

PART 1 PROJECT DESCRIPTION

Use for all categories. Projects are judged based on criteria of sustainable design, architectural merit and innovation.

2022

CANADIAN GREEN BUILDING AWARDS

THE NATIONAL PROGRAM OF
SUSTAINABLE ARCHITECTURE
& BUILDING MAGAZINE

SABMag

Project categories

Identify which Award category you are entering

☐

1. Residential [small]

Open to new or renovated buildings less than 600m² in area, of which a minimum of 75% is dedicated to single-family or multi-family residential uses.

☐

2. Residential [large]

Open to new or renovated buildings [typically multi-unit buildings or groups of related buildings] greater than 600m² in area, of which at least 75% is dedicated to residential uses.

☐

3. Commercial/Industrial [small]

Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to commercial or industrial uses.

☐

4. Commercial/industrial [large]

Open to new or renovated buildings [or groups of related buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to commercial or industrial uses.

☐

5. Institutional [small]

Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to institutional uses.

☐

6. Institutional [large]

Open to new or renovated buildings [or groups of buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to institutional uses.

☐

7. Mixed Use

Open to new or renovated buildings [or groups of related buildings] of any size, in which no individual use exceeds 75% of the overall floor area.

☐

8. Existing Building Upgrade

Open to buildings of any size or type in which the primary focus of the work has been to enhance the performance or extend the life of an existing structure. Entries in this category are required to respond only to the submission criteria appropriate to the project.

☐

9. Interior Design

Open to interior design projects of any size or type. Entries in this category are required to respond only to the submission criteria appropriate to the project.

An award will be given in each category at the discretion of the jury.

PROJECT DETAILS

Project name: _____

Address: _____

Year completed: _____

PROGRAM AND CONTEXT

Project type: [Identify all uses occupying 10% or more of gross floor area]

Project site: [Check all that apply]

- ☐ Previously undeveloped land ☐ Urban ☐ Rural
- ☐ Previously developed land ☐ Suburban

Other Building description: [Check only one]

- ☐ New ☐ Renovation ☐ Both [If both, list ___% new and ___% renovation]

STATISTICS* Provide the following metrics as applicable to your project.

- Site Area: _____ m²
- Building gross floor area: _____ m²
- Energy Intensity: _____ KWhr/m²/year [Include both base building and process energy]

[optional: report energy intensity separately as follows:

- Energy Intensity, base building: _____ KWhr/m²/year
- Energy Intensity, process energy: _____ KWhr/m²/year
- Reduction in energy intensity: _____ %.
- State the reference standard on which the % reduction is based: MNECB, NECB or ASHRAE 90.1

[include version]: _____

- Recycled materials content: _____ % by value
- Water consumption from municipal source: _____ litres/occupant/year

[Include both base building and process consumption]

- Reduction in water consumption: _____ %
- State the reference on which the % reduction is based: LEED ☐ or other ☐
- Construction materials diverted from landfill: _____ %
- Regional materials by value: _____ %

***NOTE FOR PART 9 RESIDENTIAL PROJECTS: PROVIDE THE STATISTICS ABOVE IF AVAILABLE.** Include in the Executive Summary [see next page] the EnerGuide or the Home Energy Rating System [HERS] ratings if available, and the WalkScore rating [see www.walkscore.com]. Also, a qualitative assessment of project performance should be included in the appropriate sections of the narrative.

MEC VANCOUVER

SAB MAG AWARDS 2022



A NEW STANDARD FOR RETAIL

MEC Vancouver is a distinctive new retail and mixed-use building at the gateway of the busy Olympic Village neighbourhood in Vancouver. The project was designed to embody the brand and values of the client, with sustainability at the forefront as LEED Gold and Salmon Safe.

Wood is an essential element of the building's design and aesthetic expression. When three levels of concrete parking reach grade, the structure flips to mass timber, using a Douglas Fir glulam column and beam system with Spruce/ Pine CLT floors and roof. A two-storey interior atrium on the retail levels provides expansive views of the structure and creates a warm, inviting atmosphere.

The high-performance building is designed to use 1/3 less energy than national energy code through high insulation and air tightness, and mechanical and electrical innovations make it the first building to sell excess energy to the NEU. Wastewater management allows for 47% reduction of potable water use. From materiality, location and landscape design to community engagement, the project sets a new standard for sustainable retail.

MEC VANCOUVER

PROJECT SUMMARY



THE “GATEWAY” TO OLYMPIC VILLAGE

MEC and Beedie Group identified the site at the corner of 2nd and Quebec based on its proximity to high volumes of pedestrian shoppers, public transportation and cycling networks, district energy system and availability without displacement—as existing buildings on the site were slated for demolition. Sited on previously developed urban land, the building avoids negative impacts on farmland, wetlands, parks, ecologically sensitive areas or habitats for threatened or endangered species.

PASSIVE & ACTIVE DESIGN

- » Wastewater management takes advantage of plentiful rainfall through reuse by a blue roof/grey water system.
- » Deep overhangs on south façade mitigate solar heat gain in the summer & allow it in the winter (blinds adjust sunlight ingress)
- » Operable windows reduce dependence on mechanical ventilation
- » Window/floor plate depth ratio increases % of floor benefiting from daylighting
- » High insulation reduces heating & cooling requirements (While radiant panel heating and cooling systems keep temperatures within design range).

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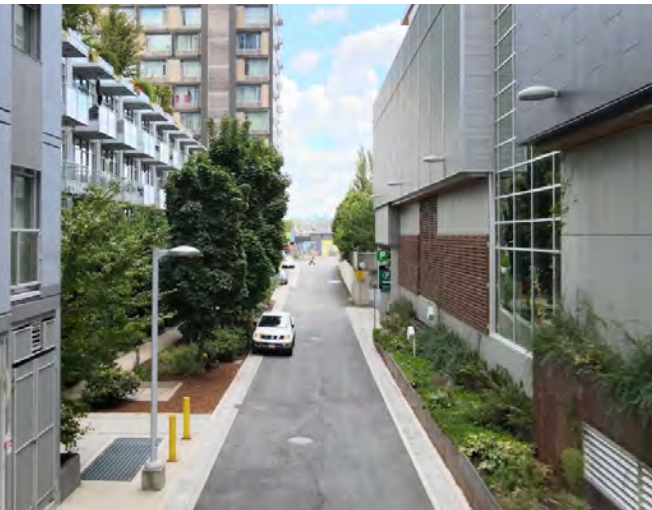
01. STRATEGIC DECISIONS



ACTIVATING A THRIVING STREET

Activating the street edge with transparency through ample glass to creates an outwardly-focused building was a design driver.

- » A cedar wood soffit/ column canopy runs the length of the building, marking the entry, providing weather protection for pedestrians and 129 bike stalls and creates a gathering place for functions
- » The site is directly adjacent to public transportation (Skytrain and bus services) and multiple dedicated cycling routes, and the parking includes 16 EV car charging stalls
- » Parking and back of house services (loading and garbage) were moved below ground to reduce operational impact on the laneway, which is treated as a secondary street in the dense residential neighbourhood.



MEC VANCOUVER
02. COMMUNITY

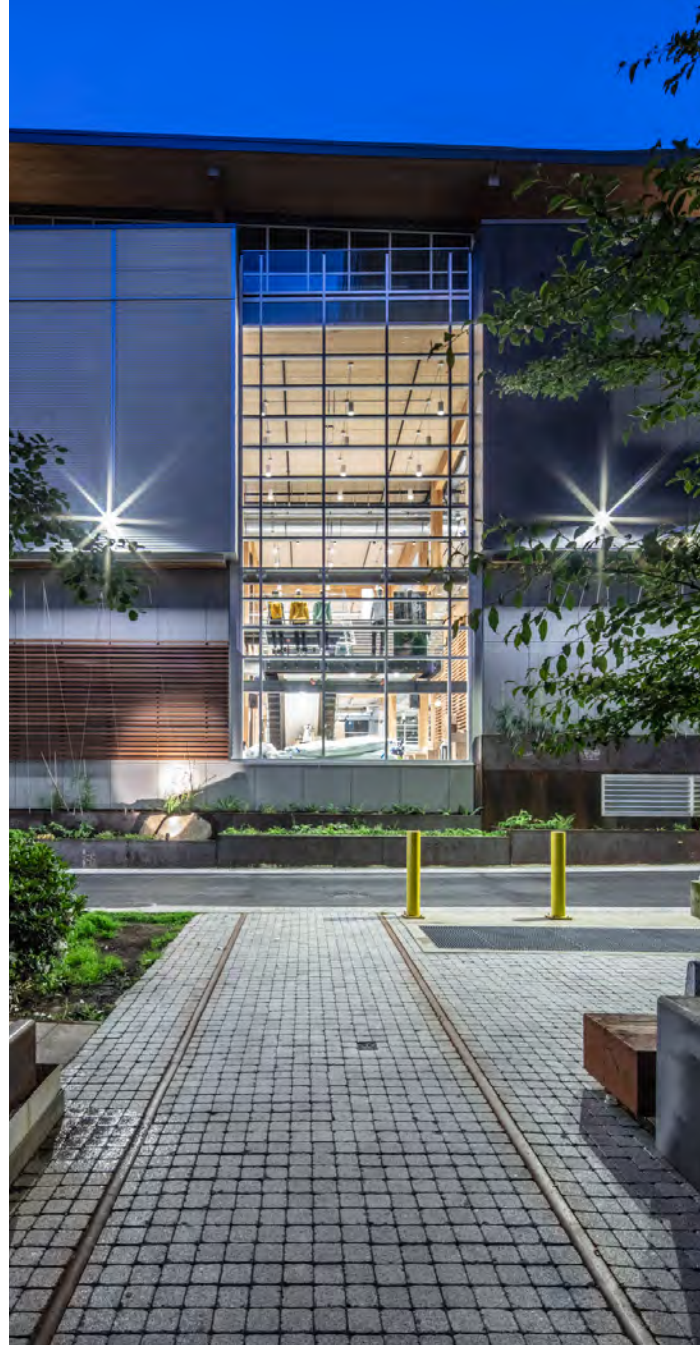
REGIONAL HISTORY

The landscape design (green edges and roofs) integrates industrial materials such as Corten steel, reused granite cobble and native plants endemic to the historical False Creek Flats.

This planting approach, which achieves “Salmon Safe” designation, consists of native climbing vines, shrubs, ferns and drought-tolerant native grasses common prior to industrialization. Rows of rain gardens connect the green roofs to stormwater through a waterfall feature, restoring natural ecology to a region where dozens of streams and tributaries once ended at False Creek.

GREEN ROOFS & HABITAT

Bird and insect houses are placed throughout the site. On the two sloping green roofs, undulating mounds of green roof mats are interspersed with logs, small boulders, pollinating shrubs and bubbles to attract wildlife native to False Creek.





MEC VANCOUVER

04. LIGHT & AIR

GENEROUS DAYLIGHTING

- » A tall floor-to-floor plate allows for deep light penetration into the building and expansive views to the outdoors
- » Generous overhangs mitigate solar heat gain in the summer and take advantage of daylighting throughout the year
- » 64% of occupied office floor area is within 7 metres of an operable window.

HIGH PERFORMANCE LIGHTING

- » LED lighting is installed throughout
- » Presence sensors in all closed rooms.
- » In the parkade, a low lighting level of 25% is maintained when there is no traffic and 100% when there is activity on the occupied levels.
- » Exterior lighting is controlled by photocell and timers.
- » In the retail area, track lighting is equipped with limiters to limit the over-installation above the prescribed W/sq ft.
- » The proposed energy consumption from lighting is 44.5 kWh/m² vs the reference of 60 kWh/m².

MEC VANCOUVER

04. LIGHT & AIR



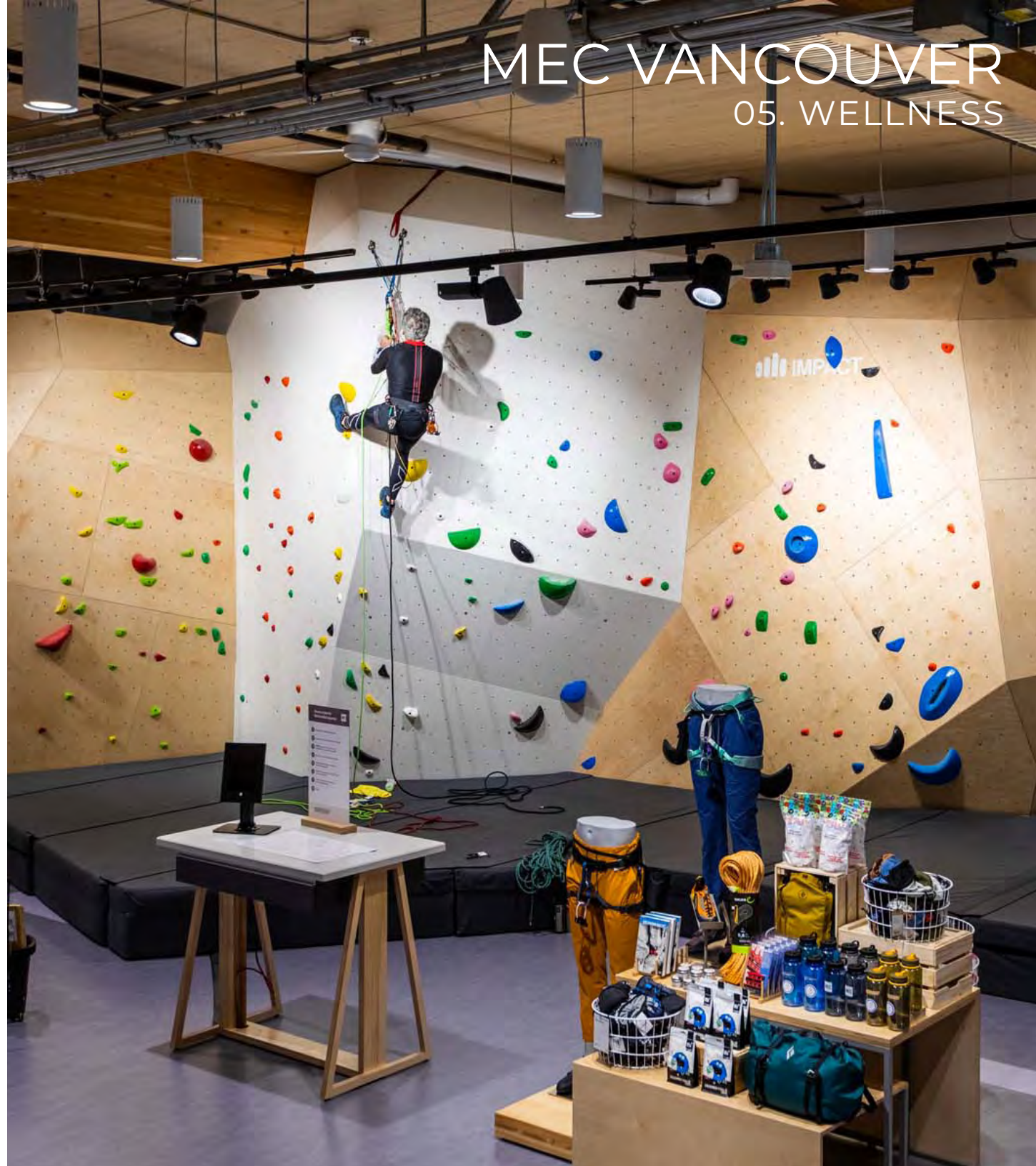
HIGH AIR QUALITY

- » Air Handling Units (AHU) with economizer mode allow generous free cooling to take advantage of the mild Vancouver climate for >60% of the occupied hours. The minimum outside air changes/hr is 1.16 ACH and goes up to 4.5 ACH in free cooling mode.
- » Two low velocity main AHU's reduce fan power requirements. Two dedicated outside air units (DOAS) are equipped with efficient air-to-air enthalpy wheels with 80% efficiency to recover energy from the store, back-store area, offices and the sanitary air exhaust.
- » A combination of ventilation methods meet the requirements of ASHRAE 62.1-2007. In harsh weather, two outside air systems with enthalpy wheel (for heat recovery) supply a total of 8,500 L/s using MERV-8 pre-filters and MERV-14 filters. In mild weather, two main AHU's switch to economizer mode, delivering up to 16,500 L/s of outside air to condition the space without mechanical cooling. CO2 sensors allow to monitor indoor air quality.
- » An Indoor Air Quality Management Plan strictly limits VOC's and pollutants in both construction and post-occupancy.



COMMUNITY ENGAGEMENT

- » MEC Vancouver was designed not just as a retail store but a community hub
- » The biophilic material of mass timber establishes a warm, inviting environment
- » A climbing wall allows active participation with the building outside of the typical retail experience
- » On the retail levels, a steel feature stair is a focal point to draw users to the second floor, visually/programmatically prioritized over the elevator to encourage stair use
- » MEC's Base Camp provides an open-concept community space designed for making connections and planning adventures with others



MEC VANCOUVER
05. WELLNESS



RAINWATER RECYCLING

- » A flat central blue roof, sandwiched between two green roofs, collects rainwater for reuse in a grey water system
- » A 15,142 L underground rainwater cistern is treated to strict City of Vancouver standards for usage in the toilets
- » Low consumption fixtures contribute an additional 15.5% in water use reduction
- » Water from green roofs travels to a sloping Corten water feature down the west face of the building, discharges into a water feature and moves to a bioswale prior to discharge in the storm water system. The site landscaping requires no irrigation.

WATER CONSERVATION FACTS

Underground Rainwater Cistern Capacity

15,142 L

Annual Reuse Volume in Toilet System

510 522 L

Reduction of Potable Water Use from Cistern

31.12%

Reduction of Water Use from Low-Consumption Fixtures

additional 15.53%

Annual Potable Water Use

2,536 L/occupant

Total Reduction of Potable Water Use

46.66%

47%

reduction of potable water use

510,000 L

annual reuse volume in toilet system

MEC VANCOUVER
06. WATER CONSERVATION





HIGHLY EFFICIENT

- » Energy efficiency was considered in every aspect of the design
- » The envelope has twice the thermal resistance of ASHRAE 90.1, providing thermal barriers of R50 and R40 for the roof and walls
- » The windows are low conductivity, with triple glazing and frames with thermal break ($U = 1.58 \text{ W/m}^2 \text{ } ^\circ\text{C}$) and low solar heat gain coefficient (0.23)
- » Perimeter heating and cooling for the third floor offices is provided by hydronic ceiling-mounted radiant panels
- » The interior heat from electrical/data rooms is recovered through a heat pump unit. Two thermal energy banks temper the need for peak power and reduce the building's heating/cooling needs.



MEC VANCOUVER

07. OPERATING ENERGY

104
kWh/m²
annual energy
consumption for
building

83
kWh/m²
annual energy use
intensity (considering
energy sent to
NEU)

AN ENERGY PIONEER

Due to its location in False Creek, MEC Vancouver was required to connect to the NEU, district energy network (which provides 39% of the total building energy consumption via heat and hot water from recycling waste thermal energy from sewage). This provided an unexpected opportunity.

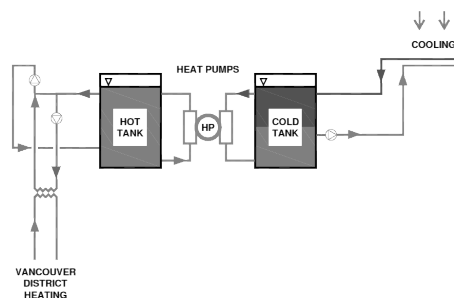
Since the building is surrounded by condos, we avoided noisy heat rejection equipment on the roof by rejecting heat to the NEU loop during cooling season using a heat pump. This was the first time rejecting heat to the NEU was proposed. During 2020, twice as much heat was rejected than was used by the building during heating season, **making it the first building that is a NET energy producer to the NEU**. The project results in a reduction of 6 tons of CO₂ yearly.



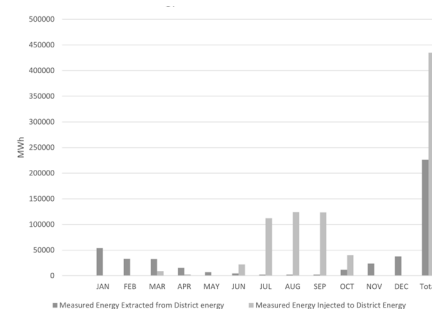
MEC VANCOUVER

07. OPERATING ENERGY

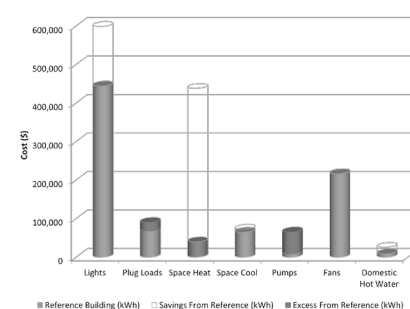
SUPPLYING ENERGY TO NEU IN SUMMER



2020 ENERGY CONSUMED VS. RETURNED TO NEU



ENERGY CONSUMPTION BY CATEGORY



LIFE CYCLES

The project supports recycling at all stages of the life cycle and sourced regional materials wherever possible.

- » As a mass timber structure, regional content accounts for 39.7% by cost of all building materials and products used.
- » Mass timber benefits both user health & wellness and the environment, as a renewable material that stores carbon & can be reused at the end of its life.
- » Through a Construction Waste Plan, 80.2% of waste generated on-site during construction was separated and hauled to facilities for recycling, reuse or other sustainable end-uses
- » The occupied building includes recycling areas for all occupants, providing centralized separation and removal of paper, corrugated cardboard, glass, plastics and metals



MEC VANCOUVER
08-09. MATERIALS, RESOURCES & LIFE CYCLES

INFORMATION SHARING

During construction, the firm held tours with professionals from around the world who sought to gain an understanding of the design and features.

Within MEC, interpretive signage informs users and generates interest in the efficient systems of the building.

PUBLICITY

- » Print: Wood Design & Building magazine (2020) WoodWORKS! 2021 Case Study (2021)
- » Selected Online: ArchDaily, Daily Hive, Think Wood, Naturally Wood, MonteCristo Magazine, The Vancouver Sun
- » Presentations: Feature of “Réseau Energie et Batiments” symposium on Cities energy network (2019); “The Material is the Message”, Wood Solutions Conference (2020); “MEC Vancouver”, CaGBC Awards Seminar (2021)

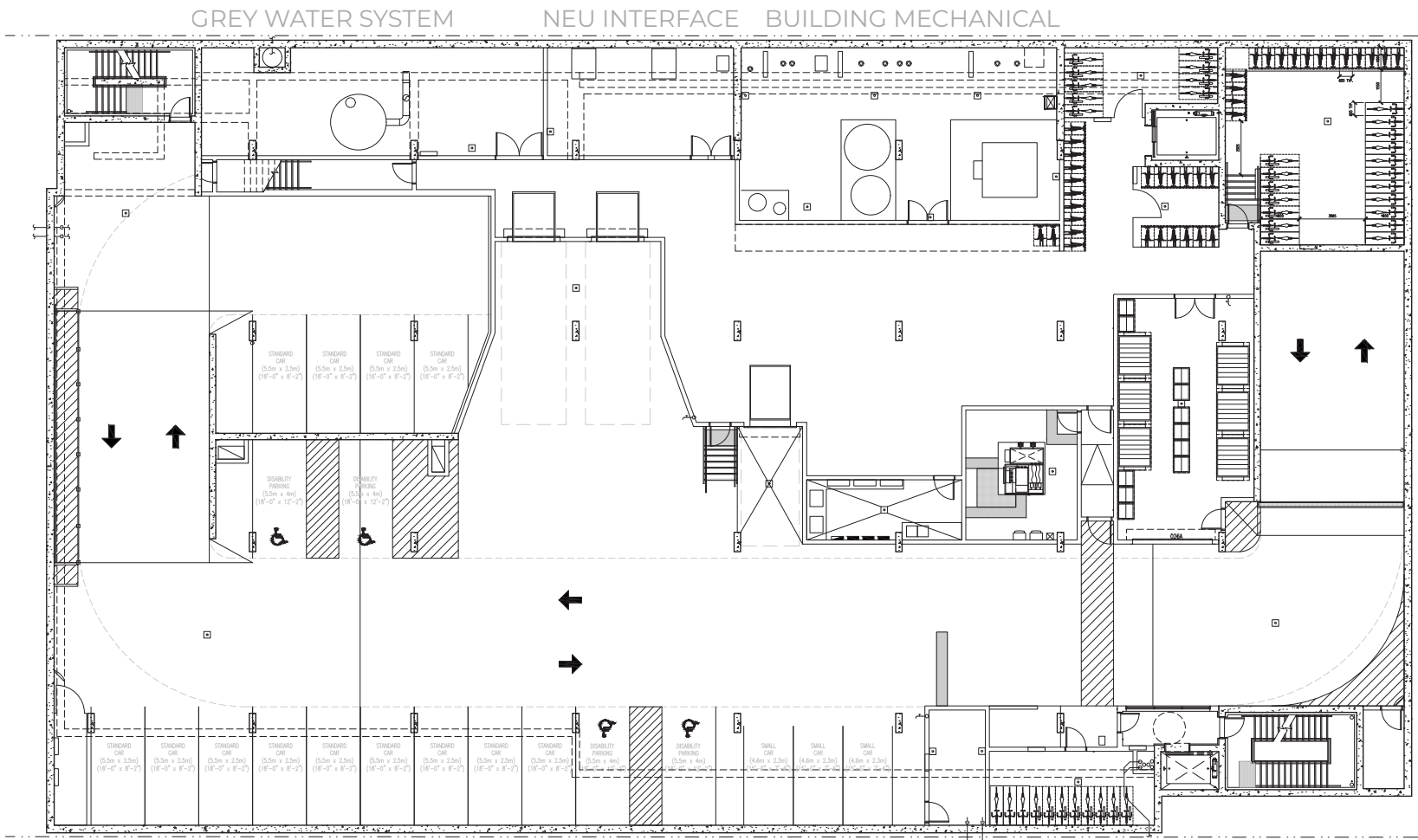


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10. EDUCATION & INFORMATION SHARING



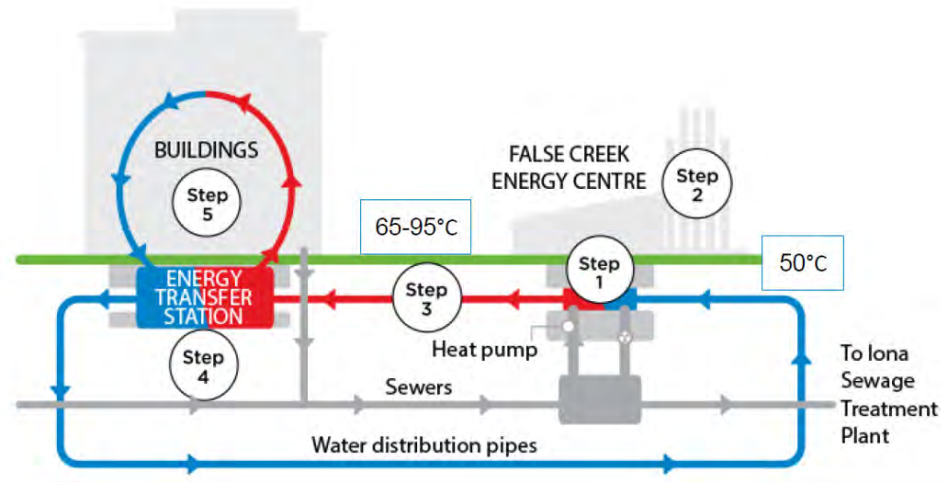
MEC VANCOUVER
SELECTED DRAWINGS



MEC VANCOUVER

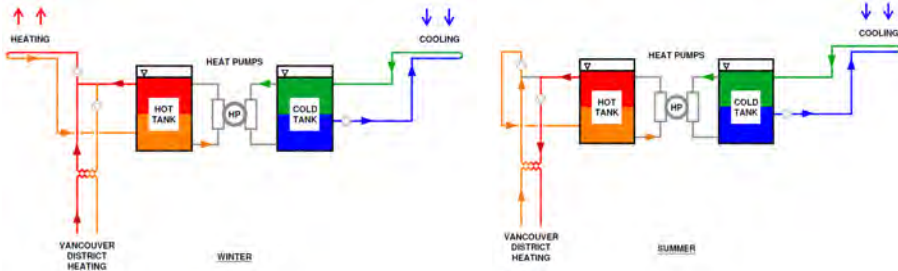
PARKING 1 PLAN

FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY (NEU)



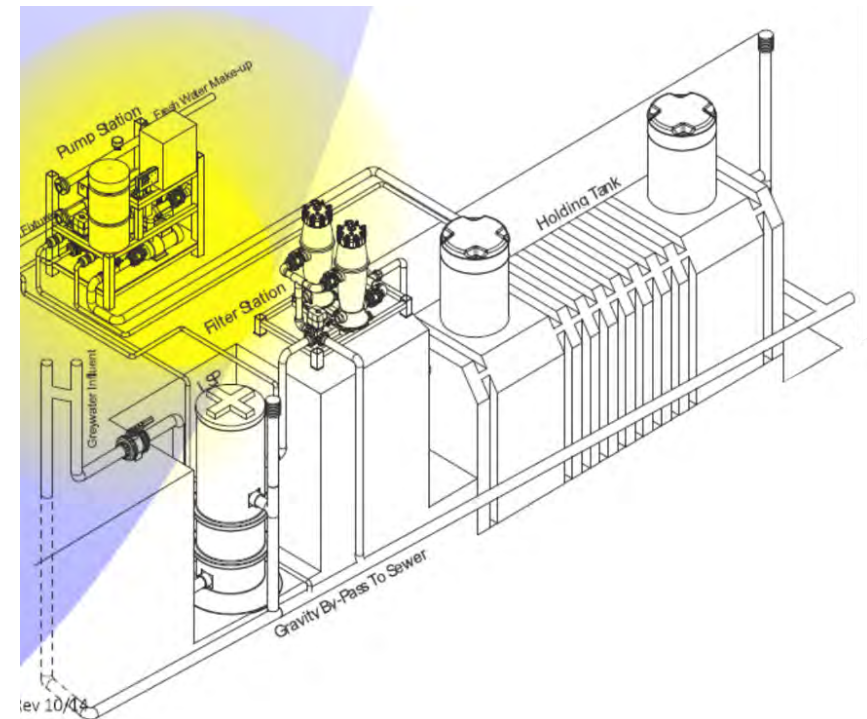
WINTER

SUMMER



GREY WATER SYSTEM

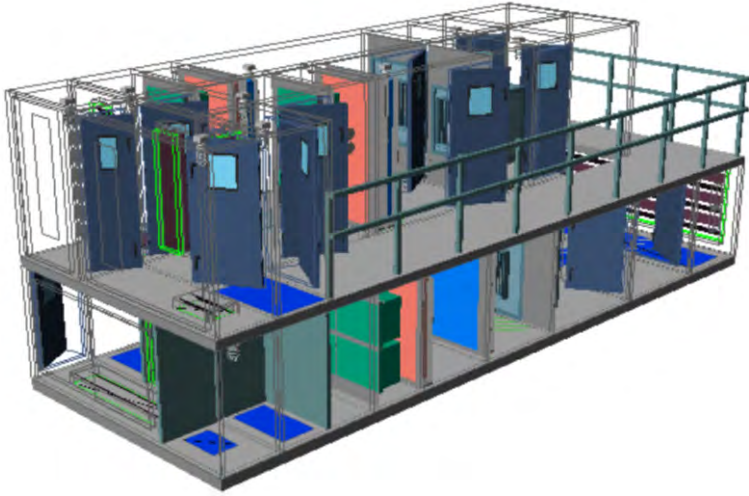
WATER TANK



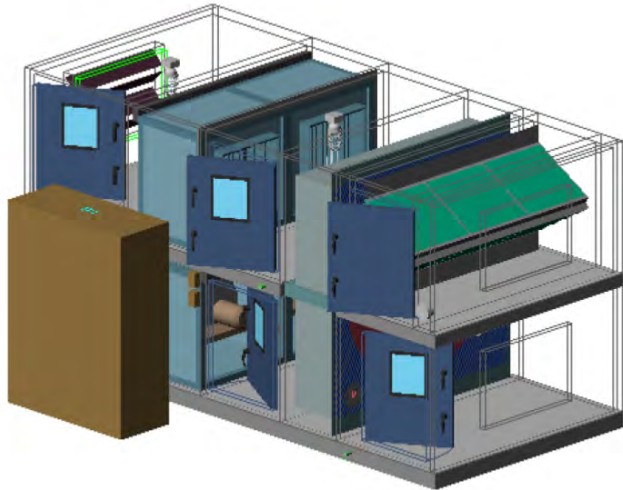
MEC VANCOUVER

ILLUSTRATIVE DIAGRAMS

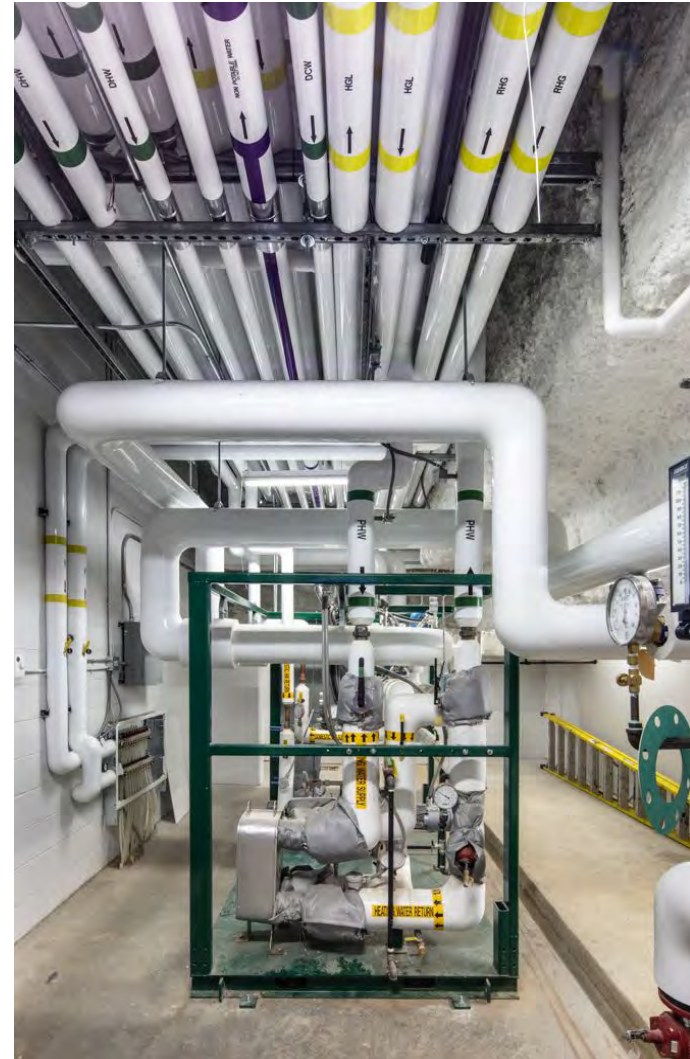
AIR HANDLING UNIT



DEDICATED OUTSIDE AIR UNIT

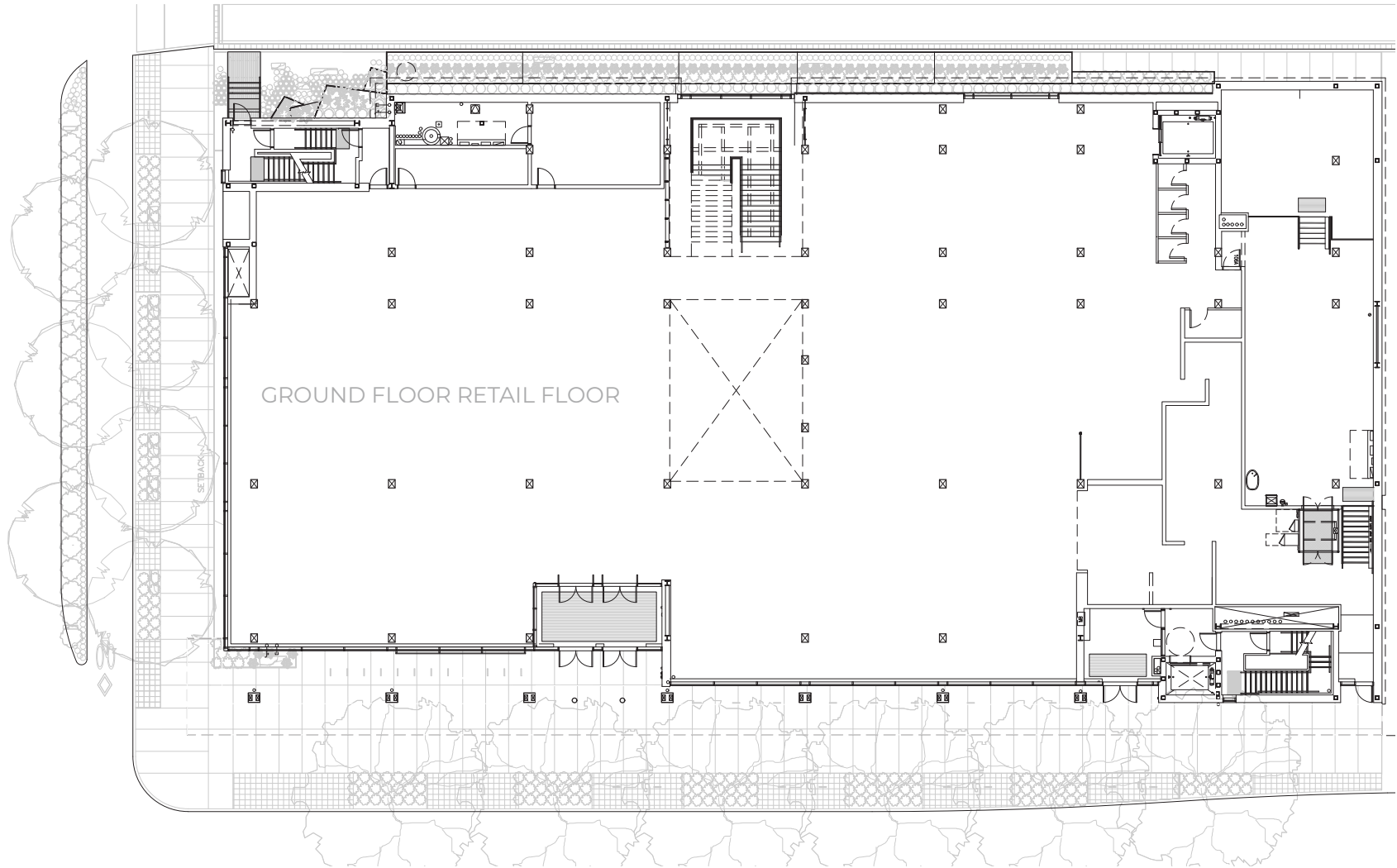


MECHANICAL ROOM



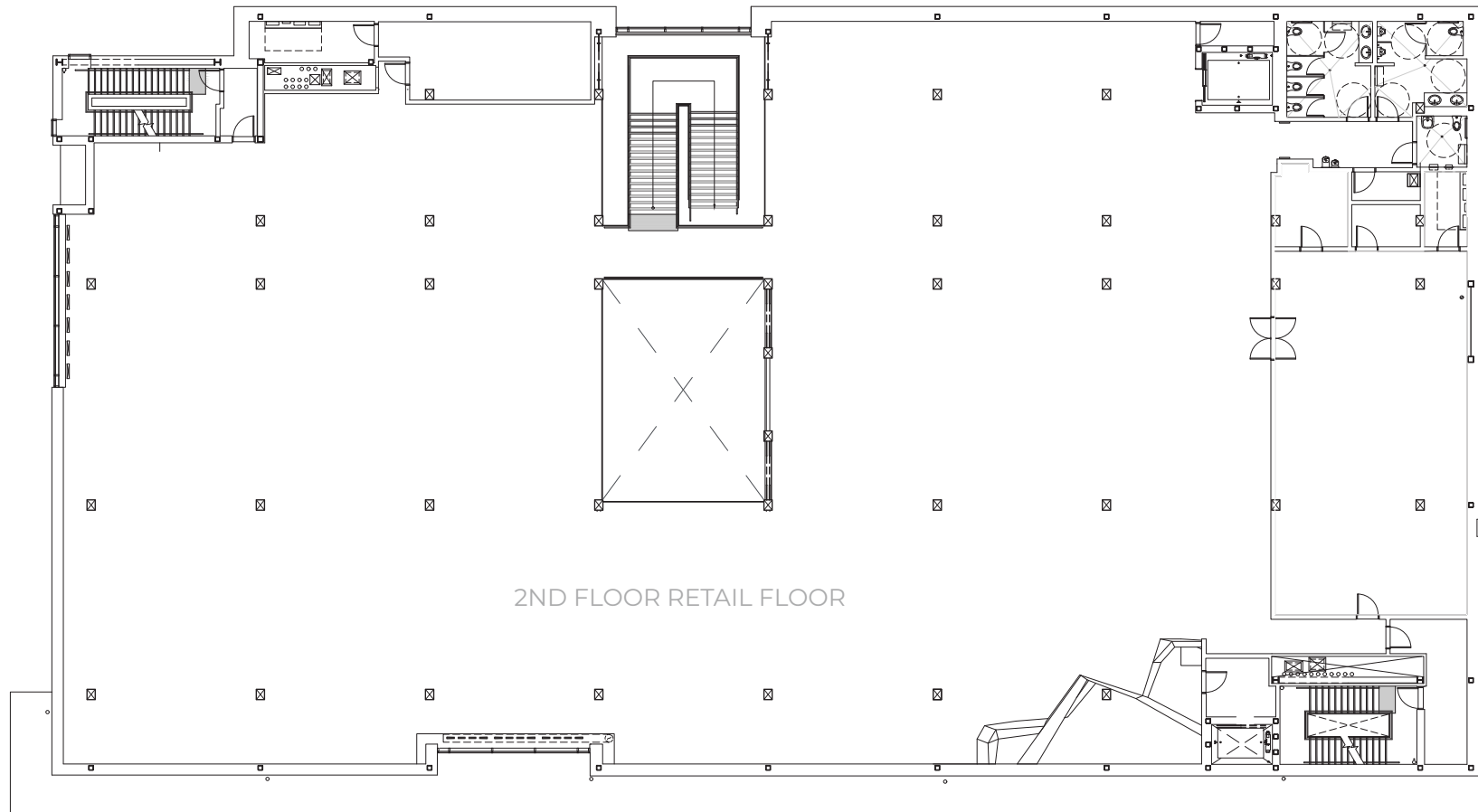


QUEBEC ST



MEC VANCOUVER

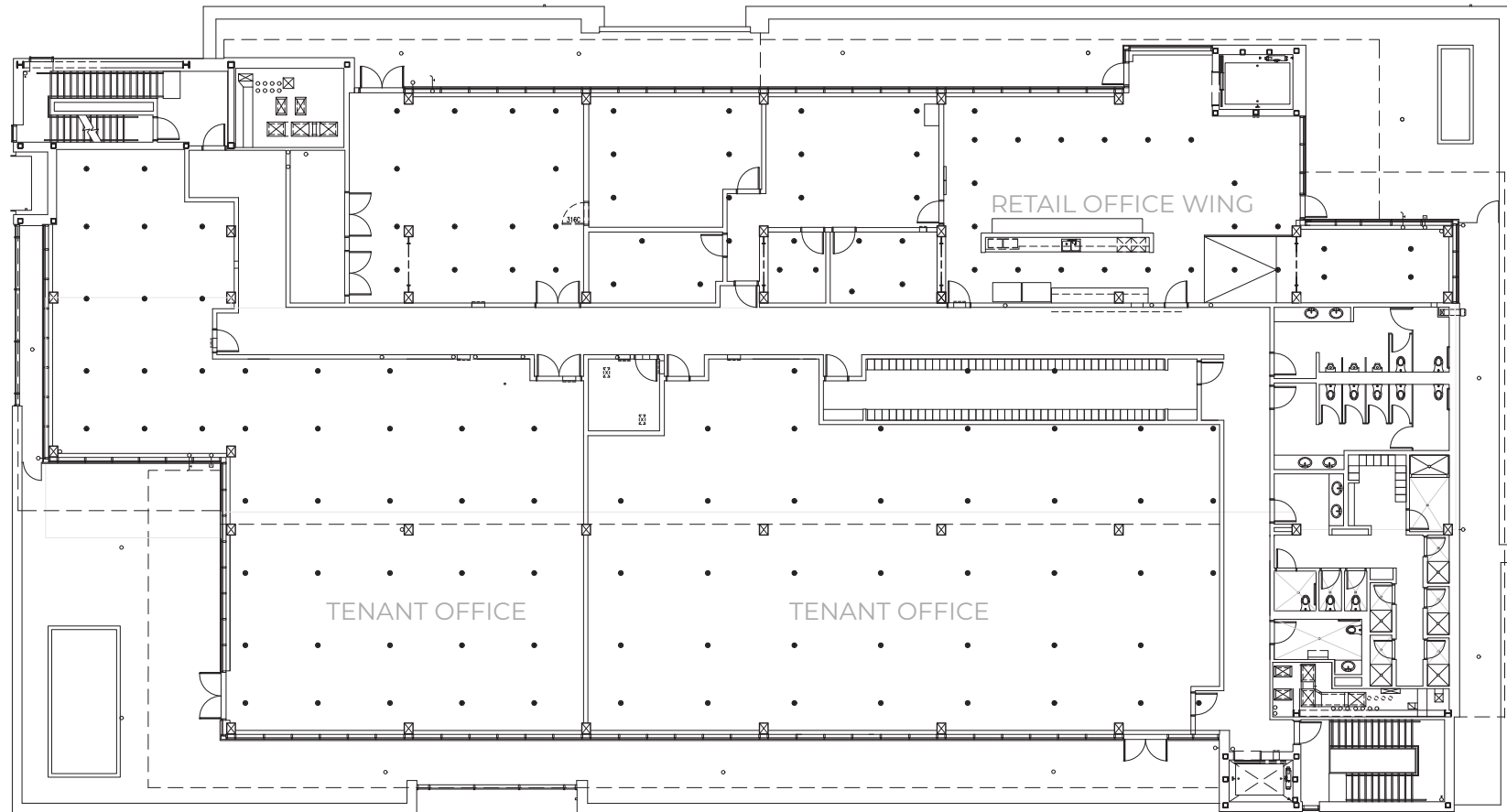
GROUND FLOOR PLAN



2ND FLOOR RETAIL FLOOR

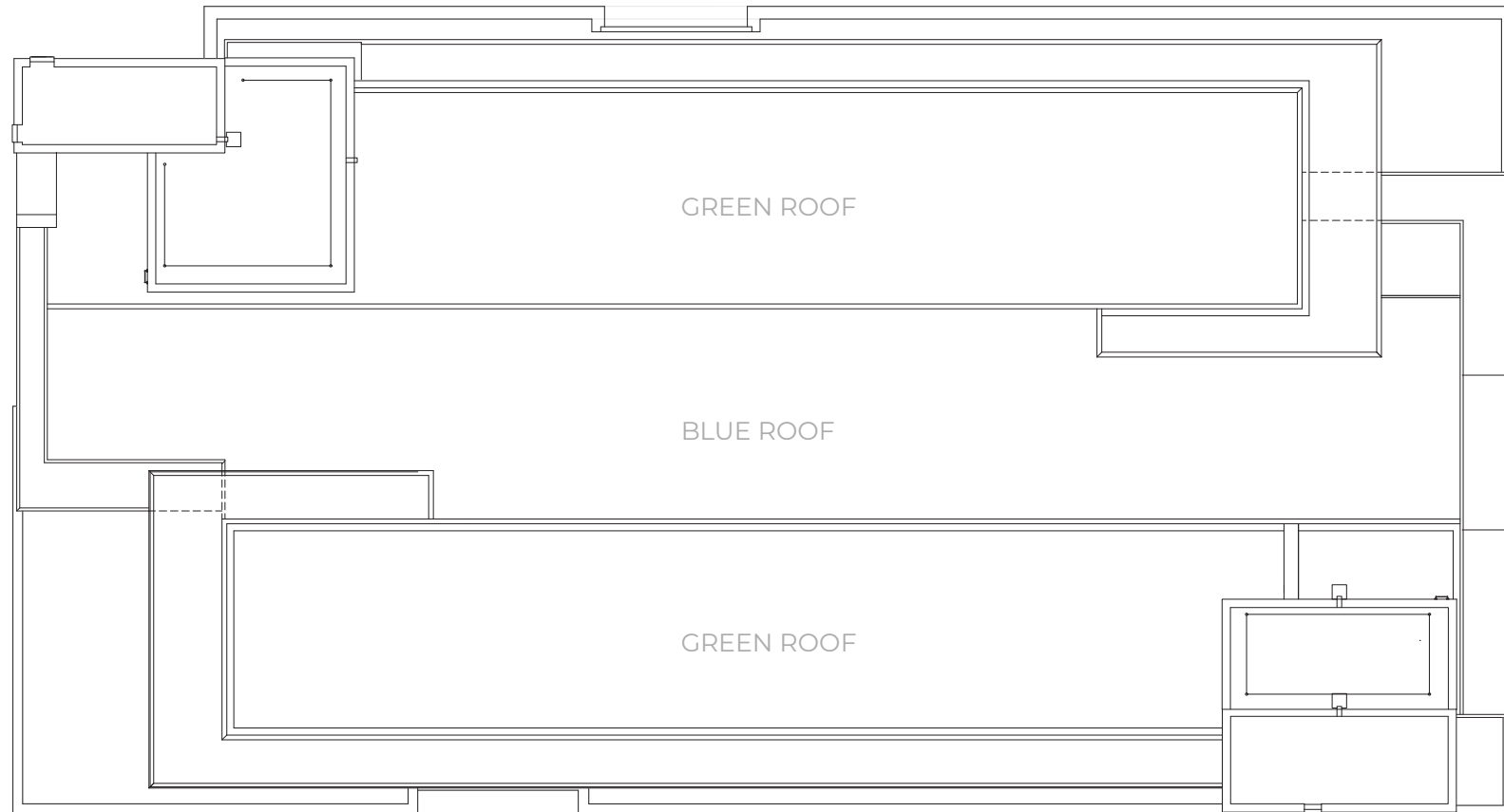
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SECOND FLOOR PLAN



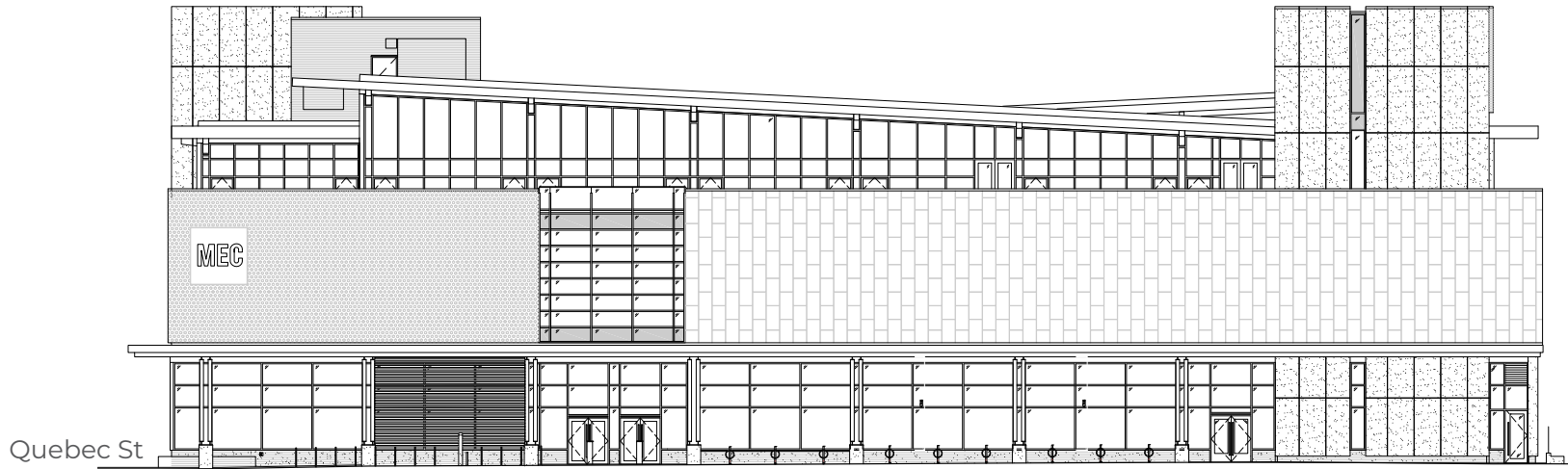
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THIRD FLOOR PLAN

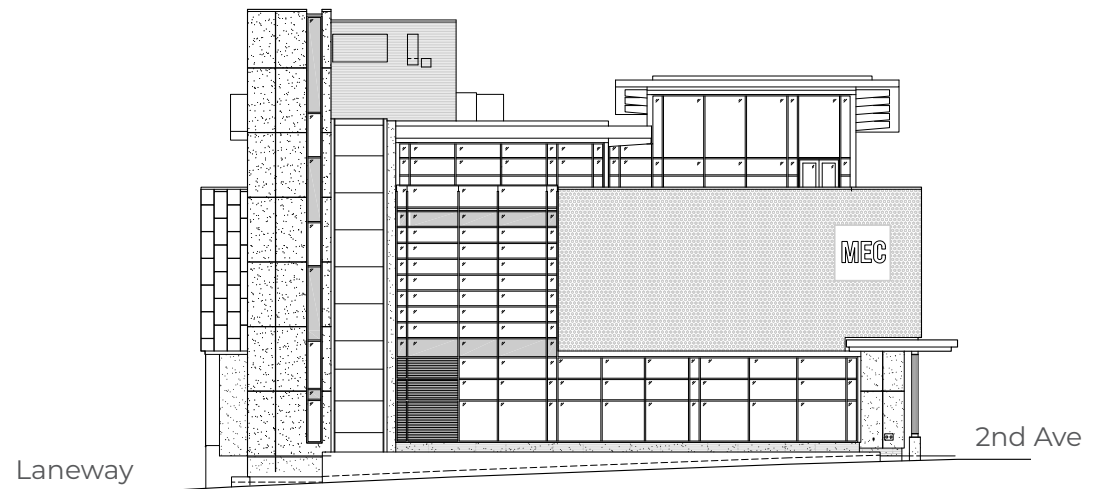


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MECHANICAL PENTHOUSE ROOF PLAN



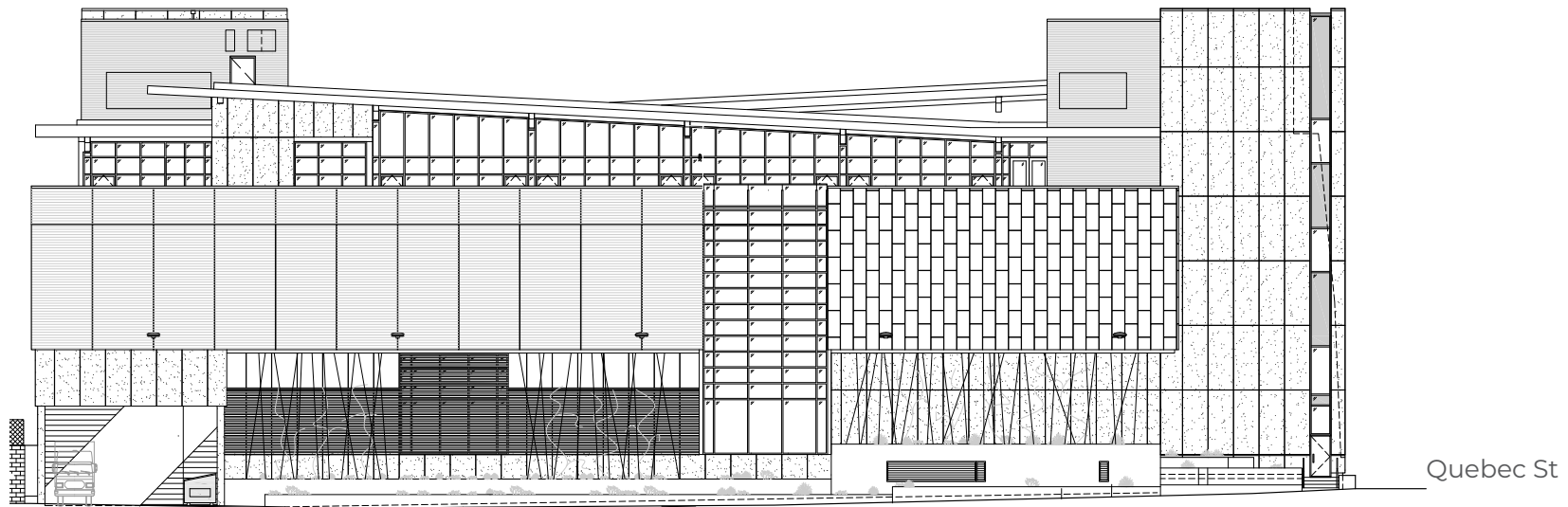
SOUTH ELEVATION



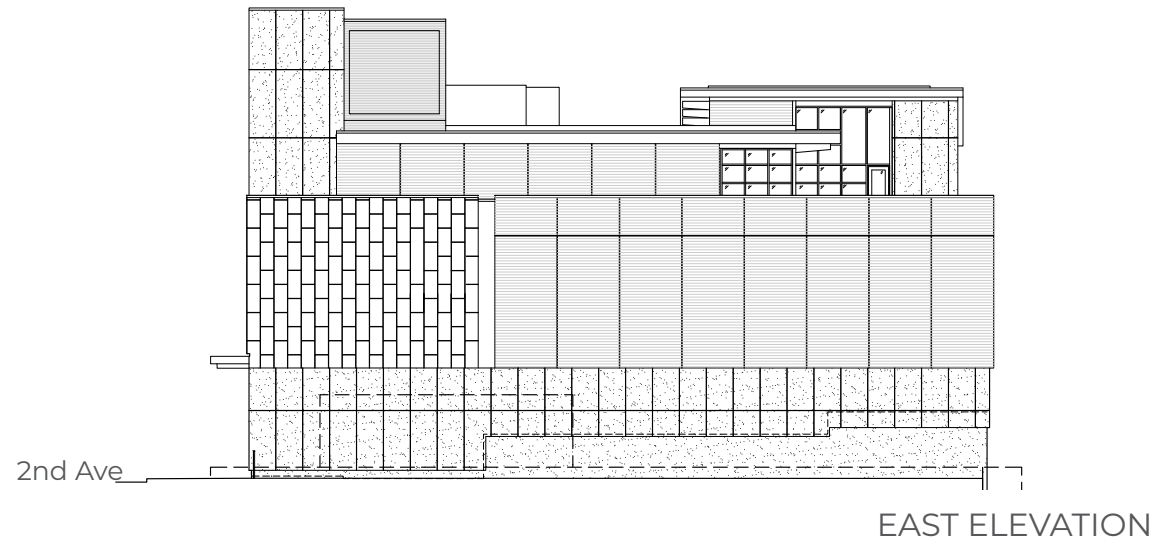
WEST ELEVATION

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SOUTH & WEST ELEVATIONS



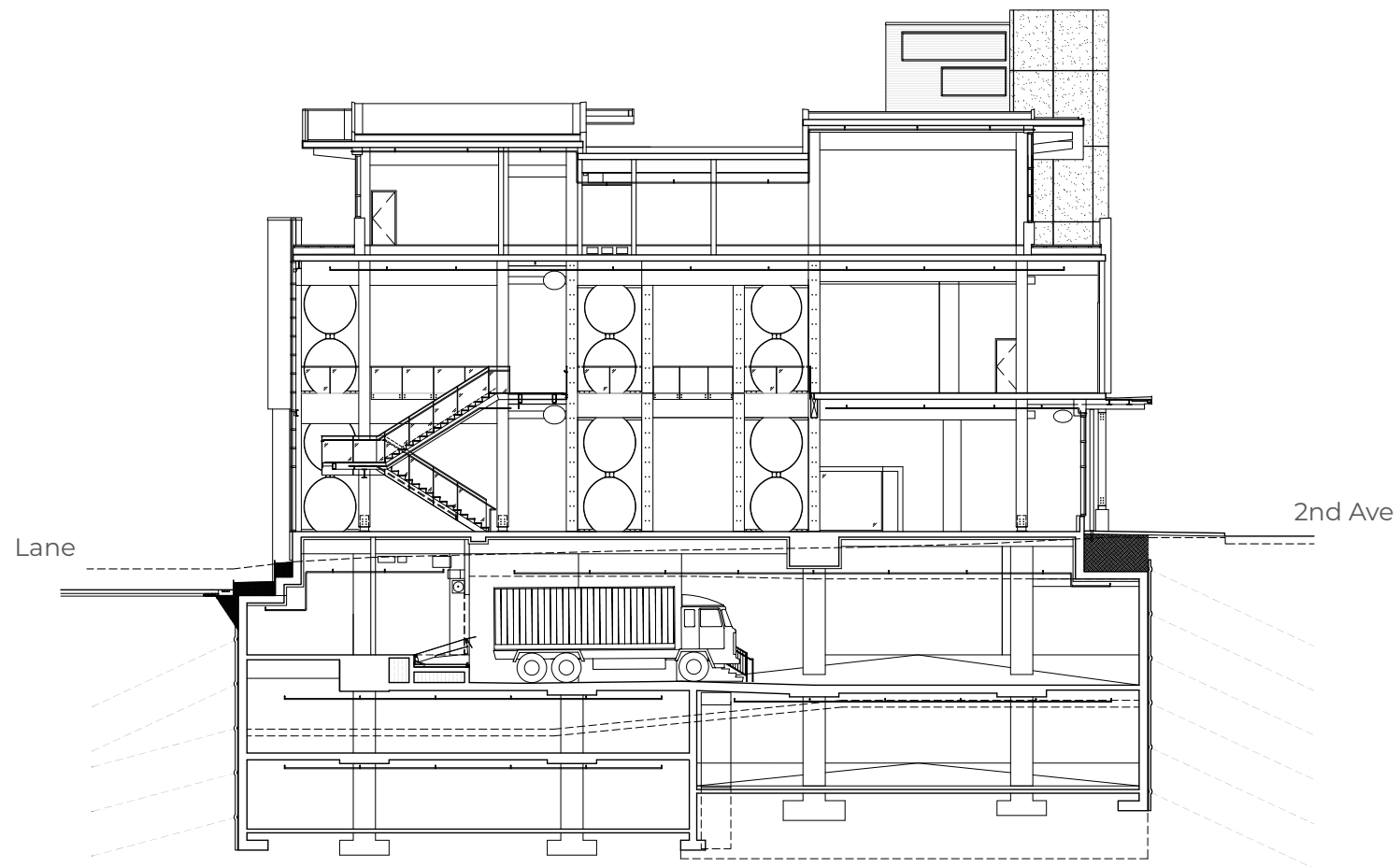
NORTH ELEVATION



EAST ELEVATION

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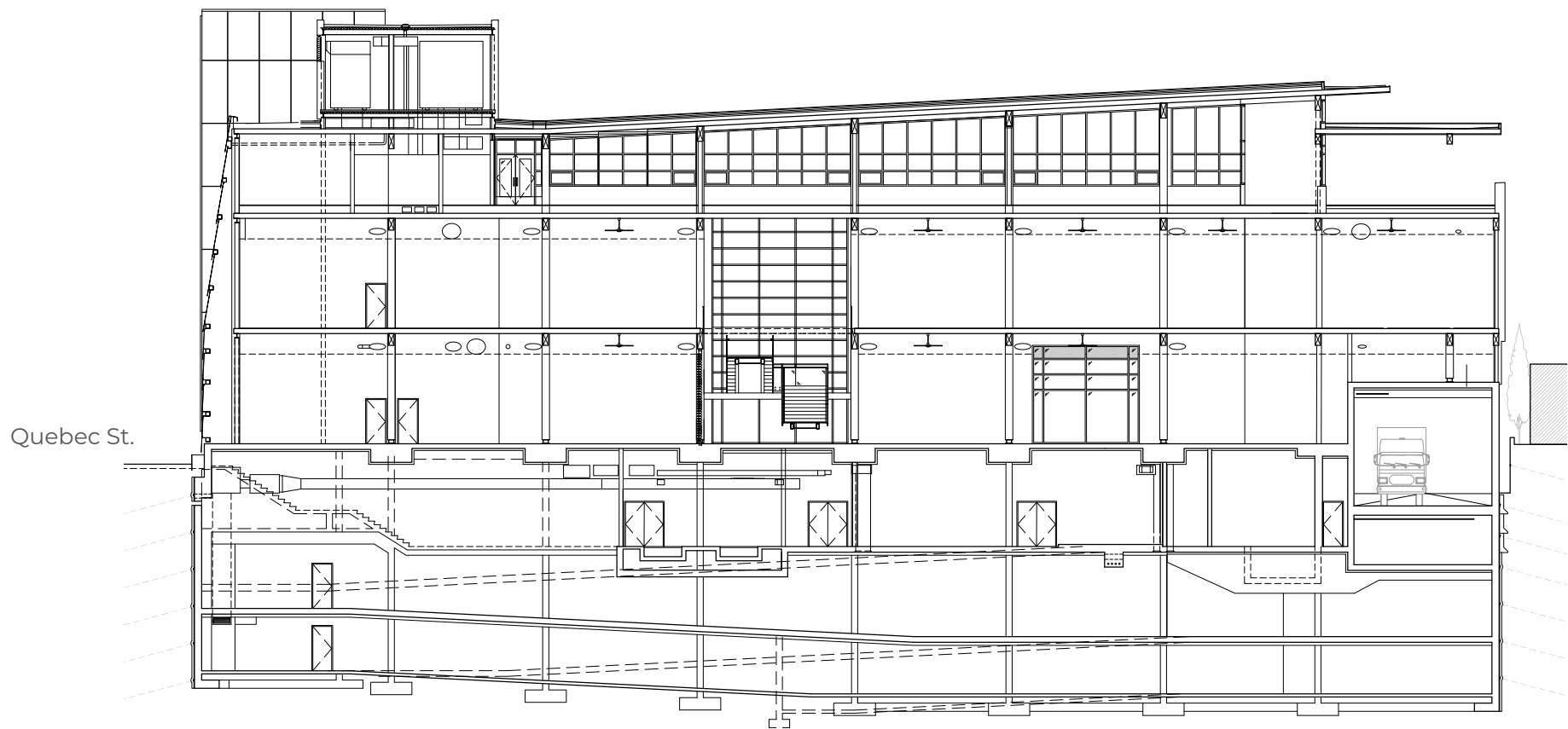
NORTH & EAST ELEVATIONS



TRANSVERSE SECTION

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BUILDING SECTION



LONGITUDINAL SECTION

MEC VANCOUVER

BUILDING SECTION