From: Brad Jones
Sent: Friday, October 21, 2022 8:08 AM
To: Meghan@meghan4mayor.ca; diana@dianadilworth.ca; Callan M <callan@callanmorrison.com>; Samantha Agtarap <hi@samantha-agtarap.ca>; David Stuart <dc_stuart@shaw.ca>; contact@votehaven.com; Kyla Knowles <kylaknowlesforpomocouncil@gmail.com>
Subject: Master Plan Community Tour for Coronation Park

Good morning,

As the newly elected Port Moody City Council, firstly I'd just like to congratulate you all and say that the team at Wesgroup is looking forward to working collaboratively with all of you on Coronation Park. As part of this, we would like to invite you all to join us on a tour of our River District master plan in Vancouver, where we have been engaged in building out a mixed-use community for the past 20 years to talk about our approaches, what has worked well, what we learned and might do differently, etc. and how that relates to Coronation Park. It will also give us the opportunity to speak about the history of Coronation Park that led to approval of the OCP Amendment and we could answer any questions about the rezoning application, which is under review with City Staff currently. This is something we did with members of the previous Council, which we found to be quite an effective place for a great conversation around community building. I spoke with the Mayor elect and she was supportive of this idea and suggested that we try to coordinate this over a few hours a weekend date that works for most interested parties over the next month.

Could you all let me know by replying to this email if November 5, 6, 7, 19, 20 or 21st would work for you? The time would likely be mid-morning and we could order in lunch, or begin at lunch and run into the afternoon.

Thank you, we look forward to meeting all of you

Brad Jones
SVP Development

Wesgroup Properties
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Visit us online at **wesgroup.ca**

From: Evan French <efrench@wesgroup.ca>
Sent: Wednesday, November 16, 2022 9:53 AM
To: mlahti@portmoody.ca; sagtarap@portmoody.ca; ddilworth@portmoody.ca; kyknowles@portmoody.ca; alubik@portmoody.ca; hlurbiecki@portmoody.ca; cmorrison@portmoody.ca
Cc: Brad Jones <bjones@wesgroup.ca>; Dean Johnson <djohnson@wesgroup.ca>; Kaylen Blomkamp <kblomkamp@wesgroup.ca>
Subject: Master Plan Community Tour for Coronation Park Follow Up

Hi Councillors,

I hope that you have all had a good week. Thanks again to those who were able to make it out over the weekend to tour around River District with our team and talk through what we have learned over the last 20 years of our build out and how it relates to Coronation Park. It was a great opportunity to initiate conversation and some community building. For those who were unable to make it, we would still very much like to schedule another tour that could work with everyone's schedules.

In the meantime, I wanted to forward the slide deck we referenced during the tour. Generally, you will find some background on Wesgroup, an overview of opportunities and challenges with masterplan developments, a timeline of Coronation Park's process and a summary of each iteration of the project as it made its way through the OCP approvals process.

Please don't hesitate to let me know if you have any questions.

Best,
Evan French

Evan French
Senior Development Manager

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Vancouver, BC V6C 0E4

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coronation park

HISTORY AND OVERVIEW

NOVEMBER 6, 2022

wesgroup

ABOUT wesgroup

- Family-owned real estate company specializing in the development of sustainable, master planned community, mixed-use space
- One of Western Canada's largest private real estate organizations with over 230 employees
- Over 3.2 million SF of commercial property
- Built more than 7,000 homes in 100 communities with 1,379 homes under construction
- Nation's largest recipient of funding through CHMC Rental Construction Financing Initiative to bring forward over 1,000 new rental homes

RIVER DISTRICT

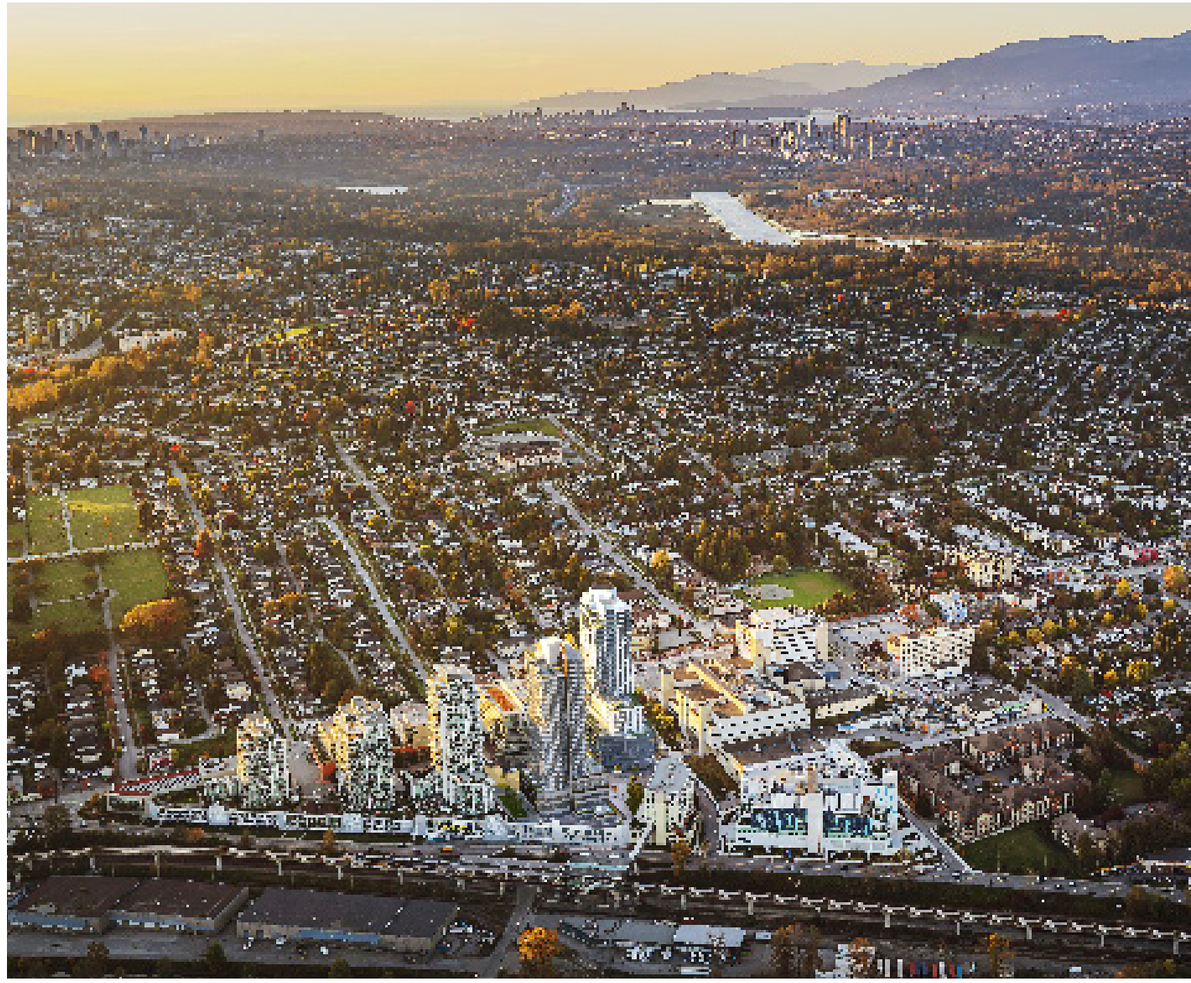
- 128-acre former industrial site
- Acquired in 2001
- Official Development Plan adopted in 2006
- Added 500K SF+ of secured market rental housing
- Currently over 1,800 units built for 3,000 residents
- Anticipated completion in 2035+
- 18,000 residents, 250,000 SF of retail space & 260,000 SF of office space at full build-out
- 2 schools, 4 daycare centers
- Community centre
- 25-acres of park use

DEVELOPMENT TIMELINE

2002	2004	2006	2006	2008	2010	2023	2040
Planning Program Commenced	Policy Statement Adopted	Official Development Plan Adopted	Additional Rental Housing Added	Community Sub-Area Rezoning Applications Submitted	Community Sub-Area Rezoning Approval	Official Development Plan 10 Year Update Approved	Full Build Out Complete

BREWERY DISTRICT

- 9-acre master planned community, former Labatt Brewery
- Acquired in 2007
- ODP update in 2008 converting 375K SF of strata to secured market rental housing
- Rezoning application approved in 2007
- Currently over 543 homes built & 356,112 SF of commercial space built
- Anticipated completion in +2025
- 900 residential homes, 560,000 SF of office space & 140,000 SF of retail space
- Tenants include Save-On-Foods, Shoppers Drug Mart, Translink, Browns Socialhouse and Starbucks



DEVELOPMENT TIMELINE

2005	2006	2007	2016	2019	2025
Planning Program Commenced	Rezoning Application Submitted	Rezoning Application Approved	Rezoning to convert strata to market rental	2nd rezoning to convert almost 300K SF strata to market rental	Full Build Out Complete

Master Planning:

OPPORTUNITIES

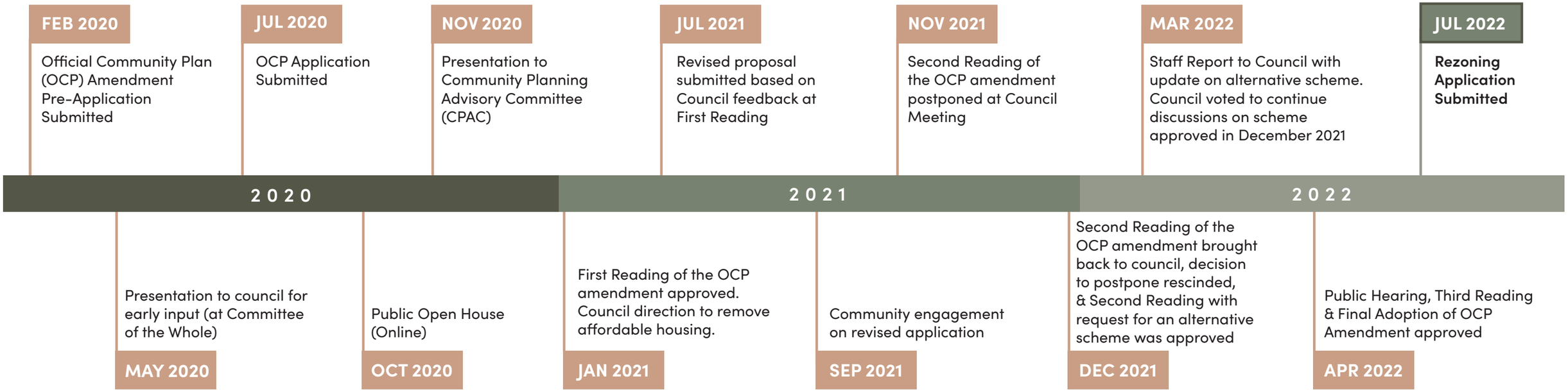
- Adapt to changing needs of community
- Ability to provide more rental through time
- Deliver more & larger-scale community amenities through density that may not be possible on a single site
- Improved urban design, sustainability & a complete community
- Opportunity for community building & stronger placemaking
- Act as partner with local municipality on a neighbourhood planning level

Master Planning:

CHALLENGES

- Funding more complex for land assembly vs. single site
- Phasing and infrastructure
- Front-ending community amenities
- Changing policy and council priorites due to long-term nature of master plans
- Additional cost & work
- Cost of capital and carrying

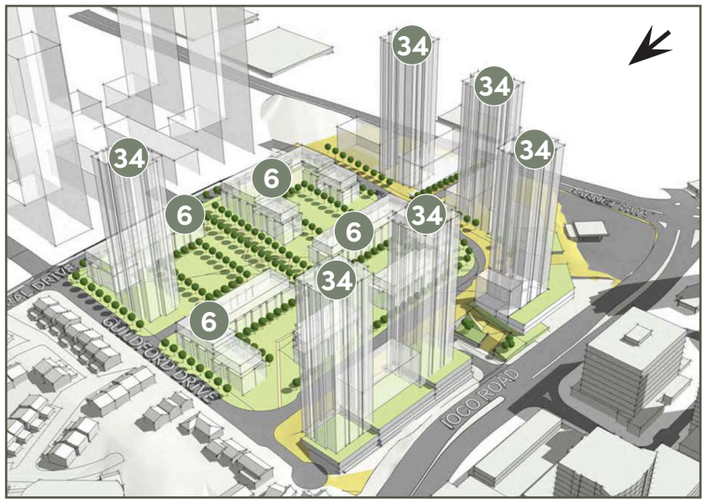
TIMELINE

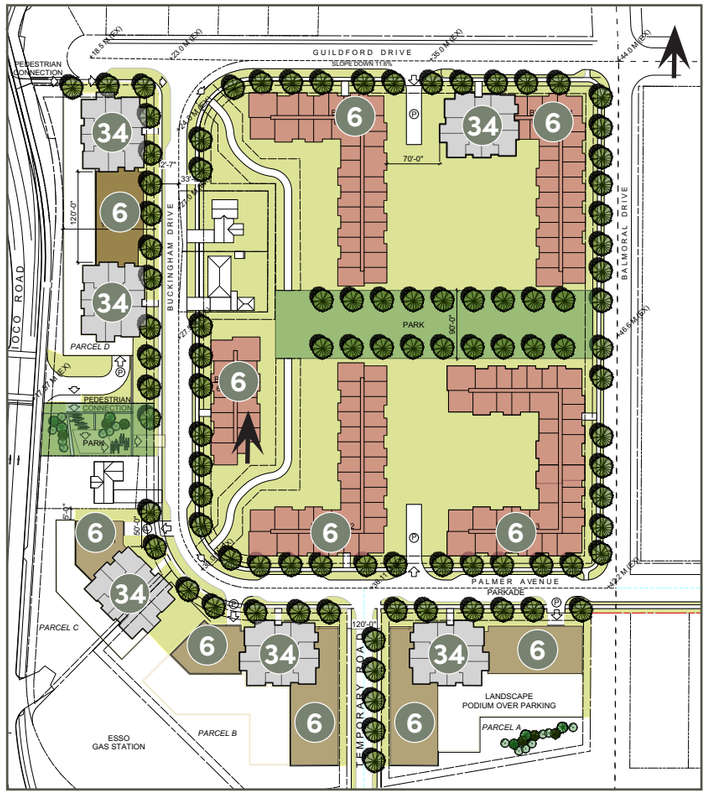

FEB 2020
Official Community Plan (OCP) Amendment Pre-Application Submitted
JUL 2020
OCP Application Submitted
NOV 2020
Presentation to Community Planning Advisory Committee (CPAC)
JUL 2021
Revised proposal submitted based on Council feedback at First Reading
NOV 2021
Second Reading of the OCP amendment postponed at Council Meeting
MAR 2022
Staff Report to Council with update on alternative scheme. Council voted to continue discussions on scheme approved in December 2021
JUL 2022
Rezoning Application Submitted
2020
2021
2022
Presentation to council for early input (at Committee of the Whole)
MAY 2020
Public Open House (Online)
OCT 2020
First Reading of the OCP amendment approved. Council direction to remove affordable housing.
JAN 2021
Community engagement on revised application
SEP 2021
Second Reading of the OCP amendment brought back to council, decision to postpone rescinded, & Second Reading with request for an alternative scheme was approved
DEC 2021
Public Hearing, Third Reading & Final Adoption of OCP Amendment approved
APR 2022

CORONATION PARK: Pre-Application (Feb 2020)

Presented to Council at Committee of the Whole in May 2020

Heights	34 storeys
Gross Floor Area	2,442,446 ft²
Residential Unit Count	• 2,300 Strata Market Units • 50 Affordable Rental Units • 450 Market Rental Units
Community Benefits	• Linear Park - 1.10 Acres • Retail - 12,000 ft²
Council Direction	• Increase and centralize park space • Increase retail space • Add daycare • Increase below-market rental housing • Remove market rental housing • Improve loco frontage • Reduce number of towers



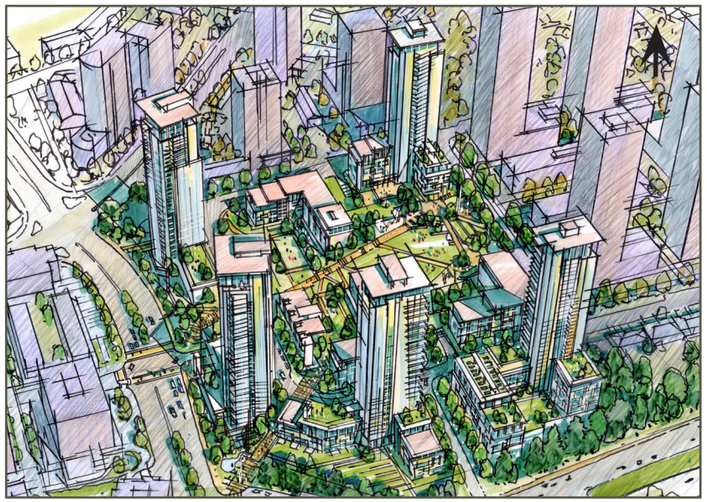


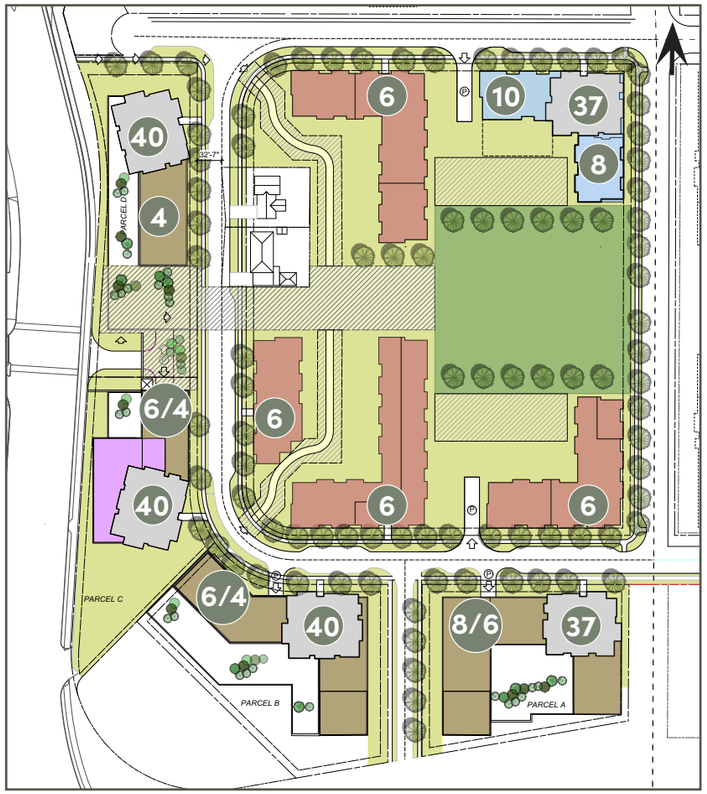
CORONATION PARK:

OCP Amendment Application (July/Nov 2020)

Presented to Community Planning Advisory Committee & Council at First Reading in January 2021

Heights	37-40 storeys
Gross Floor Area	2,429,548 ft²
Residential Unit Count	• 2725 Strata Market Units • 175 Below Market Rental Units
Community Benefits	• Daycare - 7,962 ft² • Retail - 10,990 ft² • Public Park Space (City-Owned) - 1.5 Acres • Public Open Space - 1.9 Acres
Council Direction (Key Points)	• Reduction in heights over affordable housing • Increase employment-generating uses and jobs-to-population ratio • Explore social connectedness and mental health in high rises • Tower reconfiguration • Eliminate internal roads



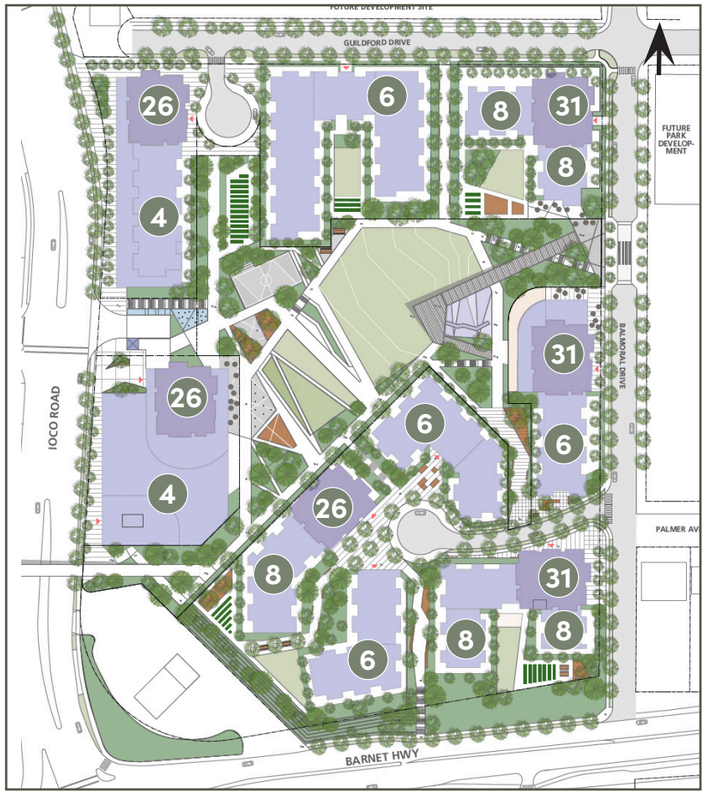


CORONATION PARK:

Revised OCP Amendment Application (Nov/Dec 2021)

Presented to Council at Second Reading in November 2021/December 2021

Heights	31-26 storeys
Gross Floor Area	2,208,013 ft²
Residential Unit Count	• 2565-2585 Strata Market Units • 80-100 Market Rental Units
Community Benefits	• Daycare - 9,500 ft² • City-Owned Amenity Space - 3,000 ft² • Retail - 76,708 ft² • Office - 29,248 ft² • Public Park Space (City-Owned) - 2.53 Acres • Public Open Space - 1.5 Acres
Council Direction	• Explore affordable housing options with partnerships while maintaining density • Higher jobs to population ratio • Provide option to council that provides alternate massing

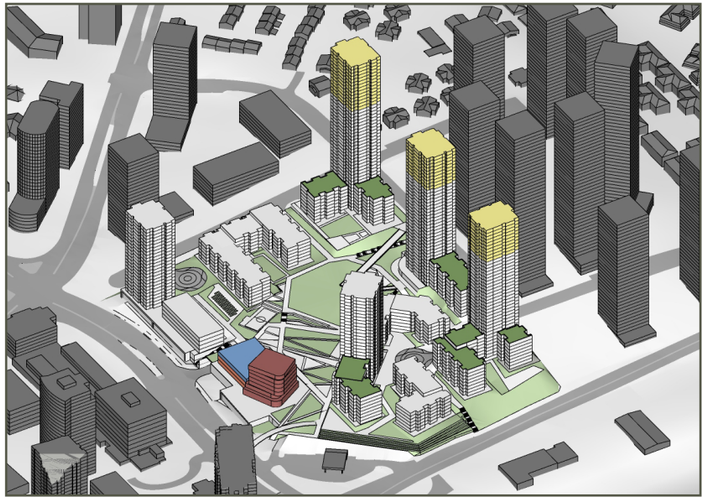


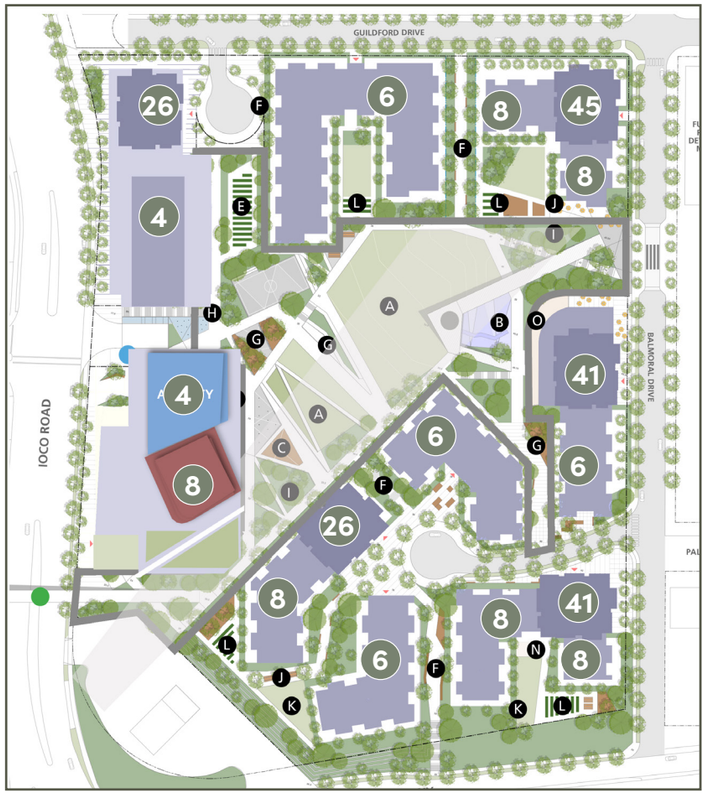
CORONATION PARK:

Revised Massing (March 2022)

Presented to Council in March 2022

Heights	41-45 storeys
Gross Floor Area	2,262,050 ft²
Residential Unit Count	• 2565-2585 Strata Market Units • 80-100 Market Rental Units
Community Benefits	• Daycare - 9,500 ft² • City-Owned Amenity Space - 3,000 ft² • Retail - 76,708 ft² • Office - 54,000 ft² • Public Park Space (City-Owned) - 2.53 Acres • Public Open Space - 1.5 Acres
Council Direction	• Preferred previous version, which recieved Second Reading in December 2021





INCLUSIONARY ZONING POLICY

Approved by Council on April 19, 2022

SUMMARY OF POLICY: Requires all new multi-family developments seeking additional zoning through an Official Community Plan (OCP) amendment or rezoning (above a 2.0 FAR) to provide either:

- a minimum 15% of residential FAR as below-market rental units, or
- a minimum 6% of residential FAR as non-market rental units.

The City may allow for flexibility in the following circumstances:

- Applications that can demonstrate **unique development circumstances and financial hardship that may impact development viability, and would jeopardize the delivery of a community amenity,**
- Applications that includes existing market rental properties subject to the City's Rental Protection Policy, or
- Applications that provide significant community benefits (social, environmental, cultural) of a demonstrable value.

SUMMARY OF FINANCIAL ANALYSIS (Coriolis Consulting):

- 6 different development scenarios, indicative of a typical redevelopment property in Port Moody were selected by Staff and the financial consultant (Coriolis)
- Findings suggest land values in Port Moody reduced by 18% and 47%
- Expected reduction in density bonus contributions by 40%-100
- May not be financially viable for some higher density projects to provide affordable housing due to unique circumstances such as servicing costs and provision of on-site amenities
- Below-market rental requirement of 15% would significantly reduce the number of viable rezoning scenarios by 65%

WESGROUPS RESPONSE:

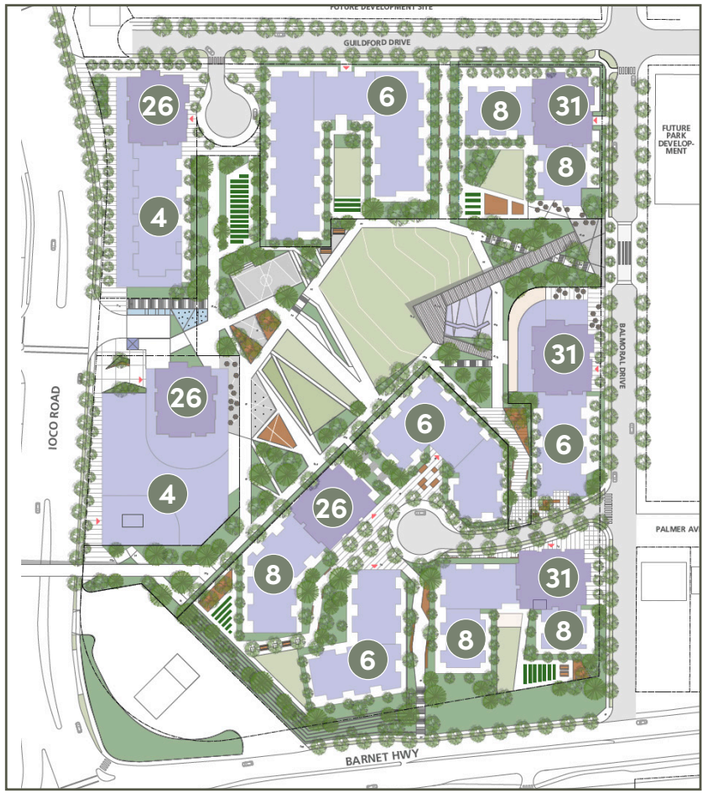
- A financial analysis has been completed by Altus and submitted with rezoning application (submitted July 2022)
- Given the extensive community benefits committed to be delivered through Coronation Park, and the moving market, without external funding or density increases the project is not capable of delivering housing under the inclusionary zoning policy

CORONATION PARK:

Public Hearing (April 26, 2022)

Presented to Council in April 2022

Heights	26-31 storeys
Gross Floor Area	2,208,013ft^2
Residential Unit Count	• 2565-2585 Strata Market Units • 80-100 Market Rental Units
Community Benefits	• Daycare - 9,500 ft^2 • City-Owned Amenity Space - 3,000 ft^2 • Retail - 76,708 ft^2 • Office - 54,000 ft^2 • Public Park Space (City-Owned) - 2.53 Acres • Public Open Space - 1.5 Acres • Pedestrian Overpass • $86 M in Community Benefits
Presented Options for Affordable Housing	1. Provincial/Federal Funding 2. City Control 3. Provincial / Federal Funding plus 4. Developer / City Funded



AFFORDABLE HOUSING: OPTIONS

Presented to Council at Public Hearing on April 26, 2022

BACKGROUND:

- Third party financial analysis (November 2020)
- Determined that inclusion of affordable housing only achievable through additional density

FUTURE OPTIONS:

1. **Provincial/Federal Funding**
   - Convert rental housing to affordable housing through government programs
2. **City Control**
   - City creates funding through allocation of development charges
3. **Provincial/Federal Funding Plus**
   - Utilizes first option and provides rental with affordable housing component
4. **Developer/City Funded**
   - Additional density added to site to pay for affordable housing

SUMMARY OF OCP PROCESS

	February 2020 Pre-application	**July/November 2020** OCP Amendment Application (First Reading)	**November/December 2021** Revised OCP Amendment Application (Second Reading)	**March 2022** Revised Massing	**April 2022** Public Hearing (Third Reading & Approval)
Gross Floor Area	2,442,446 ft^2	2,429,548 ft^2	2,208,013 ft^2	2,262,050 ft^2	2,208,013 ft^2
Affordable Housing Units	50	0	0	0	0
Market Rental Units	450	175	80-100	80-100	80-100
Market Strata Units	2300	2725	2565-2585	2565-2585	2565-2585
Total Unit Count	2800	2900	2665	2665	2665
Community Benefits	City Owned Park - 1.1 Acres Retail - 12,000 ft^2	Daycare - 7,962 ft^2 Retail - 10,990 ft^2 City-Owned Park - 1.5 Acres	Daycare - 9,500 ft^2 Retail - 76,708 ft^2 City-Owned Park - 2.53 Acres Office - 29,248 ft^2 City-Owned Amenity Space - 2,000 ft^2	Daycare - 9,500 ft^2 Retail - 76,708 ft^2 City-Owned Park - 2.53 Acres Office - 54,000 ft^2 City-Owned Amenity Space - 2,000 ft^2	Daycare - 9,500 ft^2 Retail - 76,708 ft^2 City-Owned Park- 2.53 Acres Office - 54,000 ft^2 City-Owned Amenity Space - 2,000 ft^2 Pedestrian Overpass

*Numbers based on staff report

From: Evan French <efrench@wesgroup.ca>
Sent: Wednesday, December 7, 2022 12:23 PM
To: Samantha Agtarap <sagtarap@portmoody.ca>; Callan Morrison <cmorrison@portmoody.ca>
Cc: Brad Jones <bjones@wesgroup.ca>; Dean Johnson <djohnson@wesgroup.ca>; Kaylen Blomkamp <kblomkamp@wesgroup.ca>
Subject: Coronation Park - Step Code Tour and Discussion

Hi Councillors,

I wanted to thank you again for taking time on Monday morning to come down to River District to talk through the nuance of BC's Step Code and how it impacts the overall design of buildings. We had a great time and while cold, the sun was certainly preferred to sleet!

Attached you will find a digital copy of the materials we provided during our tour. Much of the information in this package was taken from the BC Step Code Design Guide prepared by BC Housing and can be found here: https://www.bchousing.org/sites/default/files/rcg-documents/2022-09/BC-Energy-Step-Code-Design-Guide-Supplement.pdf .

As we had talked about, to achieve Step 3 or 4, it is critical that the building applies the key design strategies. High-end mechanical systems and insulation/wall assemblies can only achieve so much with the biggest impact coming from the base-design of the building. This includes a strategically orientated building with a larger footprint. Minimal articulation or terracing also help to improve the VFAR. A reduction in window wall with approximately a 30% WWR is required to achieve Step 3 and 4. Ultimately, in achieving upper levels of Step Code it is key to lean on colouration and balcony design to achieve an aesthetically pleasing design rather than sculpted/articulated massing.

It is important to note that currently no Step 4 building has been built in Metro Vancouver that we can look to. While on a different code system, the complications in achieving the equivalent upper levels of Step Code have the City of Vancouver looking at retracting some of their targets and focusing more on the GHGI calculations.

Please feel free to share this information with the rest of Council. If your colleagues are interested, we would be more than happy to host another tour or perhaps arrange for Chad from BCBS to run a session on Step Code for both staff and Council.

Best,
EF

RIVER DISTRICT ENERGY PERFORMANCE PROGRESS

BC Building Science

wesgroup

	Parcel 16.2	Parcel 26	Parcel 29	Parcel 11	Parcel 16.2 Modified
TEDI	55	50	40	30	15
TEUI	145	140	130	120	100
GHGI	9	8	6	5.5	3
VFAR	0.50	0.60	0.53	0.65	0.45
WWR	50%	30%	40%	30%	30%
GLAZING	Double-glazed	Double-glazed	Double-glazed	Triple-glazed	Triple-glazed
STEP	~1	~1.5	~2.5	~3	~4, Future

03.2 Performance Metrics

The BC Energy Step Code specifies levels of performance in Thermal Energy Demand Intensity (TEDI), Total Energy Use Intensity (TEUI), and airtightness. (See the Glossary of Terms for an explanation of each.) The key principles for achieving good performance in each of the three metrics are outlined below.

BC ENERGY STEP CODE

TEDI

Thermal Energy Demand Intensity is a measure of the total heating energy necessary to maintain a comfortable indoor temperature over the course of a year, measured and expressed in kWh/m²/year. The metric considers both passive gains (e.g. incoming solar radiation, heat generated by indoor appliances) and losses (e.g. heat losses through the building envelope), as well as any energy needed to mechanically heat a building or warm incoming ventilation air.

To achieve a TEDI target, professionals must maximize gains and minimize losses as much as possible, and reduce reliance on mechanical systems.

Strategies for achieving TEDI targets:

- *Minimize heat loss*
- *Consider occupant and unit density*
- *Optimize fenestration*
- *Increase building R-values*
- *Reduce thermal bridging*
- *Increase airtightness*
- *Recover heat during ventilation*

TEUI

Total Energy Use Intensity is a measure of the total amount of energy a building uses over the course of a year, per unit of building area. The metric considers all energy used in a building, including plug loads (e.g. lighting, appliances) and process loads (e.g. elevators, mechanical systems, fans). Like TEDI, TEUI is measured and expressed in kWh/m²/year.

Strategies for achieving TEUI targets:

- *Consider occupant and unit density*
- *Optimize fenestration*
- *Increase airtightness*
- *Recover heat during ventilation*
- *Separate heating and cooling from ventilation*

Airtightness

In Part 3 buildings, professionals measure ***airtightness*** using the Normalized Air Leakage Rate, which tracks the rate at which air leaks through the envelope. The air leakage rate is measured per unit of envelope area and expressed as L/s·m² at 75 Pascals pressure differential.

Strategies for increasing airtightness include:

- *Designing buildings with a more compact massing to reduce the number of corners*
- *Limiting building-envelope penetrations*
- *Paying careful attention to detailing at interfaces*
- *Ensuring strict adherence to construction practices*

VANCOUVER'S ZEBP

GHGI

The City of Vancouver has authority over its own building code, and has instituted its own step code-like provisions described in the Zero Emissions Building Plan. In addition to setting targets for TEUI and TEDI, the plan also sets thresholds for performance in ***greenhouse gas intensity (GHGI)***.

GHGI is a measure of the emissions intensity of a building's emissions, measured and expressed in tonnes or kilograms of carbon dioxide equivalent per unit area over the course of a year (kg CO^2/m²/year).

For more information, go to Supplement S, pg 45.

03.3 Achieving the BC Energy Step Code

The strategies presented in this guide represent the lowest cost strategies to achieve Steps 2, 3, and 4 of the BC Energy Step Code in Climate Zone 4, as determined by the 2017 BC Step Code Metrics Study. However, this is only one set of strategies that can be used to achieve the performance targets in the BC Energy Step Code. There are many different possible combinations of measures that can be taken to achieve the same level of performance, depending on the nature and goals of the project. Designers should use energy models to explore the different trade-offs between strategies and identify the appropriate set of architectural, envelope, and mechanical strategies for their project.

This chart presents a summary of the kinds of measures required to meet each step of the BC Energy Step Code.

Higher Performance

Step 1

Step 1 is often referred to as "enhanced compliance", because it simply requires builders to demonstrate that they have achieved the energy-efficiency requirements of the existing BC Building Code. In a Step 1 project, builders must supply officials with an energy model to demonstrate that their design will meet the code requirements. Upon substantial completion, a builder must also submit the results of an airtightness test. He or she would ideally do so before installing drywall or other interior surfaces, to allow opportunities to address leaks.

Step 2

Builders can achieve Step 2 using conventional practices and widely available materials. However, they will need to improve the building's overall airtightness and use additional measures. For example, they should:

- [ ] Design for a lower overall window-to-wall ratio (e.g. 40% WWR)
- [ ] Require higher building R-values (e.g. minimum effective R-10 for walls and effective R-20 for roofs)
- [ ] Improve window performance (e.g. double- and triple-glazed windows with higher U-values)
- [ ] Improve heat-recovery efficiency (e.g. 60%)

Step 3

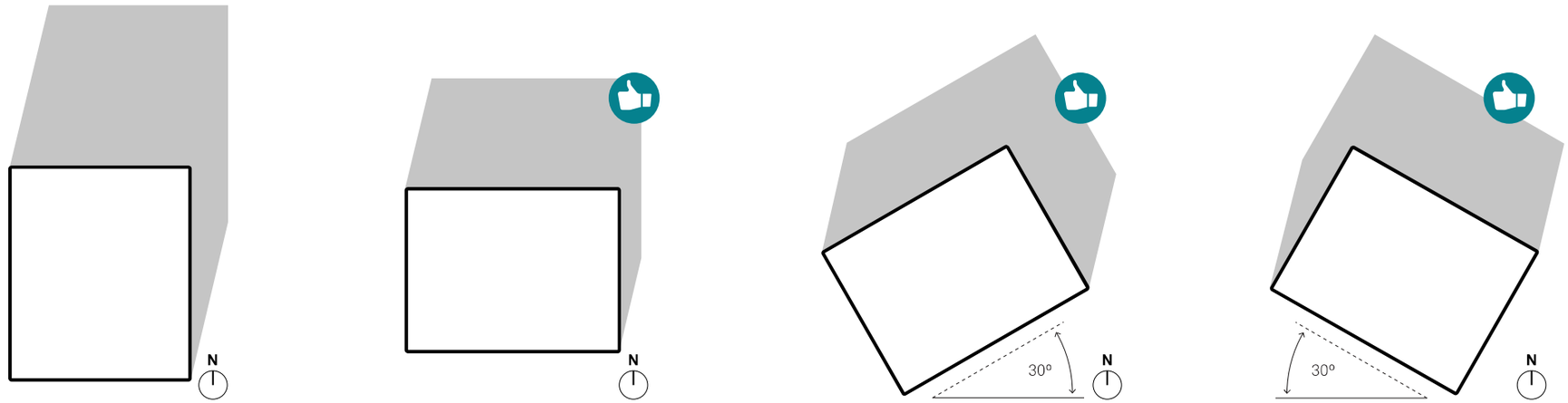
To comply with the requirements of Step 3, designers will use many of the Step 2 strategies noted here. However, they will also begin to take a more integrated approach. To reach Step 3, they might also:

- [ ] Consider sealing off individual building units and uses from one another to improve airtightness, a practice known as compartmentalization
- [ ] Reduce thermal bridging

Step 4

Designers wishing to achieve Step 4's more rigorous energy efficiency and airtightness requirements will need to reconsider multiple practices and systems. Although they can achieve this level of performance using wall systems applicable to the Lower Steps, they will want to consider the building envelope first. Designers should look to the strategies we suggest for Step 3 and also:

- [ ] Specify very high levels of heat recovery efficiency (e.g. at least 80%)
- [ ] Source triple-glazed windows with high performance frames and reduce frame elements
- [ ] Eliminate all significant thermal bridges



Professionals who orient their buildings to maximize solar-gain potential from the south can reduce heating demands by as much as 30 to 40%. While this strategy does not minimize heat losses per se, it does take advantage of passive heat gains that can provide a benefit when reaching for a TEDI target.

Take Advantage of Natural Light

Thoughtful building orientation can also help designers reach TEUI targets, by taking advantage of natural light to reduce lighting loads.

Maximize Solar Gains

To maximize the potential for solar gains, designers should orient a proposed building's longest facade as close to due south as possible. Ideally, the south-facing facade should be within 30 degrees of due south. While many sites are constrained by existing adjacent buildings and street grids, opportunities may exist to orient upper floors to the south.

Avoid Overheating

At the same time, designers taking advantage of solar gain must be careful to avoid overheating in the summer months, by specifying the use of thermally-broken external shading (see Exterior Shading callout).

KEY TAKEAWAY

Orient the longest facade of the building towards south as much as possible. Shade south-facing facades to mitigate the risk of overheating.

Most important metric(s) to consider TEDI TEUI

04.2a Building Massing: High-Rise MURB

The design of high-rise residential towers is often constrained by existing site conditions, including the size of the lot and its orientation with respect to the existing street grid. However, designers can take measures to improve a proposed building's ability to meet the BC Energy Step Code's TEDI targets.

Lower VFAR

High-rise residential towers designed with a lower vertical surface area to floor area ratio (**VFAR**) have a lower overall potential for heat loss through the building envelope. Towers with smaller, narrower floor plates tend to lose more heat through the building envelope. In tower forms, any floor plate of 600m² (6,500ft²) or less can be considered to be a "smaller" floor plate. As cities often emphasize smaller floor plates to help maximize daylight to the street, building designers will need to strive for a balance between municipal requirements and a building's energy performance.

Simpler Form

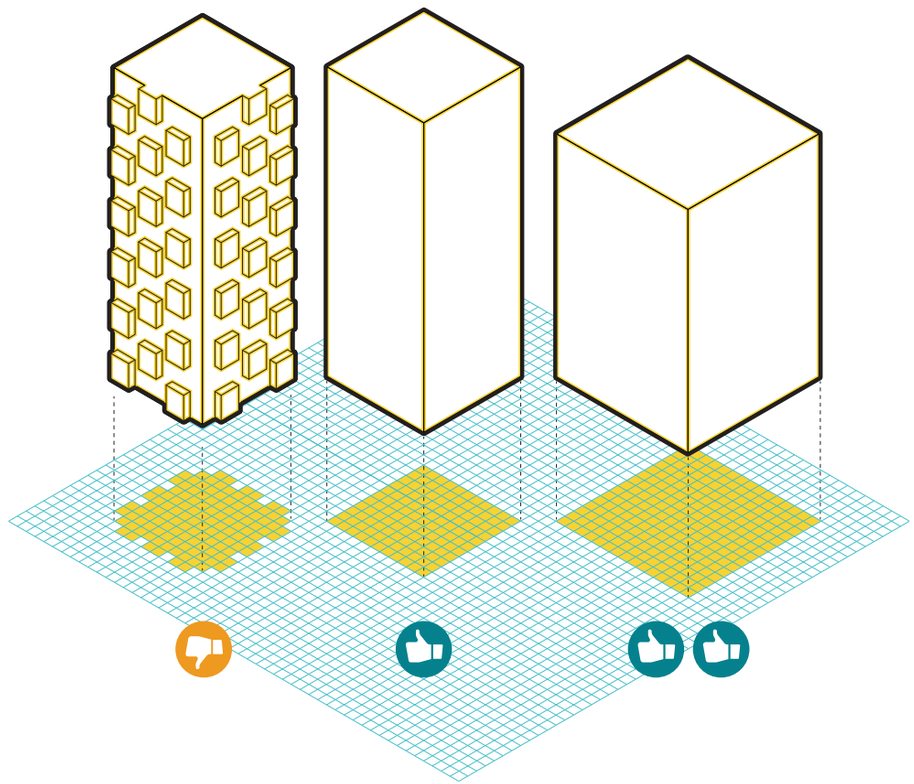
Heat loss through the building envelope is also influenced by the complexity of the building's shape, or **massing**. High-rise MURBs tend to have simpler forms than low- or mid-rise residential buildings. Nonetheless, designers should still work to minimize the number of junctions, indents, and intersections in the building envelope.

Optimized Orientation

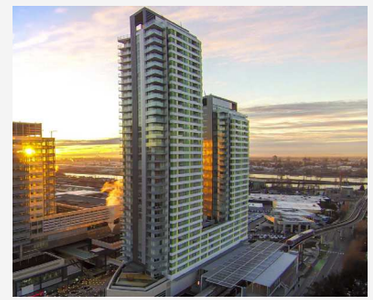
Finally, high-rise MURBs that are designed in such a way that incoming solar gains are maximized in the winter will reduce heating requirements in the wintertime, helping to achieve TEDI performance targets. The **orientation** of residential towers should allow the longest facade of the building to align with due south as much as possible, while ensuring precautions are taken to address the potential for overheating (see Fenestration and Shading). While orientation is often highly constrained by existing street grids and other considerations, high-rise MURB can be designed in such a way that the building's podium aligns with the grid, and the tower is oriented to align towards south.

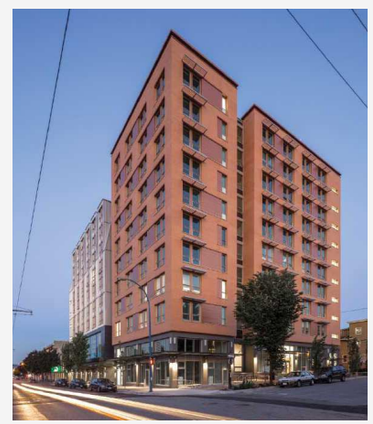
A building with several complex junctions and corners will lose far more heat through the envelope than a building that has been designed as a simple, solid form (e.g. cube, rectangle)

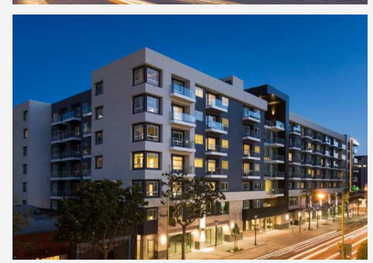
Complexity of shape and size of floor plate both impact Step Code targets



Top *Marine Gateway, Vancouver, B.C.*
Middle *Budzey Building, Vancouver, B.C.*
Bottom *Olympic by Windsor, Los Angeles, CA*







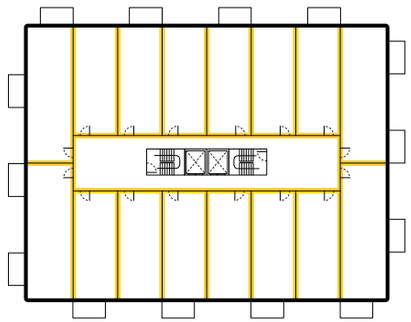
Most important metric(s) to consider TEDI Airtightness

03.42 Consider Unit Density

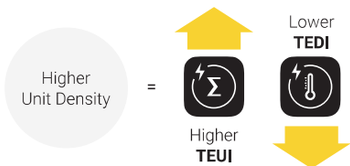
Occupant and unit density significantly influence a proposed building's TEDI and TEUI performance.

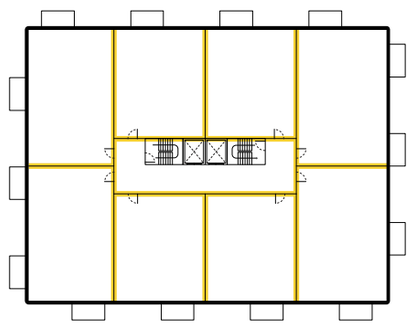
Higher occupant density can make it easier to achieve a TEDI target, while pushing a TEUI objective farther out of reach. This is because a building's occupants drive plug loads, as more people switch on more appliances, and turn on hot-water faucets. As such, the higher a building's occupancy, the more difficult it may be to achieve a specified TEUI. While this trend can be inhibited by poor ventilation, designers should nevertheless look for opportunities to reduce hot-water demand when planning high-occupancy buildings.

On the flip side, the higher a given building's occupancy, the greater the potential for passive internal heat gains. Those appliances and all that hot water — and even the warmth generated by human bodies — all help passively heat buildings. As such, in cooler months, higher occupancy can also reduce a building's heating requirements. Designers should therefore carefully consider expected occupant and unit densities when calculating TEDI and TEUI.

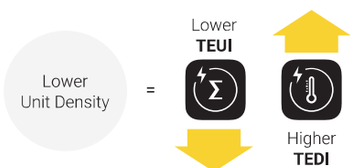


Higher density buildings will achieve TEDI targets more easily as a result of higher rates of passive heating, but can experience challenges in achieving TEUI targets.





Lower density buildings experience the opposite, and have greater ease in achieving TEUI due to a lower overall demand for energy.



KEY TAKEAWAY

Consider trade-offs between TEDI and TEUI carefully in building energy modelling.

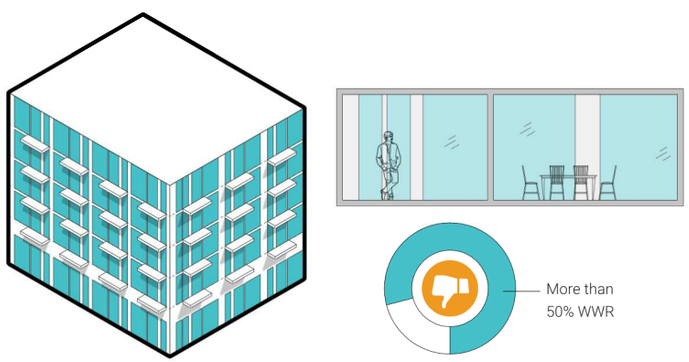
Most important metric(s) to consider TEDI TEUI

03.43 Optimize Fenestration

Fenestration refers to the number, size, and placement of windows on a building's facades. Size and placement are key factors when considering passive heat gains and daylighting.

Window-to-Wall Ratio (WWR)

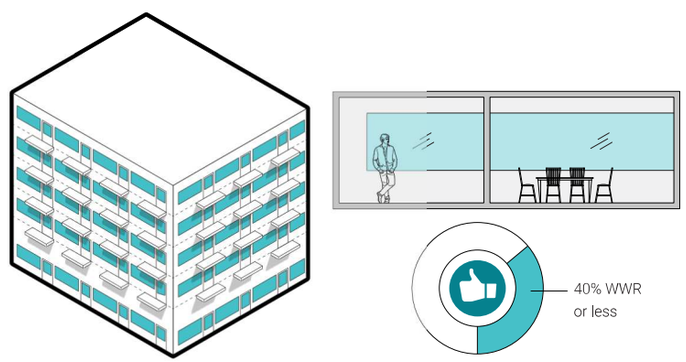
When compared with opaque walls, windows offer low thermal resistance. As such, a lower window-to-wall ratio (WWR) reduces heat gain and loss through the envelope by increasing the area of insulated wall. As a rule of thumb, designers working to comply with the Lower Steps of the BC Energy Step Code should target no more than a 50% WWR. Buildings intended to meet Upper Steps should target a WWR of less than 40%.



While many building designs emphasize much larger WWR (e.g. floor-to-ceiling windows), larger windows can provide harsh light at certain times of the day.

Orientation and Site Specific Considerations

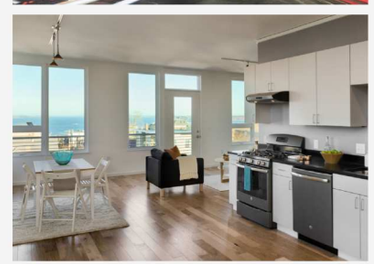
Designers should also consider the direction the building's windows will face, as well as site-specific considerations, such as shading from nearby buildings. Buildings with a high WWR on the southern elevation will maximize their solar gains in the cooler winter months when the sun is lower in the sky. As north-facing windows have the lowest potential for solar gains, WWR on north facades should be more modest if possible. Abundant glazing on south and west facades will support solar heat gains during the winter months.



Reducing the size of windows can actually help to improve occupants' comfort by reducing glare and providing a more comfortable indoor temperature, without requiring any additional indoor lighting or losing the potential for views.

Designers should specify lower window sills to sit 24 inches or more above the floor helps to reduce unnecessary solar radiation at foot-level, while still allowing light and views while occupants are sitting or standing.

Top *Cornerstone Apartments, Vancouver, B.C.*
Middle *Girard, 600 Harrison Ave, Boston, MA*
Bottom *Marquis Lofts, Portland, ME*



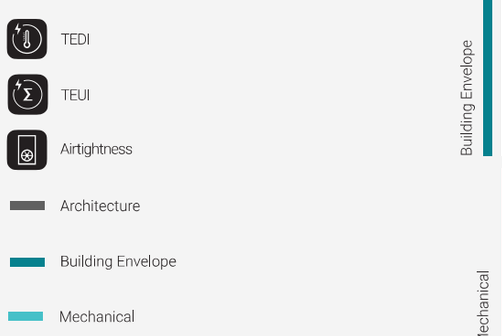
KEY TAKEAWAY

Target a 40% window-to-wall ratio (WWR)

Most important metric(s) to consider TEDI

03.5 Summary of Key Strategies

While certain design strategies will help meet a single BC Energy Step Code performance target (e.g. TEDI), others will help accomplish all three. Practitioners should consider these core strategies — addressing building shape, orientation, and envelope, as well as mechanical and ventilation systems — early in the design process. Proponents must retain the services of an energy modeler at the design and permitting stages. To ensure overall compliance, designers should rely on hourly energy modelling tools.

Diagram Description

The figure to the right shows the importance of each design strategy in relation to the three key metrics of the BC Energy Step Code (TEDI, TEUI, and airtightness). To explore the impact of different design decisions interactively, visit the **Building Pathfinder website**.