Northwest Wood Design Symposium
Microsoft Sammamish Village

Tim J. Whitcombe, RIBA
Senior Associate, NBBJ
19th June 2019
Project Overview
Sammamish Village

Masterplan → Weave Whatcom → Geode Washington → Living Room Sammamish → Civic Portal Chelan
Current Masterplan
Campus-wide diagram illustrating proposed villages.

Microsoft reserves the right to change village boundaries in the future.
Concept
Sammamish Village

Inverse Density

Developing on the theme of Sammamish as the Forest Village, with Buildings 212, 213, 214 & 215 nestled between the forest and the Campus Edge, the Inverse Density diagram is reminiscent of the natural landscape of the Pacific Northwest.

Using the Inverse Density diagram to represent the forest on the Office Heads, the Office Link takes on the Calm Horizontal of the river, cutting through the forest and revealing the Building Entries and Living Rooms.

Setting the Living Rooms and Dens within the clearings provides access to light, views, and the outdoors, as well as providing a distinct differentiation in articulation across the building, breaking down the building massing.

Concept Image: Nisqually River cuts through the dense forest, revealing Mt. Rainier

Concept Diagram: Inverse Density cut by Calm Horizontal
Timber Considerations

• Structural Comparison
  • Concrete
  • Steel
  • Timber
  • Hybrid
• Use Type and Occupancy
• Fire Proofing
• CLT or DLT
## System Descriptions

<table>
<thead>
<tr>
<th>Structural System Options</th>
<th>CONCRETE ON METAL DECK W/ STEEL WF BEAMS &amp; INTERMEDIATE SPAN GIRDERS</th>
<th>CONCRETE PT SLAB</th>
<th>CLT/DLT PANELS &amp; TOPPING W/ GLULAM BEAMS</th>
<th>CLT/DLT PANELS &amp; TOPPING W/ STEEL WF BEAMS &amp; GIRDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral System Options</td>
<td>/ +/30’ x +/-30’ column grid / 6 1/2&quot; thick concrete filled metal deck / 16’ x 21’ wide deep flange beams / Wide flange columns / Fireproofed structure if lightweight concrete fill no spray on soffit</td>
<td>/ +/-30’ x +/-30’ column grid / 9” thick PT concrete slabs / Concrete columns /</td>
<td>/ +/-30’ x +/-30’ column grid / 2 1/4” - 3 1/2” concrete topping over 7 ply CLT panels or 2x10 DLT panels (total slab depth = 11 1/2” - 13 1/2”) / 30’-36’ deep glulam beams / Timber columns</td>
<td>/ +/-25’ x +/-40’ column grid / 2 1/4” - 3 1/2” concrete topping over 7 ply CLT panels or 2x10 DLT panels (total slab depth = 11 1/2” - 13 1/2”) / 18” to 24” deep wide flange beams / Wide flange columns / Varying amount of fireproofing concrete fill no spray on soffit</td>
</tr>
<tr>
<td>Operational and Environmental Value</td>
<td>[ ] Carbon leadership (story potential)</td>
<td>[ ] Embodied carbon</td>
<td>[ ] Efficient use of materials by paneling</td>
<td>[ ] Structural eight impacts on lateral system &amp; foundation cost</td>
</tr>
<tr>
<td></td>
<td>[ ] Energy performance impact</td>
<td></td>
<td>[ ] Varying amount of fireproofing concrete fill no spray on soffit</td>
<td></td>
</tr>
<tr>
<td>Health &amp; Social Impact</td>
<td>[ ] Serviceability acoustics</td>
<td>[ ] Serviceability vibration</td>
<td>[ ] Serviceability floor flatness</td>
<td>[ ] Red list / ingredient impacts</td>
</tr>
<tr>
<td></td>
<td>[ ] Experience: Biophilic connection with nature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ ] Space planning impact</td>
<td>[ ] Flexibility bay sizes</td>
<td>[ ] Systems: Comfort improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ ] Systems: Daylighting impact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ ] Health/social impact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ ] Storming practices</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Structural System Options

- **Concrete on Metal Deck**: w/ Steel WF Beams & Intermediate Span Girders
- **Concrete PT Slab**: w/ CLT/DLT Panels & Topping w/ Glulam Beams
- **CLT/DLT Panels & Topping w/ Steel WF Beams & Girders**

### Key Details

- **Concrete on Metal Deck**
  - +/-30’ x +/-30’ column grid
  - 6 1/2” thick concrete filled metal deck
  - 16’ x 21’ wide deep flange beams
  - Wide flange columns
  - Fireproofed structure if lightweight concrete fill no spray on soffit

- **Concrete PT Slab**
  - +/-30’ x +/-30’ column grid
  - 9” thick PT concrete slabs
  - Concrete columns

- **CLT/DLT Panels & Topping w/ Glulam Beams**
  - +/-30’ x +/-30’ column grid
  - 2 1/4” - 3 1/2” concrete topping over 7 ply CLT panels or 2x10 DLT panels (total slab depth = 11 1/2” - 13 1/2”)
  - 30’-36’ deep glulam beams
  - Timber columns

- **CLT/DLT Panels & Topping w/ Steel WF Beams & Girders**
  - +/-25’ x +/-40’ column grid
  - 2 1/4” - 3 1/2” concrete topping over 7 ply CLT panels or 2x10 DLT panels (total slab depth = 11 1/2” - 13 1/2”)
  - 18” to 24” deep wide flange beams
  - Wide flange columns
  - Varying amount of fireproofing concrete fill no spray on soffit
Sammanish Village

**Considerations - Structural Comparison**

- **Test-fit Plan**: Concrete
- **Test-fit Plan**: Steel
- **Test-fit Plan**: CLT / DLT & Steel Beams
- **Test-fit Plan**: CLT / DLT & Glulam Beams

---

**Test-fit Section**:
- **Concrete**
- **Steel**
- **CLT / DLT & Steel Beams**
- **CLT / DLT & Glulam Beams**

---

**Kitchen**

**WCs**
Sammamish Village
Considerations - Use Type & Occupancy

"A" Occupancy
Less than or Equal to 4 floors

"B" Occupancy
Less than or Equal to 6 floors

Sammamish:
• Principally "B" Occupancy
• Less than or Equal to 5 floors
• Gathering spaces are below 750sf
  AND / OR
• Gathering spaces are below 10% floor area
Considerations - Fire Proofing

Photo credit: Arup / thinkwood.com
• DLT is a one-way span system, resulting in a greater span, with less depth, giving a taller floor to ceiling.

• Electrical can be routed through the DLT Panel.

• DLT Boards run perpendicular to the Glulam Beams, creating visual interest from below.

• Design Team's aesthetic preferences.
Proposed System
Sammanish Village

Proposed System

"Living Rooms"

Amenity "pop outs"

CLT / DLT & Glulam Beams

CLT / DLT & Steel Beams
Proposed System

Mass Timber Deck with Concrete topping slab to create diaphragm / vibration control, Glulam Beams & Glulam Columns

Post-tension flat Concrete Slab, Concrete Columns
Sammamish Village

Proposed System

DLT & Glulam Beams Typical Details

DLT Deck with Concrete topping & Glulam Beams

DLT to Concrete Connection Detail Sketch

Glam to Concrete Detail Sketch

"Living Rooms"
Proposed System

Amenity "pop outs"

DLT & Steel Beam Typical Details

DLT Deck with Concrete topping & Steel Beams
Questions?

Tim J. Whitcombe, RIBA, LEED® Green Assoc.
NBBJ Senior Associate / Architect

twhitcombe@nbbj.com
+1. 206.223.5220
www.nbbj.com
@nbbjdesign