Shrinkage
Connection Design

GLULAM COLUMN
COLUMN BASE C/W 3-5mm KNIFE PLATES AND CENTERING STUB
CONCRETE TOPPING
DRAG MAT 5mm PLATE C/W WELDED REINFORCING BARS SCREWED TO WOOD DECK TIGHT FIT HOLE AROUND BEARING STUB
MASS TIMBER DECK
COLUMN TOP C/W (3) 5mm KNIFE PLATES AND 12mm BE SEATS, BEARING STUB WITH SLOTS FOR CENTERING PIN
SFS SCREWS
GLULAM BEAM
CRACK STOP HOLE WITH FINISHING DOWEL
WOOD FINISHING BLOCK
GLULAM COLUMN
1 - Steel column with base milled to mate with column top below. Milled shape to self center columns to speed erection

2 - 50 concrete topping

3 - 175 Glulam slab

4 - Glulam beams

5 - Pre-engineered dovetail connection (SHERPA or approved equivalent). Connections routed into beam and columns to conceal connection and provide fire protection. Beams and columns arrive to site with connections installed to speed erection

6 - Column, milled at top to mate with column from above. Milled shape to self center column above to speed erection
Structural Design Summary

- **Composite Wood / Concrete Solution:**
  - Uses 60% less concrete than a conventional concrete structure
  - Reduces the weight of the building (over conc. alternative) by 50%
  - No formwork - significant reduction in construction site waste
  - Prefabrication of reinforcing on the bubble deck slabs – time saving
  - Prefabrication of wood panels - better overall quality control
  - Wood used in system contains as much as 200 kg of CO2 /m2 area
  - Biophilia – exposed wood has positive health and well-being benefits on occupants
    
    *Studies by D. Fell (UBC) and FPInnovation; Kelz et al. Austria*
Engineering Concept
Proposed LID and SWM Measures

- Permeable Pavement & Storage in stone reservoir
- Bio-swale/ bioretention & surface ponding
- Edge treatment (Filter strip)
- Edge pre-treatment (gravel diaphragm)
- Green roof and/or rainwater harvesting
## Building Energy Performance

<table>
<thead>
<tr>
<th>Building</th>
<th>EUI (ekWh/sf/yr)</th>
<th>Energy Cost ($/yr)</th>
<th>Comments Re Source</th>
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<tbody>
<tr>
<td>Market Average</td>
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<td>Toronto Average</td>
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<td>Good New Build</td>
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<td>Tier 1 Bldg. 33% &lt; MNECB</td>
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### Building Carbon Performance

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<tr>
<th>Building</th>
<th>EUI (ekWh/sf/yr)</th>
<th>Operating Carbon tonnes/Yr</th>
<th>Comments Re Source</th>
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<td>TRCA – Low Op Cost</td>
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<td>200</td>
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<tr>
<td>TRCA – Low Op Carbon</td>
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<td>130</td>
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