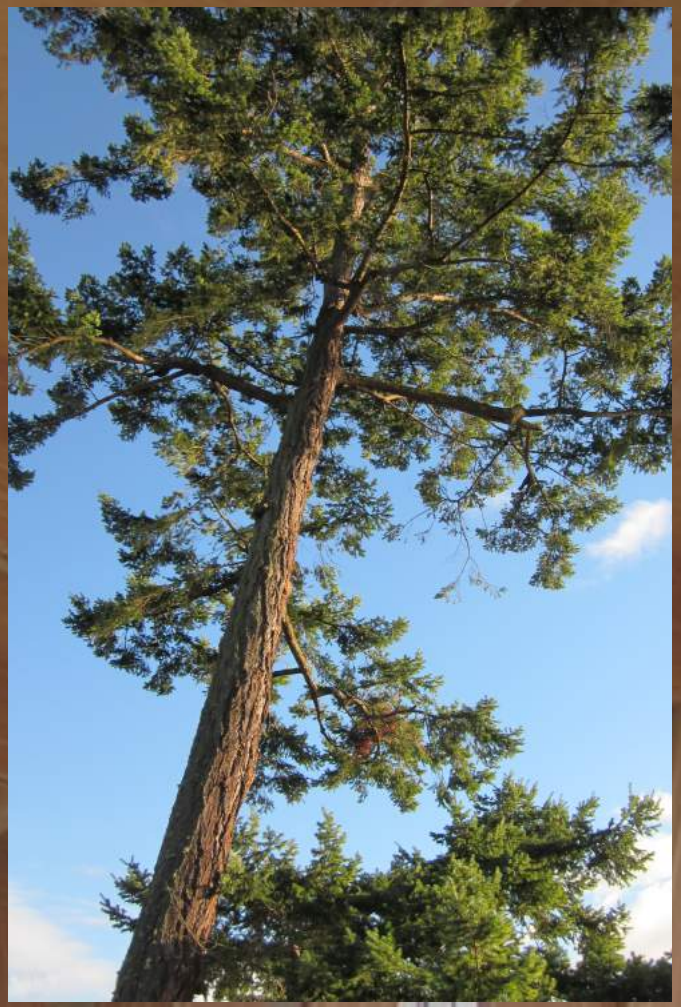
Specification

Key Points

- Glue Laminated Timber (GL24)
- Douglas Fir
- Intended for Beith site (interior)

Specification

- 8 250 x 45mm timber (column)
- 20 90 x 45mm timber (beam)
- Urea Formaldehyde adhesive
- M20 galvanised threaded bar



Transport & Ecology

Specification

Key Points

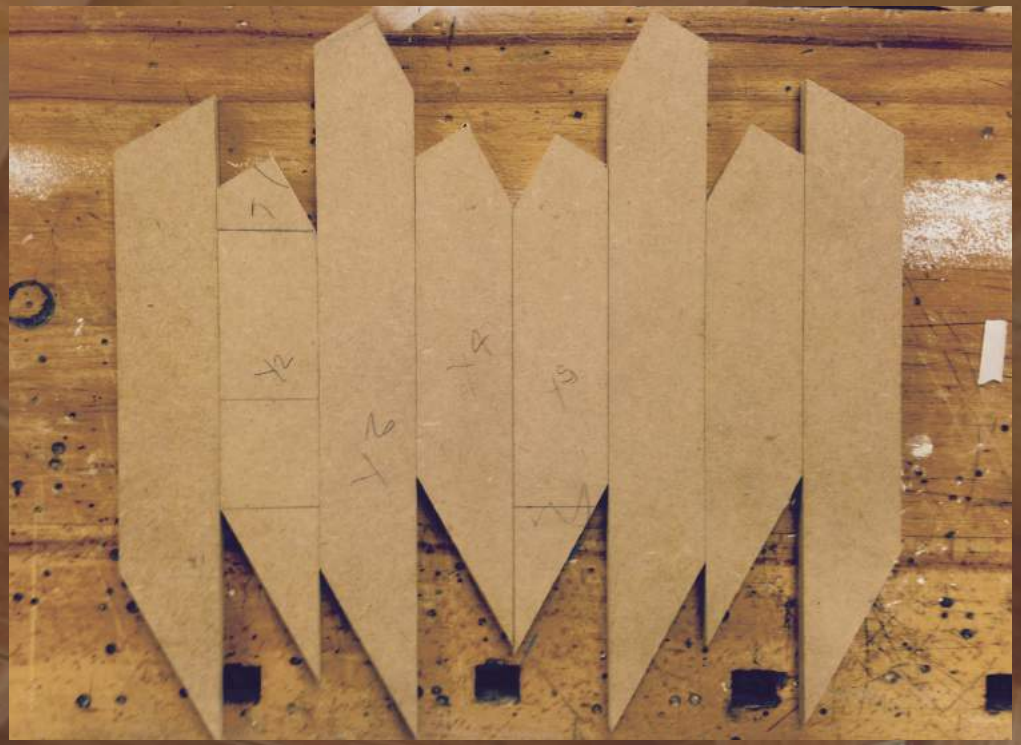
- **Prefabrication**
- **Ease of Transport**
- **Ecological Consideration**

Ease of Assembly

Specification

Key Points

- **Seamless joints**
- **Natural symmetry**
- **Exterior fixings**




Questions?