

DRAFT Development Permit & Development Variance Permit DP20-0011 / DVP20-0013



This permit relates to land in the City of Kelowna municipally known as

Leon Ave 234-278 and Water St 1620-1660

and legally known as

- Lot 4, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 266 Leon Ave, Kelowna, BC;
- Lot 5, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 264 Leon Ave, Kelowna, BC;
- Lot A, District Lot 139, Osoyoos Division Yale District, Plan 22722 located at 1660 Water St, Kelowna, BC;
- North ½ Lot 2, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 1630 Water St, Kelowna, BC;
- South ½ Lot 2, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 1630 Water St, Kelowna, BC;
- North ½ Lot 1, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 1620 Water St, Kelowna, BC;
- South ½ Lot 1, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 1620 Water St, Kelowna, BC;
- Lot 3, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 278 Leon Ave, Kelowna, BC;
- Lot 6, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 248 Leon Ave, Kelowna, BC;
- Lot 7, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 238 Leon Ave, Kelowna, BC; and
- Lot 8, Block 10, District Lot 139, Osoyoos Division Yale District, Plan 462 located at 234-236 Leon Ave, Kelowna, BC;

and permits the land to be used for an apartment building as described in Schedule 'A', 'B', and 'C'.

The present owner and any subsequent owner of the above described land must comply with any attached terms and conditions.

<u>Date of Council Decision</u>	January 12, 2021
<u>Decision By:</u>	COUNCIL
<u>Development Permit Area:</u>	Comprehensive
<u>Existing Zone:</u>	C7 – Central Business Commercial
<u>Future Land Use Designation:</u>	MXR – Mixed Use (Residential / Commercial)

This is NOT a Building Permit.

In addition to your Development Permit, a Building Permit may be required prior to any work commencing. For further information, contact the City of Kelowna, Development Services Branch.

NOTICE

This permit does not relieve the owner or the owner's authorized agent from full compliance with the requirements of any federal, provincial or other municipal legislation, or the terms and conditions of any easement, covenant, building scheme or agreement affecting the building or land.

Owner: 1157695 B.C. LTD., INC.NO. BC1157695
Applicant: Anthony Beyrouiti
Planner: AC

Terry Barton
Community Planning Department Manager
Planning & Development Services

Date

1. SCOPE OF APPROVAL

This Development Permit applies to and only to those lands within the Municipality as described above, and any and all buildings, structures and other development thereon.

This Development Permit is issued subject to compliance with all of the Bylaws of the Municipality applicable thereto, except as specifically varied or supplemented by this permit, noted in the Terms and Conditions below.

The issuance of a permit limits the permit holder to be in strict compliance with regulations of the Zoning Bylaw and all other Bylaws unless specific variances have been authorized by the Development Permit. No implied variances from bylaw provisions shall be granted by virtue of drawing notations that are inconsistent with bylaw provisions and that may not have been identified as required Variances by the applicant or Municipal staff.

2. CONDITIONS OF APPROVAL

- a) The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
- b) The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
- c) That a Building Permit is not issued until the rear lane has a public statutory right-of-way registered on the northern 0.8 metres of the lot.
- d) That the Development Permit is not issued until the City and the applicant has resolved the proposed air space parcel accommodating the bridge across Leon Avenue.
- e) That a Building Permit is not issued until the modified compact stalls are labelled and signed as "small vehicle parking only".

AND THAT the variances to the following sections of Zoning Bylaw No. 8000 be granted, as shown on Schedule "A, B, & C":

Section 14.7.5 (b) – C7 – Central Business Commercial - Development Regulations

To vary the maximum height from 76.5 metres (approx. 26 storeys) to 80 metres for Tower 'A' (24 storeys), 135 metres for Tower 'B' (42 storeys), and 92 metres for Tower 'C' (28 storeys).

Section 8 – Parking and Loading - Table 8.2.7 (b) Ratio of Parking Space Sizes

To vary the maximum small vehicle stall size from 0.0% to 3.3% (24 stalls).

Section 8 – Parking and Loading - Table 8.5 Minimum Bicycle Parking Required

To vary the minimum amount of short-term bicycle parking stalls from 122 stalls to 28 stalls.

This Development Permit and Development Variance Permit is valid for two (2) years from the date of approval, with no opportunity to extend.

3. PERFORMANCE SECURITY

As a condition of the issuance of this Permit, Council is holding the security set out below to ensure that development is carried out in accordance with the terms and conditions of this Permit. Should any interest be earned upon the security, it shall accrue to the Developer and be paid to the Developer or his or her designate if the security is returned. The condition of the posting of the security is that should the Developer fail to carry out the development hereby authorized, according to the terms and conditions of this Permit within the time provided, the Municipality may enter into an agreement with the property owner of the day to have the work carried out, and any surplus shall be paid over to the property owner of the day. Should the Developer carry out the development permitted by this Permit within the time set out above, the security shall be returned to the Developer or his or her designate. There is filed accordingly:

- a) An Irrevocable Letter of Credit **OR** certified cheque in the amount of **\$n/a**

Before any bond or security required under this Permit is reduced or released, the Developer will provide the City with a statutory declaration certifying that all labour, material, workers' compensation and other taxes and costs have been paid.

5. INDEMNIFICATION

Upon commencement of the works authorized by this Permit the Developer covenants and agrees to save harmless and effectually indemnify the Municipality against:

- a) All actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and by whomsoever brought, by reason of the Municipality said Permit.

All costs, expenses, claims that may be incurred by the Municipality where the construction, engineering or other types of works as called for by the Permit results in damages to any property owned in whole or in part by the Municipality or which the Municipality by duty or custom is obliged, directly or indirectly in any way or to any degree, to construct, repair, or maintain.

**The PERMIT HOLDER is the CURRENT LAND OWNER.
Security shall ONLY be returned to the signatory of the
Landscape Agreement or their designates.**



WATER STREET BY THE PARK

Client: Anthony Beyrouiti

Project No. 10141492

Project Address : 234-278 Leon Ave & 1620-1630 Water st,
Kelowna, BC

DEVELOPMENT PERMIT

Issue Date: 20/12/2019

SCHEDULE

This forms part of application

DP20-011 / DVP20-0013

Planner Initials

AC

A & B

City of Kelowna

DEVELOPMENT PLANNING

ARCHITECTURE DRAWINGS LIST	
A01	SITE ANALYSIS
A02	CONTEXT PHOTOS
A03	CONTEXT PHOTOS
A04	CONTEXT PHOTOS
A05	SITE ANALYSIS
A06	FUTURE DEVELOPMENT
A07	EXISTING DEVELOPMENT
A08	SITE PLAN
A09	SITE SURVEY
A10	PLAN - UNDERGROUND PARKING P0
A11	PLAN - MAIN FLOOR CRU + PARKING P1
A12	PLAN - MAIN FLOOR CRU + PARKING P1
A13	PLAN - SECOND FLOOR + PARKING P2
A14	PLAN - SECOND FLOOR + PARKING P2
A15	PLAN - THIRD FLOOR + PARKING P3
A16	PLAN - THIRD FLOOR + PARKING P3
A17	PLAN - FOURTH FLOOR + PARKING P4
A18	PLAN - FOURTH FLOOR + PARKING P4
A19	PLAN - FIFTH FLOOR + PARKING P5
A20	PLAN - FIFTH FLOOR + PARKING P5
A21	PLAN - SIXTH FLOOR - RESIDENTIAL AMENITY R1
A22	PLAN - SIXTH FLOOR - RESIDENTIAL AMENITY
A23	PLAN - SEVENTH FLOOR - RESIDENTIAL LIVING R2
A24	PLAN - SEVENTH FLOOR TOWER A - RESIDENTIAL R2A
A25	PLAN - SEVENTH FLOOR TOWER B - RESIDENTIAL R2B
A25.1	PLAN - TWENTY-NINTH FLOOR TOWER B - RESIDENTIAL R2B
A26	PLAN - SEVENTH FLOOR TOWER C - R2
A26.1	PLAN - PENTHOUSE FLOOR TOWER A + B - RESIDENTIAL R2A
A27	ELEVATIONS
A28	ELEVATIONS
A29	ELEVATIONS
A30	SECTION
A31	FUTURE CONTEXT
A32	SOLAR ANALYSIS
A33	SHADOW ANALYSIS
A34	MATERIALS & FINISHES
A35	PERSPECTIVE
A36	PERSPECTIVE

LANDSCAPE DRAWINGS LIST	
L1/4	CONCEPTUAL LANDSCAPE PLAN
L2/4	WATER CONSERVATION/IRRIGATION PLAN
L3/4	OFFSITE LANDSCAPE PLAN
L4/4	OFFSITE IRRIGATION PLAN

PROJECT DATA AND ZONING BYLAW SUMMARY			
SITE	LEGAL DESCRIPTION	CIVIC ADDRESS	ZONING
PROJECT LOT	LOTS 1-8, BLOCK 10, PLAN 462 & LOT A, PLAN 22722	234 - 278 LEON AVE & 1620-1630 WATER ST, KELOWNA, BC	C7 - CENTRAL BUSINESS COMMERCIAL
LOT AREA	4,567.4sm (49,163 SF) / 1,148.8 sm (12366 SF)		
PROJECT DESCRIPTION:		BICYCLE PARKING:	
CONSTRUCTION OF A MIXED USE DEVELOPMENT WITH RESIDENTIAL, COMMERCIAL AND PARKING COMPONENTS		PROPOSED: LONG TERM = 566 SHORT TERM = 28	
SITE AREA:		REQUIRED: LONG TERM: 0.75 PER 2 BEDROOM OR LESS + 1.0 PER 3 BEDROOM OR MORE + 1 PER 500sm GFA (COMMERCIAL) SHORT TERM: 6 PER ENTRANCE + 1/5 OVER 70 UNITS + 2 PER ENTRANCE (COMMERCIAL)	
49163SF + 12366SF ≈ 61529SF TOTAL			
MAX BUILDING HEIGHT:		SETBACKS:	
PROPOSED: APPROX. 134.72m (442'-0")		ALLOWABLE:	
ALLOWABLE: 76.5m (250'-11 3/4")		PROPOSED	
DIFFERENCE: 58.2m (191'-0")		0 TO 16m:	
PARKING:		MINIMUM FRONT YARD: 0.0m	
PROPOSED: 727 PARKING STALLS		MINIMUM SIDE YARD: 0.0m	
REQUIRED: RESIDENTIAL: 0.9 PER 1 BR UNIT, 1.0 PER 2-3 BR UNIT, 0.14 PER UNIT AS VISITOR, COMMERCIAL: 0.9 PER 100 SM GFA		MINIMUM REAR YARD: 0.0m	
		FIRST STOREY ONLY, TRIANGULAR SETBACK (SEE FIGURE 1): 4.5m	
		MAXIMUM FLOOR PLATE 4.5m	
		N/A 0000	
		16m AND ABOVE:	
		MINIMUM FROM ABUTTING STREET: 3.0m	
		MINIMUM FROM ANY PROPERTY LINE 4.0m	
		ABUTTING ANOTHER PROPERTY: 4.0m	
		MAXIMUM FLOOR PLATE (PER TOWER): 1,221sm	
		696sm	

Figure 1

DEVELOPMENT PERMIT - REVISED

Issue Date: 10/16/2020



- 1

PROPOSED MIXED USE DEVELOPMENT
- 2

DOWNTOWN MARINA
- 7

LEON AVE & SERVICE ROAD
LOOKING EAST
- 3

KELOWNA CITY HALL
- 4

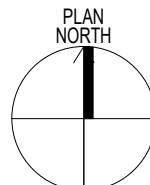
KELOWNA CITY PARK
- 8

WATER ST LOOKING NORTH
- 5

OKANAGAN LAKE
- 6

LEON & WATER
INTERSECTION
- 9

LEON AVE LOOKING
SOUTH



SCHEDULE

A & B

This forms part of application

DP20-011 / DVP20-0013

Planner

Initials

AC

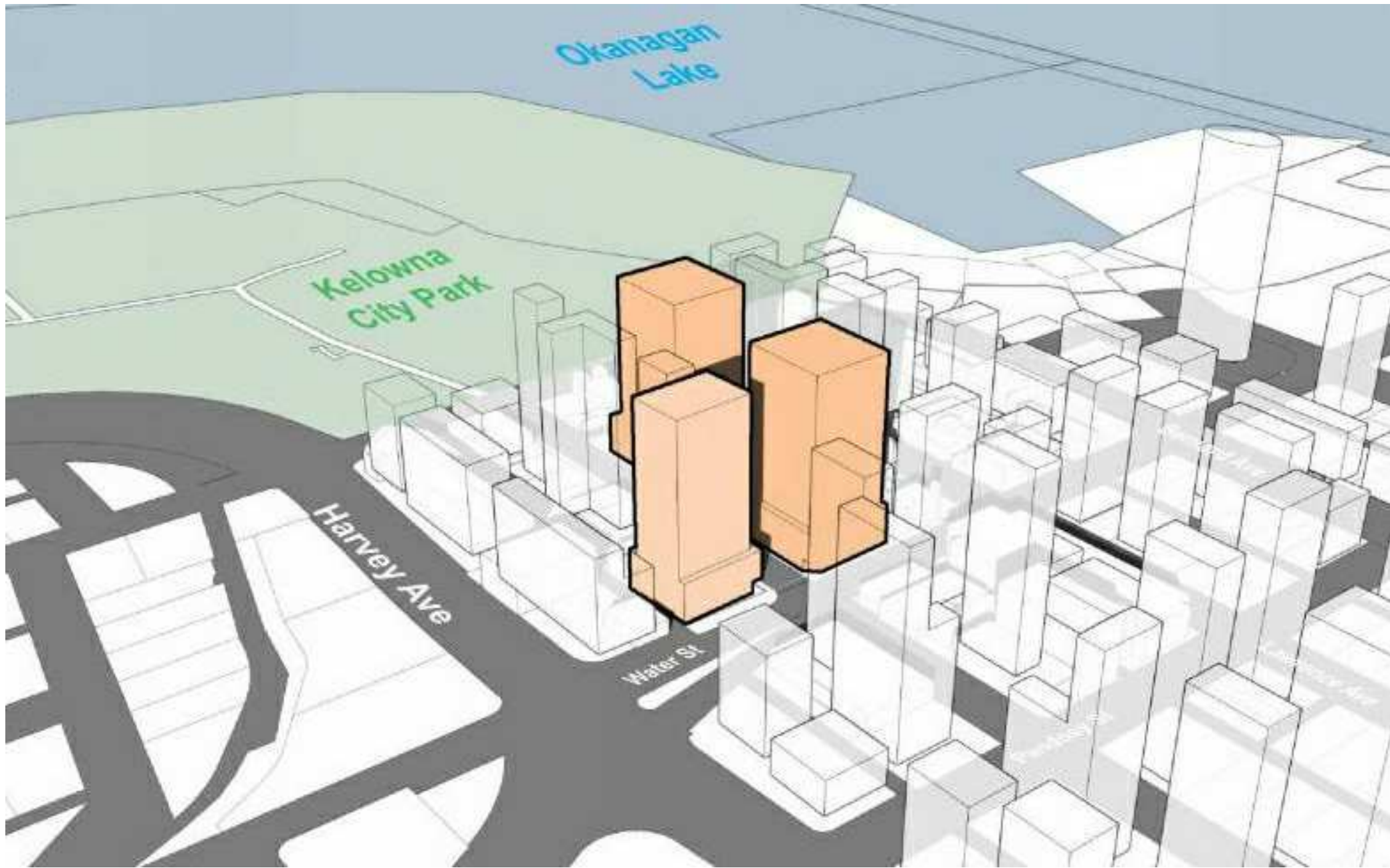
City of

Kelowna

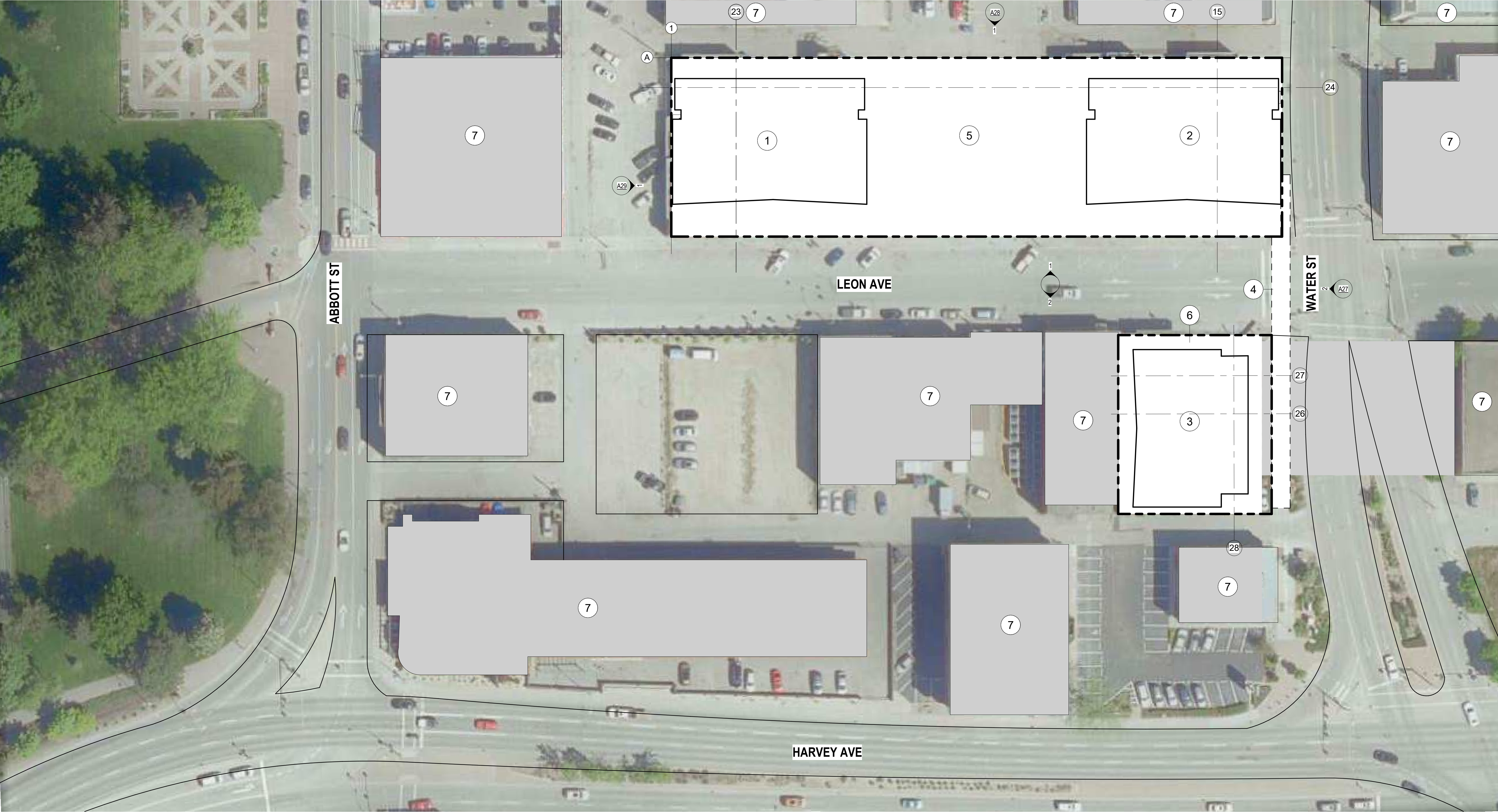
DEVELOPMENT PLANNING



ALLOWABLE ZONING



FUTURE ZONING



- | | | |
|--|--|---------------------------------|
| ① PROPOSED TOWER A (24 STOREYS)
(18 STOREYS MARKET RESIDENTIAL) | ③ PROPOSED TOWER C (28 STOREYS)
(22 STOREYS MARKET RESIDENTIAL) | ⑤ PROPOSED PODIUM (TOWER A & B) |
| ② PROPOSED TOWER B (42 STOREYS)
(36 STOREYS MARKET RESIDENTIAL) | ④ PROPOSED CROSS OVER BRIDGE | ⑥ PROPOSED PODIUM (TOWER C) |



1 - VIEW FROM BRIDGE / VIEW FROM NORTH OF WATER STREET



2 - VIEW FROM EAST HARVEY AVE



3 - VIEW LOOKING SOUTH ALONG WATER ST



4 - VIEW FROM NORTH OF OKANAGAN LAKE / VIEW FROM SOUTH OF WATER ST



5 - VIEW FROM WEST OF OKANAGAN LAKE



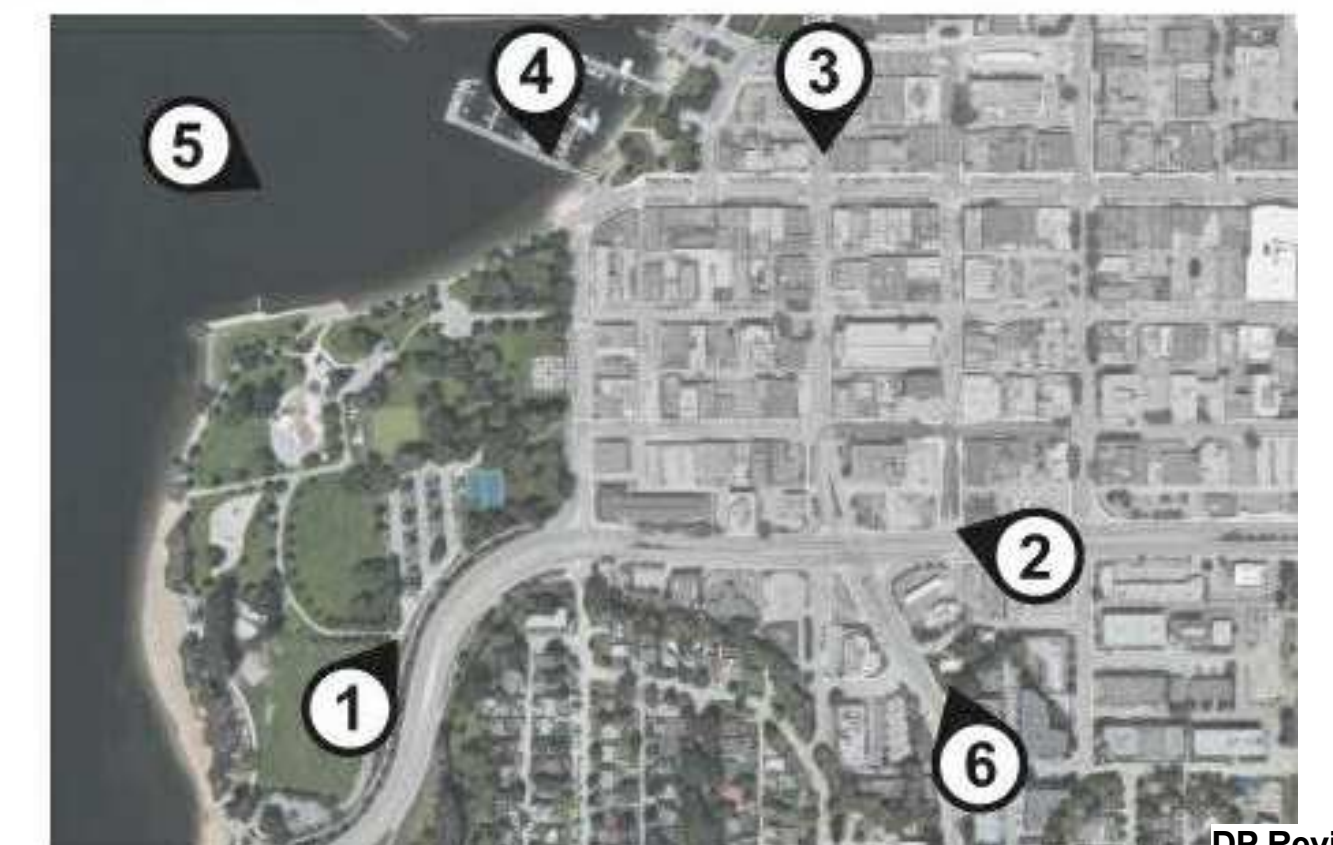
6 - VIEW LOOKING NORTH ALONG PANDOSY ST

SCHEDULE A & B

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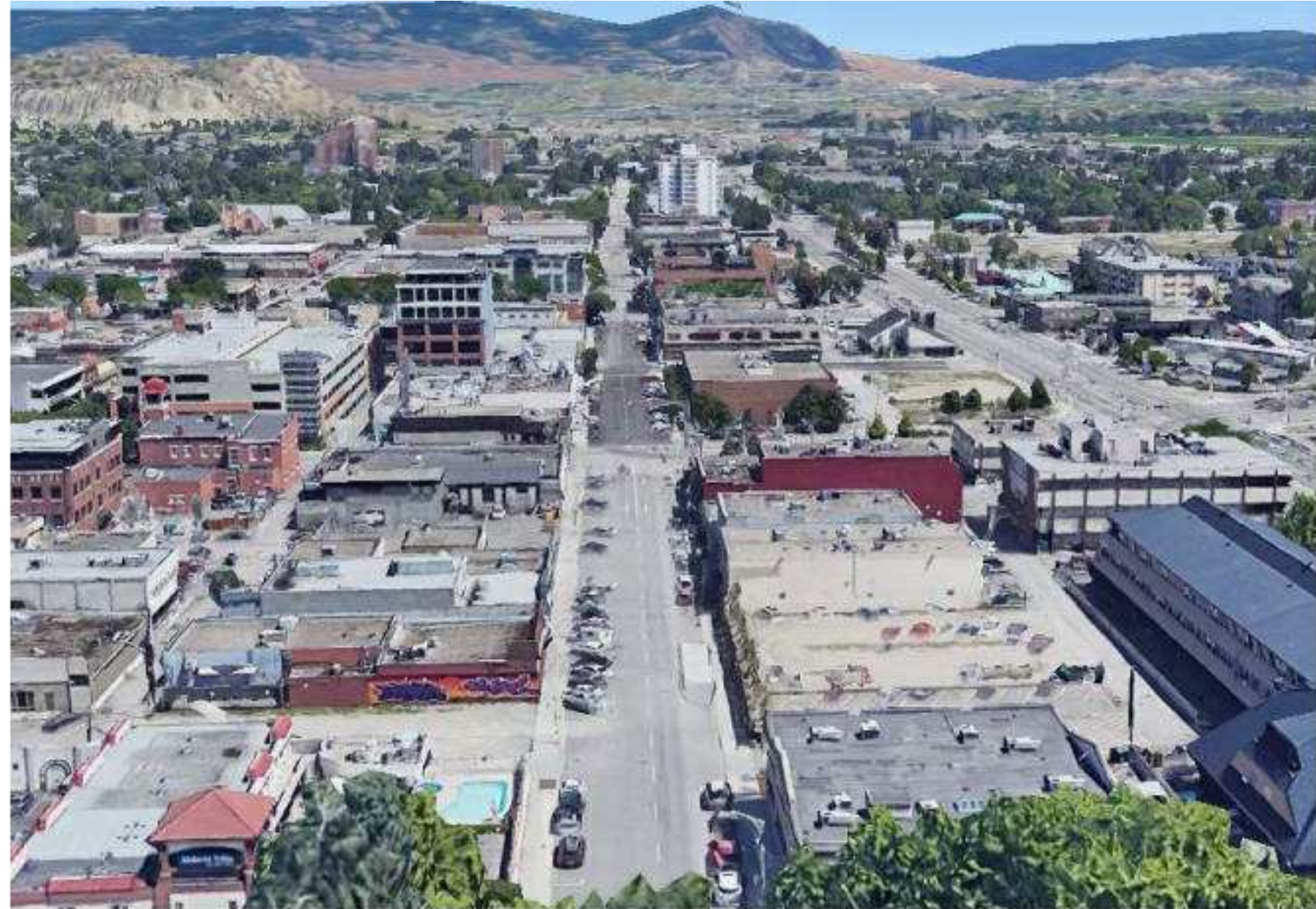
City of Kelowna
DEVELOPMENT PLANNING



DP Revised 10/16/2020
Development Permit 20/12/2019



1 - VIEW FROM SOUTH WEST LEON AVE / VIEW FROM EAST LEON AVE



2 - VIEW FROM EAST LEON AVE / VIEW FROM CITY PARK TOWARDS LEON AVE



3 - VIEW FROM NORTH WEST WATER ST / VIEW FROM WEST WATER ST



4 - VIEW FROM SOUTH WEST WATER ST / VIEW FROM WATER ST AT SOUTH TOWER



5 - VIEW FROM CITY PARK

SCHEDULE

A & B

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DP20-011 / DVP20-0013

Planner
Initials

AC

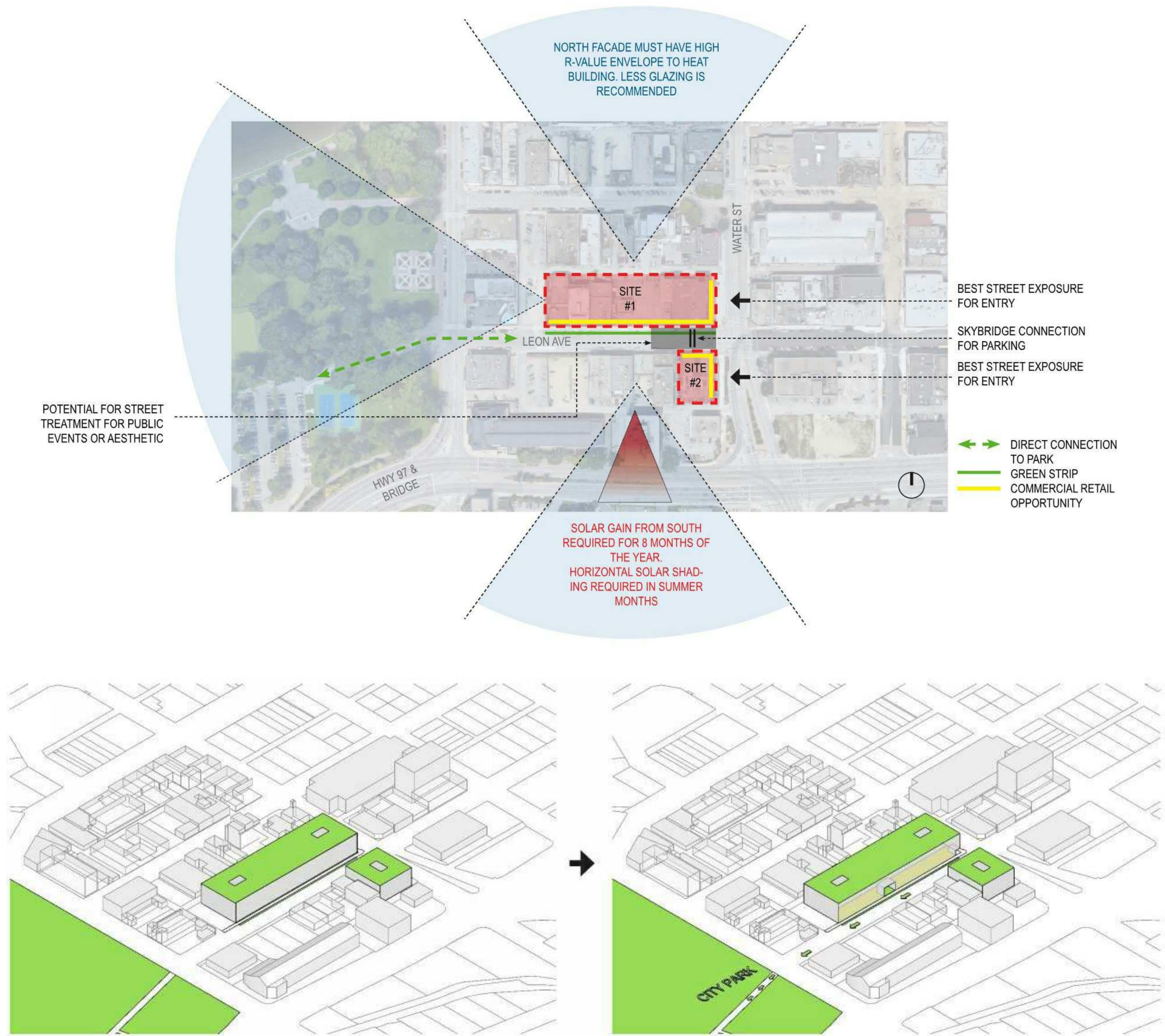


City of
Kelowna
DEVELOPMENT PLANNING



DP Revised 10/16/2020
Development Permit 20/12/2019





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City of Kelowna
DEVELOPMENT PLANNING

PROVIDING **AMENITIES** ON TOP OF THE PODIUM PROVIDES OUTDOOR SPACE FOR USERS OF THE BUILDING. BY BRINGING THE GROUND PLANE UP, IT TAKES ADVANTAGE OF PARK AND MOUNTAIN VIEWS.

PROVIDING **COMMERCIAL RETAIL UNITS** AND A **GREEN STRIP** ALONG SIDEWALK INVITES PUBLIC FROM CITY PARK TO THE SITE.



One Water Street - 36 & 29 Storeys



Westcorp - 33 Storeys



Brooklyn - 25 Storeys



Ella - 20 Storeys



Prospera Towers - 37 & 27 Storeys

SCHEDULE A & B
 This forms part of application
 # DP20-011 / DVP20-0013
 City of Kelowna
 DEVELOPMENT PLANNING
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DP Revised 10/16/2020
 Development Permit 20/12/2019



Landmark VI - 17 Storeys



Skye - 26 Storeys



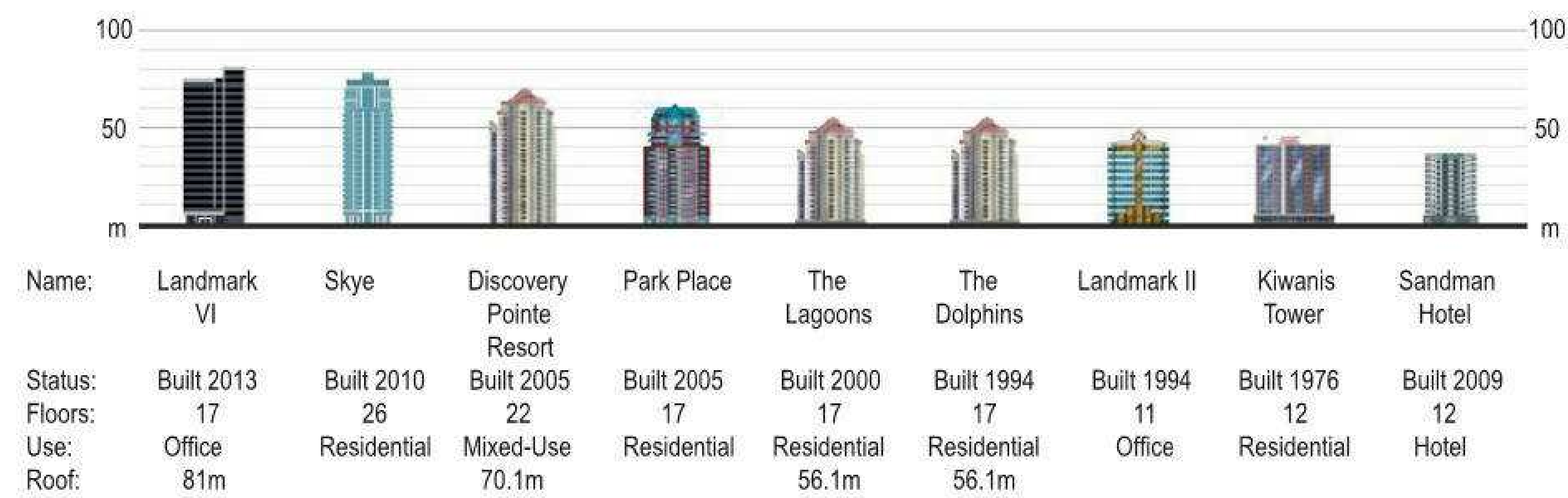
Discovery Point Resort - 22 Storeys



Park Place - 17 Storeys



Sopa Square - 14 Storeys



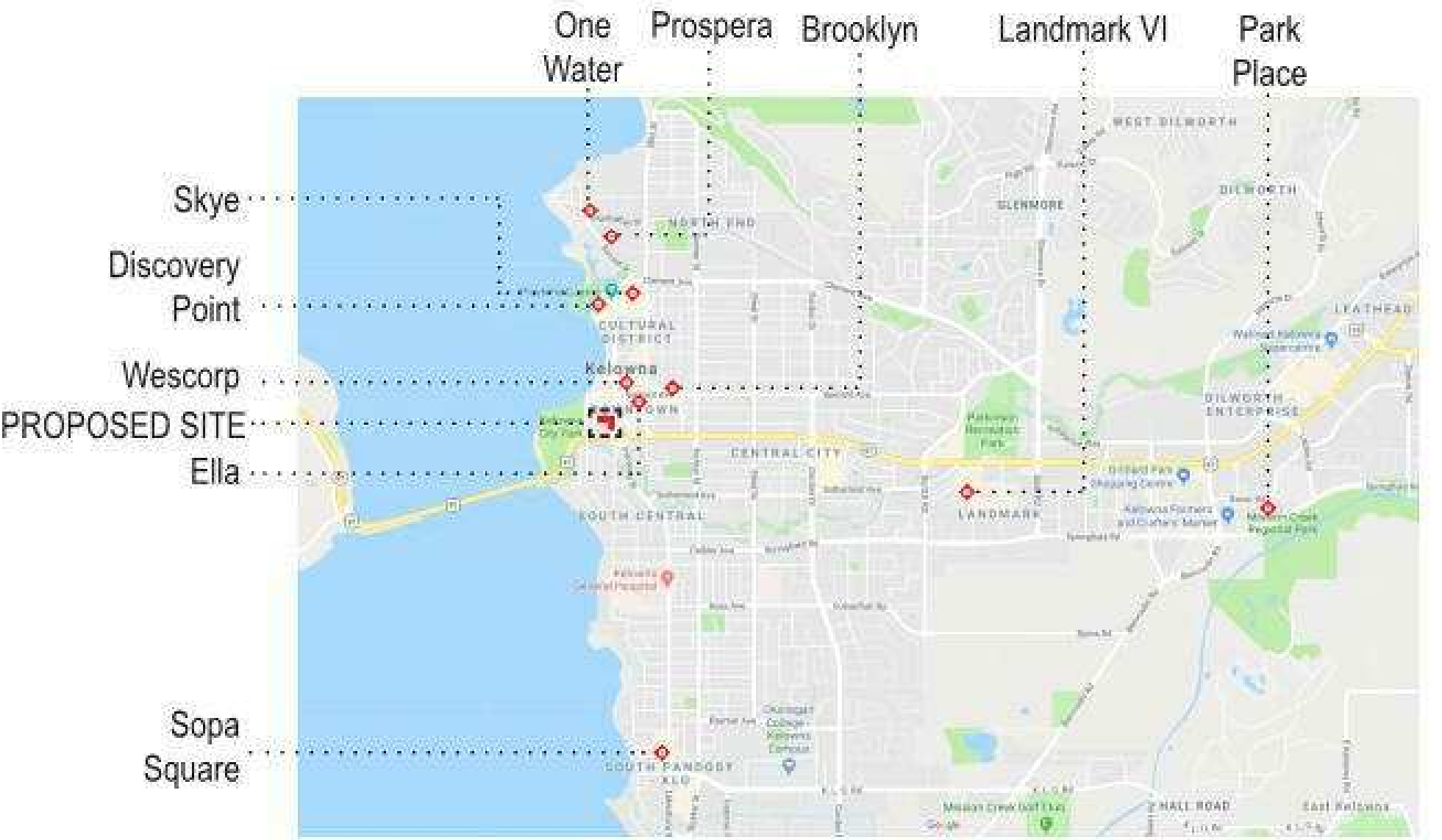
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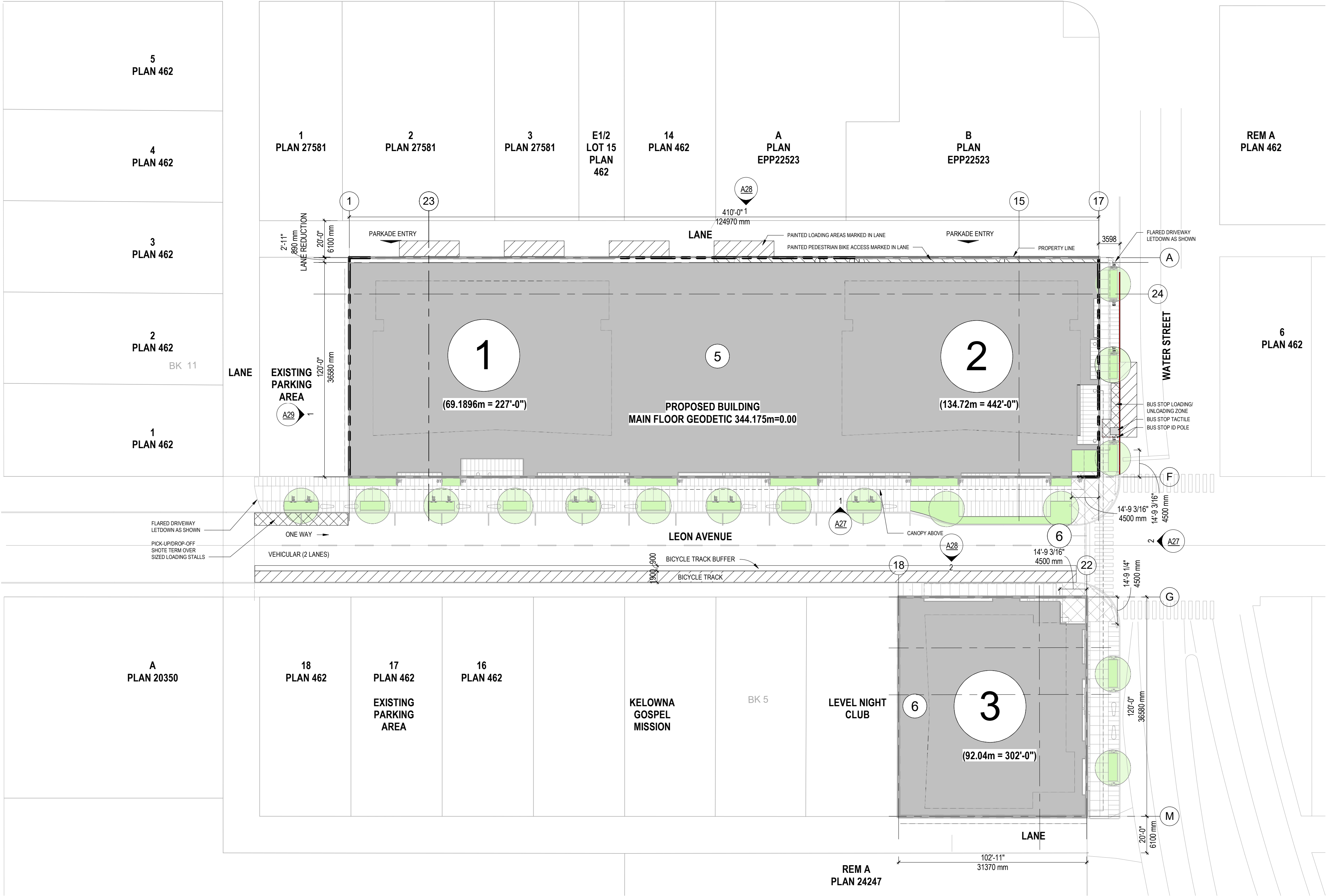
A & B

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City of Kelowna
DEVELOPMENT PLANNING





ZONING BYLAW SUMMARY			
SITE	LEGAL DESCRIPTION	CIVIC ADDRESS	ZONING
PROJECT LOT	LOTS 1-8, BLOCK 10, PLAN 462 & LOT A, PLAN 22722	234 - 278 LEON AVE & 1620-1630 WATER ST, KELOWNA, BC	C7 - CENTRAL BUSINESS COMMERCIAL
LOT AREA	4,567.4 sm (49,163.1 SF) / 1,148.8 sm (12,365.6 SF)		

ZONING ANALYSIS TABLE		
CRITERIA	C7 ZONE REQUIREMENTS	PROPOSAL
DEVELOPMENT REGULATIONS		
	PRINCIPLE BLDGS	PRINCIPLE BLDGS
HEIGHT	76.5m (250'-11 3/4')	TOWER A = 79.9m (262'-0") = 3.4m VARIANCE TOWER B = 134.7m (442'-0") = 58.2m VARIANCE TOWER C = 92.04m (302'-0") = 15.54m VARIANCE
FRONT YARD	0 m	0 m
FRONT YARD	0 m	0 m
SIDE YARD	0 m	0 m
SETBACKS FOR PORTIONS OF HEIGHT >16 m ABUTTING A STREET	3m	3 m
SETBACK FOR PORTIONS OF HEIGHT >16 m ABUTTING A PROPERTY	4 m	4 m
SITE COVERAGE	N/A	100%
LOT AREA	N/A	5716.2m2 (61529sf)
NET AREA	N/A	51778.4m2 (557338.1sf)
FAR	9.0	9.0
OTHER REGULATIONS		
NUMBER OF RESIDENTIAL UNITS	N/A	650 UNITS
CRU AREA	N/A	4046 m2 (43554 sf)
MINIMUM PARKING REQUIREMENTS	RESIDENTIAL BASE PARKING REQUIRED: 0.9 PER 1 BR UNIT (316 UNITS) = 284 1.0 PER 2 BR OR MORE UNIT (334 UNITS) = 334 0.14 PER UNIT VISITOR (650 UNITS) = 91 SUB-TOTAL RESIDENTIAL REQUIRED = 709 (TOWER 1 = 170, TOWER 2 = 368, TOWER 3 = 171) COMMERCIAL: 0.9 PER 100 SM GFA = 36 STALLS, HOWEVER, THESE STALLS GROUPED WITH VISITOR, THEREFORE NOT ADDED. TOTAL PARKING REQUIRED = 709 STALLS	TOTAL PARKING PROVIDED REGULAR: 352 STALLS @ 6.0m X 2.5m or 6.0m X 2.7m next to columns "REGULAR REDUCED": 35 STALLS @ 5.2m X 2.5m or 5.2m X 2.7m next to columns HC ACCESSIBLE STALLS: 16 STALLS @ 2.5m X 1.5m access X 6.0m 2 STALLS @ 3.3m X 1.5m access X 6.0m SMALL CAR: 298 STALLS @ 4.8m X 2.3m or 4.8m X 2.5m next to columns COMPACT (INCREASED WIDTH): 24 STALLS @ 3.4m X 2.5m TOTAL: 352+35+16+2+298+24 = 727 STALLS 727 STALLS PROVIDED - 709 STALLS REQUIRED = 18 STALLS IN EXCESS
MINIMUM BICYCLE PARKING REQUIREMENTS	LONG TERM RESIDENTIAL : 0.75 PER 2 BEDROOM OR LESS UNITS: 542*0.75 = 407 1.0 PER 3 BEDROOM OR MORE UNITS: 108 LONG TERM COMMERCIAL: 1 PER 500SM GFA = 4046SM/500SM = 8 THEREFORE: 407+108+8 = 523 LONG TERM STALLS REQUIRED SHORT TERM RESIDENTIAL: 6/ENTRY+1/5 UNITS ABOVE 70 = 6*3 = 18 + 650/70 = 9.285=116, THEREFORE 18+116 = 134 SHORT TERM COMMERCIAL: 2/ENTRY (GREATER VALUE THAN 1/750SM) = 2*8 = 16 THEREFORE: 134+16 = 150 SHORT TERM STALLS REQUIRED	LONG TERM BIKE PARKING PROVIDED FLOOR MOUNTED: 199 STALLS (2 PER) = 398 WALL MOUNTED: 84 STALLS (2 PER) = 168 298+168 = 566 LONG TERM STALLS PROVIDED EXCESS LONG TERM BIKE PARKING = 566-523 = 43 SHORTFALL OF 93 WALL MOUNTED FOR 50:50 RATIO SHORT TERM BIKE PARKING PROVIDED FLOOR MOUNTED: 28 SHORTFALL OF 122 SHORT TERM BIKE PARKING
PRIVATE OPEN SPACE	10.0m² / 1BR DWELLING, AND 15.0 m² /2BR+ (10x316)+15(334) = 8170m² TOTAL REQD	16142.83m2 (173760sf)
SHARED AMENITY SPACE	N/A	4493.72m2 (48370sf)
1 - HEIGHT VARIANCE: THE DEVELOPMENT IS 58.2 M HIGHER THAN THE ZONE ALLOWS (76.5 M), HOWEVER THE TOWERS MATCH THE CITY'S VISION FOR THE FUTURE OF THIS ZONE (OCP). THE FAR IS COMPLIANT WITH THE ZONING BYLAW. Tower A 79.9 M (3.4 M variance) Tower B 134.72 M (58.20 M variance) Tower C 92.04 M (15.54 M variance) 2 - PARKING VARIANCE: THE 727 PARKING STALLS PROVIDED MEETS (EXCEEDS) THE REQUIRED 709 STALLS, HOWEVER 24 OF THE STALLS ARE "MODIFIED COMPACT STALLS @ 3.4m x 2.5m", WHICH HAVE BEEN APPROVED FOR USE AS PER DISCUSSIONS WITH COK PLANNING DEPARTMENT. 3 - SHORT TERM BIKE PARKING: THE CALCULATIONS PROVIDED IN THE BYLAW ARE MEANT FOR SMALLER DEVELOPMENTS; THE 150 REQUIRED PER THE CURRENT BYLAW EXCEEDS ANY TEMPORARY USE IN THIS DEVELOPMENT. THUS A SHORTFALL OF 122. LONG TERM BIKE PARKING: RATIO OF WALL MOUNTED BIKE SPACES; SHORTFALL OF 93, HOWEVER, WE HAVE AN EXCESS OF FLOOR MOUNTED LONG TERM STALLS OF 136. TOTAL 566 STALLS PROVIDED (EXCESS OF 43). Tower A (24 storey total / 18 storey market housing) Tower B (42 storey total / 36 storey market housing) Tower C (28 storey total / 22 storey market housing)		

2 01-A-FLOOR PLAN - TOWERS A+B
1:400

- 1

PROPOSED TOWER A (24 STOREYS)
(18 STOREYS MARKET RESIDENTIAL)
- 2

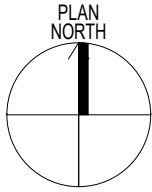
PROPOSED TOWER B (42 STOREYS)
(36 STOREYS MARKET RESIDENTIAL)
- 3

PROPOSED TOWER C (28 STOREYS)
(22 STOREYS MARKET RESIDENTIAL)
- 4

PROPOSED CROSS OVER BRIDGE
- 5

PROPOSED PODIUM (TOWER A & B)
- 6

PROPOSED PODIUM (TOWER C)



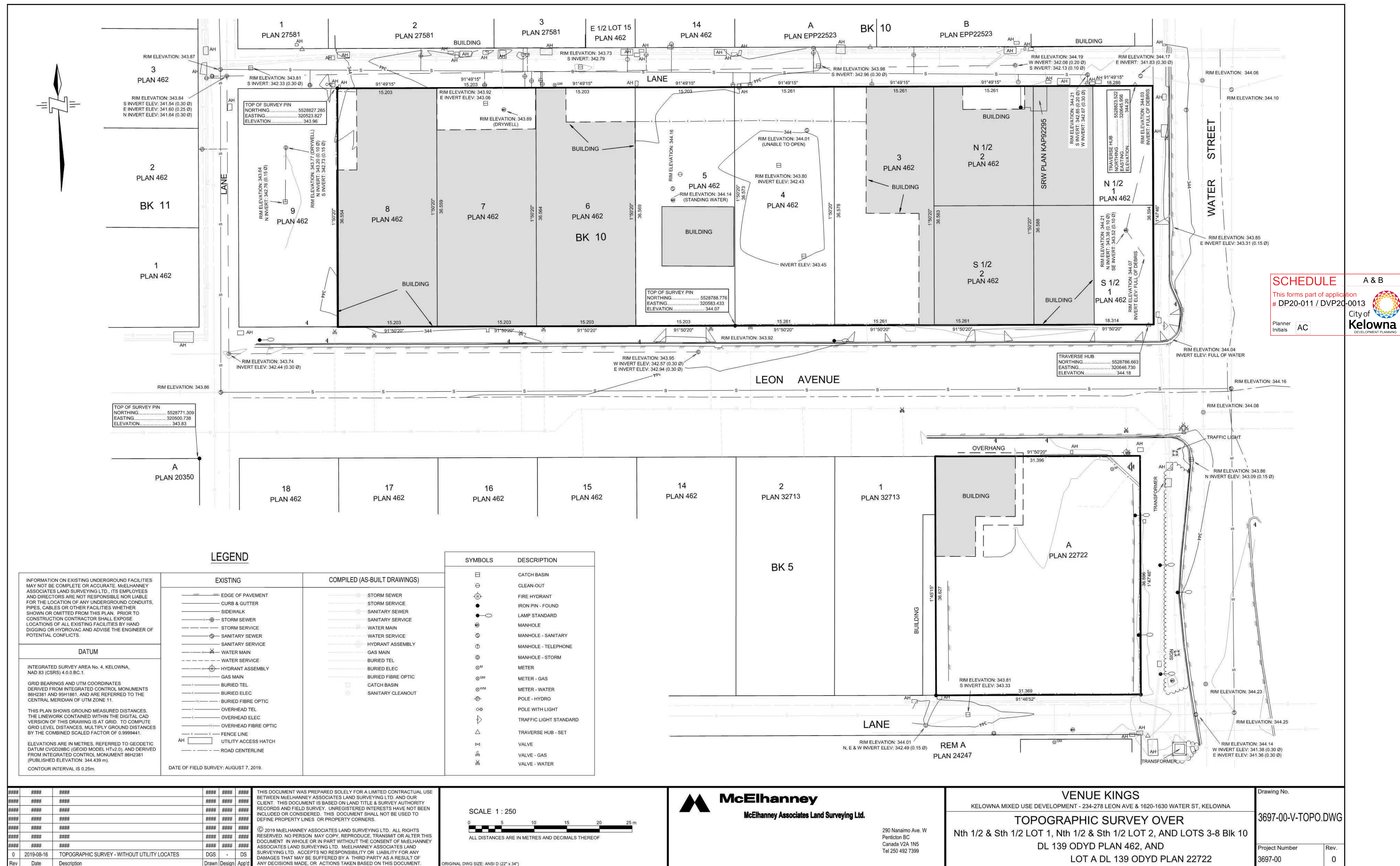
SCHEDULE A & B

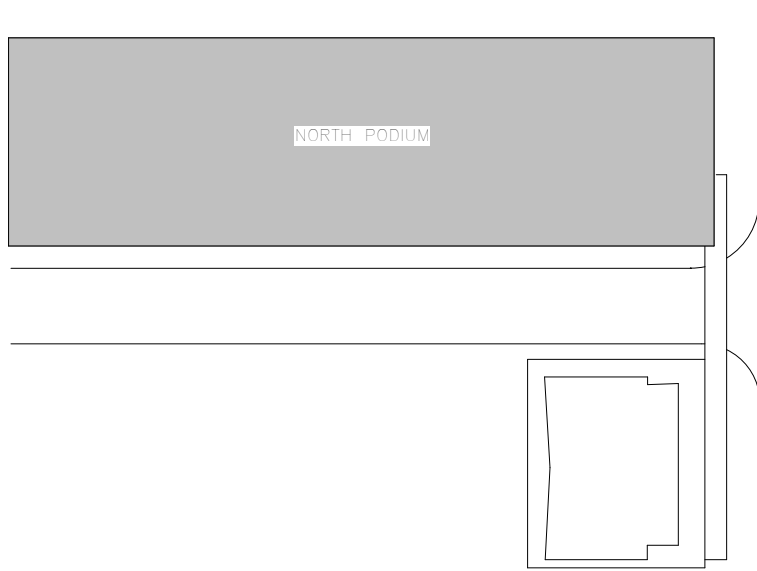
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City of Kelowna
DEVELOPMENT PLANNING







KEY PLAN

OVERALL PARKING SCHEDULE	
PARKING STALL TYPE	COUNT
Compact - 3.4m x 2.5m Wide Compact	24
	24
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	18
	18
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	387
	387
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	298
	298
Grand total: 727	727

PARKING SCHEDULE - LEVEL 0		
PARKING STALL TYPE	LEVEL	COUNT
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 0	2
		2
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 0	77
		77
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 0	66
		66
Grand total: 145		145

SCHEDULE

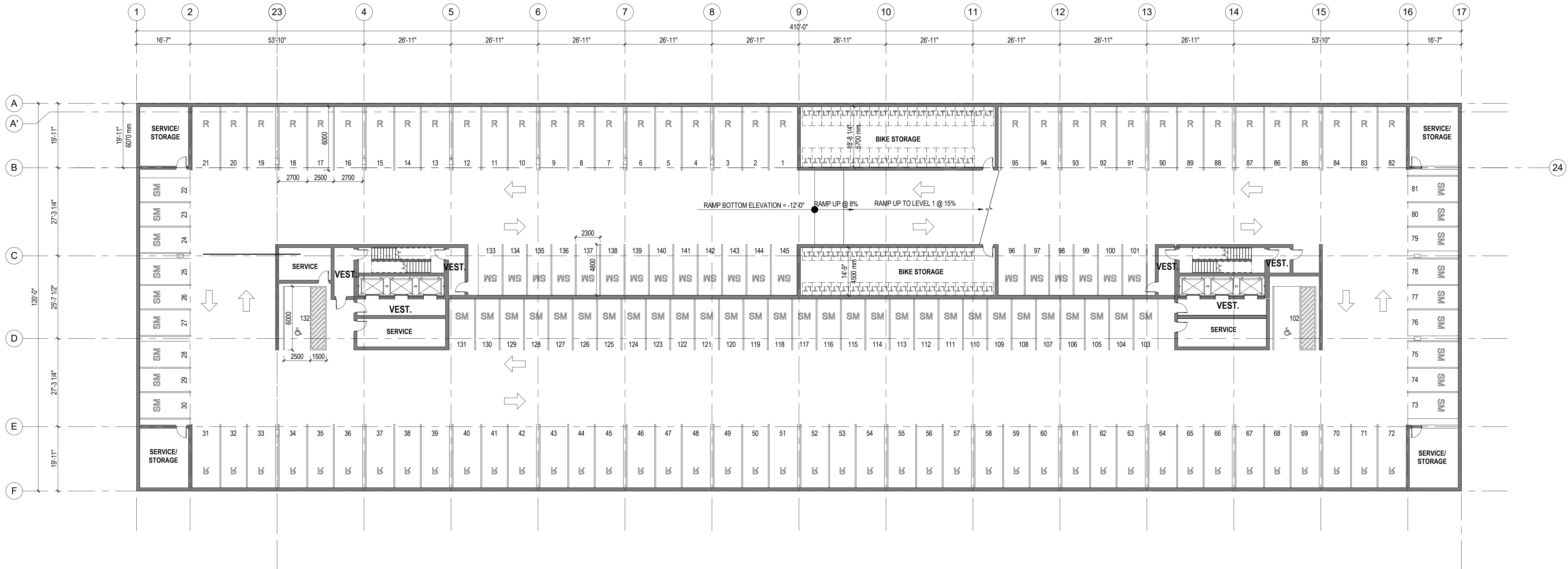
A & B

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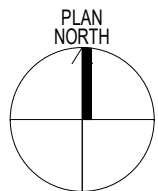
Planner
Initials

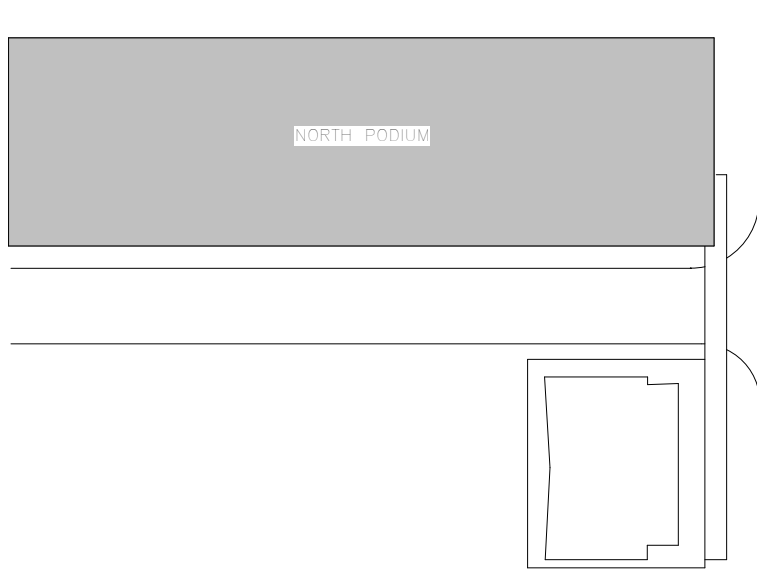
AC

City of
Kelowna
DEVELOPMENT PLANNING



1 00-A-BASEMENT PLAN - TOWERS A+B
1:200





KEY PLAN

PARKING SCHEDULE - LEVEL 1		
PARKING STALL TYPE	LEVEL	COUNT
Compact - 3.4m x 2.5m Wide Compact	LEVEL 1	24
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 1	7
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 1	34
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 1	27
Grand total: 92		92

SCHEDULE A & B

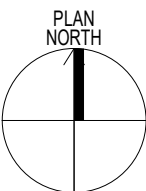
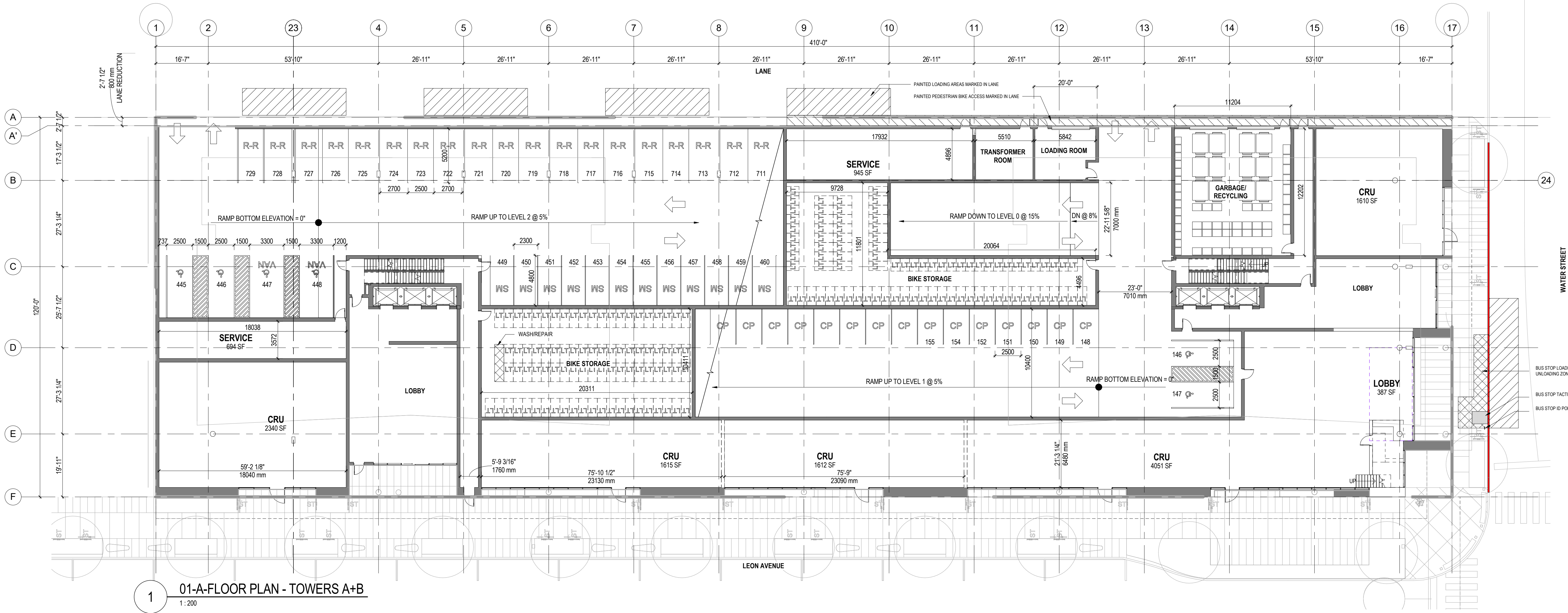
This forms part of application

DP20-011 / DVP20-0013

City of Kelowna

DEVELOPMENT PLANNING

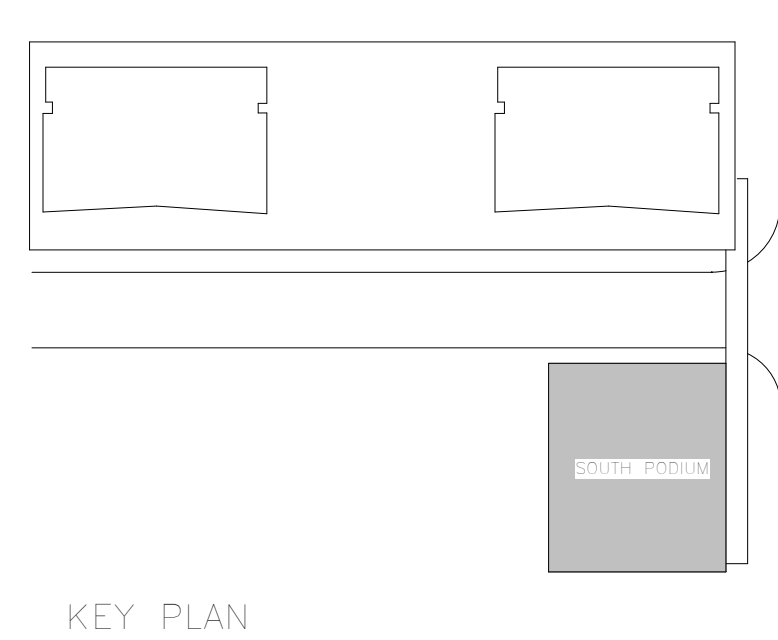
Planner Initials AC



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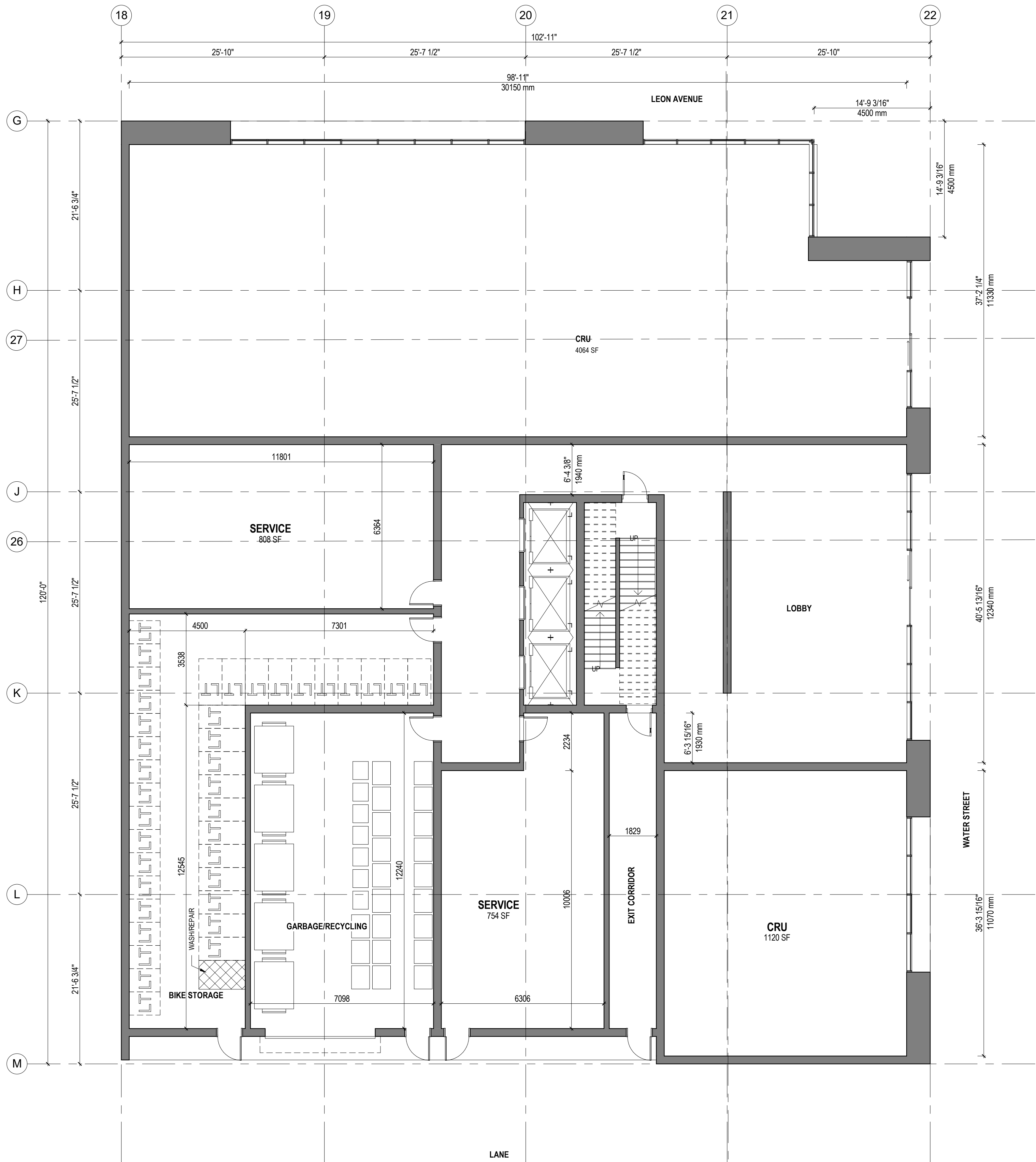


SCHEDULE A & B

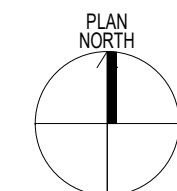
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Planner Initials **AC**

City of Kelowna
DEVELOPMENT PLANNING



1 01-A-FLOOR PLAN - TOWER C
1:100





KEY PLAN

PARKING SCHEDULE - LEVEL 2		
PARKING STALL TYPE	LEVEL	COUNT
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 2	4
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 2	74
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 2	35
Grand total:		113

SCHEDULE

A & B

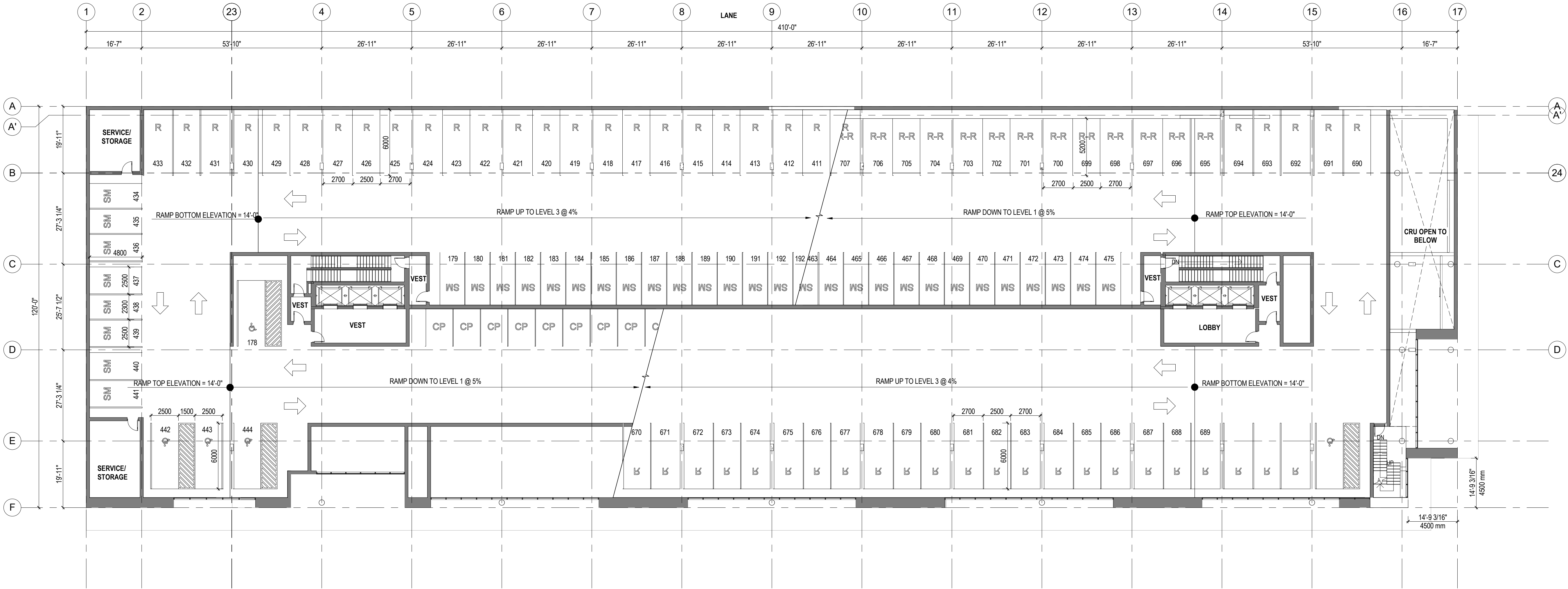
This forms part of application

DP20-011 / DVP20-0013

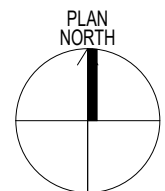
Planner Initials AC

City of Kelowna

DEVELOPMENT PLANNING

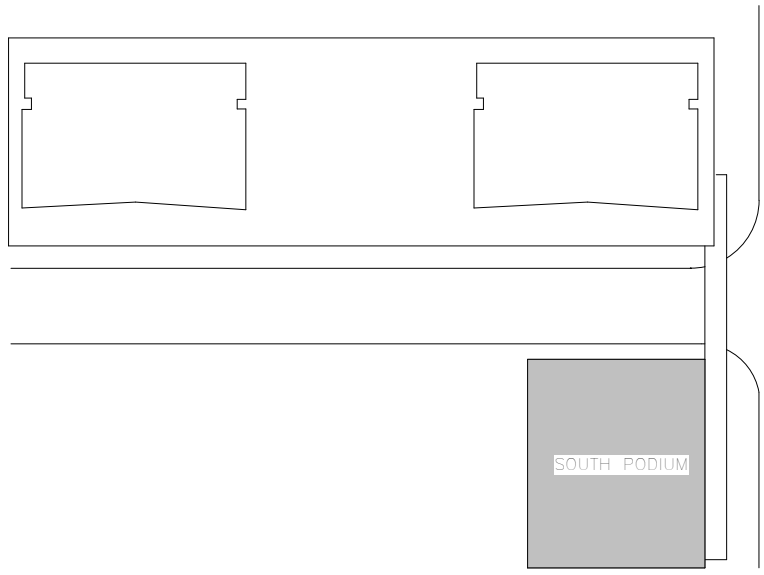


1 02-A-FLOOR PLAN
1:200



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Development Permit 20/12/2019



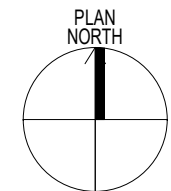
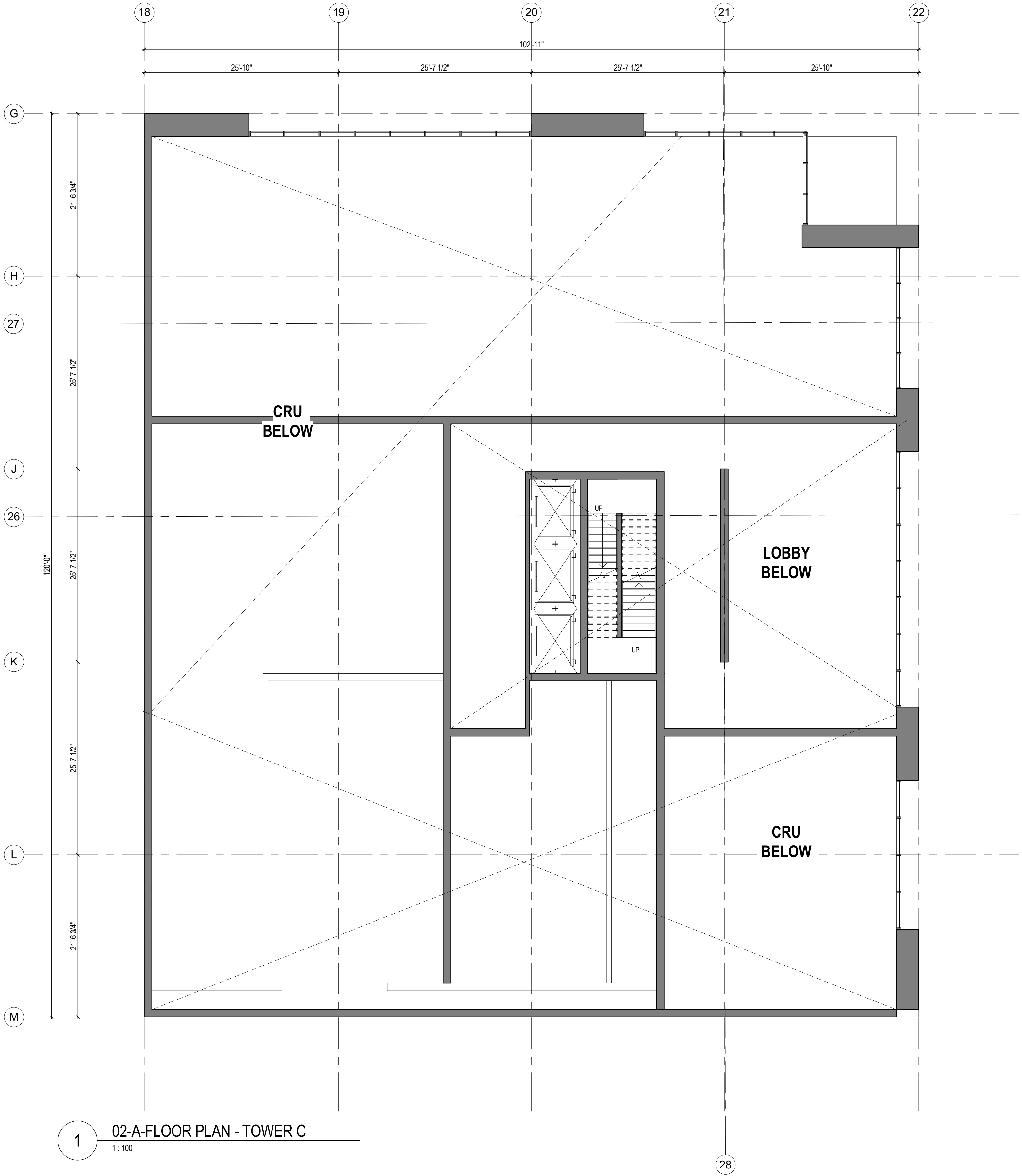


KEY PLAN

SCHEDULE
This forms part of application
DP20-011 / DVP20-0013
Planner Initials **AC**

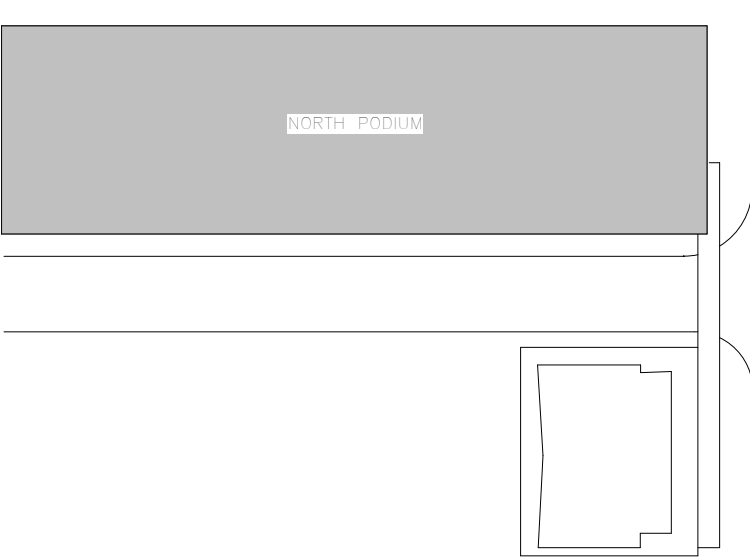
A & B

City of Kelowna
DEVELOPMENT PLANNING



DP Revised 10/16/2020
Development Permit 20/12/2019





KEY PLAN

PARKING SCHEDULE - LEVEL 3			
PARKING STALL TYPE	LEVEL	COUNT	
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 3	2	
		2	
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 3	83	
		83	
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 3	70	
		70	
Grand total: 155		155	

SCHEDULE

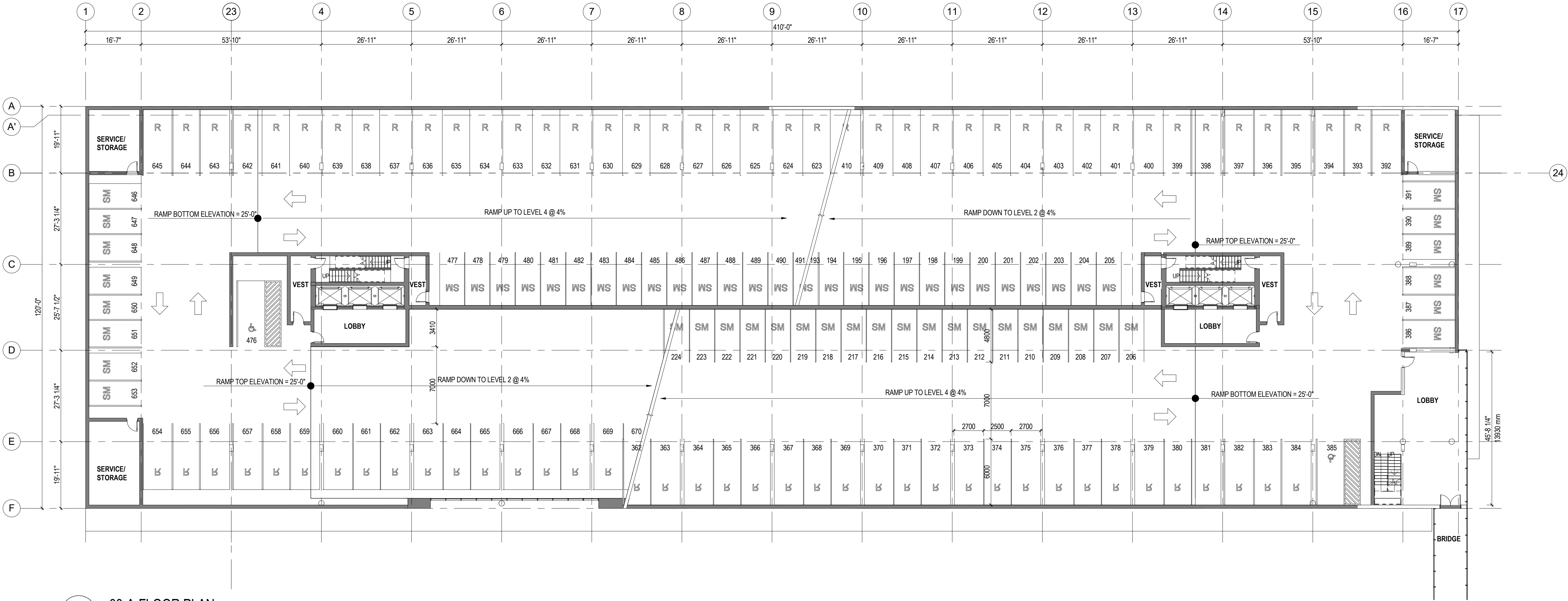
A & B

This forms part of application
DP20-011 / DVP20-0013

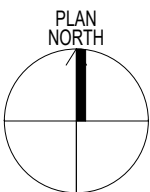
Planner Initials AC

City of Kelowna

DEVELOPMENT PLANNING



1 03-A-FLOOR PLAN
1:200



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Development Permit 20/12/2019



SCHEDULE

This forms part of application

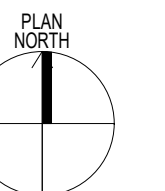
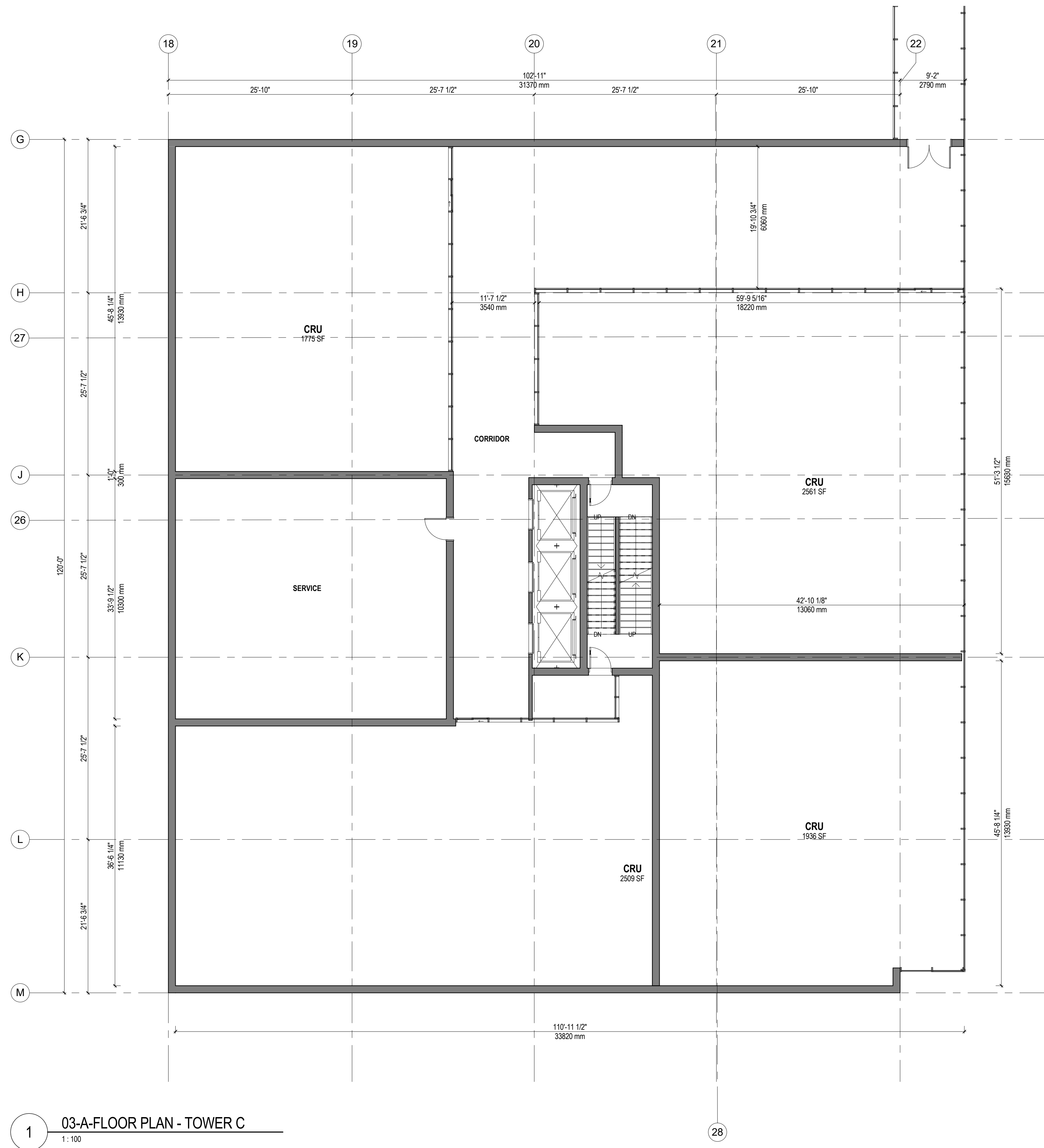
DP20-011 / DVP20-0013

Planner Initials **AC**

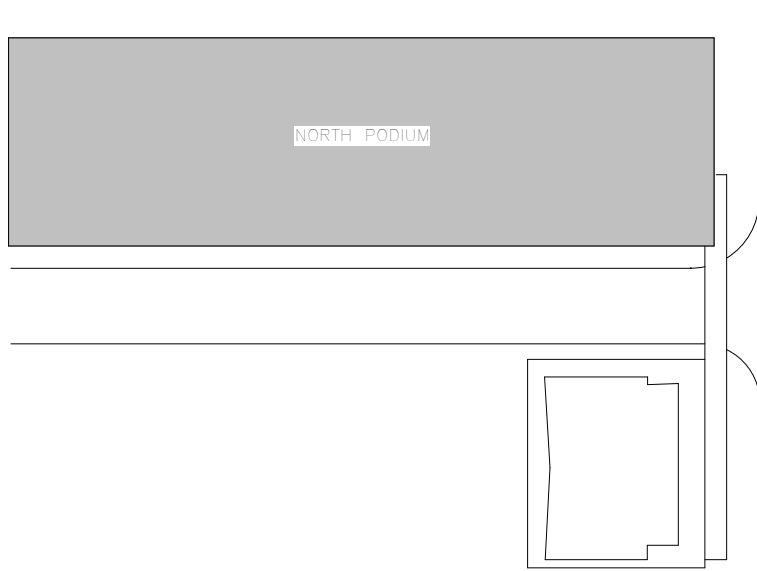
A & B



City of
Kelowna
DEVELOPMENT PLANNING



Development Permit 20/12/2019



KEY PLAN

PARKING SCHEDULE - LEVEL 4		
PARKING STALL TYPE	LEVEL	COUNT
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 4	2
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 4	81
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 4	71
Grand total: 154		154

SCHEDULE

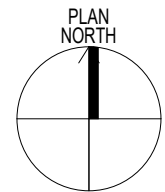
This forms part of application
DP20-011 / DVP20-0013

Planner Initials AC

A & B
City of Kelowna
DEVELOPMENT PLANNING

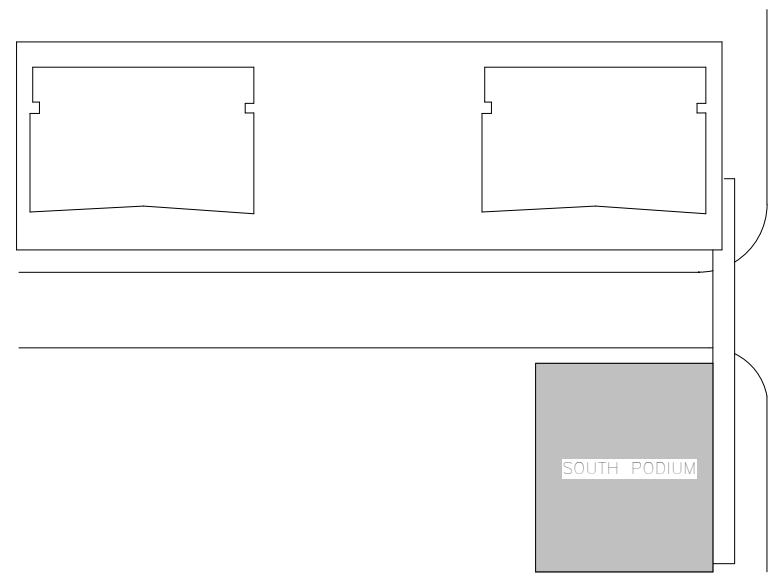


1 04-A-FLOOR PLAN
1:200



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Development Permit 20/12/2019



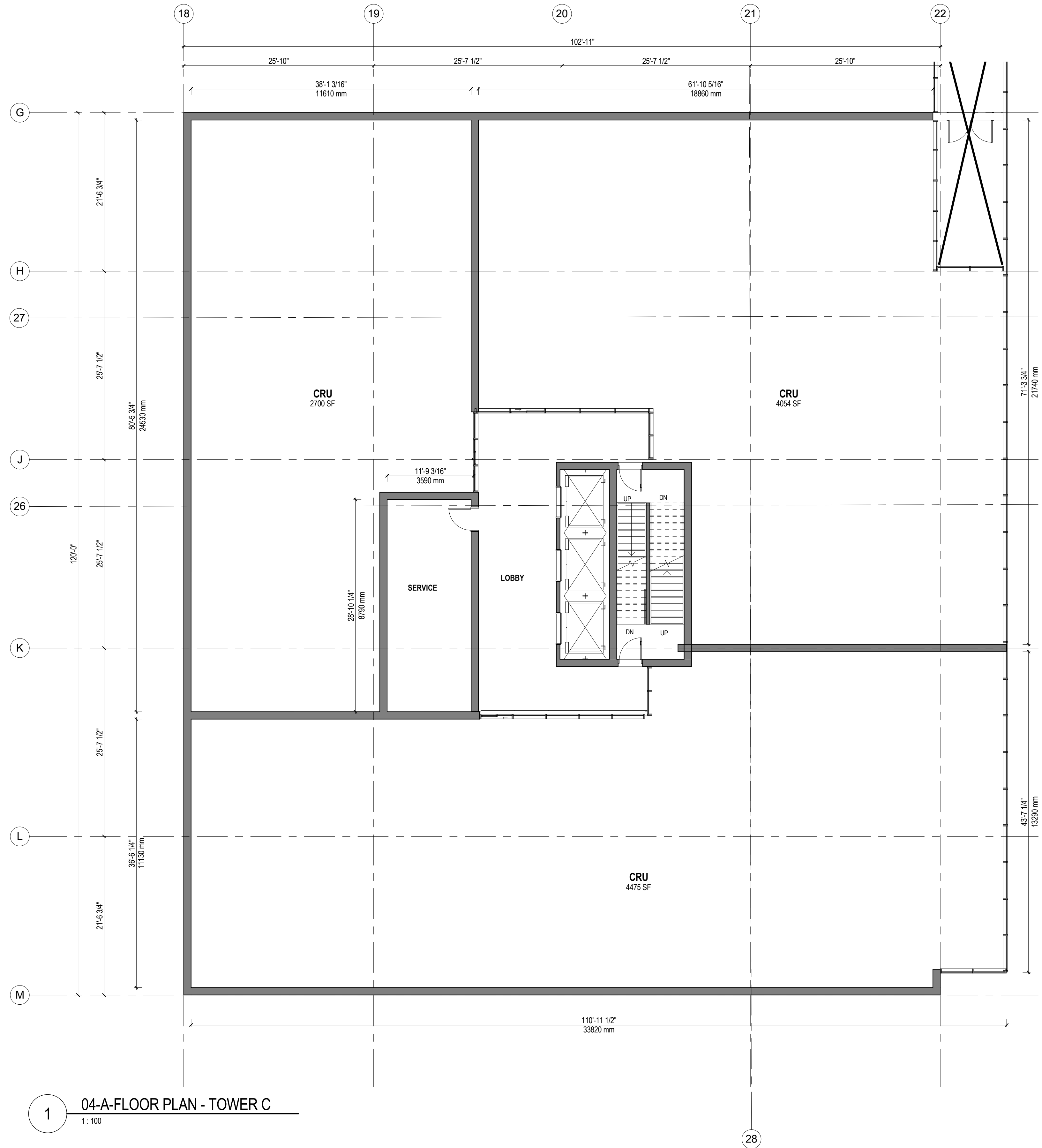


KEY PLAN

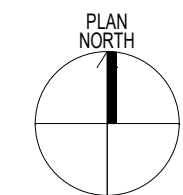
SCHEDULE
This forms part of application
DP20-011 / DVP20-0013
Planner Initials **AC**

A & B

City of
Kelowna
DEVELOPMENT PLANNING



1 04-A-FLOOR PLAN - TOWER C
1:100





KEY PLAN

PARKING SCHEDULE - LEVEL 5		
PARKING STALL TYPE	LEVEL	COUNT
HC Parking Space - 2.5m x 6.0m or 3.3m x 6.0m (Van) + 1.5m access	LEVEL 5	1
Regular - 6.0m x 2.5m or 6.0m x 2.7m at columns	LEVEL 5	38
Small - 4.8m x 2.3m or 4.8m x 2.5m at columns	LEVEL 5	29
Grand total: 68		68

SCHEDULE

A & B

This forms part of application
DP20-011 / DVP20-0013

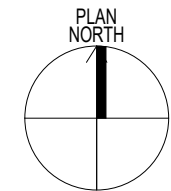
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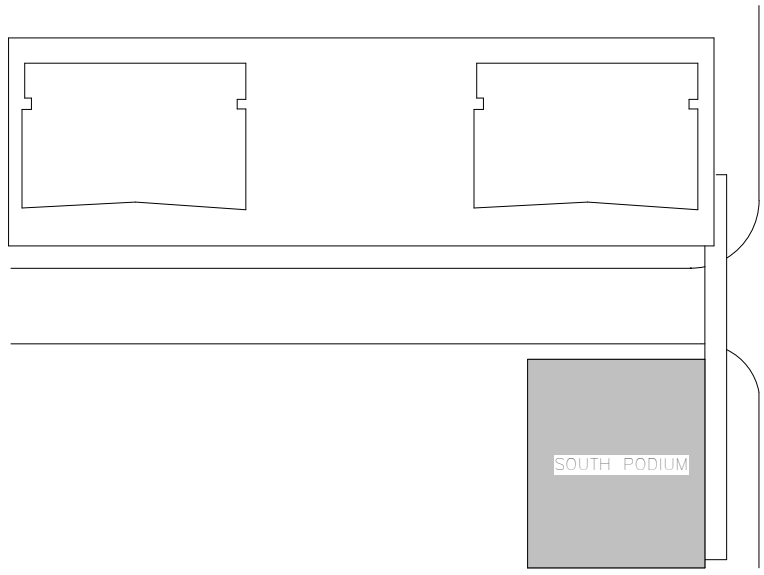
City of Kelowna

DEVELOPMENT PLANNING



1 05-A-FLOOR PLAN
1:200





KEY PLAN

SCHEDULE

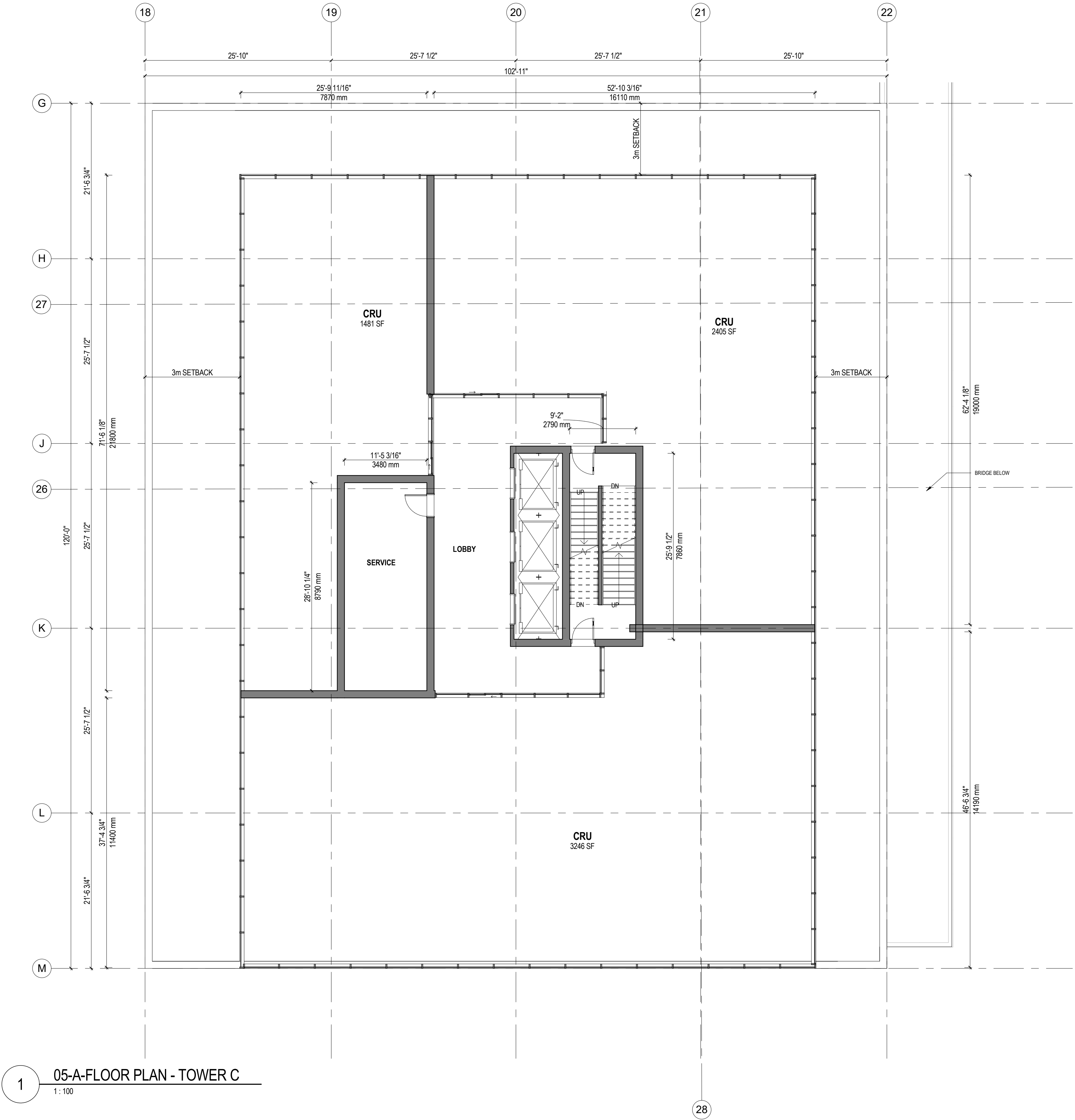
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DP20-011 / DVP20-0013

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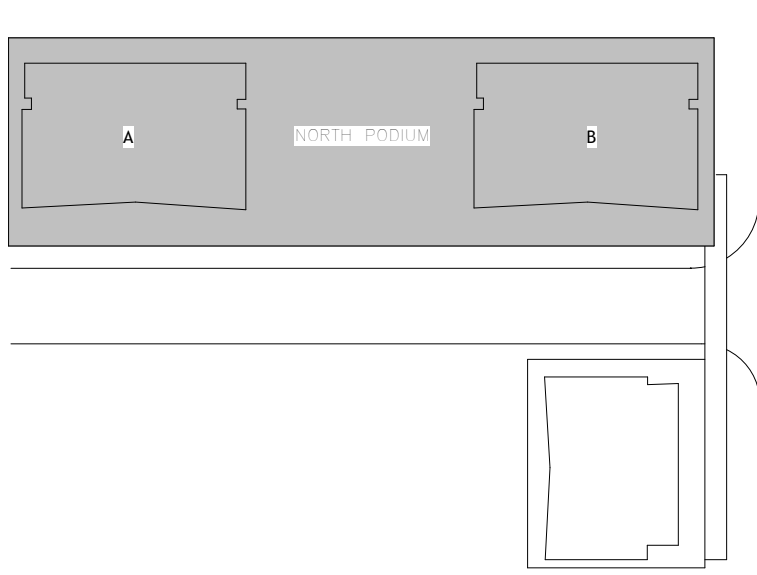
A & B


City of
Kelowna
DEVELOPMENT PLANNING



1 05-A-FLOOR PLAN - TOWER C
1:100





KEY PLAN

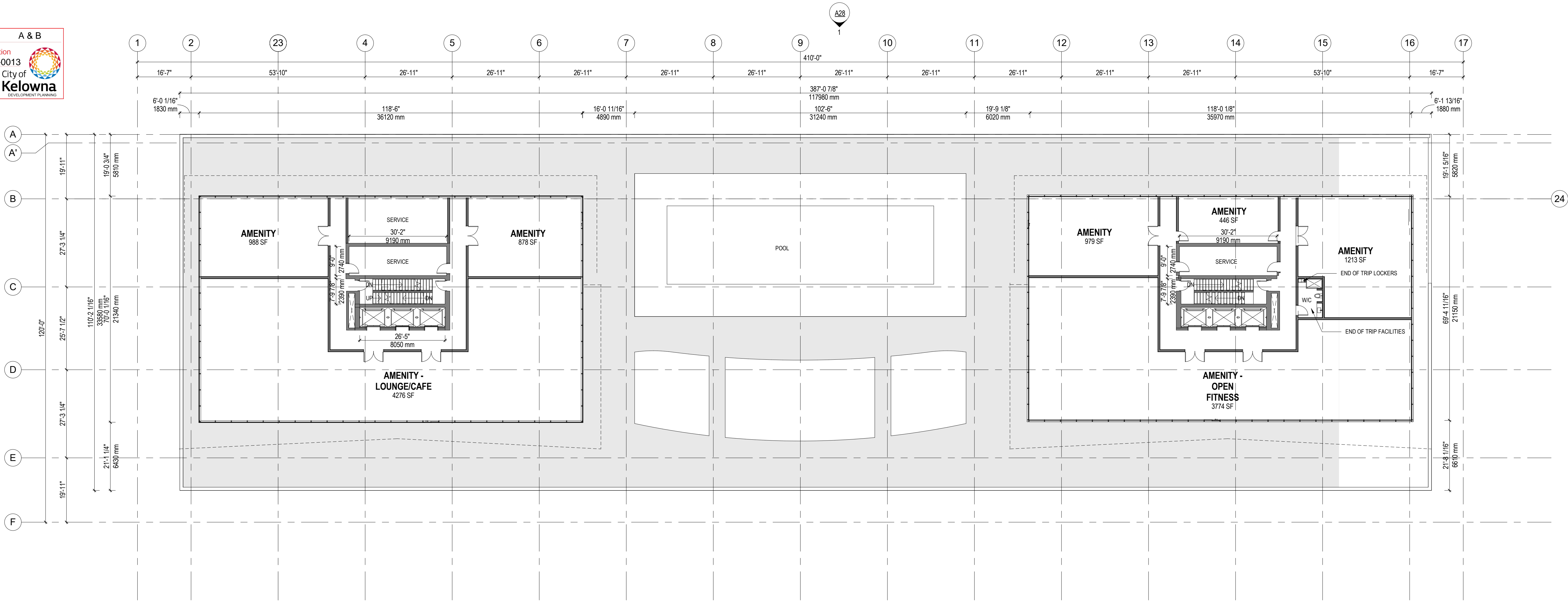
SCHEDULE

This forms part of application
DP20-011 / DVP20-0013

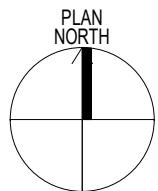
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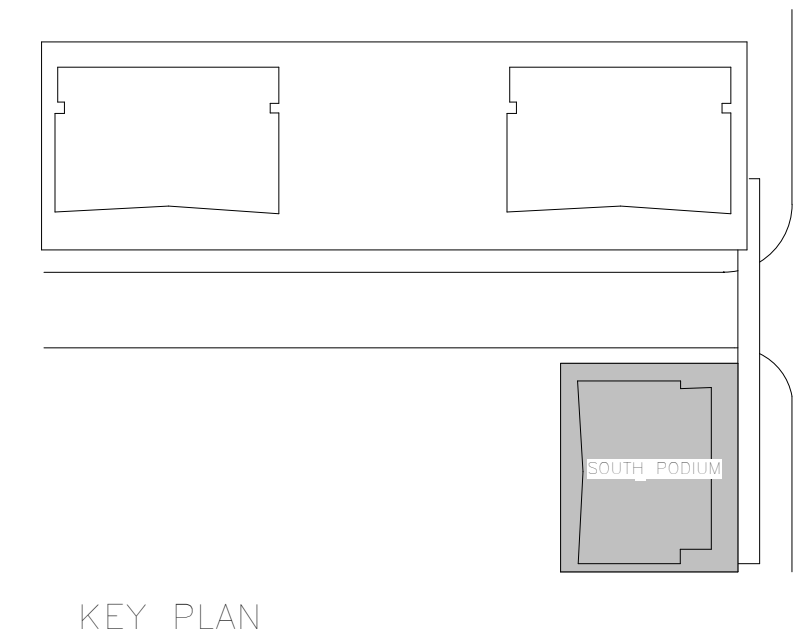
A & B

City of Kelowna
DEVELOPMENT PLANNING

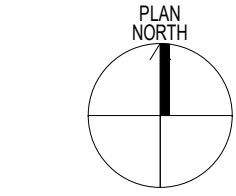
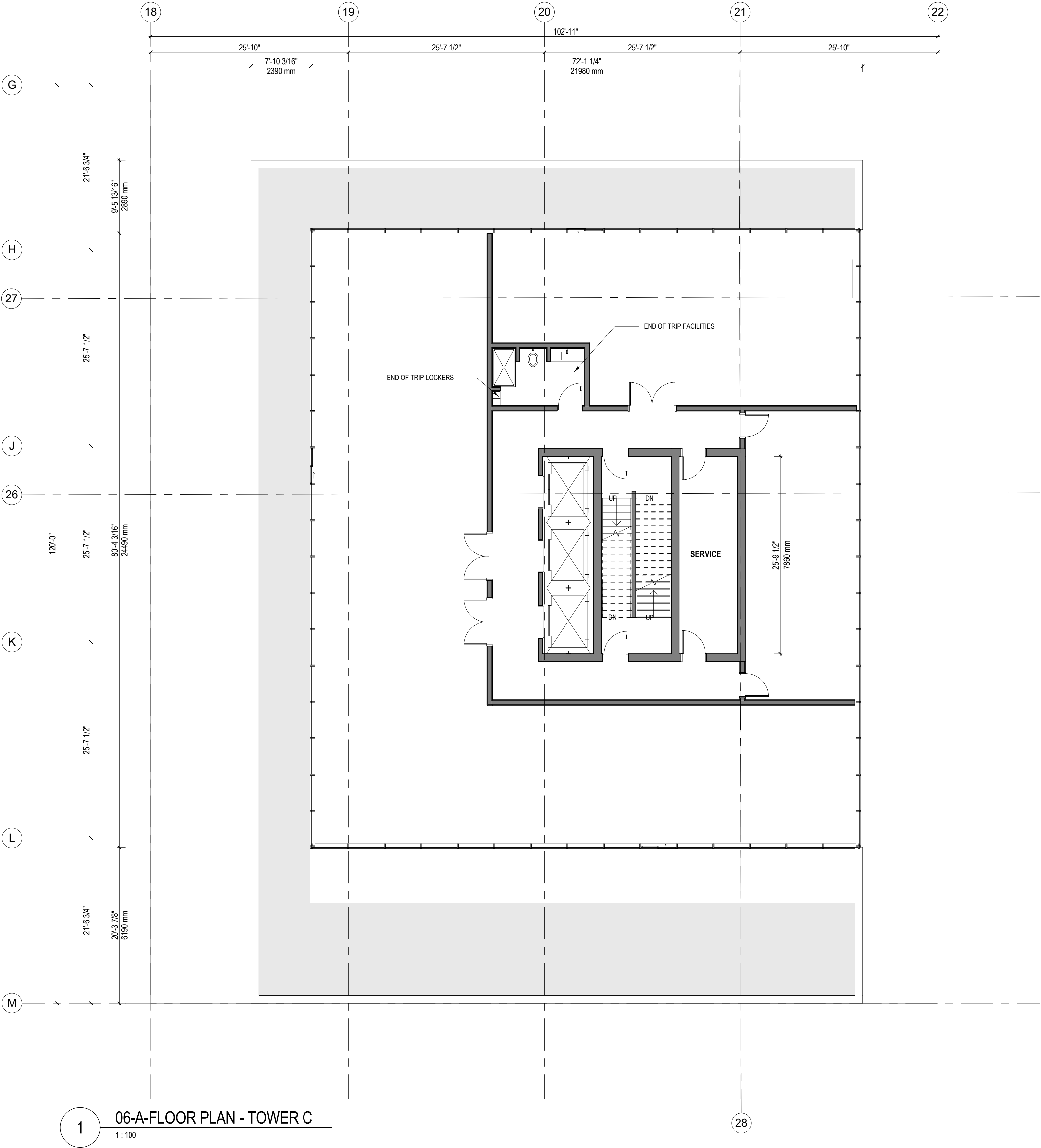


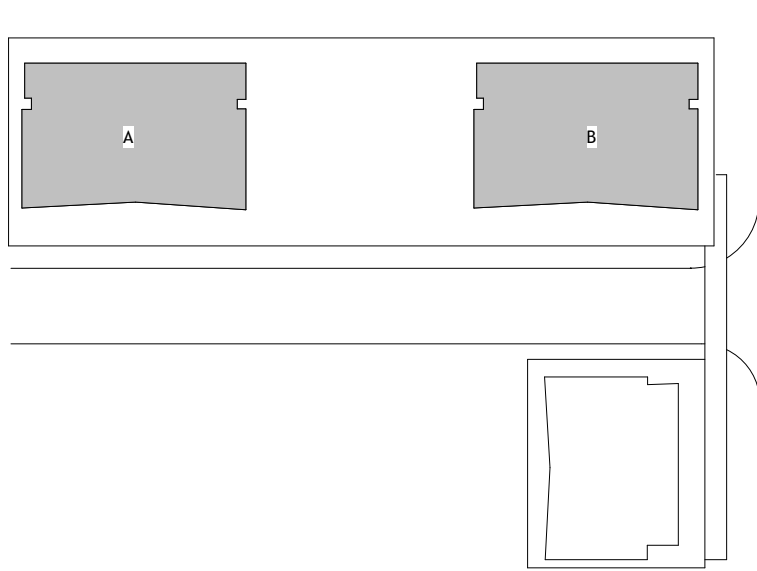
1 06-A-FLOOR PLAN
1:200





SCHEDULE A & B
This forms part of application
DP20-011 / DVP20-0013
Planner Initials **AC**
City of Kelowna
DEVELOPMENT PLANNING





KEY PLAN

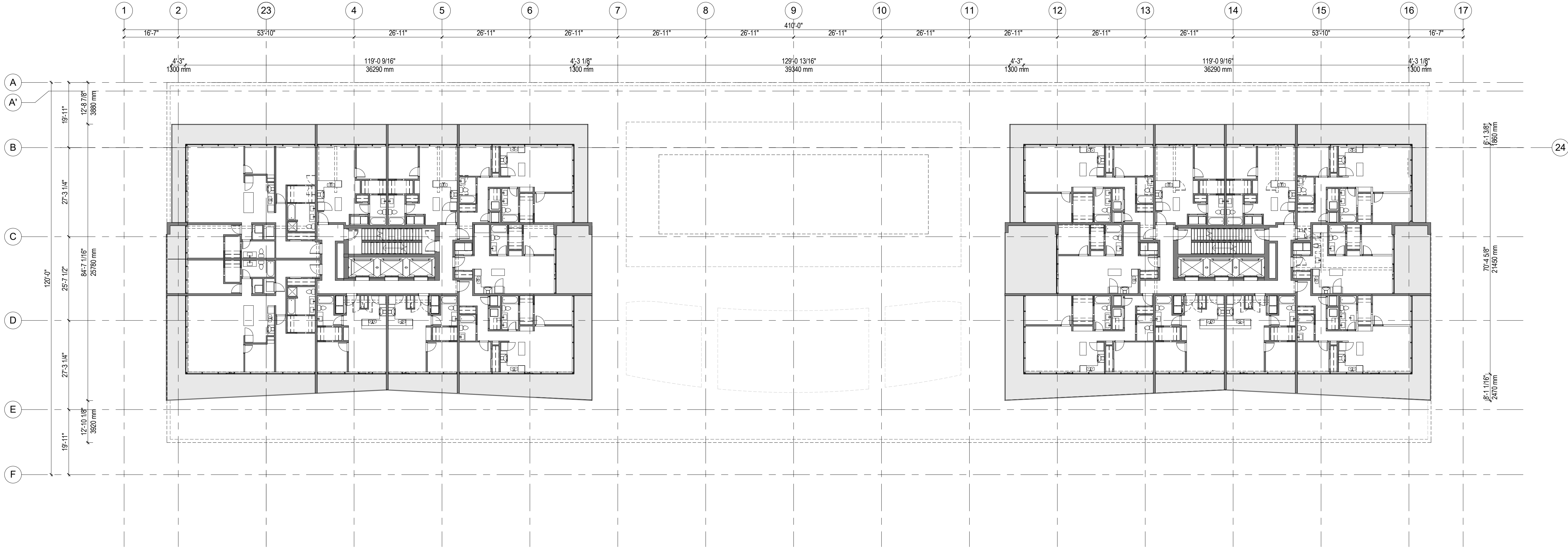
UNIT TYPE SUMMARY			
UNIT TYPE	TOWER A (24 STOREYS) MARKET HOUSING	TOWER B (42 STOREYS) MARKET HOUSING	TOWER C (28 STOREYS) MARKET HOUSING
1 BEDROOM A (485SF)	N/A	N/A	44
1 BEDROOM B (530SF)	32	68	N/A
1 BEDROOM C (535SF)	32	68	N/A
1 BEDROOM D (620SF)	16	56	N/A
2 BEDROOM E (700SF)	N/A	N/A	44
2 BEDROOM A (780SF)	N/A	N/A	22
2 BEDROOM B (885SF)	32	68	N/A
2 BEDROOM C (975SF)	N/A	44	N/A
3 BEDROOM D (1125SF)	N/A	N/A	44
2 BEDROOM E (1075SF)	2	2	N/A
2 BEDROOM F (1090SF)	2	2	N/A
2 BEDROOM G (1260SF)	4	4	N/A
3 BEDROOM H (1420SF)	36	28	N/A
TOTAL UNIT TYPES	156	340	154
TOTAL UNITS		650	

SCHEDULE A & B

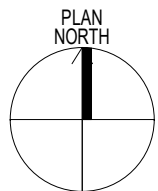
This forms part of application
DP20-011 / DVP20-0013

Planner Initials AC

City of Kelowna
DEVELOPMENT PLANNING



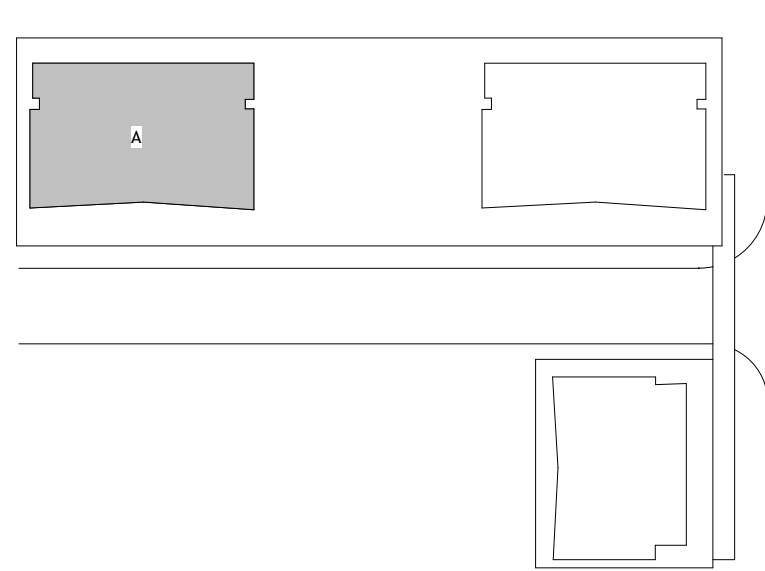
1 07-A-FLOOR PLAN
1:200



DP Revised 10/16/2020

Development Permit 20/12/2019





KEY PLAN

SCHEDULE

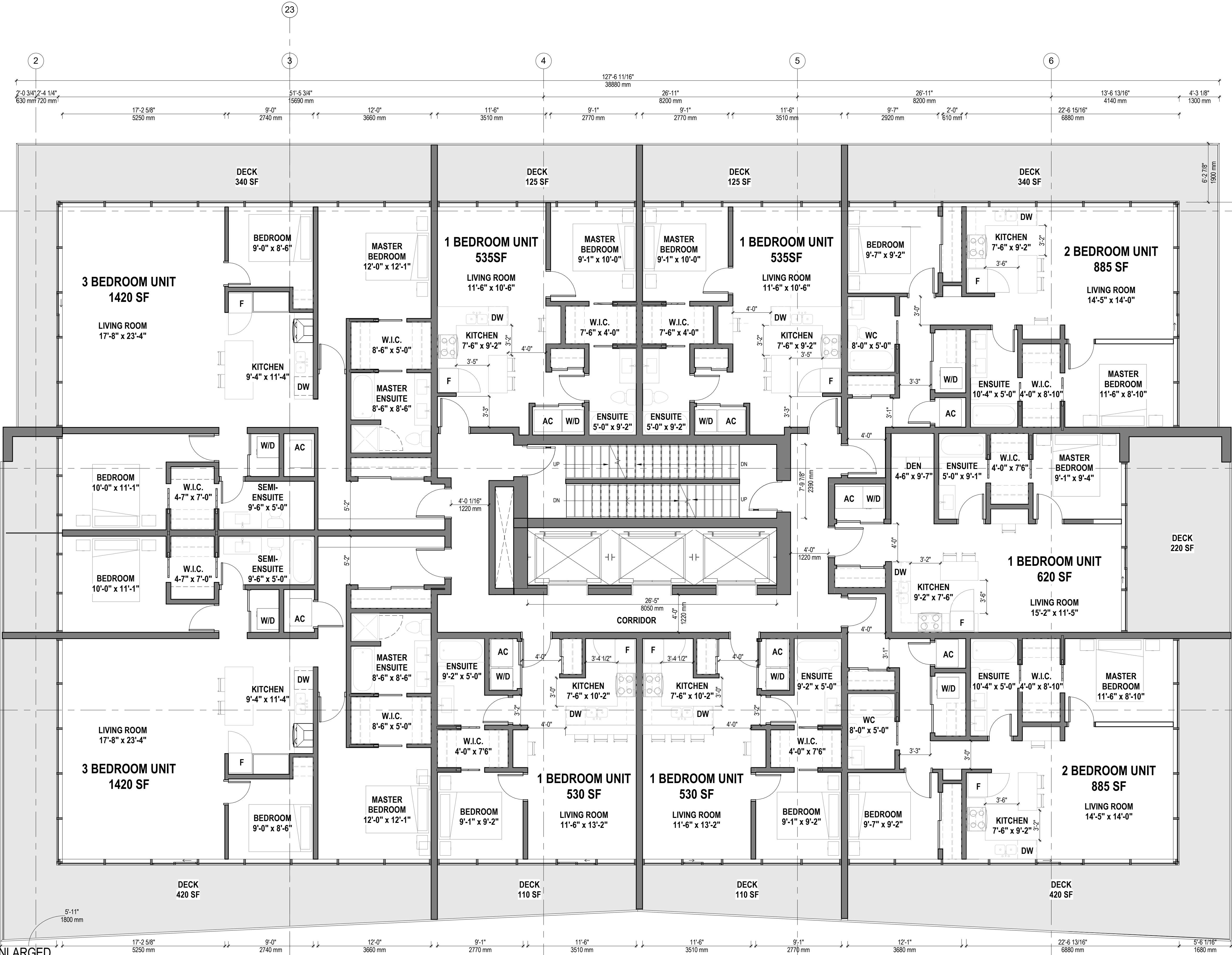
A & B

This forms part of application
DP20-011 / DVP20-0013

City of Kelowna

DEVELOPMENT PLANNING

Planner Initials AC

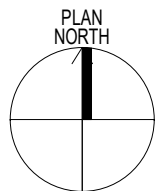


LEVELS 7-22 - (16 FLOORS):	
1 BEDROOM:	5 UNITS / LEVEL
2 BEDROOM:	2 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	9 UNITS / LEVEL

LEVELS 23-24 (PH) - (2 FLOORS):	
2 BEDROOM:	4 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	6 UNITS / LEVEL

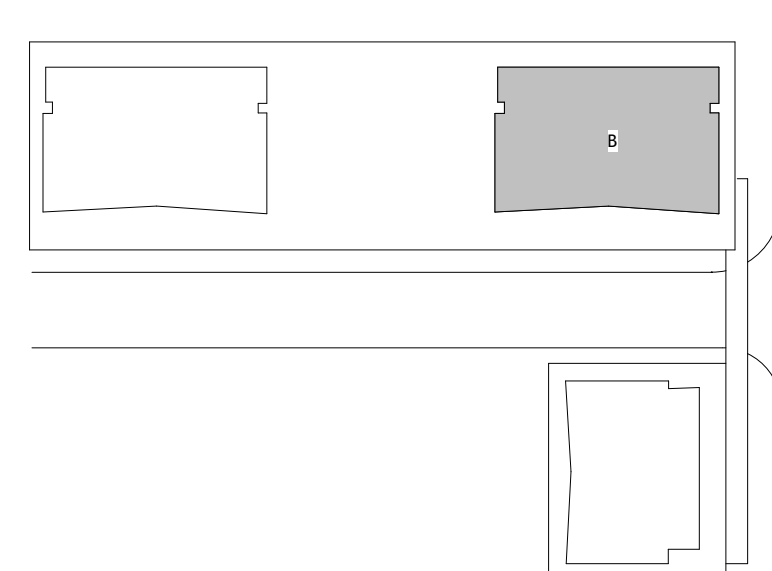
TOTAL NUMBER OF UNITS (18 FLOORS):	
1 BEDROOM:	80 UNITS
2 BEDROOM:	40 UNITS
3 BEDROOM:	36 UNITS
TOTAL:	156 UNITS

SUITE MATRIX	
1 BEDROOM:	530 SF
1 BEDROOM:	535 SF
1 BEDROOM:	620 SF
2 BEDROOM:	885 SF
3 BEDROOM:	1420 SF
PH 2 BEDROOM	
+ DEN:	1075 SF
PH 2 BEDROOM	
+ DEN:	1090 SF
PH 2 BEDROOM	
+ DEN:	1260 SF
PH 3 BEDROOM:	1420 SF



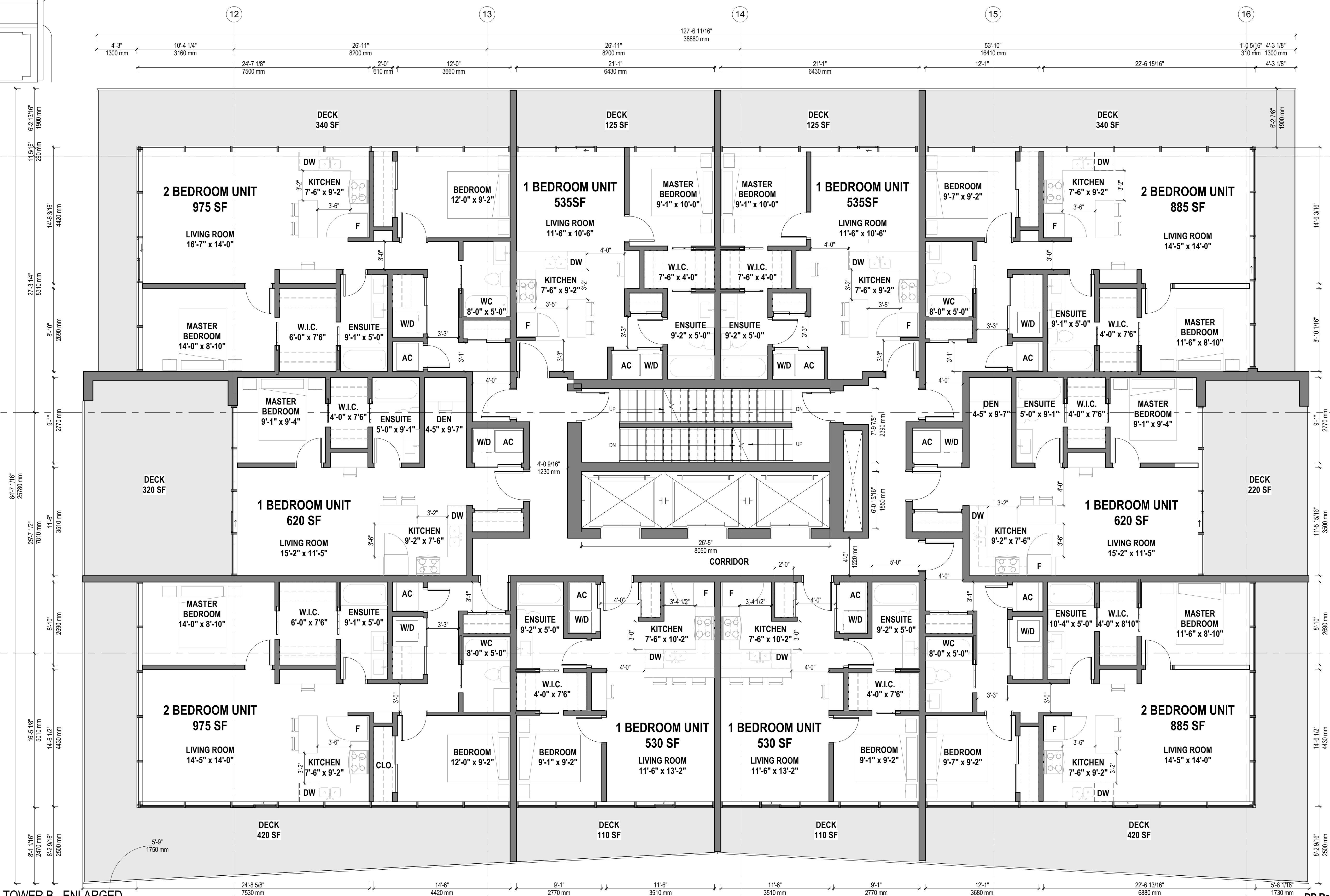
07-A-FLOOR PLAN - TOWER A - ENLARGED





KEY PLAN

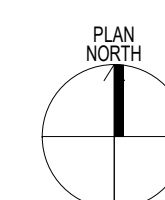
SCHEDULE A & B
This forms part of application
DP20-011 / DVP20-0013
City of Kelowna
Planner Initials AC



LEVELS 7-28 - (22 FLOORS):	
1 BEDROOM:	6 UNITS / LEVEL
2 BEDROOM:	4 UNITS / LEVEL
TOTAL:	10 UNITS / LEVEL
LEVELS 29-40 - (12 FLOORS):	
1 BEDROOM:	5 UNITS / LEVEL
2 BEDROOM:	2 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	9 UNITS / LEVEL
LEVELS 23-24 (PH) - (2 FLOORS):	
2 BEDROOM:	4 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	6 UNITS / LEVEL
TOTAL NUMBER OF UNITS (36 FLOORS):	
1 BEDROOM:	192 UNITS
2 BEDROOM:	120 UNITS
3 BEDROOM:	28 UNITS
TOTAL:	340 UNITS

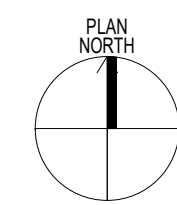
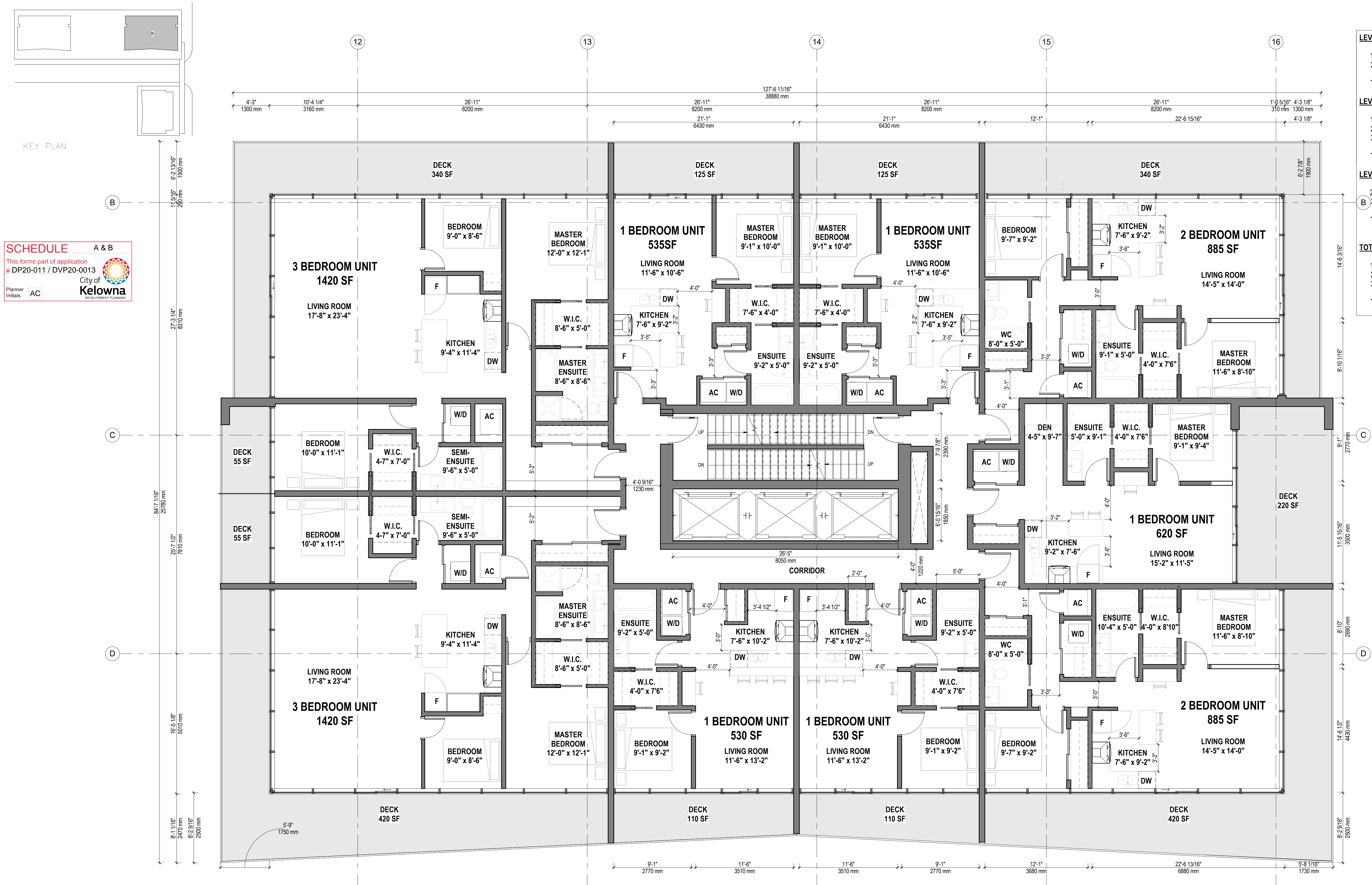
SUITE MATRIX	
1 BEDROOM:	530 SF
1 BEDROOM:	535 SF
1 BEDROOM:	620 SF
2 BEDROOM:	885 SF
2 BEDROOM:	975 SF
3 BEDROOM:	1420 SF
PH 2 BEDROOM	
+ DEN:	1075 SF
PH 2 BEDROOM	
+ DEN:	1090 SF
PH 2 BEDROOM	
+ DEN:	1260 SF
PH 3 BEDROOM:	1420 SF

1 07-A-FLOOR PLAN - TOWER B - ENLARGED
3/16" = 1'-0"



DP Replacement Sheets 30/03/2020
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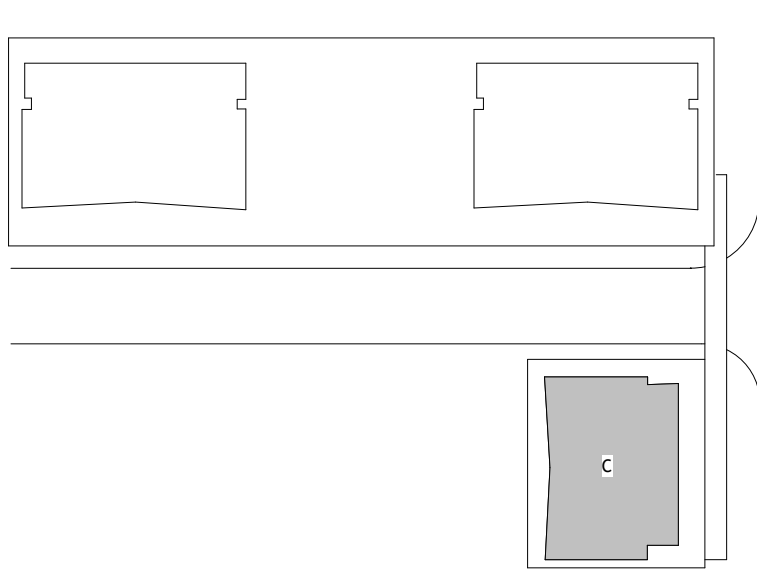




DP Revised 10/16/2020

Development Permit 20/12/2019





KEY PLAN

SCHEDULE

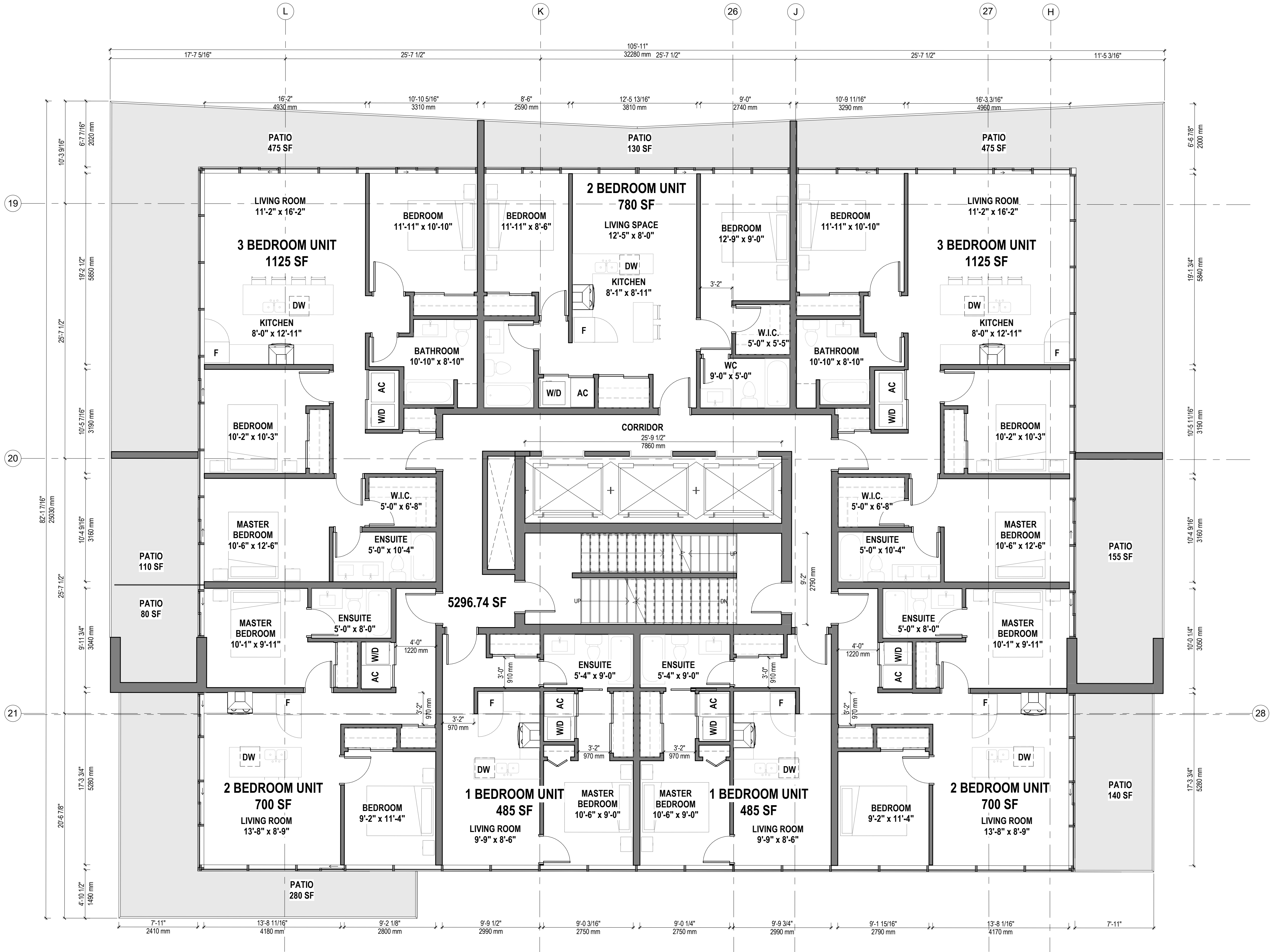
A & B

This forms part of application
DP20-011 / DVP20-0013

Planner Initials AC

City of Kelowna

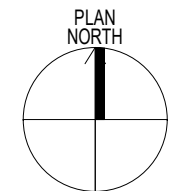
DEVELOPMENT PLANNING

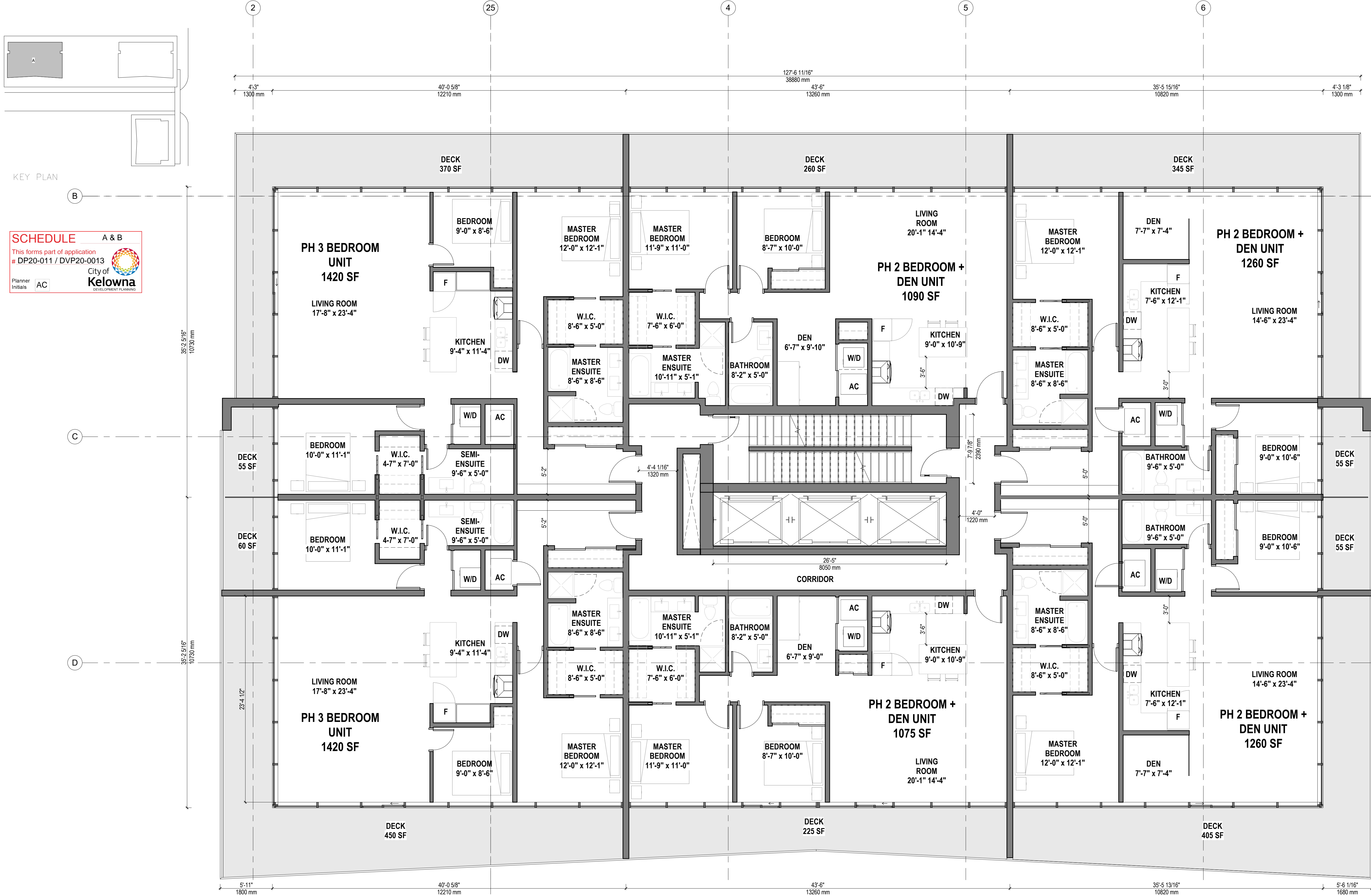


LEVELS 7-28 - (22 FLOORS)	
1 BEDROOM:	2 UNITS / LEVEL
2 BEDROOM:	3 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	7 UNITS / LEVEL
TOTAL NUMBER OF UNITS (22 FLOORS)	
1 BEDROOM:	44 UNITS
2 BEDROOM:	66 UNITS
3 BEDROOM:	44 UNITS
TOTAL:	154 UNITS

SUITE MATRIX	
1 BEDROOM:	485 SF
2 BEDROOM:	700 SF
2 BEDROOM:	780 SF
3 BEDROOM:	1125 SF

1 07-A-FLOOR PLAN - TOWER C - ENLARGED
3/16" = 1'-0"





A26.1

LEVELS 7-22 - (16 FLOORS):	
1 BEDROOM:	5 UNITS / LEVEL
2 BEDROOM:	2 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	9 UNITS / LEVEL
LEVELS 23-24 (PH) - (2 FLOORS):	
2 BEDROOM:	4 UNITS / LEVEL
3 BEDROOM:	2 UNITS / LEVEL
TOTAL:	6 UNITS / LEVEL
TOTAL NUMBER OF UNITS (18 FLOORS):	
1 BEDROOM:	80 UNITS
2 BEDROOM:	40 UNITS
3 BEDROOM:	36 UNITS
TOTAL:	156 UNITS

SUITE MATRIX	
1 BEDROOM:	530 SF
1 BEDROOM:	535 SF
1 BEDROOM:	620 SF
2 BEDROOM:	885 SF
3 BEDROOM:	1420 SF
PH 2 BEDROOM + DEN:	1075 SF
PH 2 BEDROOM + DEN:	1090 SF
PH 2 BEDROOM + DEN:	1260 SF
PH 3 BEDROOM:	1420 SF

1 45-A-FLOOR PLAN - TOWER A - ENLARGED
3/16" = 1'-0"

DP Revised 10/16/2020

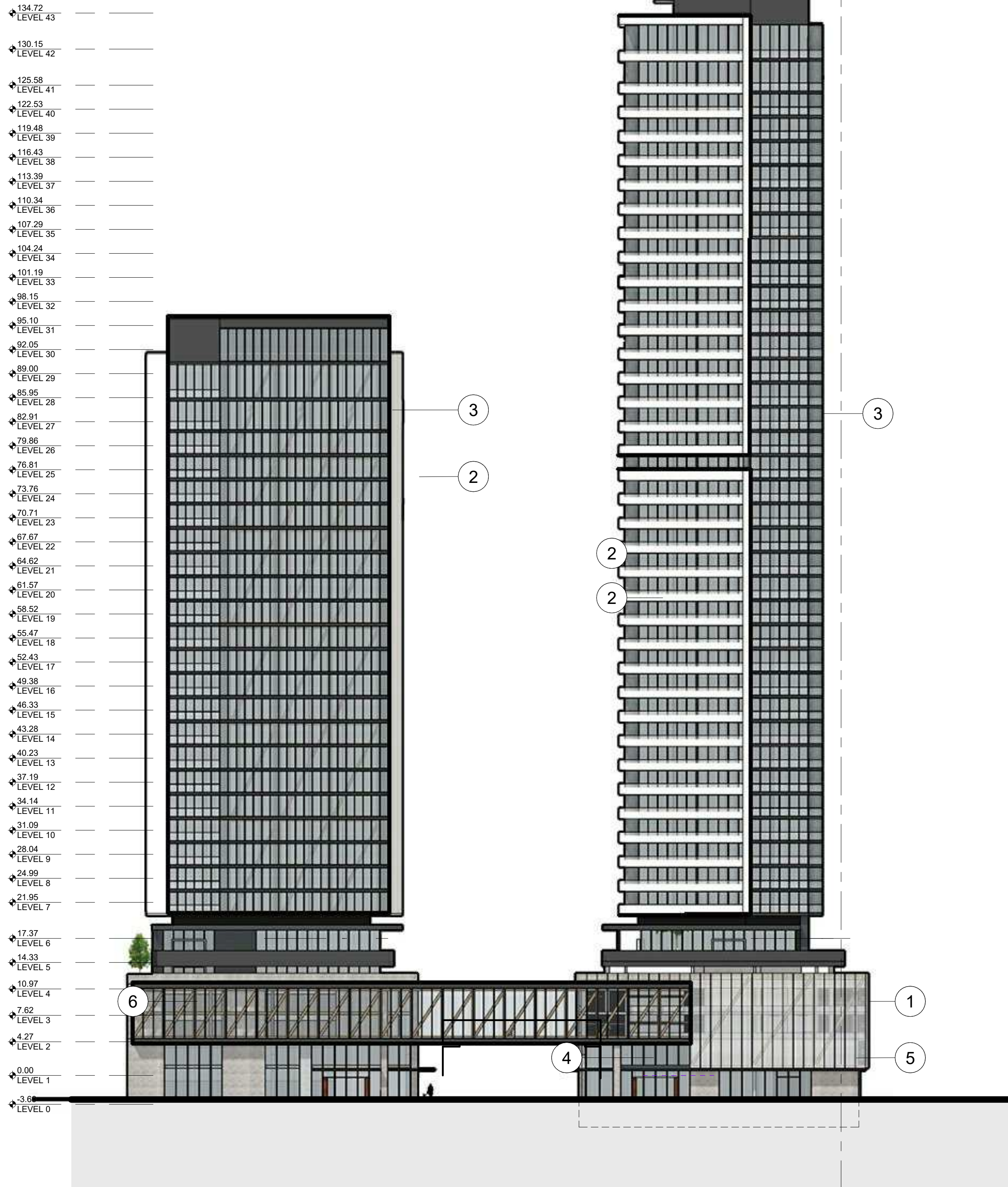


- 1 POLYCARBONATE TRANSLUCENT PANELS
- 2 PREFINISHED WHITE METAL CLADDING
- 3 PREFINISHED GREY METAL CLADDING
- 4 CORTEN
- 5 GREY BRICK VENEER
- 6 WOOD / CLT
- 7 FROSTED GLASS
- 8 NATURAL CONCRETE

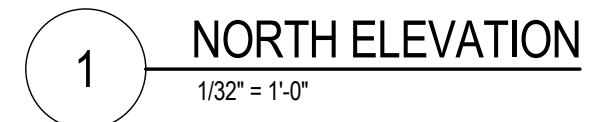


1 LEON AVE SOUTH ELEVATION
1/32" = 1'-0"

SCHEDULE A & B
This forms part of application
DP20-011 / DVP20-0013
Planner Initials **AC**
City of Kelowna
DEVELOPMENT PLANNING



2 WATER STREET EAST ELEVATION
1/32" = 1'-0"



SCHEDULE **A & B**

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City of Kelowna
DEVELOPMENT PLANNING

2 LEON AVE NORTH ELEVATION
1/32" = 1'-0"

- ① POLYCARBONATE TRANSLUCENT PANELS
- ② PREFINISHED WHITE METAL CLADDING
- ③ PREFINISHED GREY METAL CLADDING
- ④ CORTEN
- ⑤ GREY BRICK VENEER
- ⑥ WOOD / CLT
- ⑦ FROSTED GLASS
- ⑧ NATURAL CONCRETE

SCHEDULE

A & B

This forms part of application

DP20-011 / DVP20-0013

Planner

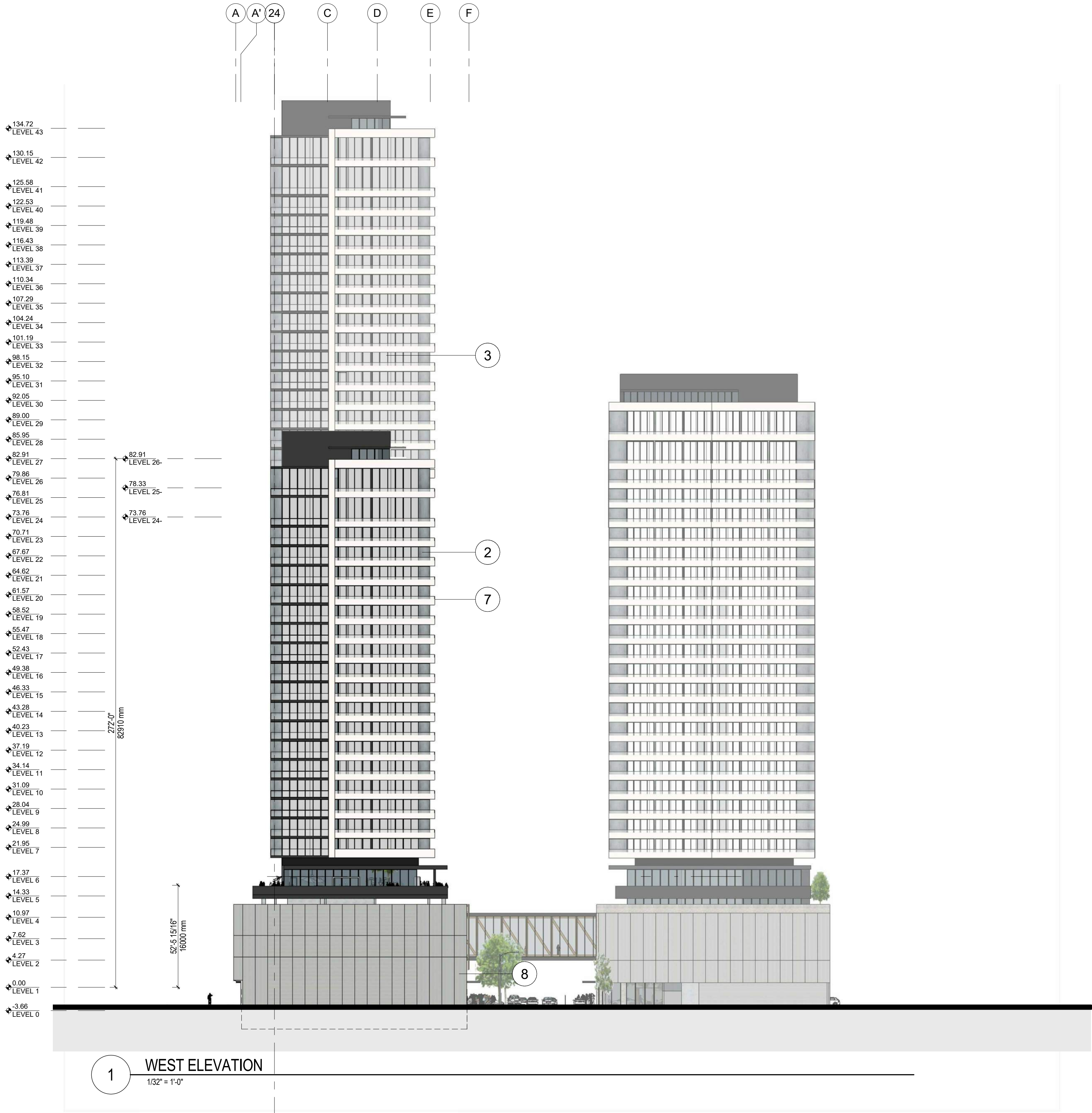
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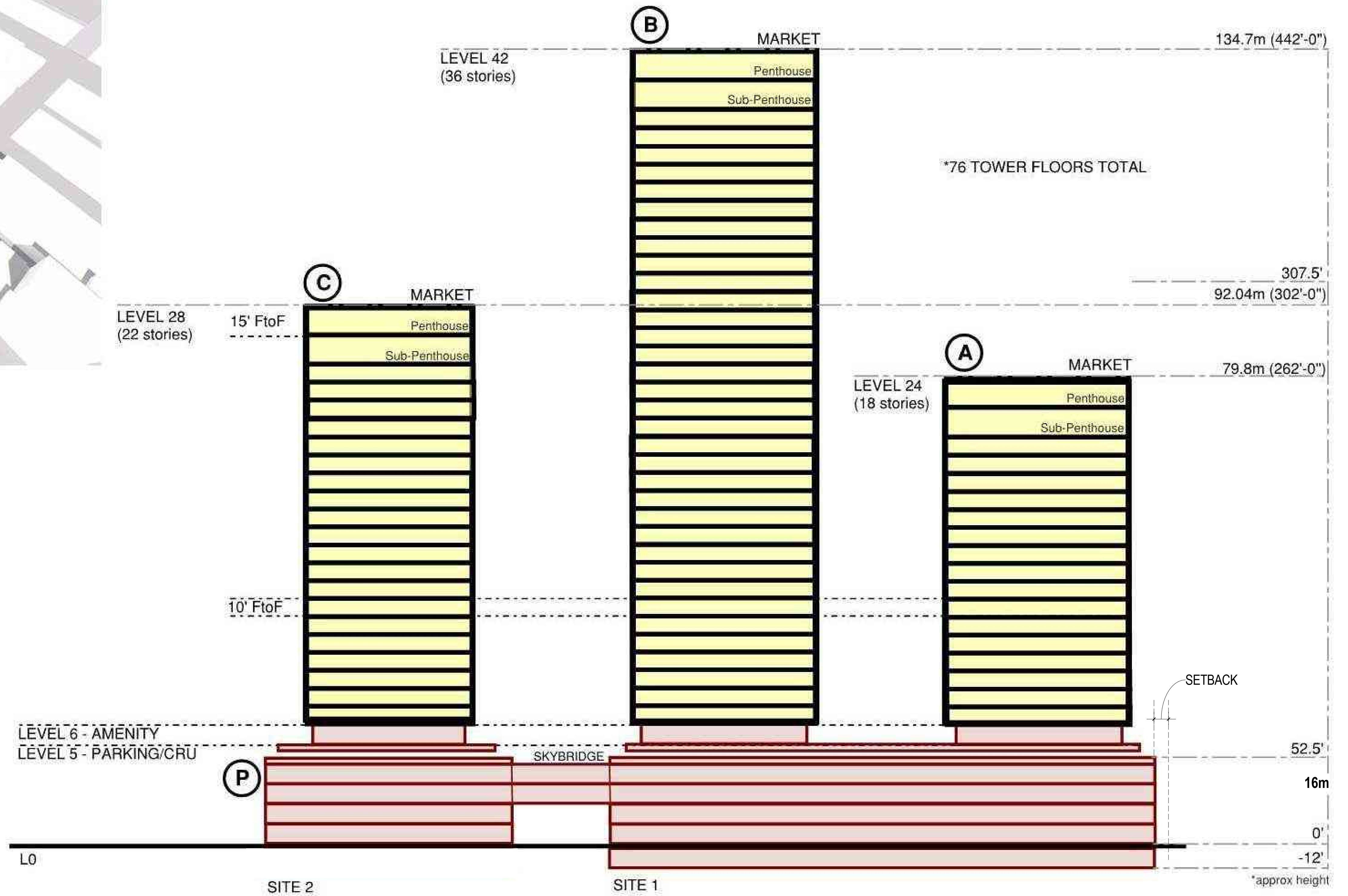
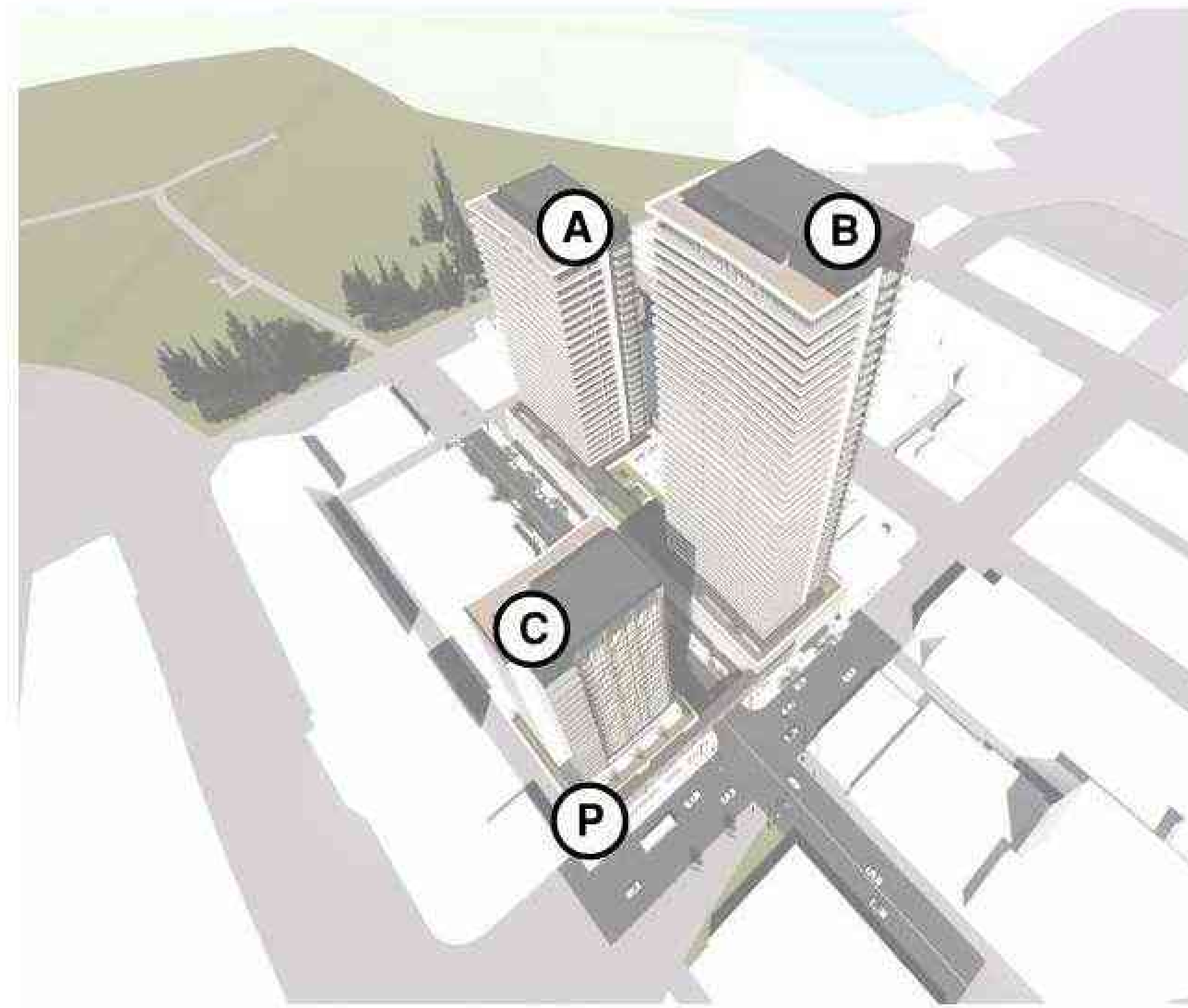
AC

City of

Kelowna

DEVELOPMENT PLANNING





SCHEDULE A & B

This forms part of application
DP20-011 / DVP20-0013

Planner Initials AC

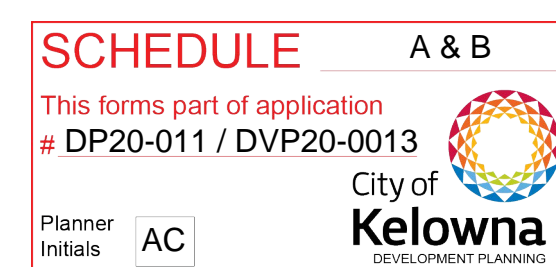
City of Kelowna
DEVELOPMENT PLANNING

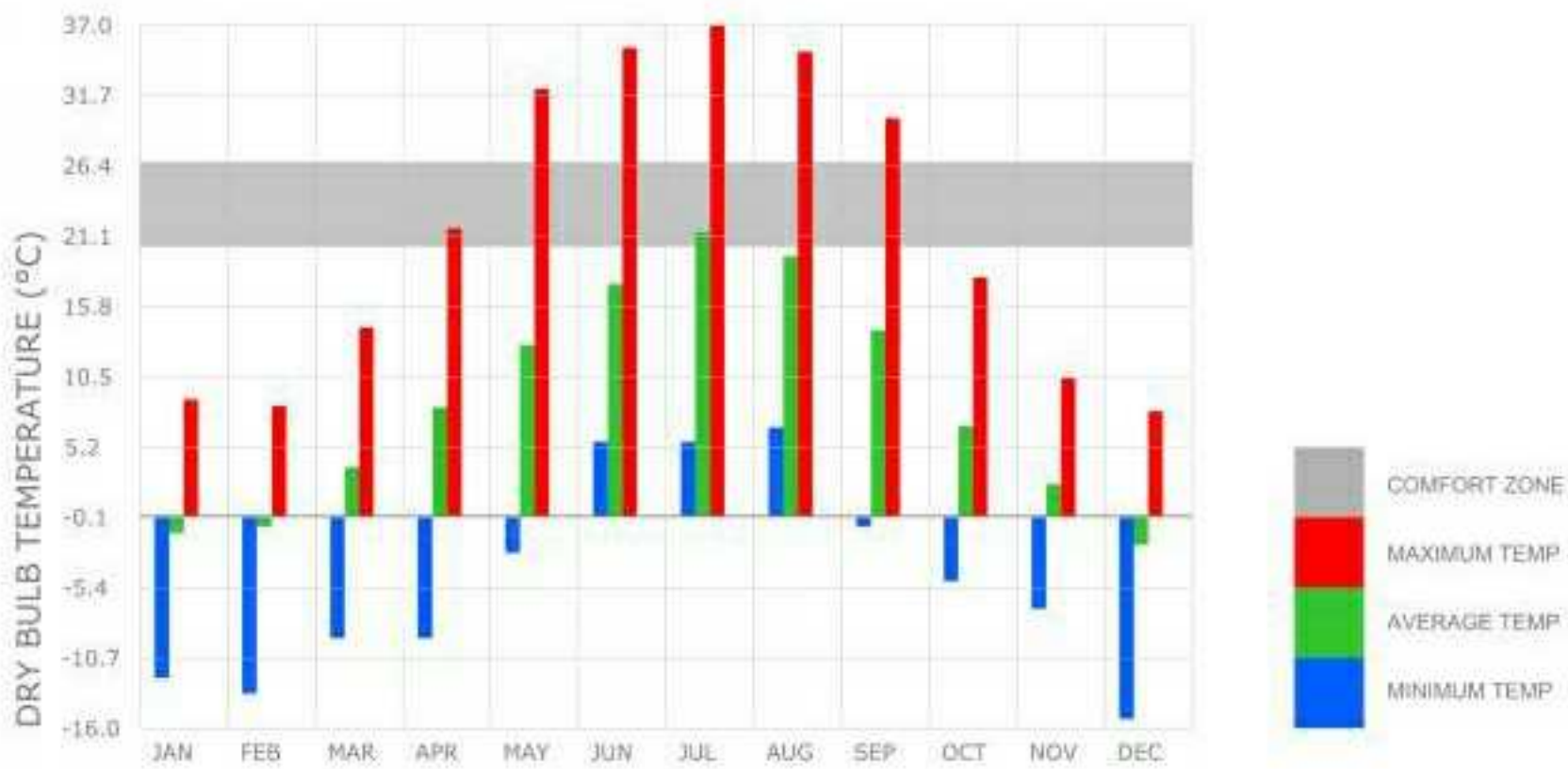


NORTH EAST VIEW (CURRENT)

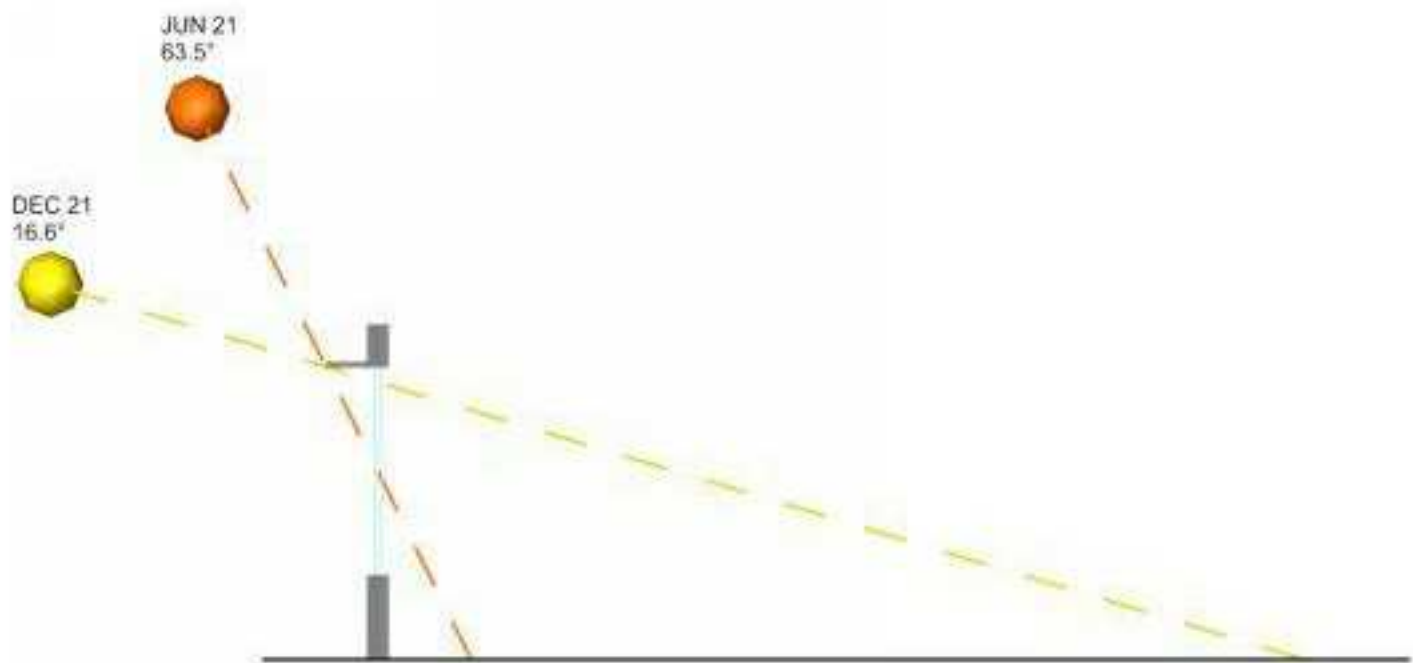


NORTH EAST VIEW (FUTURE)

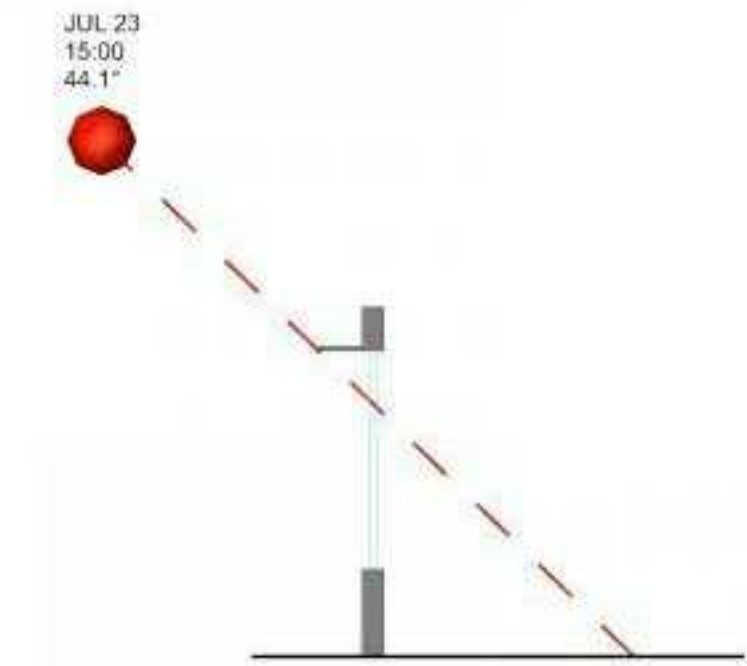




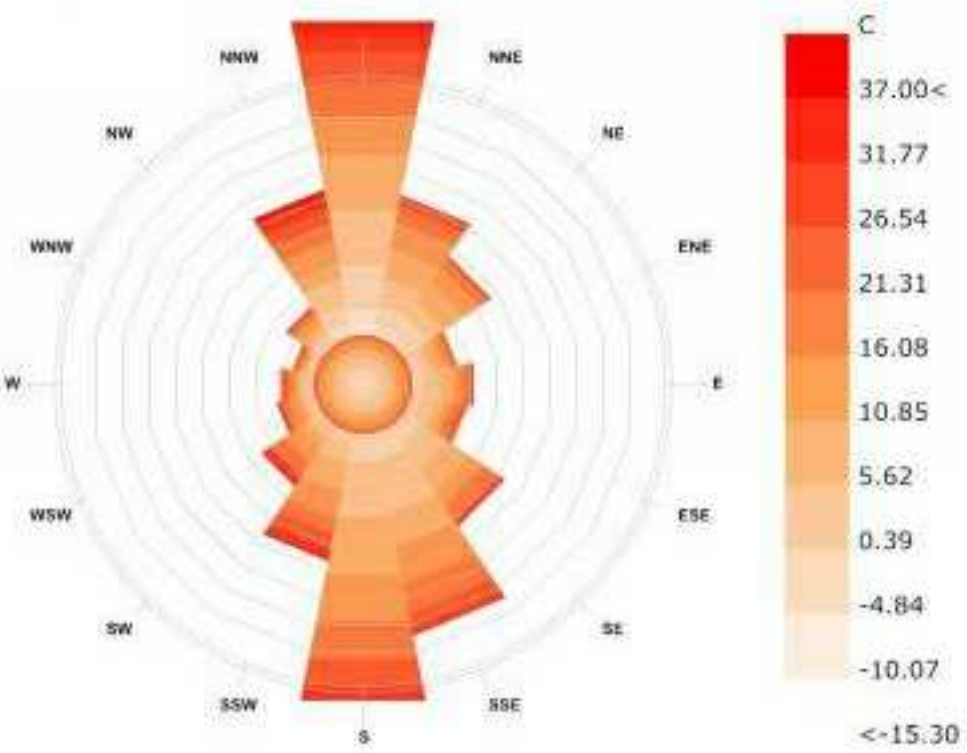
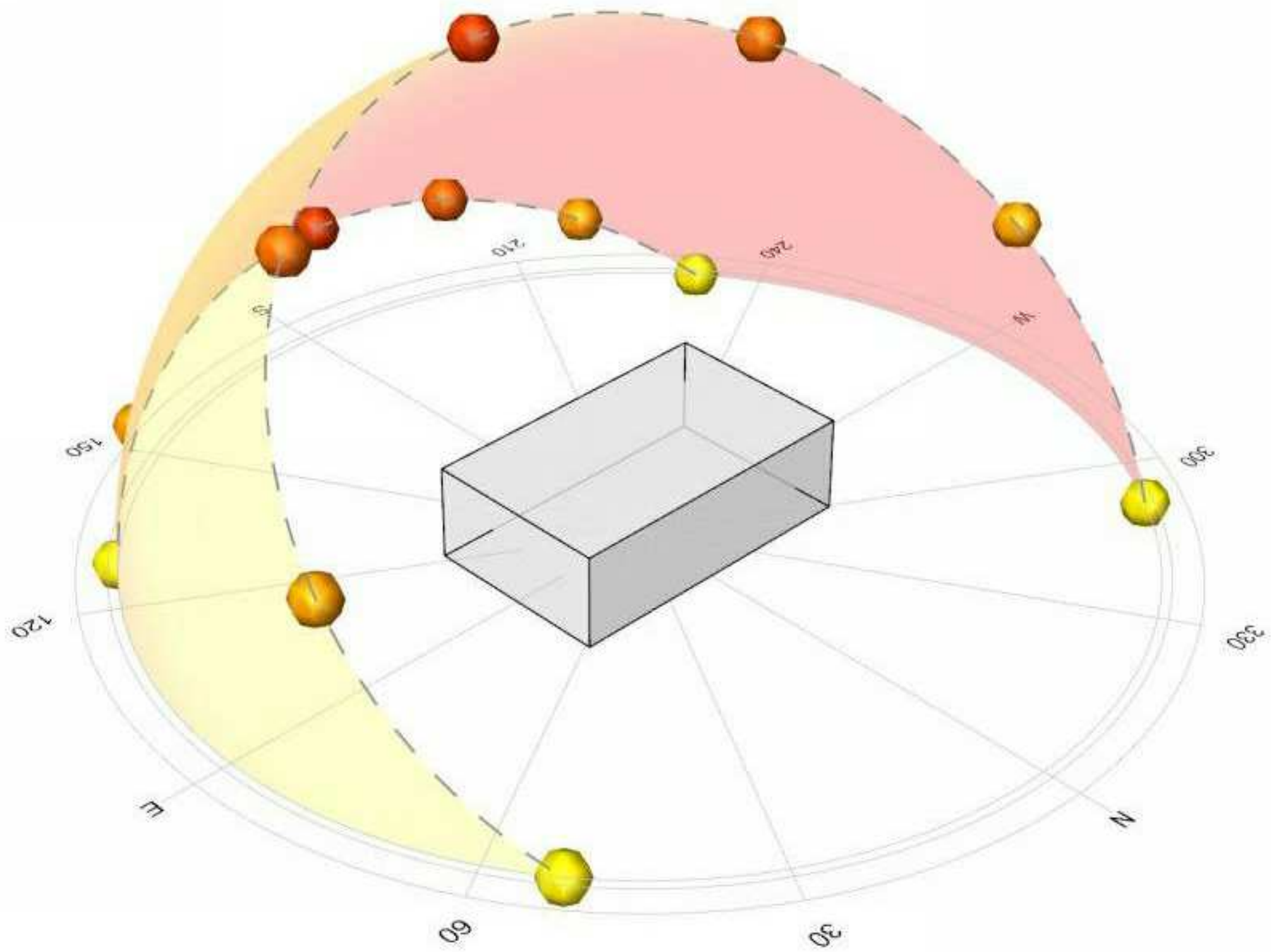
TEMPERATURE + COMFORT



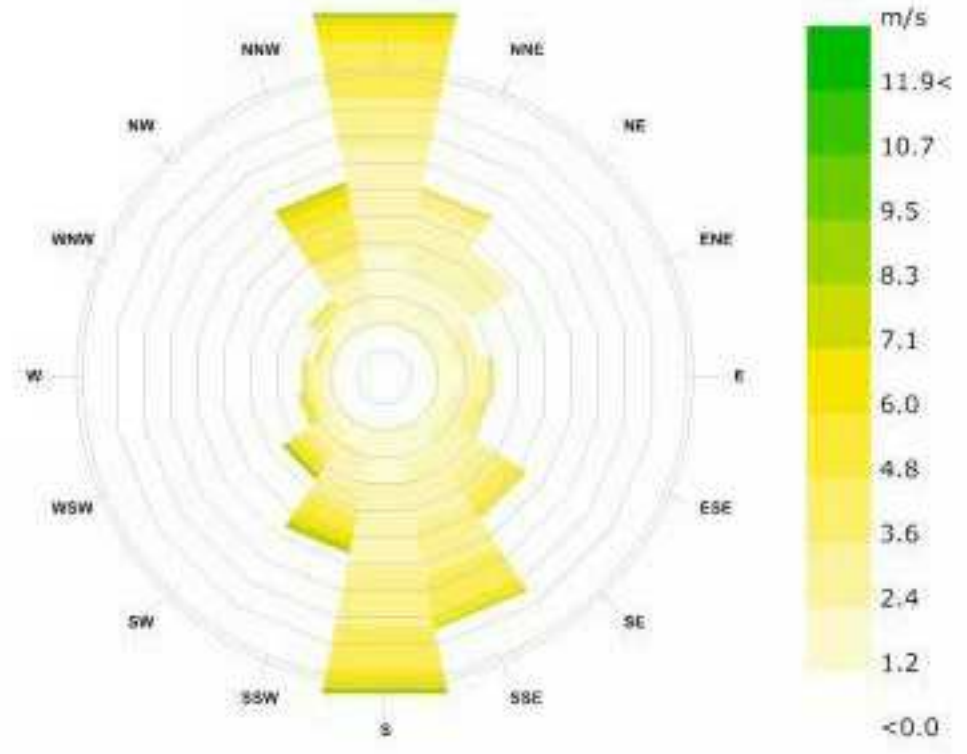
SUN ANGLES AT NOON ON WINTER AND SUMMER SOLSTICES (2' OVERHANG SHOWN)



SUNG ANGLE DURING HOTTEST TIME OF YEAR (2' OVERHANG SHOWN)



ANNUAL WIND ROSE - DRY BULB TEMPERATURE



ANNUAL WIND ROSE - WIND SPEED
(Most Frequent Wind from the South for 10.37% of the Year)

SCHEDULE

A & B

This forms part of application
DP20-011 / DVP20-0013

Planner Initials

AC

City of Kelowna

DEVELOPMENT PLANNING

SCHEDULE

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Initials

A & B

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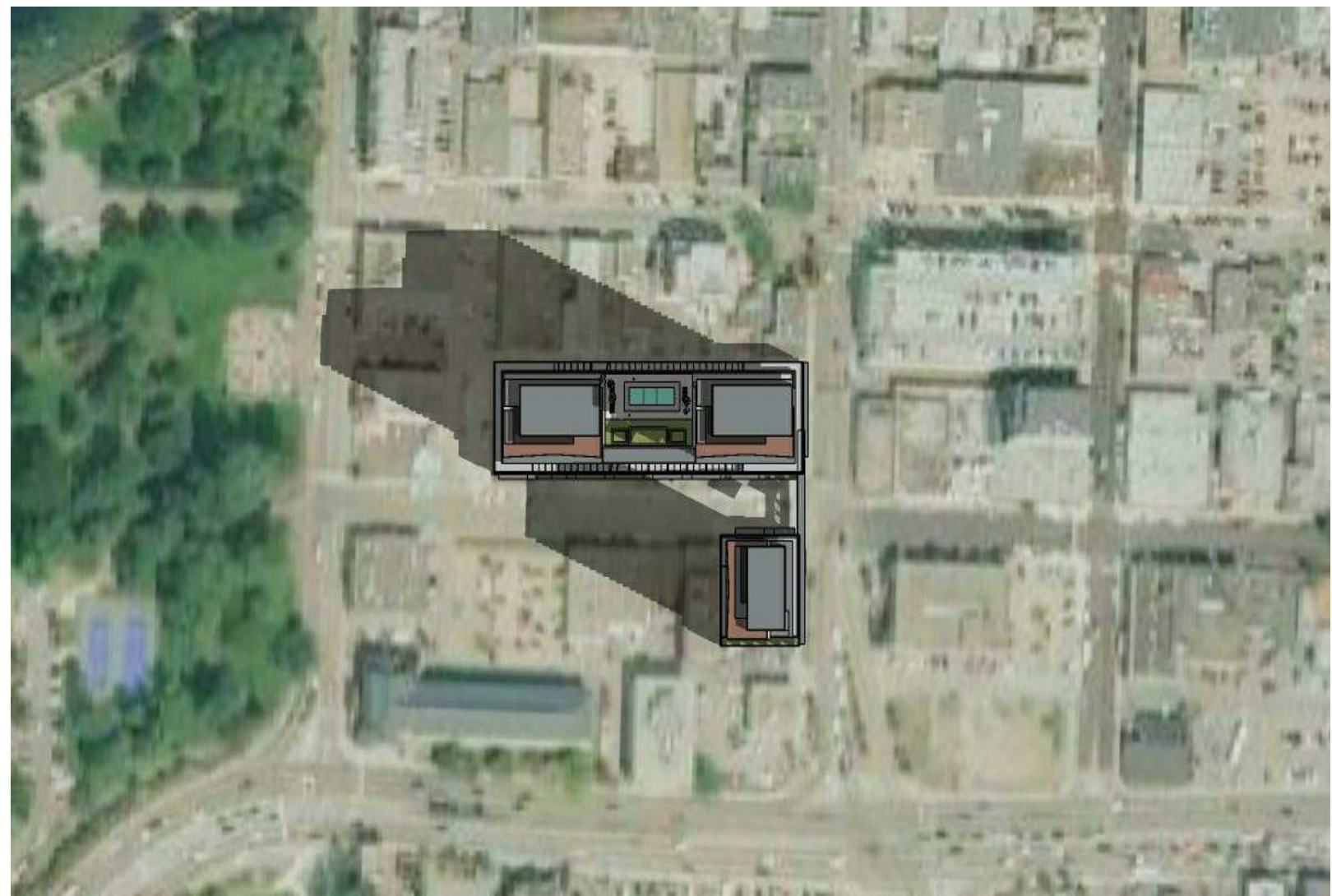
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MARCH 21 - 12:00PM



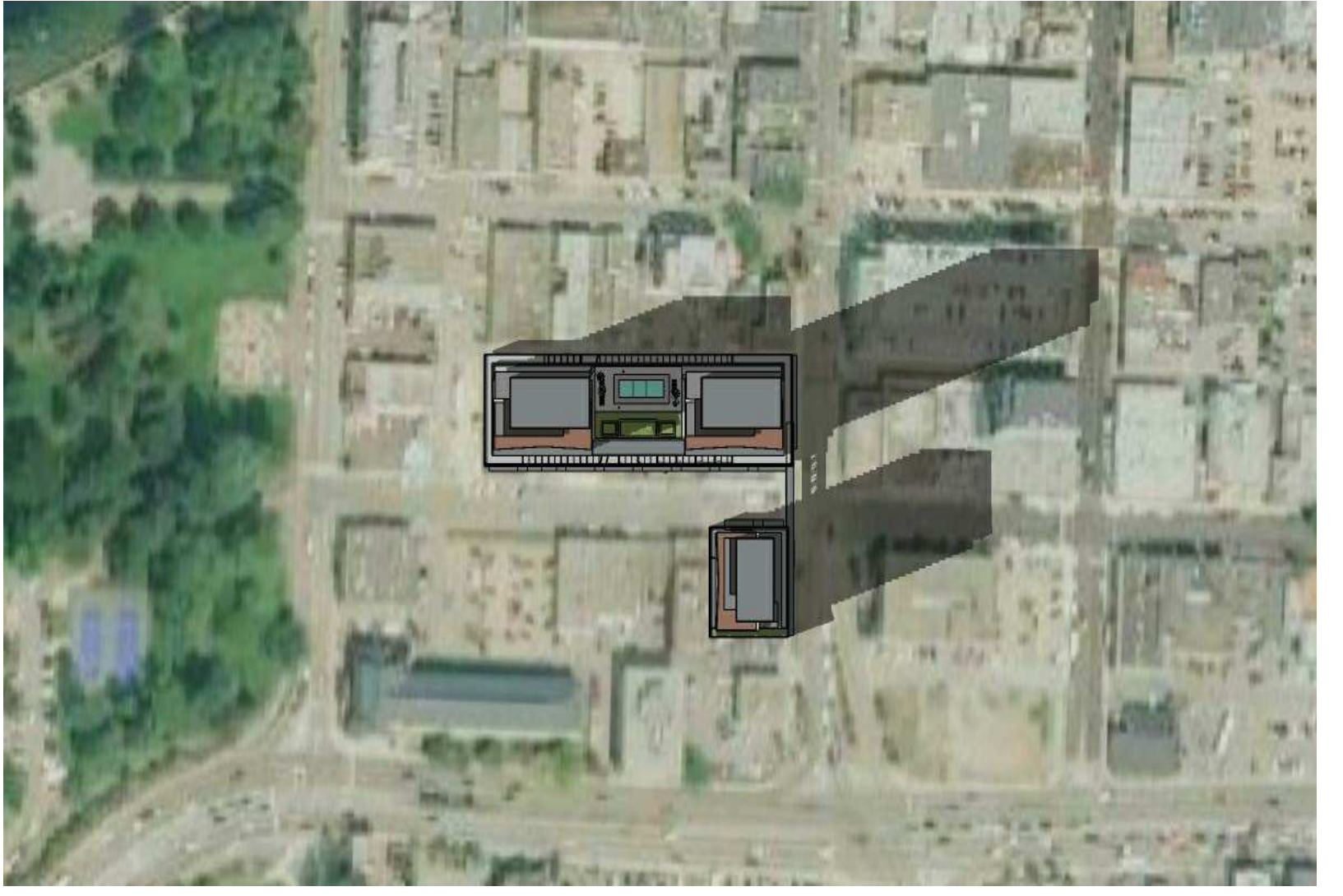
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JUNE 21 - 9:00AM



JUNE 21 - 12:00PM



JUNE 21 - 3:00PM



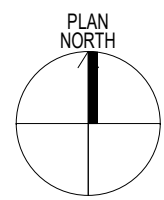
DECEMBER 21 - 9:00AM



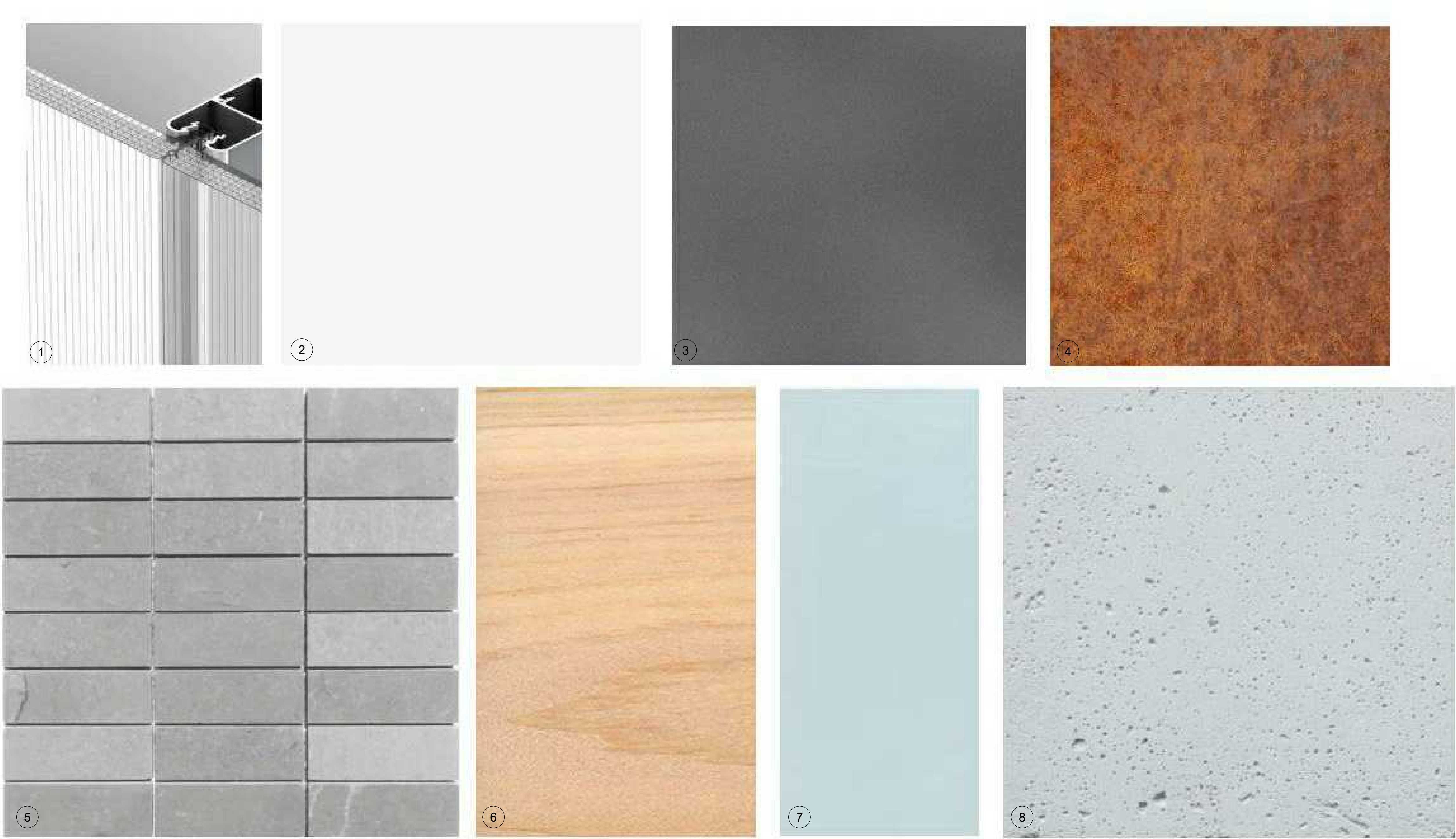
DECEMBER 21 - 12:00PM



DECEMBER 21 - 3:00PM



DP Revised 10/16/2020
Development Permit 20/12/2019



- ① POLYCARBONATE TRANSLUCENT PANELS
- ② PREFINISHED WHITE METAL CLADDING
- ③ PREFINISHED GREY METAL CLADDING
- ④ CORTEN
- ⑤ GREY BRICK VENEER
- ⑥ WOOD / CLT
- ⑦ FROSTED GLASS
- ⑧ NATURAL CONCRETE

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BIRDS' EYE VIEW LOOKING NORTH WEST



BIRDS' EYE VIEW LOOKING SOUTH WEST



BIRDS' EYE VIEW LOOKING SOUTH EAST



BIRDS' EYE VIEW LOOKING NORTH



LEON AVE VIEW LOOKING WEST



WATER STREET VIEW LOOKING NORTH WEST



KELOWNA PARK VIEW LOOKING EAST



BIRDS' EYE VIEW LOOKING NORTH EAST

CITY OF KELOWNA

MEMORANDUM

Date: February 6, 2020
File No.: DP20-0011
To: Community Planning (AC)
From: Development Engineering Manager (JK)
Subject: 278,264,266,248,238 234-236 Leon Ave, 1630, 1620 Water St. form and character



The Development Engineering Department has the following comments and requirements associated with this rezoning application. The road and utility upgrading requirements outlined in this report will be a requirement of this development.

The Development Engineering Technologist for this project is Ryan O'Sullivan

1. General

- a. The proposed Development triggers a traffic impact assessment. The applicant's transportation engineer shall contact the City's Development Engineering group who will determine the terms of reference for the study. Recommendations from the Traffic Impact Analysis (TIA) will become requirements of Building Permit.
- b. Comments below will be required at Building Permit.

2. Domestic Water and Fire Protection

- a. The subject property is not currently serviced. The developer's consulting mechanical engineer will determine the domestic and fire protection requirements of this proposed development. The City will model these flows to determine capacity/improvements. The applicant, at his cost, will arrange for the installation of a new service to this development.

3. Sanitary Sewer

- a. City of Kelowna's records indicate that this property is not currently serviced. The developer's consulting mechanical engineer will determine the development requirements of this proposed development and establish the service needs. The City will model these flows to determine capacity/improvements. Only one service will be permitted for this development. The applicant, at his cost, will arrange for the installation of one new larger service to this development.

4. Storm Drainage

- a. The developer must engage a consulting civil engineer to provide a storm water management plan for the site, which meets the requirements of the City Storm Water Management Policy and Design Manual. The storm water management plan must also include provision of lot grading plan, minimum basement elevation (MBE), if applicable, and recommendations for onsite drainage containment and disposal systems.

- b. On site storm drainage systems for the site will be reviewed and approved by Engineering when a site servicing design is submitted.
- c. There is a possibility of a high water table or surcharging of storm drains during major storm events. This should be considered in the design of the onsite system. No permanent pumping of groundwater to storm will be permitted.

5. Road Improvements

- a. Leon Ave fronting this development site is urbanized but the existing curb and sidewalk are in a deteriorated state. The existing driveways letdown will need to be removed and replaced with barrier curb and gutter and sidewalk. The upgrades to Leon Ave that are required are curb, gutter, boulevard street trees, driveway letdown and sidewalk removal and reconstruction, as well as the re-location or adjustment of any existing utility appurtenances if required to accommodate the upgrading construction.
- b. The laneways fronting this development will need to be upgraded with new pavement widening and a storm drainage system.
- c. Leon Ave will remain one way east bound way two lanes of traffic.
- d. Improvements and upgrades as per the Traffic Impact Assessment.

6. Road Dedication and Subdivision Requirements

- a. By Registered plan to provide the following
 - i. Dedicate 0.8m width along the North-South full lane frontage
 - ii. Dedication of a south east corner rounding
 - iii. Grant statutory rights-of-way if required for utility services
 - iv. Lot consolidation is required
 - v. Turning lanes as per Traffic Impact Assessment.



7. Electric Power and Telecommunication Services

- a. All proposed service connections are to be installed underground. It is the developer's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for these services, which would be at the applicant's cost
- b. Re-locate existing utilities, where necessary

8. Design and Construction

- a. Design, construction supervision and inspection of all off-site civil works and site servicing must be performed by a Consulting Civil Engineer and all such work is subject to the approval of the City Engineer. Drawings must conform to City standards and requirements.
- b. Engineering drawing submissions are to be in accordance with the City's "Engineering Drawing Submission Requirements" Policy. Please note the number of sets and drawings required for submissions.
- c. Quality Control and Assurance Plans must be provided in accordance with the Subdivision, Development & Servicing Bylaw No. 7900 (refer to Part 5 and Schedule 3).
- d. A "Consulting Engineering Confirmation Letter" (City document 'C') must be completed prior to submission of any designs.
- e. Before any construction related to the requirements of this subdivision application

commences, design drawings prepared by a professional engineer must be submitted to the City's Development Engineering Department. The design drawings must first be "Issued for Construction" by the City Engineer. On examination of design drawings, it may be determined that rights-of-way are required for current or future needs

9. Servicing Agreements for Works and Services

- a. A Servicing Agreement is required for all offsite works and services on City lands in accordance with the Subdivision, Development & Servicing Bylaw No. 7900. The applicant's Engineer, prior to preparation of Servicing Agreements, must provide adequate drawings and estimates for the required works. The Servicing Agreement must be in the form as described in Schedule 2 of the bylaw.
- b. Part 3, "Security for Works and Services", of the Bylaw, describes the Bonding and Insurance requirements of the Owner. The liability limit is not to be less than \$5,000,000 and the City is to be named on the insurance policy as an additional insured.

10. Other Engineering Comments

- a. Provide all necessary Statutory Rights-of-Way for any utility corridors as required.
- b. If any road dedication affects lands encumbered by a Utility right-of-way (such as Terasen, etc.) please obtain the approval of the utility prior to application for final subdivision approval. Any works required by the utility as a consequence of the road dedication must be incorporated in the construction drawings submitted to the City's Development Manager

11. Development Permit and Site Related Issues

- a. Provide all necessary Statutory Rights-of-Way for any utility corridors as required.
- b. If any road dedication affects lands encumbered by a Utility right-of-way (such as Fortis, etc.) please obtain the approval of the utility prior to application for final subdivision approval. Any works required by the utility as a consequence of the road dedication must be incorporated in the construction drawings submitted to the City's Development Manager.
- c. Access to the development will be from the lane only but will be discussed at drawing review.

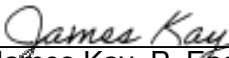
12. Geotechnical Study

- (a) Provide a geotechnical report prepared by a Professional Engineer competent in the field of hydro-geotechnical engineering to address the items below: NOTE: The City is relying on the Geotechnical Engineer's report to prevent any damage to property and/or injury to persons from occurring as a result of problems with soil slippage or soil instability related to this proposed subdivision. The Geotechnical reports must be submitted to the Development Services Department for distribution to the Development Engineering Branch and Inspection Services Division prior to submission of Engineering drawings or application for subdivision approval:
 - i. Area ground water characteristics, including any springs and overland surface drainage courses traversing the property. Identify any monitoring required.
 - ii. Site suitability for development.

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- iii. Site soil characteristics (i.e. fill areas, sulphate content, unsuitable soils such as organic material, etc.).
- iv. Any special requirements for construction of roads, utilities and building structures.
- v. Recommendations for items that should be included in a Restrictive Covenant.
- vi. Any items required in other sections of this document.
- vii. Drill and / or excavate test holes on the site and install piezometers if necessary. Log test hole data to identify soil characteristics, identify areas of fill if any. Identify unacceptable fill material, analyse soil sulphate content, identify unsuitable underlying soils such as peat, etc. and make recommendations for remediation if necessary.

Additional geotechnical survey may be necessary for building foundations, etc


James Kay, P. Eng.
Development Engineering Manager

RO





HDR Architecture Associates Inc.
210 Hastings Avenue
Penticton, BC
V2A 2V6



December 20, 2019 (October 15 2020)

City of Kelowna Planning and Development Services
1435 Water Street
Kelowna BC, V1Y 1J4

RE: WATER STREET by the Park, 234-278 Leon Ave & 1620-1630 Water Street
Design Rationale: Development Permit Submission

To whom it may concern,

Anthony Beyrouthi has commissioned our firm, HDR Architecture Associates, Inc., to provide architectural design services for the development permit application (development variance permit) for a new purpose built mixed use development (650 suites total + CRU) at 234-278 Leon Ave & 1620-1630 Water Street in Kelowna.

A new mass timber pedestrian bridge is proposed to connect both sites across Leon Avenue; providing joint access to parking and a new gateway to Kelowna City Park. Parking (727 stalls) are provided for both sites on the north side of Leon Ave with one level underground and the remaining above grade. The parking structure is concealed by a double height CRU space and a gently curving mass timber (glulam) and polycarbonate external screen. The open parking structure will allow light to wash through the mass timber supporting structure and polycarbonate screen; providing a warm glow to the streetscape below (refer to cover sheet).

The CRU space at grade will help rejuvenate and enliven the streetscape; the public realm modifications allow for soft and hard landscaping treatments (refer to L1). Angled parking on the north side of Leon Avenue is replaced with parallel parking (similar to the south side of the street); this allows a more generous pedestrian oriented streetscape with an additional bike lane. Greening of the street will act as a natural gateway to one of Kelowna's most precious resources (City Park and the waterfront). A continuous CLT (cross laminated timber) canopy at street level provides protection from the elements; activities within the building are visible through the glazed façade to activate the street (eyes on the street for security).

There are many good reasons to explore the full potential of wood, as a viable option to steel and concrete, but as architects, our primary interest is in the fact that wood sequesters carbon dioxide at a rate of 1-1.2 tons/m³ of wood. In a world where the construction industry is responsible for 40-

hdrinc.com/ca

210 Hastings Avenue, Vancouver, BC, CA V6G 2Z6A 2V6
T (604) 687-1898

Registered Architects: Jim Aalders, Architect AIBC, AAA, MRAIC, LEED AP Veronica Gillies, Architect AIBC, FRAIC, LEED AP BD+C
Troy Ransdell, Architect AIBC Rod Windjack, Architect AIBC, MRAIC, LEED AP

50% of CO2 emissions, renewable materials, such as wood, can mitigate the rate of global warming. With massive human migration occurring in developing countries, such as Asia and South America, triggering a massive building boom, new forms of construction for housing must be explored that are viable solutions to the traditional multi storey, concrete, apartment block that are commonly constructed in these areas. This development is proposing to use wood in strategic locations to maximize the benefits.

The current C7 (Central Business Commercial) zoning will accommodate the scheme presented except for the following variances (3) and text amendment:

1 - HEIGHT VARIANCE: THE DEVELOPMENT IS 58.2 M HIGHER THAN THE ZONE ALLOWS (76.5 M), HOWEVER THE TOWERS MATCH THE CITY'S VISION FOR THE FUTURE OF THIS ZONE (OCP), THE FAR IS COMPLIANT WITH THE ZONING BYLAW.

2 - PARKING VARIANCE: THE 727 PARKING STALLS PROVIDED MEETS (EXCEEDS) THE REQUIRED 709 STALLS, HOWEVER 24 OF THE STALLS ARE "MODIFIED COMPACT STALLS @ 3.4m x 2.5m", WHICH HAVE BEEN APPROVED FOR USE AS PER DISCUSSIONS WITH COK PLANNING DEPARTMENT.

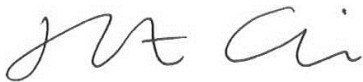
3 - SHORT TERM BIKE PARKING: THE CALCULATIONS PROVIDED IN THE BYLAW ARE MEANT FOR SMALLER DEVELOPMENTS; THE 150 REQUIRED PER THE CURRENT BYLAW EXCEEDS ANY TEMPORARY USE IN THIS DEVELOPMENT. THUS A SHORTFALL OF 122.

LONG TERM BIKE PARKING: RATIO OF WALL MOUNTED BIKE SPACES; SHORTFALL OF 93, HOWEVER, WE HAVE AN EXCESS OF FLOOR MOUNTED LONG TERM STALLS OF 136. TOTAL 566 STALLS PROVIDED (EXCESS OF 43).

Towers A and B are oriented East West with a slight v shaped deck articulation to accentuate the slender form as seen from Harvey Avenue. The translucent glass guards on the tower balconies provide a sculptural aesthetic while minimizing the visual impact of ones possessions. This proposal will be a positive contribution to our community by allowing more housing and commercial opportunities and allowing densification in an area which is within the downtown core and its associated amenities. This project is in close proximity to bike and walking trails and a viable alternative to urban sprawl and hope for a reduction in vehicular reliance. The developer would like to work with the City of Kelowna to provide a public contribution for community benefit; to help combat the housing crisis.

Sincerely,

HDR Architecture, Inc.



Robert Cesnik ARCHITECT AIBC, MRAIC, LEED AP BD+C
Associate

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ATTACHMENT		C
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Water Street by the Park – Final

Version 2

Transportation Impact Assessment

Completed for Anthony Beyrouti

234-278 Leon Avenue & 1620-1630 Water Street, Kelowna, BC

August 18, 2020



The material in this report, "Water Street by the Park Transportation Impact Assessment", reflects HDR's professional judgment considering the scope, schedule and other limitations stated in the document and in the contract between HDR and the client. The opinions in the document are based on conditions and information existing at the time the document was published and do not consider any subsequent changes. In preparing the document, HDR did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that HDR shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party resulting from decisions made or actions taken based on this document.

Version	Date Issued	Authored By	Quality Review
FINAL	June 15, 2020	Lynn Machacek	Stephen Power
FINAL Version 2	August 18, 2020	Lynn Machacek	Stephen Power



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1 Introduction

Anthony Beyrouti is proposing a mixed-use commercial and residential development on the northwest and southwest corners of the intersection of Leon Avenue and Water Street in downtown Kelowna. The City of Kelowna has requested a Transportation Impact Assessment (TIA) for the development, and HDR has been retained to conduct the study.

The proposed development will include 550 residential condo units, 198 short term rental units, and 44,201 ft² of commercial / retail space, and will be split into two sites. For the north site, pedestrian access will be from the building frontages on Leon Avenue and Water Street, and vehicle access will be from the lane north of the site (between Leon and Lawrence Avenues). Four loading spaces will be provided in the rear lane, and two on-street parking spaces on the north side of Leon Avenue will be reserved as short term pick-up drop-off, and will be able to be used by larger loading vehicles. The public lane can be accessed from Lawrence Avenue, Leon Avenue, or Water Street.

For the south site, pedestrian access will also be from the frontages on Leon Avenue and Water Street, and a loading area is provided south of the site off of the lane. All parking for the development will be accommodated with a parkade on the north site, and both sites will be connected with an overhead walkway over Leon Avenue. The development plan includes the reconfiguration of Leon Avenue. This includes changes from angled to parallel parking, the addition of an eastbound buffered cycle track, and wider sidewalks on the north side of the street.

1.1 Scope of Work

The following study follows the scope of work provided to HDR by the City of Kelowna. A high level summary of the scope is provided below, and the full scope can be found in Appendix A. This report has been updated based on comments received by the City of Kelowna, and a log of the comments and revisions are also included in Appendix A.

- Estimate future site trip generation for the site based on the proposed uses
- Distribute and assign the site generated traffic from the site onto the local street network
- Evaluate existing, background, and future vehicle operations at:
 - Water Street & Bernard Avenue
 - Water Street & Lawrence Avenue
 - Water Street & Leon Avenue
 - Water Street / Pandosy Street & Harvey Avenue
 - Abbott Street & Leon Avenue
 - Lane access on Lawrence Avenue, Water Street and Leon Avenue
- Confirm the future laning and traffic control on the study area network, and provide recommendations if deficient.
- Review active transportation and transit networks around the site.
- Review the site access and loading, including loading vehicle swept paths.
- Review the future operation of Leon Avenue.
- Conduct a sensitivity analysis of relocating a parkade entrance onto Leon Avenue

2 Existing Conditions

2.1 Site Location & Context

The proposed development site is located in downtown Kelowna, on the northwest and southwest corners of the intersection of Water Street and Leon Avenue. The proposed “site” consists of two separate locations, one rectangular site on the north side of Leon Avenue, and a square site on the south side. The two individual sites will be connected by an overhead pedestrian bridge, providing access to the southern site from the parkade within the north site. The site is one block north of Harvey Avenue / Highway 97, and one block east of Kelowna City Park and Abbott Street.

The downtown Kelowna area has a gridded block structure, with close spacing between avenues (~100 m), and longer spacing between streets (~200 m).

Notable destinations in the area include Kelowna City Hall, Arts District and Prospera Place a few blocks to the north, City Park to the west, and the Chapman Parkade and the Queensway Transit Exchange to the northeast.

Figure 1 shows the location of the site and the study area intersections.

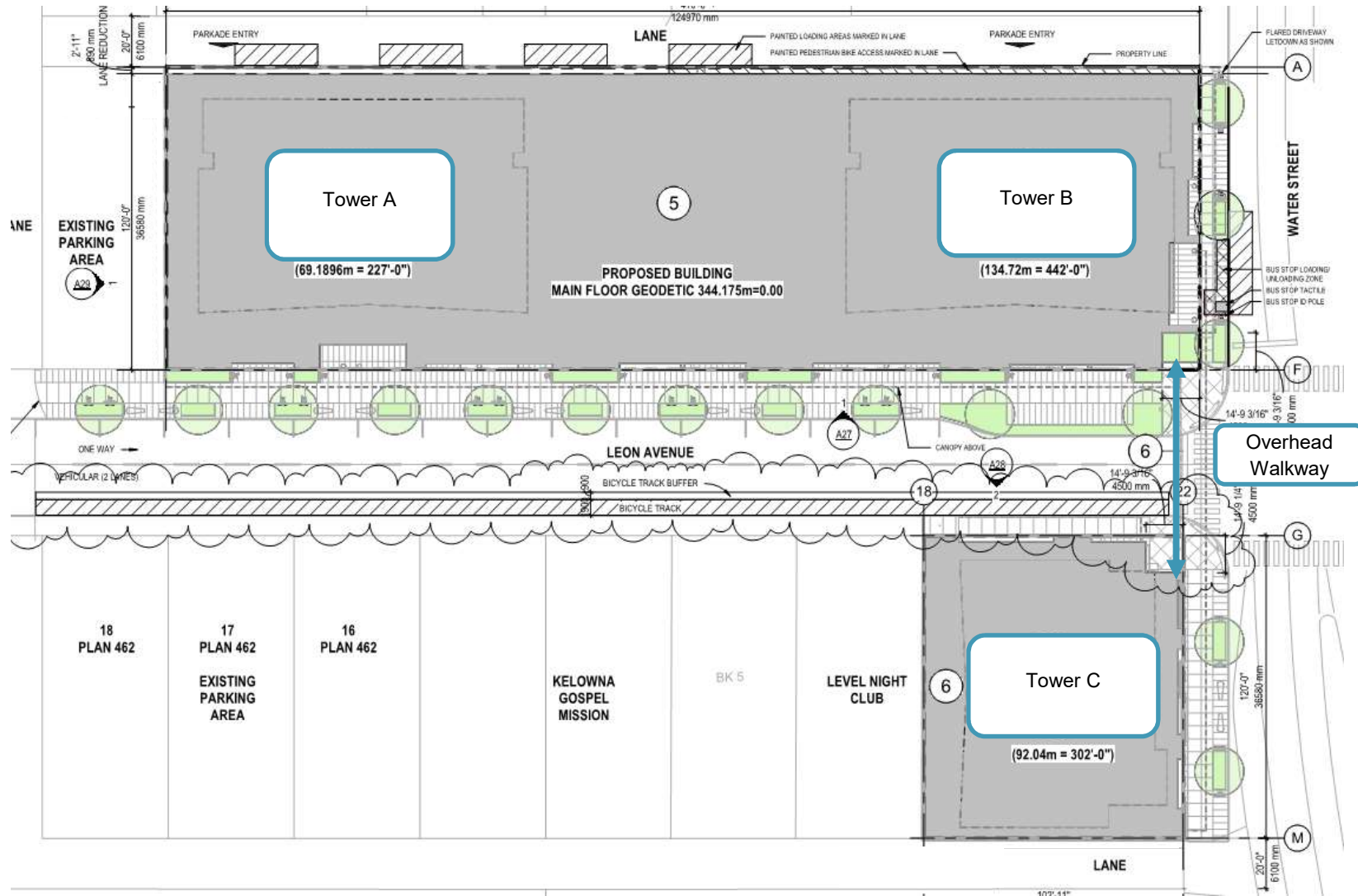
Figure 2 shows the ground floor site plan. Vehicle access will be provided from two parkade accesses on the lane north of the north site.



Figure 1: Site Location and Study Area Context



Figure 2: Site Plan



2.2 Transportation Network

2.2.1 Active Transportation

Figure 4 shows the existing walking and cycling facilities near the site, and includes the location of the nearby transit exchange and bus stops.

Sidewalks are provided on both sides of all streets near the study site, and crosswalks are provided on all legs of the study intersections, except on some legs at the intersections of Harvey Avenue / Water Street and Leon Avenue / Abbott Street. Curb ramps are provided at most of the corners of the study area intersections, and curb extensions are also provided at some intersection corners.

There are a variety of cycling facilities, including shared-use pathways, bicycle lanes, and cycle tracks in the study area. These facilities provide connections to the site from the north, south and west, but there are no close by facilities for travel to/from the east.

The City of Kelowna has identified future active transportation facilities near the development site in the Pedestrian and Bicycle Master Plan¹, including a cycle track on Leon Avenue, from Abbott Street eastward, bicycle lanes on Water and Ellis Streets, and a shared-use pathway on Pandosy Street, north of Leon Avenue.



Figure 3: Curb Extension and Ramps on the NW corner of Water Street / Leon Avenue

Source: Google Maps

2.2.2 Transit

There are two bus stops near the development site. Bus stop #102868 is located on the east frontage of the site, and the northbound stop #102869 is southeast of the intersection of Leon Avenue and Water Street. Both stops serve Route 1 - Lakeshore. The Queensway Transit Exchange is located three blocks to the northeast of the study site, and is the terminus for a number of different bus routes. All routes near the site (including at the Queensway Exchange) are shown Table 1, and the headway of each route at certain times in the day is indicated.

¹ Pedestrian and Bicycle Master Plan, April 2016, City of Kelowna

Table 1: Transit Routes & Headways

Route			Headway (min)				
#	Name	Location	AM Peak	Mid-day	PM Peak	Evening	Saturday
1	Lakeshore	102868 / 102869	15	30	15	60	30
2	North End Shuttle	Queensway Exchange	30	30	30	60	30
5	Gordon		30	30	30	60	30
6	Glenmore / UBCO Exchange		70	70	70	-	60
9	Shopper Shuttle		Infrequent service throughout the day				
10	North Rutland		20	30	20	45	30
11	Rutland		15	30	30	60	30
18	Glenmore / Downtown		25	40	30	45	60
97	Okanagan		15	30	15	30	30

Source: BC Transit

Fall 2019 ridership data for the two bus stops near the site were obtained from the City of Kelowna. Out of a total of 964 bus stops in the region, bus stops 102868 and 102869 rank as the 144th and 248th busiest bus stops in the network, with stop 102868 being a popular stop for boarding and 102869 being a popular stop for alighting.

With the nearby Queensway Exchange, and the significant number of routes available, transit in the area is considered to be sufficient to accommodate the future transit trips from the site.

Figure 4: Active Transportation and Transit



2.3 Existing Traffic Volumes & Operation

2.3.1 Vehicle Network

Figure 5 shows the current laning configurations and traffic controls within the study area. The site is oriented around Leon Avenue, a two-lane one-way eastbound street, with angled parking on the north side and parallel parking on the south. Water Street bounds the east side of the site, and it is a two-way four-lane street that provides a north-south connection between downtown Kelowna, the waterfront, and Harvey Avenue. The speed limit in the study area is 50 km/h. There is T-shaped public lane configuration on the north side of the north site, and the lane connects to Lawrence Avenue, Leon Avenue, and Water Street.

2.3.2 Traffic Volumes

Existing traffic volumes and signal timing plans were provided to HDR by the City of Kelowna, and are included in Appendix B. A summary of the counts is provided in Table 2.

Table 2: Turning Movement Count Dates

Intersection	Count Date
Water Street & Bernard Avenue	Thursday May 24, 2018
Water Street & Lawrence Avenue	Tuesday November 3, 2015
Water Street & Leon Avenue	Wednesday May 1, 2019
Water Street / Pandosy Street & Harvey Avenue	Tuesday June 19, 2018
Abbott Street / Leon Avenue	Tuesday June 19, 2018

The existing traffic counts were balanced up to create a set of “Existing Balanced” volumes, and existing turning movement volumes were estimated at the public lanes accesses on Lawrence Avenue, Leon Avenue, and Water Street. The Existing Balanced volumes are shown in Figure 6.

2.3.3 Intersection Analysis Methodology

To assess the capacity and operation of the vehicle network, we conducted traffic analysis using Synchro 9, and provided results based on Highway Capacity Manual (HCM) 2010 methodology. Level of Service (LOS) definitions are shown in **Table 3**. The HCM defines LOS for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated per movement, approach or for the entire intersection.

Table 3: Highway Capacity Manual Level of Service Definitions for Intersections

LOS	Signalized Intersection Average Vehicle Control Delay	Unsignalized Intersection Average Vehicle Control Delay
A	≤10 sec	≤10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	≥80 sec	≥50 sec

The City of Kelowna did not provide specific performance thresholds for the study. Instead, HDR has indicated (highlighted) where movements are approaching typical performance thresholds (movements that exceed LOS D, a v/c ratio of 0.90, or a 95th percentile queue greater than available storage). We provide commentary on each instance where this occurs, and recommendations for monitoring or mitigation measures.

It is also noted that while loading will periodically occur in the lane south of the south site, no vehicle parking is provided directly on this site, and so the lane and accesses to it from the street network have not been modelled.



Figure 5: Laning Configurations and Traffic Control

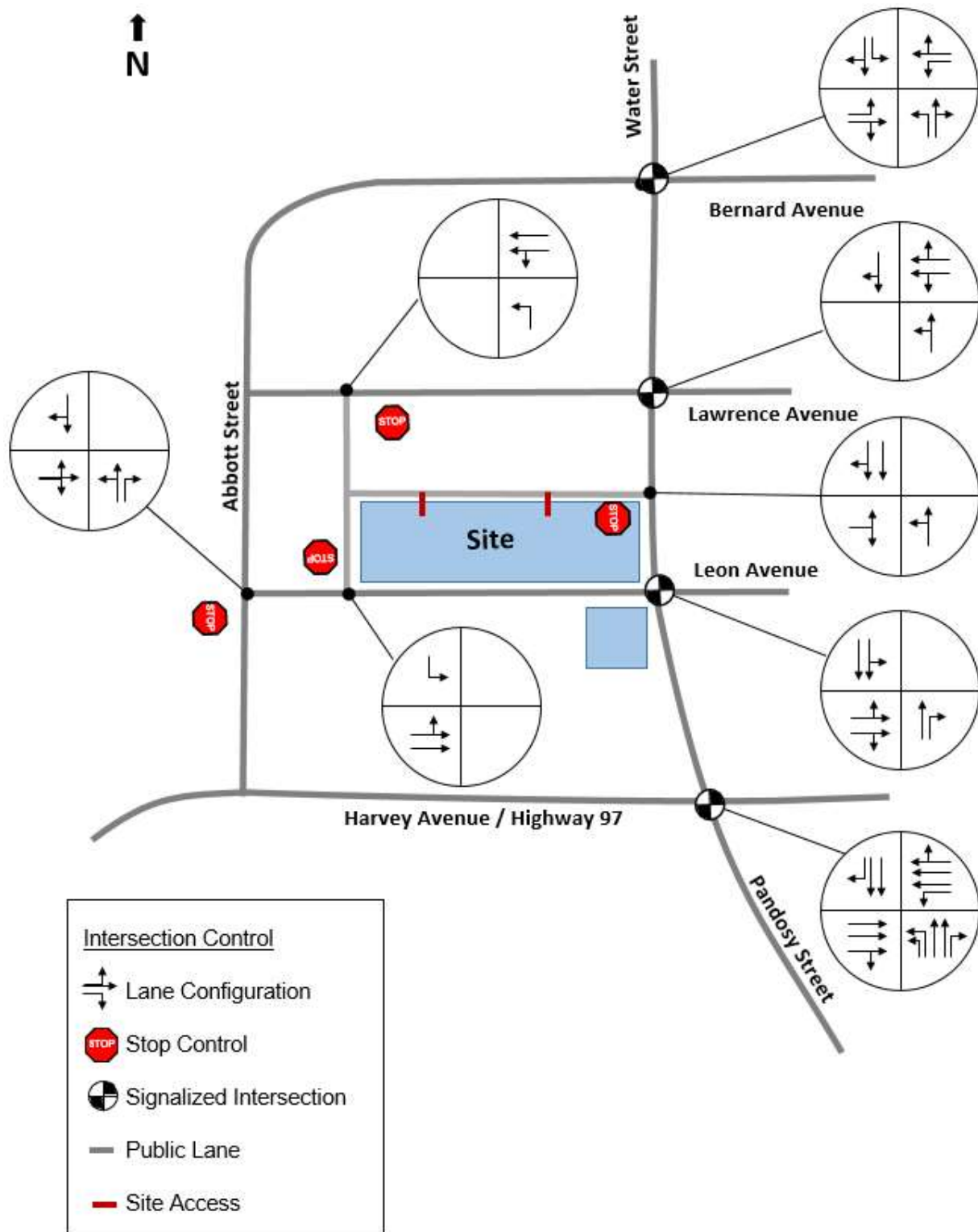
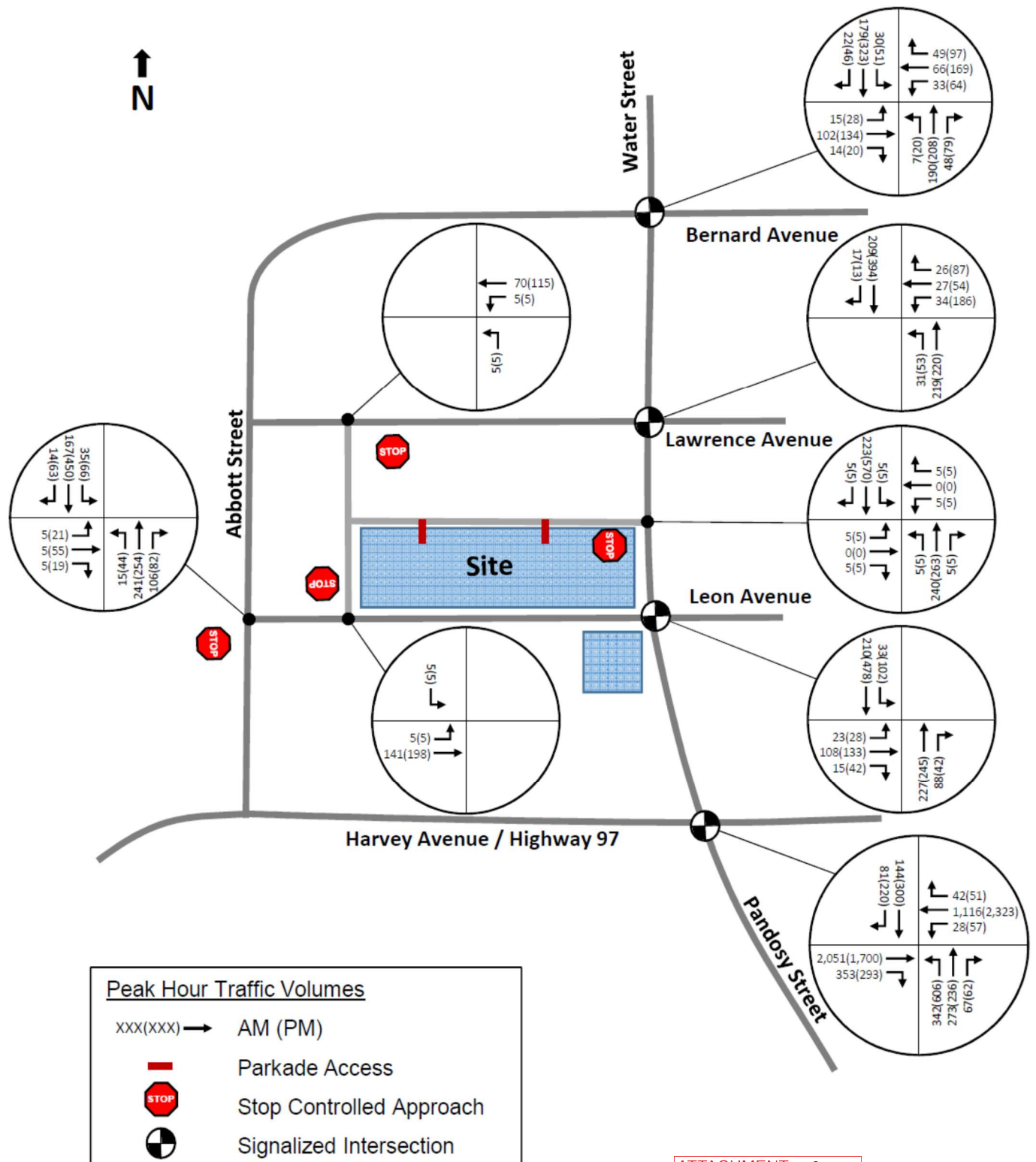


Figure 6: Existing Balanced Traffic Volumes



2.3.4 Existing Traffic Operations

Vehicle operations were assessed based on the existing road network and volumes. Existing traffic operations at the study area intersections are shown in Table 4 and Table 5.

Table 4: Existing Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.*	LOS	Delay (s)	v/c	95 th Q	Vol.	LOS	Delay (s)	v/c	95 th Q
Water Street & Bernard Avenue - Signal	EBL	1	15	B	19	0.05	3	28	C	30	0.14	8
	EBTR	1	102/14	B	18	0.29	23	134/20	B	19	0.34	36
	WBL	1	33	B	19	0.11	7	64	C	24	0.23	17
	WBTR	1	66/49	B	18	0.33	23	169/97	C	25	0.71	72
	NBL	1	7	B	15	0.01	2	20	A	2	0.05	2
	NBTR	1	190/48	B	16	0.31	54	208/79	A	2	0.40	5
	SBL	1	30	B	12	0.07	5	51	A	10	0.10	8
	SBTR	1	179/22	A	8	0.26	29	323/46	B	14	0.50	74
	Total		-	B	14	-	-	-	B	15	-	-
Water Street & Lawrence Avenue - Signal	WBLTR	2	34/27/26	C	21	0.16	10	186/54/87	C	28	0.55	53
	NBLT	2	31/219	A	0	0.23	2	53/220	A	1	0.27	2
	SBTR	1	209/17	B	11	0.21	48	394/13	A	1	0.37	4
	Total		-	A	8	-	-	-	A	10	-	-
Abbott Street & Leon Avenue – Stop Control	EBLTR	1	5/5/5	A	9	0.01	1	21/55/19	D	26	0.38	2
	NBLT	1	15/241	A	8	0.01	0	44/255	A	9	0.05	0
	NBR	1	106	A	0	0.01	0	82	A	0	0.00	0
	SB	1	35/167/14	A	8	0.03	0	66/450/63	A	1	0.06	0
	Total		-	A	1	-	-	-	A	3	-	-
Water Street & Leon Avenue - Signal	EBLTR	2	23/108/15	C	21	0.24	16	28/133/42	C	28	0.35	30
	NBT	1	227	A	6	0.22	26	245	A	5	0.21	30
	NBR	1	88	A	5	0.10	9	42	A	4	0.05	5
	SBLT	2	33/210	A	0	0.14	1	102/478	B	15	0.30	74
	Total		-	A	7	-	-	-	B	15	-	-
Harvey Avenue & Water Street /Pandosy Street - Signal	EBTR	3	2051/253	B	17	0.74	257	1700/293	C	28	0.77	249
	WBL	1	28	D	54	0.35	19	57	F	97	0.68	47
	WBTR	3	1116/42	B	10	0.37	93	2323/51	D	38	0.88	341
	NBL	2	342	F	84	0.89	105	606	F	102	1.02	233
	NBT	2	273	D	49	0.38	68	236	C	35	0.21	52
	NBR	1	67	A	0	0.00	0	62	A	0	0.00	0
	SBT	2	144	F	88	0.79	51	300	E	64	0.79	83
	SBR	1	81	A	0	0.00	0	220	A	0	0.00	0
	Total		-	C	25	-	-	-	D	42	-	-

Note: For lane groups with more than one movement, the volume for each movement is shown in the order indicated in the Movement / Lane column, and in the order left/through/right

Table 5: Existing Traffic Operations - Lane Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	LOS	Delay (s)	v/c	95 th Q	Vol.	LOS	Delay (s)	v/c	95 th Q
Lawrence Avenue & Lane – Stop Control	WBLT	2	5/70	A	1	0.00	0	5/115	A	0	0.00	0
	NBL	1	5	A	9	0.01	0	5	A	9	0.01	0
	Total		-	A	1	-	-	-	A	1	-	-
Water Street & Lane – Stop Control	EB	1	5/0/5	B	12	0.02	0	5/0/5	C	17	0.04	0
	WB	1	5/0/5	B	11	0.02	0	5/0/5	B	13	0.02	0
	NB	2	5/240/5	A	0	0.00	0	5/263/5	A	0	0.01	0
	SB	2	5/223/5	A	0	0.00	0	5/570/5	A	0	0.01	0
	Total		-	A	1	-	-	-	A	1	-	-
Leon Avenue & Lane – Stop Control	EBLT	2	5/141	A	0	0.00	0	5/198	A	0	0.00	0
	SBL	1	5	A	9	0.01	0	5	A	7	0.00	0
	Total		-	A	1	-	-	-	A	0	-	-

The intersection of Harvey Avenue and Water Street is the only intersection that will have movements operating beyond traditional performance thresholds. The City of Kelowna requested that no changes be made to this highway intersection, and so existing signal timings have been maintained for the rest of this study.

2.4 Future Background

To incorporate some future traffic growth on the network (representative of 5 to 10 years at a 1-2% growth rate), existing traffic volumes were grown at a blanket 10% to show what operations would be like if traffic grew in the area.² Figure 7 shows the future background traffic volumes, and Table 6 through Table 8 show the future background traffic operations. The analysis at the intersection of Highway 97 and Water Street / Pandosy includes a new eastbound right turn lane to be added in the near future.

Table 6: Future Background Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Bernard Avenue – Signal	EBL	1	17	B	20	0.06	3	31	C	30	0.16	9
	EBTR	1	112/15	B	18	0.31	25	147/22	B	19	0.35	40
	WBL	1	36	B	20	0.12	8	70	C	23	0.24	17
	WBTR	1	73/54	B	18	0.36	26	186/107	C	26	0.73	79
	NBL	1	8	B	16	0.02	2	22	A	4	0.07	3
	NBTR	1	209/53	B	17	0.34	59	229/87	A	2	0.46	5
	SBL	1	33	B	13	0.08	6	56	B	11	0.12	10
	SBTR	1	197/24	A	9	0.29	32	355	A	16	0.57	85
	Total		-	B	15	-	-	-	B	15	-	-
Water Street & Lawrence Avenue – Signal	WBLT	2	37/30/29	C	21	0.17	11	205/59/96	C	28	0.58	59
	NBLT	2	34/241	A	1	0.25	2	58/242	A	1	0.31	3
	SBTR	1	230/19	B	12	0.23	53	433/14	A	1	0.41	4
	Total		-	A	8	-	-	-	A	9	-	-
Abbott Street & Leon Avenue – Stop Control	EBLT	1	6/6/6	B	12	0.04	1	23/61/21	D	34	0.49	19
	NBTL	1	17/265	A	7	0.01	0	48/279	A	9	0.06	1
	NBR	1	117	A	0	0.00	0	90	A	0	0.00	0
	SBLT	1	39/184/15	A	8	0.04	1	73/495/69	A	8	0.07	1
	Total		-	A	1	-	-	-	A	4	-	-
Water Street & Leon Avenue - Signal	EBLT	2	25/119/17	C	21	0.26	18	31/146/46	C	28	0.39	33
	NBT	1	250	A	6	0.24	29	270	A	5	0.24	34
	NBR	1	97	A	5	0.11	11	46	A	4	0.05	5
	SBTL	2	36/231	A	0	0.15	2	112/526	B	16	0.34	81
	Total		-	A	7	-	-	-	B	15	-	-

² A 10% growth value was used based on discussion with the City of Kelowna.

Table 7: Future Background Traffic Operations – Street Intersections Continued

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Harvey Avenue & Water Street/ Pandoso Street - Signal	EBT	3	2256	B	15	0.70	213	1870	C	25	0.72	214
	EBR	1	388	A	0	0.00	0	322	A	0	0.00	0
	WBL	1	31	D	46	0.34	19	63	F	87	0.66	49
	WBTR	3	1228/46	B	11	0.41	98	2555/56	D	45	0.98	440
	NBL	2	376	F	92	0.93	116	667	F	136	1.12	274
	NBT	2	300	D	50	0.41	74	260	C	35	0.23	57
	NBR	1	74	A	0	0.00	0	68	A	0	0.00	0
	SBT	2	158	F	100	0.86	59	330	E	67	0.84	91
	SBR	1	89	A	0	0.00	0	242	A	0	0.00	0
Total			-	C	26	-	-	-	D	52	-	-

Table 8: Future Background Traffic Operations - Lane Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Lawrence Avenue & Lane – Stop Control	WBLTR	2	6/77	A	0	0.01	0	6/127	A	7	0.01	0
	NBL	1	6	A	7	0.01	0	6	A	9	0.01	0
	Total		-	A	1	-	-	-	A	1	-	-
Water Street & Lane – Stop Control	EB	1	6/0/6	B	12	0.03	1	6/0/6	C	19	0.05	1
	WB	1	6/0/6	B	12	0.02	1	6/0/6	B	14	0.03	1
	NB	2	6/264/6	A	0	0.01	0	6/289/6	A	0	0.01	0
	SB	2	6/256/6	A	0	0.01	0	6/627/6	A	0	0.01	0
	Total		-	A	1	-	-	-	A	1	-	-
Leon Avenue & Lane – Stop Control	EBLT	2	6/156	A	0	0.01	0	6/218	A	7	0.01	0
	SBL	1	6	A	7	0.01	0	6	A	0	0.01	0
	Total		-	A	1	-	-	-	-	0	-	-

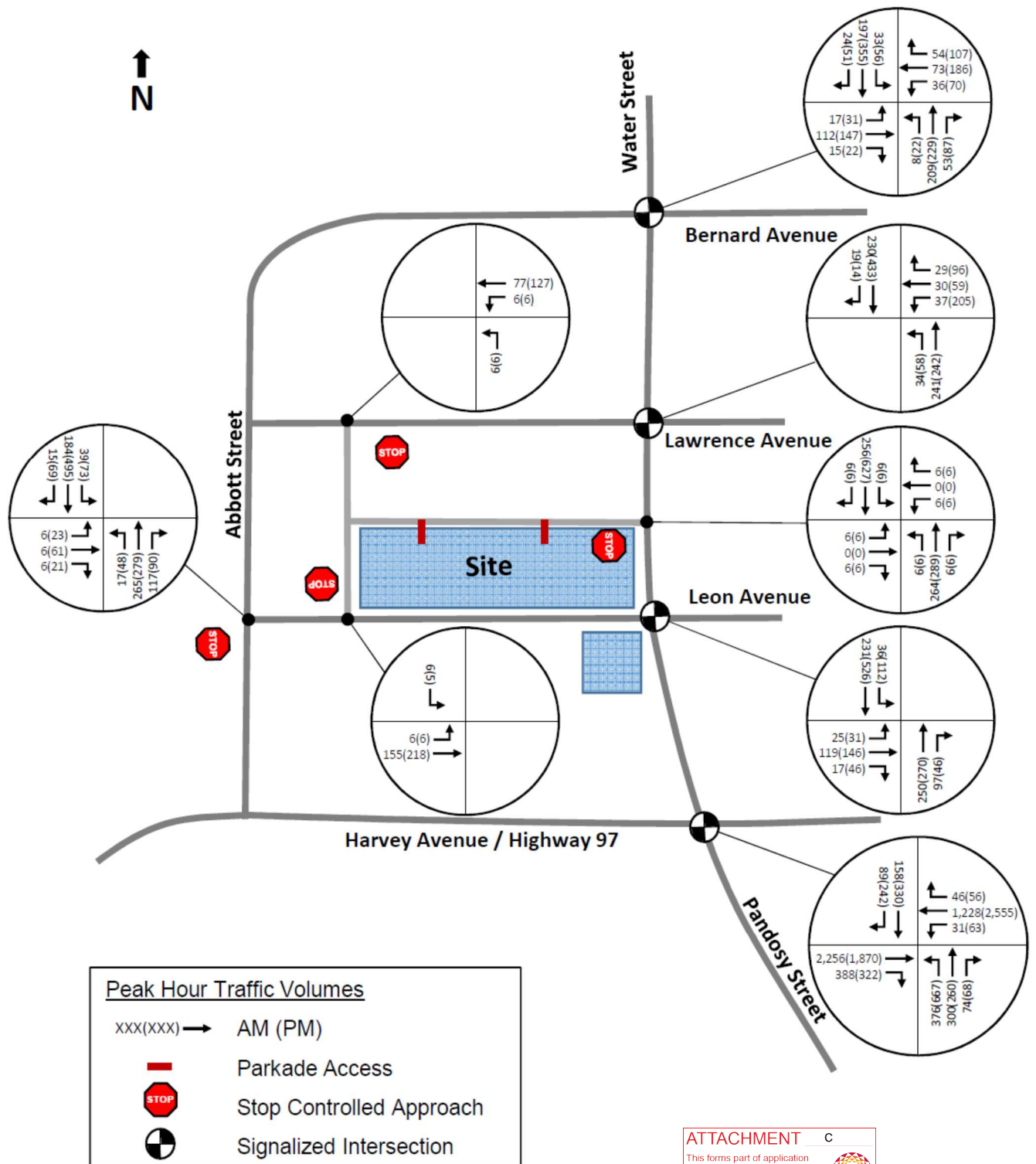
If traffic volumes were to grow, the Harvey Avenue and Water Street would become more congested, with delays and queues for the critical movements worsening. However, the movements near capacity, such as northbound left turn, would naturally moderate traffic growth on these movements and at the intersection, and would encourage drivers to use different routes, and/or travel at a different time period, widening the PM peak period.

The PM southbound queue at the intersection of Water Street and Bernard Avenue would exceed the available intersection spacing of 80 metres by 5 meters, meaning that the queue could extend into the roundabout once or twice during the PM peak period. Adjusting the signal timing to provide more southbound green time would resolve the issue, as demonstrated in Table 9.

Table 9: Future Background Intersection Operations - Mitigated

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Bernard Avenue – Signal	EBL	1	17	Unchanged				31	C	32	0.16	8
	EBTR	1	112/15					147/22	C	21	0.37	38
	WBL	1	36					70	C	25	0.25	17
	WBTR	1	73/54					186/107	C	31	0.77	78
	NBL	1	8					22	A	2	0.05	2
	NBTR	1	209/53					229/87	A	1	0.38	4
	SBL	1	33					56	A	9	0.10	8
	SBTR	1	197/24					355/51	B	13	0.48	71
	Total		-					-	B	16	-	-

Figure 7: Future Background Traffic Volumes



3 Development Plan

3.1 Site Access & Street Reconfigurations

Pedestrian access to the proposed development will be provided at ground level from Leon Avenue and Water Street. Vehicle access will be provide from two parkade entrances on the public lane north of the site. No vehicle parking will be provided for the south site, and an elevated pedestrian will connect the north and south sites, providing a route for people who park in the north building to travel to the south site.

The plan will remove six existing driveways and curb cuts, five on Leon Avenue and one on Water Street, and this will improve pedestrian comfort along these frontages. It is proposed that Leon Avenue is reconfigured along with the development, with the north side angled parking being replaced by parallel parking, and an on-street eastbound buffered cycle track being added to the south side of Leon Avenue, between Abbott Street and Water Street. This proposed cycle track was requested by the City.

Sidewalk extensions will be added on the west side of the intersection of Leon Avenue and Water Street to reduce pedestrian crossing distances.

3.2 Land Use and Vehicle Trip Generation

The proposed development site will consist of two separate podiums, one on the north side of Leon, and the other on the south. The north podium will have two towers, and the south podium will have one. Commercial retail units will be located in the bottom of both podiums, with a parkade on the bottom floors of the north site, and residential condo units on the remaining floors. The towers on the north podium (A and B) will be condo units, while the tower on the south podium (C) will be short term rental, such as AirBnB or Vrbo.

The 10th Generation of the Institute of Transportation Engineers (ITE) Trip Generation Manual does not provide a vehicle trip rate for the short term rental land use, and Hotel is considered to be the closest land use.

Table 10 compares the a number of land uses similar proposed short term rental for Tower C. Based on this comparison, and recommendations from the City of Kelowna (provided in Appendix A), we have created a modified hotel based vehicle trip rate, with a total AM vehicle trip generation rate of 0.40 per unit and a PM rate of 0.60 per unit.

This trip rate is considered a conservative (high) estimate of the trip generating capacity of the proposed land use, because it is on the higher end of the trip rates shown in Table 10, and because the proposed development will be located in the walkable, dense, mixed-use location of downtown Kelowna, where as many of the trip rates shown are for General Urban / Suburban locations.

Table 10: Vehicle Trip Rate Comparison by Land Use

ITE Land Use – (Land Use Code)	Setting / Location	Vehicle Trip Rates					
		AM Peak Hour			PM Peak Hour		
		% In	% Out	Rate	% In	% Out	Rate
Multifamily (High Rise) – (222)	Dense Multi-use Urban	12%	88%	0.21	70%	30%	0.19
Multifamily (High Rise) – (222)	General Urban / Suburban	24%	76%	0.31	61%	39%	0.36
Hotel – (310)	General Urban / Suburban	59%	41%	0.47	51%	49%	0.60
Timeshare – (265)	General Urban / Suburban	60%	40%	0.40	40%	60%	0.63
Modified Hotel – (310)	Dense Multi-use Urban	59%	41%	0.40	51%	49%	0.60

Based on the proposed land uses, vehicle trip generation for the site was conducted using the 10th Generation of the ITE Trip Generation Manual. The forecasted peak hour trip generation is shown in Table 11. To account for the mix of uses on the site, and the fact that some trips will both begin and end within the site, methodology from the National Cooperative Highway Research Program (NCHRP) Report 684 on internal trip capture was used to estimate internal trips between the site uses.

Table 11: Vehicle Trip Generation

Land Use	ITE Code	Units / Area (ft ²)	Trip Rate per 1000 ft ² or unit [Rate (In/Out)]		Vehicle Trips					
			AM	PM	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Residential Condo	222	550	0.21 (12% / 88%)	0.19 (70% / 30%)	14	102	116	73	31	105
Short Term Rental	Modified 310	198	0.40 (59% / 41%)	0.60 (51% / 49%)	47	32	79	61	58	119
Ground Floor Commercial	820	44,201	0.94 (62% / 38%)	3.81 (48% / 52%)	26	16	42	81	88	168
Sub Total					86	150	236	215	177	392
Internal Capture Reduction (Based on NCHRP 684 procedure. Only 75% of the NCHRP estimate was used for the PM peak period)					2%	1%	-	13%	15%	-
					2	2	4	27	27	54
Total					84	148	232	188	150	338

The development is forecasted to generate a total of 232 vehicle trips in the AM peak hour, and 338 vehicle trips in the PM peak hour. The development will also generate walking, cycling and transit trips. However, the ability for the surrounding network to accommodate these trips is based primarily on facility availability (sidewalks, bicycle lanes, transit service, etc.), and not on the capacity of these facilities, as their physical capacity is generally much higher than actual use. Therefore, detailed trip generation has not been completed for these modes of transportation, and instead the provision of facilities for these modes is based on facility availability and quality surrounding the site, as assessed in Sections 2.2 and 5.3.

3.3 Vehicle Distribution & Assignment

Table 12 shows the anticipated vehicle trip distribution for the site. The distribution represents which direction / streets the vehicle trips will travel on to reach the site.

Table 12: Trip Distribution

Direction	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
To/from the west on Harvey Avenue	20%	20%	20%	20%
To/from the east on Harvey, Leon, Lawrence, and Bernard Avenues	60%	60%	60%	60%
To/from the south on Water/Pandosy Street	10%	10%	10%	10%
To/from the north on Water Street	10%	10%	10%	10%
Total	100%	100%	100%	100%

Of the 60% of trips destined to/from the east, Table 13 shows the trip assignment used for eastbound travel on the main eastbound routes (Bernard, Leon, Lawrence, and Harvey Avenues).

Table 13: Eastbound Assignment

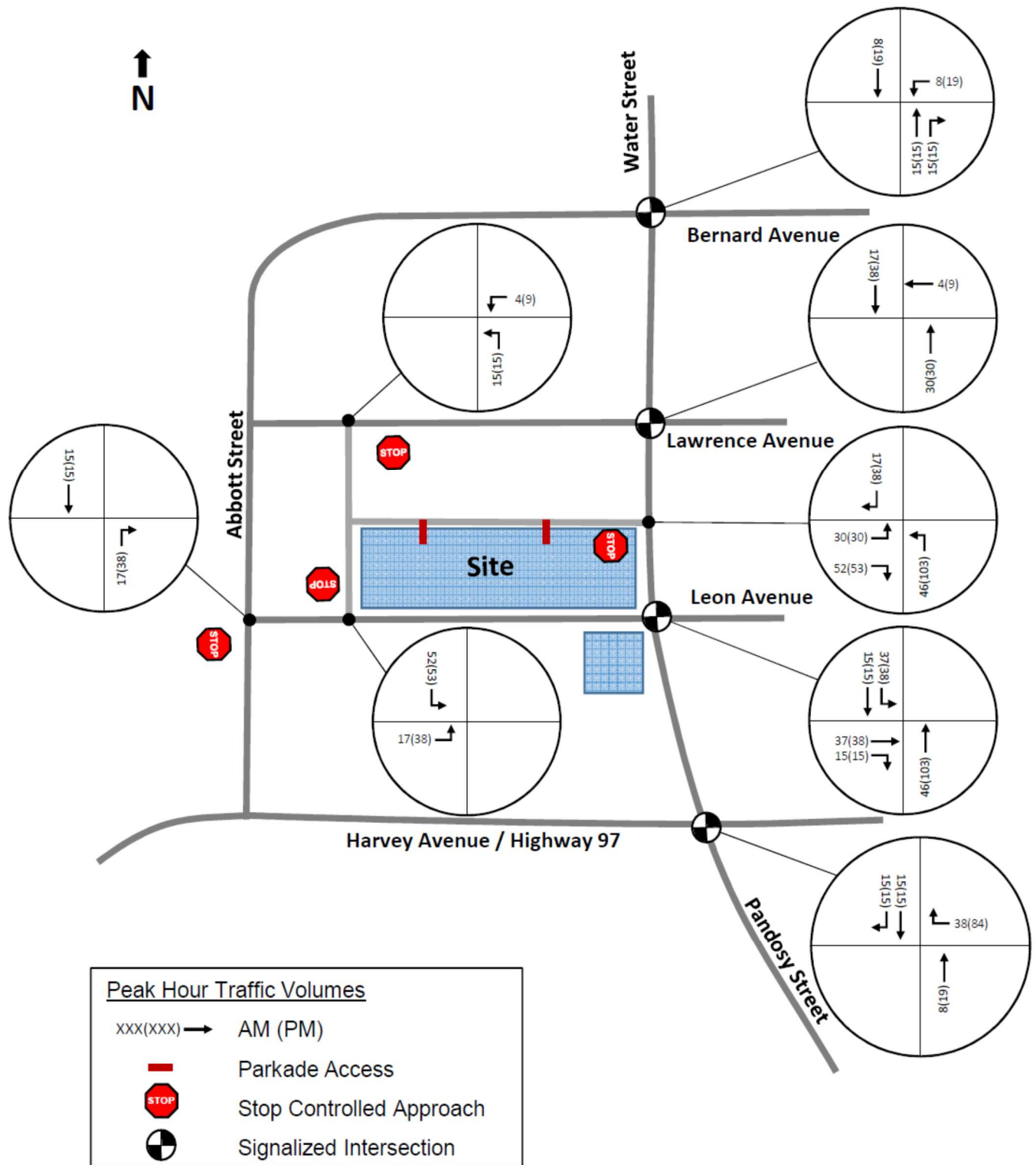
Eastbound Direction	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Bernard Avenue	10%	10%	10%	10%
Leon / Lawrence Avenue	5%	5%	5%	5%
Harvey Avenue (via Leon Avenue to Ellis Street for outbound trips)	45%	45%	45%	45%
Sub Total	100%	100%	100%	100%

Vehicle trips were assigned based on the above trip distribution and available vehicle network. The majority of eastbound trips were assigned to Harvey Avenue, and all northbound trips were assigned to Water Street. Eastbound and southbound trips were assigned to Harvey Avenue and Water / Pandosy Street respectively.

Trips were assigned to the public lane accesses based on the trip destination (for example, trips to/from the east were assigned to the Water Street access, while trips to/from the west were assigned to the Leon Avenue access). Figure 8 shows the site-generated vehicle trips on the network.

The trip generation, distribution, and assignment were shared with the City of Kelowna and adjusted to incorporate comments from the City, prior to the traffic analysis being conducted. All correspondence is included in Appendix A.

Figure 8: Site Trips



3.4 Transit Trip Generation

The City of Kelowna requested an estimate of the transit trip generating capacity of the proposed development, and its potential effect on the transit routes in the area. Table 14 shows transit trip generation for the site based on the ITE trip generation and downtown Kelowna mode splits.

Table 14: Transit Trip Generation

Component	Trips					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Vehicle Trip Generation Source: Table 12 – before Internal Capture	84	148	232	188	150	338
Existing Vehicle Mode Share (Auto Driver)*	59%					
Total Site Trip Estimate (all modes)	143	251	394	318	254	572
Transit Vehicle Mode Share*	8%					
Transit Trips	11	20	31	25	20	46

* - Source: Kelowna TMP - Existing and Future Conditions Technical Report, Urban Centre, Travel Mode by Where People Live

Table 15 shows the transit trips distributed using the vehicle trip distribution presented in Table 12.

Table 15: Transit Trip Generation Distribution

Direction	Trips					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
To/from the west	2	4	6	5	4	9
To/from the east	7	12	19	15	12	27
To/from the south	1	2	3	3	2	5
To/from the north	1	2	3	3	2	5
Total	11	20	31	25	20	46

The trips (transit users) to/from the south are anticipated to use Route 1 and stops #102868 and #102869 adjacent to the site on Water Street. All other trips destined to/from the west, east and north are anticipated to walk approximately 5 minutes to the Queensway Exchange. Table 16 shows the number of trips assigned in each direction (to each route / route group), and the average number of new trips per bus in the peak hours by direction.

Table 16: Transit Trips Compared to Service

Item		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit Trips by Direction (Table 15)	To/from the south	1	2	3	3	2	5
	To/from the west, east, north	10	18	28	23	18	41
Bus Trips by Route (Table 1)	Route 1	4	4	8	4	4	8
	Queensway Exchange (Routes 2,5,6,9,10,11,18,79)	36	36	72	32	32	64
Average Site Trips by Bus	Route 1	0.25	0.50	0.38	0.75	0.50	0.63
	Queensway Exchange (Routes 2,5,6,9,10,11,18,79)	0.29	0.50	0.39	0.72	0.57	0.64

The proposed development will add between 0.25 to 0.75 transit trips to each bus in the peak hours, depending on the bus route and direction. This level of additional transit trips is minimal compared to the capacity of a typical bus (~40-50 persons each), and therefore service improvements will not be required to support to additional transit ridership generated by the proposed development.



4 Post Development Traffic Operations

4.1 Opening Day Post Development

Figure 9 shows the Opening Day Post Development Traffic volumes (Existing Volumes + Site Trips), and Table 17, Table 18, and Table 19 show the resulting operations.

Table 17: Opening Day Post Development Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Bernard Avenue – Signal	EBL	1	15	B	19	0.05	3	28	C	30	0.14	8
	EBTR	1	102/14	B	17	0.29	23	134	B	19	0.34	36
	WBL	1	41	B	20	0.14	8	83	C	24	0.29	22
	WBTR	1	66/49	B	18	0.32	23	169/97	C	25	0.70	72
	NBL	1	7	B	16	0.01	2	20	A	3	0.06	2
	NBTR	1	205/63	B	17	0.35	60	223/94	A	2	0.44	5
	SBL	1	30	B	13	0.07	5	51	A	10	0.10	8
	SBTR	1	187/22	A	8	0.27	30	342/46	B	14	0.52	79
	Total		-	B	15	-	-	-	B	15	-	-
Water Street & Lawrence Avenue – Signal	WBLTR	2	34/31/26	C	21	0.17	11	186/63/87	C	28	0.55	52
	NBLT	2	31/249	A	1	0.26	2	53/250	A	1	0.30	3
	SBTR	1	226/17	B	12	0.23	52	432/13	A	1	0.41	4
	Total		-	A	8	-	-	-	A	9	-	-
Abbott Street & Leon Avenue – Stop Control	EBLTR	1	5/5/5	B	12	0.03	1	21/55/19	D	27	0.39	14
	NBLT	1	15/241	A	8	0.01	0	44/254	A	9	0.05	2
	NBR	1	123	A	1	0.00	0	120	A	1	0.00	0
	SB	1	35/185/14	A	8	0.03	1	66/465/63	A	8	0.06	2
	Total		-	A	1	-	-	-	A	3	-	-
Water Street & Leon Avenue - Signal	EBLTR	2	23/145/30	C	21	0.32	23	28/171/57	C	28	0.42	39
	NBT	1	273	A	6	0.26	33	348	A	6	0.31	48
	NBR	1	88	A	5	0.10	9	42	A	5	0.05	5
	SBLT	2	70/225	A	1	0.19	4	140/493	B	18	0.36	84
	Total		-	A	8	-	-	-	B	16	-	-

Table 18: Opening Day Post Development Traffic Operations - Street Intersections Continued

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Harvey Avenue & Water Street/Pandosy Street - Signal	EBTR	3	2051/353	B	17	0.74	257	1700/293	C	28	0.77	250
	WBL	1	28	D	54	0.35	19	57	F	98	0.69	47
	WBTR	3	116/80	B	10	0.39	96	2323/135	D	44	0.93	380
	NBL	2	342	F	84	0.89	103	606	F	102	1.02	233
	NBT	2	281	D	50	0.39	70	255	C	35	0.23	56
	NBR	1	67	A	0	0.00	0	62	A	0	0.00	0
	SBT	2	159	F	101	0.87	59	315	E	65	0.81	86
	SBR	1	96	A	0	0.00	0	235	A	0	0.00	0
	Total		-	C	26	-	-	-	D	44	-	-

Table 19: Opening Day Post Development Traffic Operations - Lane Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Lawrence Avenue & Lane – Stop Control	WBLT	2	9/70	A	1	0.00	0	14/115	A	1	0.00	0
	NBL	1	20	A	7	0.01	0	20	A	7	0.01	0
	Total		-	A	3	-	-	-	A	2	-	-
Water Street & Lane – Stop Control	EB	1	35/5/57	B	14	0.21	6	35/0/58	D	29	0.41	14
	WB	1	5/0/5	B	13	0.02	1	5/0/5	C	18	0.04	1
	NB	2	51/240/5	A	8	0.04	1	108/263/5	A	10	0.13	4
	SB	2	5/233/22	A	8	0.01	0	5/570/43	A	8	0.00	1
	Total		-	A	3	-	-	-	A	4	-	-
Leon Avenue & Lane – Stop Control	EBLT	2	22/141	A	7	0.02	-	43/198	A	7	0.03	1
	SBL	1	57	A	9	0.07	0	58	A	1	0.00	0
	Total		-	A	3	-	-	-	A	3	-	-

The intersection of Harvey Avenue and Water Street will operate in a nearly identical fashion as it does today, except for westbound through / right queue increasing by approximately 40 metres, and the southbound delay and v/c ratio increasing slightly. Both of these movements already experience issues in the existing analysis, and the impact of the site traffic is negligible on total intersection operations.

The 86 metre PM peak hour queue at southbound approach at the intersection of Water Street and Leon Avenue will extend beyond the available intersection spacing of approximately 80 metres.

Adjusting the signal timing splits does not materially lower the queue, but reducing the cycle length from 75 seconds to 70 seconds significantly reduces the southbound queue, as shown in Table 17. However, this intersection is currently coordinated with the adjacent intersections on Water Street, and any changes in cycle length would need to take into account the pros / cons of the changes on the entire network. Therefore it is recommended that operations on Water Street are monitored once the site is built, and that signal timing is adjusted as need if the reported queuing does materialize.

Table 20: Opening Day Post Development Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	LOS	Delay (s)	v/c	95 th Q	Vol.	LOS	Delay (s)	v/c	95 th Q
Water Street & Leon Avenue - Signal	EBLTR	2	23/145/30	No change				28/171/57	B	17	0.31	36
	NBT	1	273					348	B	10	0.36	46
	NBR	1	88					42	A	3	0.06	5
	SBLT	2	70/225					140/493	B	12	0.48	48
	Total		-					-	A	12	-	-



4.2 Future Post Development

Figure 10 shows the Future Post Development Traffic volumes (Future Background Volumes + Site Trips), and Table 21, Table 22, and Table 23 show the traffic operations.

Table 21: Future Post Development Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Bernard Avenue – Signal	EBL	1	17	B	20	0.06	3	31	C	30	0.16	9
	EBTR	1	112/15	B	17	0.31	25	147/22	B	19	0.35	40
	WBL	1	43	B	20	0.15	9	89	C	24	0.31	24
	WBTR	1	73/54	B	18	0.35	25	186/107	C	25	0.72	78
	NBL	1	8	B	16	0.02	2	22	A	4	0.07	4
	NBTR	1	224/68	B	17	0.38	65	244/102	A	2	0.50	6
	SBL	1	33	B	13	0.08	6	56	B	11	0.12	10
	SBTR	1	205/24	A	9	0.30	34	374/51	A	17	0.60	90
Water Street & Lawrence Avenue – Signal	Total		-	B	15	-	-	-	B	16	-	-
	WBLTR	2	37/34/29	C	21	0.18	11	205/69/96	C	27	0.58	58
	NBLT	2	34/270	A	1	0.28	2	58/272	A	1	0.33	6
	SBTR	1	247/19	B	12	0.25	57	471/14	A	1	0.45	5
	Total		-	A	8	-	-	-	A	9	-	-
Abbott Street & Leon Avenue – Stop Control	EBLTR	1	6/6/6	B	12	0.04	1	23/61/21	E	38	0.50	16
	NBLT	1	17/265	A	8	0.01	0	48/279	A	9	0.06	2
	NBR	1	133	A	1	0.00	0	128	A	1	0.00	0
	SB	1	39/198/15	A	8	0.04	1	73/510/69	A	8	0.07	2
	Total		-	A	1	-	-	-	A	4	-	-
Water Street & Leon Avenue - Signal	EBLTR	2	25/156/31	C	21	0.34	24	31/184/61	C	27	0.45	42
	NBT	1	296	A	6	0.29	36	373	A	7	0.34	52
	NBR	1	97	A	5	0.11	11	46	A	5	0.05	5
	SBTL	2	73/246	A	1	0.20	4	150/541	B	20	0.41	92
	Total		-	A	8	-	-	-	B	17	-	-

Table 22: Future Post Development Traffic Operations - Street Intersections Continued

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Harvey Avenue & Water Street/Pandosy Street - Signal	EBT	3	2256	B	19	0.70	213	1870	C	25	0.72	217
	EBR	1	388	A	0	0.00	0	322	A	0	0.00	0
	WBL	1	31	D	46	0.50	19	63	F	88	0.66	50
	WBTR	3	1228/84	B	11	0.43	102	2555/141	F	69	1.01	706
	NBL	2	376	F	92	0.93	116	667	F	136	1.12	274
	NBT	2	308	D	50	0.42	75	278	C	35	0.24	60
	NBR	1	74	A	0	0.00	0	68	A	0	0.00	0
	SBT	2	173	F	117	0.94	68	345	F	68	0.86	95
	SBR	1	104	A	0	0.00	0	257	A	0	0.00	0
	Total		-	C	27	-	-	-	E	56	-	-

Table 23: Future Post Development Traffic Operations - Lane Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Lawrence Avenue & Lane – Stop Control	WBLT	2	10/77	A	0	0.00	0	15/127	A	1	0.00	0
	NBL	1	20	A	7	0.01	0	21	A	7	0.01	-
	Total		-	A	2	-	-	-	A	2	-	-
Water Street & Lane – Stop Control	EB	1	35/0/51	B	15	0.20	5	36/0/58	F	38	0.50	17
	WB	1	6/0/6	A	8	0.05	1	6/0/6	C	19	0.05	2
	NB	2	52/264/6	A	1	0.00	1	109/289/6	A	10	0.14	4
	SB	2	6/256/22	A	7	0.05	1	6/627/43	A	8	0.01	0
	Total		-	A	3	-	-	-	A	4	-	-
Leon Avenue & Lane – Stop Control	EBLT	2	22/156	A	7	0.02	0	44/218	A	7	0.03	1
	SBL	1	57	A	1	0.00	0	58	A	1	0.00	0
	Total		-	A	3	-	-	-	A	3	-	-

The operations at Water Street and Bernard / Leon Avenues have been shown using existing signal timings, and the queues for the southbound approaches at both intersections will continue to exceed available intersection spacing by 10, and 12 metres accordingly. As demonstrated earlier, adjusting the signal timing at the intersections can bring the queues within

the available intersection spacing, but will have network-wide impacts, and it is recommended that these movements be monitored to see if the queues actually materialize.

The eastbound approach at Abbott Street and Leon Avenue is at LOS E in the PM peak hour. SimTraffic shows eastbound delays of 31, 27 and 15 seconds for the eastbound left, through and right turn movements accordingly (LOS D, D, and C). The eastbound approach at the east-west lane and Water Street intersection will also be LOS E in the PM peak hour. However, the adjacent signalized intersections will create gaps in traffic, and this is substantiated by SimTraffic, which shows eastbound delays of 29 and 14 seconds for the eastbound left and right turn movements (LOS D and B). Therefore no measures are recommended at either location.

The intersection of Harvey Avenue and Water Street will operate similarly to the Future Background horizon, with the westbound through / right and southbound movements operating marginally worse. As noted for the background analysis, these movements will be self-regulating, and a detailed study of the corridor would be required to understand if changes to improve traffic operations on the minor approaches (such as the northbound approach, which provides access to the site) are warranted, or if existing operations prioritizing the highway should be maintained, and with the resulting excess traffic being pushed to different routes and/or times during the peak period.

A summary of the recommended traffic mitigation measures are provided in Section 6.

Figure 9: Opening Day Post Development Traffic Volumes

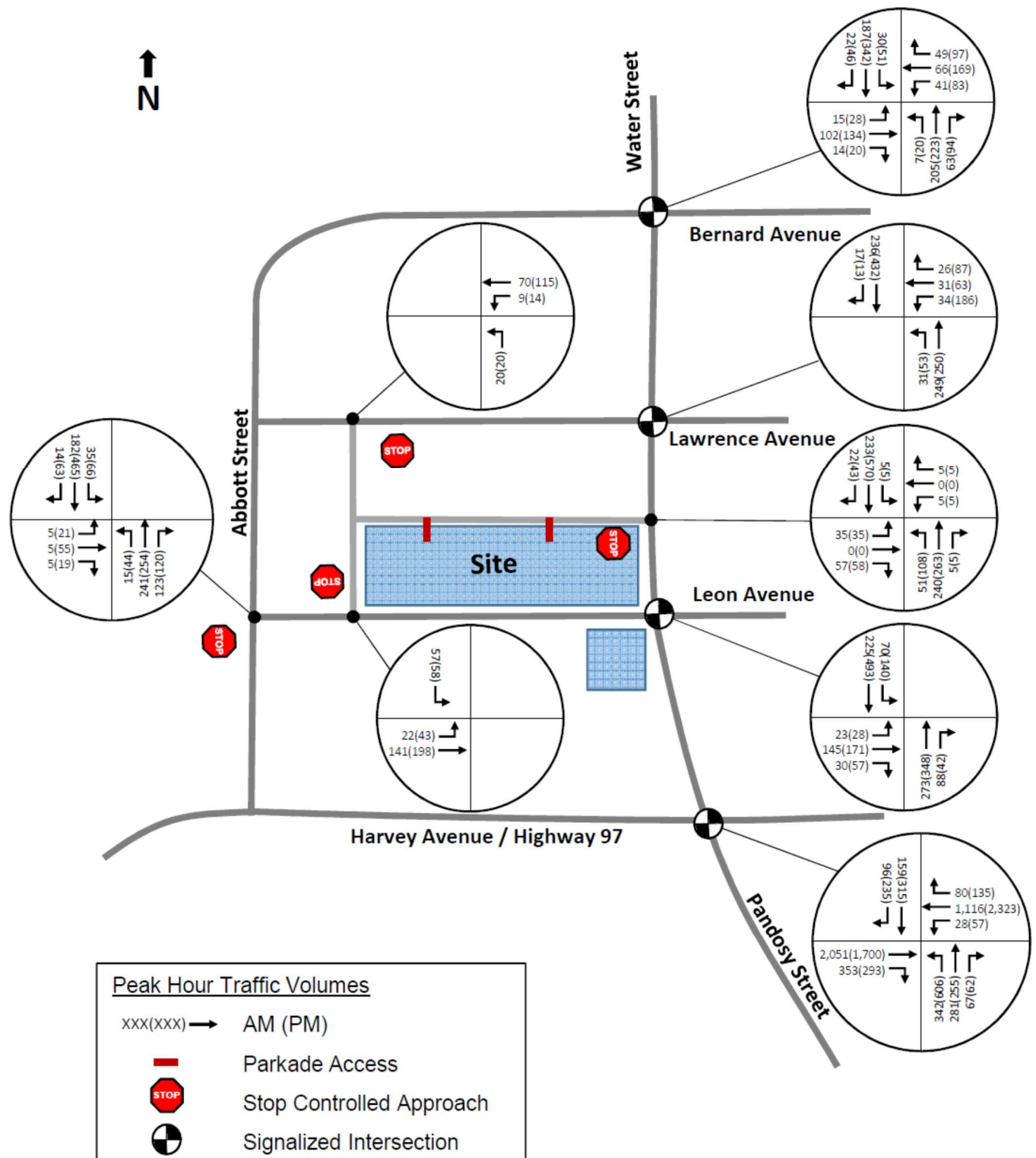
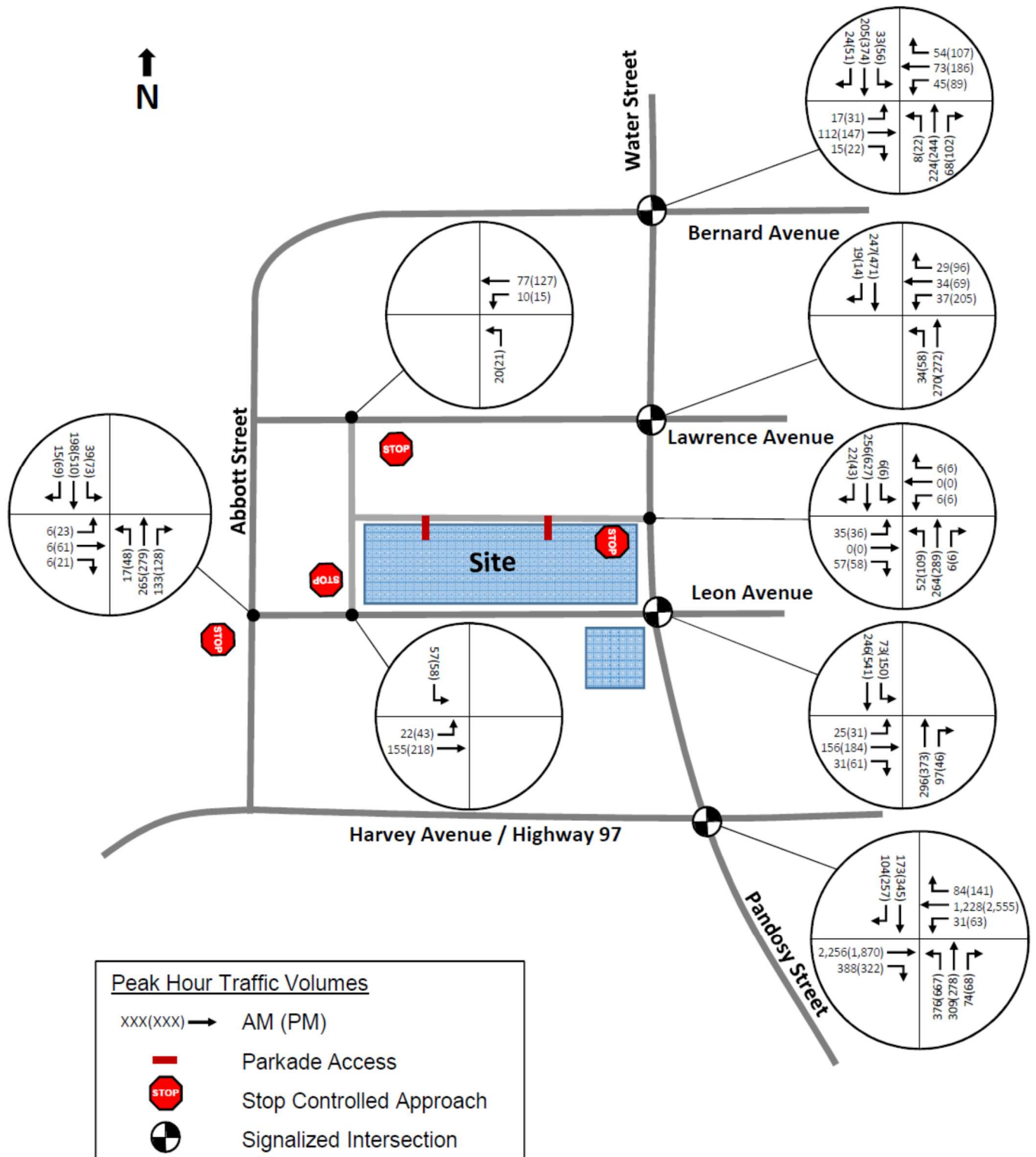


Figure 10: Future Post Development Traffic Volumes



5 Parking, Loading and Operational Details

5.1 Parking and Passenger Vehicle Operations

Vehicle parking will be provided via a multi-story parkade in the north building, and accessed from the rear lane. Long term bicycle parking will be provided on the ground floor of the parkade, and the development will also provide end of trip facilities for cycling, including facilities such as showers and tools. Short term bicycle parking will be provided in front of the site on Water and Leon Streets.

The bylaw requires one loading bay, and the proposed development will provide 4 loading bays in the rear lane. The proposed vehicle and bicycle parking supplies are being negotiated between the City and the proponent.

AutoTURN has been used to show how access and loading operations will work, and passenger vehicle access is shown in Figure 11 based on a TAC P vehicle. Buffers of 0.3 metres have been shown on either side of the vehicle movement paths. Comments on the movement paths are labelled with “ID numbers”, and then discussed further in Table 24.

As shown, passenger vehicles are able to access the lane from Water and Leon Avenues, and two-way operation is possible at both parkade entrances. A passenger vehicle is also able to drive around loading vehicles stopped in the rear lane, as shown in the bottom image. These routes are to show how residents and visitors will access the site, including delivery vehicles such as taxis and food delivery drivers. A total of 105 visitor parking spaces are provided on the main floors of the parkade, and will be accessible to all visitors and pick-up drop-off users (not behind gates).

5.2 Garbage Operations

A garbage room is provided on the north side of the north building, immediately west of the east parkade access. Figure 12 shows garbage vehicle access to / from the site based on a 10.3m long front loading garbage truck. The garbage vehicle will be able to access the site, but with essentially no clearance at the corner between the two lanes. Recommended improvements to resolve this existing issue are summarized at the end of this section in Table 24.

5.3 Loading Operations

A loading room is also provided on the north side of the north building, adjacent to the garbage room. Figure 13 shows the turning paths for a 10 m long MSU truck. The loading vehicle will be able to enter and exit the lane from the public street network, and is also anticipated to barely be able to make the corner between the two lanes, without any margin for error.

As vehicles larger than an MSU will not be able to navigate the intersection between the north-south and east-west public lanes, an alternative loading strategy will be required.

Figure 14 shows how oversized vehicle loading could be accommodated by the on-street parking on Leon Avenue, either immediately adjacent to the north-south rear lane, or directly in front of the building lobby. The spaces would need to be reserved as pick-up drop-off loading

spaces with maximum time limits, servicing pick-up drop-off demand such as taxis and delivery drivers most of the time, and then being used for oversized loading vehicles as needed.

Loading for the south site is also shown in Figure 12 for an MSU. The MSU tracks slightly into the adjacent corner property, but the corner of the property is currently hatched to enable such overturns. All vehicles larger than an MSU will be able to service the south site from two more proposed on-street pick-up drop-off spaces Leon Avenue that could be used by oversized vehicles, as shown in Figure 13.

5.4 Conclusion & Recommendations

Based on this review of passenger, garbage and loading vehicle operations, all comments and recommendations are summarized in Table 24. The ID's in the table match the highlighted areas shown in Figure 11 through Figure 14.

Table 24: Parking and Loading Recommendations

Aspect	ID	Comment	Recommendation
Passenger Operations	-	No changes required.	-
Garbage Operations	1	Vehicle will be able to make turn, but without any clearance on either side.	Recommend City work with property owners to formalize over tracking on these sites. This tight corner is an existing situation, and loading operations for the adjacent sites current operate within this existing situation. The need for improvement is not specifically associated with the proposed development.
Loading Operations	2	MSU will over track over private adjacent site.	Corner of the site is currently hatched to enable over tracking. Recommend City work with property owner to formalize over tracking on this site.
	3	Loading spaces have been marked out in the lane to maximize the number of loading vehicles than can be accommodated, and to keep the lane passable for other vehicles.	-
	4	Vehicle will not be able to make turn without encroaching into private parking lot to south.	Same recommendation as ID 1.
	5	Vehicles larger than a MSU will not be able to travel through the lane.	Reserve 2 on-street parking spaces on the north side of Leon Avenue as short term pick-up drop-off / loading spaces with a maximum time restriction 10-20 minutes. This will enable larger vehicles (up to HSU) to use these spaces and service the north building.

Figure 11: Passenger Vehicle Access

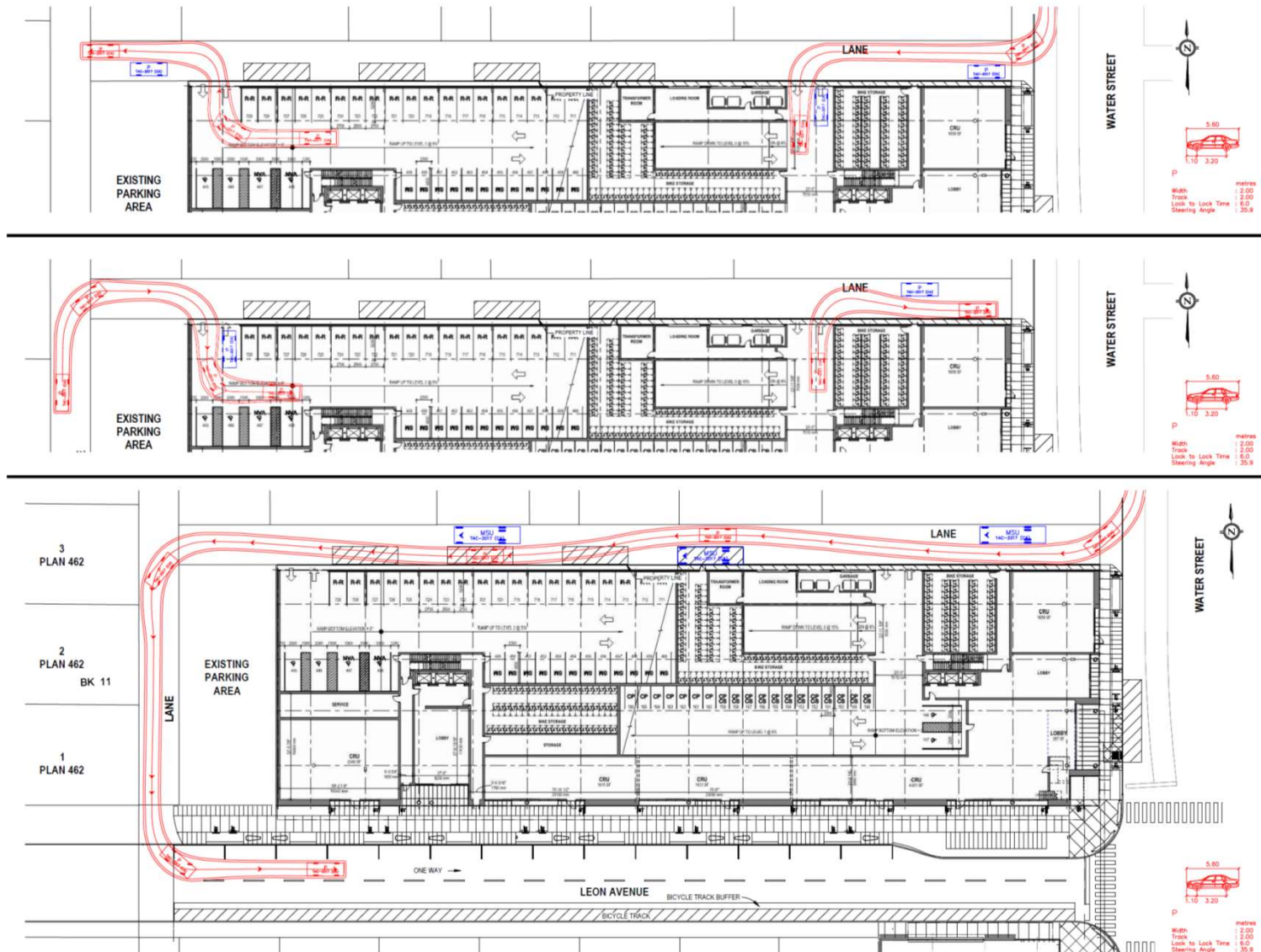


Figure 12: Garbage Vehicle Access & South Site Loading

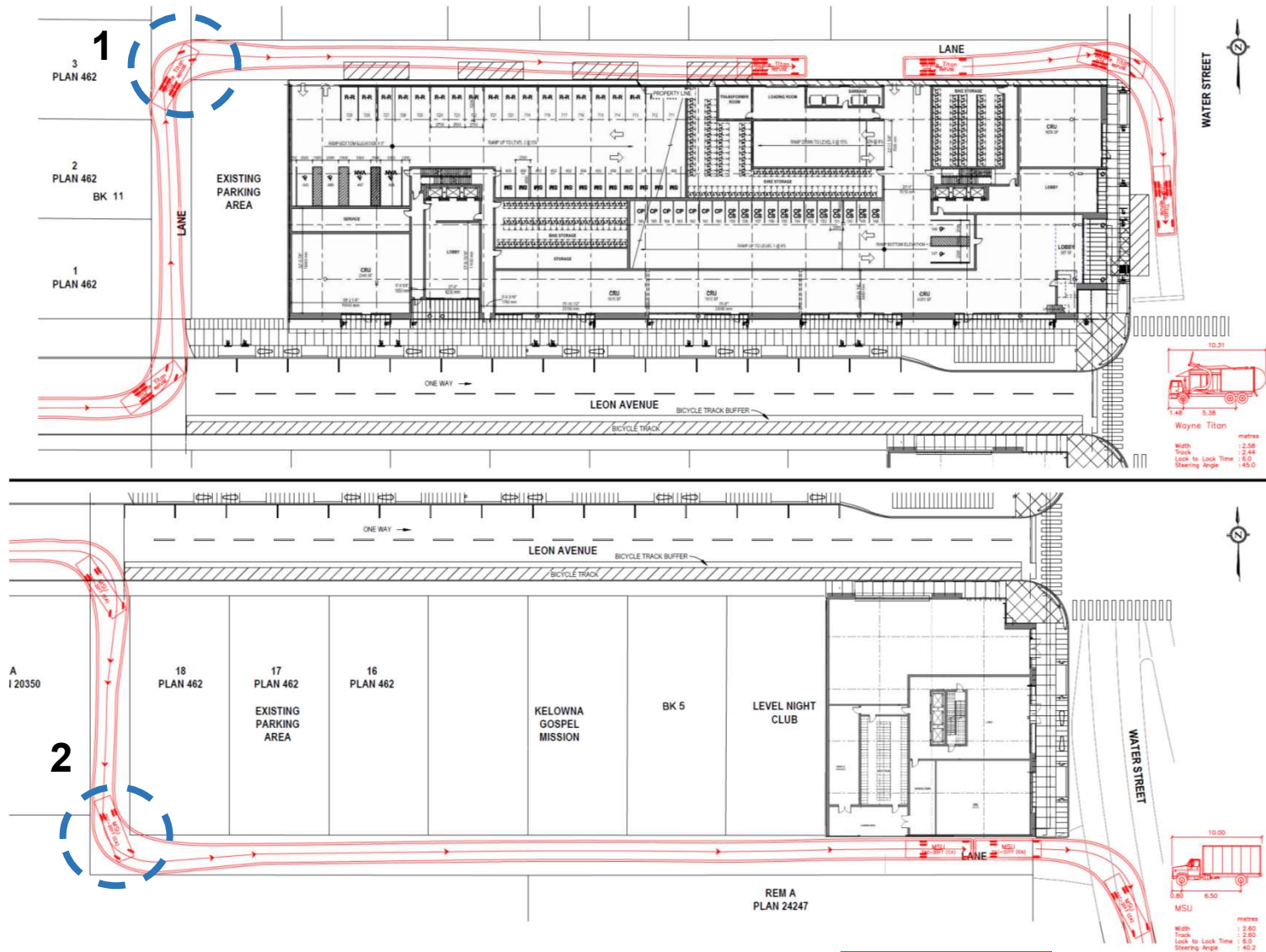


Figure 13: MSU Loading and Access

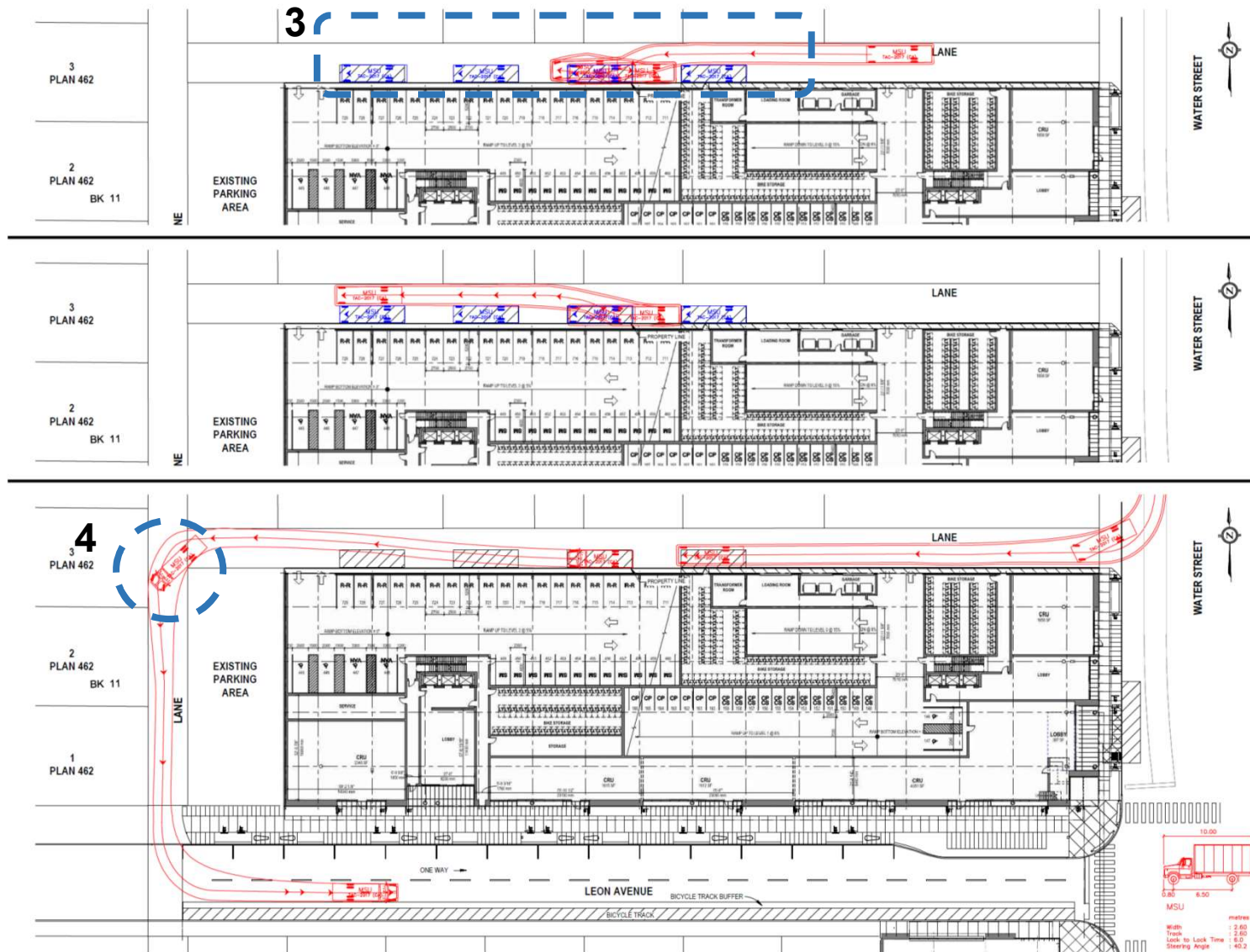
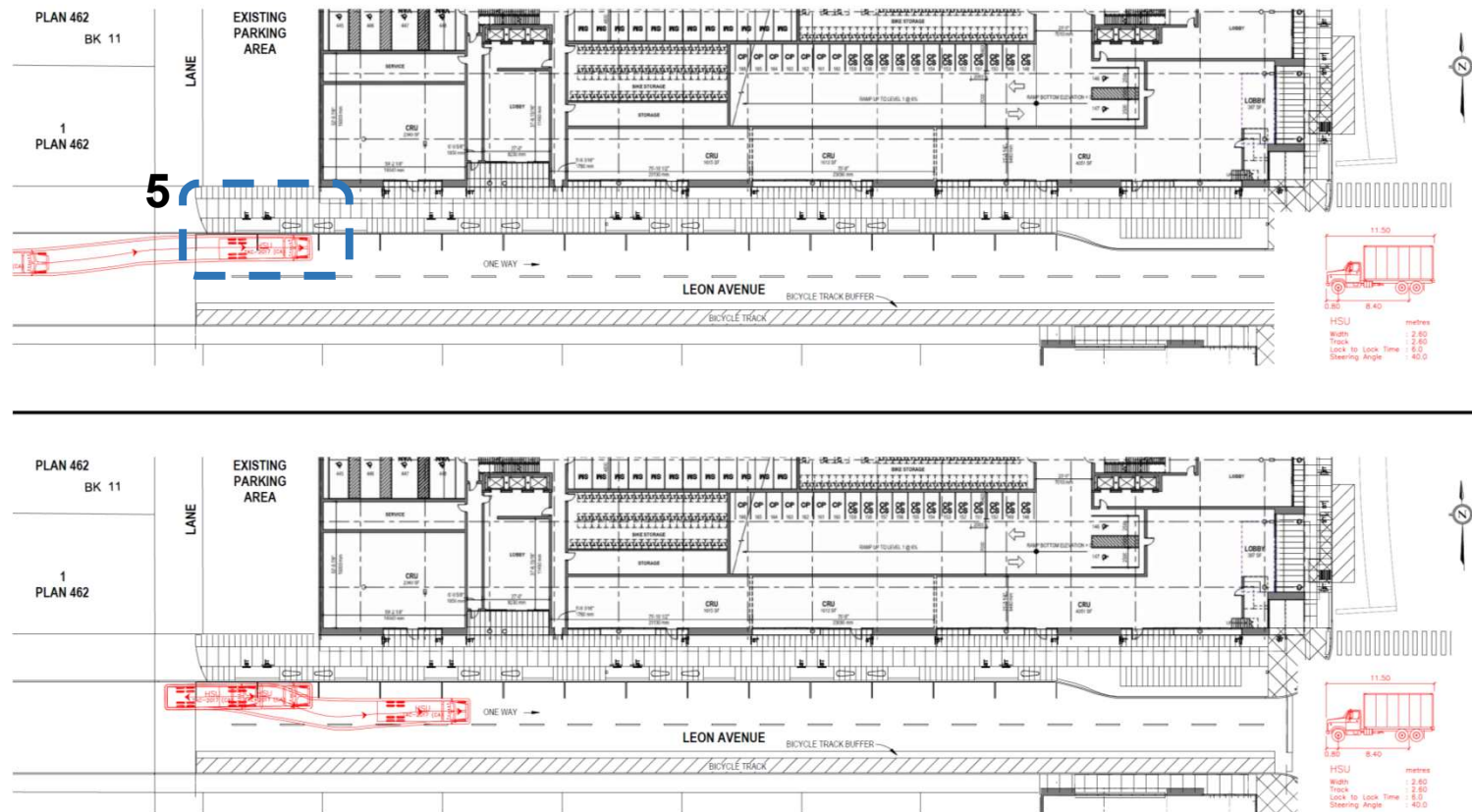


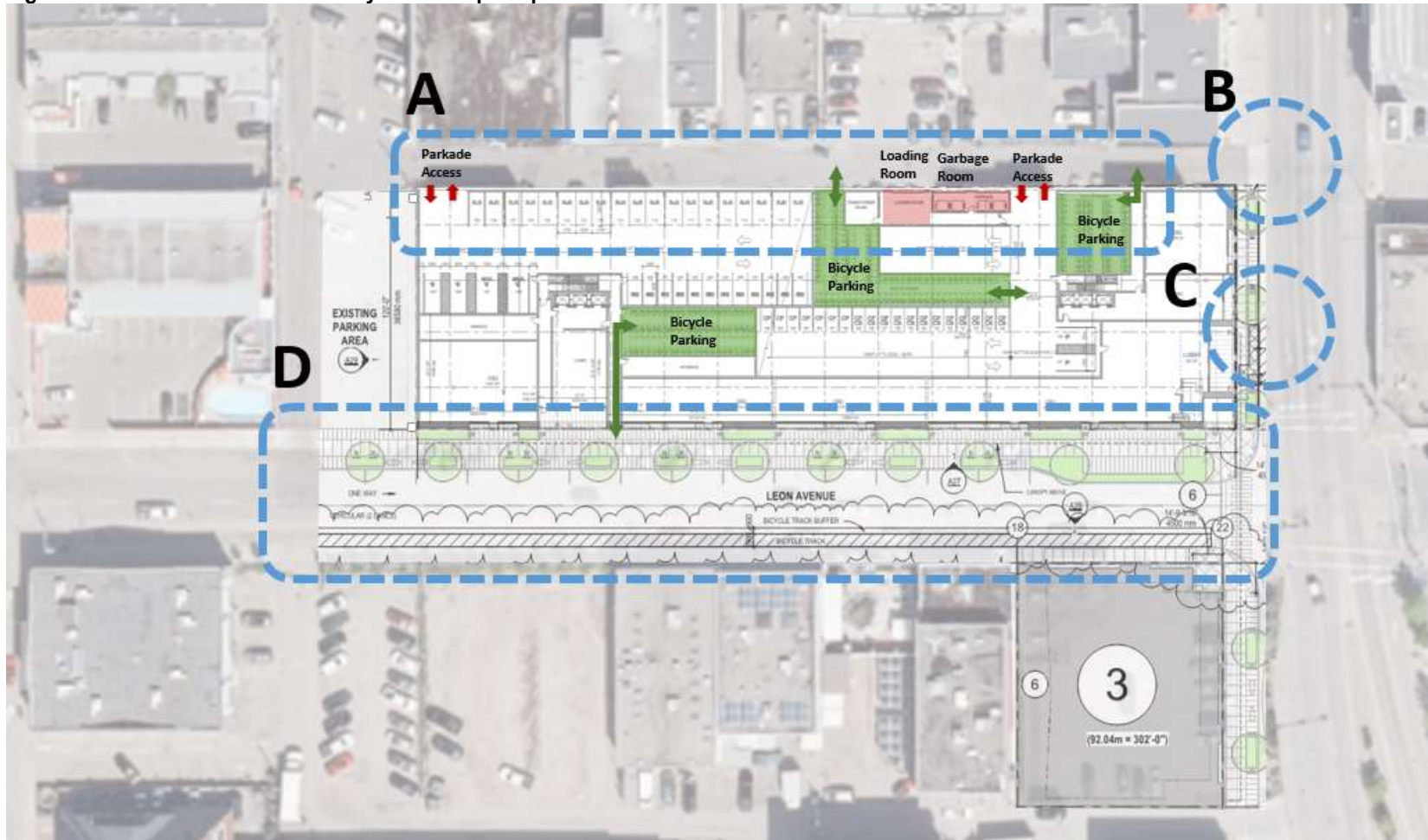
Figure 14: Large Vehicle (WB-19) Loading and Access



5.5 Additional Operational Details

In addition to the traffic analysis completed on the study area network, HDR conducted a detailed review of the anticipated future multi-modal transportation operations and changes immediately surrounding the site. Four primary areas were identified for detailed analysis. They are shown Figure 15, and are discussed in the following section. The following section also includes the Sensitivity Analysis requested by the City to review the implications of moving one of the parkade accesses from the lane to Leon Avenue.

Figure 15: Leon Avenue and Pandosy Streetscape Improvements



5.5.1 Public Lane Operations (A)

The lane on the north side of the site will provide access to the two parkade entrances, loading room, garbage room, and two of the secured bicycle parking rooms. To facilitate loading and smooth traffic operations in the lane, and based on recommendations by the City of Kelowna, the ground floor of the development has been set back approximately 0.9 m south, resulting in an overall future lane width of approximately 7.0 m.

The site will generate a total of 232 AM and 338 PM peak hour vehicles trips, equivalent to around 3-6 vehicle trips per minute, or one every 10-20 seconds. These trips will be split between the two parkade entrances, with some vehicles accessing the lane from the west, and the others from the east. The distribution and assignment used for this study has approximately 1/3 of the trips entering/exiting from the west end of the lane, and the other 2/3 of the trips entering/exiting from the east. The east side of the lane (the busier end) will experience between 2-4 trips each minute, or one trip every 15-30 seconds.

This level of activity is well within the capacity of a two-way lane, and is typical of many urban lanes during peak periods. In addition, because the lane can be accessed from both Water Street and Lawrence / Leon Avenues, residents and frequent visitors will be able to learn which route is quickest for them and naturally balance traffic on the lane and to/from the site. Businesses and delivery providers will also naturally adjust, as they generally try to schedule loading to off-peak times to reduce travel times for their vehicles. This means that when the lane is the busiest for passenger vehicle traffic (AM and PM peak periods), loading activity is likely to be lighter than during other times in the day (such as before the AM peak and around mid-day), and most if not all of the lane will be free for passenger vehicle use during the passenger vehicle peak periods.

Nevertheless, there are a couple of measures that have been incorporated to help the lane operate effectively and enable it to meet the needs of all users:

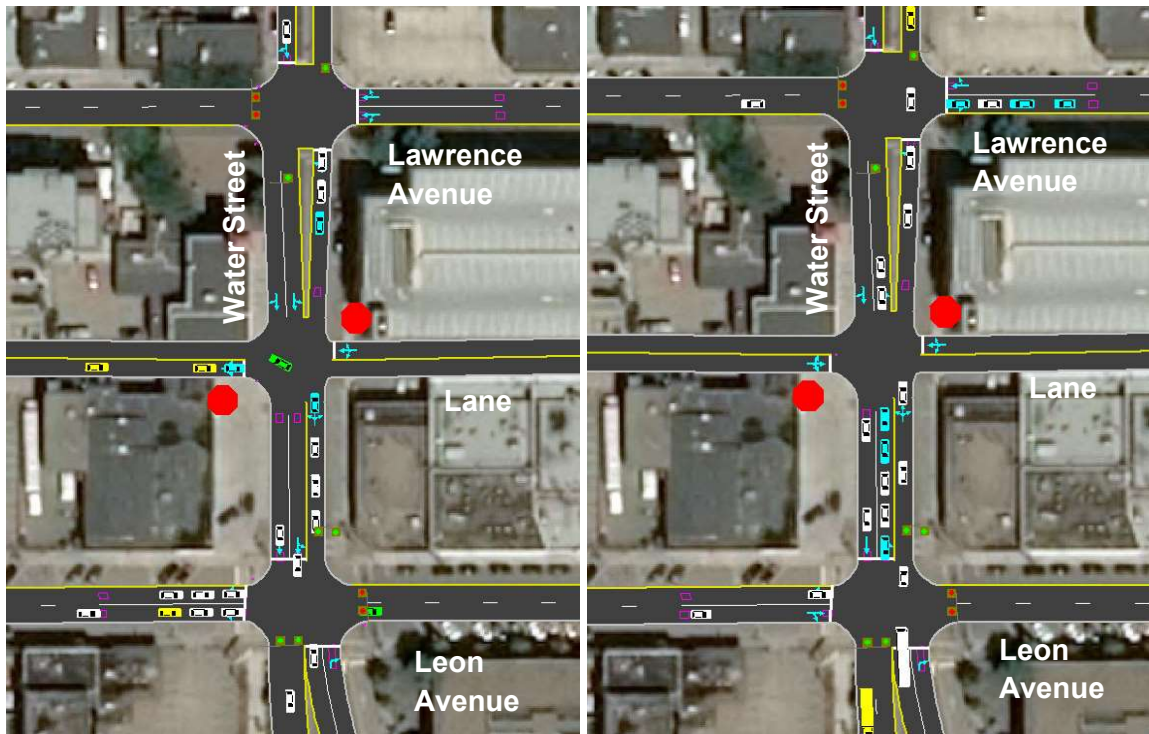
- Loading areas have been marked off in the lane to minimize the disruption of loading on general lane traffic, and keep the north side of the lane free vehicle travel at all times of the day.
- A 1.0m wide pedestrian area has been marked off immediately adjacent to the building to provide a place for people accessing the bicycle parking spaces to walk their bicycles to/from Water Street.

5.5.2 Public Lane & Water Street (B)

Much of the future site traffic will use the existing lane access on Water Street, and it is important to understand how it will operate.

The intersection was included in the traffic analysis, and as shown earlier in this study, is anticipated to generally operate within tradition traffic thresholds. SimTraffic was used to confirm the Synchro operation, and a screen shot of the SimTraffic operation is shown in Figure 16.

Figure 16: Water Street and Lane - Traffic Operations



The left side of the figure shows an instance where the westbound queue on the lane reaches the 95th percentile queue length of approximately 16 m or two cars, as reported in Future Post Development Section. The right side of the image shows an instance where the southbound approach at Leon Avenue temporarily extends beyond the lane. Both of these occurrences happened once or twice during the 1 hour SimTraffic simulation run, and dissipated within a short period of time. These occurrences can be expected to occur once the site is built on occasion during the peak hours, and are typical operations in a constrained urban environment.

In addition to vehicle operations, the proposed development will also impact pedestrian operations at this location. More traffic will be crossing the sidewalk on the west side of Water Street, and the northeast corner of the proposed development could impact vehicle – pedestrian sight lines at this location.

To slow vehicle traffic in the lane and increase the visibility of pedestrians on the sidewalk, the following mitigation measure will be provided:

- Eastbound stop sign and stop bar on the lane, immediately before the sidewalk.
- Convex mirror mounted on the proposed development and oriented to enable eastbound drivers to see pedestrians approaching the lane / sidewalk crossing from the south
- Painted or textured sidewalk to indicate a vehicle / pedestrian cross area

5.5.3 Water Street Bus Stop #102868 Integration with Site (C)

The City has asked for the proposed development to incorporate the existing bus stop located on the west side of Water Street (east development frontage), and the site has been designed accordingly.

Guidelines for the installation of urban bus stops are provided by BC Transit in the Bus Stop Installation Guide³. These guidelines are meant to ensure that bus stops are barrier free, easily accessible, and have amenities such as shelters, benches, and adequate lighting.

Table 25 summarizes the required / optional components in the Bus Stop Installation Guide with the proposed site plan.

Table 25: Site Plan Compliance with Bus Stop Installation Guide

Required / Optional Components and Amenities	Condition Met with Proposed Development Site Plan?
Requirements	
Bus Stop Location - Near side bus stop signage to be placed 15m north of downstream street (Leon Avenue)	Yes
Bus Stop Layout – A 42.5m bus stop to be provided, with 15m in front of the bus / bus sign, 12.5m for the bus, and 15m behind. The entire length of curb in this area is to be painted red to indicate a bus stop. No-stopping bus zone signage is to be placed at both ends of the bus area.	Yes
Clear space at bus doors – A 1.5m long and 1.2m wide clear space is required adjacent to the front bus door, and 1.5m long and 2.0m wide clear space is required at the rear bus door.	Yes
Option Amenities – Local Transit	
Transit Shelter	No – insufficient space to provide
3.0m wide sidewalk, with 1.5m clear pedestrian travel zone	Yes – sidewalk area is 3.0m wide, and includes a 1.5m wide pedestrian travel zone.
Bench	No - will not be provided
Illumination	No - will not be provided
Tactical Warning Strip	Yes



³ BC Transit Bus Stop Installation Guide - <https://www.bctransit.com/documents/1507213895398>

5.5.4 Reconfigured Leon Avenue (D)

The proposed project includes changes to Leon Avenue, including converting the existing angled parking on the north side to parallel parking, increasing the north sidewalk width to approximately 4.3 m, adding an eastbound buffered cycle track on the south side of the street, and a curb extension on the north side of the street at the intersection of Water Street and Leon Avenue. The proposed cross section element widths are shown in Table 26. The City of Kelowna does not have a road standard for this exact proposed situation (two lane one-way street with cycle track), but the proposed lane and sidewalk dimensions are consistent with standards for a 2 lane arterial street⁴ with 3.35m wide lanes and 1.5m wide sidewalks. The proposed widths for the other facilities are typical for similar urban environments and are considered adequate.

Table 26: Proposed Leon Avenue Cross Section

Component	Proposed Dimension (m)
North Sidewalk	4.3
On-street Parking (Parallel)	2.1
Eastbound Lane	3.35
Eastbound Lane	3.35
Eastbound Cycle Track Median	0.9
Eastbound Cycle Track	1.9
South Sidewalk	2.4

Traffic operations on Leon Avenue were reviewed with SimTraffic, and interactions with on-street parking were included in the analysis. With around 14 parking spaces on the north side, and an assumed parking turnover time of 1 hour, this could result in 14 inbound and 14 outbound parking maneuvers on the street during peak parking periods. This is equivalent to one vehicle either arriving or leaving every two minutes. Based on observing SimTraffic operations, and comparable street sections with similar traffic and parking levels, such as on Bernard Avenue between Ellis and Bertram Street, Leon Avenue will operate sufficiently in this configuration.



⁴ City of Kelowna Subdivision, Development & Servicing Bylaw, Schedule 5, Drawing Part 5c, Arterial Class 3 – 2 Lane.

5.5.5 Leon Avenue Access – Sensitivity Analysis

The City of Kelowna requested an analysis to show the impact of one of the parking entrances being moved to Leon Avenue. As the volume of traffic that would use this access is unknown, half of the site traffic at the Water Street / Lane intersection has been reassigned to the Leon Avenue access (which is equivalent to roughly 1/3 of all site traffic). Table 27 shows the traffic operations for this scenario at the new parkade entrance on Leon Avenue, and for the intersections between Water Street and the Lane and Leon Avenue in the Future Post Development Horizon.

The results can be compared with the results previously presented in Table 21 and Table 23. Shifting one of the parkade access will improve the performance of the eastbound Lane approach at Water Street from LOS E to D, and the remainder of the movements and intersections will operate within typical capacity thresholds and very similar to the original scenario.

Table 27: Leon Avenue Access - Sensitivity Analysis - Future Post Development

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Lane – Stop Control	EB	1	20/0/25	B	14	0.10	2	21/0/32	D	25	0.25	7
	WB	1	6/0/6	B	13	0.03	1	6/0/6	C	17	0.04	1
	NB	2	29/288/6	A	8	0.03	1	57/340/6	A	10	0.07	2
	SB	2	6/256/12	A	8	0.01	0	6/627/43	A	8	0.01	0
	Total		-	A	2	-	-	-	A	2	-	-
Water Street & Leon Avenue - Signalized	EBLTR	2	40/147/39	C	21	0.40	28	46/213/69	C	27	0.49	49
	NBT	1	296	A	6	0.29	35	373	A	7	0.34	56
	NBR	1	97	A	5	0.12	11	46	A	5	0.05	5
	SBLT	2	55/239	A	1	0.18	2	131/533	B	19	0.39	88
	Total		-	A	8	-	-	-	B	17	-	-
Leon Avenue & New Driveway – Stop Control	EBLT	2	32/212	A	7	0.02	1	71/286	A	7	0.05	1
	SBL	1	41	B	10	0.06	2	42	B	12	0.08	2
	Total		-	A	2	-	-	-	A	3	-	-

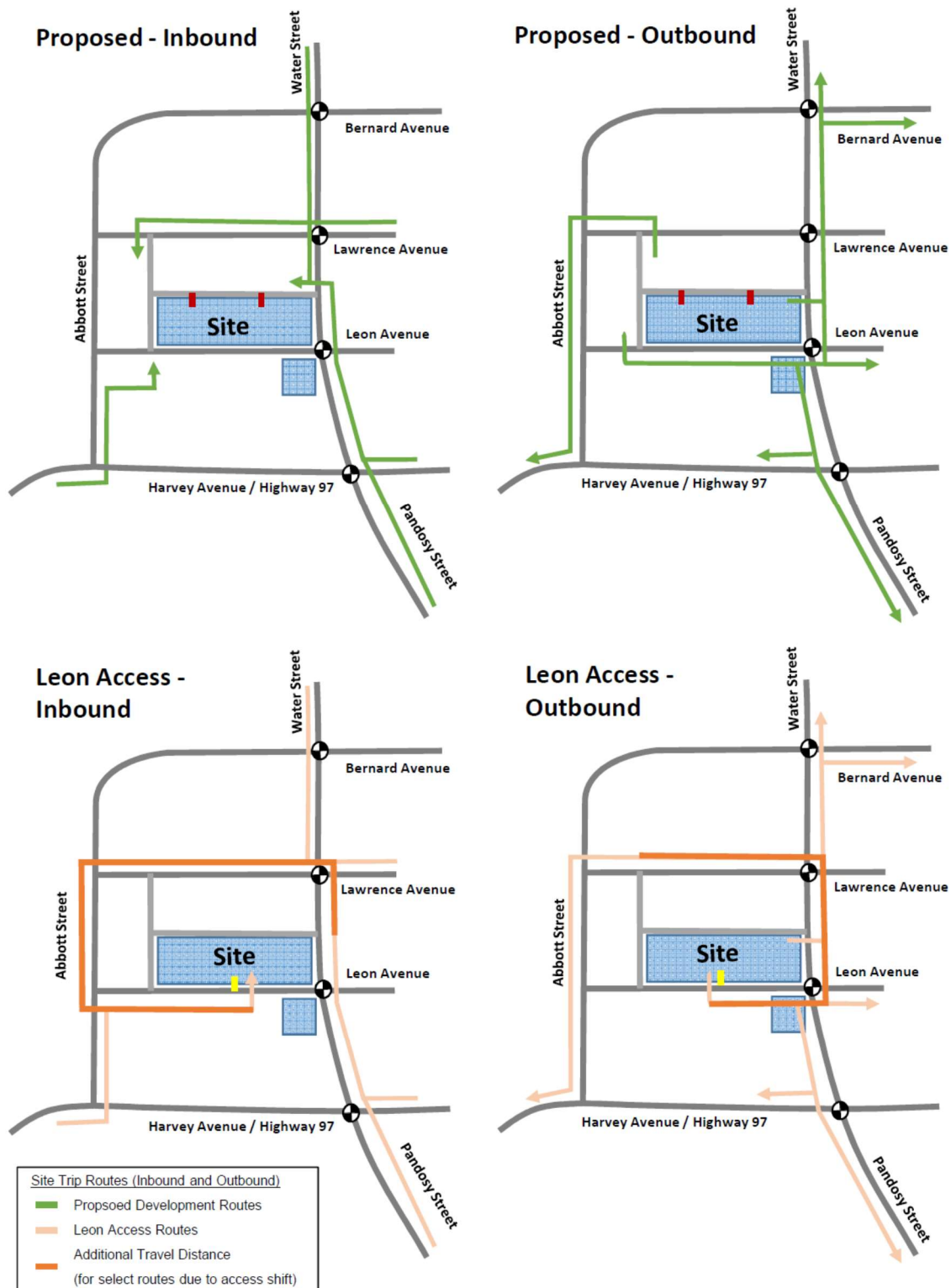
As this analysis does not significantly differentiate the two alternatives, we have also conducted a route-based analysis comparing the base case with the sensitivity analysis, as shown in Figure 17. The top half of the figure shows the existing access configuration and routes, and the bottom half shows only the routes for a Leon Avenue access. With the existing configuration, both parkade entrances are accessed from the rear lane, and drivers are able to choose the most direct path to the parkade and rear lane based on their inbound / outbound directions. For the Leon Avenue accesses alternative, all drivers required to use the access would have to use one-way Leon Avenue, based on the interior parking spot that they are destined to. This would result in longer

travel paths for certain trips and un-needed vehicular circulation around the site. The dark orange lines indicate the addition trip distances required for certain routes compared to the existing configuration (such as inbound vehicles approaching from the south, or exiting to the west). Therefore, while a proposed access on Leon Avenue would decrease traffic volumes on the rear lane, it would in fact result in an un-necessary increase in traffic volumes on the public road network.

In addition, by introducing a new driveway on Leon Avenue, this alternative would increase the number of driveways that pedestrians would have to cross. It would also segment the proposed commercial frontage of the site, and this could negatively impact the perceived walkability and attractiveness of the store fronts to pedestrians. The access would not have a material effect on the proposed cycle track on Leon Avenue, as the cycle track is on the south side of the street and will be protected by a median buffer. Best practices for redevelopment in urban areas are to use lanes for vehicle access where possible. In this case, because the proposed parkade access configuration and Lane / Water Street intersection will operate sufficiently, and because of the noted downsides of introducing a new driveway on Leon Avenue, it is recommended that the current parkade access scheme is maintained.



Figure 17: Leon Avenue Access Analysis



5.5.6 Water Street / Lane – Northbound Left Turn Ban Analysis

The City of Kelowna has indicated that they plan on banning the northbound left turn movement from Water Street into the rear lane. This section reviews the effect of this ban at the Water Street / rear lane intersection, and the other adjacent intersections that will be effected. The analysis has been completed for the AM and PM peak hours in the Future Post Development horizon, as this is horizon with the highest traffic volumes. Figure 18 shows the revised volumes, and Table 28 and Table 29 show the resulting traffic operations.

Figure 18: Future Post Development Volumes - With Northbound Left Turn Ban at Water Street & Lane

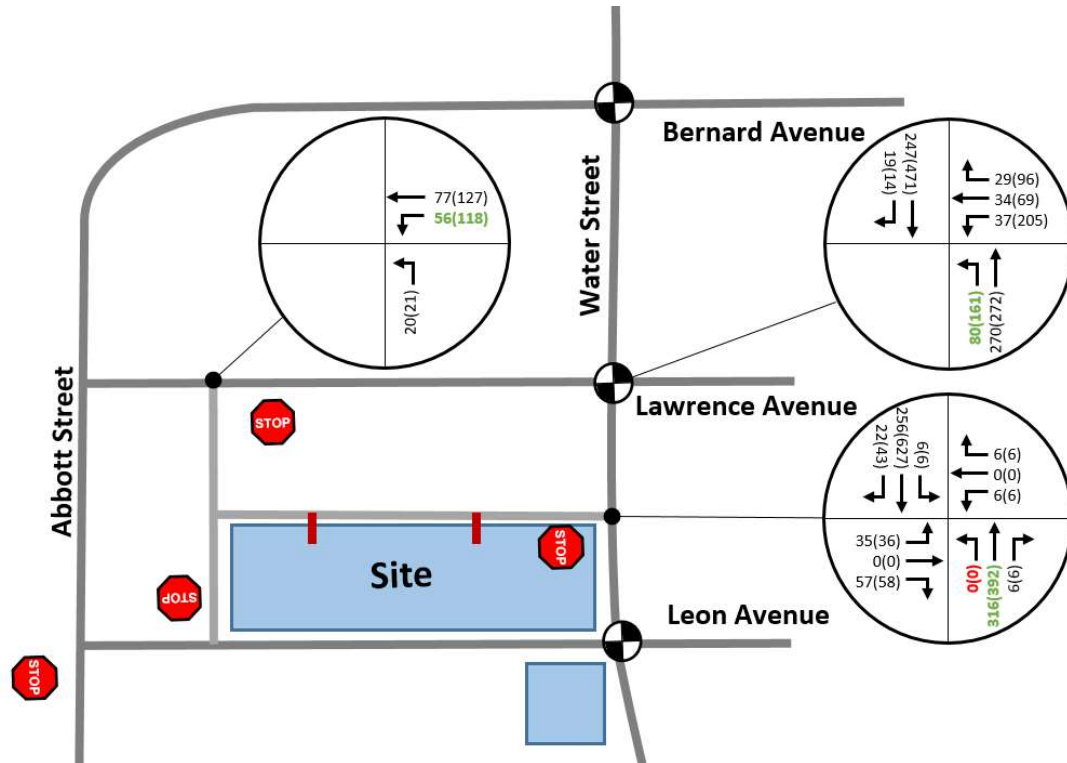


Table 28: Future Post Development Traffic Operations – Street Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	L O S	Delay (s)	v/c	95 th Q	Vol.	L O S	Delay (s)	v/c	95 th Q
Water Street & Lawrence Avenue – Signal	WBLTR	2	37/34/29	C	21	0.18	11	205/69/96	C	27	0.58	58
	NBLT	2	80/270	A	1	0.36	4	161/272	A	2	0.52	7
	SBTR	1	247/19	B	12	0.25	57	471/14	A	1	0.45	5
	Total		-	A	8	-	-	-	A	9	-	-

Table 29: Future Post Development Traffic Operations - Lane Intersections

Intersection	Movement / Lanes		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Vol.	LOS	Delay (s)	v/c	95 th Q	Vol.	LOS	Delay (s)	v/c	95 th Q
Lawrence Avenue & Lane – Stop Control	WBLT	2	56/77	A	3	0.04	1	118/127	A	7	0.08	1
	NBL	1	20	A	10	0.03	1	21	B	12	0.04	2
	Total		-	A	4	-	-	-	A	4	-	-
Water Street & Lane – Stop Control	EB	1	35/0/51	B	14	0.18	5	36/0/58	D	26	0.37	11
	WB	1	6/0/6	B	13	0.03	1	6/0/6	C	16	0.04	2
	NB	2	0/316/6	A	1	0.00	1	0/392/6	A	0	0.00	0
	SB	2	6/256/22	A	8	0.05	1	6/627/43	A	8	0.01	0
	Total		-	A	2	-	-	-	A	2	-	-

With the northbound left turn movement banned at the Water Street / Lane intersection, the previous northbound left turning vehicles were reassigned to turn left onto Lawrence Avenue, and then left from Lawrence Avenue into the rear lane to reach the site. This turn ban improved the eastbound approach operation at Water Street / Lane (lane exit onto Water Street) from LOS E to D, and had minimal effects on the other two intersections.

This analysis confirms that the proposed turn restriction will operate sufficiently.

6 Conclusion

Anthony Beyrouti is proposing a mixed-use commercial and residential development near the intersection of Leon Avenue and Water Street in downtown Kelowna. A review of the transportation impact of the proposed development was conducted, and all recommendations are summarized below:

Active Transportation & Transit Networks

- The existing walking, cycling, and transit networks are sufficient to accommodate the proposed development.

Vehicle Operations

- The forecasted traffic generated by the proposed development can be accommodated on the existing transportation network with minor changes to signal timing at existing intersections. The following is recommended:
 - Monitor southbound PM peak period queues at the intersections of Bernard Avenue and Leon Avenue with Water Street. If excessive queuing materializes, adjust the signal timing along Water Street to reduce southbound queuing.
 - Operations at Harvey Avenue and Water Street, and the impact of development on the highway corridor should be reviewed in the context of the entire highway corridor, and changes to signal timing and operation should be made to benefit overall corridor operation. If no changes are made, the site traffic can still be accommodated by the intersection, but some traffic on the constrained movements will shift to different routes or times within the peak period.

Garbage and Loading Operations

- The City should pursue an agreement with property owners at the T lane intersection near the north site, and the lane to lane 90° intersection near the south site, to protect the ability of large vehicles to travel through these junctions. These are existing issues for all properties currently served by these lanes.
- It is recommended that the City mark off two parking spaces on the north side of Leon Avenue as pick-up drop-off / loading spaces to enable oversized loading vehicles to service both sites.

Additional Operational Details

- The bus stop fronting the site (# 102868) has been incorporated into the development plans.
- The proposed Leon Avenue cross section is considered adequate.
- The proposed parkade access scheme is recommended over an alternative access scheme that would relocate one of the parkade accesses to Leon Avenue.

