Section 6.0

Architectural Drawings

contents

6.1 Project Data & FSR Summary

PROJECT INFORMATION BREAKDOWN (NORTH TOWER)

PROPOSED USE	RESIDENTIAL / COMMERCIAL					
FSR AREA - TOTAL	98,234.9 ft² (9,126.3 m²)					
	FSR AREA - COMMERCIAL	13,276.7 ft² (1,233.4 m²)				
	FSR AREA - RESIDENTIAL	83,376.2 ft² (7,745.9 m²)				
BUILDING HEIGHT	167'-10" (51.15m)					
BUILDING STOREYS	14					
TOTAL NUMBER OF RESIDENTIAL UNITS	120					
UNIT MIX SUMMARY	UNIT TYPE	NO. OF UNITS	AVERAGE UNIT SIZE			
			NET		GROSS	
			m²	ft²	m²	ft²
	STUDIO	60	31.1	334.2	35.7	384.3
	1 BD	24	42.8	461.0	48.4	520.9
	2 BD	36	71.8	773.5	80.7	868.3
	3 BD	0				

PROJECT INFORMATION BREAKDOWN (SOUTH TOWER)

PROPOSED USE	RESIDENTIAL / COMMERCIAL					
FSR AREA - TOTAL	159,214.4 ft² (14,791.5 m²)					
	FSR AREA - COMMERCIAL	4,556.6 ft² (423.3 m²)				
	FSR AREA - RESIDENTIAL	154,657.8 ft² (14,368.2 m²)				
BUILDING HEIGHT	275'-6" (83.97m)					
BUILDING STOREYS	25					
TOTAL NUMBER OF RESIDENTIAL UNITS	207					
UNIT MIX SUMMARY	UNIT TYPE	NO. OF UNITS	AVERAGE UNIT SIZE			
			NET		GROSS	
			m²	ft²	m²	ft²
	STUDIO	92	30.5	328.0	34.7	373.8
	1 BD	23	37.5	403.5	43.4	466.8
	2 BD	69	71.8	773.5	80.7	868.3
	3 BD	23	87.1	938.2	98.1	1056.0

RESIDENTIAL UNIT MIX SUMMARY (BELOW-MAKET RENTAL)

UNIT TYPE	NO. OF UNITS	% PROVIDED	FAMILY HOUSING		AVERAGE UNIT SIZE			
			REQUIRED	PROVIDED	NET		GROSS	
					m²	ft²	m²	ft²
STUDIO	30	45.5%	35%	39.4%	30.7	330.5	35.1	377.9
1 BD	10	15.2%			40.2	432.8	45.9	494.4
2 BD	21	31.8%			71.8	773.5	80.7	868.3
3 BD	5	7.6%*			87.1	938.2	98.1	1056.0
TOTAL	66	100.0%						
Family Unit ≥2 BD	26	39.4%						

NOTE: 20% OF THE TOTAL RESIDENTIAL RENTAL AREA IS BELOW-MARKET RENTAL UNITS
*REFER TO REQUEST FOR RELAXATION #3

RESIDENTIAL UNIT MIX SUMMARY (NON-BELOW MARKET RENTAL)

UNIT TYPE	NO. OF UNITS	% PROVIDED	FAMILY HOUSING		AVERAGE UNIT SIZE			
			REQUIRED	PROVIDED	NET		GROSS	
					m²	ft²	m²	ft²
STUDIO	122	46.7%	35%	39.1%	30.7	330.5	35.1	377.9
1 BD	37	14.2%			40.2	432.8	45.9	494.4
2 BD	84	32.2%			71.8	773.5	80.7	868.3
3 BD	18	6.9%*			87.1	938.2	98.1	1056.0
TOTAL	261	100.0%						
Family Unit ≥2 BD	102	39.1%						

NOTE: *REFER TO REQUEST FOR RELAXATION #3

CHILDCARE SUMMARY

	SPACES	GROSS INDOOR	COVERED OUTDOOR	TOTAL OUTDOOR
PRESCHOOL (PART-TIME)	20	268 m² (2,884 ft²)	33 m² (355 ft²)	141 m² (1,520 ft²)

NOTE: GROSS INDOOR AREA INCLUDES CHILDCARE LOBBY AND SUPPORT SPACE

PROJECT INFORMATION

PROJECT NAME	600 Kingsway
CIVIC ADDRESS	602-644 KINGSWAY, VANCOUVER
LEGAL DESCRIPTION	602-644 Kingsway [PID 004-696-760, Lot A Block 101 District Lot 301 Plan 20943; PID 004-696-786, Lot B Block 101 District Lot 301 Plan 20943; PID 004-696-808, Lot C Block 101 District Lot 301 Plan 20943; PID 025-565-613, Lot D Block 101 District Lot 301 Group 1 New Westminster District Plan BCP1286; PID 014-234-521, Amended Lot 3 (See 224853L) Block 101 District Lot 301 Plan 1888; PID 014-234-599, Amended Lot 5 (Explanatory Plan 3722) Block 101 District Lot 301 Plan 1888; PID 014-234-611, Lot 6 Block 101 District Lot 301 Plan 1888; PID 014-234-629, Lot 7 Block 101 District Lot 301 Plan 1888] 603 E 16th Ave [PID 004-696-808, PID 004-696-786]
CURRENT ZONING	C-2C
PROPOSED ZONING	CD-1
SITE DIMENSIONS	72.5m (238') x 25.9m (85'), 30.5m (100') x 30.2m (99')
SITE AREA	2,817 m² (30,321.9 ft²)
SITE COVERAGE	98%

		MIN REQUIRED	PROVIDED
SETBACK	KINGSWAY	8'3" (2.5m)	9' (2.74m)
	CAROLINA ST	5' (1.5m)	5' (1.5m)
	E 16TH AVE	5' (1.5m)	5' (1.5m)
	LANE	5' (1.5m)	3' (1.0m) - 8' 11" (2.7m) (REFER TO SITE PLAN RZ-A003)
		MAXIMUM ALLOWED (C-2C ZONING)	PROVIDED
BUILDING HEIGHT		45.28 ft (13.8m)	275'-6" (83.97m)
BUILDING STOREYS		6	25
FSR		3	8.5
USES	RESIDENTIAL / COMMERCIAL		RESIDENTIAL / COMMERCIAL

RESIDENTIAL UNIT MIX SUMMARY (TOTAL)

UNIT TYPE	NO. OF UNITS	% PROVIDED	FAMILY HOUSING		AVERAGE UNIT SIZE			
			REQUIRED	PROVIDED	NET		GROSS	
					m²	ft²	m²	ft²
STUDIO	152	46.5%	35%	39.1%	30.7	330.5	35.1	377.9
1 BD	47	14.4%			40.2	432.8	45.9	494.4
2 BD	105	32.1%			71.8	773.5	80.7	868.3
3 BD	23	7.0%*			87.1	938.2	98.1	1056.0
TOTAL	327	100.0%						
Family Unit ≥2 BD	128	39.1%						

NOTE: *REFER TO REQUEST FOR RELAXATION #3

RESIDENTIAL UNIT MIX

UNIT TYPE	BEDROOMS	UNIT AREA				COUNT	% PROVIDED
		NET m²	GROSS m²	NET ft²	GROSS ft²		
STUDIO UNIT - TYPE A	0	30.5	34.7	328.0	373.8	140	42.8%
STUDIO UNIT - TYPE B	0	33.3	39.6	358.8	426.1	12	3.7%
1 BED UNIT - TYPE A	1	48.1	53.4	518.3	574.9	12	3.7%
1 BED UNIT - TYPE B	1	37.5	43.4	403.5	466.8	35	10.7%
2 BED UNIT - TYPE A	2	71.9	80.7	773.8	869.0	70	21.4%
2 BED UNIT - TYPE B	2	71.8	80.5	772.7	867.0	35	10.7%
3 BED UNIT - TYPE A	3	87.1	98.1	938.2	1056.0	23	7.0%
TOTAL						327	

FSR SUMMARY

PERMITTED			PROVIDED		
FSR AREA			FSR AREA		
CATEGORY	ft2	m2	CATEGORY	ft2	m2
COMMERCIAL (MINIMUM REQUIRED)	6,641.18	616.98	COMMERCIAL	19,415	1,804
RESIDENTIAL	N/A		RESIDENTIAL	238,033	22,114
TOTAL	64,514.32	5,993.57	TOTAL		
FSR			FSR		TOTAL FSR
COMMERCIAL FSR (MINIMUM REQUIRED)	0.35		COMMERCIAL FSR	0.65	
RESIDENTIAL FSR	N/A		RESIDENTIAL FSR	7.85	
TOTAL FSR	8.5		TOTAL FSR	8.50	
OPEN BALCONY			OPEN BALCONY		
PERCENTAGE OF PERMITTED FLOOR AREA: 8% (C-2C ZONING)*			36, 630.72 ft2		3,403 m2
			PERCENTAGE 14.2% OF TOTAL FSR**		

NOTE: *OTHER ZONING DISTRICTS IN VANCOUVER ALLOW OPEN BALCONY AREA UP TO 12% OF THE PERMITTED FLOOR AREA
** REFER TO REQUEST FOR RELAXATION #1

REQUEST FOR RELAXATION

1. THE PROJECT PROPOSES A REQUEST FOR RELAXATION ON THE OPEN BALCONY FSR EXCLUSION TO 14.2% OF TOTAL FSR AREA BASED ON FOLLOWING DESIGN RATIONALE:

THE BALCONY DESIGN OF THE PROJECT IS INTENDED TO ENHANCE THE LIVABILITY OF RESIDENTS BY PROVIDING PLANTING BOXES BETWEEN UNITS, AS WELL AS BY EXTENDING THE BALCONY TO THE FULL WIDTH OF THE STUDIO AND 1-BED UNITS TO INCREASE THE PRIVATE EXTERIOR SPACE. AS A RESULT, THE OPEN BALCONY AREA ON EACH LEVEL IS INCREASED TO 14.2% OF TOTAL FSR AREA TO INCORPORATE THE ABOVE DESIGN STRATEGIES. IT IS UNDERSTOOD THAT THE BASE ZONING OF THE PROJECT SITE (C-2C) ALLOWS 8% OF PERMITTED FLOOR AREA AS OPEN BALCONY, WHILE THE PROJECT PROPOSES AN INCREASE IN THE OPEN BALCONY EXCLUSION AND NONE OF THE AREA WOULD BE ENCLOSED WITH REFERENCE TO OTHER ZONING DISTRICTS IN VANCOUVER WHICH ALLOWS OPEN BALCONY AREA UP TO 12% OF THE PERMITTED FLOOR AREA.

2. THE PROJECT PROPOSES A REQUEST FOR RELAXATION ON THE TOWER SEPARATION REDUCTION TO 67'-7" AT THE PINCH POINT, DUE TO AN IRREGULAR SITE CONDITION AND TO AVOID SHADOWING OVER ROBSON PARK AND MCAULEY PARK. HORIZONTAL ANGLE OF DAYLIGHT ANALYSIS ON SHEET RZ-G007 DEMONSTRATES THAT THE TOWER DESIGN IS ABLE TO ENSURE THE LIVABILITY OF EACH DWELLING UNIT WITH REDUCED 67'-7" TOWER SEPARATION, WHILE LIMITING SHADOW IMPACTS ON BOTH ROBSON AND MCAULEY PARKS AS DEMONSTRATED IN THE SHADOW ANALYSIS (SHEET RZ-G006 - SHADOW STUDIES - PROPOSED MASSING)

3. THE PROJECT PROPOSES LESS THAN 10% OF TOTAL UNITS BEING 3-BED UNITS. HOWEVER, THE PERCENTAGE FOR FAMILY SIZE UNITS IS WELL OVER THE 35% THRESHOLD.

DRAWING INDEX - REZONING

Sheet Number	Sheet Name	ISSUED FOR REZONING	ISSUED FOR REZONING APPLICATION ADDITIONAL CITY REQUEST
		2024/06/07	2024/08/07
RZ-G000	COVER SHEET	●	●
RZ-G001	PROJECT DATA & FSR SUMMARY	●	●
RZ-G002	PARKING STATISTICS	●	●
RZ-G003	SITE SURVEY	●	●
RZ-G004	BUILDING GRADE		●
RZ-G005	SITE COVERAGE & ZONING DIAGRAM	●	●
RZ-G006	SHADOW STUDIES - EXISTING MASSING	●	●
RZ-G007	SHADOW STUDIES - PROPOSED MASSING	●	●
RZ-G008	HORIZONTAL ANGLE OF DAYLIGHT	●	●
RZ-A001	CONTEXT PLAN	●	●
RZ-A002	SITE CONTEXT PHOTOS	●	●
RZ-A003	SITE PLAN	●	●
RZ-A101	FLOOR PLAN - LEVEL P4	●	●
RZ-A102	FLOOR PLAN - LEVEL P3	●	●
RZ-A103	FLOOR PLAN - LEVEL P2	●	●
RZ-A104	FLOOR PLAN - LEVEL P1	●	●
RZ-A105	FLOOR PLAN - LEVEL 01	●	●
RZ-A106	FLOOR PLAN - LEVEL 01 MEZZANINE	●	●
RZ-A107	FLOOR PLAN - LEVEL 02	●	●
RZ-A108	FLOOR PLAN - LEVEL 03-14	●	●
RZ-A109	FLOOR PLAN - LEVEL 15	●	●
RZ-A110	FLOOR PLAN - LEVEL 16-25	●	●
RZ-A111	ROOF PLAN	●	●
RZ-A112	ENLARGED TOWER PLANS	●	●
RZ-A201	OVERALL ELEVATION - WEST	●	●
RZ-A202	OVERALL ELEVATION - SOUTH	●	●
RZ-A203	OVERALL ELEVATION - NORTH	●	●
RZ-A204	OVERALL ELEVATION - LANEWAY	●	●
RZ-A301	OVERALL BUILDING SECTION - NE-SW	●	●
RZ-A302	OVERALL BUILDING SECTION - N-S	●	●
RZ-A303	OVERALL BUILDING SECTION - W-E	●	●
RZ-A304	BUILDING SECTIONS	●	●
RZ-A501	OVERALL VIEWS	●	●
RZ-A502	STREET VIEWS	●	●
RZ-A701	3D AXONOMETRIC VIEWS	●	●
RZ-A702	3D AXONOMETRIC VIEWS	●	●

DRAWING INDEX - REZONING FSR

Sheet Number	Sheet Name	ISSUED FOR REZONING	ISSUED FOR REZONING APPLICATION ADDITIONAL CITY REQUEST
		2024/06/07	2024/08/07
RZ-FSR001	PROJECT DATA AREA SUMMARY	●	●
RZ-FSR101	LEVEL 01 FSR OVERLAY	●	●
RZ-FSR102	LEVEL 01 MEZZANINE	●	●
RZ-FSR103	LEVEL 02 FSR OVERLAY	●	●
RZ-FSR104	LEVEL 03-14 FSR OVERLAY	●	●
RZ-FSR105	LEVEL 15 FSR OVERLAY	●	●
RZ-FSR106	LEVEL 16-25 FSR OVERLAY	●	●
RZ-FSR107	LEVEL ROOF FSR OVERLAY	●	●

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

PROJECT DATA & FSR SUMMARY

SHEET NUMBER

RZ-G001

6.2 Parking Statistics

PARKING

REQUIRED						PROVIDED	
PARKING	BYLAW REFERENCE Vancouver Off-Street Parking Space Regulations June 2024	UNITS	GFA	MAX	MIN	PARKING SPACE PROVIDED	
RESIDENTIAL (4.1.1)	No parking spaces are required for the off-street parking of motor vehicles accessory to any development in the City...	327			0	RESIDENTIAL	102
RES ACCESSIBLE (4.1.4a)	For multiple dwelling or live-work use in buildings that contain at least seven dwelling units, a minimum of 1.0 spaces...	327			1	ACCESSIBLE (RESIDENTIAL)	12
	....and an additional 0.034 space for each additional dwelling unit				11		
VAN ACCESSIBLE (4.1.4)	The first accessible parking space provided, plus every tenth accessible parking space provided, must be a van accessible parking space.				2	VAN ACCESSIBLE	2
VISITOR PARKING (4.1.3)	For dwelling uses, including live-work use, a minimum of 0.05 spaces and a maximum of 0.1 spaces per dwelling unit	327		33	16	VISITOR PARKING	16
RETAIL (4.2.5)	1 space for each 115 m² of gross floor area		1,855 m²	14	0	RETAIL	3
RETAIL ACCESSIBLE (4.1.4b)	for non-residential uses in buildings that contain at least 500 m² of gross floor area, a minimum of 1.0 spaces		1,855 m²		1	ACCESSIBLE (RETAIL)	2
	....plus an additional 0.4 parking space for each 1000 m² of gross floor area				1		
CHILDCARE	Two (2) parking stalls for staff.				2	CHILDCARE STAFF	2
CHILDCARE	Two (2) parking stalls for childcare visitor.				2	CHILDCARE VISITOR	2
	TOTAL			**48**	**34**	TOTAL	**141**

PASSENGER SPACES

REQUIRED						PROVIDED
CLASS A	BYLAW REFERENCE Vancouver Off-street Passenger Space Regulations June 2024	UNITS	GFA	MIN	MAX	CLASS A PASSENGER SPACES
RESIDENTIAL (7.2.1)	A minimum of 1 space for any development with 50 to 125 dwelling units, plus one space for every additional 150 dwelling unit.	327		2		RESIDENTIAL 2
RETAIL (7.2.5.1)	A minimum of one space for each 4000 m² of gross floor area		1,855 m²	0		RETAIL 0
	CLASS A TOTAL			2		**TOTAL 2**
CLASS B	BYLAW REFERENCE Vancouver Off-street Passenger Space Regulations January 2024	UNITS	GFA	MIN		**CLASS B PASSENGER SPACES**
RESIDENTIAL (7.2.1)	No requirement.	327		0		RESIDENTIAL 0
RETAIL (7.2.5.1)	No requirement.		1,855 m²	0		RETAIL 0
	CLASS B TOTAL			**0**		**TOTAL 0**

LOADING

REQUIRED						PROVIDED
LOADING	BYLAW REFERENCE Vancouver Off-Street Loading Space Regulations June 2024	UNITS	GFA	CLASS A	CLASS B	LOADING
RESIDENTIAL (5.2.1)	Class A: At least one space for 50 to 299 dwelling units, and at least one additional space for any portion of each additional 200 dwelling units	327		2	0	CLASS A 3
	Class B: At least one space for 100 to 299 dwelling units; a minumum of one additional space for 300 to 499 dwelling units;	327			2	CLASS B 2
RETAIL (5.2.6)	Class A: No requirement				0	
	Class B: A minimum of one space for the first 2325 m² of gross floor area plus one space for any portion of the next 2325 m²		1,855 m²		1	
	TOTAL			**2**	**3**	**TOTAL 5**

INTERNAL STORAGE

REQUIRED				PROVIDED
INTERNAL STORAGE		UNITS	AREA (m²)	INTERNAL STORAGE
RESIDENTIAL	5.7 m³ of storage required per dwelling unit	327	1,864	RESIDENTIAL 850 m³
	TOTAL		1,864	TOTAL 850m³

BICYCLE PARKING

REQUIRED						PROVIDED
CLASS A	BYLAW REFERENCE Vancouver Off-street Bicycle Space Regulations June 2024	UNITS	GFA	MIN	MAX	CLASS A BICYCLE PARKING
RESIDENTIAL (6.2.1.2)	A minimum of 1.5 spaces for every dwelling unit under 65 m²	199		299		
	A minimum of 2.5 spaces for every dwelling unit over 65 m² and under 105 m²	128		320		
	A minimum of 3 spaces for every dwelling unit over 105 m²	0				
RETAIL (6.2.5.1)	A minimum of one space for each 340 m² of gross floor area		1,855 m²	5		
	CLASS A TOTAL			**624**		**624**
	CLASS A BIKE PARKING ALLOCATION					HORIZONTAL 330
HORIZONTAL OVERSIZED	Min 5% of provided spaces			32		HORIZONTAL OVERSIZED 32
HORIZONTAL STACKED	Max 60% of provided spaces in combination with vertical stalls				187	HORIZONTAL STACKED 20
VERTICAL	Max 30% of provided spaces				187	VERTICAL 178
LOCKERS	Min 10% of provided spaces			63		LOCKERS 64
						TOTAL 624
CLASS B	BYLAW REFERENCE Vancouver Off-street Bicycle Space Regulations January 2024	UNITS	GFA	MIN		**CLASS B BICYCLE PARKING**
RESIDENTIAL (6.2.1.2)	A minimum of 2 spaces for any development containing at least 20 dwelling units	327		2		RESIDENTIAL 18
	one additional space for every additional 20 dwelling units			16		
RETAIL (6.2.5.1)	A minimum of 6 spaces for any development containing a minimum of 1,000 m² of gross floor area		1,855 m²	6		RETAIL 6
	CLASS B TOTAL			**24**		**TOTAL 24**

END OF TRIP FACILITIES

REQUIRED					PROVIDED	
CLOTHING LOCKERS	BYLAW REFERENCE Vancouver Off-street Bicycle Space Regulations June 2024		CLASS A SPACES	MINIMUM REQUI...	MAXIMUM ALLOW...	END OF TRIP FACILITIES
CLOTHING LOCKERS FO...	A minimum number of clothing lockers equal to 1.4 times the min number of required Class A spaces (Non-dwelling use)		5	7		
	CLOTHING LOCKER ALLOCATION					CLOTHING LOCKERS TOTAL 7
HALF HEIGHT	No more than 50% of lockers				3	HALF HEIGHT 3
FULL HEIGHT	At least 50% of lockers			4		FULL HEIGHT 4
WATER CLOSETS	Vancouver Off-street Bicycle Space Regulations January 2024					WATER CLOSETS 1
RESIDENTIAL	No requirement		0	0		WASH BASINS 1
RETAIL (6.5A)	1 water closet for every 10 Class A bicycle spaces up to 50 spaces		7	1		SHOWERS 1
	and one for every 20 spaces above 50		0	0		
	WATER CLOSET TOTAL			**2**		
WASH BASINS	Vancouver Off-street Bicycle Space Regulations January 2024					
RESIDENTIAL	No requirement		0	0		
RETAIL (6.5A)	1 wash basin for any development requiring between 5 and 10 Class A bicycle parking spaces....		45	1		
	....plus one for every additional 20 spaces up to 50 spaces.....		0	0		
	....and one for every 40 spaces above 50		0	0		
	WASH BASIN TOTAL			**1**		
SHOWERS	Vancouver Off-street Bicycle Space Regulations January 2024					
RESIDENTIAL	No requirement		0	0		
RETAIL (6.5A)	1 shower for any development requiring between 5 and 10 Class A bicylce spaces....		45	1		
	....plus one for every 40 spaces above 10					
	SHOWER TOTAL			**1**		
GROOMING STATIONS	Vancouver Off-street Bicycle Space Regulations January 2024					
	There shall be no less than 1 grooming station for each shower provided, and each station shall be separate from the...			1		
	GROOMING STATION TOTAL			**1**		

Perkins&Will

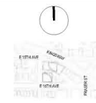
BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN



PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

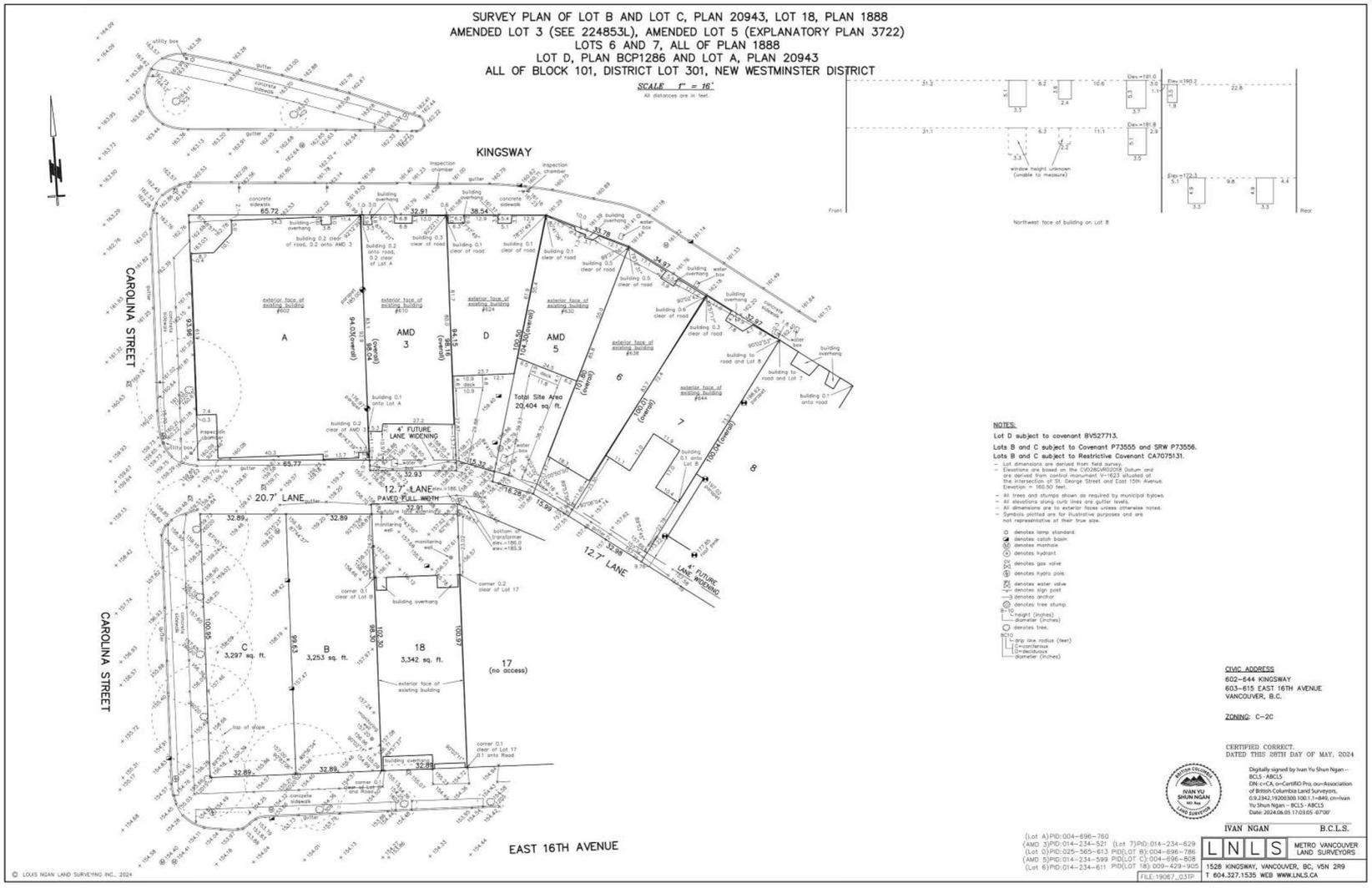
PROJECT NUMBER
412313.000

REVISIONS

TITLE
PARKING STATISTICS

SHEET NUMBER
RZ-G002

6.3 Legal Survey



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

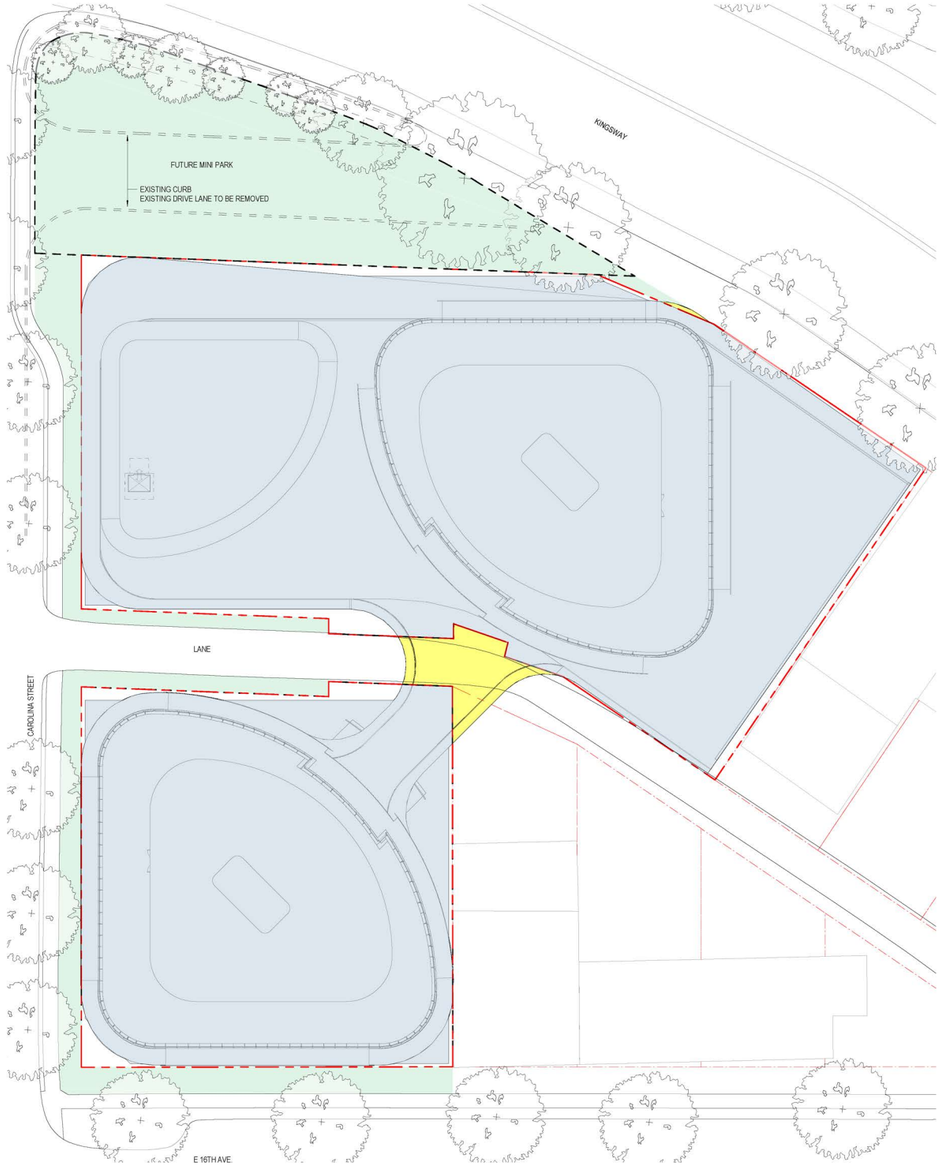
PROJECT NUMBER
412313.000

REVISIONS

TITLE
SITE SURVEY

SHEET NUMBER
RZ-G003

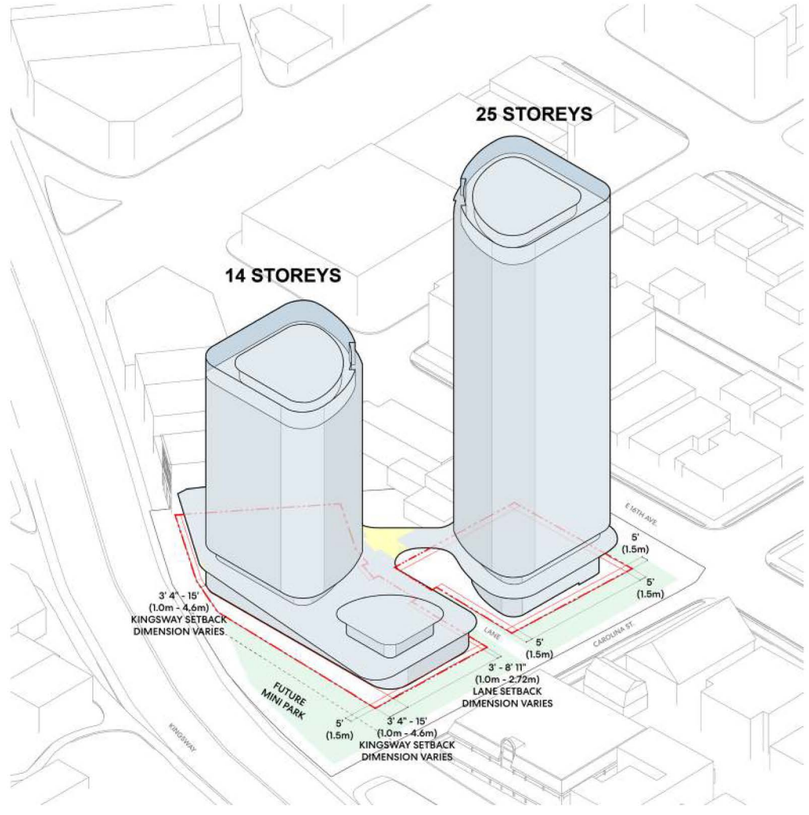
6.4 Site Coverage Plan



SITE COVERAGE

SITE COVERAGE	
SITE AREA	30321.9 ft²
BUILT AREA INSIDE PROPERTY LINE	29197 ft²
BUILT AREA BEYOND PROPERTY LINE	536.4 ft²
LANDSCAPING BEYOND PROPERTY LINE	
SITE COVERAGE	98%

1 SITE COVERAGE PLAN
1/16" = 1'-0"



2 ZONING DIAGRAM
1 1/2" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

SITE COVERAGE & ZONING DIAGRAM

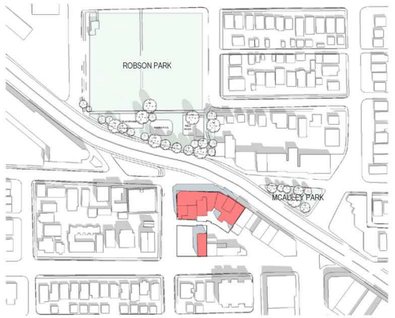
SHEET NUMBER

RZ-G004

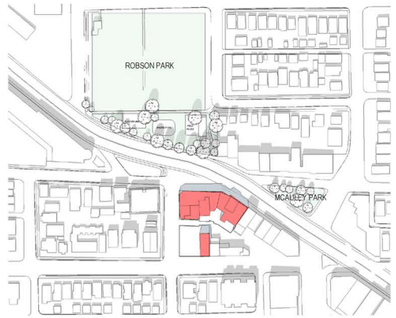
6.5 Shadow Analysis

6.5.1 Existing Context

1 MARCH 21 - 10AM - EXISTING
1" = 200'-0"



2 MARCH 21 - 12PM - EXISTING
1" = 200'-0"



3 MARCH 21 - 2PM - EXISTING
1" = 200'-0"

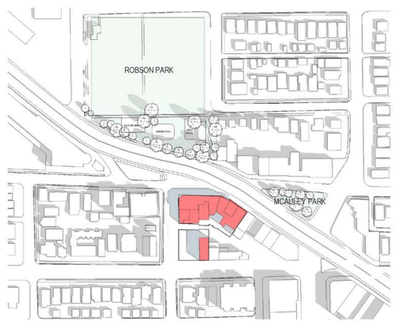
4 MARCH 21 - 4PM - EXISTING
1" = 200'-0"

5 JUNE 21 - 10AM - EXISTING
1" = 200'-0"

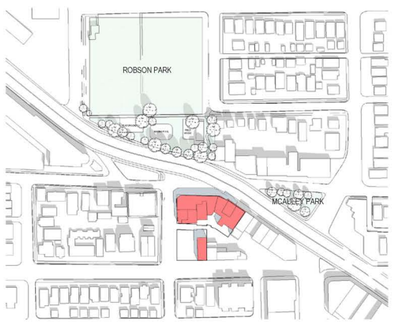
6 JUNE 21 - 12PM - EXISTING
1" = 200'-0"

7 JUNE 21 - 2PM - EXISTING
1" = 200'-0"

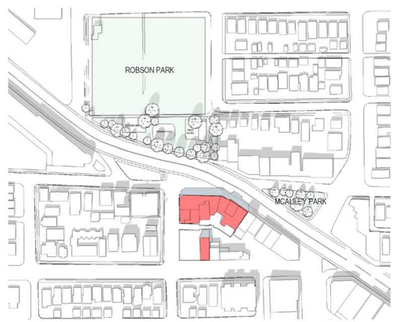
8 JUNE 21 - 4PM - EXISTING
1" = 200'-0"



9 SEPTEMBER 22 - 10AM - EXISTING
1" = 200'-0"



10 SEPTEMBER 22 - 12PM - EXISTING
1" = 200'-0"



11 SEPTEMBER 22 - 2PM - EXISTING
1" = 200'-0"

12 SEPTEMBER 22 - 4PM - EXISTING
1" = 200'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

SHADOW STUDIES - EXISTING MASSING

SHEET NUMBER

RZ-G005

Shadow Analysis

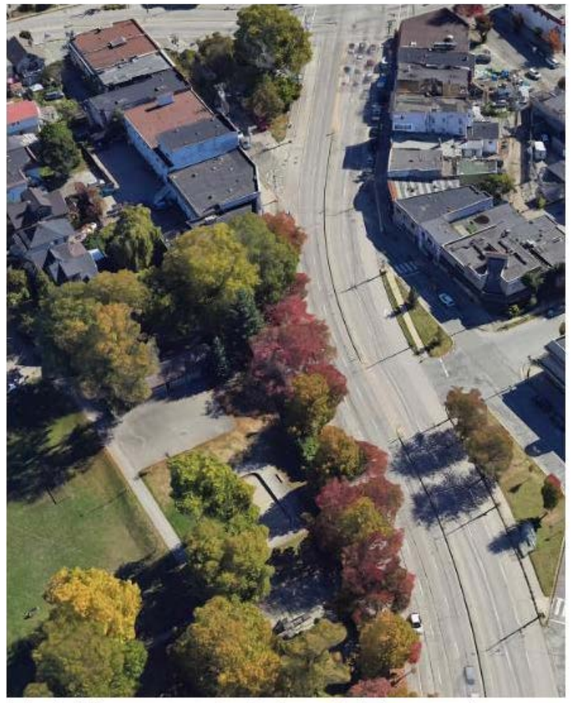
Robson Park & McAuley Park

Robson Park serves as a tranquil gateway, offering a serene escape from the hustle and bustle of the busy surrounding roads and leading into a vibrant and colorful neighborhood. As you stroll through the park, you can admire the charming community gardens, which are lovingly maintained by local residents. For a more leisurely experience, consider bringing a blanket to spread out on the grass and relax in the peaceful surroundings.

The park is named in honor of the Honourable John Robson, who was the Premier of British Columbia during the time of Vancouver's incorporation. His legacy is remembered through this beautiful green space, which adds to the historical and cultural fabric of the city.

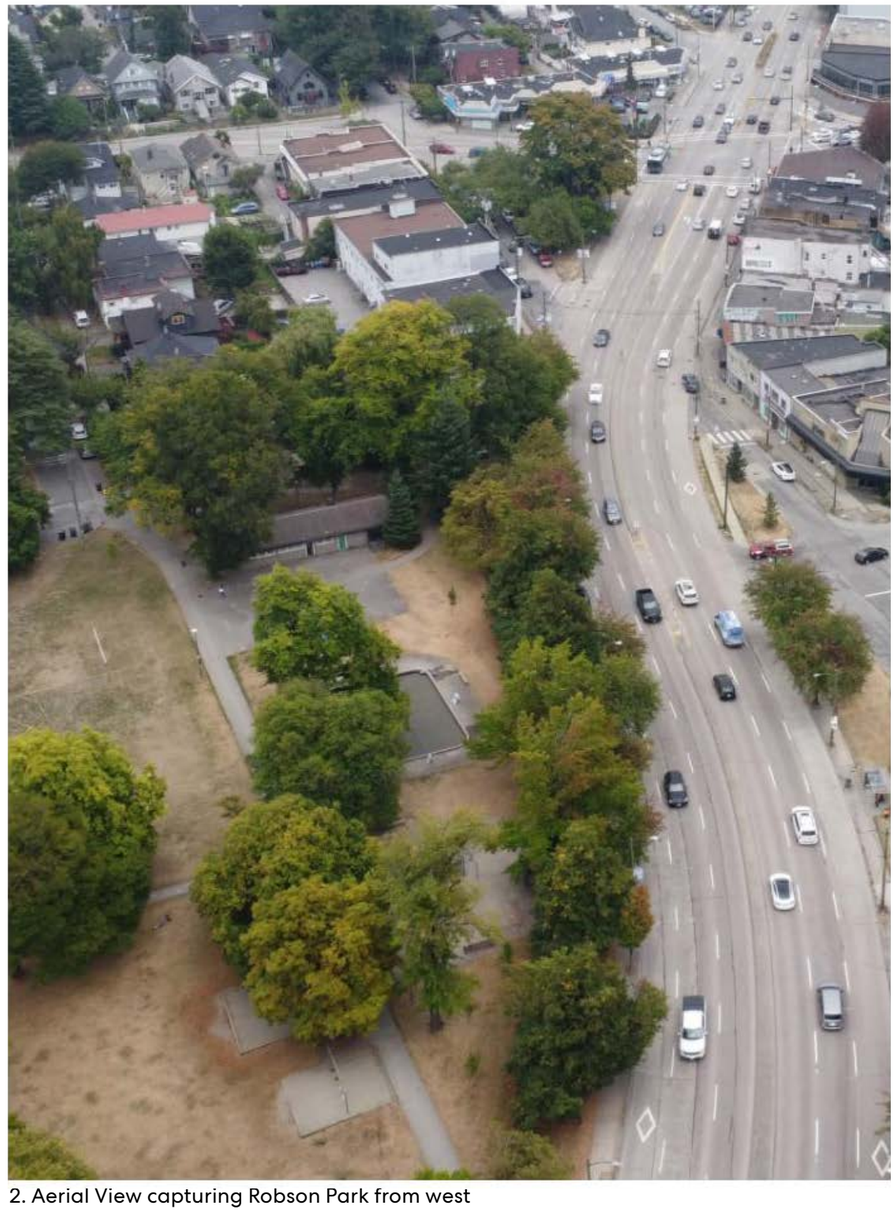
On the southern edge of Robson Park, a collection of mature trees provides a pleasant shade, creating a cool and inviting environment.

It is important to note that proposed development is not expected to significantly alter the current shading of the park, allowing it to continue serving as a cherished retreat for residents and visitors alike.



1. Aerial Photo capturing Robson Park from south

source: Google Earth



2. Aerial View capturing Robson Park from west

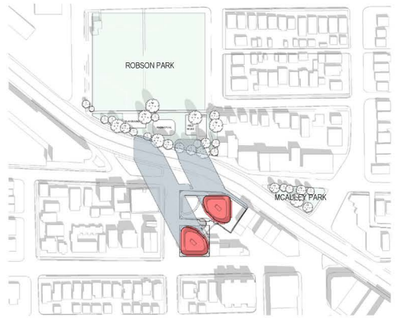
1. Aerial Photo capturing Robson Park from above

source: Google Earth

Shadow Analysis

6.5.2 Proposed Massing

1 MARCH 21 - 10AM - PROPOSED
1" = 200'-0"



2 MARCH 21 - 12PM - PROPOSED
1" = 200'-0"

ROBSON PARK
TOTAL PARK AREA: 15,600 m2
SHADED AREA: 367 m2
% OF SHADED AREA: 2.35%

3 MARCH 21 - 2PM - PROPOSED
1" = 200'-0"

ROBSON PARK
TOTAL PARK AREA: 15,600 m2
SHADED AREA: 381 m2
% OF SHADED AREA: 2.44%

4 MARCH 21 - 4PM - PROPOSED
1" = 200'-0"

MCAULEY PARK
TOTAL PARK AREA: 896 m2
SHADED AREA: 40 m2
% OF SHADED AREA: 4.46%

5 JUNE 21 - 10AM - PROPOSED
1" = 200'-0"

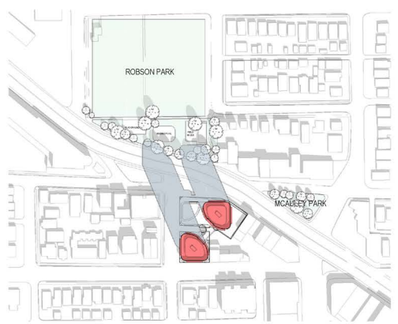
6 JUNE 21 - 12PM - PROPOSED
1" = 200'-0"

7 JUNE 21 - 2PM - PROPOSED
1" = 200'-0"

8 JUNE 21 - 4PM - PROPOSED
1" = 200'-0"

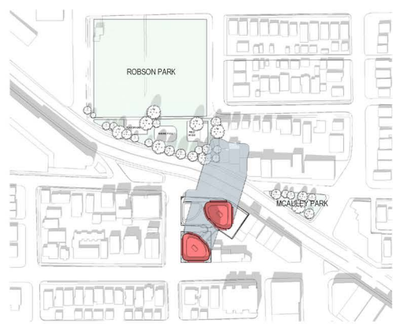
MCAULEY PARK
TOTAL PARK AREA: 896 m2
SHADED AREA: 9 m2
% OF SHADED AREA: 1.00%

9 SEPTEMBER 22 - 10AM - PROPOSED
1" = 200'-0"



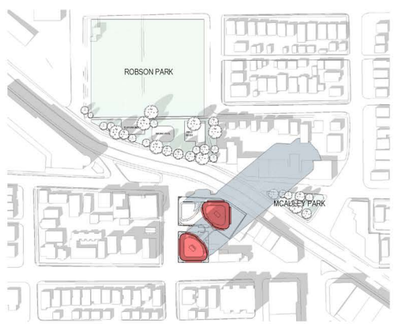
10 SEPTEMBER 22 - 12PM - PROPOSED
1" = 200'-0"

ROBSON PARK
TOTAL PARK AREA: 15,600 m2
SHADED AREA: 480 m2
% OF SHADED AREA: 3.08%



11 SEPTEMBER 22 - 2PM - PROPOSED
1" = 200'-0"

ROBSON PARK
TOTAL PARK AREA: 15,600 m2
SHADED AREA: 381 m2
% OF SHADED AREA: 1.61%



12 SEPTEMBER 22 - 4PM - PROPOSED
1" = 200'-0"

MCAULEY PARK
TOTAL PARK AREA: 896 m2
SHADED AREA: 40 m2
% OF SHADED AREA: 11.43%

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

SHADOW STUDIES - PROPOSED MASSING

SHEET NUMBER

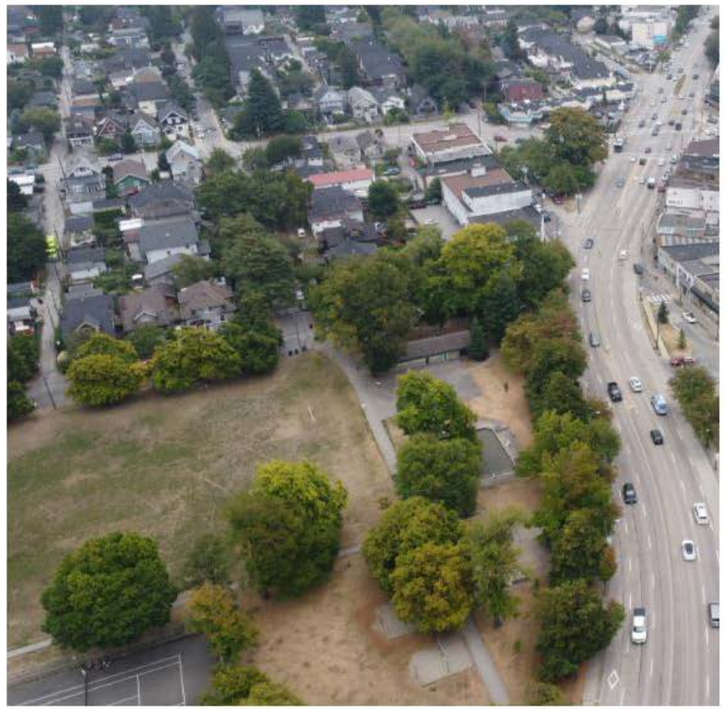
RZ-G006

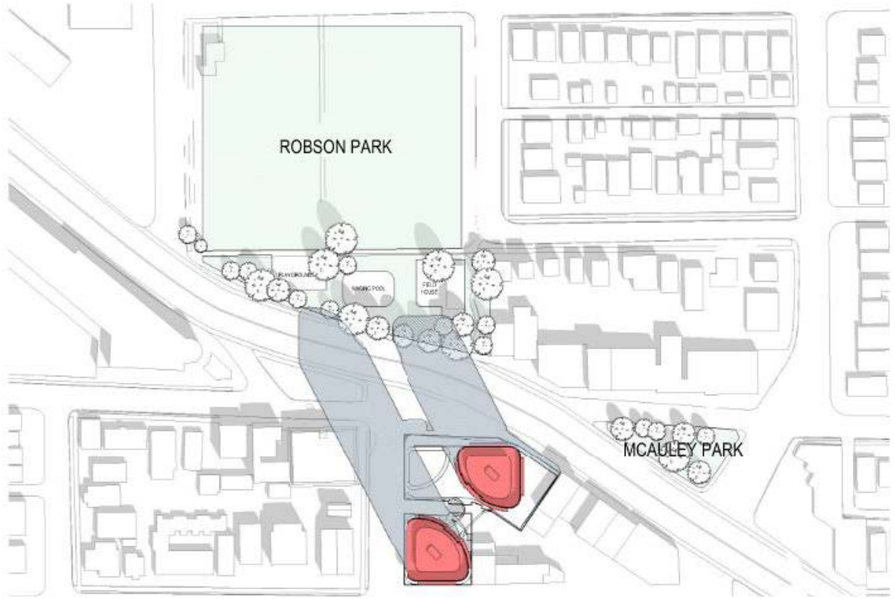
Shadow Analysis

Robson Park & McAuley Park

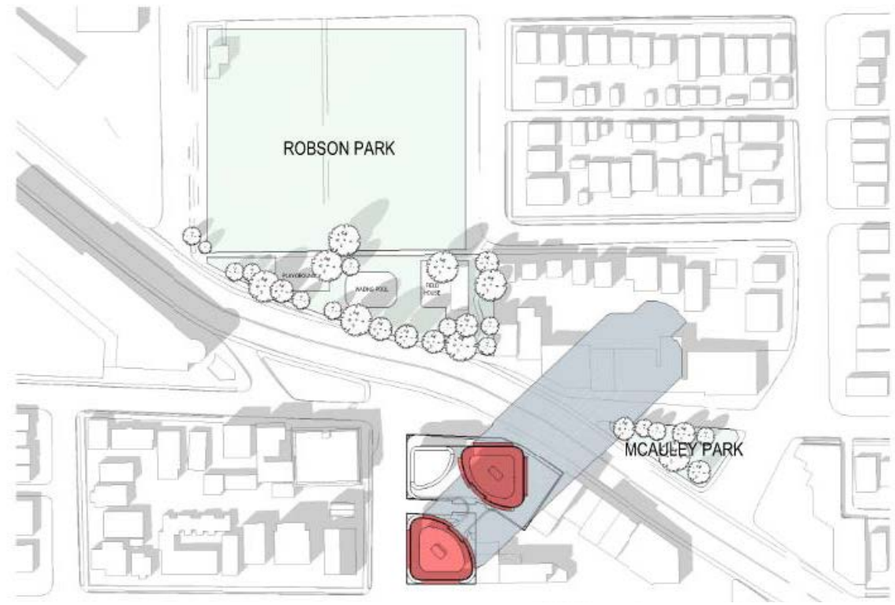
The design of the proposed residential towers has been meticulously planned to cast minimal shadows on Robson and McAuley Park, therefore preserving their sunlight exposure and overall ambiance, and maintaining their usability and enjoyment for the community as well as the residents throughout the day.

Moreover, it is essential to consider that both Robson Park and McAuley Park are already subject to shading from their mature tree canopies along Kingsway. These existing trees naturally cast shadows across various areas of the park, especially during the early morning and late afternoon hours, while serving as a buffer space between Kingsway and the green communal spaces. The presence of these trees has been factored into the shadow analysis to ensure that any additional shading from the new towers remains minimal and within limits of the shadows already casted by the existing trees. By aligning the towers' design with the current shading patterns, the new development harmonizes with the existing environmental conditions, ensuring that the parks retain their current levels of natural light, and their role as vital community amenities.



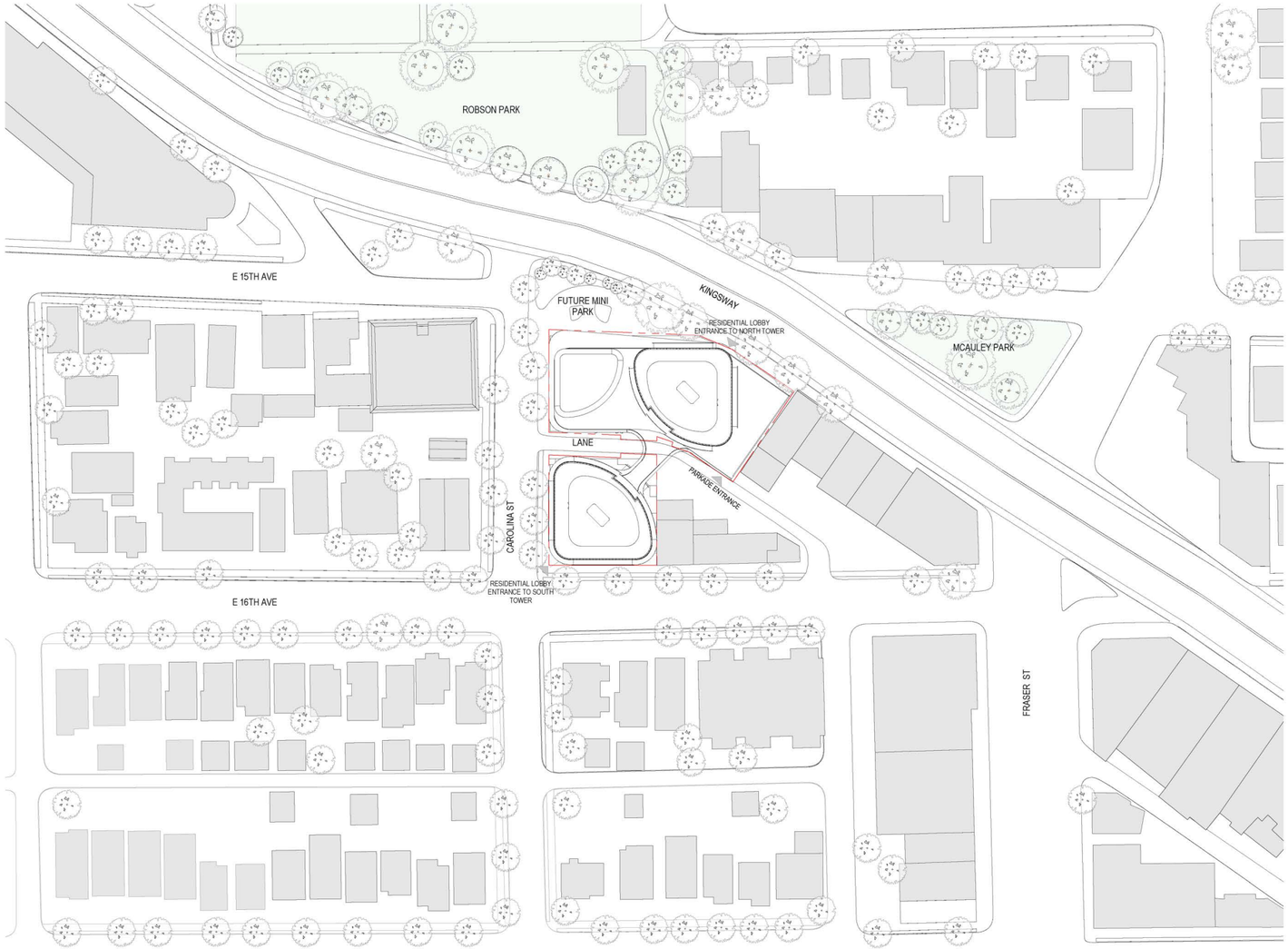


Shadow analysis on March 21 at 1:00PM shows the maximum shadow projection on Robson park, overlapping with existing tree shadows, indicating that the towers cast minimal additional shadows.



Shadow analysis on March 21 at 4:00PM shows the maximum shadow projection on McAuley Park, overlapping with existing mature canopy shadows.

6.6 Site Context



1 CONTEXT PLAN
1" = 50'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE
CONTEXT PLAN

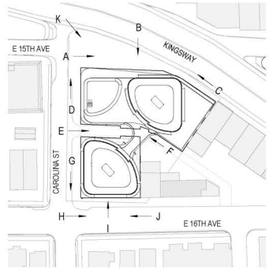
SHEET NUMBER
RZ-A001

6.7 Site Context Photos

A. E 15TH AVE LOOKING EAST

B. KINGSWAY LOOKING SOUTH

C. KINGSWAY LOOKING WEST



D. CAROLINA ST LOOKING NORTH

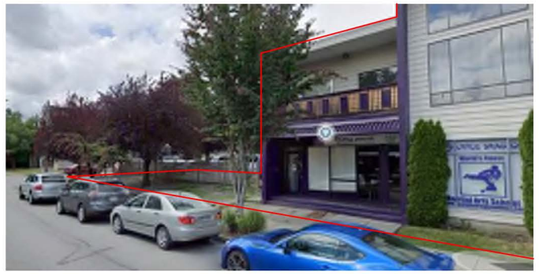
E. LANE LOOKING EAST

F. LANE LOOKING NORTH WEST

G. CAROLINA ST LOOKING SOUTH

H. E 16TH AVE LOOKING EAST

I. E 16TH AVE LOOKING NORTH



J. E 16TH AVE LOOKING WEST

K. AERIAL VIEW FROM NORTH WEST LOOKING SOUTH EAST

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

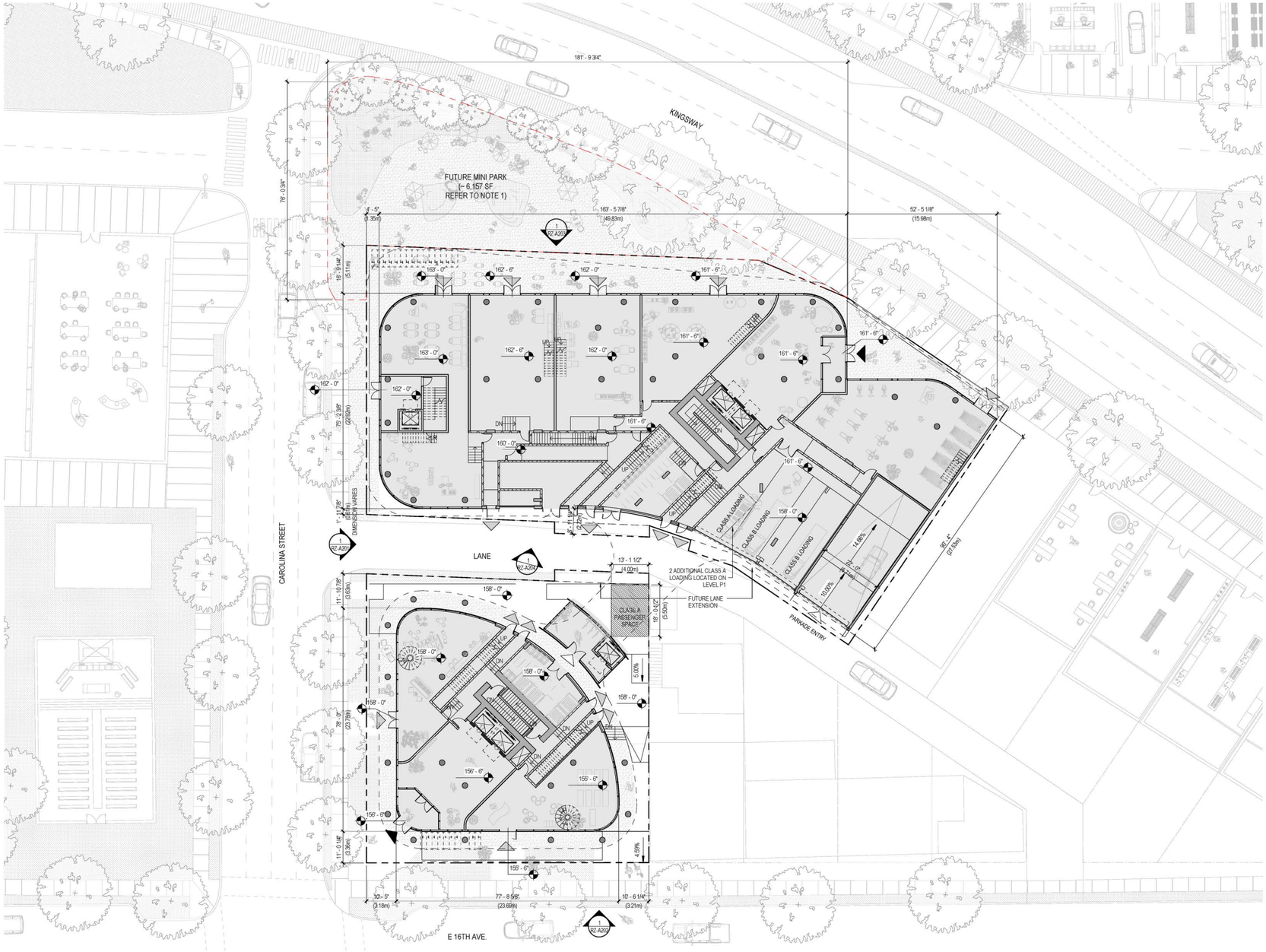
PROJECT NUMBER
412313.000

REVISIONS

TITLE
SITE CONTEXT PHOTOS

SHEET NUMBER
RZ-A002

6.8 Architectural Site Plan



RESIDENTIAL LOBBY ENTRANCE

RETAIL ENTRANCE

PARKADE / BIKE PAKRING ENTRANCE

NOTE 1: REGARDING THE PROPOSED PARK/PLAZA. A PORTION OF THE EXISTING ROAD NETWORK ALONG E 15TH AVENUE, AT THE PERIMETER OF THE SITE TO THE NORTH WILL BE CLOSED AND REPLACED WITH A PUBLIC PARK/PLAZA (~6,157 SF.) WHILE THE SAME APPROACH WAS REVIEWED AND APPROVED AS PART OF THE PREVIOUS REZONING APPLICATION FOR THE SITE (SEE REFERRAL REPORT CD-1 FOR 602-644 KINGSWAY). WE DO EXPECT THAT THERE WILL BE ONGOING CONSULTATIONS AND NEGOTIATIONS WITH ENGINEERING AND PARK BOARD AS PART OF THIS REZONING REVIEW PROCESS.

1 SITE PLAN
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

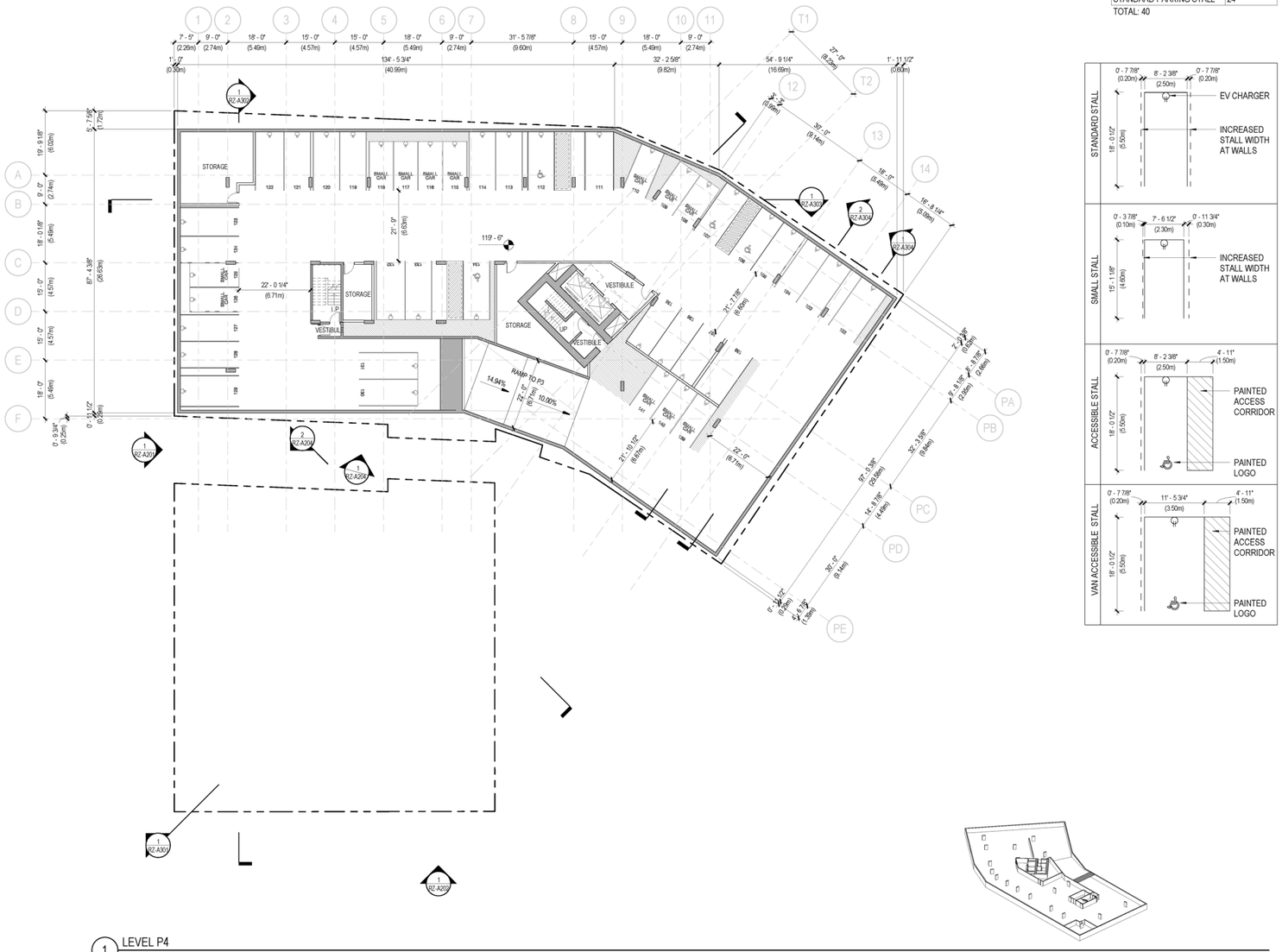
REVISIONS

TITLE
SITE PLAN

SHEET NUMBER
RZ-A003

6.9 Floor Plans

6.9.1 Parking Level P4



1 LEVEL P4
1/16" = 1'-0"

PARKING SUMMARY - P4	
TYPE	NUMBER
ACCESSIBLE PARKING STALL	4
SMALL CAR STALL	12
STANDARD PARKING STALL	24
TOTAL: 40	

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	20240807

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

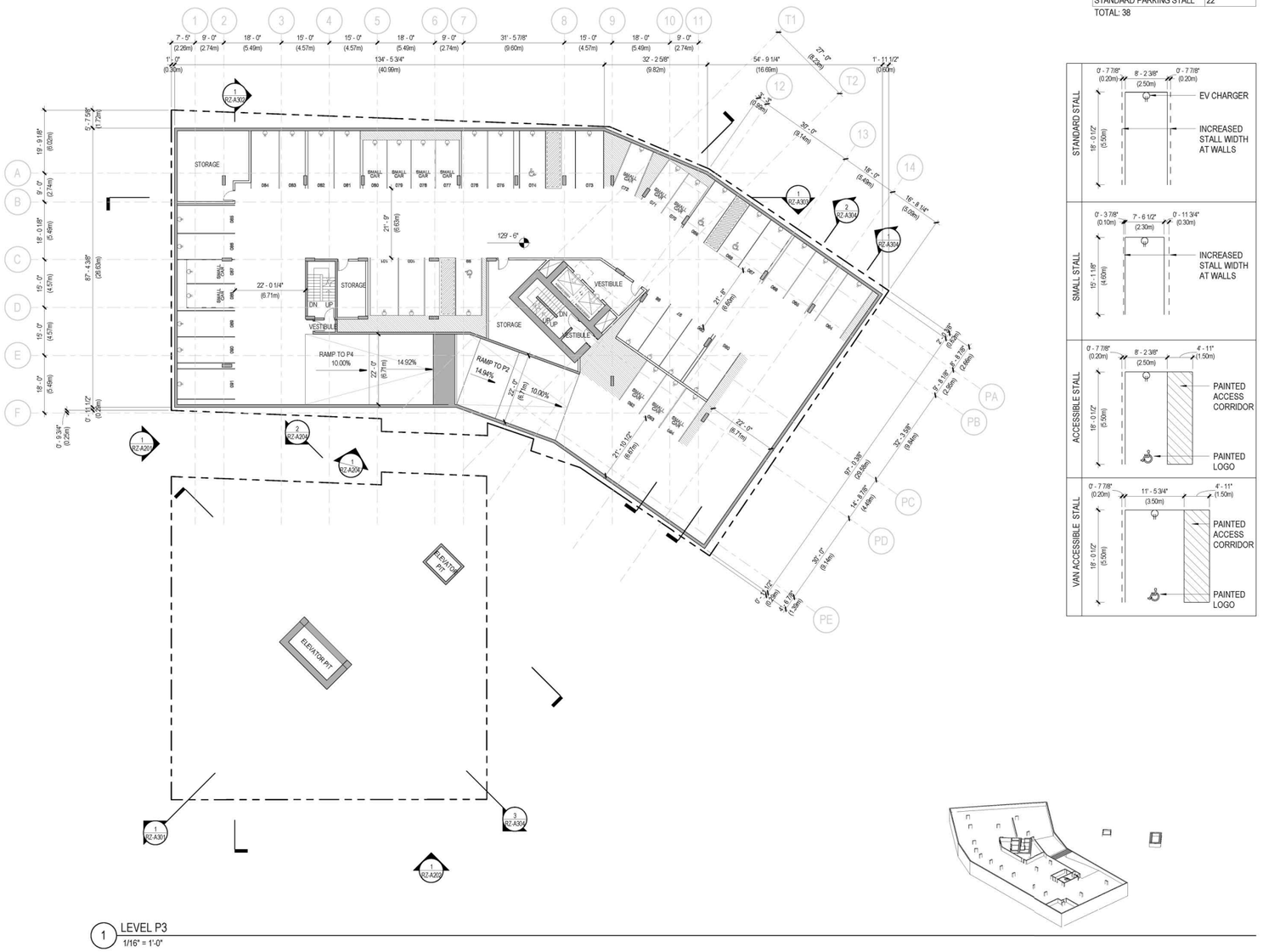
REVISIONS

TITLE
FLOOR PLAN - LEVEL P4

SHEET NUMBER
RZ-A101

Floor Plans

6.9.2 Parking Level P3



1 LEVEL P3
1/16" = 1'-0"

PARKING SUMMARY - P3	
TYPE	NUMBER
ACCESSIBLE PARKING STALL	4
SMALL CAR STALL	12
STANDARD PARKING STALL	22
TOTAL: 38	

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

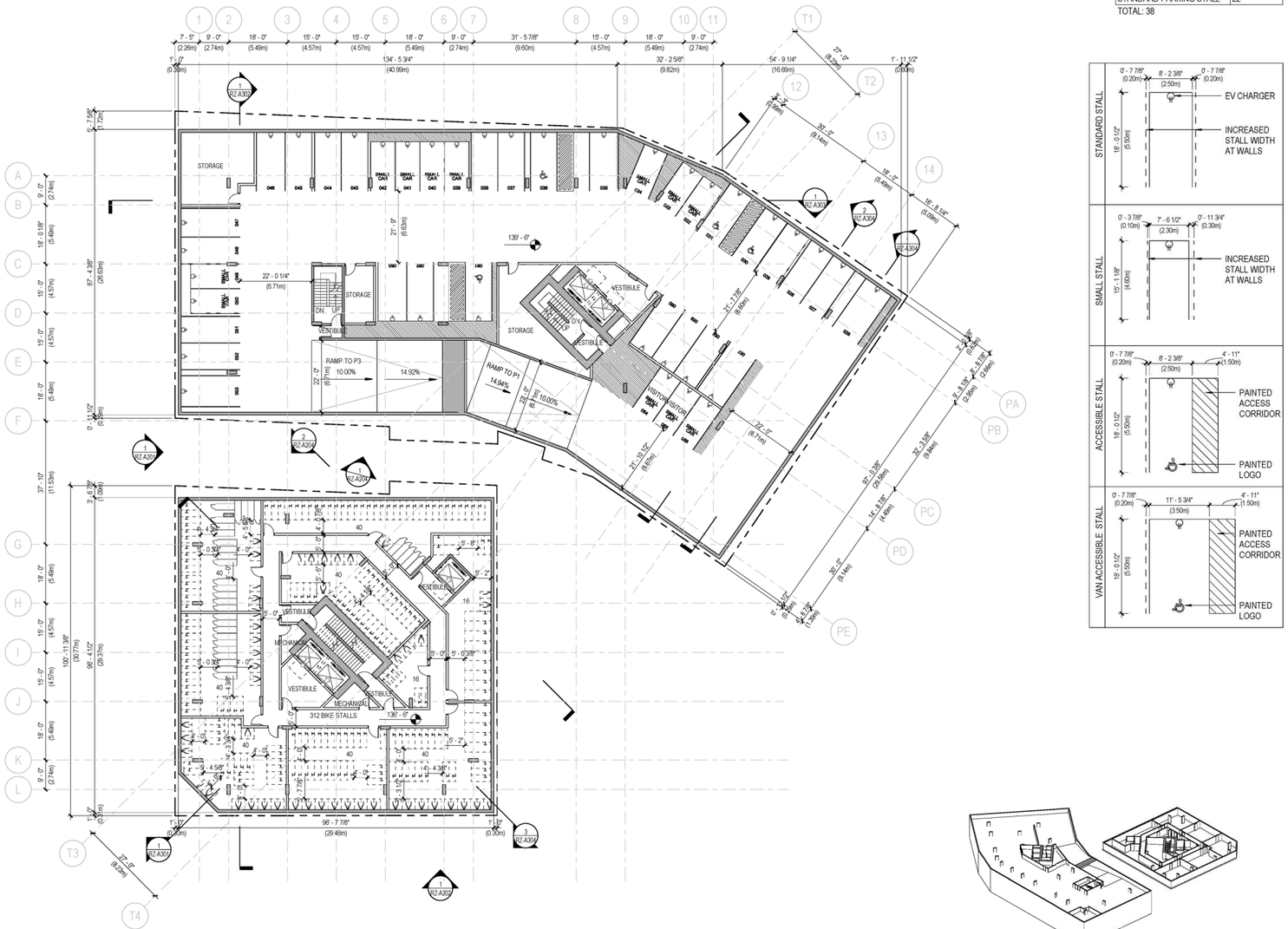
REVISIONS

TITLE
FLOOR PLAN - LEVEL P3

SHEET NUMBER
RZ-A102

Floor Plans

6.9.3 Parking Level P2



1 LEVEL P2
1/16" = 1'-0"

PARKING SUMMARY - P2	
TYPE	NUMBER
ACCESSIBLE PARKING STALL	4
SMALL CAR STALL	12
STANDARD PARKING STALL	22
TOTAL: 38	

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

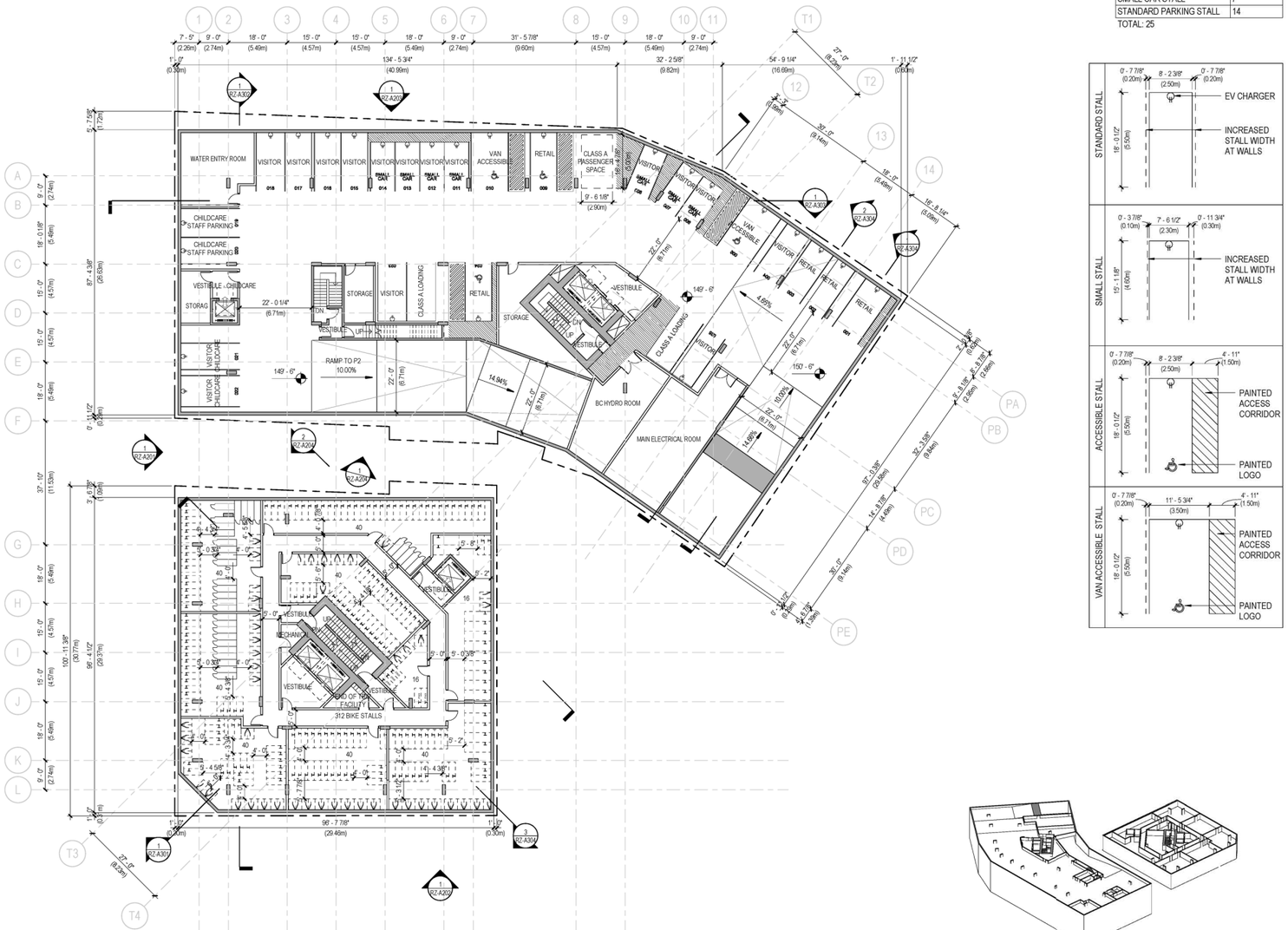
REVISIONS

TITLE
FLOOR PLAN - LEVEL P2

SHEET NUMBER
RZ-A103

Floor Plans

6.9.4 Parking Level P1



1 LEVEL P1
1/16" = 1'-0"

PARKING SUMMARY - P1	
TYPE	NUMBER
ACCESSIBLE PARKING STALL	2
ACCESSIBLE VAN STALL	2
SMALL CAR STALL	7
STANDARD PARKING STALL	14
TOTAL: 25	

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

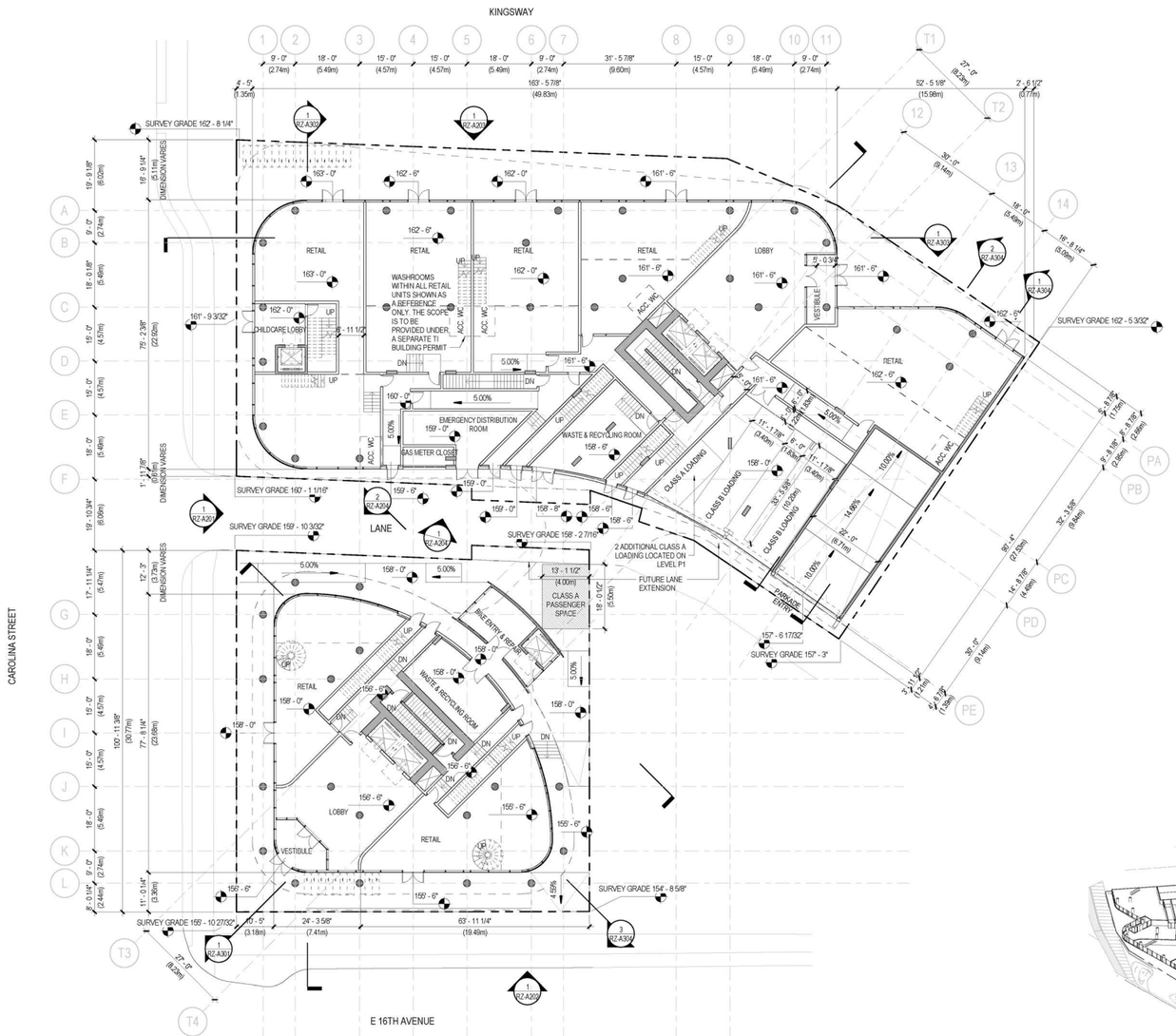
REVISIONS

TITLE
FLOOR PLAN - LEVEL P1

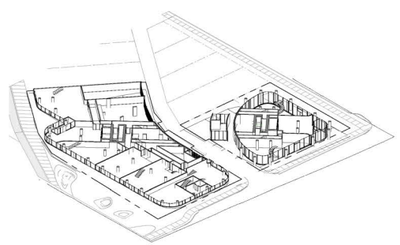
SHEET NUMBER
RZ-A104

Floor Plans

6.9.5 Ground Floor



1 LEVEL 01
1/16" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

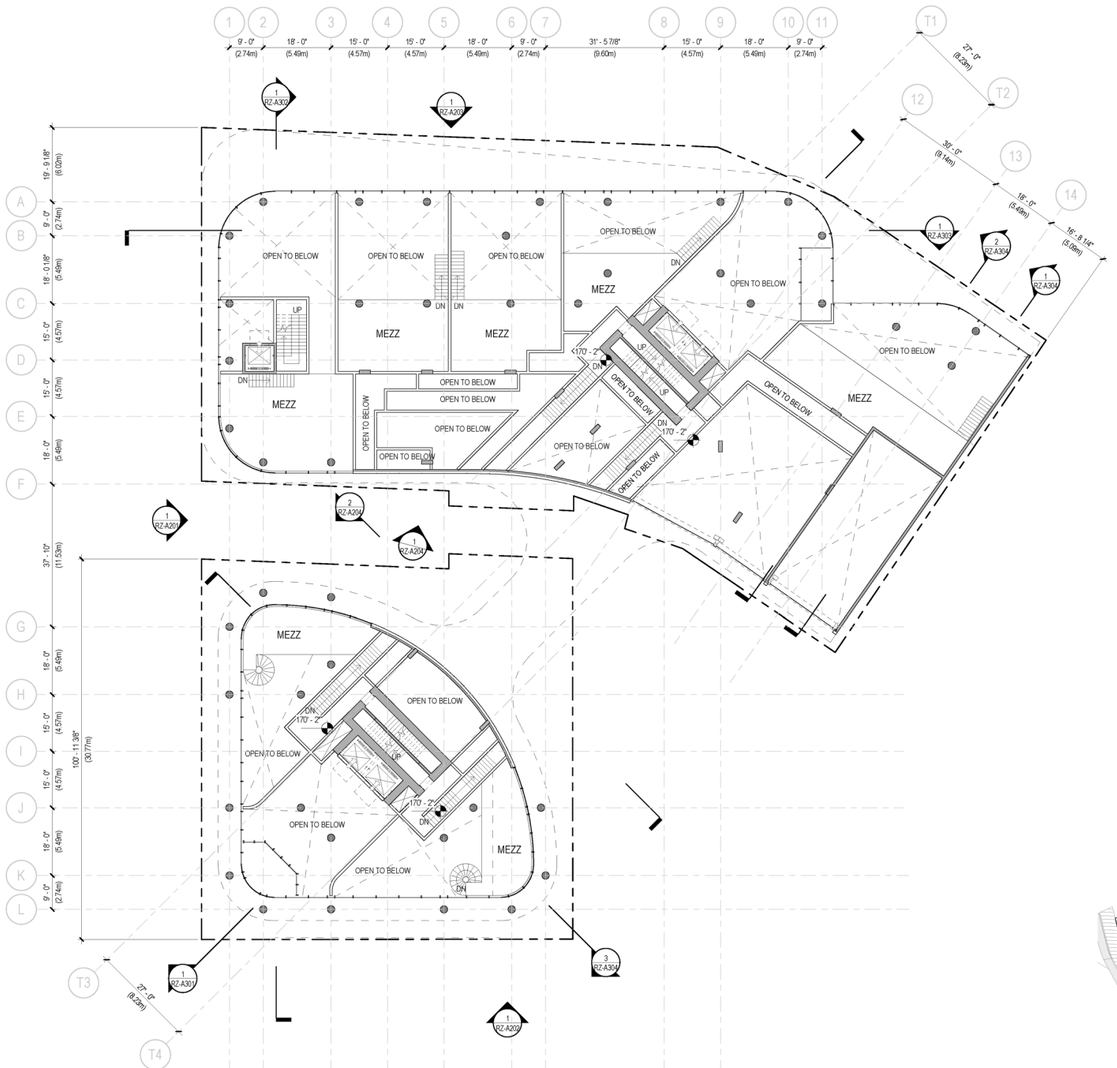
REVISIONS

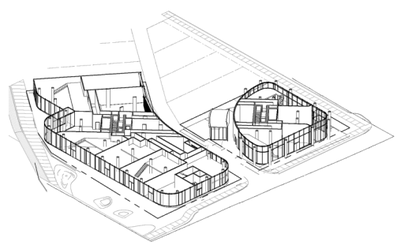
TITLE
FLOOR PLAN - LEVEL 01

SHEET NUMBER
RZ-A105

Floor Plans

6.9.6 Mezzanine Level





1 LEVEL 01 MEZZ
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

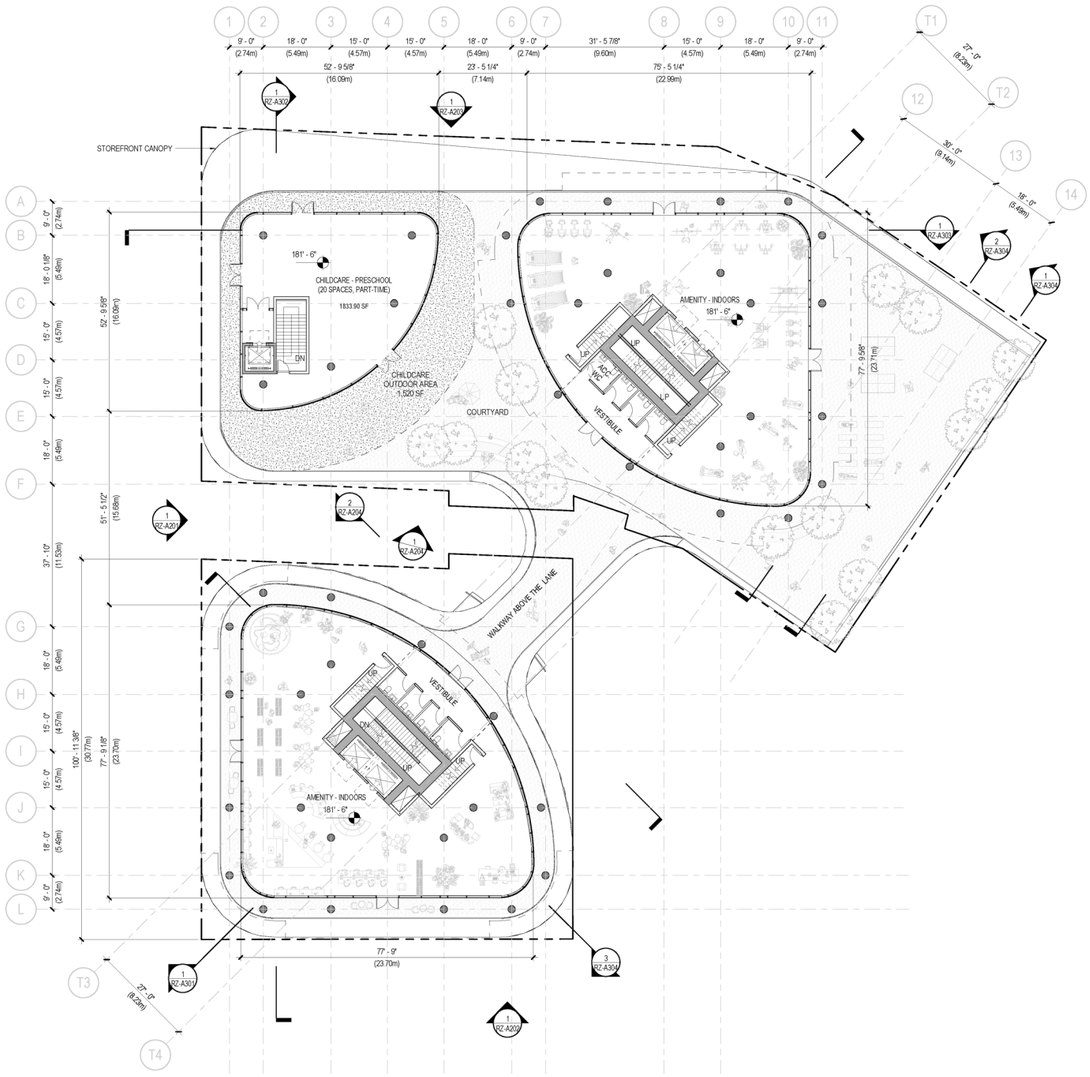
FLOOR PLAN - LEVEL 01 MEZZANINE

SHEET NUMBER

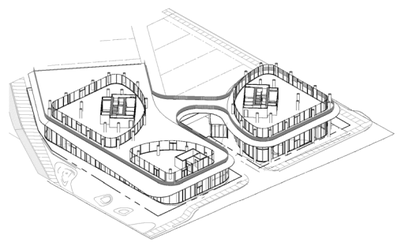
RZ-A106

Floor Plans

6.9.7 Level 2



1 LEVEL 02
1/16" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E
16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

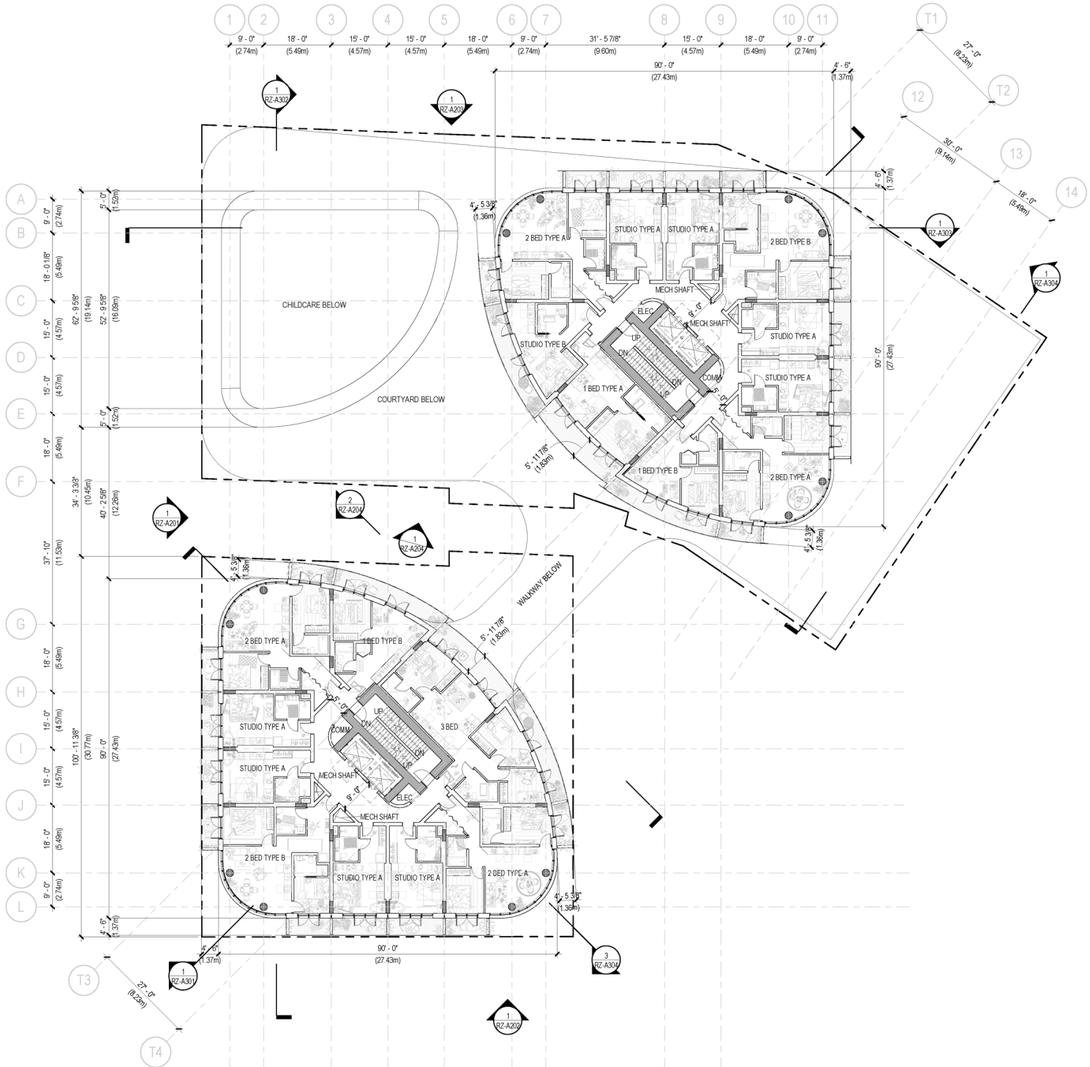
REVISIONS

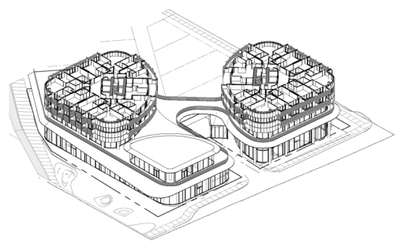
TITLE
FLOOR PLAN - LEVEL 02

SHEET NUMBER
RZ-A107

Floor Plans

6.9.8 Level 3-14





1 LEVEL 04
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

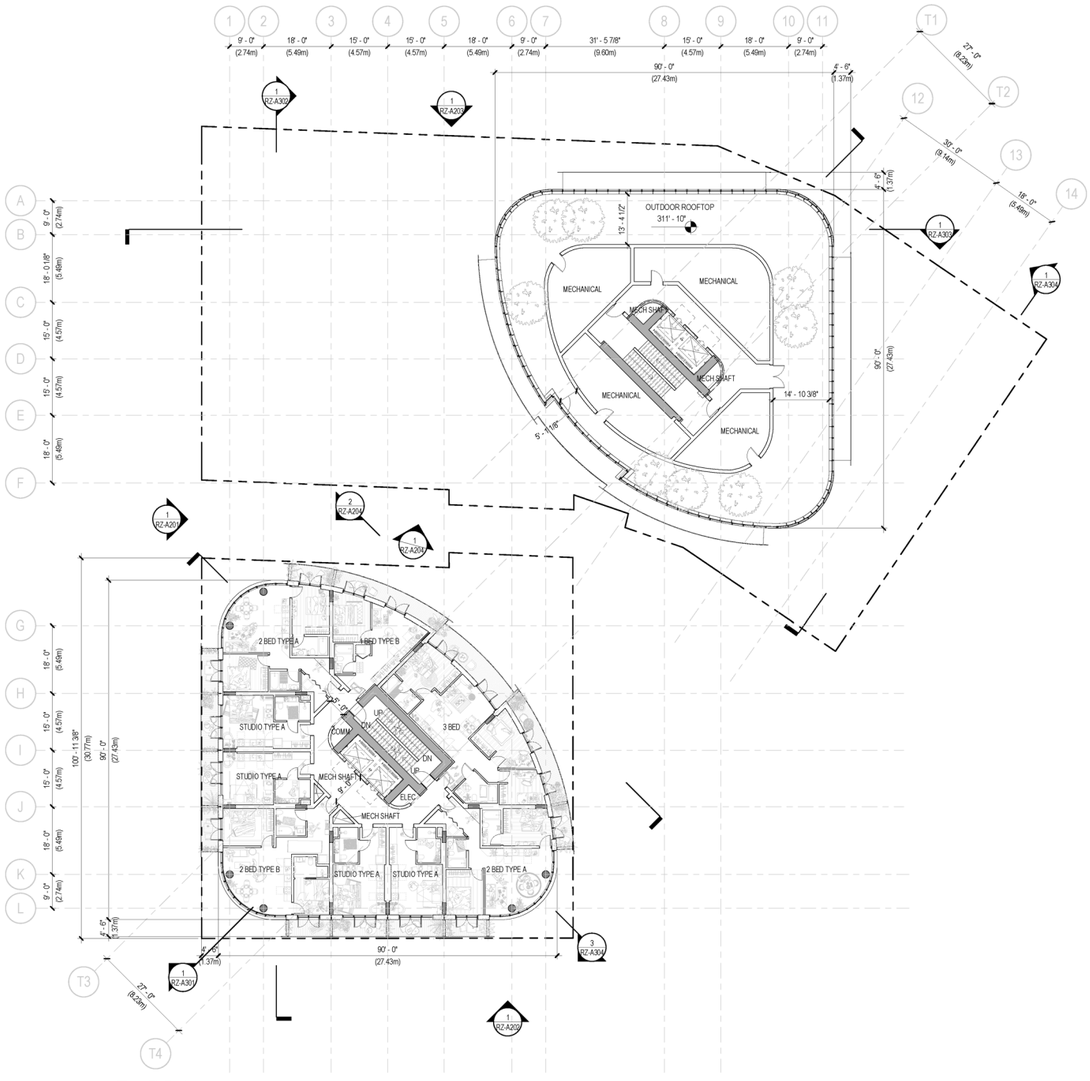
REVISIONS

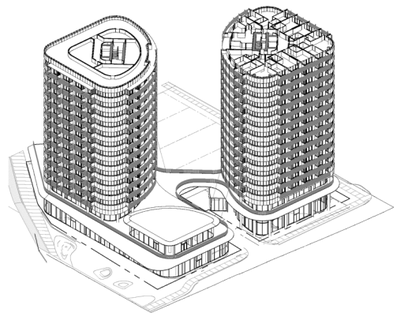
TITLE
FLOOR PLAN - LEVEL 03-14

SHEET NUMBER
RZ-A108

Floor Plans

6.9.9 Level 15





1 LEVEL 15
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

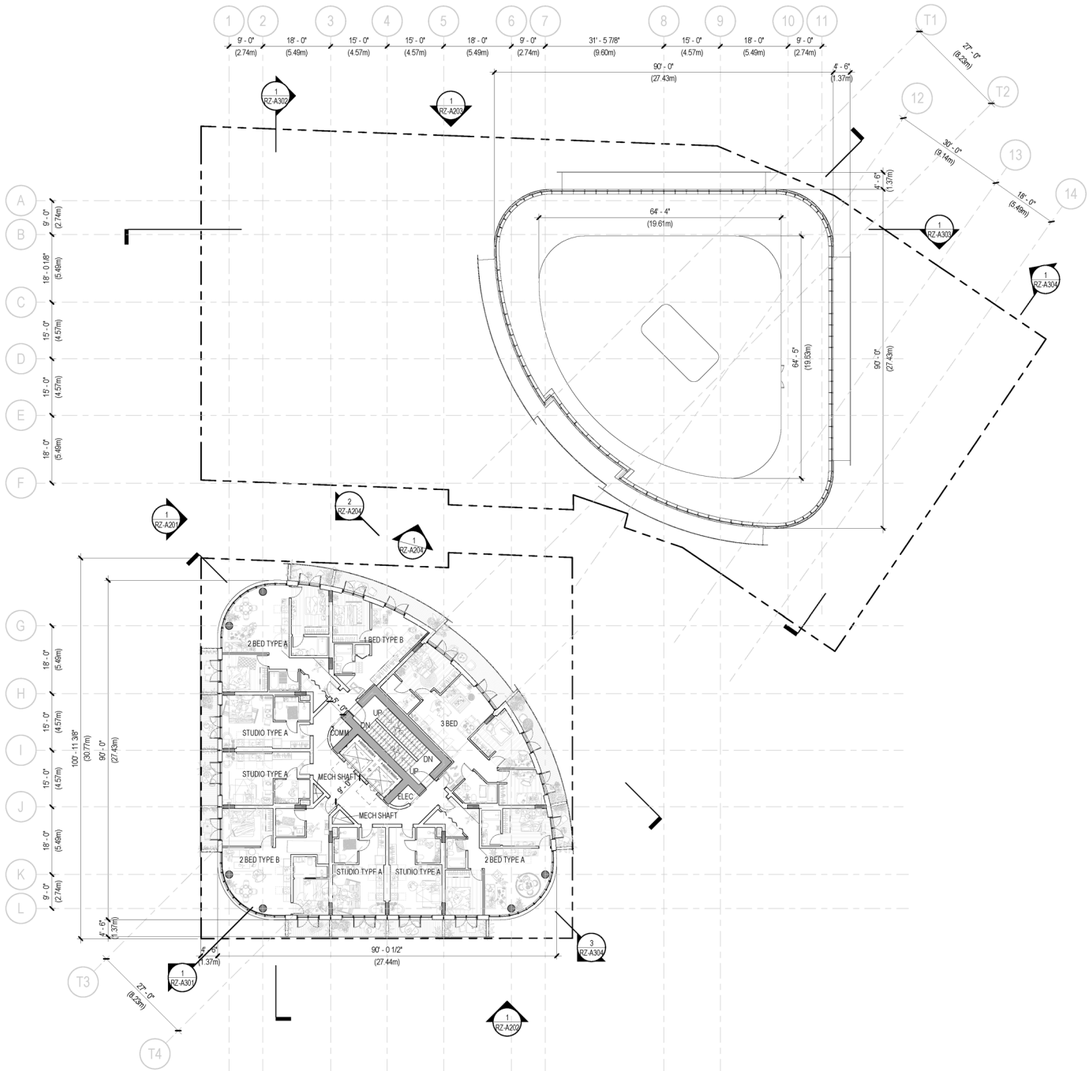
REVISIONS

TITLE
FLOOR PLAN - LEVEL 15

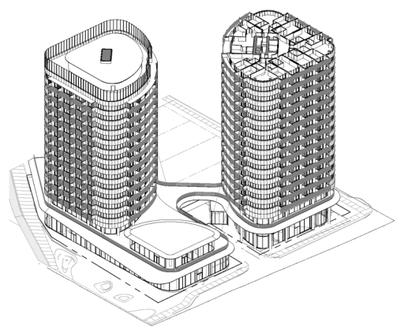
SHEET NUMBER
RZ-A109

Floor Plans

6.9.10 Level 16-25



1 LEVEL 17
1/16" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

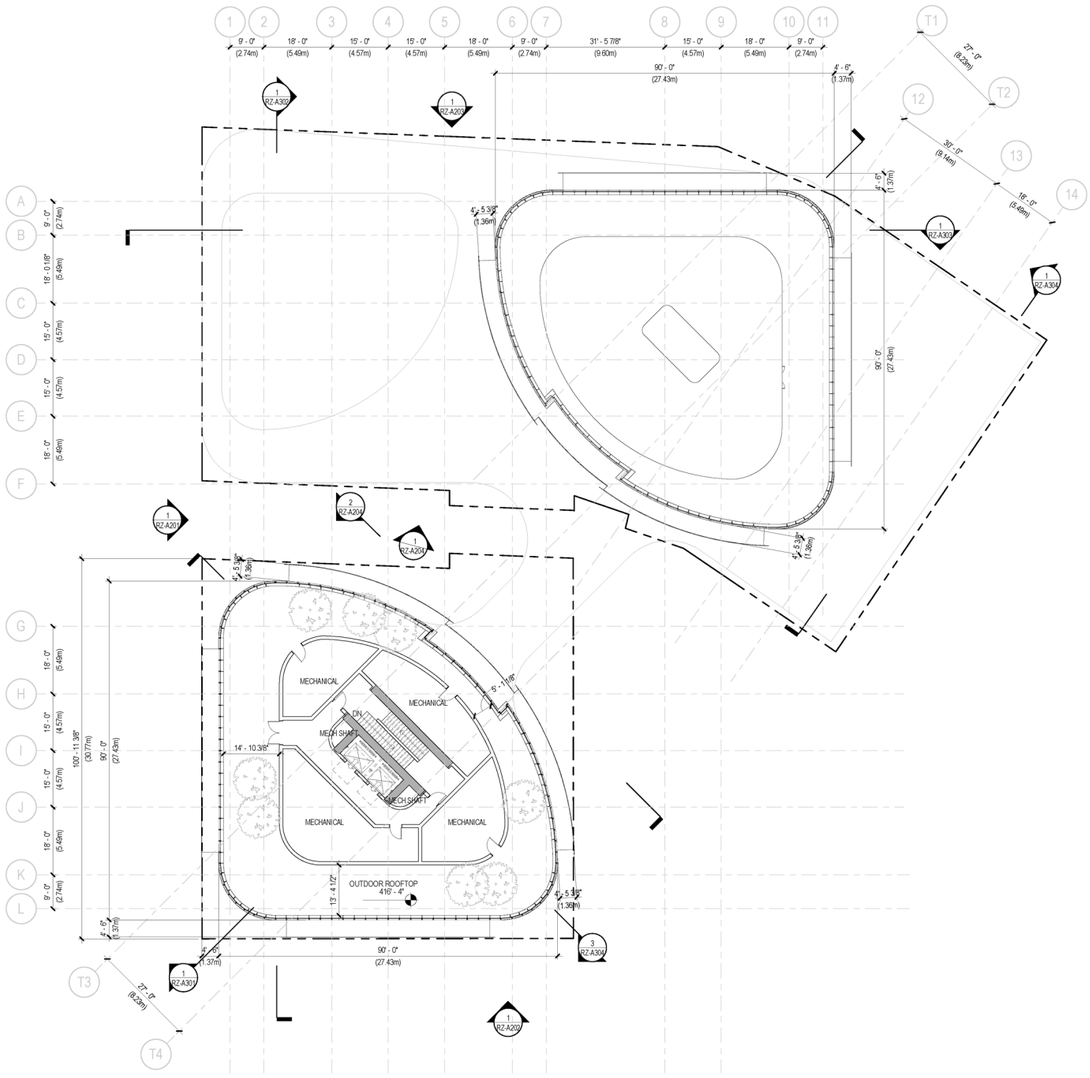
REVISIONS

TITLE
FLOOR PLAN - LEVEL 16-25

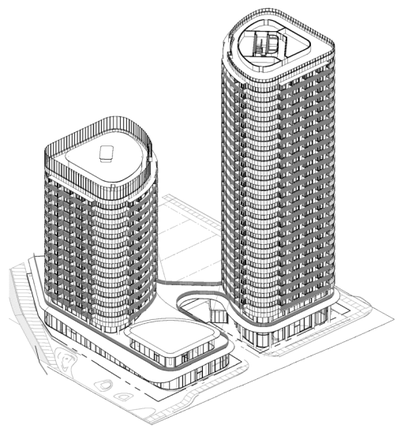
SHEET NUMBER
RZ-A110

Floor Plans

6.9.11 Roof



1 ROOF PLAN
1/16" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

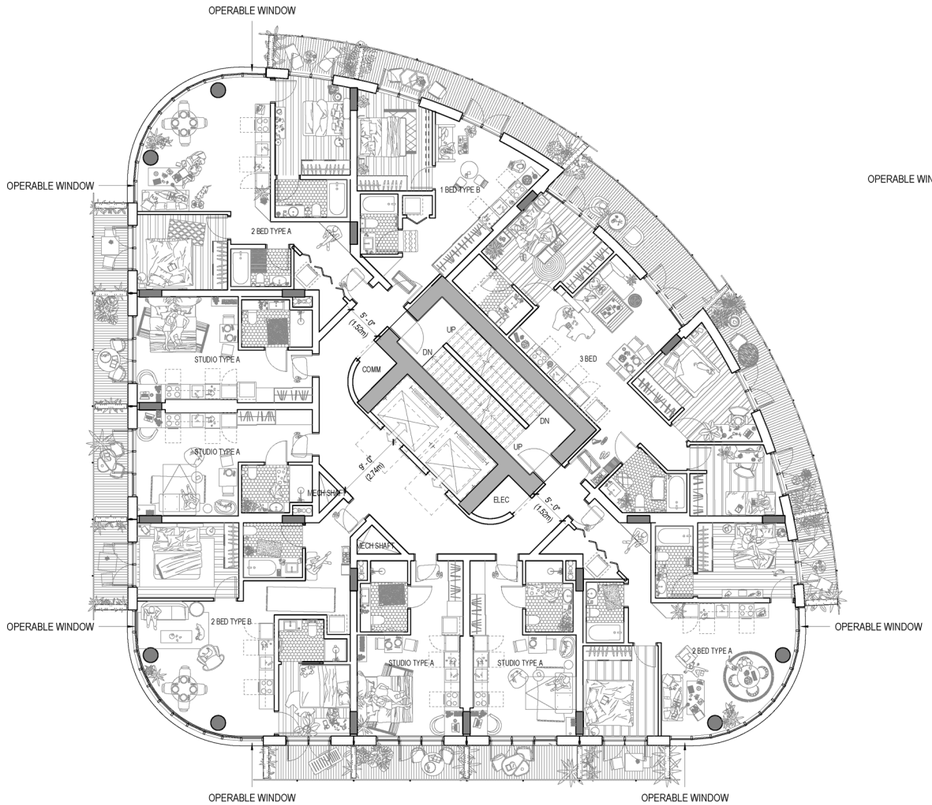
REVISIONS

TITLE
ROOF PLAN

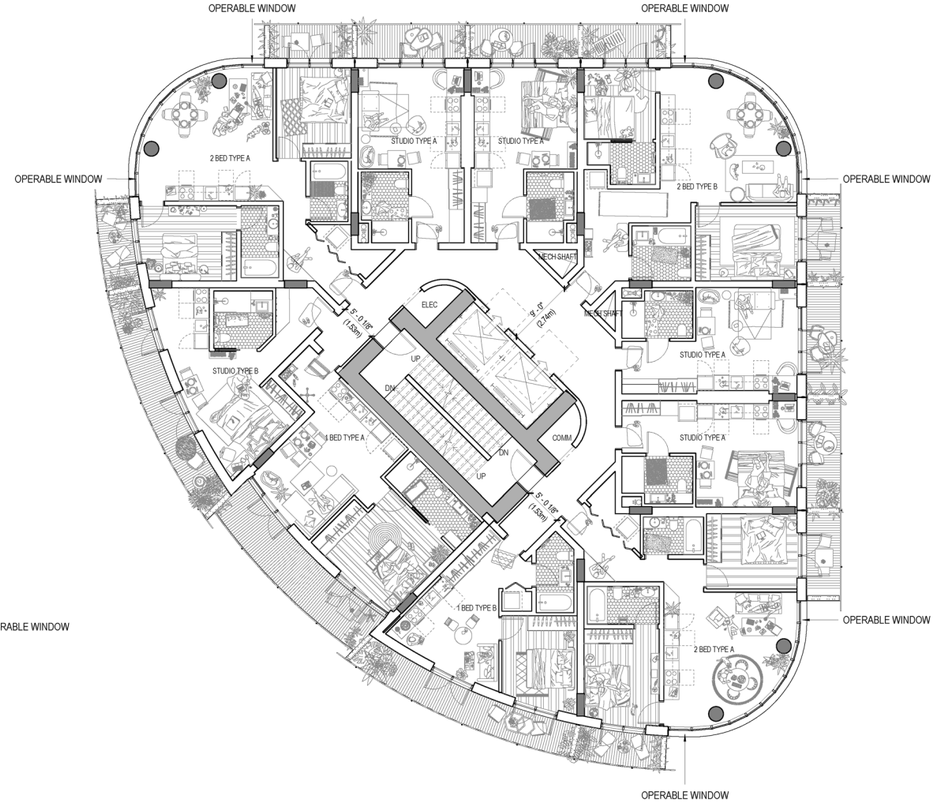
SHEET NUMBER
RZ-A111

Floor Plans

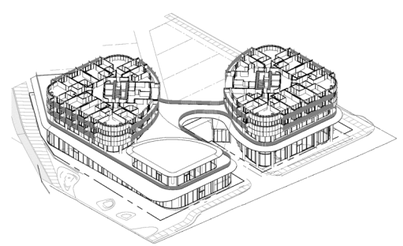
6.9.12 Enlarged Tower Plans



1 SOUTH TOWER - LEVEL 03-25
1/8" = 1'-0"



2 NORTH TOWER - LEVEL 03-14
1/8" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

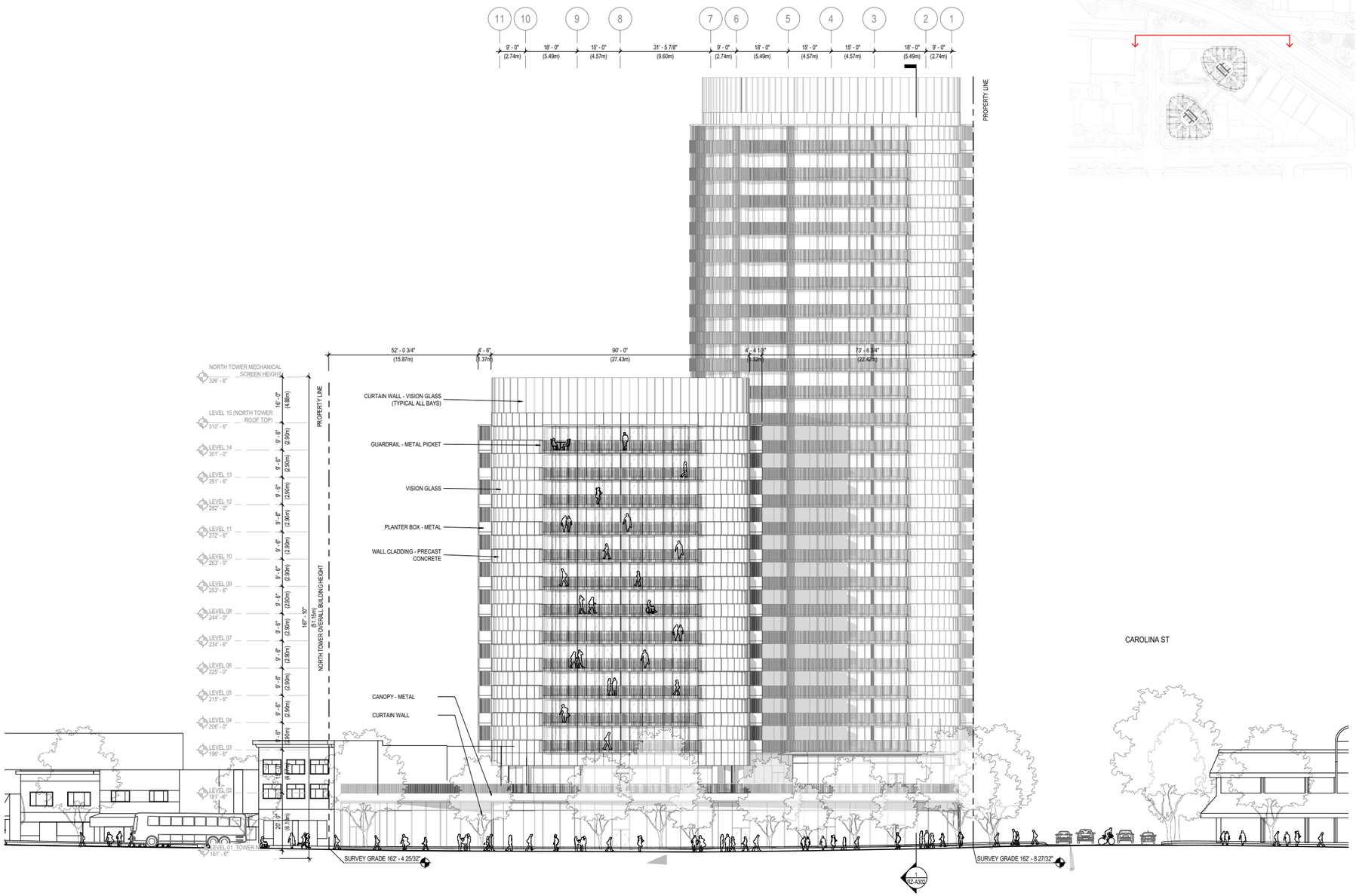
REVISIONS

TITLE
ENLARGED TOWER PLANS

SHEET NUMBER
RZ-A112

6.10 Elevations

6.10.1 E 15th Ave Elevation



1 NORTH OVERALL ELEVATION
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

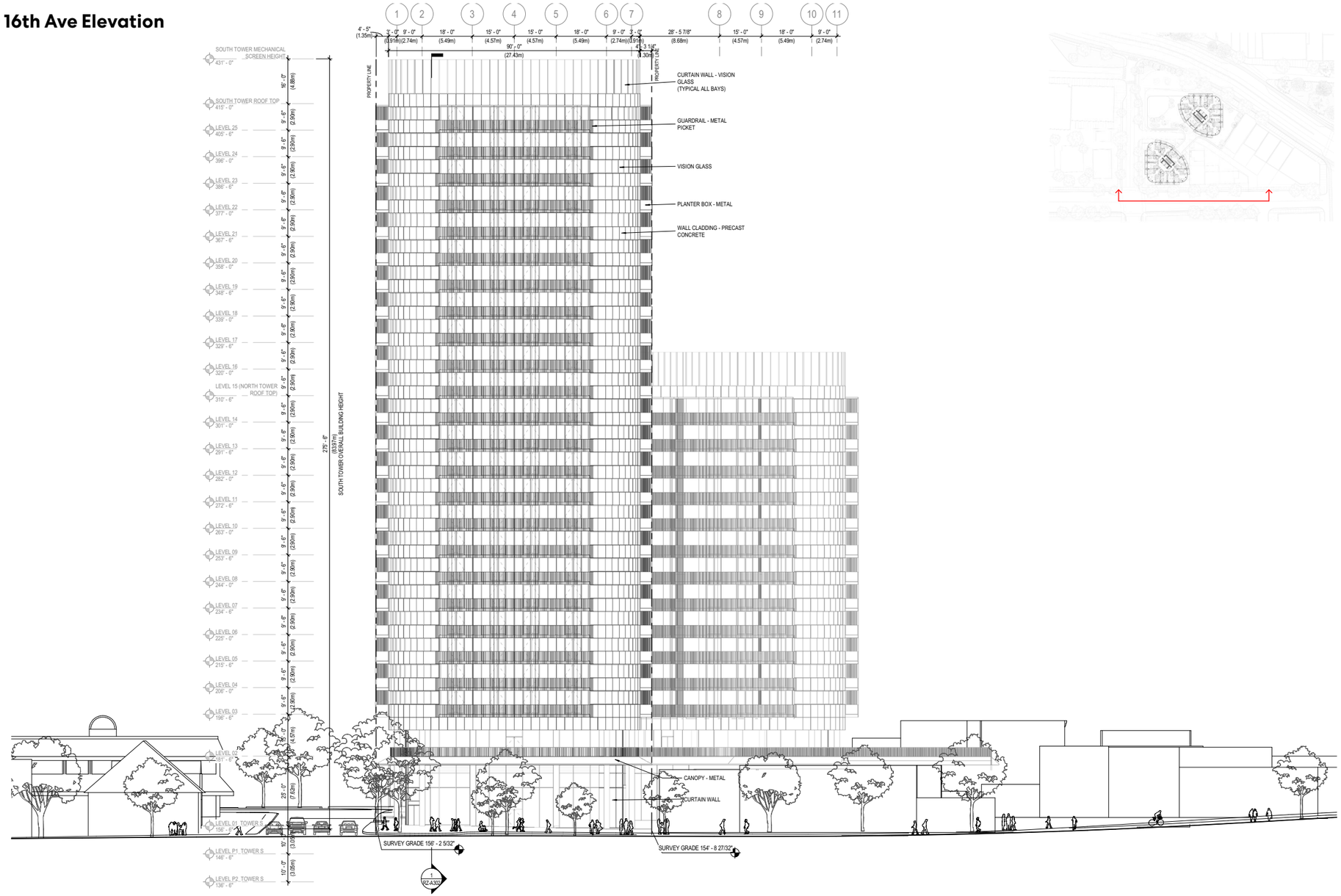
REVISIONS

TITLE
OVERALL ELEVATION - NORTH

SHEET NUMBER
RZ-A203

Elevations

6.10.2 E 16th Ave Elevation



1 SOUTH OVERALL ELEVATION
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

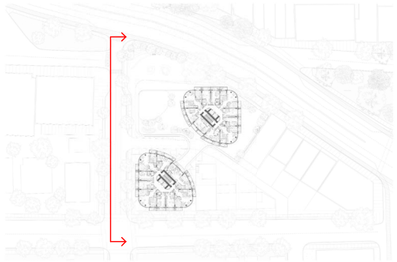
OVERALL ELEVATION - SOUTH

SHEET NUMBER

RZ-A202

Elevations

6.10.3 Carolina St Elevation



1 WEST OVERALL ELEVATION
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE
OVERALL ELEVATION - WEST

SHEET NUMBER
RZ-A201

Elevations

6.10.4 Laneway Elevations

2 OVERALL ELEVATION - LANEWAY FACING E16TH AVE
1/16" = 1'-0"

1 LANEWAY FACING KINGSWAY OVERALL ELEVATION
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

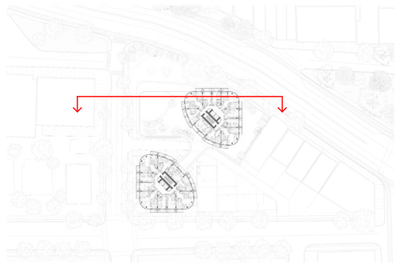
REVISIONS

TITLE
OVERALL ELEVATION - LANEWAY

SHEET NUMBER
RZ-A204

6.11 Sections

6.11.1 North Section through Kingsway



1 SECTION WEST - EAST
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

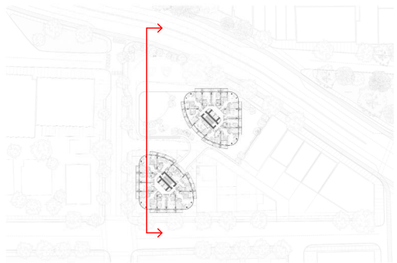
OVERALL BUILDING SECTION - W-E

SHEET NUMBER

RZ-A303

Sections

6.11.2 West Section through Carolina St



1 SECTION NORTH - SOUTH
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

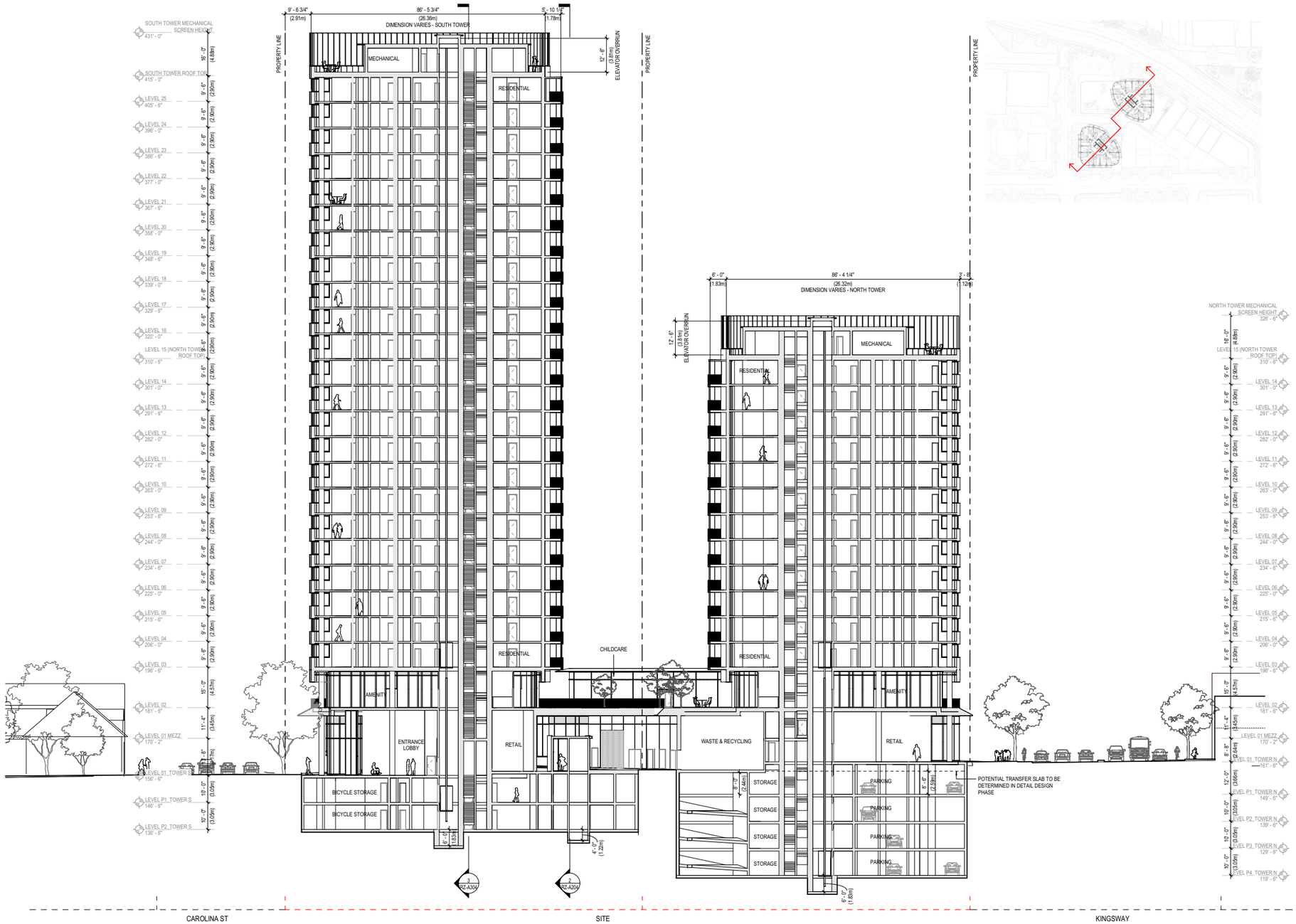
OVERALL BUILDING SECTION - N-S

SHEET NUMBER

RZ-A302

Sections

6.11.3 Diagonal Section



1 SECTION NORTH EAST - SOUTH WEST
1/16" = 1'-0"

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

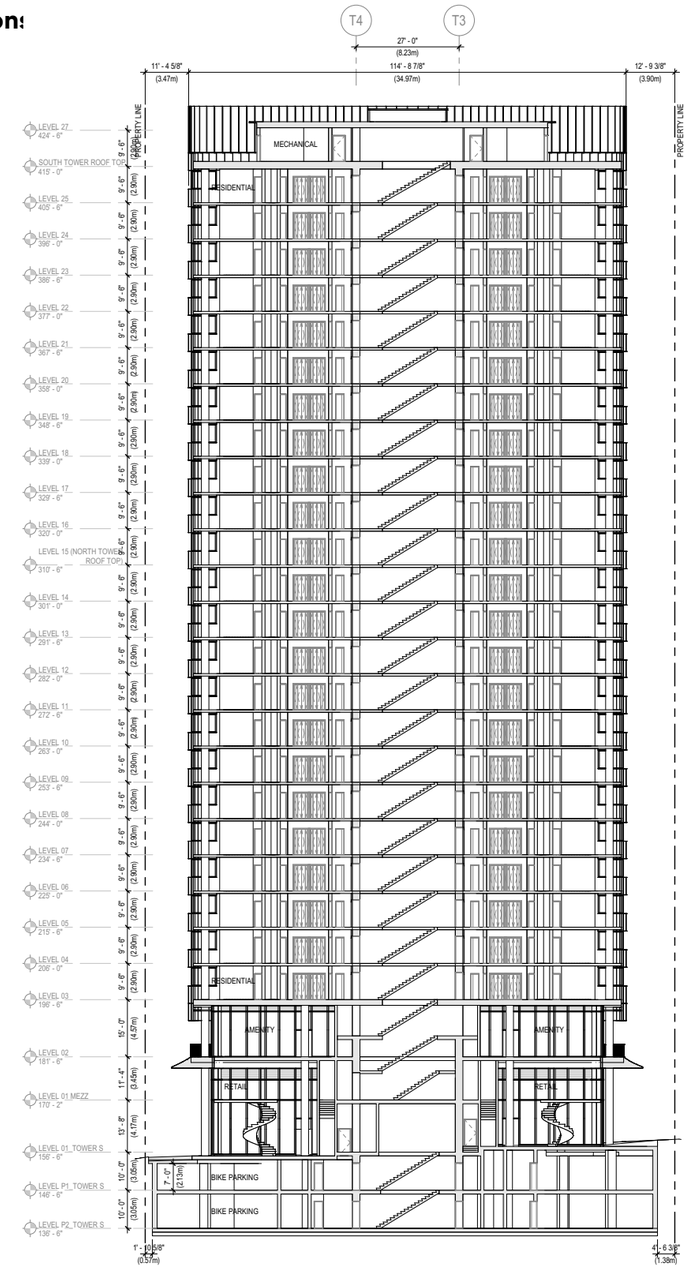
PROJECT NUMBER
412313.000

REVISIONS

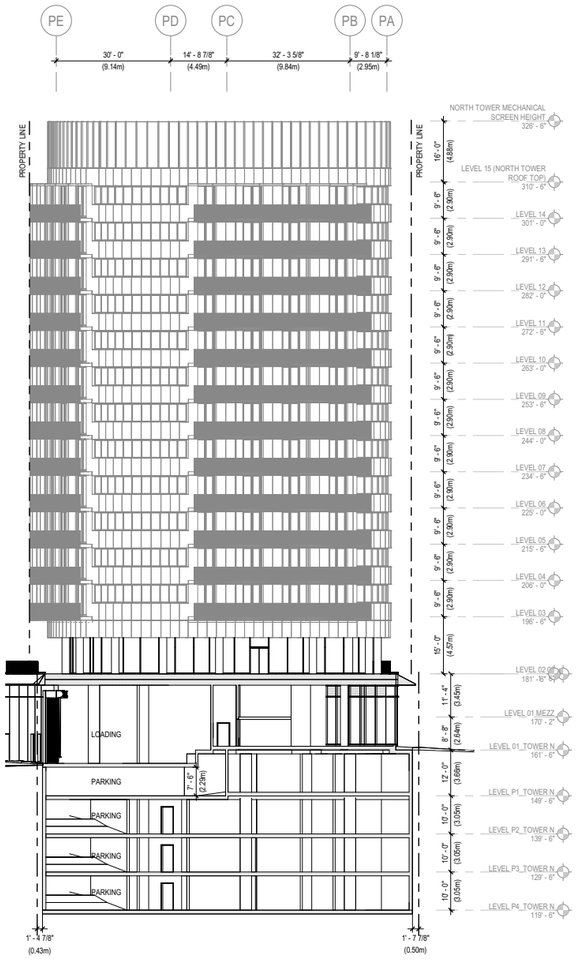
TITLE
OVERALL BUILDING SECTION - NE-SW

SHEET NUMBER
RZ-A301

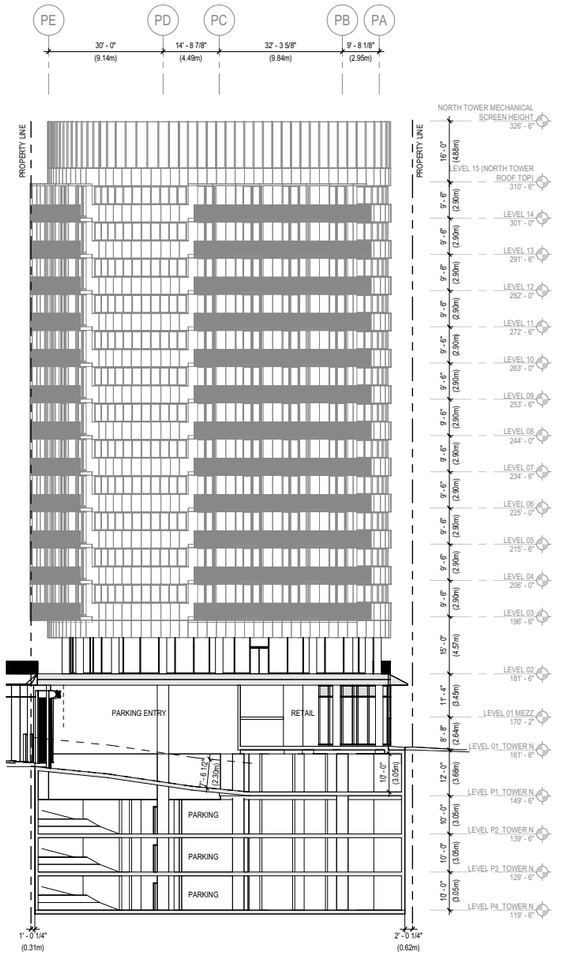
6.11.4 Building Sections



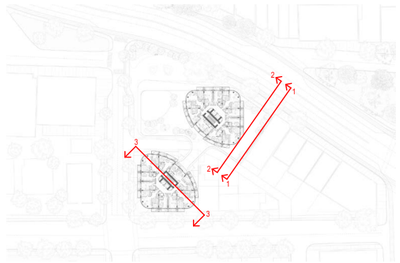
3 SECTION - EXIT STAIR
1/16" = 1'-0"



2 SECTION - LOADING
1/16" = 1'-0"



1 SECTION - PARKING ENTRY RAMP
1/16" = 1'-0"



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

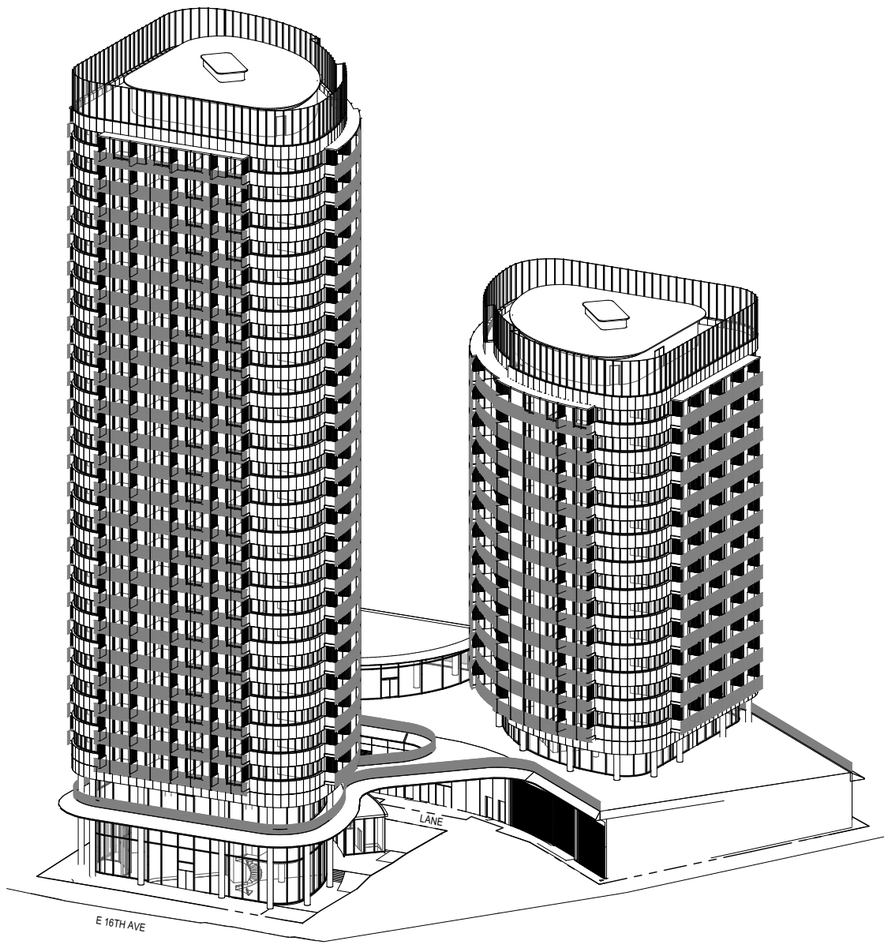
PROJECT NUMBER
412313.000

REVISIONS

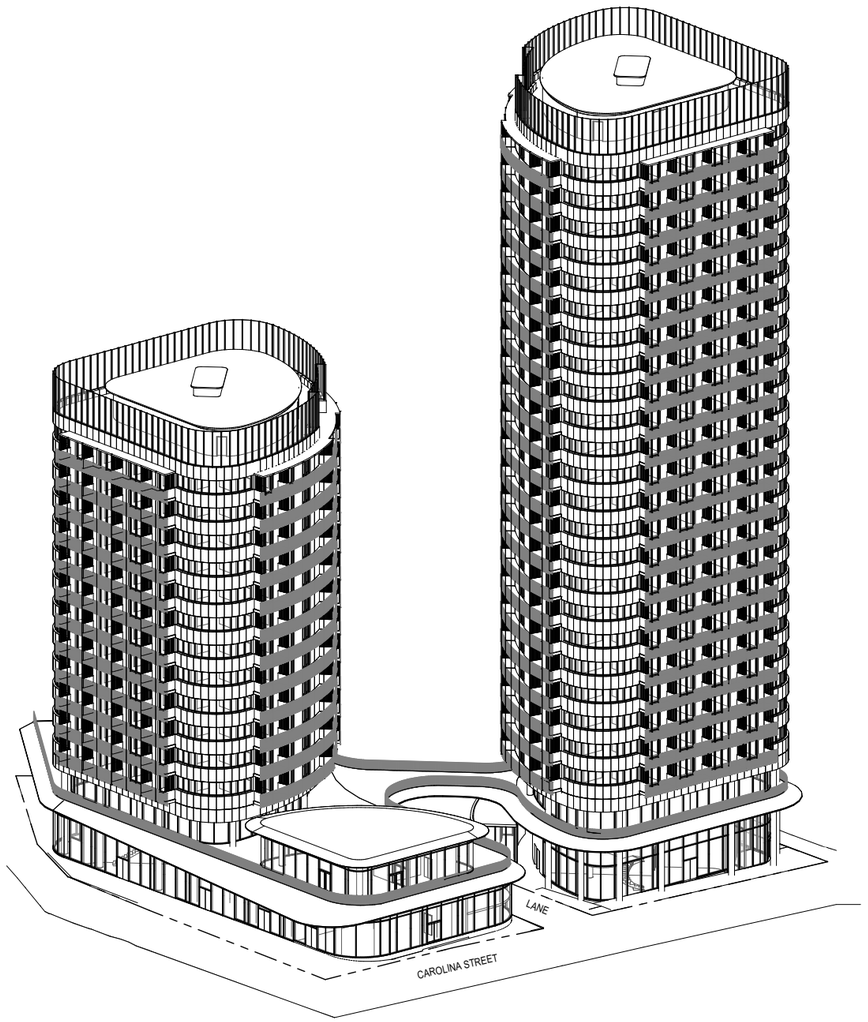
TITLE
BUILDING SECTIONS

SHEET NUMBER
RZ-A304

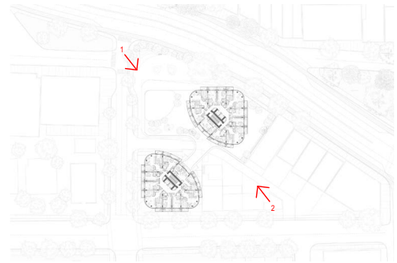
6.12 Overall Axonometric



2 AXONOMETRIC VIEW 2 - FROM SOUTH EAST LOOKING NORTH WEST



1 AXONOMETRIC VIEW 1 - FROM NORTH WEST LOOKING SOUTH EAST



Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

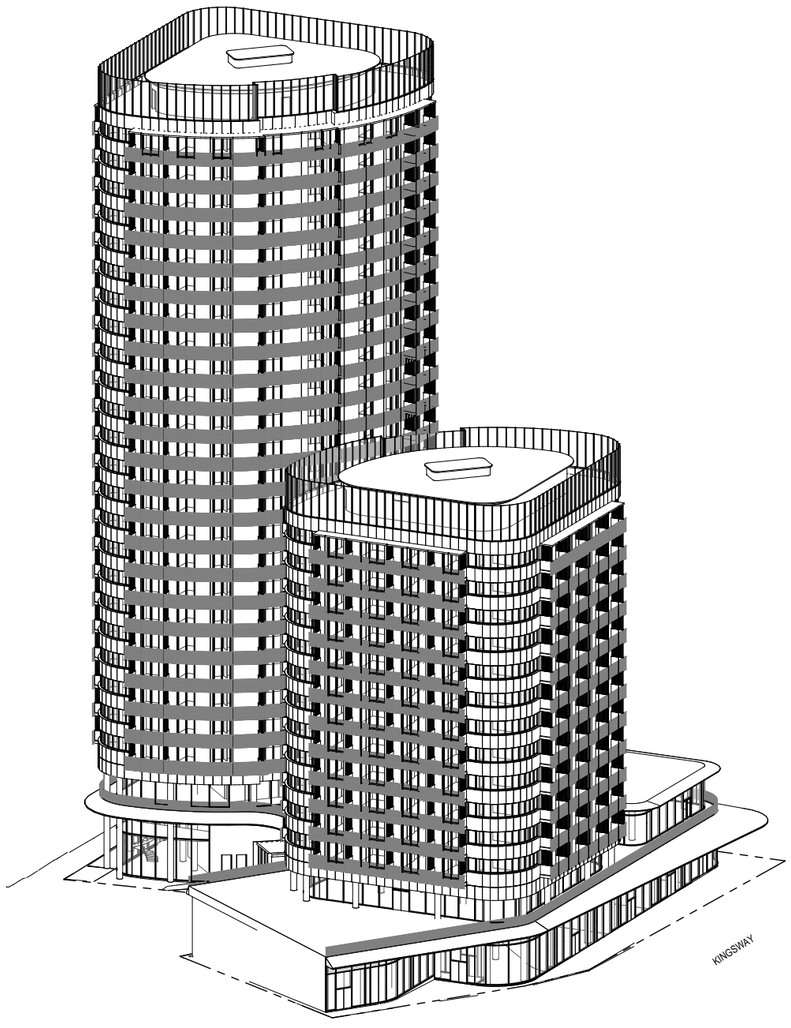
600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

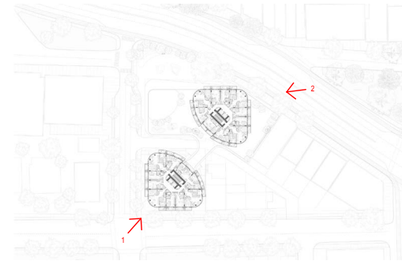
REVISIONS

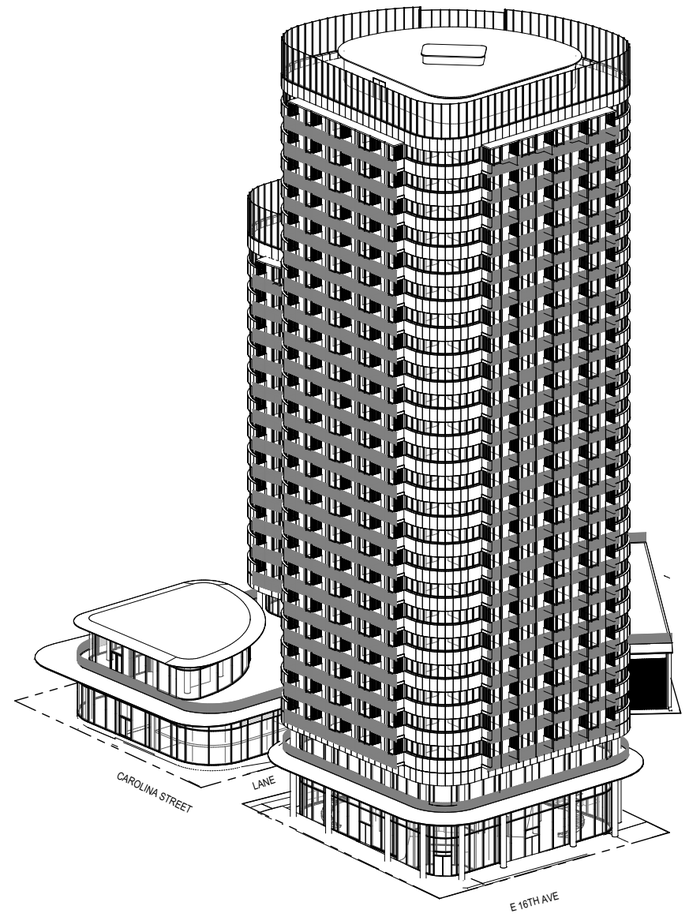
TITLE
3D AXONOMETRIC VIEWS

SHEET NUMBER
RZ-A701



2 AXONOMETRIC VIEW 4 - FROM NORTH EAST LOOKING SOUTH WEST





1 AXONOMETRIC VIEW 3 - FROM SOUTH WEST LOOKING NORTH EAST

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

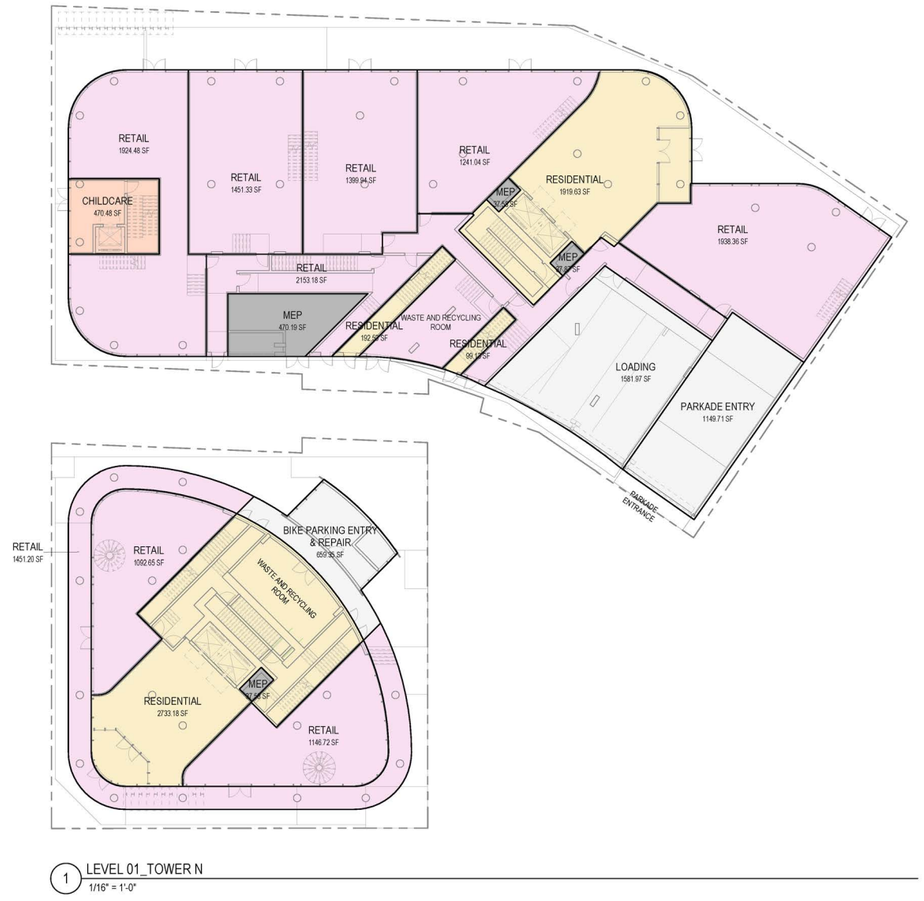
REVISIONS

TITLE
3D AXONOMETRIC VIEWS

SHEET NUMBER
RZ-A702

6.13 Floor Plans - FSR Overlay

6.13.1 Level 1



1 LEVEL 01_TOWER N
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 01

LOADING & PARKING ENTRY	659.35 SF
LOADING & PARKING ENTRY	1149.71 SF
RESIDENTIAL	1919.63 SF
RESIDENTIAL	2733.18 SF
RESIDENTIAL	192.53 SF
RESIDENTIAL	99.13 SF
TOTAL RESIDENTIAL FSR AREA	6753.53 SF

_RETAIL FSR AREA - LEVEL 01

RETAIL	1938.36 SF
RETAIL	1092.65 SF
RETAIL	1146.72 SF
RETAIL	1924.48 SF
RETAIL	1451.33 SF
RETAIL	1399.94 SF
RETAIL	1241.04 SF
RETAIL	2153.18 SF
RETAIL	1451.20 SF
TOTAL RETAIL FSR AREA	13798.89 SF

_MECHANICAL EXCLUSION - LEVEL 01

MECHANICAL	470.19 SF
MECHANICAL	37.58 SF
MECHANICAL	37.67 SF
MECHANICAL	37.58 SF
TOTAL MECHANICAL EXCLUSION	583.22 SF

_CHILDCARE EXCLUSION - LEVEL 01

CHILDCARE	470.48 SF
TOTAL CHILDCARE FSR AREA	470.48 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

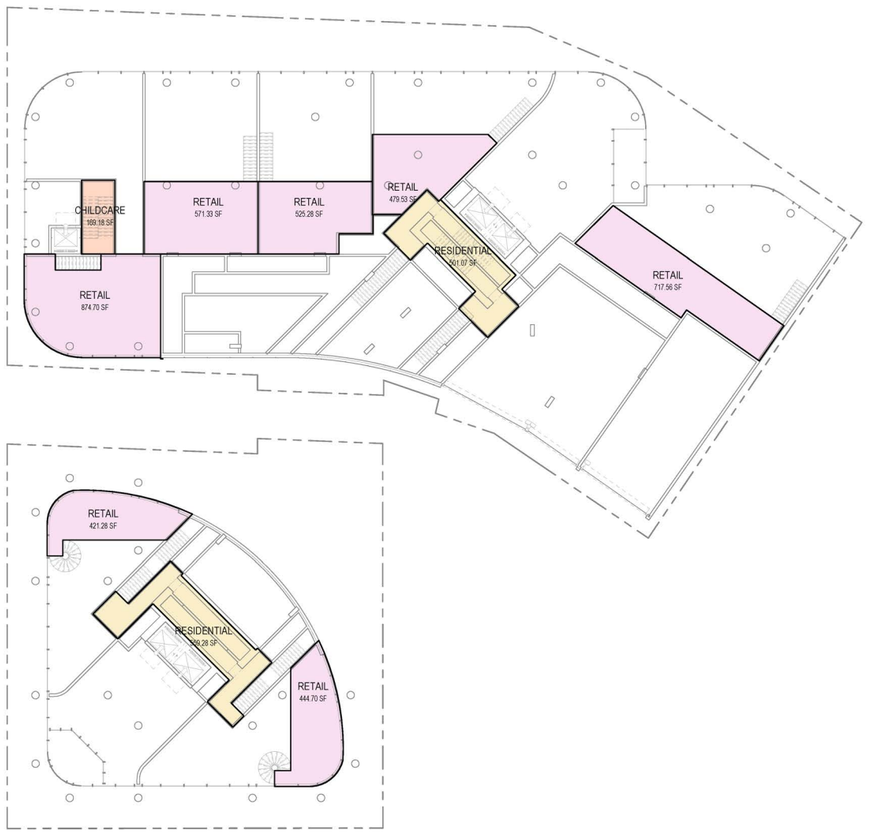
REVISIONS

TITLE
LEVEL 01 FSR OVERLAY

SHEET NUMBER
RZ-FSR101

Floor Plans - FSR Overlay

6.13.2 Mezzanine Level



1 LEVEL MEZZ
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL MEZZ	
RESIDENTIAL	501.07 SF
RESIDENTIAL	559.28 SF
TOTAL RESIDENTIAL FSR AREA	1060.35 SF

_RETAIL FSR AREA - LEVEL MEZZ	
RETAIL	444.70 SF
RETAIL	421.28 SF
RETAIL	571.33 SF
RETAIL	717.56 SF
RETAIL	874.70 SF
RETAIL	525.28 SF
RETAIL	479.53 SF
TOTAL RETAIL FSR AREA	4034.38 SF

_CHILDCARE EXCLUSION - LEVEL MEZZ	
CHILDCARE	2244.56 SF
TOTAL CHILDCARE FSR AREA	2244.56 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE
LEVEL 01 MEZZANINE

SHEET NUMBER
RZ-FSR102

Floor Plans - FSR Overlay

6.13.3 Level 02

1 LEVEL 02
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 02	
RESIDENTIAL	645.36 SF
RESIDENTIAL	448.39 SF
TOTAL RESIDENTIAL FSR AREA	1093.74 SF

_AMENITY EXCLUSION - LEVEL 02	
AMENITY	4294.05 SF
AMENITY	4494.28 SF
TOTAL AMENITY EXCLUSION	8788.32 SF

_MECHANICAL EXCLUSION - LEVEL 02	
MECHANICAL	33.69 SF
MECHANICAL	33.78 SF
MECHANICAL	35.08 SF
MECHANICAL	35.65 SF
TOTAL MECHANICAL EXCLUSION	138.20 SF

_CHILDCARE EXCLUSION - LEVEL MEZZ	
CHILDCARE	2244.56 SF
TOTAL CHILDCARE FSR AREA	2244.56 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE
LEVEL 02 FSR OVERLAY

SHEET NUMBER
RZ-FSR103

Floor Plans - FSR Overlay

6.13.4 Level 03-14

2 LEVEL 03
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 03

RESIDENTIAL	6489.65 SF
RESIDENTIAL	6489.71 SF
TOTAL RESIDENTIAL FSR AREA	12979.36 SF

_OPEN BALCONY EXCLUSION - LEVEL 03

OPEN BALCONY	2093.19 SF
TOTAL OPEN BALCONY EXCLUSION	2093.19 SF

_MECHANICAL EXCLUSION - LEVEL 03

MECHANICAL	37.56 SF
MECHANICAL	37.70 SF
MECHANICAL	20.26 SF
MECHANICAL	13.78 SF
MECHANICAL	37.56 SF
MECHANICAL	37.70 SF
MECHANICAL	13.78 SF
MECHANICAL	20.26 SF
TOTAL MECHANICAL EXCLUSION	218.59 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

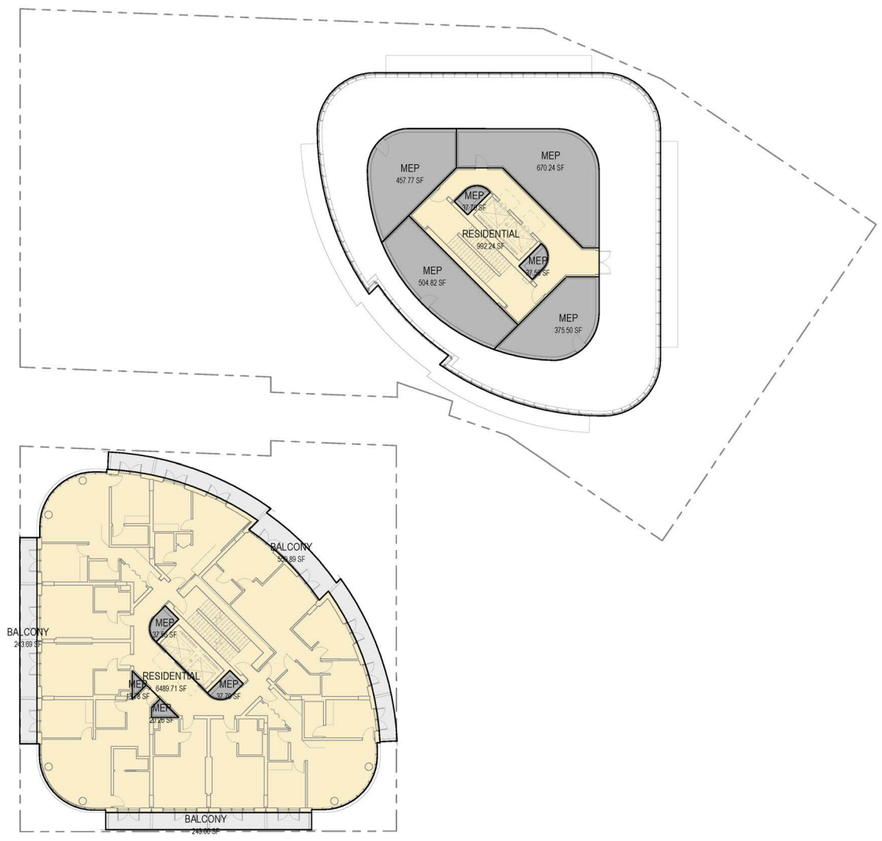
LEVEL 03-14 FSR OVERLAY

SHEET NUMBER

RZ-FSR104

Floor Plans - FSR Overlay

6.13.5 Level 15



1 LEVEL 15
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 15	
RESIDENTIAL	6489.71 SF
RESIDENTIAL	992.24 SF
TOTAL RESIDENTIAL FSR AREA	7481.96 SF

_OPEN BALCONY EXCLUSION - LEVEL 15	
OPEN BALCONY	1046.58 SF
TOTAL OPEN BALCONY EXCLUSION	1046.58 SF

_MECHANICAL EXCLUSION - LEVEL 15	
MECHANICAL	37.56 SF
MECHANICAL	37.70 SF
MECHANICAL	13.78 SF
MECHANICAL	20.26 SF
MECHANICAL	37.70 SF
MECHANICAL	37.56 SF
MECHANICAL	670.24 SF
MECHANICAL	457.77 SF
MECHANICAL	504.82 SF
MECHANICAL	375.50 SF
TOTAL MECHANICAL EXCLUSION	2192.88 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

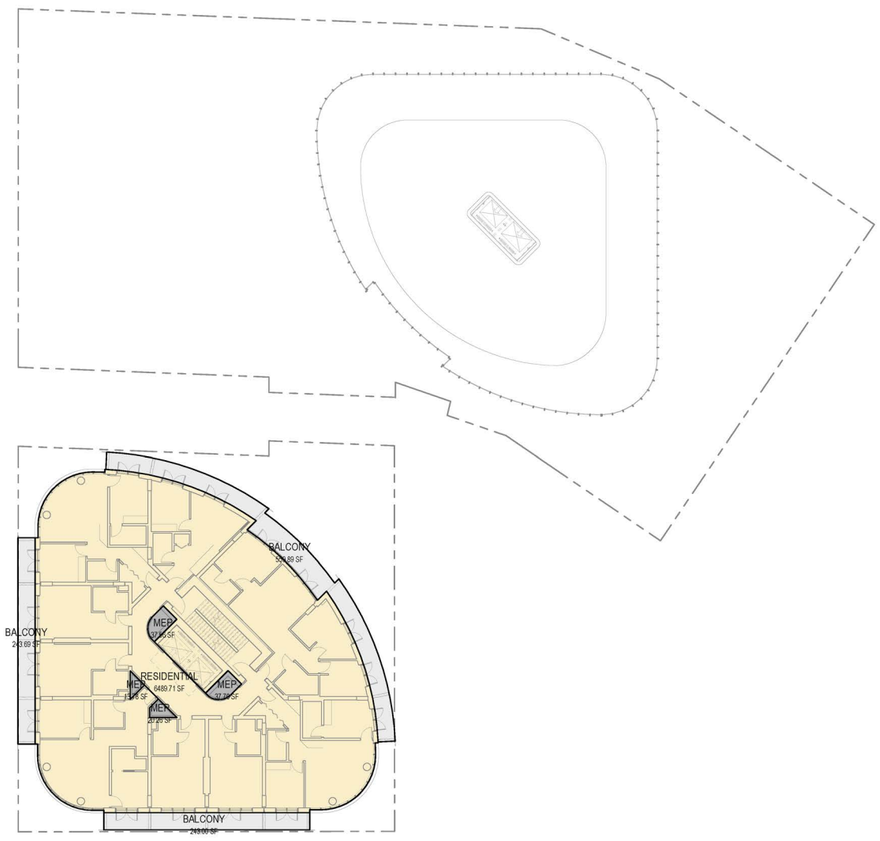
REVISIONS

TITLE
LEVEL 15 FSR OVERLAY

SHEET NUMBER
RZ-FSR105

Floor Plans - FSR Overlay

6.13.6 Level 16-25



1 LEVEL 16
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 16	
RESIDENTIAL	6489.71 SF
TOTAL RESIDENTIAL FSR AREA	6489.71 SF

_OPEN BALCONY EXCLUSION - LEVEL 16	
OPEN BALCONY	1046.58 SF
TOTAL OPEN BALCONY EXCLUSION	1046.58 SF

_MECHANICAL EXCLUSION - LEVEL 16	
MECHANICAL	37.56 SF
MECHANICAL	37.70 SF
MECHANICAL	13.78 SF
MECHANICAL	20.26 SF
TOTAL MECHANICAL EXCLUSION	109.30 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

REVISIONS

TITLE

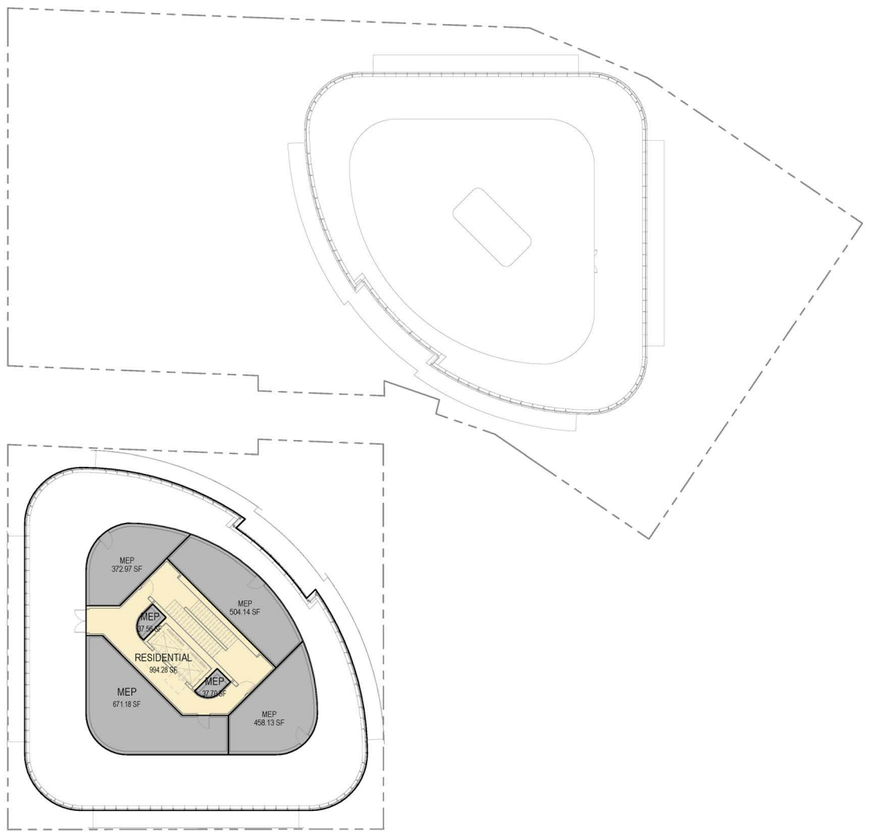
LEVEL 16-25 FSR OVERLAY

SHEET NUMBER

RZ-FSR106

Floor Plans - FSR Overlay

6.13.7 Roof



1 LEVEL 26
1/16" = 1'-0"

_RESIDENTIAL AREA SUMMARY - LEVEL 26	
RESIDENTIAL	994.28 SF
TOTAL RESIDENTIAL FSR AREA	994.28 SF

_MECHANICAL EXCLUSION - LEVEL 26	
MECHANICAL	671.18 SF
MECHANICAL	37.56 SF
MECHANICAL	37.70 SF
MECHANICAL	458.13 SF
MECHANICAL	504.14 SF
MECHANICAL	372.97 SF
TOTAL MECHANICAL EXCLUSION	2081.68 SF

Perkins&Will

BONNIS PROPERTIES

REZONING APPLICATION
AUGUST 7TH, 2024

ISSUED

ISSUED FOR REZONING APPLICATION	2024/08/07

KEYPLAN

PROJECT

600 KINGSWAY
602-644 KINGSWAY AND 603 E 16TH AVE, VANCOUVER, BC

PROJECT NUMBER
412313.000

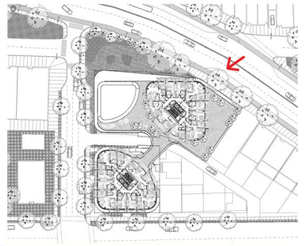
REVISIONS

TITLE
LEVEL ROOF FSR OVERLAY

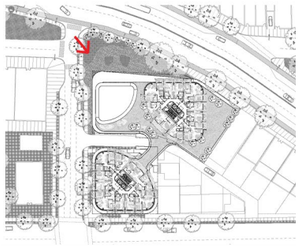
SHEET NUMBER
RZ-FSR107

6.14 Eye Level Views

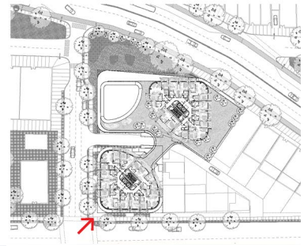
6.13.8 Eye Level View from Kingsway



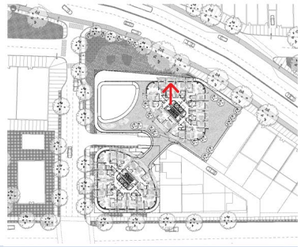
6.14.1 Eye Level View from Carolina St



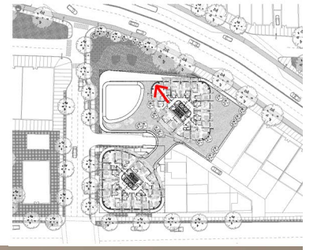
6.14.2 Entrance at South Tower



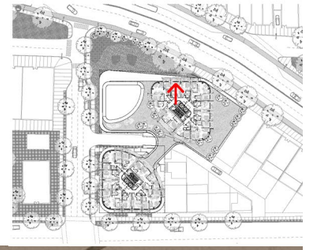
6.14.3 Eye Level View from Robson Park



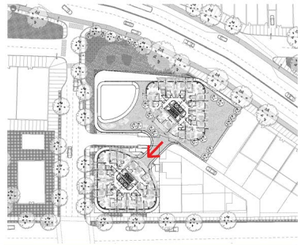
6.14.4 Interior View Looking at Corner

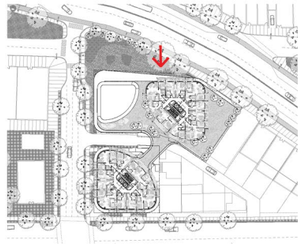


6.14.5 Studio Interior View



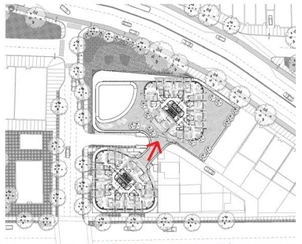
6.14.6 Terrace View II





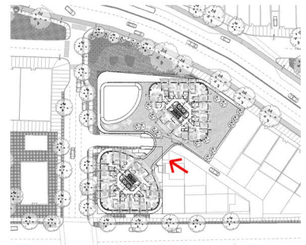
6.14.7 Aerial View

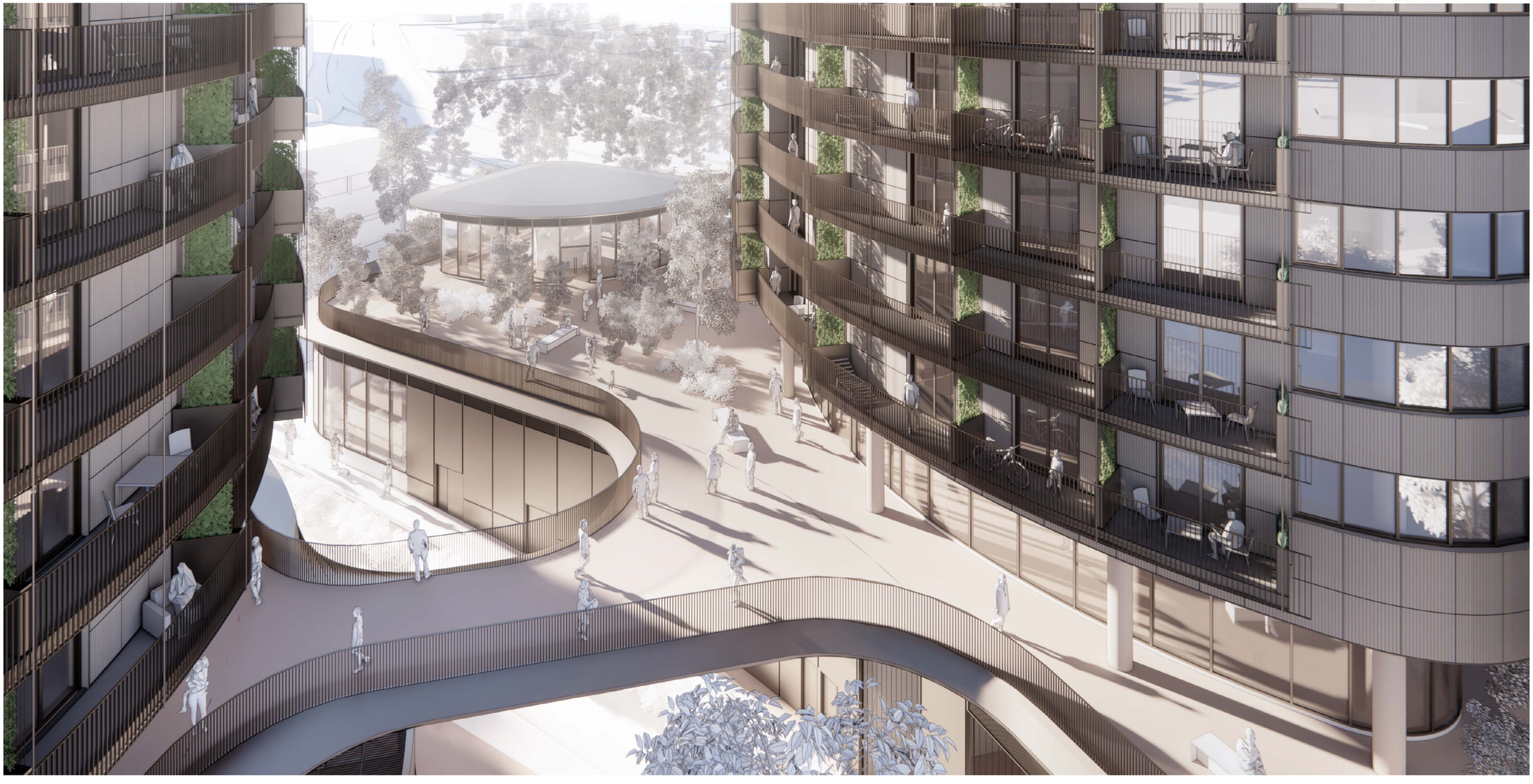
6.14.8 Terrace View from Balcony



6.15 Aerial Views

6.14.9 Aerial View over Bridge





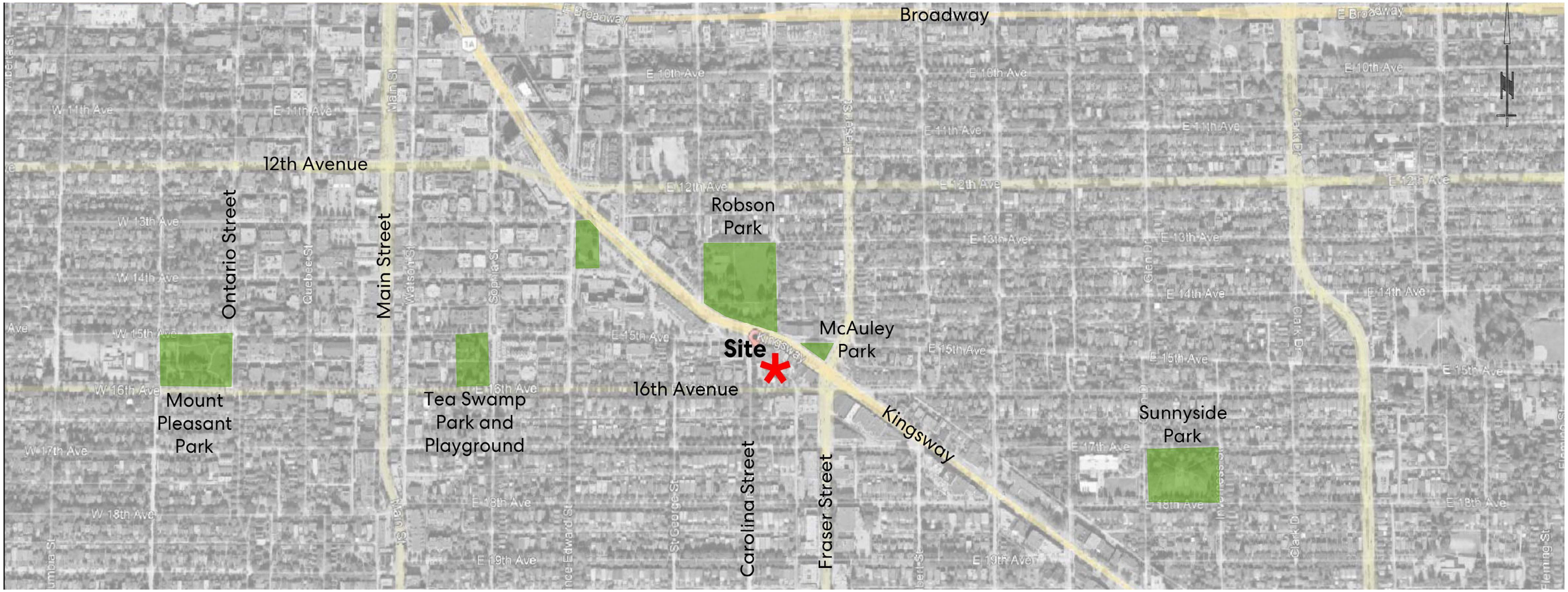
1:*50 facade study physical model, showcasing curved concrete paneling, as well as glazing and balcony approach.*

Section 7.0

Landscape Drawings

contents

7.1 Project Context



History

Kingsway cuts across the street grid of Vancouver and Burnaby, and has been used as a direct means of wheeled travel since the late 19th century. However, the route was overlain on a centuries old Indigenous pathway that followed a gradual slope to the inlet that was later called False Creek. The development of the site at 600 Kingsway will help to resurrect a pedestrian friendly environment in the neighbourhood.

600 Kingsway is located within the southeast corner of the boundary of the Broadway Plan.

The Broadway Plan

The site is within Mount Pleasant Centre - Area C, which is being planned as a dense, high rise area with continuous active services and retail on the ground levels of residential developments. The area will be both diverse and vibrant, with a mix of uses, and a well-developed and accessible streetscape.

The City building objectives of the plan will guide the development of the site. In conjunction with responding to the character of the Mount Pleasant neighbourhood, techniques for the sustainable use of storm water, planting regimes that recognize climate change patterns, and enhancing the streetscape, building entries and the pedestrian realm with well defined pedestrian spaces, will drive the landscape design.

With the overarching direction of the Broadway Plan, the City of Vancouver's Streetscape Design Guidelines (SDG) will guide the specific treatment of the public sidewalk on Kingsway.

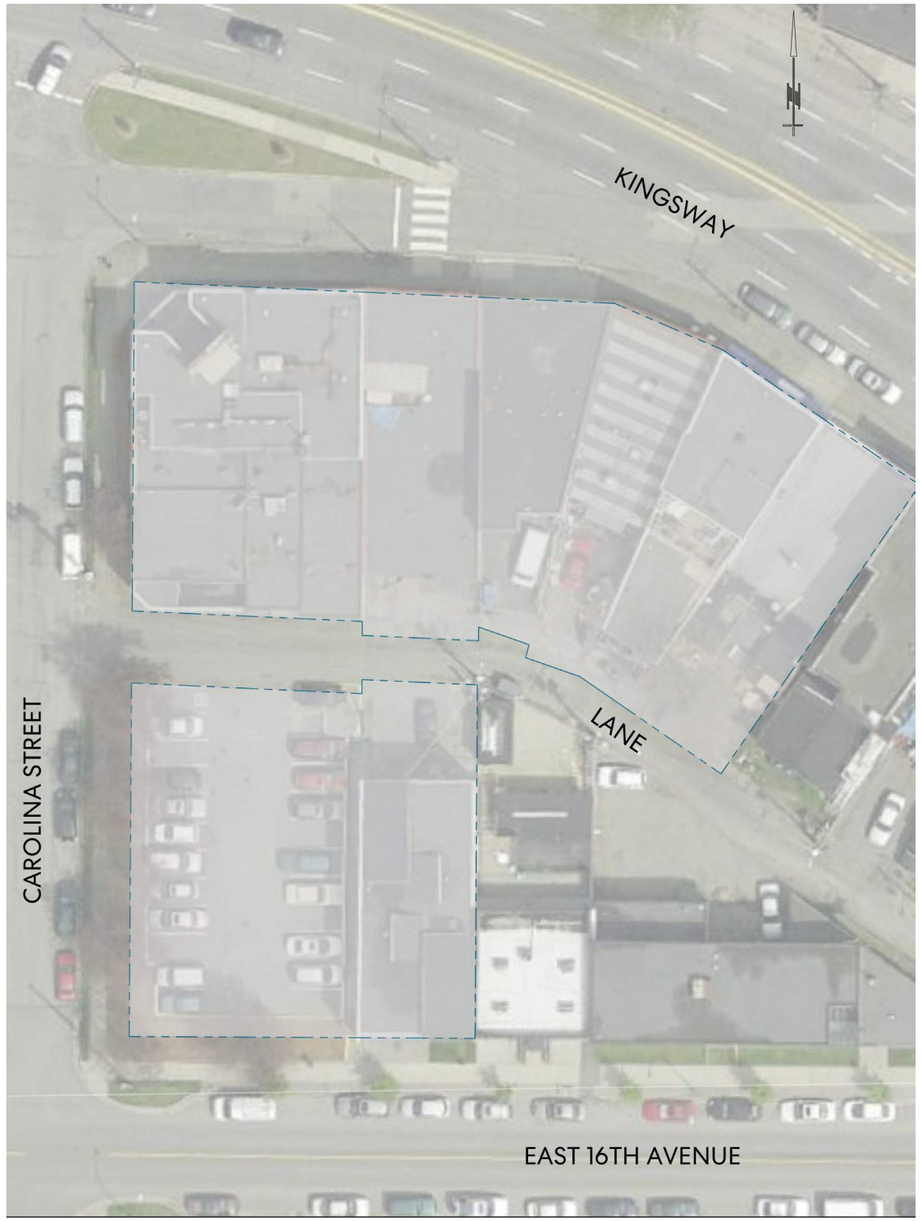
Green Space Context

As Vancouver grew, this portion of Kingsway remained limited in terms of green space. However, Robson Park, one of the few parks within a 5 block radius, is directly across the street from the site, providing essential green space for future residents. The small pocket park of McAuley Park is immediately to the southeast. Street trees lining the north side of Kingsway enhance the feel of a green corridor.

Neighbourhood parks within a kilometer include Mouth Pleasant Park and Tea Swamp Park to the west, and Sunnyside Park to the east. One of east Van's most popular parks, John Hendry Park (formerly Trout Lake Park) is 3.3 kilometer due east.

The adjacent residential neighbourhoods have a variety of street trees, many of which are decades old. Species include chestnuts, maples, hornbeam, ash and cherries, among others.

7.2 Existing Site




Median on Kingsway looking west


Median with pines at Kingsway


North on Carolina at Kingsway


Robson Park

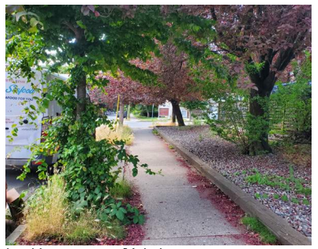

Kingsway at 15th Avenue


Kingseway at Site looking west


Kingsway, north side looking west


Looking north on Carolina


Looking south on Carolina


Looking west on 16th Avenue

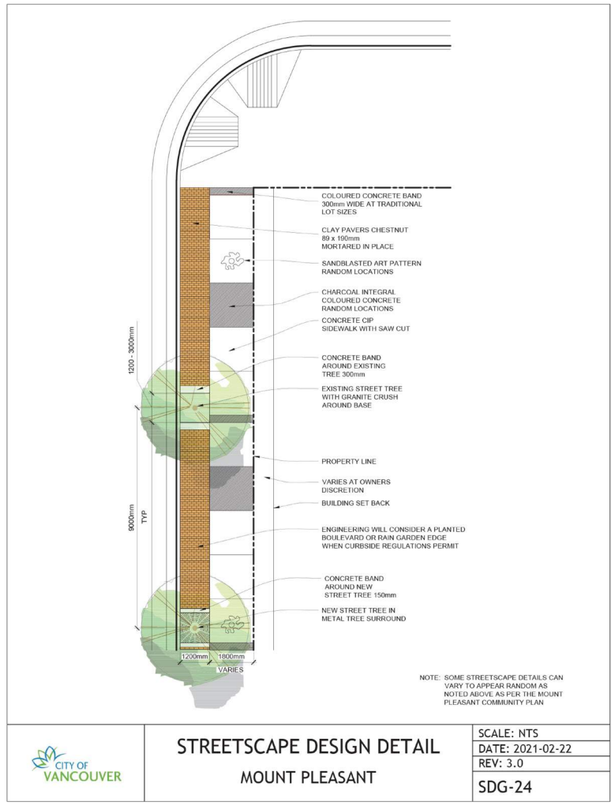
Existing Site Character

The existing site has evolved within an urban landscape for at least one hundred years. Small businesses and services along Kingsway have been backed by residential areas to the south and north. The slopes are very moderate, and the site has strong southern exposure. Prunus cerasifera “Atropupuera” line Carolina Street and the corner of 16th/ Avenue, while three Carpinus betulus are immediately south the site, on 16th/ Avenue. Two Pinus strobus are located on the small, grassed median on the north side of the site. The Tree Report prepared for this project (Froggers Creek Tree Consultants Ltd, January 2024) makes recommendations regarding the site trees.

7.3 Landscape Plan

7.3.1 Landscape Plan

Regarding the proposed park/plaza, a portion of the existing road network along e 15th avenue, at the perimeter of the site to the north will be closed and replaced with a public park/ plaza (~6,157 sf). While the same approach was reviewed and approved as part of the previous rezoning application for the site (see referral report cd-1 for 602-644 kingsway), we do expect that there will be ongoing consultations and negotiations with engineering and park board as part of this rezoning review process.



NOTE:

The Mount Pleasant Streetsape detail will be used as a guide for the development of Kingsway. For Carolina Street, we recommend a less urban treatment to integrate with the adjacent neighbourhood streetscape.

LANDSCAPE CONCEPT

The landscape concept plan for 600 Kingsway has identified four main goals for the design:

- Develop well defined pedestrian spaces, both on private and public lands
- Provide a variety of accessible gathering spaces that enhance indoor event spaces
- Provide both visual and physical connections to the surrounding neighbourhood
- Mitigate adverse microclimate effects, including excessive heat from the urban heat island, traffic noise and fumes from Kingsway, and extreme moisture regimes from weather events.

The on-grade landscape design for 600 Kingsway will be a cohesive blending of the private and public realms, with the intent of establishing welcoming pedestrian spaces on the ground level, to meet the Broadway Plan's goal of developing the Kingsway streetscape as a pedestrian friendly environment.

The plaza and public park on the north side of the site has several functions. It is an entry to the north building, including the residential entry, as well as acting as a foyer to several retail locations. The plaza and park space provides opportunities for residents and visitors to gather and socialize and helps activate the storefronts along Kingsway by providing a generous outdoor seating area. It also functions as a transition space between the building entry, Kingsway and Carolina Street, making connections to the streetscape and neighbouring green spaces. It will also help to manage site stormwater.

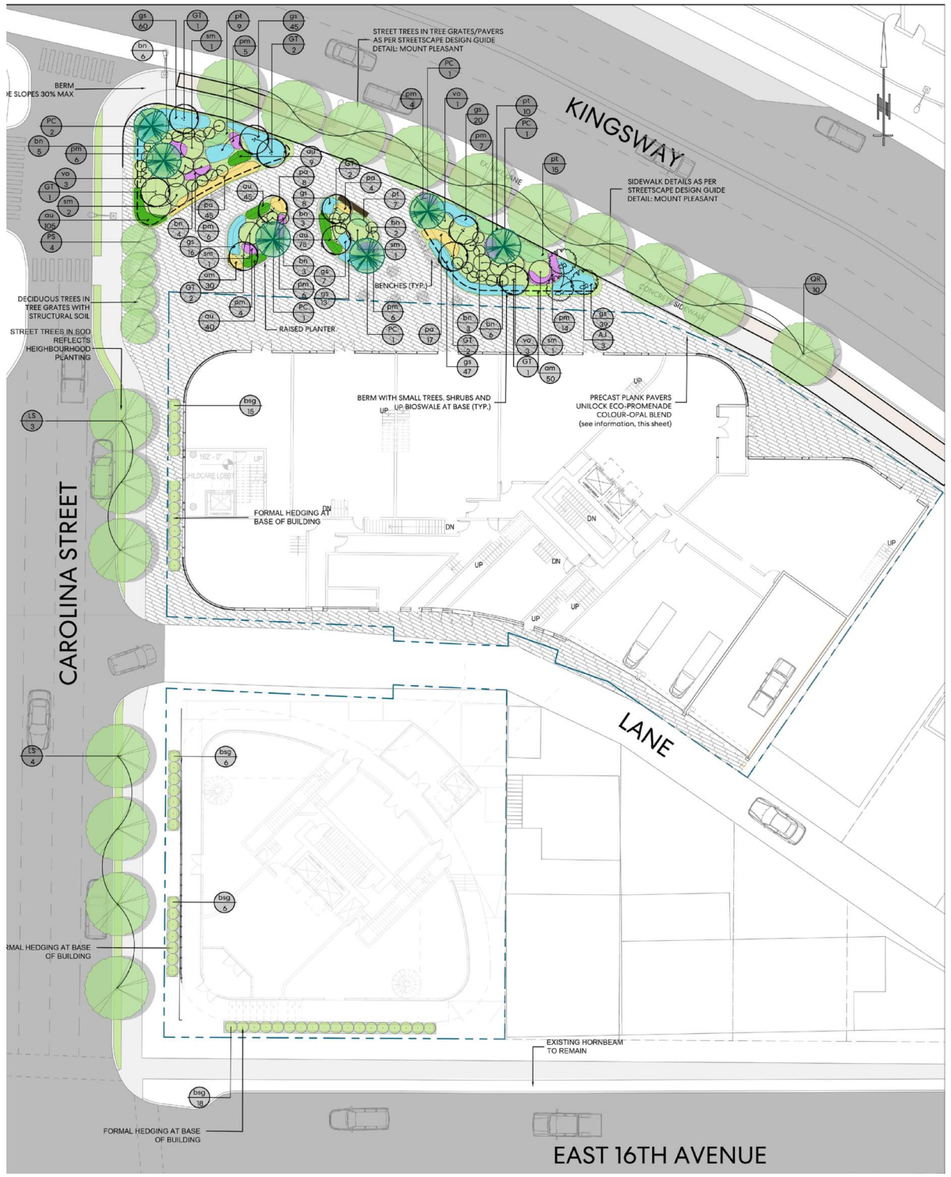
The landscape treatment on Carolina Street and 16th Avenue transitions between the long standing residential neighbhourhood west and south of the site, and retail services on the ground level of the buildings. Formal hedging lines the building bases, while street trees define the boulevard and provide shade and a green setting to the development

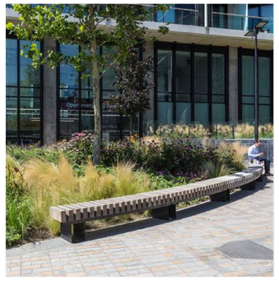
On level two, the amenity space will be developed for the residential community. A multi-purpose room on the west side of the level opens up to a large outdoor terrace, with a series of gathering areas that are defined by raised planters, benches and café seating.

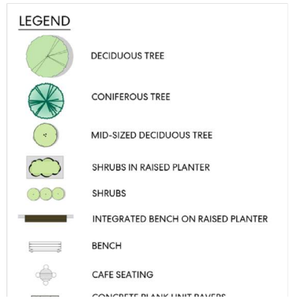
The rooftop terraces on both buildings tower will give further opportunities for residents to enjoy an outdoor area - with planters, seating and views over the city.

7.4 Future Mini Park Landscape Plan

7.4.1 Landscape Plan - Ground Level







Qty	Key	Botanical Name	Common Name	Size	Notes
Trees					
3	AJ	Acer japonicum	Fernleaf Full Moon Maple	5 gal pot	
11	GT	Gleditisia triacanthos 'Imperial'	Honey Locust var. 'Imperial'	65 mm cal B&B	
7	LS	Liquidamber styraciflua	Sweet Gum	65 mm cal B&B	
6	PC	Pinus contorta	Shore Pine	3.0m HT B&B	Native
4	PS	Prunus serrulata 'Shirofugen'	Japanese Cherry	65 mm cal B&B	
10	QR	Quercus rubra 'Red Oak'	Red Oak	65 mm cal B&B	
Shrubs					
32	bn	Berberis nervosa	Dull Oregan Grape	#2 Pot	Native
45	bsg	Buxus sempervirens 'Green Mountain'	Green Mountain Boxwood	#2 Pot	
7	vo	Vaccinium ovatum	Evergreen Huckleberry	#5 Pot	Native
6	sm	Syringa meyeri 'Palibin'	Dwarf Koran Lilac	#5 Pot	
Groundcover/ Grasses/ Perennials					
265	au	Arctostaphylos uva-ursi	Kinninikinnick	#2 Pot	Native
30	am	Achillea millefolium	Yarrow	#2 Pot	Native
250	gs	Gaultheria shallon	Salal	#2 Pot	Native
41	pt	Pachysandra terminalis	Japanese Spurge	#2 Pot	Native

room for cafe seating as needed. The plaza merges into a small public park, which in turn transitions into a treed streetscape.

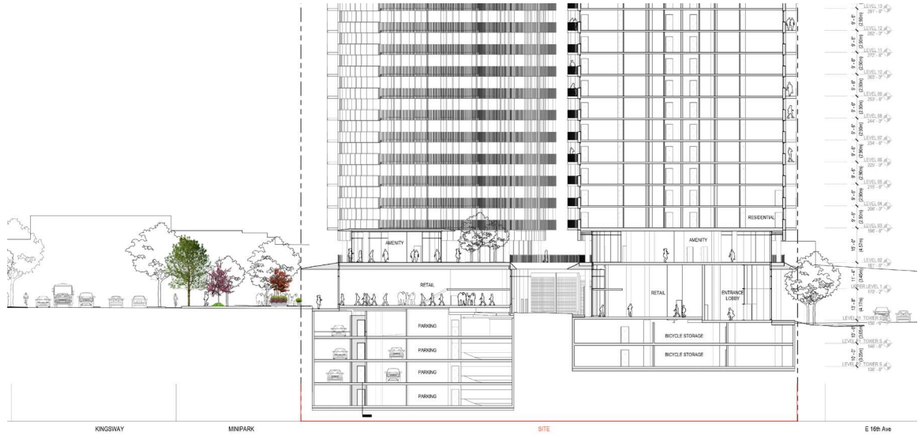
Access is from both Carolina Street on the west side, and Kingsway on the north. In an effort to promote climate resilience of the site, well planted berms with bioswales will be located on the north side of the plaza. The berms support resilient trees and shrubs and add verticality to the plaza space. They will also protect users from the effects of traffic on Kingsway, provide a green backdrop to the pedestrian space, and will help to manage the stormwater run-off from the plaza by directing flow from the plaza into bioswales at their base. The berms will have a maximum slope of 30%. The slopes of the berm, and the design of the bioswales will be coordinated with the site drainage regime, and be planted with mid-sized trees, both coniferous and deciduous, shrubs and groundcover/ grasses. Native material will be considered -its use based on tolerance of microclimate, and availability. In the center of the plaza space, smaller berms in raised planters mirror the curving shapes of the towers and provide integrated timber seating and greenery and shade to users. The plaza berms may support more ornamental plant material.

The plank paving pattern picks up on the dynamic angle of Kingsway. The treatment of the street trees and sidewalk on Kingsway will follow SDG.

Unilock Eco-Promenade Permeable Plank Style Paver
"75mm x 300mm x 100mm"
-appropriate for pedestrian and vehicular spaces

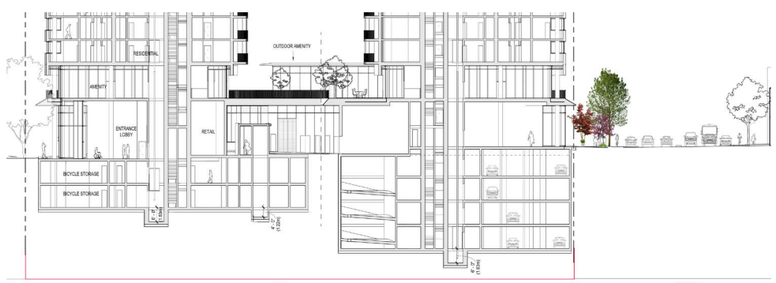
7.5 Future Mini Park Sections

7.5.1 West Section through Carolina Street

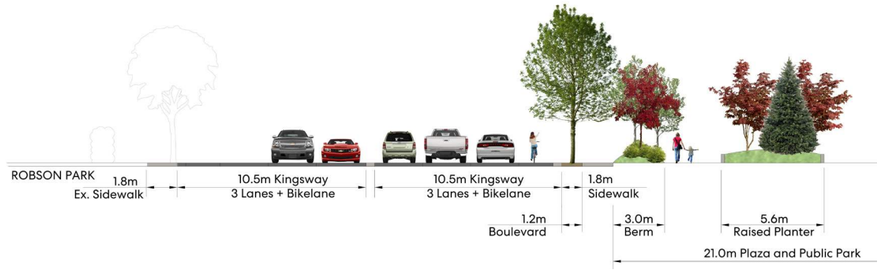


7.5.2 North Section through Kingsway

7.5.3 East Section 16th Avenue to Kingsway



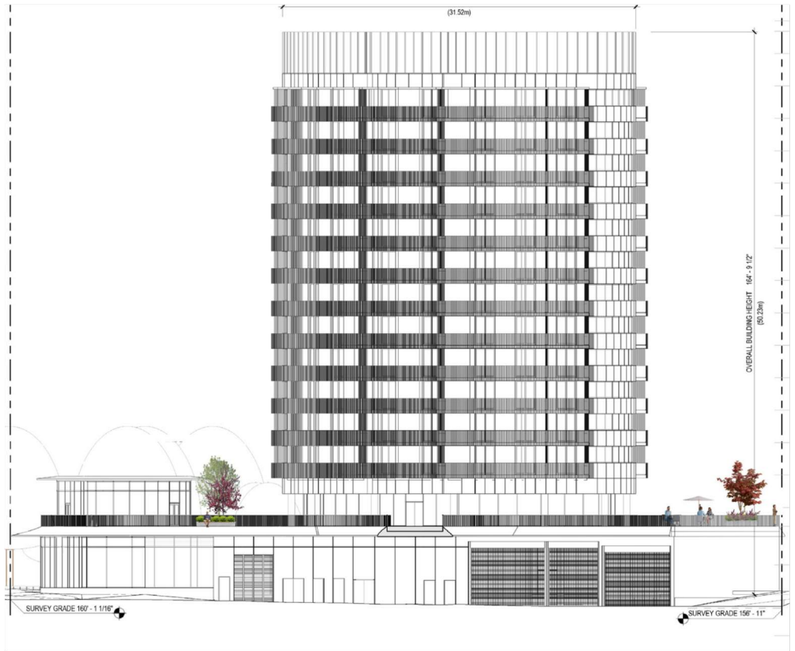
7.5.4 Existing Conditions at Kingsway and Proposed Future Mini Park

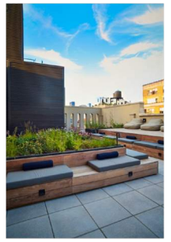


7.6 Amenity Level Plan and Sections

7.6.1 Landscape Plan - Amenity Level

7.6.2 Section East Side of Amenity Level





Design Highlights

The Amenity Level provides an outdoor area for the multi-purpose room as well as places to gather and socialize. Small trees, low shrubs and groundcover will add depth and background to the gathering areas. Utilizing raised planters that reflect the curving shape of the towers, the planting breaks up the level into more intimate spaces while still allowing free flow through the space and peekaboo views through the dense, layered planting.

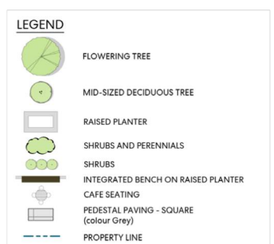
7.7 Roof Terraces Plan and Sections

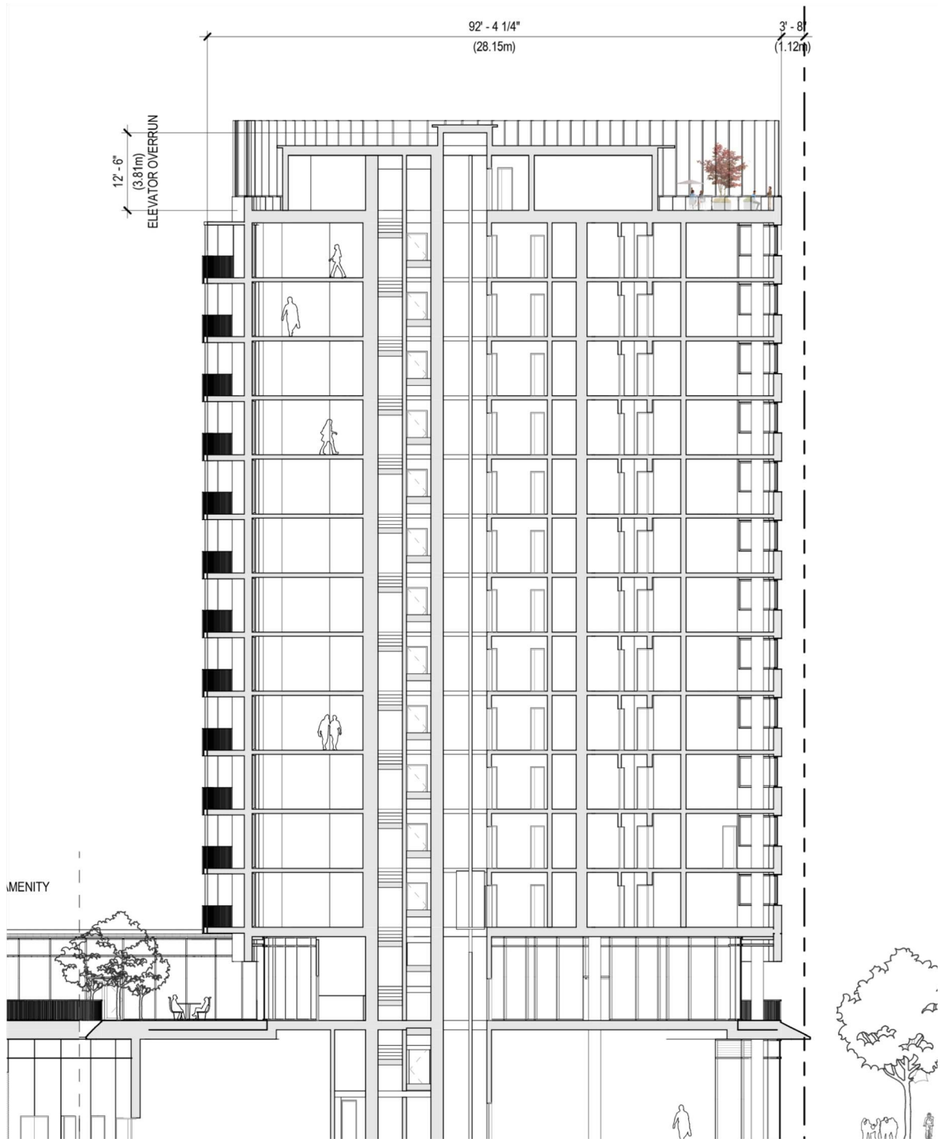
7.7.1 Landscape Plan - Roof Terraces

7.7.2 Section at Roof Terrace

Design Highlights

The roof terraces on each building provide planting and seating with which to enjoy panoramic views of the city. Raised planters include shrubs and in some spots, integrated timber seating. Flowering trees define the corners of the spaces.





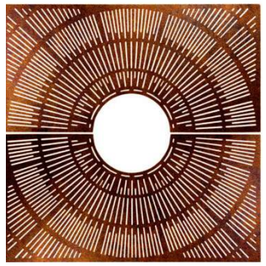
7.8 Landscape Details and Materials

7.8.1 Site Furnishings

Free Standing Bench

Circular Bike Racks

Bollards



Tree Grate

Waste Bins

Integrated Timber Seating

7.8.2 Ground Plane/Amenity Deck/Roof Terraces Paving

Plank Unit Pavers

Ground Plane Paving

PEDESTAL PAVER SYSTEM IN LIGHT COLOUR TO REDUCE SOLAR ABSORPTION

Amenity/Roof Terrace Paving

Architectural Colour and Texture

7.8.3 Planting

Pin Oak

Scots Pine

Deutzia

Dwarf Viburnum

Lavender

Red Maple

Privet

Ornamental Grasses

Daylilies

On Grade Planting

Catsura Tree

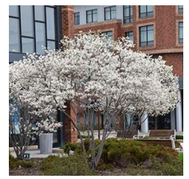
Kousa Dogwood

Spiraea var.

Hosta

Ajuga

Japanese Maple



Service Berry

Ferns var.

Ornamental Grasses

Amenity and Roof Terrace Planting

Landscape Details

The landscape details and choice of materials will reflect the architectural language of the buildings, using simple, contemporary forms and compatible colours and textures. Hard landscape elements will include raised planters, inset timber seating, benches, waste bins, bike racks and paving. The paving on the amenity level and roof terraces will be light in colour to reflect solar rays and lower heat absorption.

The planting palette will strike a balance between verdant growth and species that have a tolerance for excessive heat and rain that is predicted to come with the change in climate.

The street trees on Kingsway will be planted in tree grates, with sidewalk details as per the SDG. Those trees on Carolina Street located on the park will be planted in tree grates and structural soil or soil cells. Street trees continue along the west side of the site on Carolina Street and will coordinate with the boulevard trees in the neighbourhood. Formal shrub planting will enhance the retail facades on the west side of the building.

A model showing the structural and formal expression of the proposed project viewed from the adjacent north-west corner of the site.

Section 8.0

Appendix

contents

Not included in the booklet - provided as a separate report:

Development Water Demand Calculations

Arborist Report

Site Disclosure Statement

Preliminary Hydrogeological Study

Renter Screening Form

Survey Plan

Site Profile

Change Summary and Title Search

BC Company Summary

Community-Serving Spaces Information Form

8.1 Green Buildings Policy for Rezoning

600 Kingsway | July 24, 2024

Green Buildings Policy for Rezonings

Table of Contents

Project Overview

The 600 Kingsway project encompasses two new high-rise towers: a 14-storey North Tower and a 25-storey South Tower, connected by a shared podium. The project includes mixed-use development, featuring commercial spaces, residential units, and ground-activating retail.

The project complies with the Green Building Policy for Rezonings last amended June 2023 and this document outlines the project's response to its requirements.

1. Reporting of Green and Resilient Building Measures

1.1. Energy & Emissions Performance Limits

1.1.1. Policy Requirement

The Green Building Policy for Rezonings requires completion of the Energy & Emissions Design Report for each building to demonstrate that the project is on track to meet the Vancouver Building By-law (VBBL) energy and emissions performance limits expected to be in force at the time of the project's first Building Permit application. The following targets apply to 600 Kingsway based on building type:

Performance Limits			
Building Type	TEUI (kWh/m²)	TEDI (kWh/m²)	GHGI (kgCO_2e/m²)
Residential	120.0	29.0	.0

Table 1 - Performance Limits

1.1.2. Project Compliance

The 600 Kingsway project will use a reversible air and water heat pump (AWHP) with backup condensing gas boilers. The project is following a non-Low Carbon Energy System (LCES) compliance path. The project team has completed a preliminary energy model based on the City of Vancouver Energy Modelling Guidelines. The summary of performance results is as follows:

600 Kingsway Performance Results		
TEUI (kWh/m²)	TEDI (kWh/m²)	GHGI (kgCO_2e/m²)
90.5	28.5	1

Table 2 - Energy Modelling Performance Results

Results are based on a mixed energy system with gas heating used for space heating in all residential and commercial units. For more details, refer to the Energy and Emissions Design Report.

1.2. Embodied Carbon Limits

1.2.1. Policy Requirement

The Green Building Policy for Rezoning, amended on July 25th, 2023, requires the completion of the Embodied Carbon Design Report for each building to demonstrate that the project is on track to meet the VBBL limits for life-cycle equivalent CO_2 emissions expected to be in force at the time of the project's first Building Permit application. Embodied carbon is calculated for each building in kgCO2/m² using a Whole Building Life Cycle Assessment (WBLCA) based on standard assumptions outlined in the City of Vancouver Embodied Carbon Guidelines.

1.2.2. Project Compliance

Introduction

Perkins&Will has completed a study for 600 Kingsway North and South Towers using the Embodied Carbon Pathfinder tool. The tool calculates the approximate Global Warming Potential (GWP) of the buildings and was used to understand the Total GWP of the project and elements with the highest GWP, that can be studied further as the design evolves.

Due to the project's early stage, limited information was available for a detailed WBLCA. Instead, key inputs in Pathfinder include envelope and structural elements. The project consists of two towers on a shared podium: a 14-storey North tower and a 25-storey South tower. Both buildings, classified as high-rise (12 to 30 stories), share similar materiality, typology, and construction techniques, thus a single assessment was performed.

Results

The study results exclude biogenic carbon and include life cycle stages A to C. The GWP for 600 Kingsway is estimated at 293.5 kgCO_2/m². The exported results from Pathfinder are shown below in Figure 1.

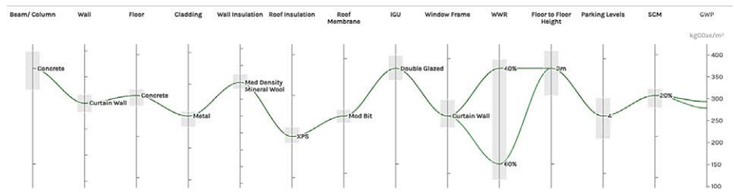


Figure 1 - Global Warming Potential Impact

The study indicates the absolute pathway is achievable and a maximum GWP of 360 kgCO_2/m² will be targeted. The results for each building are listed in Table 3.

Impact Category	North Tower	South Tower	Total Life Cycle Impact (A-C)
Global Warming Potential ($KgCO_2$)	2,886,643.9	5,335,287.7	8,221,931.6
Intensity ($KgCO_2/m^2$)	293.5	293.5	293.5

Table 3 – Embodied Carbon Assessment Results

Reducing Embodied Carbon

From Rezoning through to Building Permit application, the project team will continue to explore design strategies to reduce the total embodied carbon of the buildings, including:

- Reducing the volume of glass by switching from a triple to double glazed system, if energy performance can be maintained.
- Optimize concrete mix designs by working with the structural engineer, contractor, and concrete supplier to set a GWP budget for the project's concrete.
- Working with the structural engineer to refine the design and reduce reinforcement rates and member sizes.
- Stacking vertical elements where possible to eliminate or reduce the size of transfer structures.
- Reviewing envelope material choices with the EC3 tool to further reduce the building's total embodied carbon.

Please refer to the Energy and Emissions Design Report for more details.

1.3. Resilient Buildings Planning Worksheet

1.3.1. Policy Requirement

This policy requires the completion of the Resilient Buildings Planning Worksheet to summarize the level of resilience planning undertaken by the project team and to identify proposed strategies. Projects must outline building strategies that eliminate, reduce, and mitigate adverse impacts, including those due to changing climate conditions and seismic events.

1.3.2. Project Compliance

The project team assessed the project's risks and mitigation strategies and completed a single Resilient Buildings Planning Worksheet for the project. During the resilience planning workshop, medium and high risks were identified for natural disasters, extreme weather, poor air quality, power outages, and pandemics.

and strategies to mitigate risks for 2050 and 2100 future climate scenarios were considered.

The majority of strategies are multi-disciplinary in nature and will be incorporated into the project during the Design Development phase. The project team will continue to evaluate current and future climate projections to design a building that can meet current needs and adapt to a changing climate.

Please refer to the Resilient Buildings Planning Worksheet for more details.

2. Enhanced Commissioning

2.1. Policy Requirements

The City requires the engagement of a third-party commissioning authority to oversee an enhanced commissioning process for all building energy systems in accordance with CSA Z5000-18, or ASHRAE Guideline 0-2005 and 1.1-2007, or an alternate commissioning standard. As part of this requirement, the Commissioning Authority is responsible for developing a Commissioning Plan and Commissioning Report and submitting these documents to the City of Vancouver as per the policy's documentation requirements.

2.2. Project Compliance

A Commissioning Authority will be retained. The project will submit a copy of the Commissioning Plan at the Building Permit Stage, a draft Commissioning Report at Occupancy Permit, and a final Commissioning Report after Occupancy. Please refer to the Owner's letter of commitment for more details.

3. Energy System Sub-Metering

3.1. Policy Requirement

The policy requires separate metering for each energy utility and each building to provide sub-metering of all major energy end-uses and major space uses within each building. Details of the sub-metering requirements are further outlined in the policy document.

3.2. Project Compliance

A separate whole building metering will be provided for each utility connection, additionally, all major energy and water uses will be sub-metered. A metering plan and supporting drawings will be provided at the Building Permit Stage. Please see the Owner's letter of commitment for more details.

8.2 Letter of Commitment

#300-526 Granville Street
Vancouver, B.C. Canada
V6C 1W6
T: 604.738.4525

July 31, 2024

Attention: Carly Rosenblat
City of Vancouver | Planning, Urban Design & Sustainability
515 West 10th Avenue
Vancouver, BC V5Z 4A8

Dear Carly Rosenblat,

Re: 600 Kingsway Rezoning Application
Commitment to meet the requirements of the Green Building Policy for Rezoning

As part of our Rezoning application package for 600 Kingsway Bonnis Properties and/or it's signee hereby commit to meet the requirements of the Green Building Policy for Rezoning and commits to providing the required documentation for the following sustainability requirements:

Enhanced Commissioning
A Commissioning Authority will be retained, and the project will submit a copy of the Commissioning Plan at the Building Permit Stage, and draft Commissioning Report at Occupancy Permit, and final Commissioning Report at Post Occupancy.

Energy System Sub-Metering
Separate whole building metering will be provided for each utility connection, additionally, all major energy and water uses will be sub-metered. An energy sub-metering design will be provided at the Building Permit Stage.

In the rezoning submission, we provide a brief outline of the project, our approach, our commitment to meeting the design and operation requirements and supporting documents required to meet the Green Building Policy for Rezoning.

Sincerely,

Bonnis Development King Inc.

Dimitri Bonnis
Vice President
dimitri@bonnis.net

8.3 Resilient Buildings Planning Worksheet

Resilient Buildings Planning Worksheet

CITY OF VANCOUVER

Worksheet Instructions

A: About the worksheet

This worksheet is required for new development projects in Vancouver subject to the Green Buildings Policy for Rezonings (amended May 17, 2022) requirement for Resilience Buildings Planning Worksheet. It is designed to apply to developments of varying size and complexity (see also Section E Large Developments). The purpose of this worksheet is to provide a structured approach to examine and prioritize the climate and seismic risks to a project, so that project teams can make climate- and risk-informed decisions about the development. This worksheet aims to build capacity and knowledge in the local design and construction industry to advance the understanding of risks and available risk mitigation strategies. This worksheet contributes to the City of Vancouver's Climate Adaptation Strategy (2018) goal to future-proof buildings to create a resilient building stock.

This worksheet walks project teams through a 4-step qualitative risk assessment for the project to develop an understanding of the hazards and risks to the project and how the risks may change over time due to climate change. This worksheet encourages project teams to think through and summarize the possible risk mitigation strategies that can improve the building's resilience.

Depending on the scope, complexity or criticality of the project, the project team may find this framework and worksheet does not provide sufficient level of analysis to meet the risk tolerance or resilience objectives of the project owner. In that case, the team is encouraged to conduct a climate and seismic hazard risk and vulnerability assessment using a more in-depth standard or requirement (e.g. Climate Resilience Guidelines for BC Health Facility Planning and Design, Climate Resilience Framework & Standards for Public Sector Buildings, the Integrated Building Adaptation and Mitigation Assessment (IBAMA) Framework, the PIEVC Protocol, etc.). For such projects, the report from that assessment may be submitted in lieu of this worksheet to meet requirements of the Green Buildings Policy for Rezonings (amended May 17, 2022).

This worksheet is adapted from existing risk assessment methodologies and frameworks, most notably the PIEVC High-Level Screening Guide and the Climate Resilience Framework & Standards for Public Sector Buildings (see 'Resources' tab). Data gathered through this worksheet will support the development of future codes and policies to improve the resilience and adaptability of the building stock.

For questions related to this worksheet, email Green.Buildlings@vancouver.ca

B: Definition of Resilience & Risk

A resilient building is one built to withstand, or recover quickly from natural or human-caused hazards and disasters, and one that delivers co-benefits to people and systems in the absence of hazards and disasters. A resilient building has longevity, is safer, more durable and livable, supports a quicker recovery, and protects public and private investments.

In Vancouver, we are exposed to a range of hazards including but not limited to flooding, sea level rise, earthquakes, fires, poor air quality and hazardous materials incidents. A changing climate means that the risks created by these hazards may be exacerbated and increase in severity and/or frequency over the service life of the development project. The resilience of buildings may be improved by adding risk mitigation strategies that reduce the vulnerability of the buildings' various systems, components and occupants to the adverse effects of the hazards.
In the context of hazards, Vancouver's geography and dense population means that evacuation is a major challenge. The safety and resilience of residents and our community is closely tied to the ability to remain in, or return quickly, to their homes or workplaces when hazards strike. Sites that are designed to be inherently resilient will ensure the least amount of disruption to community and business. Preventing damage and ensuring capacity to withstand future threats and disasters also enhances the wellbeing of people and systems regardless of whether disaster strikes.

Thinking through climate and seismic risks to the project at the earliest stage of planning and design will help project teams uncover low- or no-cost risk mitigation strategies that can safeguard lives and protect investments in building assets in the future, while helping to meet low-carbon objectives.

For the purpose of this Resilient Buildings Planning Worksheet, the following definition of risk is used.

Exposure x Consequence x Likelihood = Risk

The 4 steps of this worksheet follows this definition to assess and prioritize the risks to the project.

C: Carrying out the assessment

This resilience assessment should be led by a project team member who has familiarity and experience with the general approach and process of risk assessments. Refer to the 'Resources' tab for a list of resources on risk assessment frameworks and training opportunities.

The assessment team should, at minimum, comprise all discipline leads involved in the project design, the project owner, builders, and representative(s) of the intended occupants and/or operators of the project buildings. All assessment team members should be provided with the opportunity to review the completed worksheet prior to submission to the City of Vancouver as part of a rezoning application. The risk assessment should be carried out based on the input provided by the assessment team members involved using their professional judgement.

The level and type of engagement and effort required to conduct this assessment should align with the complexity of the project. For many projects, Step 1 may be completed through a desktop review of available hazard and risk resources (see 'Resources' tab) by the resilience assessment lead. Steps 2, 3 and 4 are best completed through one or several workshops with the assessment team and facilitated by the resilience assessment lead. The workshop format is recommended as it provides the opportunity for assessment team members to:

- Review the range of hazards that the project may be exposed to;
- Consider the impacts of hazards on different components and systems within the project;
- Carry out cross-discipline conversations that identify specific risks to the project;
- Determine the level of risk and risk-mitigation efforts that is acceptable to the design team, the owner and building users;
- Generate project-specific resilience strategies to reduce the identified risks that can benefit multiple stakeholder objectives.

This worksheet is intended to be a planning tool to support the development of risk and resilience knowledge of the assessment team, and to help prioritize the climate and seismic risks facing the project, and to generate thoughtful discussions of possible resilience strategies that may be incorporated into the design or further evaluated during detailed design, construction or operational stages of the project.

D: Assessment Scope

For most projects, the assessment scope should comprise of the entire development site. Some project teams may need to expand the scope to beyond the physical boundaries of the site, depending on the complexity and criticality of the project. Some projects may need to expand the scope of the assessment to systems beyond the project boundary, and consider issues such as utility interconnections, transportation networks, and dependencies on other systems.

The systems and components that should be considered within the scope of the assessment are listed in the “Impact Categories” tab. This list is not exhaustive – the assessment team is encouraged to add to the list of categories or systems based on the characteristics, criticality and complexity of the project.

E: Large Developments

Some large development projects may contain multiple buildings planned to be built over several phases. For such projects, the minimum expectation is for teams to complete this resilience assessment based on the information available at the rezoning application stage, focusing the assessment on the first building(s) planned in the first phase of the development to meet the Resilient Buildings Planning requirement of Green Buildings Policy for Rezonings (amended May 17, 2022). For subsequent phases of the development, it is strongly recommended that the resilience assessment be reviewed and updated by the design and construction team at the development permit stage for each phase.

Resilient Buildings Planning Worksheet v1-2023-05-18

Resilient Buildings Planning Worksheet

Directions: Submit this worksheet as an excel file as part of the building rezoning application.

Please provide the following information:

Project Address	644 Kingsway
Secondary Address	
Project Working Title	BONNIS: 600 Kingsway North and South Tower
Rezoning Application Number (if known)	
Gross Floor Area indicated on Arch. Drawings (m^2)	28,013
Planned lifespan of building(s) on site (years)	60
Are there multiple buildings on this site? (Y/N)	Y
Expected building occupants	478

CITY OF VANCOUVER

Section A: List who participated or was consulted in the creation of this resilience assessment. For any roles not represented in the assessment process, provide a rationale for why it is unnecessary or indicate if another qualified individual is representing the perspective of that role.

Role in Project	First Name, Last Name, and professional designation (if any)	Organization	Title (if available)	Email	Rationale if this role was not represented in the assessment process	How did this person participate in this worksheet?
Architecture	Aik Ablimit	Perkins&Will		aik.ablimit@perkinswill.com		Interviews & Workshops
Building Envelope						
Building Operations						
Building Users or Occupants						
Civil Engineering	jeffrey.halliday@cima.ca	jeffrey.halliday@cima.ca		jeffrey.halliday@cima.ca		Interviews & Workshops
Climate Change / Climate Science Specialist						
Construction Management						
Contractors						
Electrical Engineering						
Embodied Carbon or Life Cycle Carbon	Amy Brander	Perkins&Will		amy.brander@perkinswill.com		Interviews & Workshops
Energy Modelling	Rabeeh Hosseini	Cima		rabeeh.hosseini@cima.ca		
Fire Protection						
Geotechnical Engineering						
Landscape	Dawn Brockington	Cima		dawn.brockington@cima.ca		Interviews & Workshops
Mechanical Engineering	Jean-Sebastien Tessier	Cima		jean-sebastien.tessier@cima.ca		Interviews & Workshops
Project Owner						
Property Management						
Resilience						
Structural Engineering	Harrison Glotman	Glotman Simpson		hglotman@glotmansimpson.com		Interviews & Workshops
Sustainability	Amy Brander	Perkins&Will		amy.brander@perkinswill.com		Interviews & Workshops
Other (if applicable)						
Other (if applicable)						
Other (if applicable)						
Other (if applicable)						
Other (if applicable)						

Was an alternative risk and vulnerability assessment tool or process applied for the project? If yes, name the process, tool or methodology (For example: PIEVC Protocol, IBAMA) and provide the final report from that process in lieu of completing Steps 1 to 4 of this worksheet.

Section B: Sign-off

Has the owner or owner's representative participated in the assessment process **and** reviewed the risks and strategies identified in this worksheet?		Name, title and contact information of Owner or Owner's representative:	
Date signed			

Step 1: Exposure to Hazards Screen		
Refer to 'Step 1 - Instructions' for detailed guidance on this step. **Directions:** (1) Evaluate exposure to the hazard column **B** for the each hazard in Column **A**. (2) Add "Other" hazards in rows 20 and beyond if additional hazard exposures are to be considered for the project.	**Directions:** Select the exposure level for this hazard. Yes/No	**Directions:** Describe rationale for exposure level and list sources referenced.
Hazards	**Hazard Exposure**	**Rationale Description**
Earthquake (VBBL shaking levels)	**Yes**	
Extreme heat	**Yes**	Classified as a major impact of climate change CofV
Poor air quality (wildfire related)	**Yes**	Classified as a major impact of climate change CofV
Power outage	**Yes**	
Extreme cold during winter	Yes	Climate Change Infographics, City of Vancouver
Coastal or riverine flooding (including storm surges)	*No*	*Based on Flood Plain Diagrams from the City of Vancouver Flood Plain Standards and Requirements the site is not within the flood plain boundary.*
Decreased slope stability or landslide	*No*	*Flat ground, excavated/site works.*
Drought/Water Restrictions	Yes	Classified as a major impact of climate change CofV
Extreme rainfall related flooding	Yes	Classified as a major impact of climate change CofV
Hazardous material incidents	*No*	*Not an industrial building or building handling hazardous waste.*
Reduced freeze-thaw	*No*	*City of Vancouver: 58% decrease in snow pack. Is this meant to say increased freeze-thaw?*
Pandemic	Yes	
Sea level rise	*No*	*Based on Flood Plain Diagrams from the City of Vancouver Flood Plain Standards and Requirements the site is not within the flood plain boundary.*
Warmer summer temperatures	Yes	Classified as a major impact of climate change CofV
Warmer winter temperatures	Yes	Climate Change Infographics, City of Vancouver
Wind	*No*	*Prevailing easterly wind was assessed. The highest percentage of wind speed expected is in the range of 14km/h.*
Wildfire	*No*	*Industrial/urbanised area. Not near Stanley Park or any other major green space. Poor air quality due to wildfire is marked yes.*
Poor air quality (traffic related)	Yes	Located along Kingsway, a major road/intersection.
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	
Other:	*No*	

Resilient Buildings Planning Worksheet v1-2023-05-18

Impact Categories

Directions

1) Consider the following systems and components when thinking through impacts of a hazard in Steps 2, 3 and 4.
2) This list is not exhaustive; the assessment team is encouraged to add to the list of systems or components based on the characteristics of and complexity of the project.
3) Review columns **A** through **H** and add additional components as needed. Add additional systems and components in columns I & J as needed.

Architectural Systems	Civil Engineering Systems	Emergency Preparedness, Planning and Response	Human Systems	Landscape & Ecological Systems	Mechanical & Plumbing Systems	Power & Electrical Systems	Structural Systems	Other System (Defined by assessment team)	Other System (Defined by assessment team)
Canopies, overhangs, awnings, external shading structures, balconies	Excavations	Building's ability to remain in use post hazard event	Amenity/refuge spaces	Irrigation systems	Below-grade systems & systems below flood construction level	Below-grade systems & systems below flood construction level	Foundation walls		
Entryways and exits including street access	Foundations	Emergency access	Below-grade storage	Green or natural infrastructure systems	Building pumps and controls	Building automatic control systems	Floor slabs		
Façade, cladding, siding, building envelope, weather sealing, air or vapour barrier systems	Membranes / waterproofing	Emergency/evacuation plans, building reaction plans	Building users and residents	Local habitats or ecological systems	Plumbing & venting system	Building conveyance/Elevators & associated machinery	Structural Systems		
Roofing	Site grading	Emergency shelter/refuge areas	Health and well-being (physical & mental)	Outdoor amenities, outdoor street furniture and playground equipment	Heating & cooling systems, central or decentralized or neighbourhood energy connections	Building information systems	Gravity systems (primary structural systems)		
Windows, doors, fenestration	Stormwater cisterns / irrigation, concrete works	Emergency supplies, access to water/sanitation	Maintenance & operations staff, standard operating procedures	Paving and outdoor space materials	Heat recovery systems	Energy management systems	Lateral systems (earthquake resisting systems)		
	Stormwater conveyance / drainage, green infrastructure elements		Vulnerable building users and residents (seniors, youth, children, those with mobility or health considerations)	Sidewalks and curbs	Life safety systems, sprinklers	Energy storage or battery systems			
	Utilities (above or below ground)			Trees/Vegetation/food gardens	Rooftop equipment	Lighting and plug loads			
	Underground parkades and access				Service hot water systems	Life safety systems, emergency lighting, fire suppression			
					Specialised application systems	Power supply systems including back-up power			
					Thermal storage systems				
					Ventilation & air filtration systems, exhaust systems				

Step 2: High Level Impact Assessment

Refer to 'Step 2 - Instructions' for detailed guidance on this step.
Directions:
1) All hazards selected as "**Yes**" for exposure from Step 1 will be shown in white rows. If "No"is selected from Step 1, the hazard will be shown in grey

Directions:
1) Describe impact(s) of this hazard to elements within each Impact Category. Be specific with 'who','what','why','how' of each impact of the hazard.
2) Select Consquence Rating (from 1-5).

Hazards	Architectural Systems	Consequence Rating	Civil Engineering Systems	Consequence Rating	Emergency Preparedness, Planning and Response	Consequence Rating	Human Systems	Consequence Rating	Landscape & Ecological Systems	Consequence Rating	Mechanical and Plumbing Systems	Consequence Rating	Power & Electrical Systems	Consequence Rating	Structural Systems	Consequence Rating	Other System (Defined by assessment team)	Consequence Rating	Other System (Defined by assessment team)	Consequence Rating
Earthquake (VBBL shaking levels)	Collapse of architectural systems including but not limited to canopies, balconies and envelope.	4	Aggressive movement could shift civil connections and impact buildings freshwater , stormwater, and sanitary connections	4	Evacuation. Temporary closure of the building and its facilities in a post disaster event.	5	Refuge or compensation. Physical and mental impacts to occupants including injury, shock or fear.	5	potential physical damage of planting, site furnishing, paving,particularly roof and amenity decks	3	Result in structural failure of on-site support system, pipe joints and connections	3	Result in structural failure of on-site electrical distrubiton system, live wire disconnections (possible arcing), failure of building systems that require power, loss of normal power	3	Structural system designed to support life safety and egress, but damage possible depending on severity. Design is collapse prevention for large earthquake. Would expect damage to building structure.	4				
Extreme heat	Building envelope redundancy in keeping occupants comfortable and healthy.	3	Civil infrastructure not substantially impacted by excess heat. Heat may impact plant species resulting in loss and potential soil losses resulting in impacts on rainwater management system.	2	Closure or outdoor amenity.	1	Impact to physical health due to extreme heat, in particular vulnurable building users with health considerations.	5	detirmental to plant survivability for the types of plants suited to Vancouver	4	Increase stress on electrical and mechanical system components and decrease their efficiency and reliability	2	Increased electrical load on cooling system, which could overload electrical system. Electrical systems work less efficiently in hotter environments.	3						
Poor air quality (wildfire related)	Ongoing maintenance requirements of architectural systems may be increased. Mayimpact detailing of building envelope	2			Closure or outdoor amenity.	1	Impact to physical health due to poor indoor air quality, in particular vulnurable building users with health considerations.	4	outdoor spaces unpleasant at best; polluted air will effect plant's health	3	Reduce cooling capacity, as well as creates additional maintenance of HVAC and air filtration systems.	2	Increased electrical load on HVAC system, which could overload electrical system.	2						
Power outage	Impact to way finding		Civil systems designed to function without pumping. Power outage should not impact stormwater management or waste conveyance. Sump pumps will likely be provided for elevators Cut off wall will likely be employed to manage groundwater infiltration without need for pumping Perimeter drain system could be pumped in event of extraordinary rainfall	1	If the back-up system were to reach its limit evacuation of building.	2	Slips, trips and falls. Injury.	2	if irrigation system used, and outage is long term, could effect plant health	3	Stress on electricity transmission result in failure of HVAC components. In addition, in a high rise building booster pumps will be non-operational which will prevent use of any domestic water system.	3	Building systems (not backed up by generator) are not operable. Normal lighting shuts off.	4						
Extreme cold during winter							Impact to physical health, in particular vulnurable building users with health considerations.	3	many plants chosen for this landscape will not be very cold tolerant	4	Freezing pipes, flexing and warping pipes, snow and ice accumulation around the exterior units and vents restricting airflow and reducing system efficiency	1	Increased electrical peak load on heating system, could overload electrical system.	3						
Coastal or riverine flooding (including storm surges)																				
Decreased slope stability or landslide																				
Drought/Water Restrictions	May impact maintenace of building.	1	Should be negligible so long as irrigation is in place. Sedum roof may require long term maintenance after establishment	2	Temporary closure of water-dependant facilities e.g. fountain, bike wash.	1			Detrimental to plant survivability for most plants chosen	4	Drop in water pressure affects flow dependent fixtures, increases pipe corrosion, clogs pipes and swere backups	2	N/A	1						
Extreme rainfall related flooding	Mould, pooling, envelope drainage problems, deterioration of the buildings façade.	3	Flooding of below-grade infastructure. This could lead to economic loss and destruction of building systems.	3	Temporary closure of the building and its facilities.	3			will impact most plants if they sit in pooling water; plaza and amentiy spaces compromised (inc. paved surfaces)	3	Exerting pressure on pipes and possibility of system failiure, exceeding the capacity of infrastructure drainage systems that may lead to flooding, water infiltration or increased erosion of components	3	Electrical equipment in underground parkade(s) could be damaged and become unoperable.	4						
Hazardous material incidents																				
Reduced freeze-thaw																				
Pandemic							Refuge or compensation. Physical and mental impacts to occupants including sickness and fear.	5	people may use outdoor spaces more - so as not to be stuck inside - but will require distancing	3	Increase peak load and IAQ demand	4	May be challenging to schedule maintenance workers for electrical equipment	2						
Sea level rise		1																		
Warmer summer temperatures	Building envelope redundancy in keeping occupants comfortable and healthy.	3					Impact to physical health due to extreme heat, in particular vulnurable building users with health considerations.	3	more residences may seek shade in outdoor spaces		Unseen/underestimated demand affect the HVAC system sizing, efficiency, and air quality and comfort.	2	Increased use of cooling system in building may increase peak demand and overload electrical system.	3						
Warmer winter temperatures	Building envelope design for occupants health and comfort	1							plants may require more water	3	Overstimate demand affect the HVAC system sizing and efficiency and thermal comfort	1	Decrease use of heating system may decrease electrical peak demand load	1						
Wind		3																		
Wildfire																				
Poor air quality (traffic related)	Restricts occupants use of operable windows etc and relies on additional mechanical requirements	2					Impact to physical health due to poor indoor air quality, in particular vulnurable building users with health considerations such as asthma.	4	on grade spaces close to busy Kingsway - close to traffic fumes	3	Increase healthy IAQ demand and ventilation maintenance	2	Increase use of HVAC system may increase electrical peak demand	2						
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				
Other:																				

Resilient Buildings Planning Worksheet v1-2023-05-18

Step 3: Likelihood and Risk Assessment

Refer to 'Step 3 - Instructions' for detailed guidance on this step.
Directions:
1) For each hazard rows in white, select a hazard likelihood rating between **1** and **5** and provide a rationale. For hazard rows in gray (no exposure), leave Columns B and C blank.
2) Do not adjust columns **E-N.** Risk Rating values are automatically calculated and colours are assigned based on the risk rating.

Direction: Select hazard likelihood (1-5).

Directions: Describe rationale for likelihood rating; cite resources referenced as appropriate.

Hazards	Hazard Likelihood	Rationale Description	Risk Scores: Architectural Systems	Civil Engineering Systems	Emergency Preparedness, Planning and Response	Human Systems	Landscape & Ecological Systems	Mechanical and Plumbing Systems	Power & Electrical Systems	Structural Systems	Other System (Defined by assessment team)	Other System (Defined by assessment team)
Earthquake (VBBL shaking levels)	3		12	12	15	15	9	9	9	12	0	0
Extreme heat	5	https://climateatlas.ca/	15	10	5	25	20	10	15	0	0	0
Poor air quality (wildfire related)	5	Classified as a major impact of climate change CofV	10	0	5	20	15	10	10	0	0	0
Power outage	4	With increases in extreme weather, likelihood of power outages increases.	0	4	8	8	12	12	16	0	0	0
Extreme cold during winter	1	https://climateatlas.ca/	0	0	0	3	4	1	3	0	0	0
Coastal or riverine flooding (including storm surges)			0	0	0	0	0	0	0	0	0	0
Decreased slope stability or landslide			0	0	0	0	0	0	0	0	0	0
Drought/Water Restrictions	5	Classified as a major impact of climate change CofV: https://vancouver.ca/green-vancouver/climate-change-adaptation-strategy.aspx	5	10	5	0	20	10	5	0	0	0
Extreme rainfall related flooding	5	https://climateatlas.ca/	15	15	15	0	15	15	20	0	0	0
Hazardous material incidents			0	0	0	0	0	0	0	0	0	0
Reduced freeze-thaw			0	0	0	0	0	0	0	0	0	0
Pandemic	4	CDC: risk of infectious disease increases with climate change. https://www.cdc.gov/ncezid/what-we-do/climate-change-and-infectious-diseases/index.html#:~:text=Our%20Risk%20For%20Infectious%20Diseases,harmful%20effects%20of%20climate%20change.	0	0	0	20	12	16	8	0	0	0
Sea level rise			0	0	0	0	0	0	0	0	0	0
Warmer summer temperatures	5	https://climateatlas.ca/	15	0	0	15	0	10	15	0	0	0
Warmer winter temperatures	4	Climate Change Infographics, City of Vancouver	4	0	0	0	12	4	4	0	0	0
Wind			0	0	0	0	0	0	0	0	0	0
Wildfire			0	0	0	0	0	0	0	0	0	0
Poor air quality (traffic related)	1	Cleaner fuel sources, trains and vehicles projected in the future. Electrification of systems.	2	0	0	4	3	2	2	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0
Other:			0	0	0	0	0	0	0	0	0	0

Resilient Buildings Planning Worksheet v1-2023-05-18

Step 4: Resilient Building Strategy Reporting

Refer to 'Step 4 - Instructions' for detailed guidance on this step.
Directions:
(1) Refer to the Risk, Hazard and Resilience Strategies Count table below.
(2) For each medium or high risk, provide the details of the hazard and impact categories associated with each risk (in Columns F through I).
(3) Describe the potential resilience strategies for each risk, select the current status of each strategy, and provide a rationale for each the status in Column L.

Risk, Hazard, and Resilience Strategy Count
The following risk and hazard information has been identified in Steps 1 to 3:

Medium risks:	High risks:	Hazards to consider:	Number of resilience strategies to report in Step 4:
30	6	11	36

Resilient Buildings Planning Worksheet v1-2023-05-18

Risk, Hazard, and Resilience Strategy Reporting Table

Risk	Select Hazard:	Select Impact Category:	Select the assessed risk level:	Describe potential resilience strategy or strategies to reduce this risk:	Select status of resilience strategy:	Describe rationale for status:
1	Earthquake (VBBL shaking levels)	Architectural Systems	Medium Risk	Envelope detailing to the new seismic code. Lateral loads on the envelope will increase and tolerances become stricter under the new seismic code. This will impact the design and detailing of the envelope. Consider opportunities to include a small fallout shelter structure for added safety.	Will incorporate into project	
2	Earthquake (VBBL shaking levels)	Emergency Preparedness, Planning and Response	Medium Risk	Develop and regularly update an earthquake emergency response plan, conduct drills, and ensure robust communication systems. Install a monitoring and alert system with radio capabilities to warn occupants in case of fire or earthquake.	Will incorporate into project	
3	Earthquake (VBBL shaking levels)	Human Systems	Medium Risk	Educate the community about earthquake safety and preparedness, establish clear evacuation routes, and provide mental health support post-earthquake. Install resilient drinking water fountains in lobby spaces and supply 24-hour emergency kits for all occupants.	Will be explored in future project stages - provide details	
4	Earthquake (VBBL shaking levels)	Landscape & Ecological Systems	Medium Risk	Design landscapes to recover quickly from seismic events, using native plants and high-quality hard landscape with strong foundations.	Will incorporate into project	
5	Earthquake (VBBL shaking levels)	Mechanical and Plumbing Systems	Medium Risk	Secure systems to prevent earthquake damage, use flexible connections, and conduct regular maintenance. Install seismic actuated gas shut-off valves to reduce fire risks from gas pipe failures and consider installing fountains/water systems for post-emergency use.	Will incorporate into project	
6	Earthquake (VBBL shaking levels)	Power & Electrical Systems	Medium Risk	Ensure all electrical equipment is installed with appropriate seismic supports and reviewed by a Seismic P.Eng. Implement backup power systems and use flexible conduits.	Will incorporate into project	
7	Earthquake (VBBL shaking levels)	Structural Systems	Medium Risk	Use advanced structural engineering techniques, such as base isolators and dampers, and regularly inspect and reinforce older structures. Design based on conventional concrete core construction to meet code requirements, anticipating a 17-25% increase in loads from the previous building code.	Will be explored in future project stages - provide details	The project is not considering strategies beyond current code requirements, as this is understood to provide best design practices in case of an earthquake. Increased robustness in structural design would also have significant cost implications.
8	Extreme heat	Architectural Systems	Medium Risk	Use passive cooling techniques, high-performance insulation, and energy-efficient windows to minimize reliance on mechanical systems. Adhere to Step Code 3 with a low carbon energy system and avoid fully glazed curtain walls, opting for a "punch window" approach. Incorporate screening elements and design balconies to function as a second skin to the building envelope.	Will incorporate into project	
9	Extreme heat	Civil Engineering Systems		N/A Low Risk		Water supply system risk within the scope of utility service provider. On site response to consumption reduction and backup supply resolved through mechanical systems.
10	Extreme heat	Human Systems	High Risk	Educate residents on the dangers of extreme heat, ensure access to cooling centers, hydration, and medical care. Provide air conditioning in all rooms and rely on passive envelope strategies to reduce mechanical system size.	Will incorporate into project	
11	Extreme heat	Landscape & Ecological Systems	Medium Risk	Use heat-tolerant plants, design green spaces that provide cooling, and implement water management strategies like irrigation or drought-tolerant plant material.	Will incorporate into project	
12	Extreme heat	Mechanical and Plumbing Systems	Medium Risk	Ensure HVAC systems are efficient and capable of handling extreme heat loads. Incorporate operable windows to support natural ventilation and design cooling systems to meet elevated outdoor air temperatures, maintaining corridor temperatures at 24C. Ensuring HVAC efficiency and the use of operable windows for natural ventilation were discussed as essential strategies.	Will incorporate into project	
13	Extreme heat	Power & Electrical Systems	Medium Risk	Coordinate with Mechanical design to incorporate worst-case building cooling load into electrical system sizing.	Will incorporate into project	
14	Poor air quality (wildfire related)	Architectural Systems	Medium Risk	Design buildings with high-efficiency air filtration systems and ensure windows and doors seal tightly to prevent smoke entry. Use high-performance envelope designed for airtightness.	Will incorporate into project	
15	Poor air quality (wildfire related)	Human Systems	High Risk	Protect vulnerable populations with air conditioning in all rooms, providing health advisories and ensuring access to medical care.	Will incorporate into project	
16	Poor air quality (wildfire related)	Landscape & Ecological Systems	Medium Risk	Use dense planting to absorb and mitigate air pollutants, enhancing overall planting to mitigate poor air quality.	Will incorporate into project	
17	Poor air quality (wildfire related)	Mechanical and Plumbing Systems	Medium Risk	Provide filtration systems for outdoor air supply to MERV8, and design corridor units to accommodate MERV13 filtration, storing spare filters on-site for peak wildfire season.	Will be explored in future project stages - provide details	
18	Poor air quality (wildfire related)	Power & Electrical Systems	Medium Risk	Ensure power systems operate during worst case senario events with redundant systems and backup power sources.	Will incorporate into project	
19	Power outage	Landscape & Ecological Systems	Medium Risk	Design landscapes that do not require or avoid `power-dependent maintenance, using native and drought-resistant plants.	Will incorporate into project	
20	Power outage	Mechanical and Plumbing Systems	Medium Risk	Domestic (potable) water system serving the high rise portions of the building (above level 3) will not be operational. Water filling station in the amenity spaces and generally accessible space to be provided.	Will be explored in future project stages - provide details	
21	Power outage	Power & Electrical Systems	Medium Risk	Provide emergency backup power for egress and exit lighting out of the building. Provide backup or emergency generator to power building life safety systems and/or other building systems (i.e mechanical). Provide UPS system for critical building systems.	Will incorporate into project	
22	Extreme cold during winter	Architectural Systems	Medium Risk	Use high-performance insulation and energy-efficient windows to maintain indoor temperatures, incorporating passive heating strategies. Provide active heating designed for peak use, and consider solarium screening on balconies.	Will be explored in future project stages - provide details	
23	Extreme cold during winter	Landscape & Ecological Systems	Medium Risk	avoid selection of tender plants (Zone 7 and above)	Will incorporate into project	
24	Extreme cold during winter	Mechanical and Plumbing Systems	Medium Risk	Risk low. System are regularly designed to prevent freezing and under extreme cold, indoor conditions can be slightly lower but not creating health related risks to occupants.	Will be explored in future project stages - provide details	
25	Extreme cold during winter	Power & Electrical Systems	Medium Risk	Coordinate with Mechanical design to incorporate worst-case heating load into electrical system sizing.	Will incorporate into project	
26	Drought/Water Restrictions	Civil Engineering Systems	Medium Risk	Incorporate water-saving fixtures and appliances, using drought-resistant landscaping and designing buildings to reduce water use.	Will be explored in future project stages - provide details	
27	Drought/Water Restrictions	Landscape & Ecological Systems	Medium Risk	emphasize prioritizing planted areas over paving, incorporating bioswales and berms for water absorption, using drought-tolerant plants, implementing tree trenches, opting for extensive green roofs, and using pervious paving. The main challenges include adapting to severe microclimates around towers and ensuring sustainable water usage specific to the project site conditions.	Will be explored in future project stages - provide details	
28	Drought/Water Restrictions	Mechanical and Plumbing Systems	Medium Risk	Rainwater harvesting systems can be considered for irrigation, requiring careful design to manage complexities, maintenance, and mechanical systems for safe and effective use. Compliance with building bylaws and implementing preventive measures are essential to avoid common plumbing mistakes and ensure the harvested rainwater is appropriately used, such as for toilet flushing.	Will be explored in future project stages - provide details	
29	Extreme rainfall related flooding	Architectural Systems	Medium Risk	Drainage detailing is essential to prevent flooding at parkade entry/exits, and unique planning solutions are needed to manage rainwater, including using extensive green space and mini parks for bioswales. The Vancouver-specific wall system, though costly, is effective in the rainy climate, and proper site grading, overflow management, and strategic drain placement are critical to ensure rainwater stays on the property and is directed appropriately.	Will incorporate into project	
30	Extreme rainfall related flooding	Architectural Systems	Medium Risk	Drainage detailing at parkade entry/exits is essential to prevent flooding. Unique planning for rainwater management includes using green spaces and mini parks for bioswales. Vancouver's unique rainscreen wall system, though costly, is effective in rainy conditions. Proper site grading, overflow management, and strategic drain placement are crucial for directing rainwater away from buildings and towards landscaped areas, ensuring water stays on the property and is managed effectively.	Will incorporate into project	
31	Extreme rainfall related flooding	Civil Engineering Systems	Medium Risk	Design infrastructure to manage significant flooding events, directing excess water to the city's major drainage system. Strategically place trench drains to collect runoff, and crown and extend driveways to direct water into bioretention systems, ensuring initial runoff is managed on-site before overflow is handled by the city's infrastructure.	Will be explored in future project stages - provide details	
32	Extreme rainfall related flooding	Emergency Preparedness, Planning and Response	Medium Risk	Relocation of all mechanical and electrical systems and services above the FCI of 4.6m for the portion of the site bridging the flood plain boudnary.	Will be explored in future project stages - provide details	
33	Extreme rainfall related flooding	Landscape & Ecological Systems	Medium Risk	Use absorbent soil and ensure sufficient soil depth to manage drought and flooding, and support plant health. Install pipes under bioswales for extreme rain events and prevent pooling. Design site grading and drainage to avoid plant pooling, acknowledging that extreme weather may still cause temporary pooling, but aim to minimize such occurrences.	Will be explored in future project stages - provide details	
34	Extreme rainfall related flooding	Landscape & Ecological Systems	Medium Risk	ensure good drainage throughout outdoor space; if using bioswales use drain pipes	Will incorporate into project	
35	Extreme rainfall related flooding	Mechanical and Plumbing Systems	Medium Risk	Implement an overflow pipe on the storm retention system for events exceeding design conditions. Retain all water on-site for 24 hours to prevent direct discharge into the sewer system. Ensure effective rooftop drainage through the building's mechanical system, and install backflow prevention devices to protect against surcharges during extreme flooding events.	Will be explored in future project stages - provide details	
36	Extreme rainfall related flooding	Power & Electrical Systems	Medium Risk	Coordinate with mechanical team to ensure pump system is provided for areas where critical electrical equipment is located (i.e Main Electrical Room, Generator Room, Telephone/Data Room) and equipped with backup power.	Will incorporate into project	
37	Pandemic	Architectural Systems	High Risk	Choose appropriate interior materials and finishes, considering the established material palette and avoiding undesirable materials. Design each unit with its own balcony access to ensure residents can enjoy outdoor space during lockdowns, pandemics, or extreme heat events. Provide both indoor and large outdoor amenity spaces on level two, and include various indoor amenities like coworking spaces and bookable areas to ensure residents have access to communal spaces beyond their private units during a pandemic.	Will be explored in future project stages - provide details	
38	Pandemic	Human Systems	High Risk	Level 2 has a large amount of amenity space with connection to nature and the outdoor through views of nature, daylighting and physical connection. Every unit has a private balcony. Connection to nature and daylighting. Some unit have two separate bedrooms with two separate balconies. Two seperate balconies allow for easier quarentining.	Will be explored in future project stages - provide details	
39	Pandemic	Landscape & Ecological Systems	High Risk	provide enough outdoor space to allow people to social distance- should still provide smaller spaces as well -	Will incorporate into project	
40	Pandemic	Mechanical and Plumbing Systems	Medium Risk	Prevent the use of recirculating air units serving large areas. Ensure operable windows are provided to any gathering spaces to generated high outdoor air supply.	Will be explored in future project stages - provide details	
41	Pandemic	Power & Electrical Systems	Medium Risk	Ensure electrical rooms have adequate clearance for maintenance staff. Implement control systems to monitor air quality and humidity, and include operable windows in the design to allow self-regulation of indoor environments. Ensure sufficient power allocation for control and monitoring systems, coordinating with mechanical systems for temperature and air quality measurement.	Will incorporate into project	
42	Warmer summer temperatures	Architectural Systems	Medium Risk	Step code 3 with low carbon eneergy system. Rely of the passive envelope (envelope first approach) strategies to save reduce reliance and size of mechanical systems. Approx 50% WWR will mean a more robust envelope rather than up at 60%. Following the first energy model performance analysis (daylight analysis) will a more refine WWR. Minimum double pane windows to meet step code compliance. Operable windows on all sides of the building. Air conditioning - VBBL. We are going beyond Policy and providing every apartment with air conditioning in all rooms.	Will incorporate into project	
43	Warmer summer temperatures	Human Systems	Medium Risk	Air conditioning - VBBL. We are going beyond Policy and providing every apartment with air conditioning in all rooms. In the case of extreme heat and a power outage: Rely of the passive envelope (envelope first approach) strategies to save reduce reliance and size of mechanical systems.	Will incorporate into project	
44	Warmer summer temperatures	Mechanical and Plumbing Systems	High Risk	Same as 17 above: Full mechanical cooling will be provided and cooling systems will be designed to elevated outdoor air temperature meeting the BC Housing Technical Bulletin 3-2023. Residential corridors will also be cooled under to maintain a maximum temperature of 24C under the same environmental conditions.	Will incorporate into project	
45	Warmer summer temperatures	Power & Electrical Systems	High Risk	Coordinate with Mechanical design to incorporate worst-case cooling load into electrical system sizing.	Will incorporate into project	
46	Poor air quality (traffic related)	Architectural Systems	Medium Risk	N/A Low Risk: Mini pocket park between the street and road at ground level. The massing of the site considers set back from the road. The City is future proofing street configuration under the broadway plan - adding bike and pedestrian routes and removing a car lane. At the roof terrace there will be landscaping.	Will incorporate into project	
46	Poor air quality (traffic related)	Landscape & Ecological Systems	High Risk	provide strong buffer planting between Kingsway and open space; provide abundant planting generally	Will incorporate into project	
47	Poor air quality (traffic related)	Mechanical and Plumbing Systems	High Risk	Locate air intake per ASHRAE-62.1, away from vehicular traffic. Implement MERV-13 filtration in general spaces and hallways, while suites may face challenges due to pressure drops. Follow BC Housing Standards for rental facilities and large amenities, with additional filters available during smoke events. Store extra MERV 13 filters on-site for fire events, and allocate mechanical room space for storage. Prepare filter racks for future MERV 13 installation and establish an operational schedule for periodic checks and filter replacement, especially during fire events, emphasizing readiness for higher filtration needs.	Will incorporate into project	
48	Poor air quality (traffic related)	Power & Electrical Systems	Medium Risk	Coordinate with Mechanical design to incorporate worst-case HVAC load into electrical system sizing.	Will incorporate into project	

Resources

Consider the following resources when completing this Resilient Buildings Planning Worksheet. This list is not exhaustive, worksheet users are encouraged to seek additional resources as necessary.

Title	Organization	Link	Resource Type
The Climate Atlas of Canada	Prairie Climate Centre	https://climateatlas.ca/	Hazard, Exposure, and Likelihood Data
Climate Data Canada	Environment and Climate Change Canada / Ouranos / CRIM / PCIC / Prarie Climate Centre	climatedata.ca	Hazard, Exposure, and Likelihood Data
Downscaled Climate Scenarios	Environement and Climate Change Canada	https://climate-change.canada.ca/climate-data/#/	Hazard, Exposure, and Likelihood Data
PCIC Plan 2 Adapt	Pacific Climate Impacts Constortium	https://www.pacificclimate.org/analysis-tools/plan2adapt	Hazard, Exposure, and Likelihood Data
PCIC Climate Explorer	Pacific Climate Impacts Constortium	https://www.pacificclimate.org/analysis-tools/pcic-climate-explorer	Hazard, Exposure, and Likelihood Data
Leed Resilience Screening Tool for LEED v4 Projects	US Green Building Council	https://www.usgbc.org/resources/leed-climate-resilience-screening-tool-leed-v4-projects	Hazard, Exposure, and Likelihood Data
Climate Change Adaptation Strategy	City of Vancouver	https://vancouver.ca/files/cov/climate-change-adaptation-strategy.pdf	Hazard, Exposure, and Likelihood Data
Design Value Explorer	National Research Council Canada	https://climatedata.ca/the-design-value-explorer-improving-access-to-historical-and-projected-climatic-design-variables/	Hazard, Exposure, and Likelihood Data
Climate Resilience Guidelines for BC Health Facility Planning & Design	Climate Resilience Framework and Standards for Public Sector Buildings	https://bcgreencare.ca/wp-content/uploads/2021/09/ClimateResilienceGuidelinesForBCHealthFacilityPlanningAnd-Design_v1-1.pdf	Resilience and Risk Assessment Frameworks
CanAdapt and Communities of Practice	Climate Risk Institute	https://climateriskinstitute.ca/community-of-practice/	Resilience and Risk Assessment Frameworks
Climate Lens – Climate Change Resilience Assessment	Infrastructure Canada	https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html	Resilience and Risk Assessment Frameworks
PIEVC High Level Screening Guide	Institute for Catastrophic Loss Reduction and Climate Risk Institute	https://pievc.ca/pievc-high-level-screening-guide/	Resilience and Risk Assessment Frameworks
31000 Risk management	ISO (International Organization for Standardization)	https://www.iso.org/iso-31000-risk-management.html;	Resilience and Risk Assessment Frameworks
14090 Adaptation to climate change - Principles, requirements and guidelines	ISO (International Organization for Standardization)	https://www.iso.org/obp/ui/#iso:std:iso:14091:ed-1:v1:en	Resilience and Risk Assessment Frameworks
Integrated Building Adaptation and Mitigation Assessment (IBAMA)	Pacific Institute for Climate Solutions	https://pics.uvic.ca/projects/adaptive-mitigation-framework-assessing-climate-change-solutions-urban-multifamily	Resilience and Risk Assessment Frameworks
Coastal flood risk assessment guidelines for buildings and infrastructure design: supporting flood resilience on Canada's coasts	NRC	https://nrc-publications.canada.ca/eng/view/object/?id=b4e8e5cd-ace2-4777-866f-1bb18bff77f0	Resilience and Risk Assessment Frameworks
Resilience Brief	BOMA	https://bomacanada.ca/wp-content/uploads/2019/11/BOMA_Resilience_Brief_Eng_v5.pdf	Resilience Strategies
MBAR Discussion Primers	BC Housing	https://www.bchousing.org/research-centre/library/residential-design-construction-guides/MBAR	Resilience Strategies
Climate-ready Housing Design Guide	BC Housing	https://www.bchousing.org/research-centre/library/residential-design-construction-guides/climate-ready-housing-design-guide	Resilience Strategies
Building Sustainability & Resilience Guide	ASHRAE BC	https://static1.squarespace.com/static/54762199e4b0f6ed696bf031/t/62fd59afd2fc2d056da51b2a/1660770738485/ASHRAE-BC+Building+Sustainability+%26+Resilience+Guide+-+Rev+1.1.pdf	Resilience Strategies
Climate Change Considerations for Building Enclosure Engineers, Engineers & Geoscientists British Columbia	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMWZ4OQNSFQRDEBA2GUPT6CRPJG7U/Climate%20Change%20Considerations%20for%20Building%20Enclosure%20Engineers	Resilience Strategies
Sustainability Professional Practice Guidelines	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMWYXOJJABJXV2JBKDAA5525CDJ6B/Sustainability%20Guidelines	Resources on Professional Practice related to risk and resilience
Overheating Considerations for Existing Multi-Unit Residential Buildings	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMW32WH5KF4WGZFHYUEOWQXCGSEWM/Overheating%20Considerations%20for%20Existing%20Multi-Unit%20Residential%20Buildings	Resources on Professional Practice related to risk and resilience
Electrical Considerations for Decarbonizing Existing Part 3 Buildings	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMW5K7OKYS6AQCZFYXR4QVJBNKNMH/Electrical%20Considerations%20for%20Decarbonizing%20Existing%20Part%203%20Buildings	Resources on Professional Practice related to risk and resilience
Climate Change Considerations for Building Enclosure Engineers	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMWZ4OQNSFQRDEBA2GUPT6CRPJG7U/Climate%20Change%20Considerations%20for%20Building%20Enclosure%20Engineers	Resources on Professional Practice related to risk and resilience
Joint Professional Practice Guidelines on Whole Building Energy Modelling Services	EGBC (Engineers and Geoscientists BC)	https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMW7JPMQDAJKVYBCLHGRA24FJJPH3/Whole%20Building%20Energy%20Modelling%20Services	Resources on Professional Practice related to risk and resilience

8.4 North Tower Embodied Carbon Design Report

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Instructions

Applicability

■ This Embodied Carbon Design Report (Design Report) is the reporting template designed to be used for demonstrating compliance with the embodied carbon requirements specified in Section 10.4 of the VBBL.
■ These VBBL requirements apply to all new Part 3 buildings.
■ These requirements do not apply to alterations to existing buildings, unless alterations are so significant that they are generally treated as the construction of a new building. Applicants should consult with building officials to confirm the applicability in these cases.
■ For guidance on applicability and embodied carbon emissions modelling refer to the corresponding version of Vancouver Embodied Carbon Guidelines (Guidelines).

General Instructions

■ For additional submission requirements see Section 6.2 of the Guidelines.
■ Projects with multiple buildings shall follow the guidance provided in Sections 2.4 (a) of the Guidelines to decide whether they should submit one Design Report per building or combine reporting in one report.
■ This report shall be submitted in both Excel and PDF formats.
■ Complete all fields that apply, using information that represents the current stage of design (For the City of Vancouver, submissions are required at Rezoning Permit and Building Permit).
■ For fields that do not apply or for which there is no information available (e.g. at Rezoning Permit), leave them blank or enter "N/A".
■ The row heights can be changed if more space is needed in any cell.
■ For questions relating to this design report please email green.buildings@vancouver.ca

Cell Legends

Legend	
Required Field	
Required Field with Dropdown Options	
Optional Field	
Optional Field with Dropdown Options	
No Manual Entry Required	

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Instructions

Tabs Overview

The user is encouraged to fill in the tabs in the following order, as answers to some questions will impact the following sections or tabs

Tabs	Requirement	Description
1. Instructions	Informative	(The current tab) Provides an overview of this design report
2. Project Info	Required	General information about the proposed project and building(s)
3. EC Modelling Info	Required	Information on the embodied carbon model, including the tool used and the scope
4. Results & Compliance	Required	Embodied carbon emissions results and compliance assessment with Vancouver Building By-law
5. Carbon Storage	Optional	Biogenic carbon and concrete carbonation reporting
6. Raw Data	Required	File names and submission requirements of raw data from different embodied carbon assessment software tools
7. Definitions	Informative	Definition of terms and description of the structural systems in "Project Info" tab

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Project and Building Information

Instructions

■ Use the form below to provide the general information regarding the proposed project and building(s) included in this Design Report.
■ See the definition of terms and description of the structural systems in "Definitions" tab.

Project Information

Project Working Title / Name	BONNIS: 600 Kingsway North Tower
Address *(Street No., Street Direction, Street Name)*	644 Kingsway
City	Vancouver
Province/State	British Columbia (BC)
Postal Code *(A9A 9A9)*	V5T 3K4
Secondary Address *(Street No., Street Direction, Street Name)*	
Secondary Postal Code *(A9A 9A9)*	
Number of Buildings in the Project	2
Number of Buildings included in this Design Report	1
Projected Date of First Building Permit Application *(YYYY-MM-DD)*	2025-07-01
Date wbLCA Model Completed *(YYYY-MM-DD)*	
Estimated Project Completion Year *(YYYY)*	

Embodied Carbon Design Report
Part 3 Buildings
Version 1.0
Updated: 2023-10-20
Project and Building Information

Building(s) Information

Building Name *(If different from the Project)*	
Building Address *(If different from the Project)*	
Postal Code *(If different from the Project)*	
Project Phase	Schematic Design
Permit Application Stage	Rezoning Permit
Percent of Project Phase Completed *(%)*	
Drawing Set Used for Embodied Carbon Modelling	Rezoning Submission
Primary Building Use	C (Residential Occupancies)
Secondary Building Use	
Construction Type	New Construction
Gross Floor Area without Parkade (m^2)	9,835
Parkade Gross Floor Area (m^2)	3,157
Gross Floor Area with Parkade (m^2)	12,992
Storeys Above Grade	14
Storeys Below Grade	4
Parking Type	Below grade
Building Height (m)	
No. of Units	
No. of Bedrooms	

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Project and Building Information

Structure

Primary Structural System	Concrete
Primary Horizontal Gravity System	Concrete: Non-PT Framing
Primary Vertical Gravity System	Concrete: CIP
Primary Lateral System	Concrete: Shear Walls
Podium	Primary system defined above is on a podium
Foundation Type	Shallow Foundation
Seismic Design Category	
Risk Category	
Seismic Site Class	
Allowable Soil Bearing Pressure (kg/m^2)	
Typical Column Grid, Long Direction (m)	
Typical Column Grid, Short Direction (m)	
Typical Floor Live Load (kg/m^2)	
Ground Snow Load (kg/m^2)	
Ultimate Wind Speed (kph)	

Multiple Buildings Information

Are the building(s) in this Design Report connected to other buildings in the project that are reported separately, i.e. are not included in this Design Report?	Yes
How is the common space allocated to the building(s) that their embodied carbon is reported in separate Design Reports?	Proportional to GFA

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Instructions

■ Use the form below to indicate the optional scope included in embodied carbon reporting and compliance with the City of Vancouver's requirements.
■ Unless specified in "Reporting" and/or "Compliance" columns below as "Yes", all the optional scopes will be assumed to be excluded from the embodied carbon reporting and compliance.
■ Emissions and benefits from module D, biogenic carbon, and concrete carbonation can be reported. However, these should be reported separately and are excluded from the results used for demonstrating compliance with the City of Vancouver's requirements.
■ All optional scopes are excluded from the compliance, if the "Absolute Path" is selected in tab "Results & Compliance".
■ Optional scopes are included in the results used for compliance, if the "Baseline Path" is selected in tab "Results & Compliance" and if they are indicated to be included in the "Compliance" column below.

wbLCA Model

LCA Modeller *(Company Name)*	Perkins&Will
LCA Modeller *(Contact Person Name)*	Nicole Pfeifer
Primary Material Quantity Source	BIM / Revit Takeoffs
Secondary Material Quantity Source	Project Drawing Takeoffs
Software Tool	Embodied Carbon Pathfinder

■ *Embodied Carbon Pathfinder (Pathfinder) is only acceptable at the Rezoning Permit stage.*
■ *Pathfinder provides a high-level, order-of-magnitude estimate, based on modelled scenarios for select building archetypes, and is not specific to a project's geometry or material quantities.*
■ *Project teams are encouraged to model the embodied carbon of their specific project early in the design process to help inform design and material selection.*

Green Building Rating System or Certification Pursued	None

Building Life

Building Life Time	60

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Life Cycle Stages

Specify the life cycle stages that you are including in your reporting, using data from your software tool or using project-specific or regional data.

- *The "Reporting" column is automatically populated based on the software specified in cell #D16, except for when "Other" is selected.*
- *Do not modify the auto-populated responses, unless the project is reporting embodied carbon of the missing life cycle stages using project-specific or regional data.*

	Reporting	Compliance
Product (A1-A3)	Yes	Yes
Construction Process - Transport (A4)	Yes	Yes
Construction Process - Construction (A5)	Yes	Yes
Use (B1-B5)	Yes	Yes
End-of-Life (C1-C4)	Yes	Yes
Benefits and Loads Beyond the Building Life Cycle (D1-D4)	No	No

Building Elements

- See Section 3.3 and Table 5 in Appendix B.2 of Vancouver Embodied Carbon Guidelines for a detailed list of required and optional elements and sub-element for compliance with VBBL.

Required Elements

	Reporting	Compliance
(Foundations, Subgrade enclosure, Slab-on-grade) Substructure	Yes	Yes
(Superstructure, Below-grade interior structure, Envelope, Roof) Shell	Yes	Yes

Are any required sub-elements excluded from the reporting or are any optional sub-elements within mandatory elements included in the reporting?	No

Embodied Carbon Design Report
Part 3 Buildings
Version 1.0
Updated: 2023-10-20
Embodied Carbon Modelling Information

Optional Elements

Are you including building elements other than substructure and shell (i.e. structure and enclosure) in your embodied carbon reporting?	No

	Reporting	Compliance
(Interior Construction) Interior		
(Interior Finishes) Interior		
(Plumbing) Services		
(HVAC) Services		
(Electrical) Services		
(Other) Services		
(Fixed Furnishings) Furnishings		
(Movable Furnishings) Furnishings		
(Landscaping) Sitework		
(Other) Sitework		
Other		

Carbon Storage (Optional)

	Reporting	Compliance
Biogenic Carbon Reported	No	No
Concrete Carbonation Reported	No	No

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Embodied Carbon Reduction Strategies

Describe any strategies used in the proposed design to reduce embodied carbon emissions.

(Optional) Were design for disassembly and adaptability (DfD) strategies incorporated in the proposed design, based on the CSA Z782 or ISO 20887 standards?

Assumptions, Data Modifications, and Manual Calculations

■ *If the baseline compliance path is used, answer the following questions for the proposed design and baseline.*

Did you substitute any major material or component in the building design with a proxy, due to the lack of data availability in the software tool? No

Did you modify any of default assumptions or data sources used in the software tool inside the tool or manually outside it? No

Provide any additional information on the project, embodied carbon inputs, or outputs here.

The buildings in the project share a below grade parkade. The parkade area will be split equally among the north and south building.

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Results & Compliance

Instructions

■ Use the form below to report the embodied carbon emissions and assess compliance with the embodied carbon requirements of Vancouver Building By-law.
■ "Required Elements" should only include substructure and shell (i.e. structure and enclosure).
■ "Optional Elements" shall include the other elements, indicated to be included in the "Building Elements" section of "EC Modelling Info" tab.
■ Biogenic carbon and concrete carbonation shall not be included in this tab. They may be reported separately in "Carbon Storage" tab.

Compliance Path and Requirements

The embodied carbon of the proposed design should be 20% below the benchmark for Part 3 buildings that are up to 6 storeys and can be built with wood structure and 10% for all other Part 3 buildings. The benchmark is set based on the compliance path.

Compliance Path	Absolute Path
Gross Floor Area without Parkade (m2)	9,835
Projected Date of First Building Permit Application	2025-07-01

Is the project planning to achieve any of the "Responsible Material Sourcing" criteria? Yes

Specify and describe the Responsible Material Sourcing criterion or criteria the project is meeting.

Additional details may be provided in a supporting report, as described in Section 6.2 (d) of the Guidelines.

A minimum of 20 distinct permanently installed interior materials will disclose their ingredients using HPD's, Declare labels or cradle to cradle certificates. Materials will fall within one of the following categories: flooring, insulation, wet applied products, ceilings, wall assemblies or composite wood.

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Results & Compliance

Compliance Assessment

Embodied Carbon Limit

	Proposed	Benchmark	Limit
Total Embodied Carbon Emissions (kg CO_2e)	**2,886,644**	3,934,097	**3,540,688**
Embodied Carbon Intensity (without Parkade) (kg CO_2e/m^2)	293.50	400.00	360.00

Embodied Carbon Reduction from the Benchmark (%)

The proposed design meets the embodied carbon limit	**Yes**
Minimum Reduction Required	**10%**
Reduction Achieved	**27%**

Results

Proposed Design

	Required Elements
Total Embodied Carbon Emissions (kg CO_2e)	
Modules A-C	2,886,644
Product (A1-A3)	
Transport - Construction Process (A4)	
Construction - Construction Process (A5)	
Use (B1-B5)	
End-of-Life (C1-C4)	
Total (A-C)	
Beyond the Building Life (D1-D4)	
Embodied Carbon Intensity (without Parkade) (kg CO_2e/m^2)	
Modules A-C	293
Modules D	
Embodied Carbon Intensity (with Parkade) (kg CO_2e/m^2)	
Modules A-C	222
Modules D	

Embodied Carbon Design Report
Part 3 Buildings
Version 1.0
Updated: 2023-10-20
Results & Compliance

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Carbon Storage
(Optional)

Instructions

- Reporting biogenic carbon and concrete carbonation is optional.
- Carbon storage shall be reported separately in this form and is not included in the compliance assessment.

No input is required on this page.

Results

Proposed Design

	Required Elements	Required+Optional Elements (All)
Total Carbon Storage (kg CO_2e)		
Biogenic Carbon		
Concrete Carbonation		
Carbon Storage Intensity (without Parkade) (kg CO_2e/m^2)		
Biogenic Carbon		
Concrete Carbonation		
Carbon Storage Intensity (with Parkade) (kg CO_2e/m^2)		
Biogenic Carbon		
Concrete Carbonation		

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Raw Data Submission

Instructions

- Follow the guidance provided in the link below to prepare and submit raw data from the wbLCA software tool.

https://tinyurl.com/COV-ECDR

File Names

- Provide the filename(s) of the raw data spreadsheet export from the software tool and a description of each file.
- Please ensure filenames are correct, as this will be used to link raw data files with this submission template. Example: "Project Name_Proposed_OCL LCC Results.xls"
- Select relevant file description for each filename.
- Dropdown options with * are Required file results to be included for each specific software tool. Other options without * are optional but highly recommended to be included.
- Depending on the tool, each scenario may have multiple spreadsheet exports that are relevant.

Proposed Design

File Name:	20240722_600 Kingsway_Preliminary Embodied Carbon Assessment Report	Description:	Other
File Name:		Description:	
File Name:		Description:	
File Name:		Description:	

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Building Information		
Project Phase	Concept Design	The concept phase includes developing the building concept, investigating its feasibility, and proposing the concept to stakeholders to make a decision to develop the concept further.
	Schematic Design	The schematic phase includes rough drawings or a narrative that illustrate the basic concepts of the building design which most often include spatial relationships as well as basic scale and forms the owner might desire. At this time, initial descriptions of the structural, mechanical, HVAC, plumbing and electrical, interior and exterior finishes and building site are often included. The schematic phase also includes initial cost estimates.
	Design Development	The design development phase involves finalizing the building design and specifying items such as materials, window and door locations and general structural details.
	Construction Documents	The construction document phase includes the development of final architectural, structural, civil, mechanical, and electrical drawings to be used for construction. These drawings are in greater detail than drawings produced during design development and typically include specifications for construction details and materials.
	Construction	The contractor constructs the building in accordance with the construction documents during the construction phase. The architect, engineers, and consultants perform quality control inspections, respond to Requests for Information (RFIs), review and approve technical submittals and generally ensure that the project is constructed by the contractor in accordance with the construction documents.
	As-Built	The contractor has completed the construction contract in accordance with the construction documents, and a Certificate of Occupancy has been issued.

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Structure		
Primary Horizontal Gravity System	Concrete: PT Framing	Concrete framing with PT tendons and mild reinforcing bars. Includes 2-way slab and 1-way with beams.
	Concrete: Non-PT Framing	Cast-in-place concrete system with only mild reinforcing. Includes 2-way slab and 1-way with beams.
	Concrete: Precast	System of precast elements. System may be pre-stressed and may include a concrete topping.
	Concrete: Other	2/3 of the floor area is composed of a concrete framing system not listed above or a combination of different concrete framing systems.
	Steel: Frame + Concrete on Metal Deck	Concrete or Composite slab on metal deck with steel supports, such as wide-flange beams or open web steel joists (OWSJ).
	Steel: Frame + Bare Metal Deck	Steel framing members with bare metal deck. This system should be selected when a majority of the horizontal framing in the structure is metal roof deck.
	Steel: Other	2/3 of the floor area is composed of a steel framing system not listed above or a combination of different steel framing systems.
	Wood: Joists and Sheathing	Plywood or OSB decking supported by wood joists. Joists may be standard wood or engineered wood.
	Wood: Engineered Panels	CLT, DLT, NLT, GLT or other engineered wood panels. May include concrete topping.
	Wood: Other	2/3 of the floor area is composed of a wood framing system not listed above or a combination of different wood framing systems.
	Other Material (not concrete, steel, or wood)	2/3 of the floor area is composed of a framing system not listed above.
Primary Vertical Gravity System	Concrete: CIP	Cast-in-place concrete columns and walls
	Concrete: Precast	Precast concrete columns and walls
	Concrete: Other	Other Concrete Vertical Gravity System
	Steel: Columns	Steel wide flange or rectangular, square, or round hollow structural section columns
	Steel: Cold-Formed	Cold-formed steel columns and/or Light-frame cold-formed steel bearing walls
	Steel: Other	Other Steel Vertical Gravity System
	Wood: Mass Timber	Mass or heavy timber columns, e.g. Glulam
	Wood: Light-Frame	Light-Frame wood bearing walls
	Wood: Other	Other Wood Vertical Gravity System
	Masonry	Masonry columns and/or bearing walls
	Other Material (not concrete, steel, wood, or masonry)	Not concrete, steel, wood, or masonry

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Primary Lateral System	Concrete: Shear Walls	CIP or Precast Shear Walls
	Concrete: Moment Frames	CIP or Precast Concrete Moment Frames
	Concrete: Other	Other, including concrete cantilevered columns, or multiple steel systems including all-steel dual systems
	Steel: Braced Frames	Steel braced frame, including buckling restrained braces (BRB)
	Steel: Moment Frames	Steel moment frames
	Steel: Other	Other, including steel plate shear walls, steel cantilevered columns, or multiple steel systems including all-steel dual systems
	Light Frame Shear Panels	Wood or cold formed walls with shear panels such as plywood or OSB
	Masonry: Shear Walls	Masonry Shear Walls
	Wood: Shear Panels	Engineered wood shear panels, including CLT
	Wood: Other	Other, including wood cantilevered columns or light-framed walls with shear panels of non-wood materials
	Other	Material not listed above, or no single material predominates (includes Dual Systems with multiple materials)
Primary Lateral System	Not a podium building	Select this if the building does not have a podium (see definition below).
	Primary system defined above is on a podium	Select this when the majority of floors in the superstructure (excluding slab at grade) are above the podium.
	Primary system defined above is a podium	Select this when the majority of floors in the superstructure (excluding slab at grade) are a part of the podium.
Foundation Type	Shallow Foundation	Spread footings, strip foundations, mat foundations, or raft foundations
	Deep Foundations < 50ft/15m	Foundation systems with overall depth (e.g. piles) < 50 feet or 15m
	Deep Foundations > 50ft/15m	Foundation systems with overall depth (e.g. piles) > 50 feet or 15m
	Other Foundation System	Other foundations not listed above

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Seismic Design Category	A (Low Risk)	Buildings and other structures that represent a low risk to human life in the event of an earthquake, typically in areas of low seismic activity.
	B (Low to Moderate Risk)	Structures that represent a low-to-moderate risk to human life in the event of an earthquake, typically in areas of low-to-moderate seismic activity.
	C (Moderate Risk)	Structures that represent a moderate risk to human life in the event of an earthquake, typically in areas of moderate seismic activity.
	D (High Risk)	Structures that represent a high risk to human life in the event of an earthquake, typically in areas of high seismic activity.
	E (High Risk on Soft Soils)	Structures that represent a high risk to human life in the event of an earthquake, typically in areas of high seismic activity and with soft soils.
	F (Very High Risk)	Structures that represent a very high risk to human life in the event of an earthquake, typically in areas of very high seismic activity and with soft or problematic soils. These structures require a site-specific evaluation to determine their seismic design parameters.
Seismic Site Class	Class A (Hard Rock)	This is typically composed of hard rocks that have very high velocities such as crystalline bedrock.
	Class B (Rock)	This category is characterized by rocks that are not as hard as those in Class A, such as sedimentary layers.
	Class C (Very Dense Soil and Soft Rock)	These are dense or stiff soils like hard clay, and also soft rocks like hard shale or weathered rock.
	Class D (Stiff Soil)	This class is typical for urban areas and is composed of stiff soil, which could be clay, silt, or a mixture of these.
	Class E (Soft Clay Soil)	These are soft soils with high plasticity, such as clay, and soils that are prone to significant ground motion amplification.
	Class F (Soils Requiring Site-Specific Evaluations)	These are soils that are vulnerable to potential failure or collapse under seismic loading, such as liquefiable soils, quicksand, peat, etc. These soils require site-specific evaluations to determine their properties.

8.5 South Tower Embodied Carbon Design Report

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Instructions

Applicability

■ This Embodied Carbon Design Report (Design Report) is the reporting template designed to be used for demonstrating compliance with the embodied carbon requirements specified in Section 10.4 of the VBBL.
■ These VBBL requirements apply to all new Part 3 buildings.
■ These requirements do not apply to alterations to existing buildings, unless alterations are so significant that they are generally treated as the construction of a new building. Applicants should consult with building officials to confirm the applicability in these cases.
■ For guidance on applicability and embodied carbon emissions modelling refer to the corresponding version of Vancouver Embodied Carbon Guidelines (Guidelines).

General Instructions

■ For additional submission requirements see Section 6.2 of the Guidelines.
■ Projects with multiple buildings shall follow the guidance provided in Sections 2.4 (a) of the Guidelines to decide whether they should submit one Design Report per building or combine reporting in one report.
■ This report shall be submitted in both Excel and PDF formats.
■ Complete all fields that apply, using information that represents the current stage of design (For the City of Vancouver, submissions are required at Rezoning Permit and Building Permit).
■ For fields that do not apply or for which there is no information available (e.g. at Rezoning Permit), leave them blank or enter "N/A".
■ The row heights can be changed if more space is needed in any cell.
■ For questions relating to this design report please email green.buildings@vancouver.ca

Cell Legends

Legend	
Required Field	
Required Field with Dropdown Options	
Optional Field	
Optional Field with Dropdown Options	
No Manual Entry Required	

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Instructions

Tabs Overview

The user is encouraged to fill in the tabs in the following order, as answers to some questions will impact the following sections or tabs

Tabs	Requirement	Description
1. Instructions	Informative	(The current tab) Provides an overview of this design report
2. Project Info	Required	General information about the proposed project and building(s)
3. EC Modelling Info	Required	Information on the embodied carbon model, including the tool used and the scope
4. Results & Compliance	Required	Embodied carbon emissions results and compliance assessment with Vancouver Building By-law
5. Carbon Storage	Optional	Biogenic carbon and concrete carbonation reporting
6. Raw Data	Required	File names and submission requirements of raw data from different embodied carbon assessment software tools
7. Definitions	Informative	Definition of terms and description of the structural systems in "Project Info" tab

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Project and Building Information

Instructions

■ Use the form below to provide the general information regarding the proposed project and building(s) included in this Design Report.
■ See the definition of terms and description of the structural systems in "Definitions" tab.

Project Information

Project Working Title / Name	BONNIS: 600 Kingsway South Tower
Address *(Street No., Street Direction, Street Name)*	644 Kingsway
City	Vancouver
Province/State	British Columbia (BC)
Postal Code *(A9A 9A9)*	V5T 3K4
Secondary Address *(Street No., Street Direction, Street Name)*	
Secondary Postal Code *(A9A 9A9)*	
Number of Buildings in the Project	2
Number of Buildings included in this Design Report	1
Projected Date of First Building Permit Application *(YYYY-MM-DD)*	2025-07-01
Date wbLCA Model Completed *(YYYY-MM-DD)*	
Estimated Project Completion Year *(YYYY)*	

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Project and Building Information

Building(s) Information

Building Name *(If different from the Project)*	
Building Address *(If different from the Project)*	
Postal Code *(If different from the Project)*	
Project Phase	Schematic Design
Permit Application Stage	Rezoning Permit
Percent of Project Phase Completed *(%)*	
Drawing Set Used for Embodied Carbon Modelling	Rezoning Submission
Primary Building Use	C (Residential Occupancies)
Secondary Building Use	
Construction Type	New Construction
Gross Floor Area without Parkade (m^2)	18,178
Parkade Gross Floor Area (m^2)	5,637
Gross Floor Area with Parkade (m^2)	23,815
Storeys Above Grade	25
Storeys Below Grade	4
Parking Type	Below grade
Building Height (m)	
No. of Units	
No. of Bedrooms	

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Project and Building Information

Structure

Primary Structural System	Concrete
Primary Horizontal Gravity System	Concrete: Non-PT Framing
Primary Vertical Gravity System	Concrete: CIP
Primary Lateral System	Concrete: Shear Walls
Podium	Primary system defined above is on a podium
Foundation Type	Shallow Foundation
Seismic Design Category	
Risk Category	
Seismic Site Class	
Allowable Soil Bearing Pressure (kg/m^2)	
Typical Column Grid, Long Direction (m)	
Typical Column Grid, Short Direction (m)	
Typical Floor Live Load (kg/m^2)	
Ground Snow Load (kg/m^2)	
Ultimate Wind Speed (kph)	

Multiple Buildings Information

Are the building(s) in this Design Report connected to other buildings in the project that are reported separately, i.e. are not included in this Design Report?	Yes
How is the common space allocated to the building(s) that their embodied carbon is reported in separate Design Reports?	Proportional to GFA

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Instructions

■ Use the form below to indicate the optional scope included in embodied carbon reporting and compliance with the City of Vancouver's requirements.
■ Unless specified in "Reporting" and/or "Compliance" columns below as "Yes", all the optional scopes will be assumed to be excluded from the embodied carbon reporting and compliance.
■ Emissions and benefits from module D, biogenic carbon, and concrete carbonation can be reported. However, these should be reported separately and are excluded from the results used for demonstrating compliance with the City of Vancouver's requirements.
■ All optional scopes are excluded from the compliance, if the "Absolute Path" is selected in tab "Results & Compliance".
■ Optional scopes are included in the results used for compliance, if the "Baseline Path" is selected in tab "Results & Compliance" and if they are indicated to be included in the "Compliance" column below.

wbLCA Model

LCA Modeller *(Company Name)*	Perkins&Will
LCA Modeller *(Contact Person Name)*	Nicole Pfeifer
Primary Material Quantity Source	BIM / Revit Takeoffs
Secondary Material Quantity Source	Project Drawing Takeoffs
Software Tool	Embodied Carbon Pathfinder

■ *Embodied Carbon Pathfinder (Pathfinder) is only acceptable at the Rezoning Permit stage.*
■ *Pathfinder provides a high-level, order-of-magnitude estimate, based on modelled scenarios for select building archetypes, and is not specific to a project's geometry or material quantities.*
■ *Project teams are encouraged to model the embodied carbon of their specific project early in the design process to help inform design and material selection.*

Green Building Rating System or Certification Pursued	LEED v4.0 MRc1

Building Life

Building Life Time	60

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Life Cycle Stages

Specify the life cycle stages that you are including in your reporting, using data from your software tool or using project-specific or regional data.

- *The "Reporting" column is automatically populated based on the software specified in cell #D16, except for when "Other" is selected.*
- *Do not modify the auto-populated responses, unless the project is reporting embodied carbon of the missing life cycle stages using project-specific or regional data.*

	Reporting	Compliance
Product (A1-A3)	Yes	Yes
Construction Process - Transport (A4)	Yes	Yes
Construction Process - Construction (A5)	Yes	Yes
Use (B1-B5)	Yes	Yes
End-of-Life (C1-C4)	Yes	Yes
Benefits and Loads Beyond the Building Life Cycle (D1-D4)	No	No

Building Elements

- See Section 3.3 and Table 5 in Appendix B.2 of Vancouver Embodied Carbon Guidelines for a detailed list of required and optional elements and sub-element for compliance with VBBL.

Required Elements

	Reporting	Compliance
(Foundations, Subgrade enclosure, Slab-on-grade) Substructure	Yes	Yes
(Superstructure, Below-grade interior structure, Envelope, Roof) Shell	Yes	Yes

Are any required sub-elements excluded from the reporting or are any optional sub-elements within mandatory elements included in the reporting?	No

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Optional Elements

Are you including building elements other than substructure and shell (i.e. structure and enclosure) in your embodied carbon reporting?	No

	Reporting	Compliance
(Interior Construction) Interior		
(Interior Finishes) Interior		
(Plumbing) Services		
(HVAC) Services		
(Electrical) Services		
(Other) Services		
(Fixed Furnishings) Furnishings		
(Movable Furnishings) Furnishings		
(Landscaping) Sitework		
(Other) Sitework		
Other		

Carbon Storage (Optional)

	Reporting	Compliance
Biogenic Carbon Reported	No	No
Concrete Carbonation Reported	No	No

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Embodied Carbon Modelling Information

Embodied Carbon Reduction Strategies

Describe any strategies used in the proposed design to reduce embodied carbon emissions.

(Optional) Were design for disassembly and adaptability (DfD) strategies incorporated in the proposed design, based on the CSA Z782 or ISO 20887 standards?

Assumptions, Data Modifications, and Manual Calculations

■ *If the baseline compliance path is used, answer the following questions for the proposed design and baseline.*

Did you substitute any major material or component in the building design with a proxy, due to the lack of data availability in the software tool? No

Did you modify any of default assumptions or data sources used in the software tool inside the tool or manually outside it? No

Provide any additional information on the project, embodied carbon inputs, or outputs here.

The buildings in the project share a below grade parkade. The parkade area will be split equally among the north and south building.

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Results & Compliance

Instructions

■ Use the form below to report the embodied carbon emissions and assess compliance with the embodied carbon requirements of Vancouver Building By-law.
■ "Required Elements" should only include substructure and shell (i.e. structure and enclosure).
■ "Optional Elements" shall include the other elements, indicated to be included in the "Building Elements" section of "EC Modelling Info" tab.
■ Biogenic carbon and concrete carbonation shall not be included in this tab. They may be reported separately in "Carbon Storage" tab.

Compliance Path and Requirements

The embodied carbon of the proposed design should be 20% below the benchmark for Part 3 buildings that are up to 6 storeys and can be built with wood structure and 10% for all other Part 3 buildings. The benchmark is set based on the compliance path.

Compliance Path: Absolute Path
Gross Floor Area without Parkade (m2): 18,178
Projected Date of First Building Permit Application: 2025-07-01

Is the project planning to achieve any of the "Responsible Material Sourcing" criteria? Yes

Specify and describe the Responsible Material Sourcing criterion or criteria the project is meeting.

Additional details may be provided in a supporting report, as described in Section 6.2 (d) of the Guidelines.

A minimum of 20 distinct permanently installed interior materials will disclose their ingredients using HPD's, Declare labels or cradle to cradle certificates. Materials will fall within one of the following categories: flooring, insulation, wet applied products, ceilings, wall assemblies or composite wood.

CITY OF VANCOUVER

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Results & Compliance

Compliance Assessment

Embodied Carbon Limit

	Proposed	Benchmark	Limit
Total Embodied Carbon Emissions ($kg\ CO_2e$)	**5,335,288**	**7,271,261**	**6,544,135**
Embodied Carbon Intensity (without Parkade) ($kg\ CO_2e/m^2$)	293.50	400.00	360.00

Embodied Carbon Reduction from the Benchmark (%)

The proposed design meets the embodied carbon limit	**Yes**
Minimum Reduction Required	**10%**
Reduction Achieved	**27%**

Results

Proposed Design

	Required Elements
Total Embodied Carbon Emissions ($kg\ CO_2e$)	
Modules A-C	5,335,288
Product (A1-A3)	
Transport - Construction Process (A4)	
Construction - Construction Process (A5)	
Use (B1-B5)	
End-of-Life (C1-C4)	
Total (A-C)	
Beyond the Building Life (D1-D4)	
Embodied Carbon Intensity (without Parkade) ($kg\ CO_2e/m^2$)	
Modules A-C	293
Modules D	
Embodied Carbon Intensity (with Parkade) ($kg\ CO_2e/m^2$)	
Modules A-C	224
Modules D	

CITY OF VANCOUVER

Embodied Carbon Design Report
Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Results & Compliance

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Carbon Storage
(Optional)

Instructions

- Reporting biogenic carbon and concrete carbonation is optional.
- Carbon storage shall be reported separately in this form and is not included in the compliance assessment.

No input is required on this page.

Results

Proposed Design

	Required Elements	Required+Optional Elements (All)
Total Carbon Storage (kg CO_2e)		
Biogenic Carbon		
Concrete Carbonation		
Carbon Storage Intensity (without Parkade) (kg CO_2e/m^2)		
Biogenic Carbon		
Concrete Carbonation		
Carbon Storage Intensity (with Parkade) (kg CO_2e/m^2)		
Biogenic Carbon		
Concrete Carbonation		

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Raw Data Submission

Instructions

- Follow the guidance provided in the link below to prepare and submit raw data from the wbLCA software tool.

https://tinyurl.com/COV-ECDR

File Names

- Provide the filename(s) of the raw data spreadsheet export from the software tool and a description of each file.
- Please ensure filenames are correct, as this will be used to link raw data files with this submission template. Example: "Project Name_Proposed_OCL LCC Results.xls"
- Select relevant file description for each filename.
- Dropdown options with * are Required file results to be included for each specific software tool. Other options without * are optional but highly recommended to be included.
- Depending on the tool, each scenario may have multiple spreadsheet exports that are relevant.

Proposed Design

File Name:	20240722_600 Kingsway_Preliminary Embodied Carbon Assessment Report	Description:	Other
File Name:		Description:	
File Name:		Description:	
File Name:		Description:	

Baseline

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Building Information		
Project Phase	Concept Design	The concept phase includes developing the building concept, investigating its feasibility, and proposing the concept to stakeholders to make a decision to develop the concept further.
	Schematic Design	The schematic phase includes rough drawings or a narrative that illustrate the basic concepts of the building design which most often include spatial relationships as well as basic scale and forms the owner might desire. At this time, initial descriptions of the structural, mechanical, HVAC, plumbing and electrical, interior and exterior finishes and building site are often included. The schematic phase also includes initial cost estimates.
	Design Development	The design development phase involves finalizing the building design and specifying items such as materials, window and door locations and general structural details.
	Construction Documents	The construction document phase includes the development of final architectural, structural, civil, mechanical, and electrical drawings to be used for construction. These drawings are in greater detail than drawings produced during design development and typically include specifications for construction details and materials.
	Construction	The contractor constructs the building in accordance with the construction documents during the construction phase. The architect, engineers, and consultants perform quality control inspections, respond to Requests for Information (RFIs), review and approve technical submittals and generally ensure that the project is constructed by the contractor in accordance with the construction documents.
	As-Built	The contractor has completed the construction contract in accordance with the construction documents, and a Certificate of Occupancy has been issued.

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Structure		
Primary Horizontal Gravity System	Concrete: PT Framing	Concrete framing with PT tendons and mild reinforcing bars. Includes 2-way slab and 1-way with beams.
	Concrete: Non-PT Framing	Cast-in-place concrete system with only mild reinforcing. Includes 2-way slab and 1-way with beams.
	Concrete: Precast	System of precast elements. System may be pre-stressed and may include a concrete topping.
	Concrete: Other	2/3 of the floor area is composed of a concrete framing system not listed above or a combination of different concrete framing systems.
	Steel: Frame + Concrete on Metal Deck	Concrete or Composite slab on metal deck with steel supports, such as wide-flange beams or open web steel joists (OWSJ).
	Steel: Frame + Bare Metal Deck	Steel framing members with bare metal deck. This system should be selected when a majority of the horizontal framing in the structure is metal roof deck.
	Steel: Other	2/3 of the floor area is composed of a steel framing system not listed above or a combination of different steel framing systems.
	Wood: Joists and Sheathing	Plywood or OSB decking supported by wood joists. Joists may be standard wood or engineered wood.
	Wood: Engineered Panels	CLT, DLT, NLT, GLT or other engineered wood panels. May include concrete topping.
	Wood: Other	2/3 of the floor area is composed of a wood framing system not listed above or a combination of different wood framing systems.
	Other Material (not concrete, steel, or wood)	2/3 of the floor area is composed of a framing system not listed above.
Primary Vertical Gravity System	Concrete: CIP	Cast-in-place concrete columns and walls
	Concrete: Precast	Precast concrete columns and walls
	Concrete: Other	Other Concrete Vertical Gravity System
	Steel: Columns	Steel wide flange or rectangular, square, or round hollow structural section columns
	Steel: Cold-Formed	Cold-formed steel columns and/or Light-frame cold-formed steel bearing walls
	Steel: Other	Other Steel Vertical Gravity System
	Wood: Mass Timber	Mass or heavy timber columns, e.g. Glulam
	Wood: Light-Frame	Light-Frame wood bearing walls
	Wood: Other	Other Wood Vertical Gravity System
	Masonry	Masonry columns and/or bearing walls
	Other Material (not concrete, steel, wood, or masonry)	Not concrete, steel, wood, or masonry

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Primary Lateral System	Concrete: Shear Walls	CIP or Precast Shear Walls
	Concrete: Moment Frames	CIP or Precast Concrete Moment Frames
	Concrete: Other	Other, including concrete cantilevered columns, or multiple steel systems including all-steel dual systems
	Steel: Braced Frames	Steel braced frame, including buckling restrained braces (BRB)
	Steel: Moment Frames	Steel moment frames
	Steel: Other	Other, including steel plate shear walls, steel cantilevered columns, or multiple steel systems including all-steel dual systems
	Light Frame Shear Panels	Wood or cold formed walls with shear panels such as plywood or OSB
	Masonry: Shear Walls	Masonry Shear Walls
	Wood: Shear Panels	Engineered wood shear panels, including CLT
	Wood: Other	Other, including wood cantilevered columns or light-framed walls with shear panels of non-wood materials
	Other	Material not listed above, or no single material predominates (includes Dual Systems with multiple materials)
Primary Lateral System	Not a podium building	Select this if the building does not have a podium (see definition below).
	Primary system defined above is on a podium	Select this when the majority of floors in the superstructure (excluding slab at grade) are above the podium.
	Primary system defined above is a podium	Select this when the majority of floors in the superstructure (excluding slab at grade) are a part of the podium.
Foundation Type	Shallow Foundation	Spread footings, strip foundations, mat foundations, or raft foundations
	Deep Foundations < 50ft/15m	Foundation systems with overall depth (e.g. piles) < 50 feet or 15m
	Deep Foundations > 50ft/15m	Foundation systems with overall depth (e.g. piles) > 50 feet or 15m
	Other Foundation System	Other foundations not listed above

Embodied Carbon Design Report

Part 3 Buildings

Version 1.0
Updated: 2023-10-20

Definitions

■ The definition of terms and systems from the "Project Info" tab are provided below.

Category	Term	Definitions & Description
Seismic Design Category	A (Low Risk)	Buildings and other structures that represent a low risk to human life in the event of an earthquake, typically in areas of low seismic activity.
	B (Low to Moderate Risk)	Structures that represent a low-to-moderate risk to human life in the event of an earthquake, typically in areas of low-to-moderate seismic activity.
	C (Moderate Risk)	Structures that represent a moderate risk to human life in the event of an earthquake, typically in areas of moderate seismic activity.
	D (High Risk)	Structures that represent a high risk to human life in the event of an earthquake, typically in areas of high seismic activity.
	E (High Risk on Soft Soils)	Structures that represent a high risk to human life in the event of an earthquake, typically in areas of high seismic activity and with soft soils.
	F (Very High Risk)	Structures that represent a very high risk to human life in the event of an earthquake, typically in areas of very high seismic activity and with soft or problematic soils. These structures require a site-specific evaluation to determine their seismic design parameters.
Seismic Site Class	Class A (Hard Rock)	This is typically composed of hard rocks that have very high velocities such as crystalline bedrock.
	Class B (Rock)	This category is characterized by rocks that are not as hard as those in Class A, such as sedimentary layers.
	Class C (Very Dense Soil and Soft Rock)	These are dense or stiff soils like hard clay, and also soft rocks like hard shale or weathered rock.
	Class D (Stiff Soil)	This class is typical for urban areas and is composed of stiff soil, which could be clay, silt, or a mixture of these.
	Class E (Soft Clay Soil)	These are soft soils with high plasticity, such as clay, and soils that are prone to significant ground motion amplification.
	Class F (Soils Requiring Site-Specific Evaluations)	These are soils that are vulnerable to potential failure or collapse under seismic loading, such as liquefiable soils, quicksand, peat, etc. These soils require site-specific evaluations to determine their properties.

8.6 Embodied Carbon Assessment

600 Kingsway

Embodied Carbon Study at Rezoning

REQUIREMENT

The Green Building Policy for Rezoning, amended on July 25th, 2023, requires the completion of the Embodied Carbon Design Report for each building to demonstrate that the project is on track to meet the Vancouver Building By-law (VBBL) limits for life-cycle equivalent CO_2 emissions expected to be in force at the time of the project's first Building Permit application. Embodied carbon is calculated for each building in $kgCO_2/m^2$ using a Whole Building Life Cycle Assessment (WBLCA) based on standard assumptions outlined in the City of Vancouver Embodied Carbon Guidelines.

INTRODUCTION

In alignment with the Embodied Carbon Guidelines, revised on October 18, 2023, Perkins&Will conducted a study for the North and South Towers at 600 Kingsway utilizing the Embodied Carbon Pathfinder tool. This tool estimates the buildings' Global Warming Potential (GWP), providing insights into the project's overall GWP and identifying elements with the highest GWP for further examination as the design progresses.

Preliminary calculations, key inputs, a breakdown of results, and potential measures to reduce embodied emissions during Design Development, have been provided. Due to the project's early stage, limited information was available for a detailed WBLCA. Instead, key inputs in Pathfinder include envelope and structural elements like the parking structure, wall assemblies, structural floors, roof assemblies, and concrete mix design, excluding interior finishes, excavation, interior partitions, and mechanical and electrical services.

The project consists of two towers on a shared podium: a 14-storey North tower and a 25-storey South tower. Both buildings, classified as high-rise (12 to 30 stories), share similar materiality, typology, and construction techniques, thus a single assessment was performed.

KEY INPUTS

Due to the early stage of the project, several assumptions were made. Refer to Table 1 for key assumptions of the baseline building.

Building Elements	Pathfinder High-rise Assumptions
Building Dimension	25 m x 25 m
Number of Floors	30
Service Life	60 years
Life Cycle Stages	A-C
Beam Span	8 m
Joist Span	6 m
Footings	300 mm x 100 mm below columns and perimeter walls
Slab on Grade	100 mm concrete slab
Slab on Grade	200 mm concrete
Structural component	Concrete 20% SCM
Exterior Walls	Curtain Wall
Cladding	Metal
Wall Insulation	Medium Density Mineral Wool
Roof Insulation	XPS
Roof Membrane	SBS Modified Bituminous Sheet
Glazing	Double Pane Glazing
Window Frame	Aluminum
Floor to Floor Height	3m
Window to Wall Ratio	40 - 60%
Parking Levels	4

Table 1 - Assumptions

1075 W Georgia St
Vancouver, BC V6C 2R6

www.perkinswill.com

RESULTS

The study results exclude biogenic carbon and include life cycle stages A to C. Based on the baseline assumptions in Table 1, the GWP for 600 Kingsway is estimated at 293.5 kgCO_2/m². The exported results from Pathfinder are shown below in Figure 1.

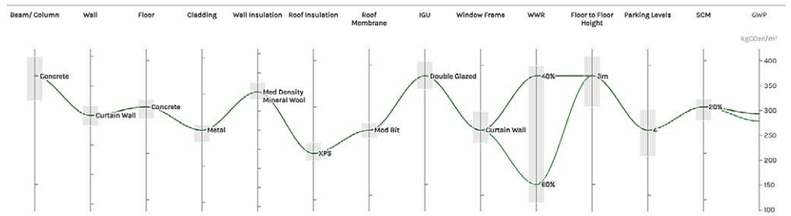


Figure 1 - Global Warming Potential Impact

EMBODIED CARBON REQUIREMENTS COMPLIANCE

The embodied carbon guideline introduces two pathways to meet the VBBL embodied carbon requirements (effective Jan 2025) at the time of project's building permit application.

Path 1 - Absolute	North and South Tower	360 kgCO_2/m^2
Path 2 - Baseline	North and South Tower	10% reduction from an equivalent baseline

Table 2 - Embodied Carbon Compliance Pathways

The results for each building are listed in Table 4 as well as the targeted compliance pathway. The study indicates the Absolute pathway is achievable and a maximum GWP of 360 kgCO_2/m2 will be targeted.

Global Warming Potential	**North Tower**	**South Tower**
Total (kgCO_2)	2,886,643.939	5,335,287.663
Intensity (kgCO_2/m^2)	293.5	293.5
Path 1 - Absolute	360	360
Path 2 - Baseline	264.15	264.15

Table 3 - Embodied Carbon Requirements at Building Permit

Early Stage Embodied Carbon Comparison

The design team explored opportunities to reduce the GWP of the building designs by comparing baseline assumptions with three different variation studies:

- Study 1 - Envelope.
- Study 2 - Glazing.
- Study 3 - Supplementary Cementitious Material (SCM) Content.

For all variations, detailed in figures 2 to 4, the baseline result is represented by the solid, thicker green line.

Study 1 - Envelope

The design is altered by replacing the curtain wall with a window wall system. The results of Study 1 range from 278.7 to 318.2 kg CO_2/m², illustrated in Figure 2. Depending on the pathway chosen, switching from curtainwall to window wall construction could impact the GWP of the project.

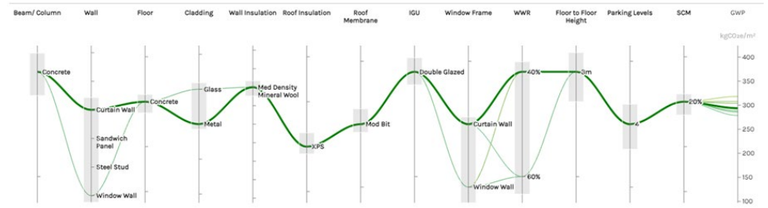


Figure 2 - Global Warming Potential Impact of Study 1 - Envelope

Study 2 - Glazing

Pathfinder was used to compare double and triple glazing, shown in Figure 3. Changing the design from triple to double glazing results in a reduction in GWP range from 296.9 to 278.7 kg CO_2/m² dependent on the pathway chosen.

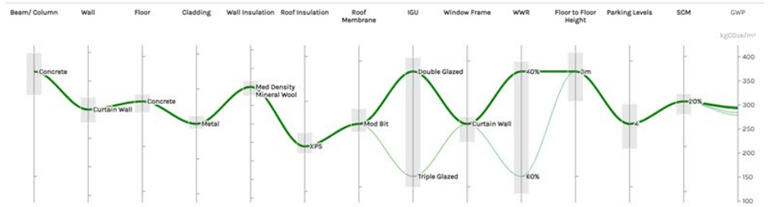


Figure 3 - Global Warming Potential Impact of Study 2 - Glazing

Study 3 - SCM Content

Changing the SCM percentage in the concrete mix from 20% to 30% was explored. According to the Concrete BC Member Industry-Wide EPD for Ready-Mix Concrete, a 20% SCM content typical in British Columbia and was considered the baseline for this study. Increasing the SCM content to 30% resulted in a lower GWP, ranging from 264 to 278.8 kgCO_2/m². This impact is illustrated in Figure 4.

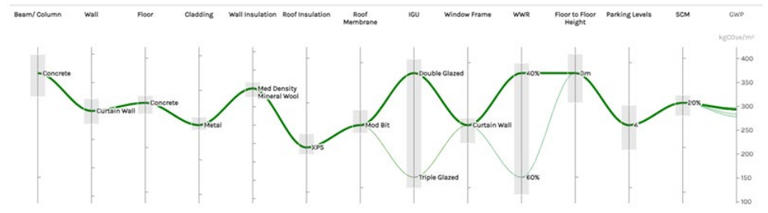


Figure 4 - Global Warming Potential Impact of Study 3 SCM Content

Embodied Carbon Reduction Opportunities

The design iterations reveal pathways to reduce embodied carbon, including:

- Reducing the volume of glass by switching from a triple to double glazed system, leading to a significant decrease in GWP.
- Optimizing concrete mix designs to reduce cement content and replace it with SCMs, further lowering the GWP.

From Rezoning through to the Building Permit application, the project team will continuously explore design strategies to minimize the buildings' total embodied carbon. These strategies include:

- Collaborating with the structural engineer to refine the design, thereby reducing reinforcement rates and member sizes.
- Stacking vertical elements where possible to eliminate or reduce the size of transfer structures.
- Evaluating envelope material choices using the EC3 tool to further decrease the building's total embodied carbon.

The team acknowledges that the Pathfinder results may be lower than those obtained from a more detailed WBLCA, nonetheless, this preliminary analysis provides valuable insights into design choices and their potential impacts on embodied carbon. The early-stage assessment using Pathfinder has been instrumental in identifying opportunities to reduce embodied carbon and ensuring alignment with the City of Vancouver requirements.

In the Design Development phase, a WBLCA will be performed using OneClick and incrementally updated through the design process to track and reduce embodied carbon.

8.7 Energy Modeling Report

600 Kingsway Towers

Preliminary Energy Modeling Report

602-644 Kingsway and 603 E 16th Ave., Vancouver, BC, V5T 2V3, CANADA

Z0014529

Prepared by:

Rabeeh Hosseini, EIT, MASc.
Professional Sustainable Building

Verified by:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
JEAN-SEBASTIEN TESSIER
33878
2024-07-26
Permit to Practice #1001723

Jean-Sebastien Tessier, P.Eng.
EGBC membership number: 33878

Keming Yan, P.Eng.
PEO membership number: 100610045

CIMA+

700 W Georgia St #900, Vancouver, BC
Canada V7Y 1K1

CIMA+file number: Z0014529
26 July 2024 – Rezoning Submission

TABLE OF REVIEW

Register of issues			
Issue No.	**Reviewed by**	**Date**	**Description of the review**
1st	Keming Yan, P.Eng.	2024-07-26	Rezoning Submission

CONFIDENTIALITY AND OWNERSHIP

EXACUTIVE SUMMARY

This report presents the energy modeling analysis of 600 Kingsway Towers, multiunit residential building located at 602-644 Kingsway and 603 E 16th Ave., Vancouver, BC. The building includes two major occupancies of 13 and 24 residential floors above the commercial retails at the ground level with four levels of parking below grade. The building is subject to rezoning and shall conform to the specified performance limit introduced by Bulletin “Green Building Policy Rezoning” amended July 2023, aligned with VBBL.

To simulate the building energy consumption, CIMA+ utilized IES VE 2023_v.5.2.0 (hourly-based energy simulation software), and the listed standards/guidelines as follows; (i) City of Vancouver Energy Modelling Guideline Version 2.0 (CoVEMG), (ii) VBBL 2024, (iii) NECB (2020)–Part 8, and (iv) EGBC–Whole Building Energy Modelling Services.

The building energy model was developed based on the architectural design and specifications listed in Table 2 and the results for TEDI, TEUI, and GHGI are recorded in Table 1. In addition, per CoVEMG, the MURB buildings are eligible for claiming the adjustment value for the identified metrics due to the air pressurization in corridors and the value is measured 10 (kWh/m^2) for the specified project, see section 2. 2..

Considering the simulated energy performance and adjusting results with the claimed value for corridor pressurization, the building is completely meet the determined benchmark and complies with the city requirements. Please see the results before and after adjustment in Table 1.

Table 1: Summary of energy performance considered adjustment value

Metrics	City requirement	Design without adjustment value	Design with adjustment value	Result
Thermal Energy Demand Intensity (kWh/m2)	29	38.5	28.5	**Complies**
Total Energy Use Intensity (kWh/m2)	120	98.2	90.5	**Complies**
Green House Gas Intensity (kgCO2/m2)	3	1.1	1	**Complies**

Note:

Per CoVEMG section 2.5.2, MURB buildings are eligible for using the adjustment value provided by corridor pressurization and the value has been claimed at this stage.

Table of Contents

List of Tables

List of Figures

1. ENERGY MODELING INPUT

Table 2: Energy modeling input

LOCATION AND WEATHER DATA	
Project location	602-644 Kingsway and 603 E 16th Ave., Vancouver, BC, V5T 2V3, CANADA
ASHRAE climate zone	4C
Simulation weather	Vancouver_BC_CWEC.fwt
Winter Design Temperature	-9 C
Summer Design Temperature db **Summer Design Temperature wb**	28 C db (July) 20 C db (July)
Modeling software	IES-ve version 2023.5.2.0
Occupancy class & Modeled floor area	Residential (C): 23072.5 m2 (94%) Commercial (E): 1518.5 m2 (6%)
ENVELOPE PERFORMANCE	
Overall roof U-value	0.187 (W/(m^{2}xK))
Overall opaque wall U-value	Residential opaque wall: 0.4 (W/(m^{2}xK)) Commercial opaque wall: 0.4 (W/(m^{2}xK))
Overall floor U-value	0.283 (W/(m^{2}xK))
Overall fenestration U-value (window/door)	1.4 (W/(m^{2}xK))

	SHGC: 0.31
Opening to wall ratio	34%
Infiltration rate[1]	0.2 (l/s/m^2) Per façade @75 pa (per COVEMG) 1.53 (l/s/m^2) Per enclosure @75 pa (calculated per designed enclosure)
INTERNAL GAIN	
Occupancy	Per COVEMG (1 person per single suite, 2 persons per 1Br., 3 persons per 2Br., and 4 persons for 3Br.)
Lighting power density	Lighting power density by space type per NECB 2020, Table 4.2.1.6 - Residential: 5 (W/m^2) - Commercial: 11.3 (W/m^2) - Amenity area: 6.3 (W/m^2) - Corridors: 4.4 (W/m^2) - Lobby: 9 (W/m^2) - Stairs: 5.3 (W/m^2) - Mechanical room: 4.6 (W/m^2) - Washroom: 5 (W/m^2) - Recycle room: 5 (W/m^2) - Loading room: 9.5 (W/m^2) - Parking: 1.5 (W/m^2)
Lighting control	Lighting fraction per NECB 2020, A-8.4.3.2. (1)-G
Exterior lighting	Basic site allowance per NECB 2020, Table 4.2.3.1.-B
Plug load	Peak receptacle load by space type Per NECB 2020, Table A-8.4.3.2. (2)-B - Residential: 5 (W/m^2) - Commercial: 2.5 (W/m^2) - Amenity area: 1 (W/m^2) - Service areas: [0-1] (W/m^2)
Process load	4 set of elevators, 3kW per each per COVEMG

[1] *Per VBBL 2019_ Section 10.2.2.21., buildings and major occupancies shall be tested for airtightness in accordance with "ASTM E 779" or "USACE Version 3" to an induced test pressure of not less than 75 Pa. The building is required to satisfy the claimed measure.*

Domestic hot water consumption / Schedule	Service water heating load by space type per Table A-8.4.3.2. (2)-B - Residential: 3.45 (l/hr.person) - Commercial: 0.68 (l/hr.person) - Amenity area: 1.02 (l/hr.person)
Operation schedule	Modeling guidance by space type per NECB 2020, Table A-8.4.3.2. (2) Operating schedule per NECB 2020, - Residential A-8.4.3.2. (1)-G - Commercial A-8.4.3.2. (1)-B - Amenity area A-8.4.3.2. (1)-C - Service area A-8.4.3.2. (1)-K & H
Mechanical systems	
Indoor design setpoint temperature and fan operation	Operating schedule by space type per NECB 2020, - Residential: Table A-8.4.3.2. (1)-G - Commercial: Table A-8.4.3.2. (1)-B - Amenity area: Table A-8.4.3.2. (1)-C - Service area: Table A-8.4.3.2. (1)-K & H
Maximum Heating/Cooling air supply temperature	32.22 C/ 12.78 C
Outdoor air requirement	Per ASHRAE 62-2001, Table 2 - Residential: 8.5 l/s/person - Commercial**:** 1.5 l/s/m^2 - Amenity area: 15 l/s/person - Lobby: 0.25 l/s/m^2 - Mechanical/ Recycle/ Loading room: 0.75 l/s/m^2 - Lobby: 0.25 l/s/m^2
Ventilation system	Vita H/ERV for Multi-Unit Residential - Airflow Range: 30 – 120 cfm - Power = 46 W - SRE = 80% @ 0C Make up air unit integrated with Air / Water Heat pump (MAU) - Refer to heating system description - Airflow MAU1: 4500 cfm - Airflow MAU2: 2350 cfm
Heating system	2x Reversible Electric Air / Water Heat pump (AWHP)_ Model: nyg-1000-1800-HP with 2x backup Condensing Gas Boiler AWHP - Heating capacity = 1560MBH (457 kWh) - Heating efficiency: COP 2.97 - Minimum operating temperature in winter: 0 F (-17 C) Condensing Gas Boiler - Heating capacity = 300 kWh - Heating efficiency: 95% Electric baseboard (EBB) - Heating capacity = vari [1-3] kW - Heating efficiency: 100%
Cooling system	2x Reversible Air / Water Heat pump (AWHP)_ Model: nyg-1000-1800-HP - Cooling capacity:30 ton (480 kW) - Cooling efficiency: EER 9.95 - Maximum operating temperature in summer = 114.8 F (46 C)
Domestic water heater	Electric DHW heater - Thermal efficiency: 95%
Pump	ASWH- Hot water loop - 349 gpm ASWH- Chilled water loop - 326 gpm
HVAC service area	AWHP integrated with ERV: - Residential suites, - Commercial suites, - Amenity spaces, - Entrance lobbies, MAU integrated with AWHP: - Corridors, EBB with separated air ventilation system: - Service rooms (mechanical/ recycle/ loading), - Stairs.

2. RESULT

2.1. SIMULATION OUTPUT

Table 3: Energy performance of the designed scenario

End use group	Interior Lighting	Exterior Lighting	Receptacle Equipment	Elevators	Space Heating	Service Water Heating	Space Cooling	Heat Rejection	Interior Central Fans	Interior Local Fans	Pumps
Energy use intensity (kWh/m^2)	17.14	0.52	15.03	1.51	15.28	34.14	1.74	1.33	7.29	3.37	0.88
% of total energy use	17	1	15	2	16	35	2	1	7	3	1
Annual Energy Performance											
Annual energy use			GJ	8695.1							
Annual carbon emission			Tonne	28.1							
Annual heating demand intensity			(kWh/m^2)	38.5							
Annual cooling demand intensity			(kWh/m^2)	14.8							

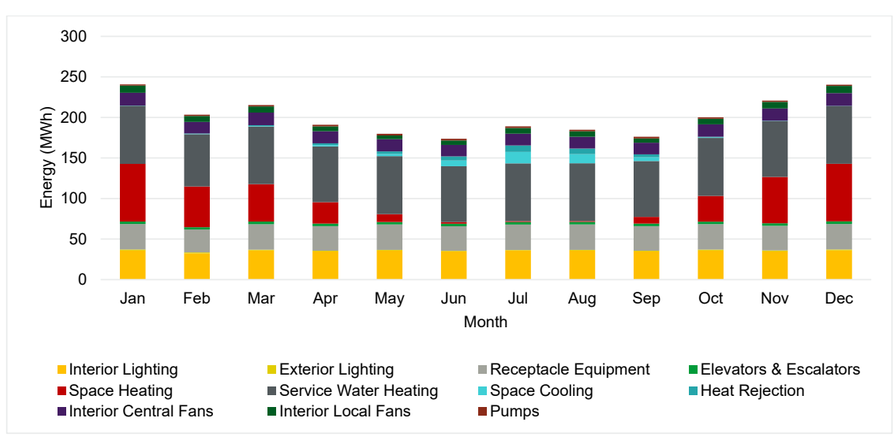


Figure 1: Monthly energy use of end-use group

2.2. TEUI/TEDI ADJUSTMENT CALCULATION

Per COVEMG, projects that provide additional airflow to corridors above the minimum required by code may subtract an adjustment value from the modelled TEUI, TEDI, and GHGI when demonstrating compliance with the performance limits. 600 Kingsway Towers have provided corridor pressurization, and the below calculation shows the possibility of utilizing the credit if needed.

$$TEDI\ Adjustment = \frac{HDD \times \left((0.029 \times \#Suites \times (L/s/door)) - (0.0073 \times Corridor\ Area)\right)}{MFA}$$

$$TEUI\ Adjustment = TEDI\ Adjustment$$

TEDI Adjustment = $\frac{2768 \times ((0.029 \times 315 \times 11.8) - (0.0073 \times 1753))}{24591}$ = 12.1 ~ (max usable is 10)

HDD = 2768

2.3. COMPLIANCE RESULTS

Table 4: Summary of energy performance

Metrics	City requirement	Design without adjustment value	Design with adjustment value	Result
Thermal Energy Demand Intensity (kWh/m2)	29	38.5	28.5	Complies
Total Energy Use Intensity (kWh/m2)	120	98.2	90.5	Complies
Green House Gas Intensity (kgCO2/m2)	3	1.1	1	Complies

8.8 TDM-TAMs

TRANSPORTATION PLANNERS AND ENGINEERS

bunt &associates

MEMO

DATE: August 13, 2024
PROJECT NO: 04-24-0144
PROJECT: 600 Kingsway
SUBJECT: Transportation Review

TO: Aik Ablimit
Perkins+Will

PREPARED BY: Roxana Sorkhi, EIT
REVIEWED BY: Christephen Cheng, P.Eng.
APPROVED BY: Christephen Cheng, P.Eng.

PROFESSIONAL ENGINEER
2024-08-13

1. INTRODUCTION

Bunt & Associates Engineering Ltd. (Bunt) has completed a Transportation Review for the proposed mixed-use redevelopment at 600 Kingsway in Vancouver, BC. The purpose of this study, supplied as supplementary information for the site's rezoning application, is to provide an overview of the key transportation considerations of the development.

The following review includes: (1) a high-level traffic impact analysis which presents the estimated future site traffic for the development and discusses the anticipated traffic impact, (2) a review of the project's Transportation Demand Management (TDM) Plan requirements, (3) a comprehensive summary of the project's parking requirements concerning vehicle, bicycle, loading, and passenger spaces, in the context of the City of Vancouver Parking Bylaw, (4) a rationale for the loading space variance sought for this project and (5) a review of the proposed site design, focusing on vehicle access, parking layout and circulation, loading, and waste collection.

2. DEVELOPMENT PLAN

Bonnis Properties Inc. (Bonnis) is proposing to develop the 600-block of Kingsway, at the southwest corner of Kingsway & Fraser Street, into a mixed-use development featuring two residential towers with market and below-market rental units and ground-floor retail. The project would include approximately 327 dwelling units and approximately 19,962 square feet of ground-floor retail. The site is located adjacent to the Frequent Transit Network (FTN) along Kingsway and Fraser Street.

1075 W Georgia St #2200,

Vancouver, BC V6E 3C9

Perkins&Will