# Vancouver Mountain Landscape Intenvention Caferteria Design In-between

# 栖间——温哥华松基山景观介入式茶室设计


| | | | |
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基地位于加拿大温哥华松基山脉北区滨海山坡上，北部毗邻当地著名的Spanish Bank Beach，基于这样背山面海的环境，我们采用在水平方向延展的长条状体量迎合地形地貌。

松基山上岩石遍布草木葱郁，这正是自然的场所，我们所希望的并不是在这样一个天然的场所创造一个人工环境，而是试图在人工与自然之间寻求和谐的对话关系。漫步于山海间丛林中，透过草木间隙看到远处的海景，阳光从树冠的间隙倾泻下来，这山林给我们的启示。

室内空间由13组伞状骨架作为主结构支撑，每个伞状骨架由7片CLT层叠而成，底部被预埋金属件固定在地面上，这13组伞状结构展开的两臂沿室内空间流动方向渐变，同时又受两侧木杆支撑，形成13品构架，水平方向杆件的链接加强了这13品构架之间的联系，使之成为一个稳定的整体结构。

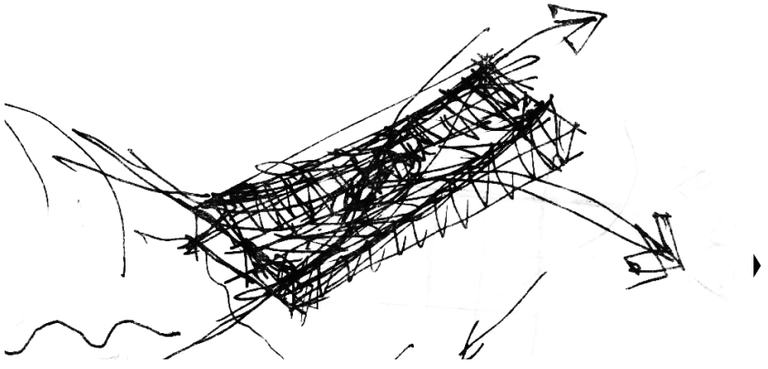
受内外两个面层和内部渐变的伞状结构的影响，室内空间具有很强的流动性和通过性，两个不同密度的主立面加强了室内空间对海景的收纳关系。

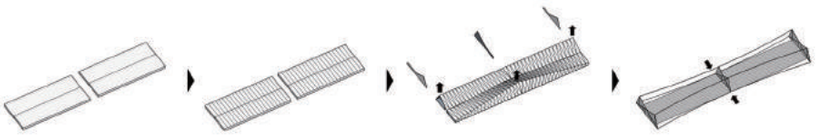
The site locates at the sea-facing declive in the northen part of Songji Mountains, Vancouver, Canada, with the famous Spanish Bank Beach by its side. Based on this mountain-sea surrounding environment, we use the horizontal expending long mass to fit the geography.

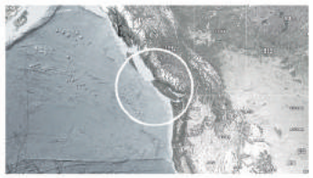
The natural place Songji Mountains is covered with abundant plants, grass and trees. What we hope to do is not to create a man-made environment, but to seek for harmony dialogical relationship between human being and nature. Wandering around the mountains and trees, enjoying beautiful sea view through trees and plants, feeling sunshine pouring down from sky, are the inspirations that we get from this nature environment.

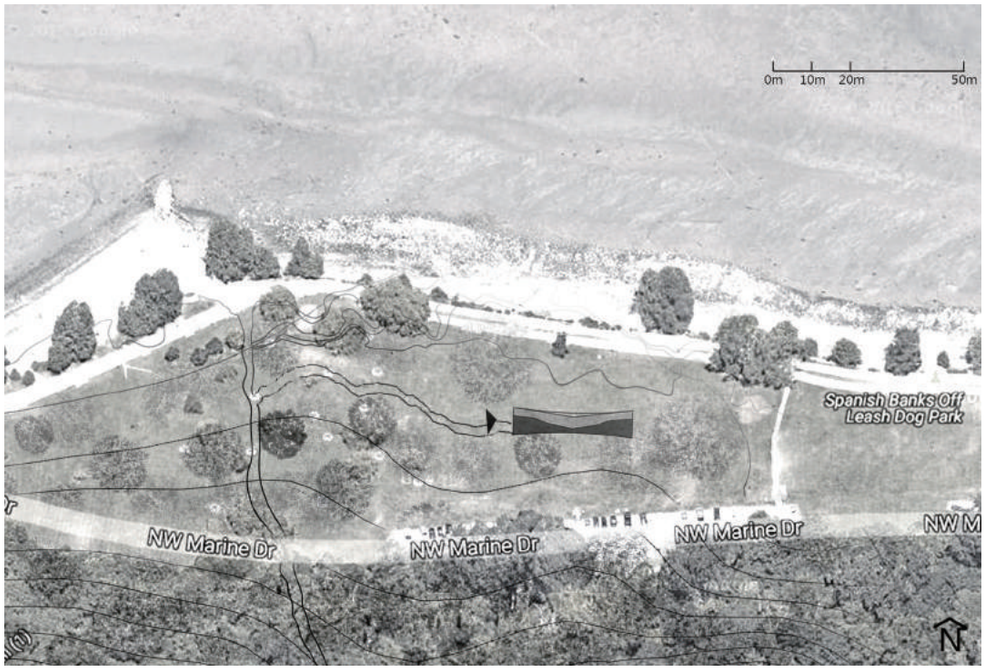
The indoor space is supported by 13 deliquescence frameworks, which work together as the main structure system. Each, consisting of 7 CLT layers is fixed to the ground at bottom by preset metal workpieces. The two extending beams of the 13 deliquescence frameworks change along the interior space floating direction, supported by timber sticks at two sides meanwhile, to form the 13 trusses of the whole architecture. The connection in vertical dimension reinforces the affiliation of these 13 frameworks, making them work together as a stable system.

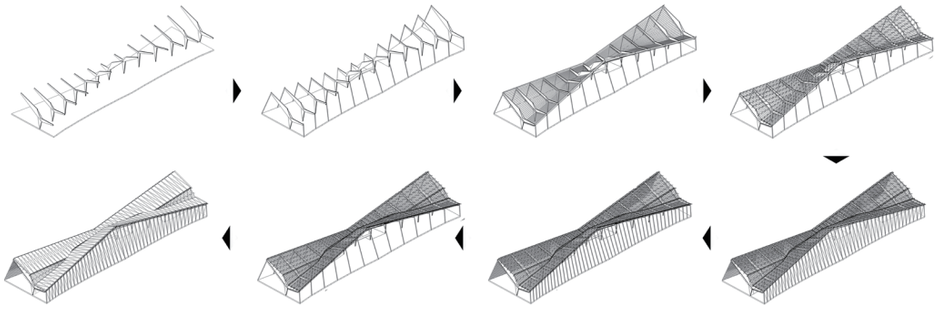
Influenced by the two gradual changing interior and exterior layers of the deliquescence frameworks, the interior space possesses characters of mobility and trafficability. Two density-distinguished main facedes enhance the receiving of seascape.

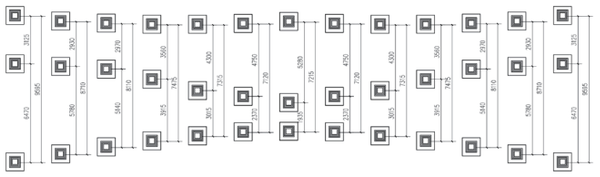


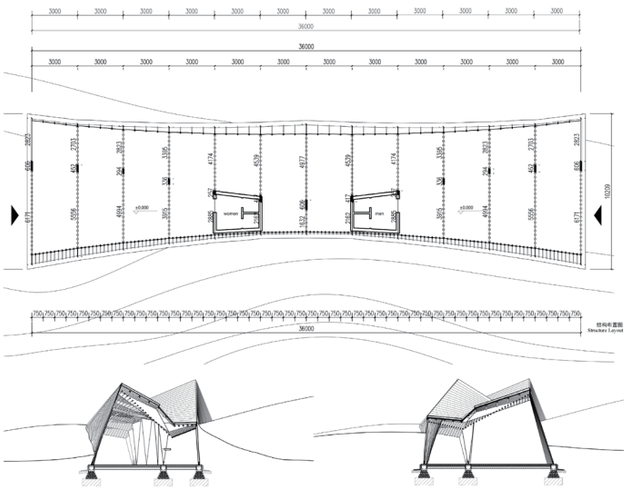


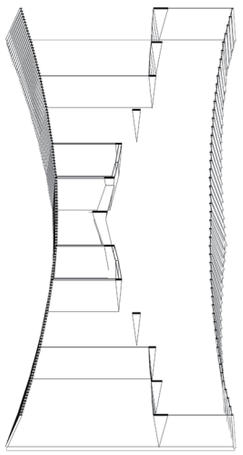


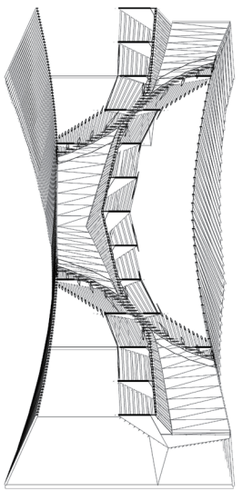

0m 10m 20m 50m
Spanish Banks Off Leash Dog Park
NW Marine Dr
NW Marine Dr
NW Marine Dr
NW M

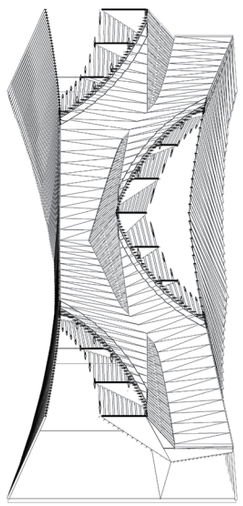


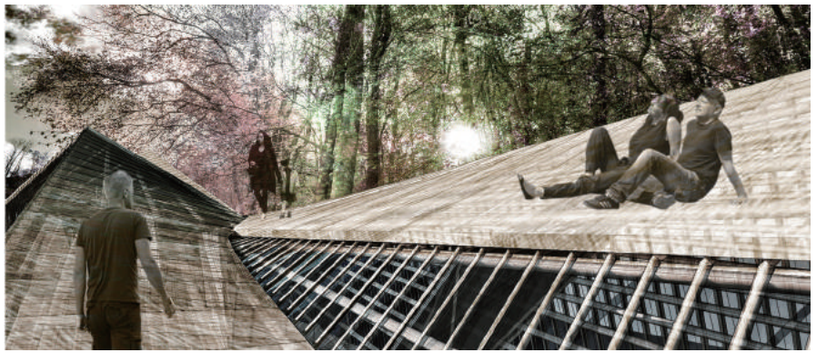


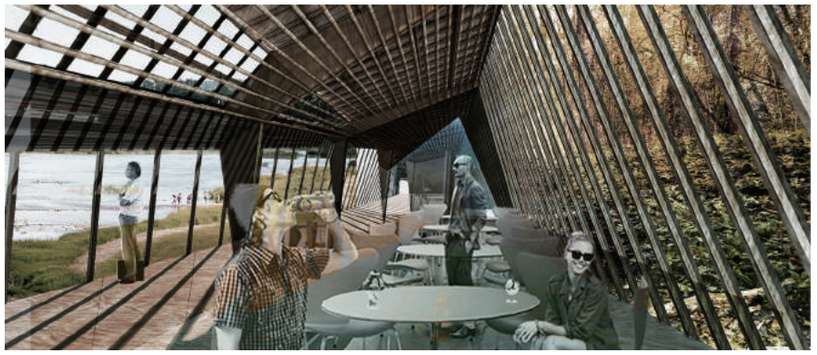


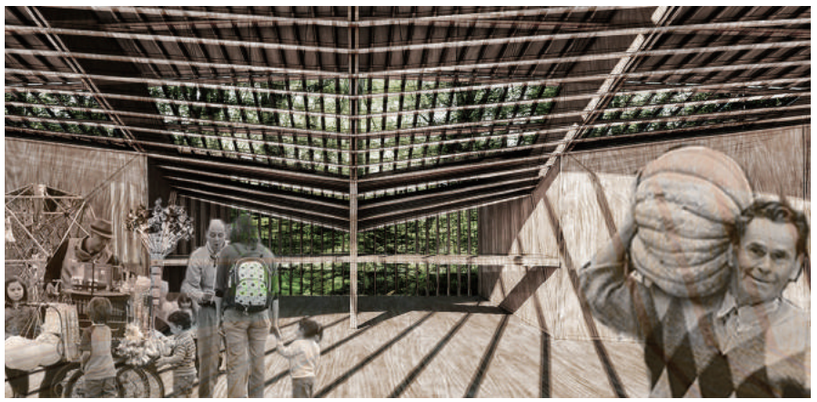


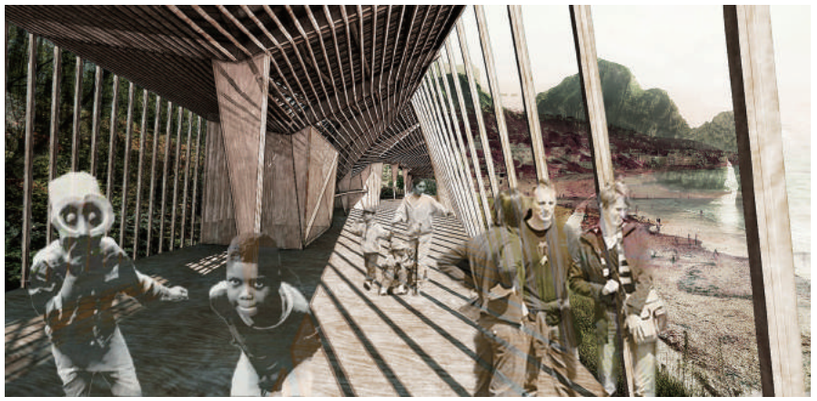


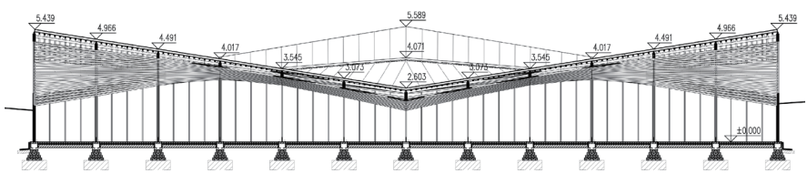


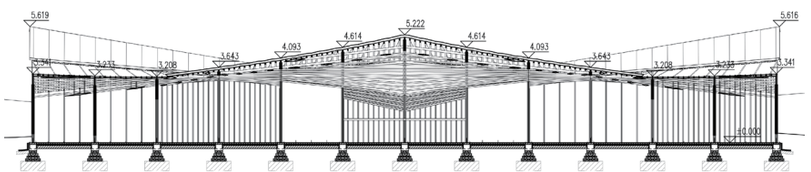









5,439
4,966
4,491
4,017
3,545
2,073
2,603
4,071
5,589
±0,000


5,619
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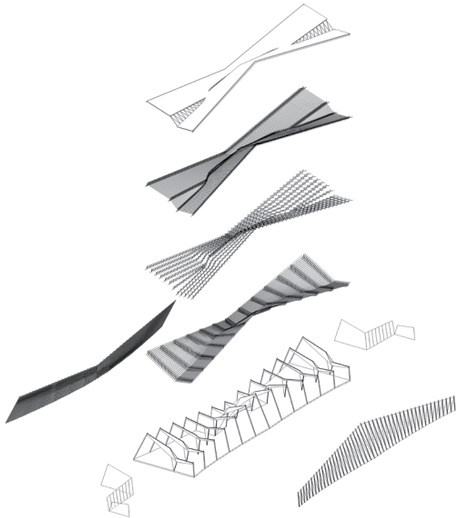
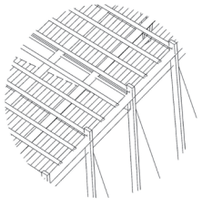
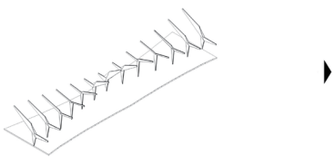
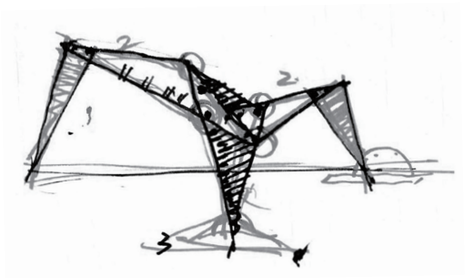
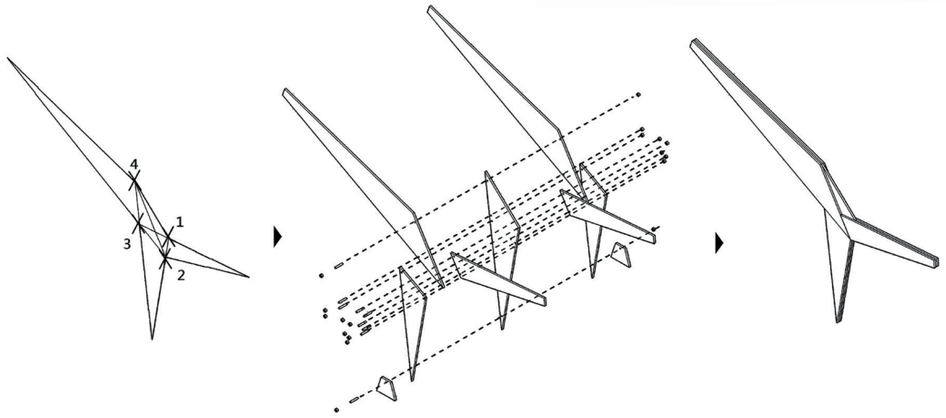
4,093
3,643
3,209
3,233
5,616
±0,000

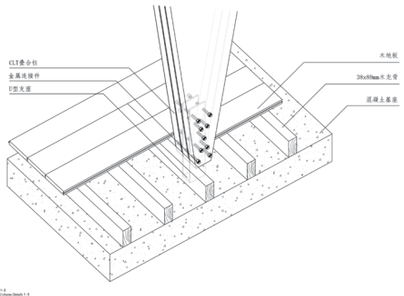


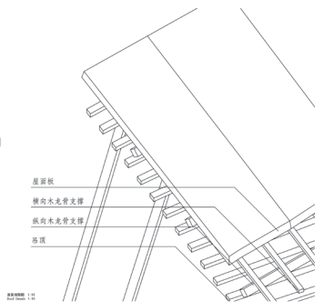


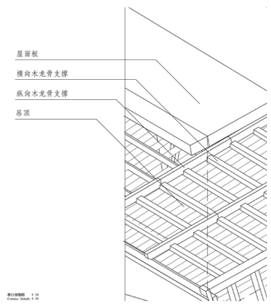




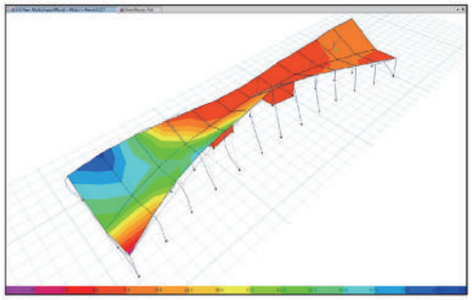

4
1
3
2

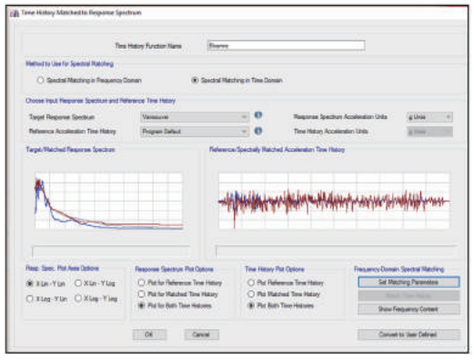

CLT叠合柱
金属连接件
U型支撑
木地板
38x89mm木龙骨
混凝土基座


屋面板
横向木龙骨支撑
纵向木龙骨支撑
吊顶


屋面板
横向木龙骨支撑
纵向木龙骨支撑
吊顶

| Case | Mode | Period sec | Frequency cyc/sec | Circular Frequency | Eigenvalue rad²/sec² |
|---|---|---|---|---|---|
| Modal | 1 | 0.227 | 4.4 | 27.6472 | 764.3658 |
| Modal | 2 | 0.22 | 4.536 | 28.5026 | 812.4 |
| Modal | 3 | 0.167 | 5.998 | 37.6881 | 1420.3914 |
| Modal | 4 | 0.165 | 6.045 | 38.0091 | 1444.6929 |
| Modal | 5 | 0.139 | 7.182 | 45.1288 | 2036.6052 |
| Modal | 6 | 0.115 | 8.676 | 54.5127 | 2971.6381 |
| Modal | 7 | 0.113 | 8.876 | 55.7712 | 3110.4293 |
| Modal | 8 | 0.111 | 9.048 | 56.8479 | 3231.6812 |
| Modal | 9 | 0.11 | 9.097 | 57.1566 | 3266.8741 |
| Modal | 10 | 0.107 | 9.31 | 58.4963 | 3421.8166 |





| Material | Density [kg/m³] | MOE [N/mm²] | Strength [N/mm²] | Shear Modulus [N/mm²] | Poisson's Ratio |
|---|---|---|---|---|---|
| Lumber | 550 | 11000 | 14 | 4264 | 0.29 |
| CLT | 450 | 11430 | 20 | 4297 | 0.33 |
| PSL | 720 | 14000 | 42 | 5600 | 0.25 |
| Glulam | 500 | 12400 | 30 | 4593 | 0.35 |
| Steel | 7850 | 200000 | 400 | 76923 | 0.30 |
| Concrete | 2402 | 24800 | 28 | 10350 | 0.20 |

**Dead loads**

| Roof | N/m2 | | | |
|---|---|---|---|---|
| Shingles | 140 | | | |
| Sheathing | 100 | | | |
| Roof | 150 | | | |
| Insulation | 35 | | | |
| Ceiling | 160 | | | |
| Sprinklers | 30 | | | |
| Other fixtures | 100 | | | |
| Self Weight | | | | |
| | | 715 | | |
| Exterior walls | | | | |
| Interior finish | 150 | | | |
| Studs | 90 | | | |
| Insulation | 35 | | | |
| Sheating | 100 | | | |
| Siding | 70 | | | |
| Other fixtures | 100 | | | |
| Self Weight | | | | |
| | | 545 | | |
| | | | 1.5 | kN/m² |
| | | | 2.25 | 4.5 kN/m |
| | | | 4.5 | 9 kN/m |

**Live loads**

| | | | | |
|---|---|---|---|---|
| | 4800 | | 4.8 | kN/m² |
| | | | 7.2 | 14.4 kN/m |
| | | | 14.4 | 28.8 kN/m |

**Snow Load (Vancouver)**

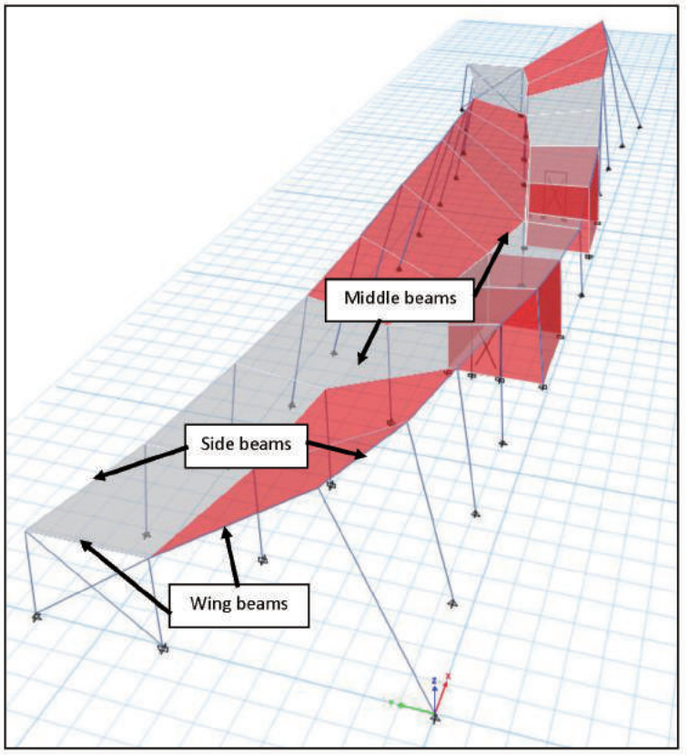
| | | | | |
|---|---|---|---|---|
| Is | 1 | | | |
| Ss | 1.8 | | | |
| Cb | 0.8 | | | |
| Cw | 0.75 | | | |
| Cs | 1 | | | |
| Ca | 1.1 | | | |
| Sr | 0.2 | 1.388 | 1.5 | kN/m² |
| | | | 2.25 | 4.5 kN/m |
| | | | 4.5 | 9 kN/m |

**Wind Loads (Vancouver)**

| | | | | |
|---|---|---|---|---|
| Iw | 1 | | | |
| q | 0.45 | 0.594 | 0.6 | kN/m² |
| Ce | 0.88 | 0.3168 | 0.35 | kN/m² |
| Cg | | 0.396 | 0.4 | kN/m² |
| Cp | | 0.792 | 0.8 | kN/m² |

**EQ Loads (Vancouver)**

| | | | | | |
|---|---|---|---|---|---|
| Site C | Fa | 1 | | | |
| Site C | Fv | 1 | | | |
| | S(Ta) | | | | |
| | Ta | 0.167185 | | | |
| | hn | 5 | | | |
| | Sa(.2) | 0.94 | | | |
| | Sa(.5) | 0.64 | 0.64 | | |
| | S(.64) | 0.553 | | | |
| | Mv | 1 | | | |
| | IE | 1 | | | |
| | W | 3.125 | | | |
| | Rd | 3 | | | |
| | Ro | 1.7 | | | |
| | F | | | 0.2 | kN/m |
| | V | 0.338848 | 0.5 | 0.5 | kN/m |




| | | |
|---|---|---|
| $P_{f\_compression}$ | 135 | kN |
| $P_{f\_tension}$ | 98 | kN |
| $M_f$ | 25 | kN-m |
| $V_f$ | 50 | kN |
| $W_{Total}$ | 23.4 | kN/m |
| $W_{Live}$ | 14.4 | kN/m |
| L | 3065 | mm |

| | | |
|---|---|---|
| B | 365 | mm |
| n | 25 | |
| d | 38 | mm |
| $d_t$ | 950 | mm |
| e | 900 | mm |
| $d_n$ | 237.5 | mm |
| Doglas Fir-Larch | | 20f-EX |