

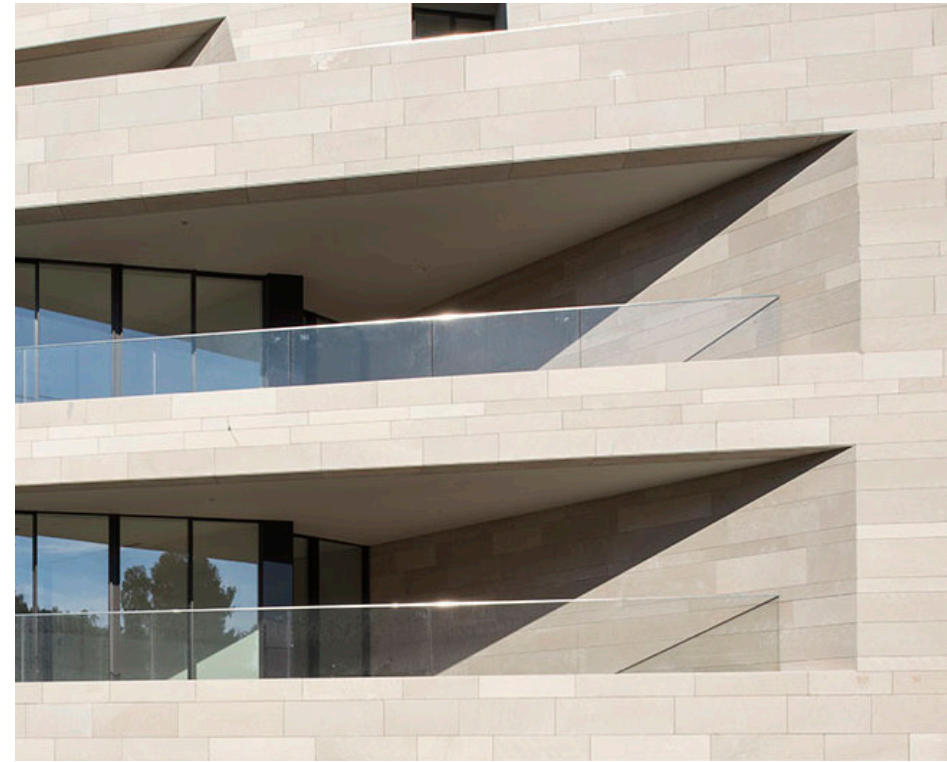
**FACADE DESIGN**



## FACADE REFERENCES

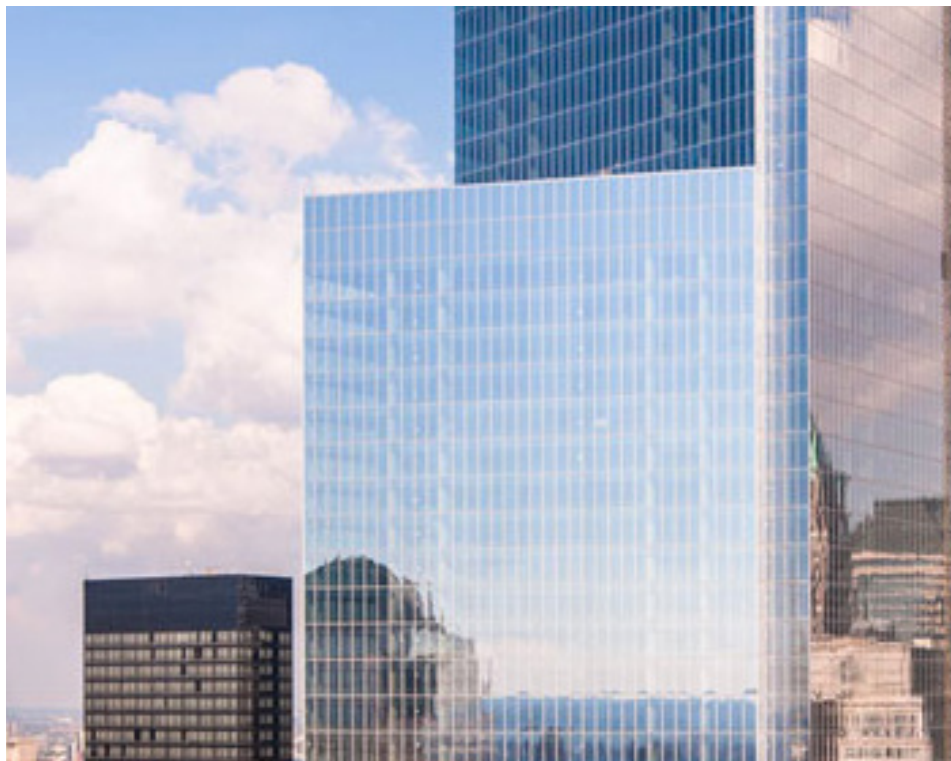


Volumetric Expression

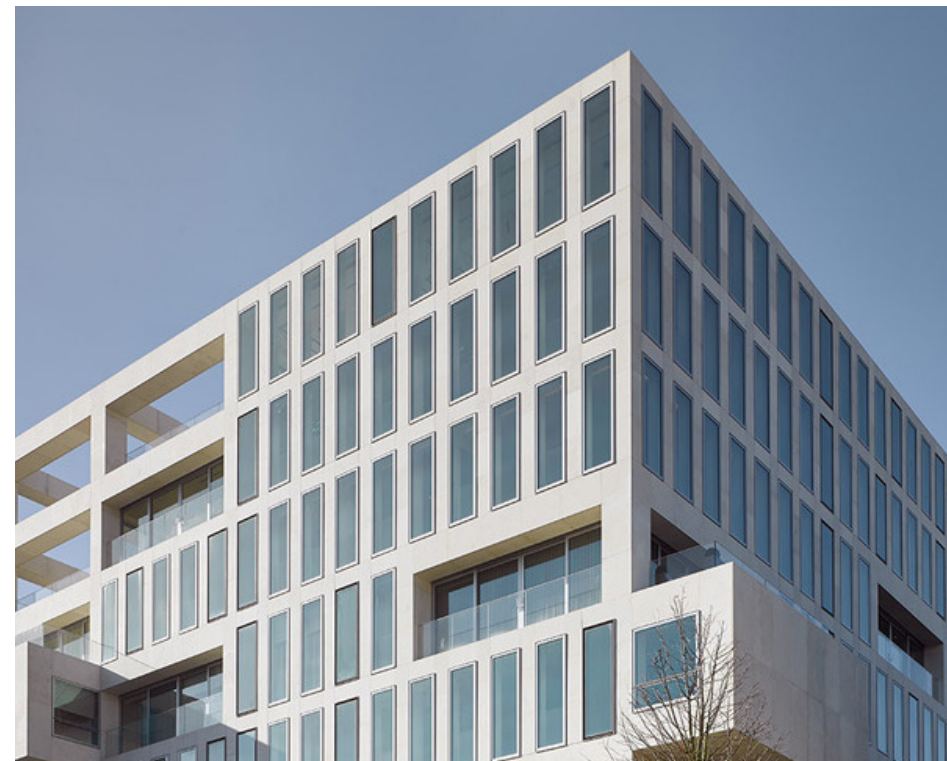


Stone Cladding

The façade design articulates the volumetric reading of the building massing by orienting and framing multi-storey cubic volumes. Front faces, sides, and soffits of the volumes are clad in opaque material that extends into recessed open areas, while glazed curtain walls provide an overall unifying element. Insulated glass units will be glazed with neutral colour glass and high performance coatings on both vision and spandrel panels to minimize the visual difference and provide calmness to the overall reading of the façade. Opaque areas will be clad in a warm stone with minimal joints to emphasize the monolithic volumes.



Curtain Wall



Townhouse Frames

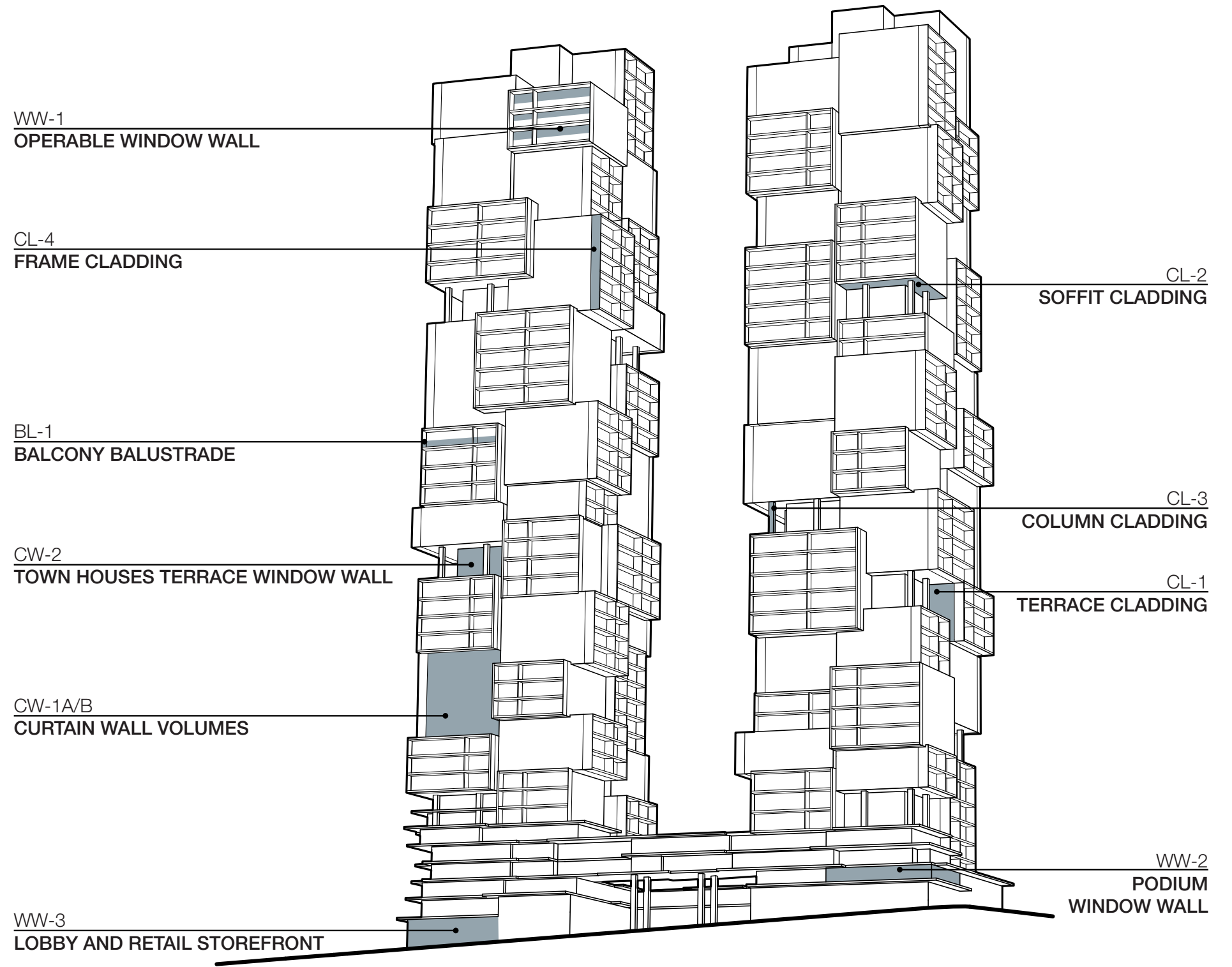
# FACADE TYPES AND ENERGY PERFORMANCE

To achieve the façade performance necessary to meet Vancouver green building policies the curtain wall has a window wall ratio of 35% glazed to 65% opaque. Panels (CW-1A/B) have large thermally broken aluminium framing with full height insulated spandrel panels with colour matched back pans. Glazed areas are comprised of argon filled triple glazed insulated glass units with a neutral coloured high performance low-e coating on surface #3.

Balcony window (WW-1) walls have triple glazed insulated glass units both fixed and sliding on thermally broken aluminium framing, with iso-core slab connections. Window wall ratio is 80% glazed 20% solid.

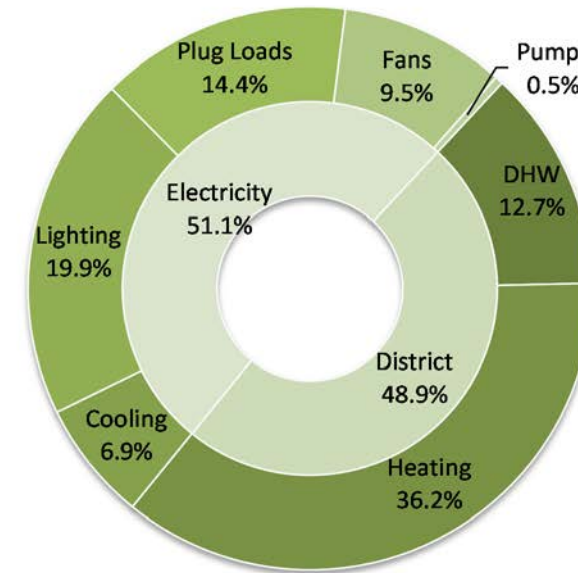
Balcony balustrades (BL-1) and open balcony frames (CL-4) are treated in transparent laminated glazing.

Opaque façades (CL-1) are comprised of stone on aluminium backing with a thermally broken framing and insulation. Joints are to be minimized.



# ENERGY MODEL RESULTS

Characteristic	Proposed Design
Weather	Vancouver, BC (ASHRAE Climate Zone 5)
Building Area	65,995 m <sup>2</sup> (plus 26,960 m <sup>2</sup> of parking/storage)
Schedules	NECB 2011 Schedules
Occupancy	1,270 people peak occupancy
Plug loads	5 W/m <sup>2</sup> electrical load in suites 1 W/m <sup>2</sup> in amenity, lobby, storage and mechanical spaces
Infiltration	0.00024 m <sup>3</sup> /s/m <sup>2</sup> (exterior surface area) x 0.224 x wind speed
Outdoor Air	Suites: Greater of 15 cfm/person and 0.35 ACH Corridors: 0.06 cfm/ft <sup>2</sup> plus 20 cfm per suite Lobby: 5 cfm per person plus 0.06 cfm/ft <sup>2</sup> Amenity: 20 cfm per person plus 0.06 cfm/ft <sup>2</sup> Parking: 0.75 cfm/ft <sup>2</sup>
Wall R-Value	R-5.0 equivalent (RSI-0.88)
Roof R-Value	R-20.8 equivalent (RSI-3.7) for upper roof R-5.0 equivalent (RSI-0.88) for roof deck of projected areas
Floors/Soffits R-Value	R-5.0 equivalent (RSI-0.88)
Window U-Value	Triple-glazing: U-0.25 (USI-1.4), SHGC 0.25 Shading as designed
Window Area %	55% overall
Interior Lighting	LED lighting throughout, except suites
Exterior Lighting	Assumed 700 W controlled by astronomical clock
HVAC Systems	Hydronic four-pipe fan coils throughout served by district heating and air-cooled chiller
Heat Recovery	HRVs in suites, amenity, lobby, storage and commercial spaces with assumed 70% efficiency
Ventilation	Corridor MUA, Parking MUA, Amenity AHUs, HRVs in suites
Fans	1.2 W/cfm HRV fans (on 24/7) 0.33 W/cfm for fan coil fans (multi-speed, at least min flow 24/7) 4" total static pressure on corridor and other MUAs (~0.67 W/cfm) 3" total static pressure on Storage MUAs (~0.5 W/cfm) 2" total static for parking exhaust (~0.33 W/cfm)
Pumps	100 ft head for heating hot water loop 60 ft head for chilled water loop Variable speed pumping
DHW	District heating 20% fixture flow rate savings over code



Scenario	Electricity (GJ)	District (GJ)	Annual Energy (GJ)	TEDI (kWh/m <sup>2</sup> )	EUI (kWh/m <sup>2</sup> )	GHGI (kWh/m <sup>2</sup> )
ZEN Targets	-	-	-	40	120	6
Preliminary Design	13,577.6	12,976.3	26,553.9	36.4	108.3	4.2

The major design features that contribute to the overall performance include:

- Heat recovery for suite ventilation air and common spaces, assumed 70% efficient.
- Triple-glazed windows, with SHGC of 0.25 and improved thermal performance at U-0.25 (USI-1.4).
- Low-flow fixtures for domestic water use (20% better than the BC Plumbing Code, which is required by VBBL).
- High efficiency lighting (LED) throughout, except suites, including parking and common areas.
- 55% window to wall ratio and an effective R-value of 5 for most opaque exterior surfaces, inclusive of all thermal bridging.
- Low carbon district heating with a GHG emissions factor of 0.07 kgCO<sub>2e</sub>/kWh.

