Outline

- **Project Description**
- **Virtual Modeling**
- **Project Schedule**
  - Concrete Cores
  - Glulam Column
  - CLT
  - Envelope Panels
  - Miscellaneous metal
- **Settlement of Building**
- Water / Fire **protection** management
- Precision Workmanship
- Reduction of Footprint
Project Description

- **Residential** building
- **272 studio** units and **33 quads**
- **18 floors** (53 m/174 ft.)
- Wood structure: **Glulam** and **CLT panels**
- **$39M** construction Budget
Mock-Ups (Floor, Columns & Façade)
Mock-Ups (Façade Only)
Virtual Modelling

- Installation
- **Sequencing** with multiple trade Participation
- **Safety** accessibility
Virtual Modelling - Cores
Virtual Modelling – Tower
Virtual Modelling – Mechanical Room
Virtual Modelling – Mechanical Room

Section B:
# Part Title Description QTY NomSize
1 ANSI-B16.9 GARTH-LR 90° REDUCING ELBOW-STD-45°x2in
2 ANSI-STANDARD-KVCI-INDUSTRIES-GATE-VALVE-FIG.272-CI-41 CLASS 150-RAISED FACE GATE VALVE 4 4in
3 ANSI-VIC-101-90° ELBOW-CS-4in 90° ELBOW 10 4in
4 ANSI-VIC-301-45° ELBOW-CS-4in 45° ELBOW 2 4in
5 ANSI-VIC-TEE-N020-4in TEE 2 4in
6 ANSI-VIC-RIGID COUPLING NO. 07-4in RIGID COUPLING 28 4in
7 FLANGE ADAPTER-VICTULIC-NO.741-4in FLANGE ADAPTER 8 4in
8 THREADED-UNION-CCFT-CLASS 300-2in UNION 8 2in
9 ANSI-B16.9 GARTH-LR 45° ELBOW-STD-3inx3in ELBOW 45° 2 3in
10 ANSI-B16.9 GARTH-LR 90° ELBOW-STD-3inx3in ELBOW 90° 12 3in
11 ANSI-B16.9 GARTH-LR 90° REDUCING ELBOW-STD-3inx3in ELBOW 90° 4 3in x 3in
12 ANSI GARTH-RAISED FACE-GASKET-CLASS 300-3inx3in GASKET 8 3in
13 ANSI STANDARDS-INDUSTRIES-GATE-VALVE-FIG.272-3IN CLASS 300-RAISED FACE GATE VALVE 4 3in
14 RPP FLANGE ANSI COASTAL CARBON STEEL-CLASS 300-STD-3IN RAISED FACE FLANGE 8 3in
15 TEE GARTH ANSI-B16.9-STD-3inx3in TEE 2 3in
16 ANSI-BONNIE-FOREI-REDUCING THREADOLET-0.75inx3in-HEATER-CLASS 3000-Steel REDUCING THREADOLET 10 3in x 0.75in
17 ANSI-BONNIE-FOREI-REDUCING THREADOLET-0.75inx4in-HEATER-CLASS 3000-Steel REDUCING THREADOLET 8 4in x 0.75in
18 ANSI-BONNIE-FOREI-REDUCING THREADOLET-1inx4in-HEATER-CLASS 3000-Steel REDUCING THREADOLET 2 4in x 1in
19 Heat Exchanger-ARMSTRONG-A-X13-750-62 HEAT EXCHANGER 2 -

# Pipe Type NomSize QTY Length
20 SCH STD-2inx4-LS-NIPPLE 2in 2 **73mm
21 SCH STD-2inx4-LS-PIPE 2in 2 **73mm
22 SCH STD-4inx4-LS-PIPE 4in 2 173mm
23 SCH STD-4inx4-LS-PIPE 4in 2 173mm
24 SCH STD-4inx4-LS-PIPE 4in 2 173mm
25 SCH STD-4inx4-LS-PIPE 4in 2 173mm
26 SCH STD-2inx2-LS-NIPPLE 2in 2 **73mm
27 SCH STD-2inx2-LS-PIPE 2in 2 **73mm
28 SCH STD-4inx2-LS-PIPE 4in 2 90mm
29 SCH STD-4inx2-LS-PIPE 4in 2 90mm
30 SCH STD-4inx2-LS-PIPE 4in 2 90mm
31 SCH STD-4inx2-LS-PIPE 4in 2 90mm
32 SCH STD-4inx2-LS-PIPE 4in 2 90mm
33 SCH STD-2inx2-LS-NIPPLE 2in 2 **73mm
34 SCH STD-2inx2-LS-PIPE 2in 2 **73mm
35 SCH STD-3inx2-LS-PIPE 3in 2 140mm
36 SCH STD-3inx2-LS-PIPE 3in 2 140mm
37 SCH STD-3inx2-LS-PIPE 3in 2 140mm
38 SCH STD-3inx2-LS-PIPE 3in 2 140mm
39 SCH STD-3inx2-LS-PIPE 3in 2 140mm
40 SCH STD-3inx2-LS-PIPE 3in 2 140mm
41 SCH STD-3inx2-LS-PIPE 3in 2 140mm
42 SCH STD-3inx2-LS-PIPE 3in 2 140mm
43 SCH STD-3inx2-LS-PIPE 3in 2 140mm

GENERAL NOTES:
1) ALL DIMENSIONS ARE GIVEN IN METRIC MILLIMETERS (mm).
2) FABRICATOR TO ENSURE ALL FLANGE BOLT HOLES STRADDLE CENTERLINES.
3) ALL PIPE LENGTHS TO BE CONFIRMED BY MECHANICAL CONTRACTOR BASED ON SITE CONDITIONS.
4) 4” (101.6mm) HOUSE KEEPING PAD WAS USED.
5) SYMMETRIC TEE'S HAVE BEEN USED, PLEASE SPOOL SYMMETRICALLY.

*Piping to be based on thread engagement & site conditions.
** Threaded nipples to be as short as possible.

---

Title: **TW-MEC**: ROOM - HX1 - HX2 - SP07.1

Project Title: **UBC BROCK COMMONS**

Date: 08/07/2016

Drawn by: ryee

Checked by: Scale: 1:30

Print Size: 11x17

Sheet No.: SP07.1

PRELIMINARY
Virtual Modelling – Mechanical Room
Project Schedule

Concrete Cores:
• 5 days cycles
• 18 floors (2 cores) in 9 weeks
• Virtually modeled
Project Schedule

Wood Element:
• Installation: June 6th - August 9th, 2016
• 16 Levels of CLT installed in 8 weeks
Project Schedule

CLT panels (Day 1):
• 5 ½ hrs. to drop in 10,000sqft of CLT, 29 panels
• Install splines, drag straps and handrails
Project Schedule

**Topping** (Day 1)

- Install *acoustic topping* 2 levels below active CLT installation
Project Schedule

Envelope Panels
Cladding:
Trespa Panels
- 2-hr fire rating
- UV protected
- CNC Milled to cut & drill holes for screw pattern
- Up to 70% natural fibers
- Long Lasting (Min 20 years expected)
Project **Schedule**

**Envelope Panels** (Day 2):

- **22 envelope panels** per floor (windows are installed in the panel at the factory)

- **One floor installed in a single day** sequence (8-9 hrs.)
Project Schedule

Envelope Panels:

- Envelope panels clip similar to a curtain wall
- System **flashing connecting** panels
- Installation of flashing from above eliminates the need of a scaffold system
Project Schedule

Envelope Panels:

- **Limitation of CNC Milling**
  - Hole dimension no more than 40mm

- **Use of Gums, Shims and Micro-shims**

- **3mm tolerance in any direction**
Load the building (Day 3):
- **L-angle** installed on the perimeter of the CLT
- **Load drywall** into building for the encapsulation
Load the building (Day 3):

- **Retractable Outriggers vs Material Hoist**
- **Schedule 5.1 Construction Elevator**
Settlement of building

- Settlement of the building.
- Cutting down the steel connections
Water/Fire Protection Management

Water Management:
• CLT protection
• M & E penetration protected after installation
• Concrete topping
• Shower Drains, kiddy pools
• Interior Tarping
• Use of fans to control moisture
Water/Fire Protection Management
Fire protection management:

• Encapsulation required 5 levels below the CLT being installed
• Standpipes and Fire Hydrant
Water/Fire Protection Management

Acoustic Topping:
• Chamfer Strips
• SIGA Tape
• Thompson Water Seal
• Prep of CLT
Precision Workmanship

- The level of precision of the manufactured panels allows following trades to work more effectively and efficiently.
- Reduces RFI’s during construction
- Reduces trade conflict changes
- Allows multiple trades to prefabricate. Reducing installation time on site.
Crane Height

- **Max Unsupported** Crane height
  - No bracing to building

- **Unable** to install **panelized** roof

- Building at **local regulation maximum** height
Fire Stopping

- **Required Vs. Installed**
- **Drywall Detail** of the curbs
- **Precision** of Installation
QC/QA

- **Column installation**: Line & Plumb
- **Surveying of L-Angles** on every floor
- **Continuous monitoring of CLT Moisture**
Reduction in Footprint

• 6 people to install 1 CLT floor vs 27 people to install concrete, reinforcing, formwork, reshoring
• Eliminates 4 floors of reshore below the active floor installation
• 6 people to install 1 envelope vs 12 multiple layers
• Eliminates scaffold installation and removal
• Reduces trucking per 1 floor to 5 trucks of acoustic concrete, 3 trucks of CLT
• 2 trucks of Envelope panels per floor
• Reduces waste bin removal on site with no noticeable waste from this type of manufactured installation.
• All of the wood wrap was placed in one bin throughout the project. This bin was later recycled into pots for planting.
• Currently project waste is 92% recycled