



Housing Design and Technical Guidelines

Planning, Urban Design and Sustainability – Housing Policy and Regulation
Office of the City Manager – Non-Market Housing Development
Real Estate, Environment and Facilities Management - Facility Planning and Development

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Background and Summary

The City of Vancouver is committed to building affordable, socially inclusive, environmentally sustainable, healthy, safe, and diverse communities. These objectives have been our guiding principles in developing the Housing Design and Technical Guidelines (HDTG).

The purpose of the HDTG is to help guide housing partners through the project development process for social housing projects secured by the City. The HDTG outline the minimum standards required by the City of Vancouver for materials, finishes, equipment and technical specifications. Standardization, through the use of the HDTG, is intended to balance immediate environmental, energy and space efficiencies, ensuring an emphasis on the long-term durability and resilience of the City asset over the life of the building. The intent is to realize City policies and goals that include for example, the [“Housing Vancouver Strategy”](#), [“The Climate Change Adaptation Strategy”](#), [“The Greenest City Action Plan: 2020”](#), and [“The Healthy City Strategy”](#), within the context of the built environment. The desired outcome is to encourage livability and inclusivity, as envisioned in these policies and in accordance with the regulatory framework set out in the Vancouver Building Bylaw (VBBL) and the Zoning and Development Bylaw (VZDBL).

The Housing Vancouver Strategy

Vancouver is a growing and diverse city with significant housing challenges. Providing more affordable housing choices for all Vancouverites through a range of housing options is critical to the social and economic health of the City. On June 25, 2024, council adopted new 10-year housing targets (2024-2033) as well as a new 3-year housing action plan (2024-2026) to implement. The updated Housing Targets and associated Action Plan will set the course for the City’s response to the housing crisis, address new Provincial housing requirements, trial new approaches and identify key priority areas for action. The Housing Vancouver targets were based on the core goals of retaining the current diversity of incomes and households in the city, shifting housing production towards rental to meet the greatest need, and coordinating action with partners to deliver housing for the lowest income households. Overall, 83,000 new homes are targeted for the next 10 years, including 10,000 social, supportive and non-profit co-operative units and 20,000 purpose-built rental units (4,000 units at below-market rents). Nearly 48 percent of the new units will serve households earning less than \$80,000 per year, and 40 percent will be family-size units.

Environmental Sustainability

For inclusionary delivered housing projects that are externally funded Passive House and LEED® certification is not required, however, all projects are to be only low carbon fuel sources ie: 100% electric.

Social Sustainability

Vancouver aspires to be a healthy city for all, one in which all of our residents can meet their basic needs; enjoy social connections and engagement; to live in environments that enable them to thrive, not just survive. However, Vancouver faces several challenges to overcome to achieve this goal. Our City has several profound inequities, and many Vancouverites struggle with low incomes, affordability of basic needs, social isolation and discrimination.

Affordable, flexible, and appropriate housing and unit design that provides a diversity of housing choices and allows for residents to age in place, supports the concept of livability, and inclusivity and will increase Vancouver residents' sense of belonging and sense of security for generations to come.

Our goal is to ensure the continued social sustainability and livability of all our neighbourhoods to meet the needs of all residents. Inclusivity means removing physical barriers as well as reducing social barriers for all citizens by creating housing diversity and equity with opportunities for a range of income groups and social and physical infrastructure for people of all ages.

Building for accessibility, by eliminating barriers to full participation for persons with disabilities is an important part of being a healthy and inclusive City. Facilitating aging in place, the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level is encouraged in all housing types.

But accessibility means more than physical accessibility. Inclusive housing design can promote genuine interactions and social connections between people of diverse backgrounds. Design that supports social interaction between market and non-market tenants is encouraged; this may be achieved through the design of common indoor and outdoor amenity spaces, and/or other means proposed by the City's housing partner. Integration, inclusion and equity among individuals of diverse socio-economic backgrounds are aspirations of a healthy society.

Together, these objectives will bring Vancouver closer to being a healthy city for all. By ensuring affordability, inclusion and accessibility while building opportunities for community connections and engagement, the HDTG support the realization of the goals of [Vancouver's Healthy City Strategy](#).

Economic Sustainability

Building affordable housing that is efficient and cost-effective and ensures livability and durability over the life cycle of the development are objectives of the HDTG. The process of developing the HDTG is grounded in evidence-based research, including cost-benefit and life cycle analysis. Through the use of materials, finishes and technologies that are reliable and environmentally sustainable, a balanced outcome that meets the City's objectives can be achieved.

SECTION 1 - CITY OF VANCOUVER GENERAL DESIGN GUIDELINES

1 GENERAL

1.1 APPLICATION & INTENT

These guidelines are:

- To be read in conjunction with and to be considered as supplemental to the current version of the BC Housing Design Guidelines and Construction Standards. This document outlines variations to the BC Housing document including additions and deletions.
- To be applied to the design and construction, renovation or conversion of any Housing secured by the City of Vancouver as a capital asset.
- The HDTG are the basis for the deliverable for housing provided as in-kind Community Amenity Contributions (CACs): used for both the negotiation for the value of the CAC and for the legal agreement defining the final deliverable.
- To provide an outline of the built form, project scale, and building program, as well as the design and technical requirements for all Housing secured by the City of Vancouver.
- To provide a minimum standard required by the City of Vancouver for materials, finishes and equipment, that ensures long-term efficiencies and durability, minimizing maintenance and operational costs during the life expectancy of the building.
- To be used as a tool by consultants in developing their designs and specifications.
- To incorporate the fundamental aspects of environmental sustainability, ensuring resource efficiency and energy savings.
- To clearly define accountability between the developer and the City.
- To ensure consistent standards of livability toward efficiency in space utilization.
- Demonstrate value to the Citizens of Vancouver.
- Variations from these guidelines may be considered but are not to proceed without prior discussion and acceptance by the City of Vancouver Housing Policy and Regulation and Facilities Planning and Development Staff.
- The City of Vancouver will only review change orders during construction that materially change the intent of the approved building permit drawings.

1.2 REGULATIONS AND STANDARDS

Consultants and Developers are to ensure that all applicable building codes, government acts and health regulations are met. These include, but are not limited to:

Regulations

- a. The current version of the City of Vancouver Building Bylaw (VBBL)
- b. The City of Vancouver Zoning and Development Bylaw (VZDBL):
- c. Occupational Health and Safety Regulation (Work Safe BC)
- d. The City of Vancouver Parking Bylaw:
- e. The Rezoning Policy for Sustainable Large Developments (RPSLD)

Note: The RPSLD policy is a condition of rezoning for all development applications over 1.98 acres or new development containing 45,000 sq. m. Developers of smaller sites are encouraged to apply the objectives, intent and deliverables set out in this policy.

Policies and Standards

- a. All City funded buildings must be designed to be certified to the Passive House energy performance standard, or an approved alternative zero emission building standard, and use low carbon fuel sources, to minimize energy consumption and GHG emissions. Refer to Passive Design Toolkit.
- b. LEED® Gold Certification is also required by the City of Vancouver for all public buildings, tenant improvements, and facilities funded by City capital funds which are over 500 square meters in area. Refer to the most current LEED® Canada NC, CI, or other appropriate LEED® category, Guidebook. The current version of the USGBC LEED® for Homes - Multi-family Midrise for 4 to 12-storey buildings is also acceptable.
- c. For inclusionary delivered housing projects that are externally funded LEED® Certification is not required.
- d. Follow BC Housing's Design Guidelines and Construction Standards but do not supersede the VBBL, the VZDBL or the City of Vancouver Housing Design and Technical Guidelines (HDTG) for Social Housing.
- e. Follow the City of Vancouver High-Density Housing Guidelines for Family with Children (HDHGFC):
- f. Follow the City of Vancouver Urban Agriculture Guidelines for the Private Realm (UAGPR):
- g. To be read with the City of Vancouver Land use policy and policy development guidelines:
- h. Where secured market rental types are provided, follow the City of Vancouver Administrative Bulletin "Rental Incentive Guidelines for the Secured Market Rental Housing Policy"
- i. The Consultant is responsible for ensuring all applicable updates or revisions to the code or regulations are addressed and included in the work.

1.3 DISCLAIMERS

- a. Some items that have been noted throughout this document are minimum standards, therefore any changes or proposed alternates must be reported to and confirmed with City of Vancouver staff, in conjunction with the Operator and will be reviewed based on appropriateness for each project. The Vancouver Building Bylaw (VBBL) or the Vancouver Zoning and Development Bylaw will govern if there are discrepancies between these and the Housing Design and Technical Guidelines.
- b. Any specific products named in this document are not to be taken as the City of Vancouver's endorsement of that product, but rather as an example of a standard of quality that has proven successful in the past. Any other products that meet this level of quality will be considered for use, but their use is not to proceed without prior discussion and acceptance by the City of Vancouver.

2 SITE INVESTIGATIONS

2.1 SITE CONSIDERATIONS – DUE DILIGENCE

- Refer to the applicable local area plan, policies, and zoning requirements specific to the project location within the City.

2.2 SITE PLANNING PRINCIPLES

- Pedestrian approach to the building (Replace with the VBBL)
- Refer to the Passive Design Toolbox, when Passive House standards are required, for recommendations on Passive Design site orientation that include landscaping wind and microclimate considerations, to increase thermal comfort and decrease active mechanical system requirements.

3 BUILDING DESIGN PRINCIPLES

3.1 BUILDING DESIGN CONSIDERATIONS

- a. Replace the term described in the BC Housing Guidelines as “BC Housing Programs” with “Housing secured by The City of Vancouver provided as in-kind Community Amenity Contribution”.
- b. Refer to applicable City of Vancouver Urban Design built-form guidelines for the zone or local area.
- c. Every habitable room shall have a minimum of one operable window except for bathrooms and kitchens is optional.
- d. Where a window opens into a walkway or occupiable landscaped area, restrict its swing so as not to create a safety hazard outside.
- e. Mitigate unwanted solar gain with external shading on the west face and refer to Section [08 50 00](#) for low e-coating and window rating.
- f. Roof designs are to be simplified, well-drained and easy to maintain.
- g. Consider enhanced roof overhangs where appropriate to address the high levels of precipitation.
- h. Exterior noise, such as traffic, mechanical equipment or other disruptive noises is to be controlled by appropriate acoustical design of the exterior wall and window systems to meet the allowable noise level for residential living, dining, and recreation rooms as defined in the VBBL.
- i. Balconies that could support a variety of outdoor activities are preferred over “Juliet” balconies.

3.2 BUILDING SIZE (Follow BCH)

4 BUILDING COMMON AREAS

Note: Common areas including, but not limited to hallways/corridors, balconies, elevators, mechanical/electrical rooms, parking, bicycle parking, and lobbies are to comply with the requirements, exclusions and exemptions as set out in the Vancouver Zoning By-law.

4.1 GENERAL (Follow BCH)

4.2 INDOOR AMENITY, PROGRAM AND OFFICE SPACES

- a. Projects with less than 26 units,
 - (398 sq.ft.). Provide a minimum amenity area of 37 sq.m. (398 sq.ft.).
- b. Projects with more than 26 units,
 - Provide a minimum amenity area of 1.4 sq.m. (15 sq. ft.) per unit.
- c. Projects with more than 90 units
 - a second amenity space for other activity uses may be required with a minimum size of 37 sq.m. (398 sq.ft.).
- d. Provide access to natural daylight in all amenity spaces.
- e. Provide access to an amenity space for all occupants.
- f. Indoor amenity space to be directly linked to at-grade, rooftop or podium outdoor amenity space as a priority, where possible. Refer to the [High-Density Housing for Families with Children Guidelines and Urban Agriculture Design Guidelines for the Private Realm](#) policies.
- g. Clear underside of ceiling heights to be a minimum of 2438 mm (8'-0").
 - A floor-to-floor height of 2946 mm (9'-8") is recommended.
- h. Provision to accommodate smudging at indoor amenity spaces as required.
 - Refer to the City of Vancouver Facilities Standard Manual details on smudging.
 - Provide appropriate mechanical ventilation and fire alarm interface.

.2 Family Housing and Independent Seniors Housing

- a. Revise BCH Guidelines requirements for **amenity kitchenette** to include:
 - 1828 mm (6 ft.) minimum length of millwork lower cabinets with drawers and a double bowl stainless steel sink.
 - A Refrigerator.
 - A microwave and shelf.
- b. Provide one storage closet for the storage of stacking chairs and folding tables. The amount of storage closet space would conform to the size of the amenity room.
- c. Provide a furniture layout with table and chairs, drawn to scale. Provide furnishings in accordance with this layout.
- d. Housing with common dining and meal preparation, replace BCH Guidelines with:
 - If a larger community style kitchen is provided, confirm cooking types expected. (Class 1 - 5 as per bulletin). Exhaust and equipment to be provided per the City of Vancouver's current Kitchen Ventilation Systems bulletin requirements.
- e. For buildings with less than 25 units,
 - Provide a fully accessible **project office** of approximately 9.29 sq. m. (100 sq. ft.).

- f. In buildings with more than 25 units,
 - Provide an office of a minimum of 24.52 sq. m. (264 sq. ft.) that will include:
 - A 12.08 sq. m. (130 sq. ft.) lockable office including provision of a desk with a return, task chair, across desk seating for 2 guests as well as a minimum of a 30" long, 3-drawer-high filing cabinet.
 - A small area for reception and for accompanying guest and/or children to wait and play. A window may be required to view the reception area.
 - Electrical capacity for small appliances such as a mini fridge, microwave, coffee maker, and printer.
 - A LAN closet - approximately 610mm x 610 mm (2'-0" x 2'-0") minimum.
- f. For building more than 80 units,
 - Provide a second office space for private meetings of approximately 9.29sq.m (100 sq.ft.)
- g. An additional minimum 3048 mm x 3048 mm (10' - 0" x 10'-0" sq. ft.) office may be required if building maintenance and management is handled on-site.

.6 Common Laundry

Requirements will be determined by the City and/or Operator. In lieu of an Operator, the following guidelines shall apply:

- a. Shared washers and dryers to be provided at one set for every 10 units in common laundry rooms. This may be reviewed by Housing and Facilities when there is a higher ratio of in-suite laundry units provided and based on unit mix.
- b. The common laundry room(s) shall be part of a programmed space (i.e., with access to natural daylight, beside amenity room or outdoor space if possible. Provide a seating area adjacent to the laundry area.
- c. The common laundry room to contain, a minimum of 1500 mm (5'0" long) long sorting table/counter and a central floor drain.
- d. Floor drains required.
- e. In the laundry room provide leased or owned card-operated appliances with necessary infrastructure, to be determined by the City and/or Operator. The fee amount, if any, is to be decided by the City and/or Operator.
- A unit in the laundry room to allow tenants to reload credit onto their laundry cards will be required. This will necessitate phone or internet connectivity and power to be sourced for the card machine.
- If the City and/or Operator's preference is for equipment to be leased from a supplier, in lieu of purchasing equipment to be owned by the Operator, a cash allowance for the same cost of the purchase of the agreed appliances will be established. The total value of the appliances is to be based on quotes from 2-3 acceptable sources. The cash allowance will be used to prepay a multi-year laundry equipment lease and service contract with a reputable company.

4.3 SERVICE AREAS

.1 Underground / Enclosed Parking

- a. Parking is to be provided in accordance with the Vancouver Parking Bylaw for visitor stalls, and a minimum ratio of 0.5 stalls per residential unit. For developments located in Transit-Oriented Areas (TOAs), a minimum ratio of 0.33 stalls per residential unit is required.
- b. Provide handicapped accessible spaces according to the Vancouver Parking Bylaw. At a minimum accessible stalls are to be provided at a ratio of 1:1 per accessible unit provided. The needs of the building may require more stalls than the minimum required. Location to suit the City and/or Operator.
- c. Provide dedicated loading and passenger spaces for social housing according to the Vancouver Parking Bylaw. Shared loading can be considered with appropriate approvals. Passenger loading should be located near the heat treatment room with accessible access to the social housing dedicated elevators.
- d. Parking ramp slope not to exceed 12 percent grade.
- e. Provide Car Share spaces according to the Vancouver Parking Bylaw.

.2 Bicycle Parking

- a. Provide ease of access to the bicycle storage located at grade near the dedicated lobby or below grade near the dedicated social housing elevators.
- b. Provide bicycle parking to be provided according to the Vancouver Parking Bylaw
- c. Provide access to a bicycle repair room that includes basic repair tools and a bicycle tire air pump.

.3 Garbage / Recycling Rooms

- a. As a part of the City's Greenest City Strategy, The City of Vancouver requires all buildings to provide adequate storage for garbage and recycling. These storage areas must meet all building code regulations and all zoning and development bylaws.
- b. Refer to the City of Vancouver's Garbage and Recycling Storage Facility Design Supplement to design garbage and recycling storage facilities for both new and retrofit buildings.
- c. Ensure that waste facilities align with both the recycling and organic collection programs.
- d. Review each building for acceptable garbage and recycling strategies: location and access, container size, type and collection schedule.
- e. Recycling, as part of the City's Green Initiative Strategy, is a requirement for all city facilities, both in individual units and for common collection, as a guideline, the suggested interior space per LEED® under Prerequisite 1, "Materials and Resources" for a commercial building of up to 465 sq. m. (5,000 sq.ft.) in size is 7.6 sq. m. (82 sq.ft.).
- f. Confirm the expected recycling volume for each building with the City and/or Operator.
- g. Provide automatic door openers for garbage/recycling room doors.

.5 Equipment Storage and Maintenance

- a. Operator storage to be provided for seasonal-use items and other large items, like collapsible and stackable tables and chairs, or room dividers. Exclusions are to be decided

by the City and/or Operator.

- b. Approximately 1.858 sq. m. (20 sq. ft.) of space for exterior landscaping supplies must be provided.
- c. Provide excess material storage space including provisions for storage of builder's/developer's warranty period materials. Room to be sized according to the anticipated amount of warranty materials expected for the project.

.7 Janitor Closets

- a. Provide a dedicated lockable janitor room with a floor sink, space for storing buckets, mops, brooms, vacuum, ladder, supplies for cleaning, shelves for paper products, light bulbs, etc., appropriately sized to adequately meet the needs of the building.

.11 Mechanical and Electrical Rooms

- a. Provide dedicated, lockable mechanical and electrical rooms to safely accommodate items such as hot water tanks, electrical panels, data lines, telephone and security equipment panels, gas, water or hydro meters and any other mechanical or electrical equipment that need to be accommodated within the building.

.12 Heat Treatment Room

- a. Provide a heat treatment (bedbug treatment) room within the building if required by the City and/or Operator. The ideal location is situated in an area where a new occupant would enter the premises with their belongings. The preferred location is within the parking garage located close to the loading bay or off the parkade elevator. The location is to be determined in discussion with the City and/or Operator.
- b. Ensure the heat treatment room reaches and maintains the required temperature of 60 degrees Celsius evenly, throughout the entire room for two or more hours.

Refer to Section 4 - Construction Standards, Division [13 20 00](#) Heat Treatment Room

Retrofit of Existing Buildings:

- c. The heat treatment room located as noted above is preferred.
- d. If space is limited, utilize an existing room (such as a janitor's closet) and retrofit in accordance with the above-noted specifications. Location is to be discussed with the City and/or Operator.
- e. The portable heaters should only be considered in situations of building retrofits where a heat treatment room or space to retrofit a janitor's closet is not available.

4.4 CIRCULATION AND ACCESS

.1 Entrance Lobby

- a. Provide an automatic door operator at the main entry.
- b. Provided mailboxes according to Canada Post standards. Parcel compartment boxes are to be provided in addition to the required customer compartment boxes. Refer to the Delivery Planning Standards Manual for Builders and Developers.
- c. Mailboxes are preferred close to the entry.

- d. Provide a counter-height shelf adjacent to the mailboxes of a suitable depth for handheld articles.
- e. Notice boards to be provided as corkboard complete with trim, or pre-approved alternate.
- f. Provide a seating area, with furniture layout drawn to scale. Provide furnishings in accordance with this layout.
- g. Provision to accommodate smudging at the main lobby area if required.
 - Refer to the City of Vancouver Facilities Standard Manual details on smudging.
 - Provide appropriate mechanical ventilation and fire alarm interface.

.2 Corridors

- a. Provide access to natural light where possible.
- b. Provide wheelchair accessible thresholds for all exterior doors.
- c. Minimum clear underside of ceiling heights to be 2438mm, (8'-0"). A floor-to-floor height of 2946 mm (9'-8") is recommended.

4.5 OUTDOOR SPACES

.1 Site Drainage

- a. Grades to provide positive drainage of all lawns, paved areas and others. Ponding is not acceptable.
- b. Allow no drainage of surface water towards buildings, across sidewalks or onto neighbouring properties. Drainage must be away from building entrances.

.3 Outdoor Recreation Area

- a. Follow the [Urban Agriculture Guidelines for the Private Realm](#) (UAGPR)
- b. Follow the [High Density Housing Guidelines for Families with Children](#) (HDGFC) where family units are included in the development as per
- c. At minimum outdoor amenity space is to be equal to the indoor amenity space.

5 DWELLING UNIT DESIGN

5.1 GENERAL

City-Wide

The following are intended for self-contained dwelling units in multi-unit residential buildings.

UNIT MIX

The unit mix will be determined by the size, location and nature of the building development and the community that it is to be part of and approved through consultation with the General Manager of Community Services.

As a general guide the following unit mix is to apply:

- 20% Studio
- 30% 1 bedroom
- 30% 2 bedrooms
- 20% 3 bedrooms

Fully integrate specialized units, such as those for persons with physical disabilities, into the community structure of the building(s). These units are to be integrated into the floor layout.

Provision to be made for smudging within dwelling units if required.

- Refer to the City of Vancouver Facilities Standard Manual details on smudging.
- Provide appropriate mechanical ventilation and fire alarm interface.

Downtown Eastside

For unit mixes within the Downtown Eastside Sub-Areas, refer to the Housing section of the Downtown Eastside Local Area Plan, for policy objectives within sub-areas.

5.2 DWELLING UNIT FLOOR AREAS

(Replace BCH Guidelines with the following)

THE CALCULATION OF UNIT AREA IS AS FOLLOWS

Net Unit Area, the measurement of the dwelling unit size, shall be calculated using the **inside finished face of the demising and exterior walls** (not the center line of walls). Interior unit walls and structure, are to be included in the measurement.

Further, in-suite storage is to be excluded, and shall **NOT** be included in the measurement of the dwelling unit floor area.

Minimum net unit size guidelines, *excluding in suite storage* are as follows:

| UNIT TYPE | BEDROOMS | SQUARE METRES | SQUARE FEET |
|--------------------|---------------------------------------|---------------|-------------|
| Row/Stacked | | | |
| | 2 | 90 | 970 |
| | 3 | 112 | 1200 |
| | 4 | 125 | 1350 |
| Apartment | | | |
| | Bachelor/Studio | 37 | 400 |
| | 1 | 46 | 500 |
| | 2 | 66 | 700 |
| | 3 | 84 | 900 |
| | 4 | 105-117 | 1125-1250 |
| | 2 bedroom in home family daycare unit | 107 - 112 | 1150-1200 |
| | 3 bedroom in-home family daycare unit | 130 - 139 | 1400 -1500 |

Unit sizes may be revised to respond to the City and/or Operator's preferences or specific programming needs on the recommendation of Housing Policy and Projects.
Net Unit areas may be increased to provide for accessibility.

** Studio area can be reduced to 30 sq.m. (320 sq.ft). as per Zoning and Development Bylaw*

ADDITIONAL REQUIREMENTS FOR UNITS

The unit-width dimension is to be a minimum of 3.66m (12'-0").

Provide dimensions for all living areas and bedrooms.

PROJECT STATISTICS CHART TO INCLUDE

Social housing unit information:

- Unit area, unit number and unit type with corresponding level
- Percentage and number of accessible units (5% accessible units are required)
- Family childcare units (if applicable)

The social housing units/City's Air Space Parcel is to be highlighted in the floor plans using a contrasting colour including all common and services spaces such as parking, elevators, lobby, recycling/garbage, electrical/mechanical, office, amenity rooms and any other City ASP areas.

DOWNTOWN EASTSIDE

New, self-contained, secured rental Micro-dwelling units to a minimum of 23.23 m² (250 sq. ft.), (subject to ensuring the design adheres to guidelines and policies to ensure livability) as per the Zoning and Development Bylaw MAY be considered, in the Downtown Eastside only, as described in the Micro Dwelling Policies and Guidelines:

Refer to the Rezoning Policy for the Downtown Eastside for development directions as they pertain to the Downtown Eastside:

5.3 LIVING-DINING AREAS

Provide a furniture layout to scale, to ensure functionality and accessibility.

.1 Suite Entrance (Follow BCH Guidelines)

- a. Provide a closet near the suite entrance.

.2 Living Area

- a. Localized drops for mechanical to be minimized and preferred not to be located in main living space.
- b. Clear underside of ceiling heights to be a minimum of 2438 mm (8'-0"). A floor-to-floor height of 2946 mm (9'-8") is recommended.
- c. The minimum acceptable ceiling height below a localized mechanical drop is 2134 mm (7'-0).
- d. Sprinkler heads and light fixtures in ceiling drops to be recessed or flush mounted.
- e. Provide a minimum of 305mm (12'-0") clear dimensions from the inside face of finished wall.

5.4 BEDROOMS

- a. Provide bedroom dimensions.
- b. Provide closets in all bedrooms.

5.5 IN-SUITE STORAGE (Replace BCH Guidelines with the following)

.1 General Storage

- a. Interior: one 3.7 m² (40 sq. ft.) of storage per unit.
- b. Unit storage to be located in the unit.

5.6 IN-SUITE LAUNDRY

Requirements will be determined by the City and/or Operator. In lieu of an Operator, the following guidelines shall apply:

- a. The requirement of in-suite washers and dryers maybe be required and will be determined by the City and/or Operator.
- b. Electrical, plumbing and exhaust hook-ups for side-by-side appliances to be included in every unit that is 2 bedrooms or more and in every accessible unit.
- c. Preference is for the provision of side-by-side appliances. An exception may be granted for the provision of stacking units in 2-bedroom non-wheelchair accessible suites. Hook-ups to be in a 6'-0" wide by 3'-6" deep minimum dedicated closet for side-by-side units. Hook-ups to be in a 3'-0" wide by 3'-6" deep minimum dedicated closet for stacked units.
- d. Confirm hookup requirement for studio and one-bedroom units with the City and/or Operator.

5.7 TWO AND THREE BEDROOM "IN-HOME" FAMILY CHILDCARE UNIT DESIGN where "In-Home" Family Childcare Units are included within the housing development

- a. Provide all "In-Home" family childcare units at ground level with living and kitchen space that is visibly and physically accessible to an outdoor balcony or patio area. If not situated at ground level, consider locating in close proximity to the outdoor amenity space within the building.
- b. The outdoor space shall receive a minimum of two hours of sunlight in total during the hours of 9:30 am - 11:30 am and/or 1:30 pm - 4:30 pm at winter solstice.
- c. The suite layout is to contain:
 1. One 3-piece bathroom with a 914 mm x 1524 mm (30" x 60") tub.
 2. One 3-piece bathroom with a shower that includes a hand-held shower unit in three-bedroom unit.
 3. An expanded countertop for diaper changing in the second bathroom or powder room and larger sink.
 4. An open concept kitchen/dining/living area for use by the children.
 5. The preferred kitchen layout would have a central island with eating bar and an open view of the play area and outdoor space.
 6. Stroller storage at the entrance.
 7. A large entry closet for the storage of children's belongings.
- d. Provide adequate short-term drop-off parking for parents on the site. The drop off stall is to be provided as close as possible to the In-Home family units and no more than 100 m from the entry.
- e. Refer to Section 3 of this guideline for materials and finishes and technical requirements.
- f. Refer to the City of Vancouver Childcare Design Guidelines for comprehensive details on site orientation, access, design consideration and landscaping with non-toxic plant materials.
- g. For more information on licenced family daycare refer to Vancouver Coastal Health Childcare Facilities Licensing.

5.8 BALCONIES

Provision of private outdoor space for all residential units is typically sought for social housing. Alternative approaches on social housing projects which are targeting Passive House certification may be considered. At a minimum, balconies are to be provided for all accessible units and family units (2 and 3-bedroom) in accordance with the [High-Density Housing for Families with Children Guidelines](#).

Juliet balconies for studio and one-bedroom units may be considered, provided an enhanced common outdoor space is also provided. It is recommended to explore enclosed balconies for units facing the SkyTrain guideway, or a major arterial. No balcony projections are permitted into SRWs, side yards or minimum rear yard setbacks. Juliet balcony projections may be considered through further design review.

6 KITCHENS AND BATHROOMS

6.1 KITCHENS

.2 Fixtures and Appliances

- a. The two-, three- and four-bedroom units are to have a dishwasher in the kitchen.
- b. Consider dishwashers in studio and one-bedroom units, based on cost/benefit lifecycle analysis and City and/or Operator preference. Dishwashers can be compact 457 mm (18") units in one bedroom and studio units.
- c. The base cabinets or pantries are to have dedicated, enclosed space for recycle bins of approximately 371 mm - 557mm (4-6 sq. ft.) depending on unit size.
- d. Provide a broom closet or pantry in the kitchen.
- e. All units to have the following appliances in the kitchen:
 1. Refrigerator:
 - a. Provide 24" refrigerator for studios
 - b. Provide 30" refrigerator for one-bedroom and two-bedroom units
 - c. Provide 36" refrigerator for three-bedroom units
 2. Stove with oven and four burners. For studios: A cooktop may be installed in lieu of a range, if specifically preferred by the user group.
 3. Range hood.
 4. Microwave: Combined Microwave and Hood Fans may be considered in small units. Dual function Convection/Microwave built-in units may also be considered.
- f. Refer to the Division 11 – [11 30 00](#) - Residential Equipment for appliance specifications.

6.2 BATHROOMS

.1 General

- a. Floor drains are to be provided in bathrooms in supported, transitional, and seniors.
- b. Floor drains are not required in low-income housing bathrooms except as required in the VBBL (Adaptability Requirements) and in wheelchair-accessible unit.

- c. Where possible, doors of bathrooms should not open directly into the kitchen.

.2 Fixtures and accessories (Follow BCH)

.3 Studios and One Bedroom units

- a. Studio and one-bedroom units are to have one, three-piece bathroom with a tub/shower combination.
- b. Tub shower combinations are to be acrylic with surrounding walls as one sealed unit.

.4 Two Bedroom Units

- a. Two-bedroom units are to have one, three-piece bathroom with a tub/shower combination.
- b. Tub/shower combination is to be acrylic with surrounding walls as one sealed unit.

.5 Three or more bedroom units

- a. Three or more bedroom units are to have one, three-piece bathroom and one powder room (consisting of a toilet and a lavatory basin with a vanity)
- b. Tub/shower combination is to be acrylic with surrounding walls as one sealed unit.

.6 Seniors Units (Follow BCH)

7 FINISHES AND MATERIALS

Also refer to Division 9 - Finishes

7.1 GENERAL

- a. Ease of maintenance, durability, environmental performance, health and safety, and, cost effectiveness are the prime considerations when choosing materials and finishes.
- b. Choice of material and finishes are to be aligned with the goals of the Greenest City 2020 Action Plan.
- c. Refer to BCH– Building and Energy Performance. LEED® –for Material and Resource Credit is a mandatory credit and must be achieved for all housing projects.
- d. Health Product Declarations (HPD) are encouraged for finishing materials utilized within housing units.
- e. Higher levels of durability may be required for at risk clients. Confirm requirements with the City and/or Operator.

7.2 INTERIOR FINISHES

.1 General (Follow BCH)

.2 Interior Walls (Follow BCH)

.3 Interior Ceilings

- a. Acoustic panel ceilings are not acceptable.
- b. Provide adequately sized access panels, complete with locks, for ease of maintenance of equipment and services located above the ceiling
- c. Finish ceilings with gypsum wallboard to receive a spray texture finish or paint finish.

- d. Kitchen and bathroom ceilings are to have a washable finish.

.4 Floor Finishes

.1 Dwelling Units

- a. Generally, flooring colours shall be consistent throughout each unit.
- b. Storage rooms and basements in units shall have resilient flooring or ceramic tile.
- c. Ceramic tile flooring and baseboards are required in bathrooms within units or finish to the City and/or Operator's preference.
- d. Dining rooms shall have resilient flooring.
- e. Living rooms and bedrooms shall have resilient flooring or carpeting, final finishes to be determined in discussion with the City and/or Operator's approval.
- f. Laundry rooms to have continuous sheet-good resilient flooring (no resilient flooring *tiles*), complete with flash cove base or ceramic tile and base.
- g. Polished concrete flooring may be accepted as a flooring finish upon approval of the City and/or Operator.

.2 Tenant Common Areas

- a. At high wear and tear locations in the facility, such as the main entrance, use a durable material which can include; non-slip ceramic tile, non-slip polished concrete, or other slip resistant material. All surfaces must be non-abrasive and washable.
- b. Common corridors shall have resilient flooring or carpet tile - confirm preference with the City and/or Operator dependent upon housing type.

.3 Laundry, Assisted Bathing Rooms, Commercial Kitchens and Common Washrooms

- a. Common Laundry rooms and public washrooms to have ceramic or water-resistant resilient flooring and baseboards.
- b. Common Amenity kitchen spaces to have ceramic tile or water-resistant resilient flooring and baseboards. Carpet tile may be considered in the seating/lounging area in combination with the above materials in high traffic or kitchen areas.
- c. Polished concrete flooring may be accepted as a flooring finish upon approval of the City and/or Operator.

.5 Baseboards

- a. At carpet and resilient floors, wood base to be hemlock or pine, with the following exceptions. Substitute wood base material for rubber base products when appropriate and upon approval of the City and/or Operator.
- b. Integral cove base at washrooms, laundry rooms and janitor rooms where flooding is a concern.
- c. At ceramic tile flooring, base to be ceramic tile to match flooring.

7.3 DOORS

.1 General (Follow BCH)

.2 Exterior and Suite Entry Doors (Revised and additional requirements)

- a. Unit doors must have one peep hole except in accessible dwelling units where two

peepholes must be provided. One is to be located at 1067mm above the floor and the other is located at 1524mm above the floor.

- b. Provide metal astragals along unit entry door edges to help prevent break and enter.
- c. Provide automatic door openers for all accessible units.

.3 Seniors, Wheelchair Accessible and Adaptable Units (Follow Section 8 of these Guidelines)

.4 Other Interior Doors

- a. Swing or bypass doors are preferable. Bi-fold doors can be considered but are not preferred.
- b. Pocket doors are not acceptable due to durability concerns.
- c. All closets and entries to basement stairs and unfinished areas must have doors.
- d. Provide automatic door openers for garbage/recycling room doors.

7.4 WINDOWS, SIDE HINGED AND SLIDING GLASS DOORS

.1 General

- a. Consider liveability and access to natural light as per VBBL and urban design requirements.
- b. Consider furniture layouts when locating and sizing windows.
- c. Where design and building by-law permits provide windows in exit stairways, except at ground floor level for security reasons.

.2 Acoustic Considerations

- a. Where road, rail or other sources of noise indicate the need for acoustical consideration, consider triple pane window systems. This will allow a resident the choice of opening windows and tolerating the noise or relying on mechanical ventilation. An Acoustical Consultant may be required to address Bylaw requirements. Acoustical considerations may extend to the construction of exterior walls.

.3 Window Cleaning

- a. Safety features such as steel eye hooks securely anchored to jambs, or roof-top cradle brackets, may be necessary for higher buildings.

.4 Window Coverings

- a. Provide blinds or roller shades for all exterior and interior windows and glazed doors. Drapes are not required.

7.5 EXTERIOR FINISHES (Follow BCH)

8 WHEELCHAIR ACCESSIBLE AND ADAPTABLE DWELLING UNITS

8.1 GENERAL

Definition and Intent (Replace BCH with the following)

Access or accessible means that a person with disabilities is, without assistance, able to approach, enter, pass to and from, and make use of an area and its facilities.

In addition to the requirements set out in **Section 3.8. of Division B** of the VBL,

5% of all units must be fully wheelchair accessible.

Depending on a need and demand analysis facilitated by the City of Vancouver, the number may increase to accommodate more wheelchair-accessible units in the project or include a requirement to accommodate motorized wheelchairs in some units.

8.2 WHEELCHAIR ACCESSIBLE UNITS (Follow BCH. and Additional requirements)

.1 General (Additional requirements)

Reference shall also be made to CSA B651-23 Accessible Design for the Built Environment for standards not covered by the BCH Guidelines or the VBL.

Reference shall also be made to CSA B652:23 Accessible dwelling for standards not covered by the BCH Guidelines or the VBL.

Provide turning diameter for wheelchairs in the living room, kitchen, all bedrooms, bathroom, and balcony.

Provide CSA B652:23 compliant 2250mm (7'-5") turning diameter in instances where motorized wheelchairs are to be accommodated.

Provide environmental controls for units where motorized wheelchairs are to be accommodated.

- a. Where possible, wheelchair-accessible units are to be located at grade and face the street or exterior amenity area.
- b. Reduce the number of interior walls where possible.
- c. Ensure there is sufficient clearance around a double bed for mobility.

.2 Circulation (Follow BCH)

Provide CSA B652:23 compliant 3150mm (10'-4") turning diameter in instances where motorized wheelchairs are to be accommodated.

.3 Unit Entrance Weather Protection (Follow BCH)

.4 Doors

- a. In wheelchair-accessible units, all-suite interior doors shall have a minimum leaf width of 914 mm (3'-0").
- b. In seniors' units, at least one bathroom and one bedroom door shall have a minimum leaf width of 914 mm (3'-0").
- c. The minimum width of all other interior door leaf and access to common living areas inside the suites must be 914 mm (3'-0").

- d. Follow VBBL for additional requirements in adaptable units.
- e. Provide rough-in at doors for future installation of door operator. Provide separate thumb-turn lock.

.5 Windows (Revised requirements)

- f. The normal height is 750mm (29.5”), this may be raised to 900mm (35.4”) in bedrooms.

.6 Kitchen

.1 Cabinets

- a. Pull down shelving system for upper cabinets.
- b. Provide a low microwave shelf in all units.
- c. Provide a pull-out sliding shelf with a heat-resistant surface below the wall oven. The shelf could extend over a deep pots and pans drawer below the oven.
- d. Provide an 1828 mm (six-foot) distance between opposing kitchen counters where possible.
- e. Provide pantry space and lower cabinet shelving. Provide a roll-out unit with drawers and heat-resistant top.

.2 Kitchen Sink

- a. The stove top and sink are to be installed on the same counter.
- b. A single sink is acceptable if counter space restriction applies and must be reviewed and approved by the CoV Housing and Facilities staff.

.3 Appliances

- a. Allow for separate stove top and wall oven.
- b. The wall oven is to have its controls on the side; the door is required be able to be hinged on either side.
- c. Do not combine microwaves and fans in Wheelchair Accessible units.
- d. Locate microwave in base cabinetry or on counter service. To be determined by the City and/or Operator.
- e. Hood fan and light controls to be mounted on the side partition or at the back of the counter at 1067 mm or 3-6” AFF.

.7 Bathroom

- a. Bathrooms to have plywood backing to 1200 mm (4'-0”) behind all walls for the fastening of all grab bars. Grab bars are to be supplied and installed on a per-unit basis according to the VBBL.
- b. Roll-in showers are to be provided instead of bathtubs
- c. Provide floor drains in bathrooms.
- d. Where possible, provide clearance on both sides of the toilet.
- e. Provide ceiling tracks for transfer lift mechanisms. Coordinate with the City and/or Operator to ensure product compatibility and sufficient structural capacity.

.8 Operable Fixtures (Follow BCH)

.9 Storage (Follow BCH)

.10 Clothes Closets (Follow BCH)

.11 Electrical Items

- a. Provide electrical outlets in compliance with SAFERhome Standards including:
 - 1. All light switches are positioned at 1066mm (42") to the centre of the electrical box from the finished floor.
 - 2. All electrical outlets positioned (18") to the centre of the electrical box from the finished floor.
 - 3. All light switches and A/C outlets to use Smart electrical boxes.
 - 4. Four-plex outlets are to be positioned in master bedrooms, home offices, garage, and recreation rooms.

8.3 ADAPTABLE UNITS (Replace BCH with the following)

Conform to Section 3.8. of Division B of the VBL: Building Requirements for Persons with Disabilities, Section 3.

9 BUILDING SYSTEMS

9.1 BUILDING ENVELOPE

Building envelope design is to take into consideration the principles and recommendations contained in the latest edition of Walls, Windows and Roofs for the Canadian Climate by the National Research Council of Canada (NRCC 13487).

9.2 ELEVATORS

.1 Elevator Location

- a. The location of the elevator is to meet CPTED principles and be visible from the lobby entry.

.2 Elevator Group Arrangements (Follow BCH)

.4 Number of Elevators

- a. Minimum of 2 per building.
- b. Provision of two elevators for social housing ASP. An exception may be considered for the provision of one elevator and/or shared elevators with the market building through discussion with the City and/or Operator.
- c. Distance from the farthest suite or room to the elevator(s) should not exceed 45m (150'-0") and 30m (98'-5") for senior projects, as per the BC Housing Design Guidelines and Construction Standards.

.6 Capacity and Size of Elevator

- a. Equip one elevator cab (the largest and highest capacity elevator if they are not the same) with hooks complete with protective blankets for moving purposes.

- b. Elevators in facilities with roof decks to be easily accessible from the loading area or at a minimum from the back lane, to facilitate delivery of items for routine maintenance such as sand, soil and engineered wood chips.
- c. Elevators in buildings with roof decks to be able to accommodate freight for the purposes of installing and maintaining podium or rooftop landscaped areas (for example to move heavy loads for soil replacement and top-up).
- d. For the Elevator minimum capacity and dimensions, follow the BCH Guidelines.
- e. The second elevator is preferred to follow BCH with a minimum capacity of 1134 kg (2500 lbs.), but 908 kg (2000 lbs.) capacity may be considered and must be reviewed with Housing and Facilities for acceptance. 907 kg (2000 lbs) elevators will only be considered if it is one of at least two elevators where the other elevators have a capacity of 1600 kg. (3500 lbs.) or 1134 kg (2500 lbs.).
- f. Equip one elevator cab (the largest and highest capacity elevator if they are not the same) with hooks complete with protective blankets for moving purposes.

.9 Lobby Sizes (Follow BCH)

.10 Machine and Control Room Locations (Follow BCH)

9.3 BUILDING AND ENERGY PERFORMANCE, MECHANICAL AND ELECTRICAL SYSTEMS

.2 Heating, Ventilation and Air-conditioning (HVAC) Systems

Refer to BC Housing Design Guidelines and Construction Standards 2019 –Construction Standards – Division 23 – Mechanical and Division 26 – Electrical except for the following additions or modifications)

Design Requirements

- a. An HVAC strategy must be discussed and agreed to with City and/or Operator, taking into account on-going operating costs, maintenance needs and environmental impact. Under special circumstances, an exception may be made if baseboard heating is proven to have a lesser impact than other systems based on the cost to the Operator, the residents and the environment over the course of the lifecycle of the building.
- b. Buildings must be designed with low-temperature hydronic heating systems and connect to neighbourhood energy systems if located in the service area of the City owned NEU and if deemed feasible by the City Engineer/ General Manager of Engineering Services.
- c. Provide abuse resistant heating thermal units including heavy gauge impact resistant enclosure with tamper proof fasteners.
- d. All multi-unit residential buildings must be designed and constructed with a ventilation system that provides outdoor air directly to all occupiable spaces, in the quantities defined by code. This included bedrooms, living rooms, and dens in residential units.
- e. All housing projects must provide mechanical cooling for all common areas and inside all living spaces for dwelling units. Where mechanical cooling is required, window-mounted air conditioning units are not permitted.
- f. Provide tamper-proof lid screws for washroom exhaust.

.3 Plumbing - (Replace BCH. Follow [Division 22 - Plumbing](#))

.4 Electrical

- a. Each room is to have its own light switch/controls - to be designed to be simple and intuitive.
- b. All switches to be easy touch rocker switches
- c. Fixtures in suites to be LED, with easily replaceable LED lamps and ballasts.
- d. Provide ceiling mounted LED fixtures in all bedrooms.
- e. Locate electrical panel by suite entry where possible.

.5 Metering - (Follow BCH. Additional Requirements follow [Division 23 - Electrical](#))

- a. Facilities to have dedicated gas, electricity and water metering and/or sub-metering such that CoV parcels are independently metered and compliance with Energy Performance targets can be monitored.
- b. All substantial building loads for electricity or natural gas are to be sub-metered with the meter linked directly to the BMS.
- c. Where a Facility occurs in a mixed-use building, meters and/or sub-meters are to be in service rooms that are easily accessible to the staff of the Facility.
- d. Provide one electricity meter per unit.
- e. All meters are to be connected to Direct Digital Control and trended for monitoring.
- f. Provide recessed lighting fixture spaces for ceiling heights less than 2.4m (8'-0").

.6 Security Systems

Secure access system planning:

- a. Utilize an integrated telephone entry system linking the entrance to each unit, provided with a dedicated telephone line.
- b. Card/fob control to be provided at the parkade entry, the entry to the building and at all common areas.
- c. Card access for individual suites to be considered, based on the Housing type. The City and/or Operator to provide advice.
- d. Secure access to and from the parking to be addressed to suit the proposed plan for each building.
 - If the units are accessed by elevator, secure access to the elevator and secure control of the elevator shall be provided through the integrated telephone entry system.
- e. Provide security cameras at each floor's elevator lobby and entry to the stairwell.
- f. Provision of security cameras and systems may be required in discussion with the City and/or Operator.

9.4 FIRE AND LIFE SAFETY MEASURES

.1 Suppression and Fire Containment

- a. Provide recessed sprinkler heads in spaces with ceiling heights less than 2.4m (8'-0").

.2 Fire Detection and Alarm

- a. Coordinate set-up of fire alarm monitoring with the monitoring company of the City's choice - to be confirmed for each Facility.

10 LANDSCAPE DESIGN

10.1 LANDSCAPING

.1 General (Additional requirements)

- a. Landscape areas to be designed and built to create a natural and pleasing environment that is sustainable, appropriate to its intended use and easy to maintain
- b. All walking surfaces shall be non-slip.
- c. The use of grass in areas to be considered carefully in high-traffic areas.
- d. Plants must be of sufficient size to withstand the use of the area. Plant species to be non-toxic, vigorous suitable to its site location and climate, and easy to maintain.
- e. At grade, use pervious surfaces wherever possible to minimize stormwater run-off.
- f. All growing media to be mushroom-free.
- g. Refer to the [Urban Agriculture for the Private Realm Policy](#).
- h. Edible landscaping is recommended wherever possible.
- i. Ensure landscape elements/roof drainable features do not include loose rocks or boulders in areas that can be reached.

.2 Landscape Irrigation

- a. If irrigation is provided, use high-efficiency irrigation technology.
- b. If irrigation is provided, include an irrigation controller as part of the Direct Digital Control system, a stand-alone irrigation control system is not acceptable.
- c. If irrigation is not provided, hose bibs are to be installed at a minimum of 15.25m (50'-0) apart.

10.2 HARD LANDSCAPING (Follow BCH)

10.3 BUILDING SIGNAGE (Follow BCH)

10.4 EXTERIOR LIGHTING

- a. Exterior lighting is required in outdoor areas, to illuminate entries, and exits as required for security.
- b. Exterior lighting to be on timers, with Direct Digital Control for oversight and monitoring.
- c. Lighting for common areas and amenity spaces to be on Direct Digital Control.
- d. Motion detector lighting is recommended at the entrance, hallways stairwells and utility spaces within accessibility suites.

10.5 FENCING (Follow BCH)

10.6 RETAINING WALLS (Follow BCH)

SECTION 2 - ENERGY AND ENVIRONMENTAL DESIGN

- The goal for the City-owned, high performance, new construction standard is to achieve near zero greenhouse gas emissions in new buildings. The purpose of this goal is to show leadership to the broader community in meeting the targets of the [Renewable City Strategy](#) and adopt a near zero emission standard for new buildings much earlier than required by building code for all new buildings constructed city wide.
- To achieve a goal of near zero GHG emissions in new buildings the following strategies are required to be incorporated into new city owned buildings:
- Facilities received from other sources, including those constructed for the city using Community Amenity Contribution (CAC) funding, and those with long term leases to the City for the life of the building, are to be constructed to the same standard as City capital funded facilities. Where the city funded facility is a small air space parcel in a larger building funded by others, and it is not viable to achieve Passive House certification for the whole building, then at a minimum the city owned portion of the building must be designed to reduce Greenhouse Gas Emissions using only low carbon fuel sources.
- Mechanical and control systems are to be designed to be as simple as possible to reduce maintenance costs and the need for specialized maintenance expertise.
- A preliminary energy modelling exercise must be undertaken during the preliminary design stage to evaluate options for design of the building envelope, mechanical and electrical systems, and energy conservation measures (ECMs) which meet or exceed the City's energy performance target and make the most sense for the project based on energy and GHG savings, financial impact and ease of maintenance.

Environmental and Health Product Declaration

- a. LEED® standards for - Material and Resource Credit must be achieved for all housing projects.
- b. Refer to The Health Product Declaration (HPD), the new industry initiative and standard format for full transparency for human toxicity and eco-toxicity impacts is encouraged for finishing materials utilized within housing units.

SECTION 3 - CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

Refer to BC Housing Design Guidelines and Construction Standards

SECTION 4 - CONSTRUCTION STANDARDS

GUARANTEES AND WARRANTIES

- a. In general, guaranties and warranties are to be provided per the industry standard.
- b. Typical warranty to be 24 months for defects in materials and workmanship, 5 years for defects in building envelope, and 10 years for structural defects.
- c. Extended guarantees and warranties required as noted in each section below as applicable.
- d. Where extended guarantees and warranties are provided, the certificates shall be issued to the City of Vancouver.

INTRODUCTION TO CONSTRUCTION STANDARDS

Refer to and follow the BC Housing Design Guidelines and Construction Standards - Sections, subsections and divisions except where noted in the following guideline.

Division 1 - General Requirements

Refer to BC Housing Design Guidelines and Construction Standards.

In addition, follow BC Housing Design Guidelines and Construction Standards Construction Standards - Division 1 – General Requirements – 01 91 00 – Building Commissioning and the BC Housing Building Commissioning Guidelines except for the following modifications and additions:

01 91 00 – Building Commissioning

- a. Wherever the Energy and Environmental Design section is mentioned, replace with the City of Vancouver Housing Design and Technical Guidelines – Energy and Environmental
- b. The Owner will hire an Independent Commissioning Service Provider that is mutually agreed to by the Owner and the City of Vancouver, for all projects as is described in the BCH Building Commissioning Requirements, Option 2, including witnessing of CAN/ULC S1001 Integrated Systems Testing of Fire Protection and Life Safety Systems. The Independent Commissioning Service Provider is to develop and implement the Owner's Project Requirements, the Commissioning Plan, and other Commissioning Process Activities described in the BCH Building Commissioning Guidelines to the mutual satisfaction of the Owner and the City of Vancouver.
- c. The Independent Commissioning Provider must be a qualified professional with significant experience in executing the building commissioning process and have superior management, coordination and communication skills, in addition to having excellent engineering and technical skills. The Independent Commissioning Provider will provide consistency throughout the project. It is the Owner's responsibility for the person designated as the Independent Commissioning Provider to satisfy as many of the following requirements as possible:

- Acted as the lead commissioning authority for at least three projects of comparable size, type and scope.
- Extensive field experience in the operation and troubleshooting of HVAC systems and energy management control systems.
- A minimum of five full years of commissioning experience.
- Knowledgeable in building operation and maintenance and O&M training.
- Demonstrated commissioning experience in all systems to be commissioned.
- Knowledgeable in test, adjust, & balance of air and water systems.
- Experienced in energy-efficient equipment design and control strategy optimization, energy features energy use/savings calculations.
- Direct experience in monitoring and analyzing system operation using energy management control system trending and stand-alone data logging equipment.
- Demonstrated experience with total building commissioning approach including building envelope, data and communication systems and other specialty systems.
- Excellent verbal and writing communication skills. Highly organized and able to work with both management and trade contractors.
- Experienced in writing commissioning specifications.
- A bachelor's degree in mechanical or electrical engineering is strongly preferred, and professional license is desired. However, other technical training, past commissioning, and field experience will be considered as a substitute.
- Experienced in commissioning of sustainable building systems

Division 2 - Site Construction

Refer to BC Housing Design Guidelines and Construction Standards

Division 3 - Concrete

Refer to BC Housing Design Guidelines and Construction Standards

03 35 00 – Concrete Finishing

Concrete flooring specification:

Polished and sealed concrete flooring may be accepted as a flooring finish upon approval of Housing and Facilities. A mock-up is to be provided prior to the first exposed floor slab being poured. See specifications and requirements below:

The following precautions to protect the slab should be considered:

- a. Ensure the concrete mix is designed to provide the necessary material to withstand minor damage and provide a durable surface for grinding, polishing, and sealing.
- b. Enforce strict quality control of the poured slab during the construction phase; including adequate curing procedures; no fired-in bracing supports, no storage of equipment and materials on the slab; temporary heavy-duty polyethylene sheet, protection board or cardboard can be used can be

used to off-set any staining from liquid type materials.

- c. Grinding and polishing processes to the required degree without exposing the aggregate (unless some degree of aggregate exposure is desirable).

Concrete Finishing:

- d. Float Finish: Consolidate the surface with power-driven floats or by hand floating if the area is small or inaccessible to power-driven floats. surface to have a uniform, smooth, granular texture.
- e. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until the surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings. Finish surfaces to the following tolerances using the F-number method per CSA A23.1, unless noted otherwise or accepted prior to the commencement of Work by Consultants.

Grinding & Polishing:

- f. Finishing of concrete slabs shall comply with CAN3-A23.1-M94, Section 13 and with tolerances indicated for Class A. Lightly sand floors to receive sealer and polish concrete floors where scheduled.

Sealed Floor Finish (Applied Liquid):

- g. Apply two (2) coats of liquid sealer as specified to floors and stairs as scheduled; using the recommended coverage rate, in strict compliance with the manufacturer's recommendations.

Applied Surface Treatments:

- h. Mock-ups on site are required before application of any applied finishes to completed floor slabs.

Division 4 - Masonry

Refer to BC Housing Design Guidelines and Construction Standards

Division 5 - Metal Fabrications

Refer to BC Housing Design Guidelines and Construction Standards

Division 6 - Wood and Plastics

06 10 00 - Rough Carpentry

Refer to BC Housing Design Guidelines and Construction Standards

06 20 00 - Finish Carpentry

Refer to BC Housing Design Guidelines and Construction Standards

06 40 00 - Millwork

Refer to BC Housing Design Guidelines and Construction Standards (Section 4 Division 12 – 12 32 00 Manufactured Wood Casework) except for the following modifications and additions:

Construction / Quality for common laundry, kitchens, bathrooms and amenity spaces:

- a. To be in accordance with “Custom Grade” as defined in the latest edition of the “Quality Standards for Architectural Woodwork” as published by AWMAC (Architectural Woodwork Manufacturers Association of Canada), except as noted below.
- b. AWMAC Guarantee to be provided.
- c. Inspection to be provided by an appointed inspector, approved by AWMABC (BC Chapter of AWMAC).
- d. All materials to be formaldehyde free.
- e. Use wood certified in accordance with the Forest Stewardship Council’s (FSC) Principles and Criteria or CSA certified material.
- f. Use adhesives and sealants that have low VOC levels per the LEED® requirements for listed under credit 4.1 “Low-Emitting Materials, Adhesives and Sealants”.
- g. Hardware:
 - All hardware to be commercial grade.
 - Hinges: Blum or Mepla, 110° opening, or pre-approved equal.
 - System screw mounting plates required at all hinges.
 - Drawers:
 - Up to 150mm (6") deep - Blum or Mepla 3/4 extension slide or pre-approved equal.
 - Over 150mm (6") - KV or Accuride full extension slides or pre-approved equal.
 - Pulls: Richelieu 33205 Brushed D or similar easy to grab handle that is a pre-approved equal
 - Standards: to be steel, adjustable on 12mm (1/2") centres, flush with cabinet side wall face.
 - Shelf clips: to be compatible with the standards, and to allow for shelves to be mechanically fastened to support bracket.
 - Locks: Corbin 0737 & 0738 with #75 Strike or pre-approved alternate.

Division 7 - Thermal and Moisture Protection

Refer to BC Housing Design Guidelines and Construction Standards except for the following modifications and additions:

07 50 00 - Membrane Roofing

The following requirements are in addition to and/or replace the requirements contained in the roofing sections of BC Housing Design Guidelines and Construction Standards:

- a. Provide roof edge safety barriers, roof anchors, and fall protection in accordance with the VBBL and with Work Safe BC requirements.

Specifically, for fall protection, each project to be assessed for where and how often parts of the roof may be accessed. If all or most servicing of roof areas can occur 3962mm (13'-0") from the edge (control zone plus buffer zone distance) there is less need for roof edge safety barriers. If areas needing servicing are located near roof edges, then we need to consider what method of fall protection is required in consultation with CoV OHS, Environmental, and Maintenance staff.

07 55 50 - Green Roofing

- a. Where an extensive green roof is provided it must:
 - Be easily removable (i.e. modular) to assist with maintenance access to the roof membrane and assembly below.
 - Require minimal maintenance for weeding, fertilizing and plant replacement
 - Not require irrigation. Temporary irrigation may be set up for the first year only (but a permanent hose bib is required at the roof).
 - Be self-sustaining
 - Proposed system to be reviewed with Facilities for quality and suitability
- b. Where an extensive or intensive green roof occurs (including roof top playgrounds), a leak detection system must be provided. This system must:
 - Be reviewed with the City of Vancouver's Facility Operations and Maintenance staff. All specifications and details of the proposed system are to be provided for review and approval prior to proceeding.
 - Have a non-proprietary monitoring system.
 - Be compatible with, and actively connected to, the City's central Direct Digital Control system to allow remote monitoring of any signals or alarms.
- c. Drainage from above-grade landscaped areas:
 - Drains to be bi-level, to drain both surface and roof waterproofing membrane
 - Both surface and waterproofing membrane must be sloped to drains.

Division 8 - Doors and Windows

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

08 50 00 – Windows, Side Hinged and Sliding Glass Doors

The following requirements are in addition to and/or replace the requirements contained in the window sections of BC Housing Design Guidelines and Construction Standards:

- a. All exterior windows, doors and other openings design and installation to be reviewed by the Building Envelope Consultant for the project. All operable vents to be:
 - Either casement, awning or hopper type, sliders are not acceptable
 - Limited to a maximum opening of 100mm (4") where accessible by children.
 - To have easy to grip locking mechanisms - lever type.
- b. The requirement for Low-E coatings on glazing will be determined by the overall energy requirements for the buildings. Mitigate unwanted solar gain with external shading.
- c. Use glass systems with good insulating values (low U-value) and thermal breaks.
- d. Screens are not required.

08 70 00 - Finish Hardware

The following requirements are in addition to and/or replace the requirements contained in the window sections of BC Housing Design Guidelines and Construction Standards:

- a. All hardware at exterior doors, common areas, and suite entries to be commercial grade.
- b. All hardware to meet accessibility requirements.
- c. Locks: Key requirements are to be provided by the City and/or Operator.

In lieu the following is the guideline:

- Key fobs are preferred for common areas in lieu of mechanical locks.
 - Individual units are to be keyed (no security chain latch).
 - Storage rooms and Laundry rooms may have mechanical locks with storeroom function.
 - Key fobs may be considered for units as per the City and/or Operator's preference.
- d. Provide durable extruded aluminum suite entry door thresholds.

Division 9 - Finishes

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

Refer to Section 1.3 - Energy Performance. LEED® Version 4 - Material and Resource Credit is a mandatory credit and must be achieved for all housing projects.

Health Product Declarations are encouraged for finishing materials utilized within housing units.

09 28 00- Gypsum Wallboard

The following requirements are in addition to and/or replace the requirements contained in the gypsum wallboard sections of BC Housing Design Guidelines and Construction Standards:

Partitions, acoustic measures:

- a. Acoustical insulating tape and strips, as required by wall assembly to meet required STC ratings.
- b. Acoustical sealant, non-hardening, as required by wall assembly to meet required STC ratings.
- c. Acoustical insulation, as required by wall assembly to meet required STC ratings. At party walls between the Building and any neighbours, an STC rating of 65 is to be achieved.
- d. At party walls between units, an STC rating of 55 is to be achieved.
- e. All interior wall assemblies, including wall sheathing must extend full height to the underside of the above floor assembly.
- f. Any penetrations through wall assemblies for mechanical ducting to be acoustically sealed.
- g. Provide adequate blocking inside walls at all millwork locations, grab-bar locations, and at wall-mounted door stops.
- h. Utilize DensShield backer board behind all tubs to 1524 mm (5'0" AFF).
- i. Shower and bath surrounds to be tile or acrylic.
- j. Abuse resistant wallboard is required in corridors, amenity spaces, up to 1219 mm (4'-0") A.F.F.

Wall assemblies for Heat Treatment rooms: **Refer Construction standards, Division 13 20 00 - Heat treatment Room, and Technical Bulletin #29**, Heat Treatment Room for Bed Bugs, Design and Construction Standards published in the B.C. Housing website.

09 65 00 - Resilient Flooring

The following requirements are in addition to and/or replace the requirements contained in the resilient flooring sections of BC Housing Design Guidelines and Construction Standards:

Resilient (smooth, non-absorbent, non-slip and washable) flooring requirements:

- i. Refer to Design Section 1 Sentence 7.2.4 for locations where resilient flooring, ceramic tile and carpet is acceptable for use.
- j. Use adhesives and sealants that have low VOC levels per LEED® requirements for listed under credit 4.1 “Low-Emitting Materials, Adhesives and Sealants”.
- k. Maximize recycled content if applicable.
- l. Maximize natural material content if applicable.
- m. All edges to be sealed.
- n. All seams of sheet goods to be fully welded.
- o. If resilient floor tiles are to be used, they are to be:
 - 0.25% dimensionally stable to minimize joint size.
 - 2mm thick or 0.11” minimum.
- p. Resilient flooring installer to guarantee in writing the installation of the flooring material for two (2) years against loose fitting, breaking of seams, breaking away from the sub-base or any other installation defect.
- q. Provide a minimum five (5) year guarantee that the resilient flooring will provide the specified level of appearance and wear, subject to proper care and maintenance. Follow manufactures specifications for installation and maintenance.
- r. Provide the City and/or Operator with a maintenance manual with instructions and care of the product as specified by the manufacturer.

Linoleum specification:

- s. Ensure that the linoleum product specified is an occupancy ready “ready to use” product with a built in high performance finish which requires no initial maintenance or polymer application.
- t. Platinum Certified linoleum in accordance with SMaRT Sustainable Products Standard is preferred.
- u. Linoleum is to have a renewable topcoat. No Polyurethane (PUR) coating permitted.

Vinyl specification:

- v. Homogeneous sheet vinyl with heat welded seams.

09 68 00- Carpet

The following requirements are in addition to and/or replace the requirements contained in the carpet sections of BC Housing Design Guidelines and Construction Standards:

- a. Use adhesives and sealants that have low VOC levels per LEED® requirements listed under credit 4.1 for “Low-Emitting Materials, Adhesives and Sealants”.
- b. Maximize recycled content and end-of-life recyclability.
- c. Carpet systems must meet or exceed the Carpet and Rug Institute’s Green Label Plus testing and product requirements per LEED® requirements for listed under credit 4.3 “Low-Emitting Materials, Carpet Systems”.

- d. Underpad, if required, acceptable product: 9mm (1/4") Duracushion, or pre-approved alternate.
- e. The carpet pattern must be integrated, not applied.
- f. Carpet may be broadloom or carpet tile.
- g. Carpet to be solution dyed nylon, level loop construction, pile weight 882g/m2 (26 oz/yd2) minimum if broadloom), or 610g/m2 (18 oz./yd2) minimum if carpet tile.
- h. All edges to be sealed.
- i. Polypropylene Olefin is not acceptable.

09 72 00- Wall Coverings

Common corridors and amenity spaces may have wall protection to a minimum of 800mm (3'0") AFF. To be determined by the City and/or Operator. Top edges and corners of wall protection material to be in turn protected (details to be provided for review). Acceptable materials:

- a. Vinyl-acrylic sheet material (PVC-free) such as Acrovyn or pre-approved alternate.
- b. Sheet Flooring.
- c. Pre-approved alternate.

09 91 00- Painting

The following requirements are in addition to and/or replace the requirements contained in the painting sections of BC Housing Design Guidelines and Construction Standards:

Paint: painting and finishing to be to the "Premium Grade" Master Painter and Decoration Association Recommendations and Standards; products to be MPI approved Institutional Low Odour VOC quality paint.

- a. Provide documentation that the MPI approved Institutional Low Odour VOC quality paint is being used.
- b. All surfaces, including those to be covered with wall vinyl, to have one coat of Hi-hide sealer primer to suit surface.
- c. Apply three finish coats and additional coats to cover as required.
- d. Paint to be sprayed or rolled on, completely dried and sanded between coats and finished to a smooth surface without streaks or marks.
- e. Gloss levels:
 - Kitchens, washrooms, laundry and janitor's room walls and ceilings to be G5 (semi-gloss).
 - Painted doors and door frames to be G5 (semi-gloss).
 - All other surfaces to be either G5 (semi-gloss), G4 (satin), or G3 (eggshell) as required for the particular Facility.
 - G1 and G2 (matte) finishes are not acceptable.

Division 10 - Specialties

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

10 28 19 - Plastic Laminate Tub Enclosure

Refer to BC Housing Design Guidelines and Construction Standards

10 40 00 - Identification Devices

- a. To conform to requirements for disabled persons.
- b. For amenity spaces, follow the recommendations in the report “Building a Path to Parks & Recreation for All”, prepared by the Trans* and Gender Variant Inclusion (TGVI) Working Group.
- c. Ensure signage is provided for the following:
 - Building identification
 - To indicate the building entrance.
 - At dedicated parking stalls.
 - For all necessary wayfinding.
 - At common amenity rooms, washrooms, laundry rooms and service rooms.
 - Numbering of individual units
 - Provide any signage required for the building, including fire and life safety plans.

Division 11 - Equipment

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

11 30 00 - Equipment

Residential Equipment

- a. All appliances to be “Energy Star” where “Energy Star” has that appliance category:
- b. Provide minimum one (1) year warranty on all appliances.
- c. Refrigerator: 20 to 22 cubic feet frost-free, with freezer compartment in all one, two and three bedroom units.
- d. While the above is also recommended for a studio, flexibility will be permitted to allow for a 12 cubic foot, frost-free, with freezer compartment in studio units.
- e. Stove with oven: 760mm (30”) wide, with 4 burners.
- f. While a 30” wide range is recommended, flexibility is permitted to allow for a 24” wide, 675mm stove with oven: with 4 burners in studio units. For studios: A cooktop may be installed in lieu of a range, if specifically preferred by the user group.
- g. Front-loading, stainless steel interior, dishwashers to be included in every unit that is 2 bedrooms or more, minimum 24” wide - built- in under counter. Provide the lowest price unit by any manufacturer as per EPA standard or better: Annual Energy use per year (kWh/yr): 275 or better.

- Water use gallons per cycle: 4 or better.
- h. In studio and one-bedroom apartments where dishwashers are provided, units can be compact 18" units.
 - i. Washer/dryer in common laundry rooms to be commercial grade.
 - j. Hood fans - refer to BCH for specifications.

Division 12 - Furnishings

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

12 20 00 - Window Treatment

Refer to BC Housing Design Guidelines and Construction Standards expect as follows.

- a. Roller shades may also be considered as a window treatment. Shades to be chain-operated, chains to be metal. Window treatment to be reviewed and approved by the City and/or Operator. Material to maximize reduction of solar gains and provide privacy.
- b. All chains and chords for blinds in amenity areas where children may have access to be secured either out of children's reach or such that they do not hang free.

12 32 00 - Manufactured Wood Casework

Refer to BC Housing Design Guidelines and Construction Standards expect as follows.

Construction / Quality standards for residential unit kitchens, bathrooms and vanities:

- a. Follow BCH standards.
- b. Use wood certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria or CSA certified material.
- c. All materials to be formaldehyde free.
- d. Use adhesives and sealants that have low VOC levels per the LEED® requirements listed under credit 4.1 "Low-Emitting Materials, Adhesives and Sealants".
- e. Hardware:
 - All hardware to be commercial grade.
 - Hinges: Blum or Mepla, 110° opening, or pre-approved equal.
 - System screw mounting plates required at all hinges.
 - Drawers:
 - Up to 150mm (6") deep - Blum or Mepla 3/4 extension slide or pre-approved equal.
 - Over 150mm (6") - KV or Accuride full extension slides or pre-approved equal.
 - Pulls: Richelieu 33205 Brushed D or similar easy to grab handle that is a pre-approved equal.
 - Standards: to be steel, adjustable on 12mm (1/2") centres, surface mounted or drilled pin supports.
 - Locks: Corbin 0737 & 0738 with #75 Strike or pre-approved alternate.

Countertops:

- f. 19mm high density particle board post-formed with backer under unsupported spans over 914mm, except, all counters with sinks shall be water-resistant plywood core.
- g. Acceptable materials: plastic laminate (post-formed edges) or pre-approved alternate.
- h. On island counters full wrap plastic laminate front and back.
- i. Use T-mold banding on side edges of counter.

Backsplashes:

- j. Follow BCH standards.
- k. Gypsum board with paint finish or vinyl wall covering not acceptable.
- l. Acceptable materials: plastic laminate (post-formed), ceramic tile, glass or other pre-approved alternate.

Division 13 - Special Construction

13 20 00 - Heat Treatment Room

Refer to BC Housing Design Guidelines and Construction Standards.

Division 14 - Conveying Systems

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

14 20 00 - Elevators

- a. The elevator controllers shall be non-proprietary allowing 3rd party maintenance to adjust or troubleshoot fault codes and be designed so that it can be included in the City of Vancouver elevator maintenance program.
- b. The suitability of the proposed controller products will be determined based on the proprietary nature of the equipment, degree of site programmability, track record on previous installations and the experience of local personnel with the product proposed.
- c. Pre-approved controller products: Motion Control Engineering (MCE) Model PTC-AC, or pre-approved alternate.

Division 21 - Fire Protection

Refer to BC Housing Design Guidelines and Construction Standards, except for the following modifications and additions:

Division 22- Plumbing

22 00 00 - Plumbing

1 General

.7 POTABLE WATER SYSTEMS

.5 Irrigation Systems:

- a. If irrigation is provided, use high-efficiency irrigation technology
- b. If irrigation is provided, include irrigation controller as part of Direct Digital Control system, stand-alone irrigation control system is not acceptable.

.12 Hose bibs:

- a. Hose bibs to be provided:
 - in each outdoor area
 - if the building has a dedicated garbage room, a hose bib (and floor drain) is to be provided there as well
 - at any condensing units
 - at any green roofs
- b. Hose bibs also to be vandal proof when they occur at grade or at any location that is accessible to the public.
- c. Hose bibs are to be recessed if they occur in children's outdoor play areas.
- d. If irrigation is not provided for landscaped areas, provide hose bibs at minimum 15.25m (50'0") apart.

.8 DOMESTIC HOT WATER SYSTEMS

- a. All hot water tanks to:
 - Be seismically secured
 - Have drain/leak pans installed and piped to drain.

.9 DRAINAGE SYSTEMS

- a. All drains in outdoor areas where children's play areas and/or urban agriculture are located, especially if they are also roof drains, to have sediment traps. Type and style of trap to be confirmed with the City of Vancouver for each Building.
 - Traps to be accessible for clean-out.
 - If there is not sufficient head room in the space below for a sediment trap, then at minimum provide a wye 45 degree elbow complete with clean-out access. Review with the City of Vancouver for each Building.
- b. All drains at hard-scaped outdoor areas to be bi-level.

2

Products

.2 FIXTURES

- a. All faucets to have aerators for water conservation.
- b. Each plumbing fixture to have its own shut-off valve.

.8 BATHTUBS

1-piece fibreglass non-slip, stain resistant, tub shower units with or without roof cap, including integrated shelf and grab bar, are permitted in place of the porcelain enameled steel bath tubs described in the BC Housing 2014 Design Guidelines and Construction Standards.

Division 23 - Heating Ventilation and Air Conditioning

Refer to BC Housing Design Guidelines and Construction Standards 2019, Section 4 – Construction Standards – Division 23 – 23 00 00 – Heating, Ventilating and Air Conditioning except for the following modifications and additions:

23 00 00 – Heating, Ventilating and Air Conditioning

1 General

Wherever the Energy and Environmental Design section is mentioned, replace with the City of Vancouver Housing Design and Technical Guidelines v10 Section 2 – Energy and Environmental Design.

.5 VENTILATION

- a. All rooms to be adequately ventilated to remove odours, especially common areas and washroom areas. Follow BC Housing: Section 4 - Construction standards, 23 500 Section 1 Line .5 Ventilation
 - Central ventilation supply and central exhaust system with heat recovery for suites is required. Where floor space is extremely tight for vertical shaft placement, consider one vertical shaft in a central location with horizontal branches. Horizontal branches to be considered carefully so not to reduce the ceiling height below 8'0" clear unless absolutely necessary.
 - As per the LEED® prerequisite EQp1 for Minimum Air Quality Performance, the project must meet the requirements of ASHRAE 62.1-2007, which requires that outdoor air must be supplied or distributed to the breathing zone in the occupiable space or spaces within a ventilation zone. This means that each individual occupiable space requires the supply or delivery of outdoor air. The use of suite door undercuts for supply of ventilation air to suites is not preferred.
 - The use of individual bathroom exhaust fans for general building exhaust is not accepted.
- b. All air intakes to be located away from sources of fumes or dust.
- c. Equipment to be easily accessible for maintenance. For example, filters and remote condensing units shall be accessible without the use of temporary scaffolding or Genie Lift type equipment. Install permanent cat walks for access and utilize best practices for fall arrest if required for service access. Units shall not be located over parking stalls. Wherever possible, equipment to be installed in a location that does not require fall arrest.

- d. If a shared kitchen is provided as an amenity, kitchen ventilation to be provided to suit Class 1, Class 2, Class 3, Class 4, or Class 5 type cooking, as applicable. Refer to per the City of Vancouver's Kitchen Ventilation Systems bulletin.

.6 CONTROLS

- a. Direct Digital Control to have internet access. Manufactures to be:
 - Delta Controls (installed by ESC Automation) or
 - Reliable Controls (installed by Control Solutions, Houle Controls or Fraser Valley Controls).
- b. Each major room (e.g. amenity space) is to be controlled individually.
- c. Perimeter to be on separate zones if the layout of spaces / windows creates problem areas.
- d. The requirement for thermostats is specific to the space and how the space is used. If thermostats are not required, sensors are to be installed.
- e. Refer also to Landscape (irrigation controls), Roofing (leak detections system monitoring), Metering and Lighting Controls sections for other items to be on Direct Digital Control.
- f. Refer to Section 5.0 Appendix 1 "Guideline for Direct Digital Control Specifications for New Projects for the City of Vancouver Rev. 1" for more details.

3 Execution

- a. Any rooftop units to be on sound isolation pads.
- b. Provide equipment demonstrations to City and/or Operator prior to turn-over.
- c. Provide operations and maintenance manuals complete with maintenance schedules.

Division 26 - Electrical

Refer to BC Housing Design Guidelines and Construction Standards 2019, Section 4 – Construction Standards – Division 26 – 26 00 00 – Electrical except for the following modifications and additions:

26 00 00 - General Electrical Provisions

2 Products & Installation

.3 BRANCH CIRCUIT PANELBOARDS

- a. Shall be accessible in suite entryway or hallway for access by maintenance staff

.4 WIRING METHODS

- b. Wiring to be copper. Aluminum alloy may be considered if the specification is pre-approved by CoV Facilities.

.5 WIRING DEVICES

- .5 All wiring devices in residential areas may be residential grade white finish, "Décora" style or as approved by the Owner & City of Vancouver Facilities.

.6 LIGHTING

- a. Minimize bulb types for each facility: no more than six (6) different types of interior bulbs will be allowed and no more than three (3) different types of exterior bulbs will be allowed
- b. Halogens and compact fluorescent are not acceptable

- c. In common areas, dimmable LED is preferred of commonly available form factor and size or suspended, fluorescent types T5 or T8 are acceptable.
- d. Fixtures in suites to be dimmable LED, with easily replaceable LED lamps and ballasts commonly available from factor and size mounted in standard overhead lighting J-box.
- e. Controls - Refer to the Design section and Appendix A for the Direct Digital Control section.
- f. All luminaires shall be selected to minimize glare and colour temperature appropriate for the area and usage.

Division 27 - Communications

27 00 00 - Communications

1 General

.1 TELECOMMUNICATIONS CABLE PLANT

.7 Telecommunications Cabling

- a. Resident Suites: Provide a minimum of one jack in each living room and each bedroom room.
- b. Minimum data outlets required: three (3) per unit, two (2) in the Operator's office. Provide one (1) with fixed IP address for Direct Digital Control. This may be in the office, or in the mechanical room where the controls are located provided there is sufficient space for a person to work in a lap-top in the room.

.4 Security System

Confirm if access equipment must be compatible with the City of Vancouver standards. If it does, acceptable product:

- Keyscan System Vantage

SECTION 5 - DRAWING AND DOCUMENT REQUIREMENTS

Refer to BC Housing Design Guidelines and Construction Standards

Appendix B - REDUCING AIR LEAKAGE BETWEEN SUITES

Refer to BC Housing Design Guidelines and Construction Standards

Appendix E - DIRECT DIGITAL CONTROL SYSTEM (DDC) SPECIFICATIONS

Refer to current City of Vancouver Direct Digital Control Technical Guidelines