City of Kelowna
Public Hearing
AGENDA

Tuesday, June 27, 2017
6:00 pm
Council Chamber
City Hall, 1435 Water Street

Pages

1. Call to Order

THE CHAIR WILL CALL THE HEARING TO ORDER:

1. (a) The purpose of this Hearing is to consider certain bylaws which, if adopted, shall amend *Kelowna 2030* - Official Community Plan Bylaw No. 10500 and Zoning Bylaw No. 8000.

(b) All persons who believe that their interest in property is affected by the proposed bylaws shall be afforded a reason-able opportunity to be heard or to present written submissions respecting matters contained in the bylaws that are the subject of this hearing. This Hearing is open to the public and all representations to Council form part of the public record. A live audio feed may be broadcast and recorded by Castanet.

(c) All information, correspondence, petitions or reports that have been received concerning the subject bylaws have been made available to the public. The correspondence and petitions received after June 14, 2017(date of notification) are available for inspection during the course of this hearing and are located on the information table in the foyer of the Council Chamber.

(d) Council debate on the proposed bylaws is scheduled to take place during the Regular Council meeting after the conclusion of this Hearing. It should be noted, however, that for some items a final decision may not be able to be reached tonight.

(e) It must be emphasized that Council will not receive any representation from the applicant or members of the public after conclusion of this Public Hearing.

2. Notification of Meeting

The City Clerk will provide information as to how the Hearing was publicized.

3. Individual Bylaw Submissions

3.1 861 Rose Ave, Z17-0012 (BL11411) - Pillar West Developments Inc. 5 - 22

To rezone the subject property from the RU6 - Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone.

3.2 **775 Rose Ave, Z17-0013 (BL11412) - Wes and Tammy Jones** 23 - 40

To rezone the subject property from the RU6 - Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone.

3.3 **300 & 310 Dougall Rd N, Z17-0014 (BL11413) - Nadeem Hussain** 41 - 74

To rezone the subject property from the RU1 - Large Lot Housing zone to the C4 - Urban Centre Commercial zone.

3.4 **815 Rose Ave - Z16-0022 (BL11416) - Paul Neufeld and Douglas Kirk** 75 - 97

To rezone the subject property from the RU6 - Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone.

3.5 **614 Barnaby Rd, Z16-0070 (BL11417) - Brent Hancock and Whitney Smith** 98 - 108

To rezone the subject property from the RR1 – Rural Residential 1 zone to the RR1c – Rural Residential 1 with Carriage House.

3.6 **1700 & 1638 Tower Ranch Blvd, OCP16-0005 (BL11418) & Z16-0078 (BL11419) - Emil Anderson Construction Inc. 0935343 BC Ltd** 109 - 117

Official Community Plan amendment and rezoning application to amend the future land use designations and rezone portions of the subject property to facilitate a single and two unit residential subdivision with park space for 1700 Tower Ranch Boulevard, and make the future land use designation consistent with existing golf course use at 1638 Tower Ranch Boulevard.

3.7 **1420 Inkar Rd, Z17-0008 (BL11420) - Bruno and Christine Cloutier** 118 - 131

To rezone the subject property from RU1 – Large Lot Housing to RU6 – Two Dwelling Housing to facilitate the development of semi-detached housing.

3.8 **1360 Belaire Ave, Z17-0023 (BL11421) - Gurpreet Pannu** 132 - 170

Mayor to invite the Applicant, or Applicant's Representative, to come forward.
To consider a Staff recommendation to NOT rezone the subject property from RU6 – Two Dwelling Housing to the RM5 – Medium Density Multiple Housing Zone.

3.9 **2446 Harvard Rd, Z17-0011 (BL11422) - Wayne and Denise Henney** 171 - 186

Mayor to invite the Applicant, or Applicant's Representative, to come forward.
To consider a Staff recommendation to NOT rezone the subject property that would facilitate the conversion of an existing accessory building into a carriage house.

3.10 **1187 Sunset Dr, Z16-0077(BL11423) - Sunset Drive Properties Ltd** 187 - 362

To consider a rezoning application on the subject property from the C4 – Urban Centre Commercial Zone to the C7 – Central Business Commercial Zone.

3.11 4975 Buckhaven Ct, OCP16-0017 (BL11424) and Z16-0058 (BL11425)- Vincent and Pamela Blaskovich 363 - 374

To amend the Official Community Plan to change the future land use designation and to rezone portions of the subject property to facilitate a residential subdivision with park and natural open space areas

3.12 437 Bay Ave, TA17-0007 (BL11428)- Carbon Capture Mini Storage 375 - 387

To consider amendments to the Zoning Bylaw in order to allow commercial storage as a permitted use in the I4 – Central Industrial zone.

4. Termination

5. Procedure on each Bylaw Submission

(a) Brief description of the application by City Staff (Land Use Management);

(b) The Chair will request that the City Clerk indicate all information, correspondence, petitions or reports received for the record.

(c) The applicant is requested to make representation to Council regarding the project and is encouraged to limit their presentation to 15 minutes.

(d) The Chair will call for representation from the public in attendance as follows:

(i) The microphone at the public podium has been provided for any person(s) wishing to make representation at the Hearing.

(ii) The Chair will recognize ONLY speakers at the podium.

(iii) Speakers are encouraged to limit their remarks to 5 minutes, however, if they have additional information they may address Council again after all other members of the public have been heard a first time.

(e) Once the public has had an opportunity to comment, the applicant is given an opportunity to respond to any questions raised. The applicant is requested to keep the response to a total of 10 minutes maximum.

(f) Questions by staff by members of Council must be asked before the Public Hearing is closed and not during debate of the bylaw at the Regular Meeting, unless for clarification.

(g) Final calls for respresentation (ask three times). Unless Council directs that the Public Hearing on the bylaw in question be held open, the Chair shall state to the gallery that the Public Hearing on the Bylaw is closed.

Note: Any applicant or member of the public may use visual aids (e.g. photographs, sketches, slideshows, etc.) to assist in their presentation or questions. The computer and ELMO document camera at the public podium are available. Please ask staff for assistance prior to your item if required.

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (TB)		
Application:	Z17-0012	**Owner:**	Pillar West Developments Inc. Inc. No. BC1066488
Address:	861 Rose Avenue	**Applicant:**	Integrity Services Inc.
Subject:	Rezoning Application		

Existing OCP Designation:	MRL – Multiple Unit Residential (Low Density)
Existing Zone:	RU6 – Two Dwelling Housing
Proposed Zone:	RM1 – Four Dwelling Housing

1.0 Recommendation

THAT Rezoning Application No. Z17-0012 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 7, District Lot 136, ODYD, Plan 8116, located at 861 Rose Avenue Kelowna, BC from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated May 29, 2017;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and Development Variance Permit for the subject property.

2.0 Purpose

To rezone the subject property to RM1 – Four Dwelling Housing to facilitate the development of four dwelling units.

3.0 Community Planning

Community Planning Staff supports the proposed rezoning application to facilitate the development of four dwelling units. The RM1 – Four Dwelling Housing zone is consistent with the Official Community Plan (OCP) Future Land Use Designation of MRL – Multiple Unit Residential (Low Density). The proposal is consistent with OCP policies for Compact Urban Form, and Sensitive Infill. Should Council support this rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading.

There are two other development applications on Rose Avenue that have been submitted to the City requesting the same zone to allow a four-plex with nearly identical floor plans. Staff have worked with the representatives from each project to ensure that differences in the materials and colour palette of each application provides variety and individuality.

4.0 Proposal

4.1 Background

The subject property features a single storey bungalow that will be demolished as a function of this development. The property is located near the new RU7 – Infill Housing Zone which will also allow for four-plex developments. It is anticipated that this area is in a stage of redevelopment where infill will become more and more frequent and density will increase.

4.2 Project Description

The proposed rezoning would facilitate the development of a four-plex on the subject property. This is consistent with the OCP Future Land Use designation of Multiple Unit Residential Low Density. The proposal meets the OCP Policy of Compact Urban Growth by increasing density where infrastructure already exists.

The proposal involves the decommissioning of a front driveway and a 5.0m road reserve across the front property for future expansion of Rose Avenue. All parking will be located in the rear, with 4 covered parking stalls and 2 uncovered stalls. The project requires one variance to allow the additional 2 uncovered stalls to be located in the side yard setback. All other Zoning Bylaw requirements are met including provision of private outdoor space, height, setbacks, and site coverage.

The proposed design has front doors facing the street for the two front units, and side entry for the two rear units. The units feature full basements and as such a 219 Restrictive Covenant regarding the Mill Creek Floodplain Bylaw has been placed on title that indemnifies the City in the event of any flooding. Four units is the maximum allowed under the zone, and therefore secondary suites would not be permitted in the units.

The design as proposed meets the majority of the design guidelines, and should Council support the rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading. There are two other applications on Rose Avenue at this time that are also rezoning to a four-plex with nearly identical floor plans. The representatives from each project have taken care to ensure that differences in the materials and colour palette of each application provides variety and individuality. The three projects are located at 775 Rose Avenue, 815 Rose Avenue, and 861 Rose Avenue as shown in the map below.

Figure 1.0 – Current Zoning Applications along Rose Avenue.

4.3 Site Context

The subject property is located in South Pandosy east of Richter Street and south of Ethel Street on the south side of Rose Avenue. The subject property is within walking distance to a variety of amenities including Guisachan Village, Cameron Park, Kelowna General Hospital, and is located on a bicycle corridor with access to the proposed Ethel Street Active Transportation Corridor. Immediately to the south of this property is Cameron Park, and an RU6 – Two Dwelling Housing neighbourhood is to the north.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU6 – Two Dwelling Housing	Residential
East	RU6 – Two Dwelling Housing	Residential
South	RU7 – Infill Housing	Residential
West	RU6 – Two Dwelling Housing	Residential

Subject Property Map: 861 Rose Avenue

4.4 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**RM1 ZONE REQUIREMENTS**	**PROPOSAL**
Development Regulations		
Floor Area Ratio	.60	.49
Site Coverage of Buildings	40%	35.5%
Site Coverage of Buildings, Parking, and Driveways	50%	47.2%
Height	2.5 storeys or 9.0m	2.5 storeys or 8.56m
Front Yard	4.5m	6.5m
Side Yard (east)	2.0m	2.75m
Side Yard (west)	2.0m	2.75m
Rear Yard	1.5m	4.5m
Other Regulations		
Minimum Parking Requirements	6 parking stalls	6 parking stalls
Setbacks to Parking		
Side Yard (east)	1.5m	0.3m ❶
Side Yard (west)	1.5m	0.3m ❷
Rear Yard	1.5m	1.5m
Private Open Space	>25m^2 per dwelling	>25m^2 per dwelling
❶ Indicates a requested variance to allow required parking in the east side yard setback.		
❷ Indicates a requested variance to allow required parking in the west side yard setback.		

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Sensitive Infill.[2] Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the character of the neighbourhood with respect to building design height and siting.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permits.

[1] City of Kelowna Official Community Plan, Policy 5.2.3 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.22.6 (Development Process Chapter).

- A third party work order may be required with the Development Engineering Department for an upgraded water line and sewage connection. These requirements are to be resolved prior to issuance of the Building Permit.
- A Mechanical room independent from the units is required for the water service to enter prior to being piped to the independent units.
- Separate and independent heating systems are required for each unit. These heating units may be required to vent thru the roof depending on distances to windows and air inlets to the building. We recommend that the location of any air conditioners are to be established at this time due to setback limitations.
- This property falls within a defined flood plain area and compliance is required to Mill Creek Bylaw No. 10248 or alternative approval from the subdivision approving officer as per section 5.3 of the bylaw is required prior to issuance of any building permits
- HPO (Home Protection Office) approval or release is required at time of Building Permit application.
- The drawings submitted for Building Permit application are to indicate the method of fire separation between the units.
- Range hood above the stove and the washroom to vent separately to the exterior of the building. The size of the penetration for this duct thru a fire separation is restricted by BCBC 12, so provide size of ducts and fire separation details at time of Building Permit Applications.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications. Please indicate how the requirements of Radon mitigation and NAFS are being applied to this complex at time of permit application.

6.2 Development Engineering Department

- Please see attached Schedule "A" dated March 6, 2017

6.3 Fire Department

- Requirements of section 9.10.19 Smoke Alarms and Carbon Monoxide alarms of the BCBC 2012 are to be met.
- All units shall have a posted address on Rose Ave.
- If a fence is ever constructed between the units a clear width of 1100mm is required to be maintained for access
- Maintain access to all units from Rose Ave - a laneway is not a reliable emergency access route.

6.4 FortisBC Electric

- There are FortisBC Inc (Electric) ("FBC(E)") primary distribution facilities along Rose Avenue and within the lane adjacent the subject's south property line. The applicant is responsible for costs associated with any change to the subject property's existing service, if any, as well as the provision of appropriate land rights where required.

7.0 Application Chronology

Date of Application Received: December 23, 2017
Date Public Consultation Completed: May 5, 2017

Report prepared by: Trisa Brandt, Planner I

Reviewed by: Terry Barton, Urban Planning Manager

Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Schedule "A": Memorandum dated March 6, 2017
Site Plan and Floor Plans
Conceptual Renderings
Landscape Plan

SCHEDULE A
This forms part of application
Z17-0012
Planner Initials TB
City of Kelowna COMMUNITY PLANNING

CITY OF KELOWNA

MEMORANDUM

Date: March 6, 2017
File No.: Z17-0012

To: Community Planning (TB)

From: Development Engineering Manager(SM)

Subject: 861 Rose Ave RU6 to RM1

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 Sergio Sartori

1. **Domestic Water and Fire Protection**

The subject property is currently serviced with a 13mm water service. The developer will need to determine the domestic and fire protection requirements of this proposed development. Only one service will be permitted for this development. The applicant will arrange for the disconnection of existing service and the installation of a new service. The disconnection of the existing small diameter water services and the tie-in of a larger new service can be provided by City forces at the developer's expense. One metered water service will supply the development. The applicant will be required to sign a Third Party Work Order for the cost of the water service upgrades. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

2. **Sanitary Sewer**

Our records indicate that this property is currently serviced with a 100mm-diameter sanitary sewer service. An inspection chamber (IC) complete with brooks box must be installed on the service at the owner's cost. Service upgrades can be provided by the City at the applicant's cost. The applicant will be required to sign a Third Party Work Order for the cost of the service upgrade. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

3. **Road Improvements**

Rose Ave must be upgraded to an urban standard along the full frontage of this proposed development, including curb and gutter, sidewalk, drainage system including catch basins, manholes and pavement removal and replacement, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. A one-time cash payment in lieu of construction must be collected from the applicant for future construction by the City. The cash-in-lieu amount is determined to be **$9,669.00** not including utility service cost.

(a) Only the service upgrades must be completed at this time. The City wishes to defer the upgrades to Rose Ave fronting this development. Therefore, cash-in-lieu of immediate construction is required and the City will initiate the work later, on its own construction schedule.

Item	Cost
Drainage	$ 2,855.00
Sidewalk	$ 2,443.00
Curb &Gutter	$ 1,954.00
Road Fillet	$ 2,052.00
Blvd Landscaping	$ 366.00
Total	**$ 9,669.00**

4. ***Subdivision***

(a) Grant Statutory Rights of Way if required for utility services.

(b) Provide a 5.0m road reserve along the full frontage of Rose Avenue.

(c) If any road dedication or closure affects lands encumbered by a Utility right-of-way (such as Hydro, Telus, Gas, etc.) please obtain the approval of the utility. Any works required by the utility as a consequence of the road dedication or closure must be incorporated in the construction drawings submitted to the City's Development Manager

5. Development Permit and Site Related Issues

Direct the roof drains into on-site rock pits or splash pads.
Access is permitted from the lane only.

6. Electric Power and Telecommunication Services

The electrical and telecommunication services to this building must be installed in an underground duct system, and the building must be connected by an underground service. 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.

7. Bonding and Levy Summary

(a) Levies

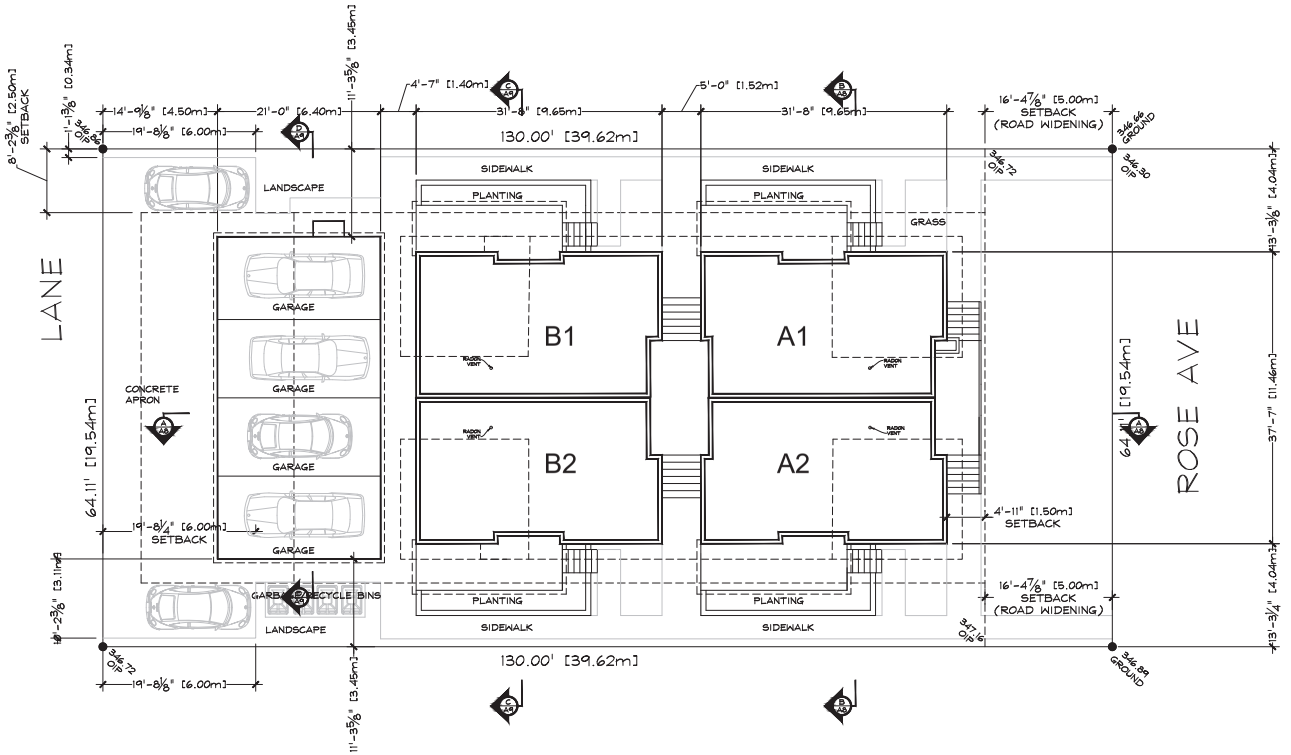
1. Rose Ave frontage improvements **$9,669.00**

(b) Bonding

1. Service upgrades To be determined

Steve Muenz, P. Eng.
Development Engineering Manager

SS



LOT COVERAGE

BUILDING COVERAGE
MAIN FLOOR = 2,082 SF
GARAGE = 872 SF
= 2,954 SF

TOTAL LOT SQ/FT = 8,334 SF
TOTAL FOOTPRINT = 2,954 SF
TOTAL COVERAGE = 35.45%
MAX ALLOWED 40%

TOTAL SITE COVERAGE
MAIN FLOOR = 2,082 SF
GARAGE = 872 SF
PARKING/DRIVEWAY = 978 SF
= 3,932 SF

TOTAL LOT SQ/FT = 8,334 SF
TOTAL FOOTPRINT = 3,932 SF
TOTAL COVERAGE = 47.18%
MAX ALLOWED 50%

FLOOR AREA RATIO:
MAIN FLOOR = 2,082 SF
UPPER FLOOR = 1,992 SF
GARAGE = 872 SF
TOTAL SQ/FT 4,946 SF
LOT AREA = 8,334 SF
FAR = 0.59 MAX ALLOWED 0.60

LOT INFORMATION

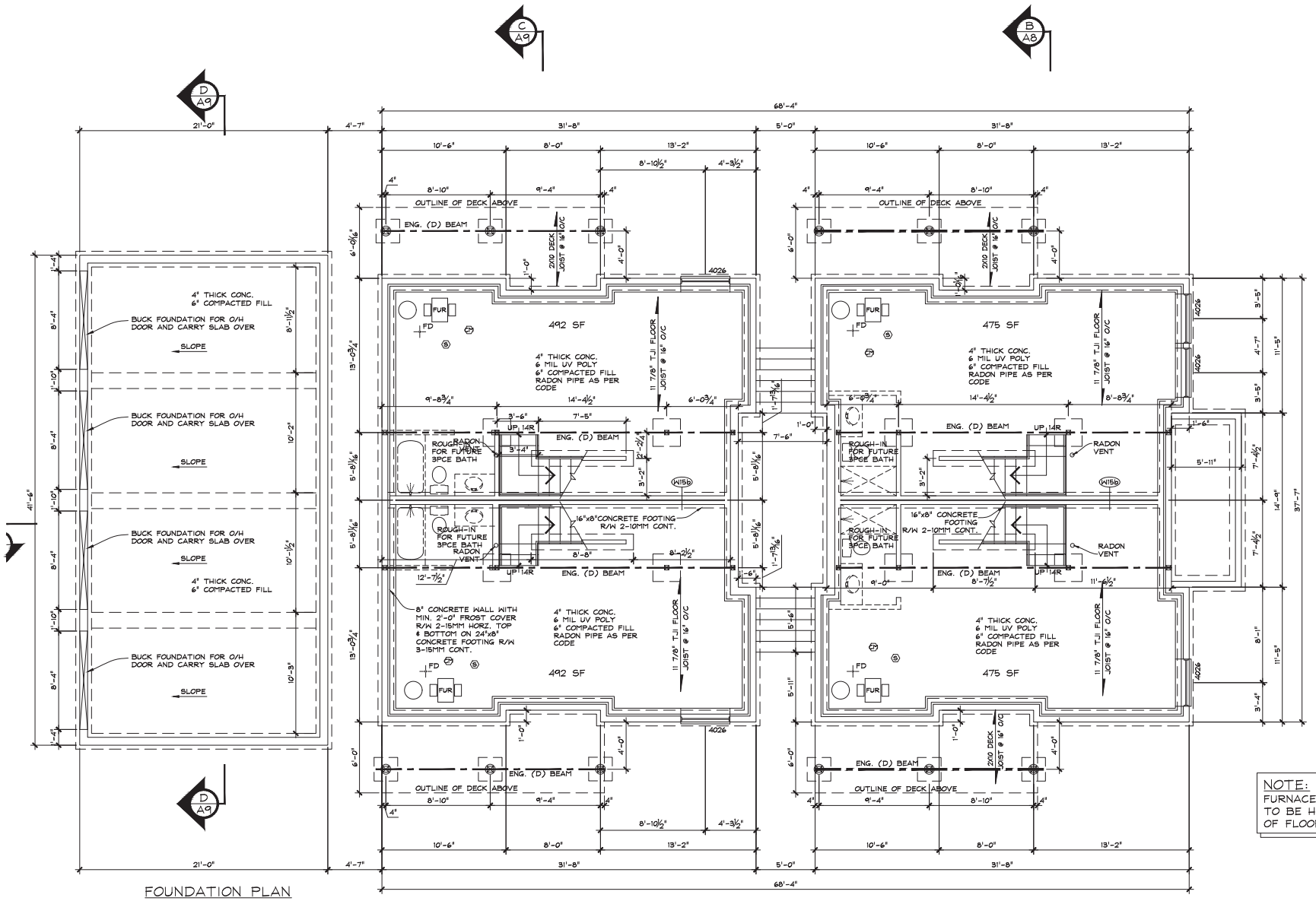
ZONING RU6 PROPOSED RM1
LEGAL DESCR. LOT 7, DL 16, ODYD PLAN 8116
CIVIC ADDRESS 861 ROSE AVE.

MILL CREEK FLOODPLAIN BYLAW: 346.75m

'Rose Avenue Project'
861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"
DATE: APR 23/17
SITE PLAN
SHEET NO. A1



FOUNDATION PLAN

SPECIFICATIONS

EXTERIOR WALL:

ACRYLIC STUCCO ON
PAPER & WIRE BASE W/SCRATCH COAT
½" SHEATHING
2x6 STUDS @ 16"O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (U.V. RESISTANT)
5/8" GYPSUM BOARD

GARAGE FLOOR:

CONCRETE SLAB
SLOPE 2" MIN FOR DRAINAGE

EXTERIOR FOUNDATION:

2 COATS ASPHALT EMULSION
8" CONCRETE FOUNDATION WALL
3" RIGID INSULATION TO
BELOW FROST LINE W/PROTECTION
MIN 24" BELOW FINISH GRADE
24"x8" CONCRETE FOOTING

INTERIOR FOUNDATION:

6" CONCRETE CURB
1'6" x 8" CONCRETE FOOTING

DRAINAGE:

6" MIN DRAIN ROCK COVER
4" DIA. DRAIN TILE

BELOW GRADE WALL ASSEMBLY

DESCRIPTION	NOMINAL	EFFECTIVE
8" FOUNDATION WALLS W/2X6 PWF @24"O.C. W/R-24 BATT INSULATION	RSI 2.66	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. DAMPROOFING/INTERIOR AIR FILM	0.33	1.9
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 2.99 (R-17.0)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS W/HRV		RSI 2.98 (R-16.92)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS		RSI 2.98 (R-16.92)

NOTE:
FURNACES IN ALL UNITS
TO BE HUNG FROM UNDERSIDE
OF FLOOR JOISTS

NOTES

PROVIDE FIRE STOPS IN ACCORDANCE WITH BC BUILDING CODE REFERENCE 9.10.15 AND SMOKE ALARMS IN ACCORDANCE WITH REFERENCE 9.10.18.

PROVIDE DAMPROOFING, WATERPROOFING AND SOIL GAS CONTROL IN ACCORDANCE WITH BC BUILDING CODE REFERENCE SECTION 9.13 & 9.16.2

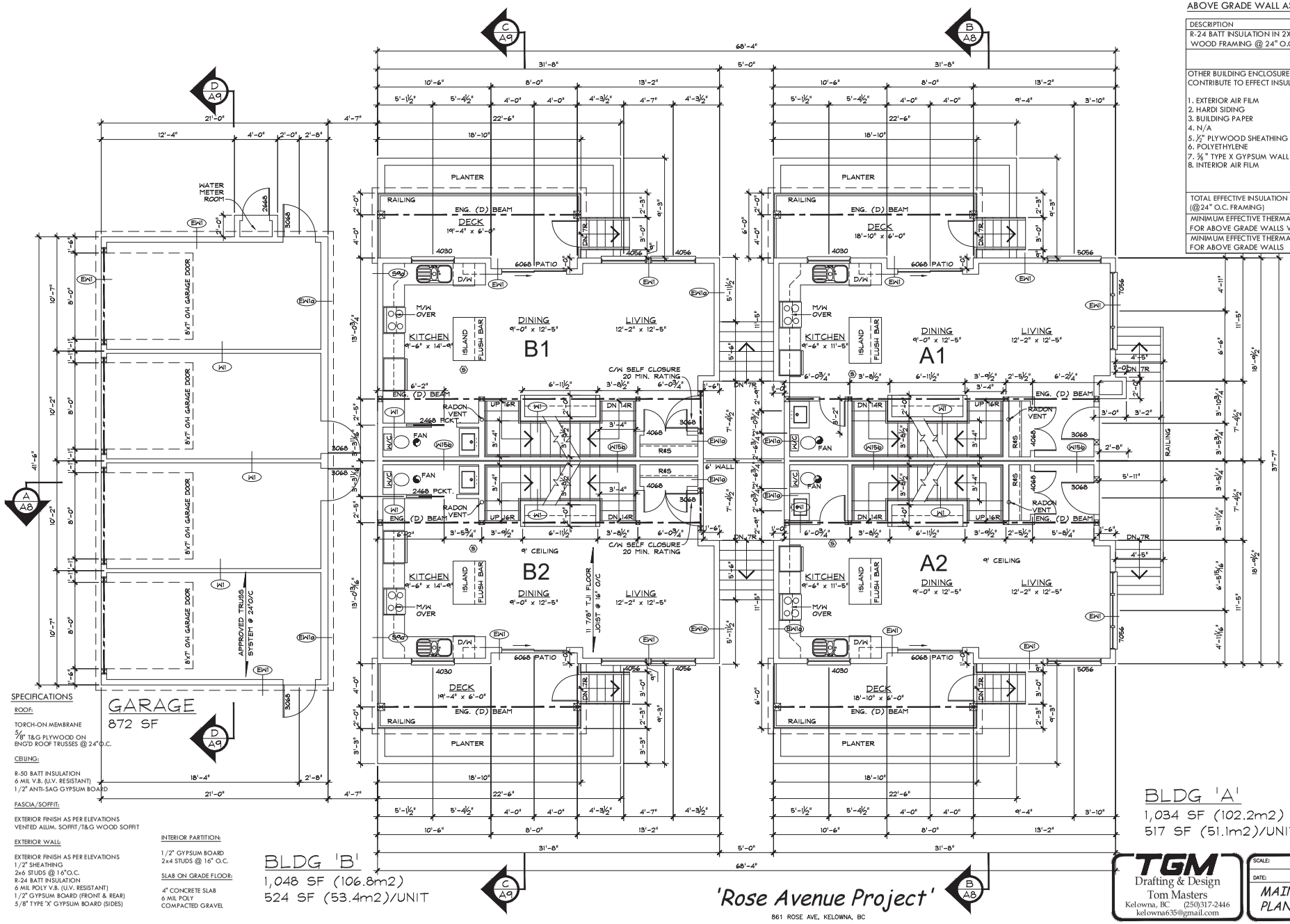
FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.

FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.COMPACTION TO BE TESTED BY QUALIFIED PROFESSIONAL OR GEOTECHNICAL ENGINEER.

'Rose Avenue Project'
861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 23/17
BASEMENT PLAN
SHEET NO. A4



ABOVE GRADE WALL ASSEMBLY (HARDI SIDING)

DESCRIPTION	NOMINAL	EFFECTIVE
R-24 BATT INSULATION IN 2X6 WOOD FRAMING @ 24" O.C.	RSI 4.23	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. EXTERIOR AIR FILM	0.03	0.17
2. HARDI SIDING	0.03	0.11
3. BUILDING PAPER	0.00	0.00
4. N/A	N/A	N/A
5. ½" PLYWOOD SHEATHING	0.11	0.63
6. POLYETHYLENE	0.00	0.00
7. ⅝" TYPE X GYPSUM WALL BOARD	0.099	0.56
8. INTERIOR AIR FILM	0.12	0.68
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 4.42 (R-17.24)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS W/HRV		RSI 2.97 (R-16.86)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS		RSI 3.08 (R-17.49)

SPECIFICATIONS

ROOF:

TORCH-ON MEMBRANE
5/8" T&G PLYWOOD ON ENG'D ROOF TRUSSES @ 24" O.C.

CEILING:

R-50 BATT INSULATION
6 MIL V.B. (L.V. RESISTANT)
1/2" ANTI-SAG GYPSUM BOARD

FASCIA/SOFFIT:

EXTERIOR FINISH AS PER ELEVATIONS
VENTED ALUM. SOFFIT/T&G WOOD SOFFIT

EXTERIOR WALL:

EXTERIOR FINISH AS PER ELEVATIONS
1/2" SHEATHING
2x6 STUDS @ 16" O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (L.V. RESISTANT)
1/2" GYPSUM BOARD (FRONT & REAR)
5/8" TYPE 'X' GYPSUM BOARD (SIDES)

INTERIOR PARTITION:

1/2" GYPSUM BOARD
2x4 STUDS @ 16" O.C.

SLAB ON GRADE FLOOR:

4" CONCRETE SLAB
6 MIL POLY
COMPACTED GRAVEL

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

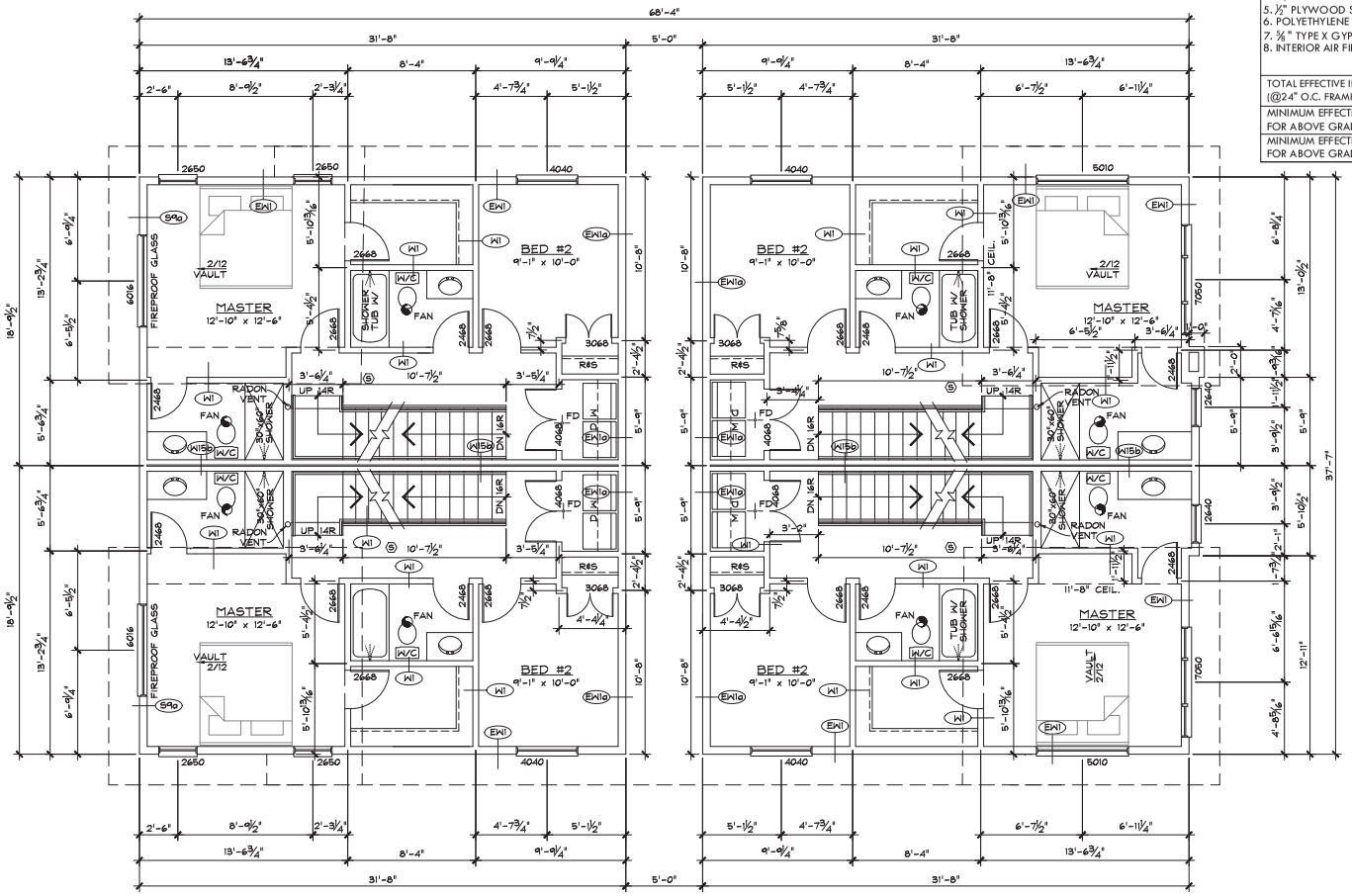
SCALE: 1/4"=1'-0"
DATE: APR 23/17
MAIN FLOOR PLAN
SHEET NO. A3

ROOF ASSEMBLY - CATHEDRAL CEILINGS

DESCRIPTION	NOMINAL	EFFECTIVE
R-50 BATT INSULATION IN ENG. TRUSS @ 24" O.C.	RSI 8.81	(R-50.0)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. INTERIOR AIR FILM	0.12	0.68
2. ½" GYPSUM BOARD	0.08	0.45
3. 7/16 SHEATHING	0.11	0.62
4. ROOF FINISH	0.00	0.00
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 9.12 (R-51.75)
MINIMUM EFFECTIVE THERMAL RESISTANCE W/HRV		RSI 4.67 (R-26.5)
MINIMUM EFFECTIVE THERMAL RESISTANCE		RSI 4.67 (R-26.5)

ABOVE GRADE WALL ASSEMBLY (HARDI SIDING)

DESCRIPTION	NOMINAL	EFFECTIVE
R-24 BATT INSULATION IN 2X6 WOOD FRAMING @ 24" O.C.	RSI 4.23	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. EXTERIOR AIR FILM	0.03	0.17
2. HARDI SIDING	0.03	0.11
3. BUILDING PAPER	0.00	0.00
4. N/A	N/A	N/A
5. ½" PLYWOOD SHEATHING	0.11	0.63
6. POLYETHYLENE	0.00	0.00
7. ⅝" TYPE X GYPSUM WALL BOARD	0.099	0.56
8. INTERIOR AIR FILM	0.12	0.68
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 4.42 (R-17.24)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS W/HRV		RSI 2.97 (R-16.86)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS		RSI 3.08 (R-17.49)



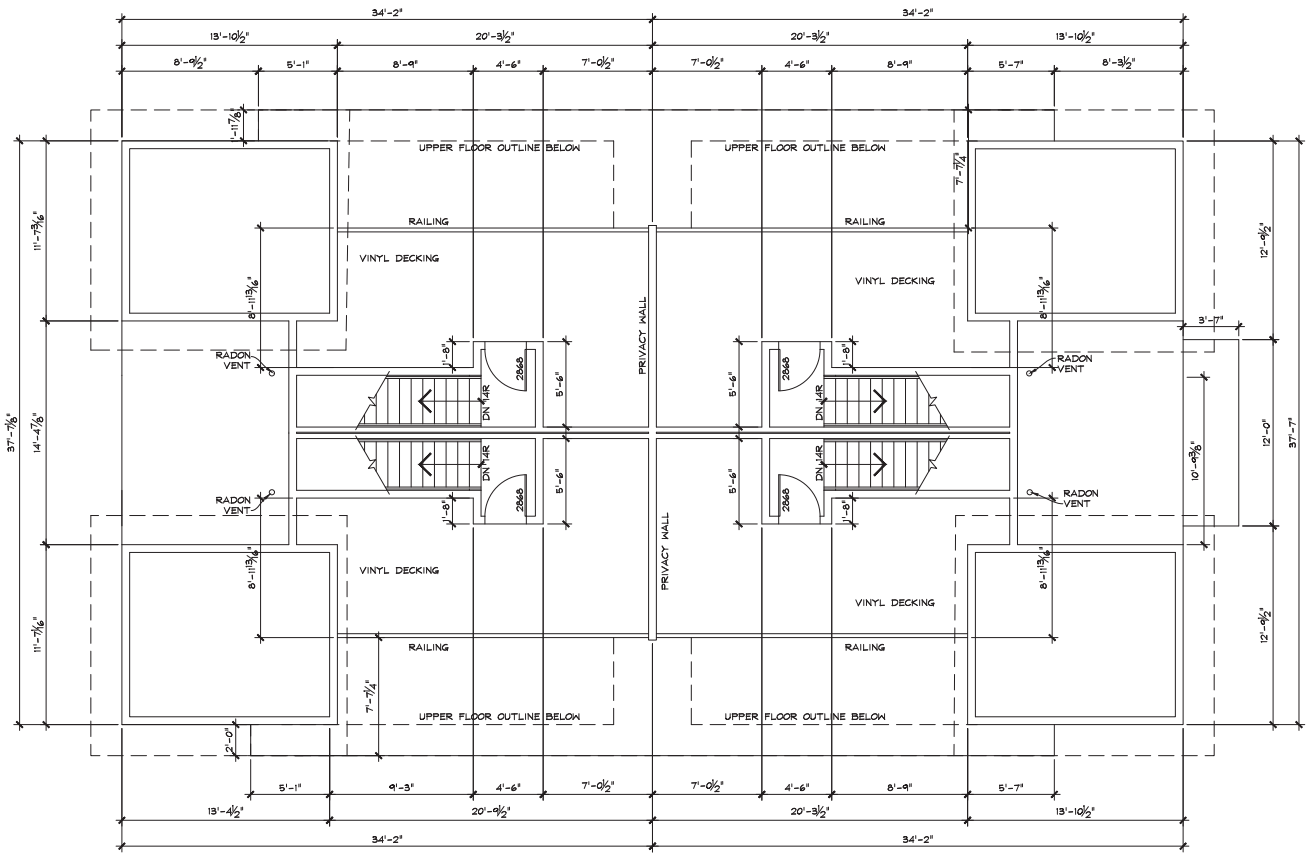
BLDG 'B'
996 SF (92.6m2)
498 SF (46.3m2)/UNIT

BLDG 'A'
996 SF (92.6m2)
498 SF (46.3m2)/UNIT

'Rose Avenue Project'
861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 23/17
UPPER FLOOR PLAN
SHEET NO. A4



ROOF PATIO

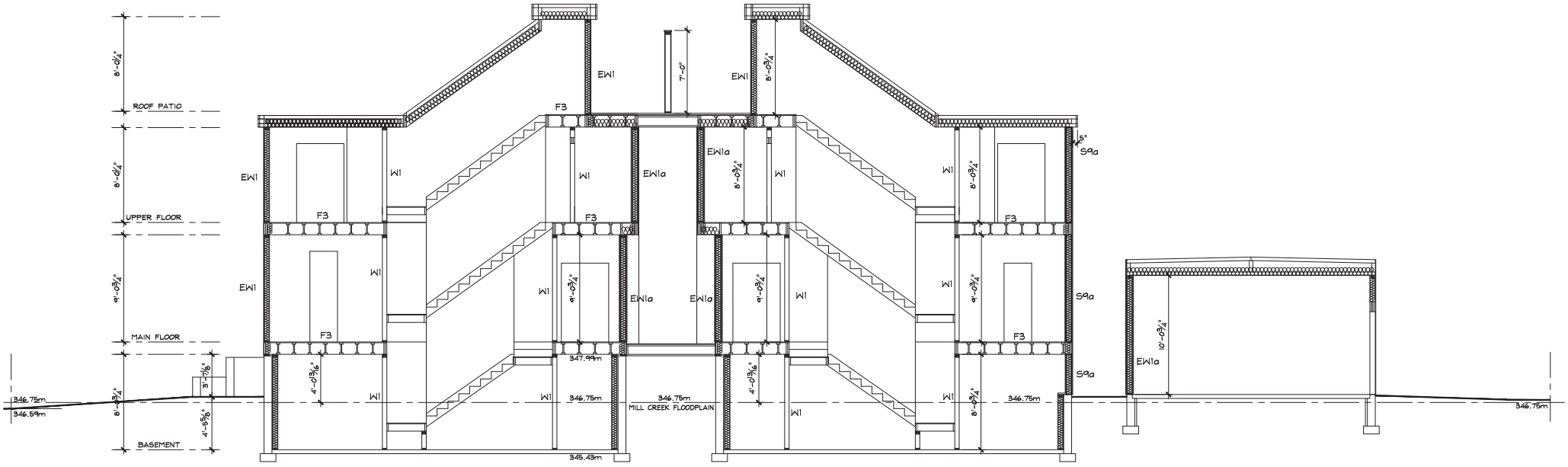
213 SF(19.87 m2)/UNIT

'Rose Avenue Project'

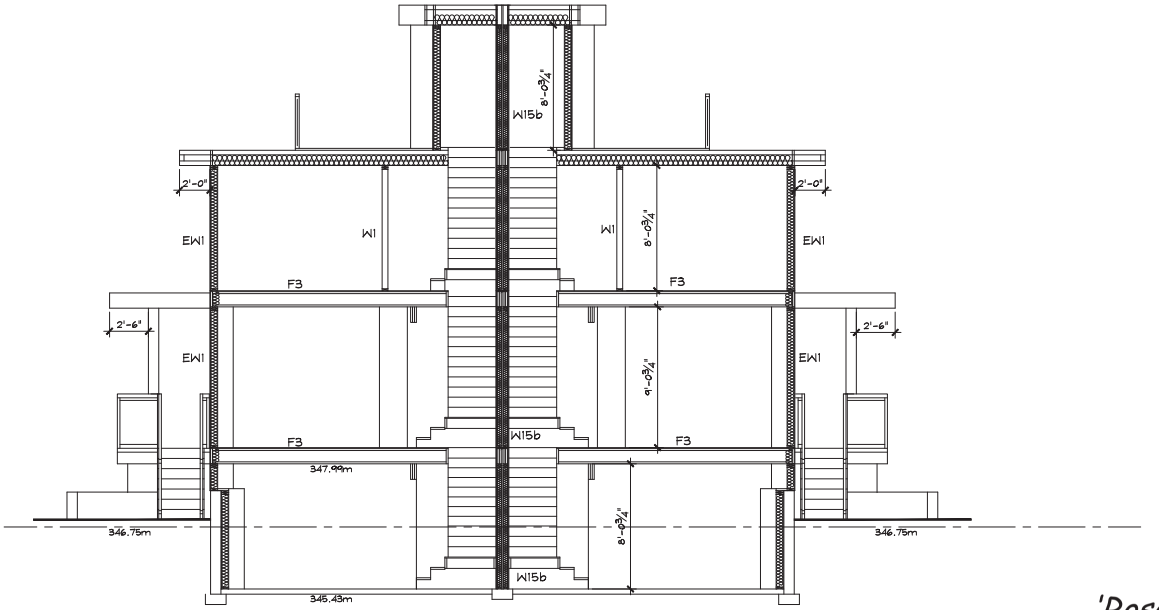
861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 23/17
ROOF PLAN
SHEET NO. A5



SECTION 'A-A'



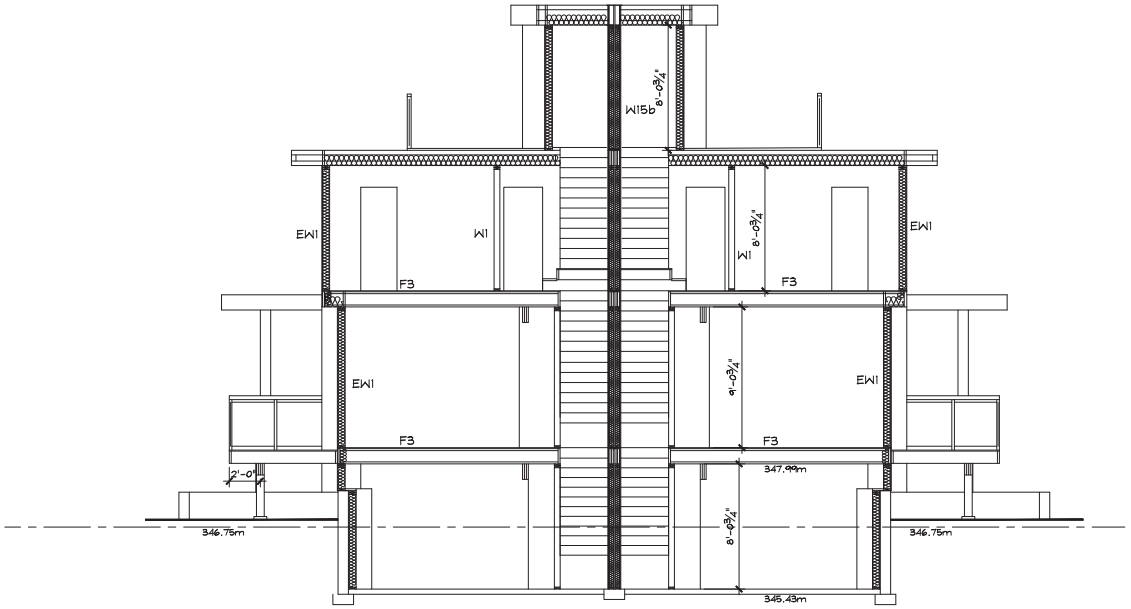
SECTION 'B-B'

'Rose Avenue Project'

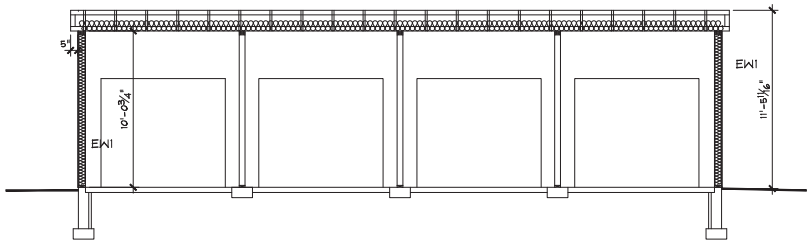
861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 23/17
SECTIONS
SHEET NO. A8



SECTION 'C-C'



SECTION 'D-D'

WALL TYPES

W1
38 MM X 89 MM STUDS SPACED 400 MM OR 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL
1 LAYER OF GYPSUM BOARD ON EACH SIDE

W15
TWO ROWS 38 MM X 89 MM STUDS, EACH SPACED 400 MM OR 600 MM O.C. ON SEPARATE 38 MM X 89 MM PLATES SET 25 MM APART
WITH OR WITHOUT ABSORPTIVE MATERIAL
2 LAYERS OF GYPSUM BOARD ON EACH SIDE

W15b
W15 WITH
89 MM THICK ABSORPTIVE MATERIAL ON EACH SIDE
12.7 MM TYPE X GYPSUM BOARD 1 H

EW1
38 MM X 140 MM STUDS SPACED 400 MM OR 600 MM O.C.
89 MM THICK ABSORPTIVE MATERIAL
1 LAYER OF 13 MM GYPSUM BOARD ON INSIDE
EXTERIOR SHEATHING AND SIDING

F3
SUBFLOOR OF 15.5 MM PLYWOOD, OSB OR WAFERBOARD, OR 17MM TONGUE AND GROOVE LUMBER
ON WOOD JOISTS CHANGE BEGINOR WOOD I-JOISTS CHANGE END SPACED NOT MORE THAN 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL IN CAVITY
1 LAYER OF GYPSUM BOARD ON CEILING SIDE

S9a
31 MM x 152 MM STEEL STUDS SPACED 400 MM OR 600 MM O.C.
2 LAYERS OF 12.7 MM TYPE X GYPSUM BOARD ON EACH SIDE
150 MM THICK ABSORPTIVE MATERIAL

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861 ROSE AVE, KELOWNA, BC

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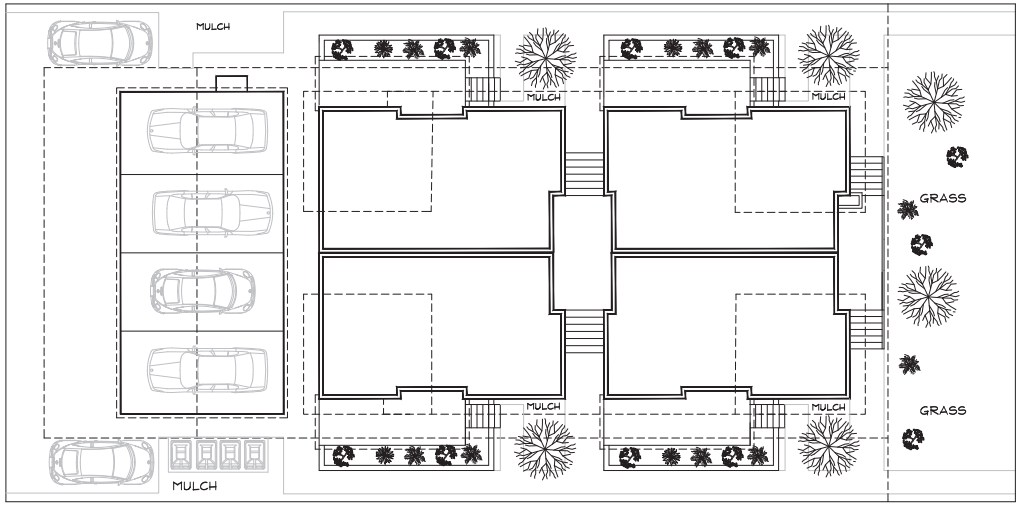
SCALE: 1/4"=1'-0"
DATE: APR 23/17
SECTIONS
SHEET NO. A9



MAPLE

JAPANESE MAPLE

NINE BARK

BARBERRY

SMALL PLANTS AND FLOWERS
WILL BE ADDED TO PLANTING BEDS

LOT INFORMATION

ZONING RU6	PROPOSED RM1
LEGAL DESCR.	LOT 7, DL 16, ODYD PLAN 8116
CIVIC ADDRESS	861 ROSE AVE.

'Rose Avenue Project'

861 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"

DATE: APR 23/17

LANDSCAPE PLAN

SHEET NO. L1

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (TB)		
Application:	Z17-0013	**Owner:**	Wes Riley Jones Tammy Retta Jones
Address:	775 Rose Avenue	**Applicant:**	Integrity Services Inc.
Subject:	Rezoning Application		
Existing OCP Designation:	MRL – Multiple Unit Residential (Low Density)		
Existing Zone:	RU6 – Two Dwelling Housing		
Proposed Zone:	RM1 – Four Dwelling Housing		

1.0 Recommendation

THAT Rezoning Application No. Z17-0013 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 7, District Lot 136, ODYD, Plan 11487, located at 775 Rose Avenue Kelowna, BC from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated May 29, 2017;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and Development Variance Permit for the subject property.

2.0 Purpose

To rezone the subject property to RM1 – Four Dwelling Housing to facilitate the development of four dwelling units.

3.0 Community Planning

Community Planning Staff supports the proposed rezoning application to facilitate the development of four dwelling units. The RM1 – Four Dwelling Housing zone is consistent with the Official Community Plan (OCP) Future Land Use Designation of MRL – Multiple Unit Residential (Low Density). The proposal is consistent with OCP policies for Compact Urban Form and Sensitive Infill. Should Council support this rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading.

There are two other development applications on Rose Avenue that have been submitted to the City requesting the same zone for the construction of a four-plex with nearly identical floor plans. Staff have worked with the representatives from each project to ensure that differences in the materials and colour palette of each application provides variety and individuality.

4.0 Proposal

4.1 Background

The subject property features a raised bungalow that will be demolished as a function of this development proposal. The property is located near the new RU7 – Infill Housing Zone which will also allow for four-plex developments. It is anticipated that this area is in a stage of redevelopment where infill will become more and more frequent and density will increase.

4.2 Project Description

The proposed rezoning would facilitate the development of a four-plex on the subject property. This is consistent with the OCP Future Land Use designation of Multiple Unit Residential Low Density. The proposal meets the OCP Policy of Compact Urban Growth by increasing density where infrastructure already exists.

The proposal involves a 5.0m road reserve across the front property for future expansion of Rose Avenue. All parking will be located in the rear, with 4 covered parking stalls and 2 uncovered stalls. The project requires one variance to allow the additional 2 uncovered stalls to be located in the side yard setback. All other Zoning Bylaw requirements are met including provision of private outdoor space, height, setbacks, and site coverage.

The proposed design has front doors facing the street for the two front units, and side entry for the two rear units. The units feature full basements and as such a 219 Restrictive Covenant regarding the Mill Creek Floodplain Bylaw has been placed on title that indemnifies the City in the event of any flooding. Four units is the maximum allowed under the zone, and therefore secondary suites would not be permitted in the units.

The design as proposed meets the majority of the design guidelines, and should Council support the rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading. There are two other applications on Rose Avenue at this time that are also rezoning to a four-plex with nearly identical floor plans. The representatives from each project have taken care to ensure that differences in the materials and colour palette of each application provides variety and individuality. The three projects are located at 775 Rose Avenue, 815 Rose Avenue, and 861 Rose Avenue as shown in the Map on Page 3.

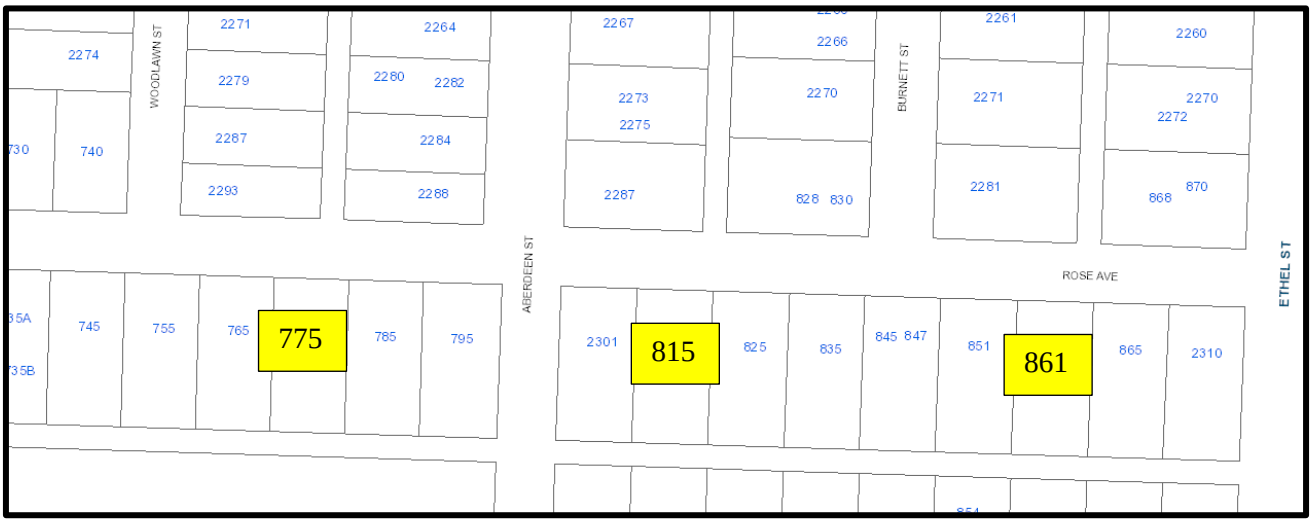


Figure 1.0 – Current Zoning Applications along Rose Avenue to RM1

4.3 Site Context

The subject property is located in South Pandosy east of Richter Street and south of Ethel Street on the south side of Rose Avenue. The subject property is within walking distance to a variety of amenities including Guisachan Village, Cameron Park, Kelowna General Hospital, and is located on a bicycle corridor with access to the proposed Ethel Street Active Transportation Corridor. Immediately to the south of this property is Cameron Park, and an RU6 – Two Dwelling Housing neighbourhood is to the north.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU6 – Two Dwelling Housing	Residential
East	RU6 – Two Dwelling Housing	Residential
South	RU7 – Infill Housing	Residential
West	RU6 – Two Dwelling Housing	Residential

Subject Property Map: 775 Rose Avenue

4.4 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**RM1 ZONE REQUIREMENTS**	**PROPOSAL**
Development Regulations		
Floor Area Ratio	.60	.49
Site Coverage of Buildings	40%	35.5%
Site Coverage of Buildings, Parking, and Driveways	50%	47.2%
Height	2.5 storeys or 9.0m	2.5 storeys or 8.56m
Front Yard	4.5m	6.5m
Side Yard (east)	2.0m	2.75m
Side Yard (west)	2.0m	2.75m
Rear Yard	1.5m	4.5m
Other Regulations		
Minimum Parking Requirements	6 parking stalls	6 parking stalls
Setbacks to Parking		
Side Yard (east)	1.5m	0.3m ❶
Side Yard (west)	1.5m	0.3m ❷
Rear Yard	1.5m	1.5m
Private Open Space	>25m^2 per dwelling	>25m^2 per dwelling

❶ Indicates a requested variance to allow required parking in the east side yard setback.
❷ Indicates a requested variance to allow required parking in the west side yard setback.

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Sensitive Infill.[2] Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the character of the neighbourhood with respect to building design height and siting.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permits.
- A third party work order may be required with the Development Engineering Department for an upgraded water line and sewage connection. These requirements are to be resolved prior to issuance of the Building Permit.
- A Mechanical room independent from the units is required for the water service to enter prior to being piped to the independent units.
- Separate and independent heating systems are required for each unit. These heating units may be required to vent thru the roof depending on distances to windows and air inlets to the building. We recommend that the location of any air conditioners are to be established at this time due to setback limitations.
- This property falls within a defined flood plain area and compliance is required to Mill Creek Bylaw No. 10248 or alternative approval from the subdivision approving officer as per section 5.3 of the bylaw is required prior to issuance of any building permits
- HPO (Home Protection Office) approval or release is required at time of Building Permit application.
- The drawings submitted for Building Permit application are to indicate the method of fire separation between the units.
- Range hood above the stove and the washroom to vent separately to the exterior of the building. The size of the penetration for this duct thru a fire separation is restricted by BCBC 12, so provide size of ducts and fire separation details at time of Building Permit Applications.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications. Please indicate how the requirements of Radon mitigation and NAFS are being applied to this complex at time of permit application.

6.2 Development Engineering Department

- Please see attached Schedule "A" dated March 6, 2017

[1] City of Kelowna Official Community Plan, Policy 5.2.3 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.22.6 (Development Process Chapter).

6.3 Fire Department

- Requirements of section 9.10.19 Smoke Alarms and Carbon Monoxide alarms of the BCBC 2012 are to be met.
- All units shall have a posted address on Rose Ave.
- If a fence is ever constructed between the units a clear width of 1100mm is required to be maintained for access
- Maintain access to all units from Rose Ave - a laneway is not a reliable emergency access route.

6.4 FortisBC Electric

- There are FortisBC Inc (Electric) ("FBC(E)") primary distribution facilities along Rose Avenue and within the lane adjacent the subject's south property line. The applicant is responsible for costs associated with any change to the subject property's existing service, if any, as well as the provision of appropriate land rights where required.

7.0 Application Chronology

Date of Application Received: December 23, 2017
Date Public Consultation Completed: May 5, 2017

Report prepared by: Trisa Brandt, Planner I

Reviewed by: Terry Barton, Urban Planning Manager

Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Schedule "A": Memorandum dated March 6, 2017
Site Plan and Floor Plans
Conceptual Renderings
Landscape Plan

SCHEDULE A
This forms part of application
Z17-0013
Planner Initials TB
City of Kelowna COMMUNITY PLANNING

CITY OF KELOWNA

MEMORANDUM

Date: March 6, 2017
File No.: Z17-0013

To: Community Planning (TB)

From: Development Engineering Manager(SM)

Subject: 775 Rose Ave RU6 to RM1

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 Sergio Sartori

1. Domestic Water and Fire Protection

The subject property is currently serviced with a 13mm water service. The developer will need to determine the domestic and fire protection requirements of this proposed development. Only one service will be permitted for this development. The applicant will arrange for the disconnection of existing service and the installation of a new service. The disconnection of the existing small diameter water services and the tie-in of a larger new service can be provided by City forces at the developer's expense. One metered water service will supply the development. The applicant will be required to sign a Third Party Work Order for the cost of the water service upgrades. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

2. Sanitary Sewer

Our records indicate that this property is currently serviced with a 100mm-diameter sanitary sewer service. An inspection chamber (IC) complete with brooks box must be installed on the service at the owner's cost. Service upgrades can be provided by the City at the applicant's cost. The applicant will be required to sign a Third Party Work Order for the cost of the service upgrade. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

3. Road Improvements

Rose Ave must be upgraded to an urban standard along the full frontage of this proposed development, including curb and gutter, sidewalk, drainage system including catch basins, manholes and pavement removal and replacement, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. A one-time cash payment in lieu of construction must be collected from the applicant for future construction by the City. The cash-in-lieu amount is determined to be **$9,669.00** not including utility service cost.

(a) Only the service upgrades must be completed at this time. The City wishes to defer the upgrades to Rose Ave fronting this development. Therefore, cash-in-lieu of immediate construction is required and the City will initiate the work later, on its own construction schedule.

Item	Cost
Drainage	$ 2,855.00
Sidewalk	$ 2,443.00
Curb &Gutter	$ 1,954.00
Road Fillet	$ 2,052.00
Blvd Landscaping	$ 366.00
Total	**$ 9,669.00**

4. Subdivision

(a) Grant Statutory Rights of Way if required for utility services.

(b) Provide a 5.0m road reserve along the full frontage of Rose Avenue.

(c) If any road dedication or closure affects lands encumbered by a Utility right-of-way (such as Hydro, Telus, Gas, etc.) please obtain the approval of the utility. Any works required by the utility as a consequence of the road dedication or closure must be incorporated in the construction drawings submitted to the City's Development Manager

5. Development Permit and Site Related Issues

Direct the roof drains into on-site rock pits or splash pads.
Access is permitted from the lane only.

6. Electric Power and Telecommunication Services

The electrical and telecommunication services to this building must be installed in an underground duct system, and the building must be connected by an underground service. 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.

7. Bonding and Levy Summary

(a) Levies

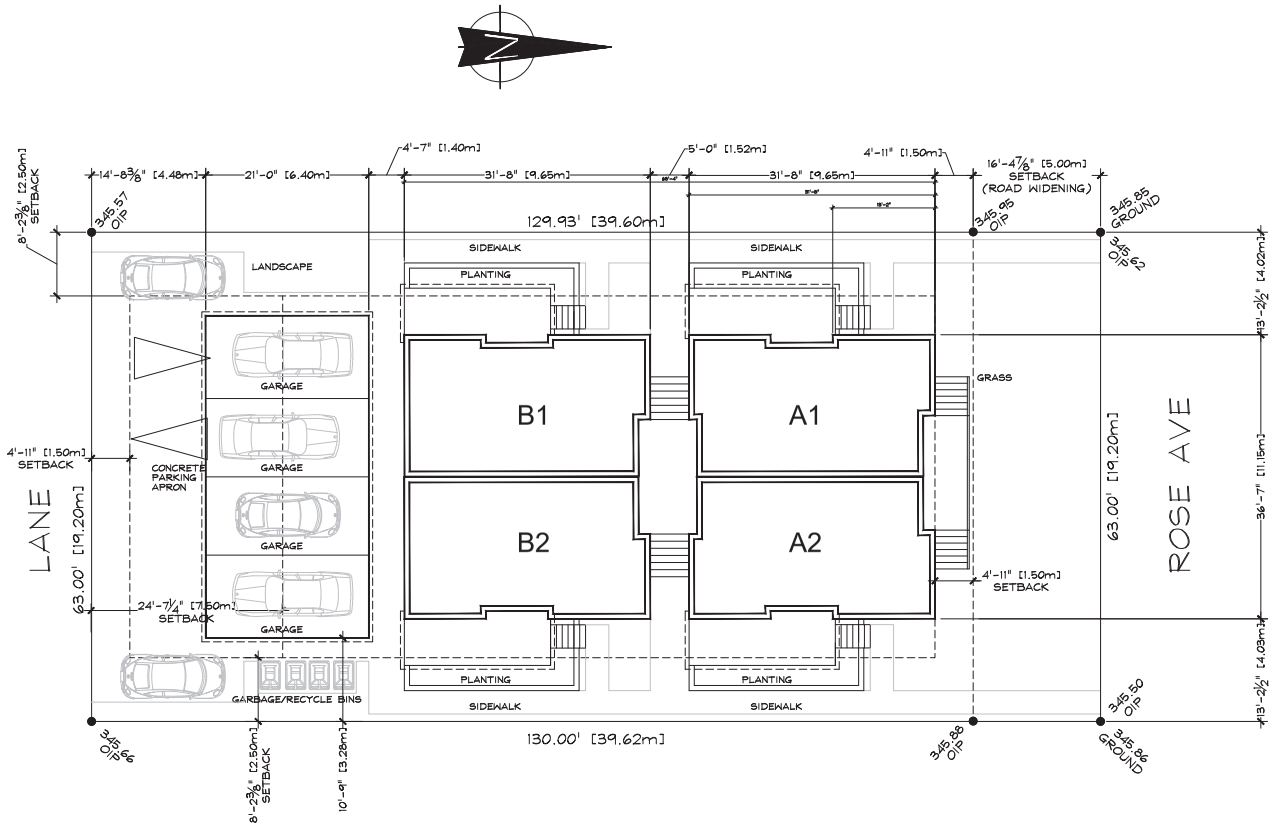
1. Rose Ave frontage improvements **$9,669.00**

(b) Bonding

1. Service upgrades To be determined

Steve Muenz, P. Eng.
Development Engineering Manager

SS



LOT COVERAGE

BUILDING COVERAGE
MAIN FLOOR = 2,022 SF
GARAGE = 872 SF
= 2,894 SF

TOTAL LOT SQ/FT = 8,186 SF
TOTAL FOOTPRINT = 2,894 SF
TOTAL COVERAGE = 35.35%
MAX ALLOWED 40%

TOTAL SITE COVERAGE
MAIN FLOOR = 2,022 SF
GARAGE = 872 SF
PARKING/DRIVEWAY = 978 SF
= 3,872 SF

TOTAL LOT SQ/FT = 8,186 SF
TOTAL FOOTPRINT = 3,872 SF
TOTAL COVERAGE = 47.30%
MAX ALLOWED 50%

FLOOR AREA RATIO:
MAIN FLOOR = 2,022 SF
UPPER FLOOR = 1,932 SF
GARAGE = 872 SF
TOTAL SQ/FT 4,826 SF
LOT AREA = 8,186 SF
FAR = 0.59 MAX ALLOWED 0.60

LOT INFORMATION

ZONING RU6 PROPOSED RM1
LEGAL DESCR. LOT 7 , DL 16, ODYD
PLAN 11487
CIVIC ADDRESS 775 ROSE AVE.

MILL CREEK FLOODPLAIN BYLAW: 345.95m

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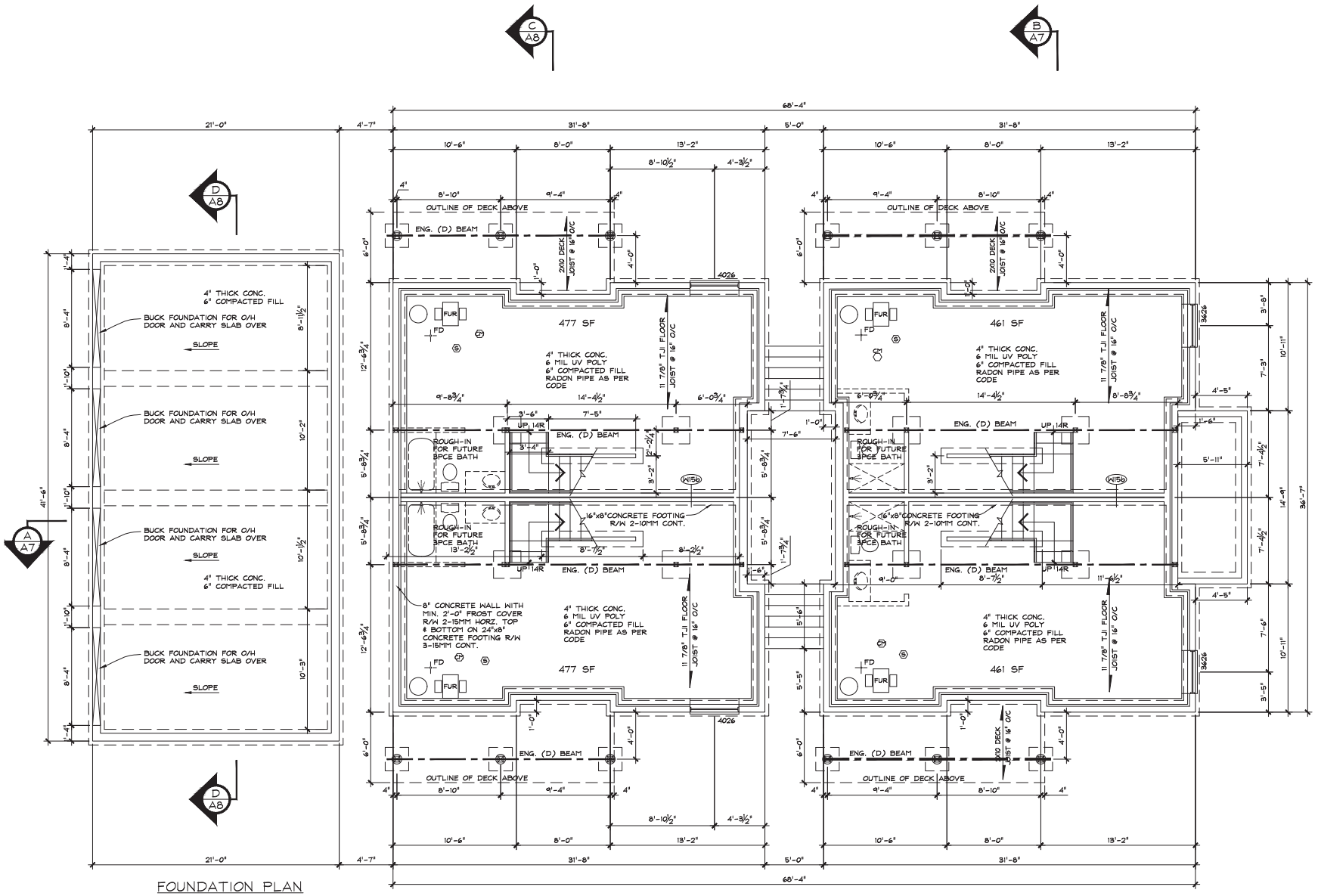
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"
DATE: APR 24/17
SITE PLAN
SHEET NO. A1



FOUNDATION PLAN

SPECIFICATIONS

EXTERIOR WALL:

ACRYLIC STUCCO ON
PAPER & WIRE BASE W/SCRATCH COAT
½" SHEATHING
2x6 STUDS @ 16"O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (U.V. RESISTANT)
5/8" GYPSUM BOARD

GARAGE FLOOR:

CONCRETE SLAB
SLOPE 2" MIN FOR DRAINAGE

EXTERIOR FOUNDATION:

2 COATS ASPHALT EMULSION
8" CONCRETE FOUNDATION WALL
3" RIGID INSULATION TO
BELOW FROST LINE W/PROTECTION
MIN 24" BELOW FINISH GRADE
24"x8" CONCRETE FOOTING

INTERIOR FOUNDATION:

6" CONCRETE CURB
16" x 8" CONCRETE FOOTING

DRAINAGE:

6" MIN DRAIN ROCK COVER
4" DIA. DRAIN TILE

BELOW GRADE WALL ASSEMBLY OPTION 1

DESCRIPTION	NOMINAL	EFFECTIVE
8" FOUNDATION WALLS W/2X6 PWF @16"O.C. W/R-24 BATT INSULATION	RSI .2.66	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. DAMPROOFING/INTERIOR AIR FILM	0.33	1.9
TOTAL EFFECTIVE INSULATION VALUE (@16" O.C. FRAMING)		RSI 2.99 (R-17.0)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS W/HRV		RSI 2.98 (R-16.92)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS		RSI 2.98 (R-16.92)

BELOW GRADE WALL ASSEMBLY OPTION 2

DESCRIPTION	NOMINAL	EFFECTIVE
8" FOUNDATION WALLS w/3" XPS	RSI .2.65	(R-15.3)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. DAMPROOFING/INTERIOR AIR FILM		
TOTAL EFFECTIVE INSULATION VALUE (@16" O.C. FRAMING)		RSI 2.98 (R-17.2)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS W/HRV		RSI 2.98 (R-16.92)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS		RSI 2.98 (R-16.92)

NOTES

PROVIDE FIRE STOPS IN ACCORDANCE WITH BC BUILDING CODE REFERENCE 9.10.15 AND SMOKE ALARMS IN ACCORDANCE WITH REFERENCE 9.10.18.

PROVIDE DAMPROOFING, WATERPROOFING AND SOIL GAS CONTROL IN ACCORDANCE WITH BC BUILDING CODE REFERENCE SECTION 9.13 & 9.16.2

FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.

FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.COMPACTION TO BE TESTED BY QUALIFIED PROFESSIONAL OR GEOTECHNICAL ENGINEER.

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Tom Masters
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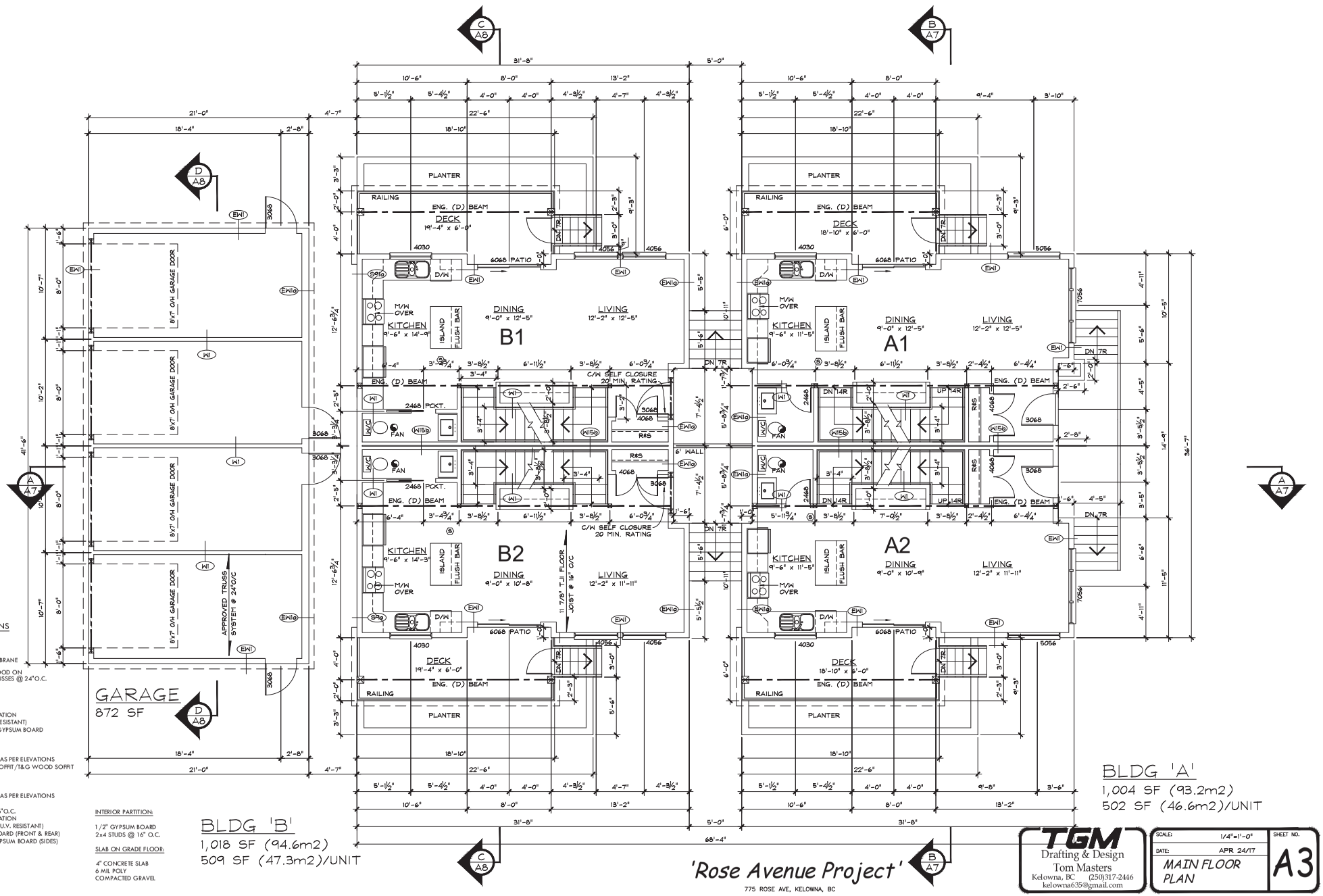
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
BASEMENT PLAN
SHEET NO. A4



SPECIFICATIONS

ROOF:

TORCH-ON MEMBRANE
5/8" T&G PLYWOOD ON ENG'D ROOF TRUSSES @ 24"O.C.

CEILING:

R-50 BATT INSULATION
6 MIL V.B. (U.V. RESISTANT)
1/2" ANTI-SAG GYPSUM BOARD

FASCIA/SOFFIT:

EXTERIOR FINISH AS PER ELEVATIONS
VENTED ALUM. SOFFIT /T&G WOOD SOFFIT

EXTERIOR WALL:

EXTERIOR FINISH AS PER ELEVATIONS
1/2" SHEATHING
2x6 STUDS @ 16" O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (U.V. RESISTANT)
1/2" GYPSUM BOARD (FRONT & REAR)
5/8" TYPE 'X' GYPSUM BOARD (SIDES)

INTERIOR PARTITION:

1/2" GYPSUM BOARD
2x4 STUDS @ 16" O.C.

SLAB ON GRADE FLOOR:

4" CONCRETE SLAB
6 MIL POLY
COMPACTED GRAVEL

BLDG 'B'
1,018 SF (94.6m2)
509 SF (47.3m2)/UNIT

BLDG 'A'
1,004 SF (93.2m2)
502 SF (46.6m2)/UNIT

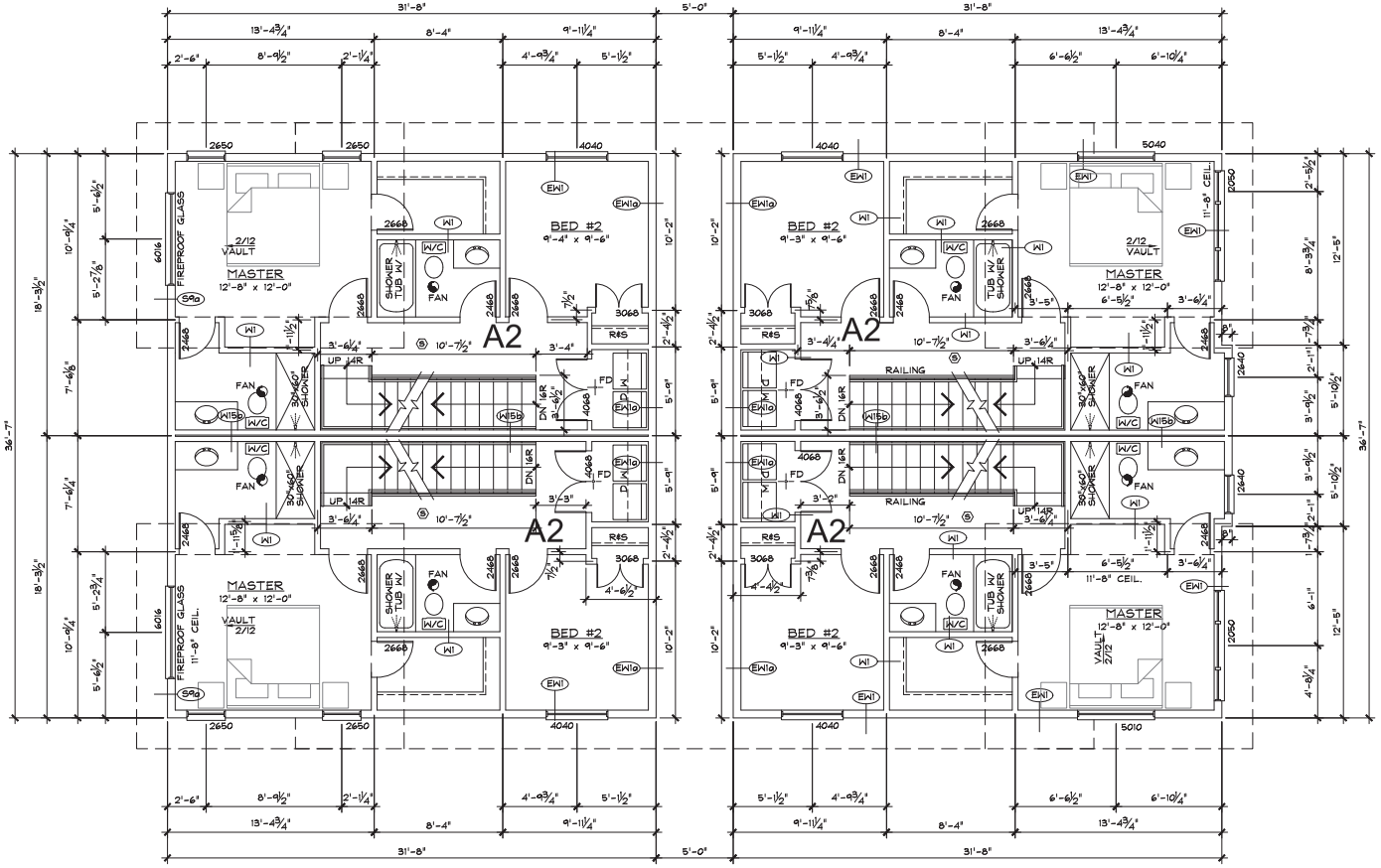
'Rose Avenue Project'
775 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
MAIN FLOOR PLAN
SHEET NO. A3

ROOF ASSEMBLY - CATHEDRAL CEILINGS

DESCRIPTION	NOMINAL	EFFECTIVE
R-50 BATT INSULATION IN ENG. TRUSS @ 24" O.C.	RSI 8.81	(R-50.0)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. INTERIOR AIR FILM	0.12	0.68
2. ½" GYPSUM BOARD	0.08	0.45
3. 7/16 SHEATHING	0.11	0.62
4. ROOF FINISH	0.00	0.00
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 9.12 (R-51.75)
MINIMUM EFFECTIVE THERMAL RESISTANCE W/HRV		RSI 4.67 (R-26.5)
MINIMUM EFFECTIVE THERMAL RESISTANCE		RSI 4.67 (R-26.5)



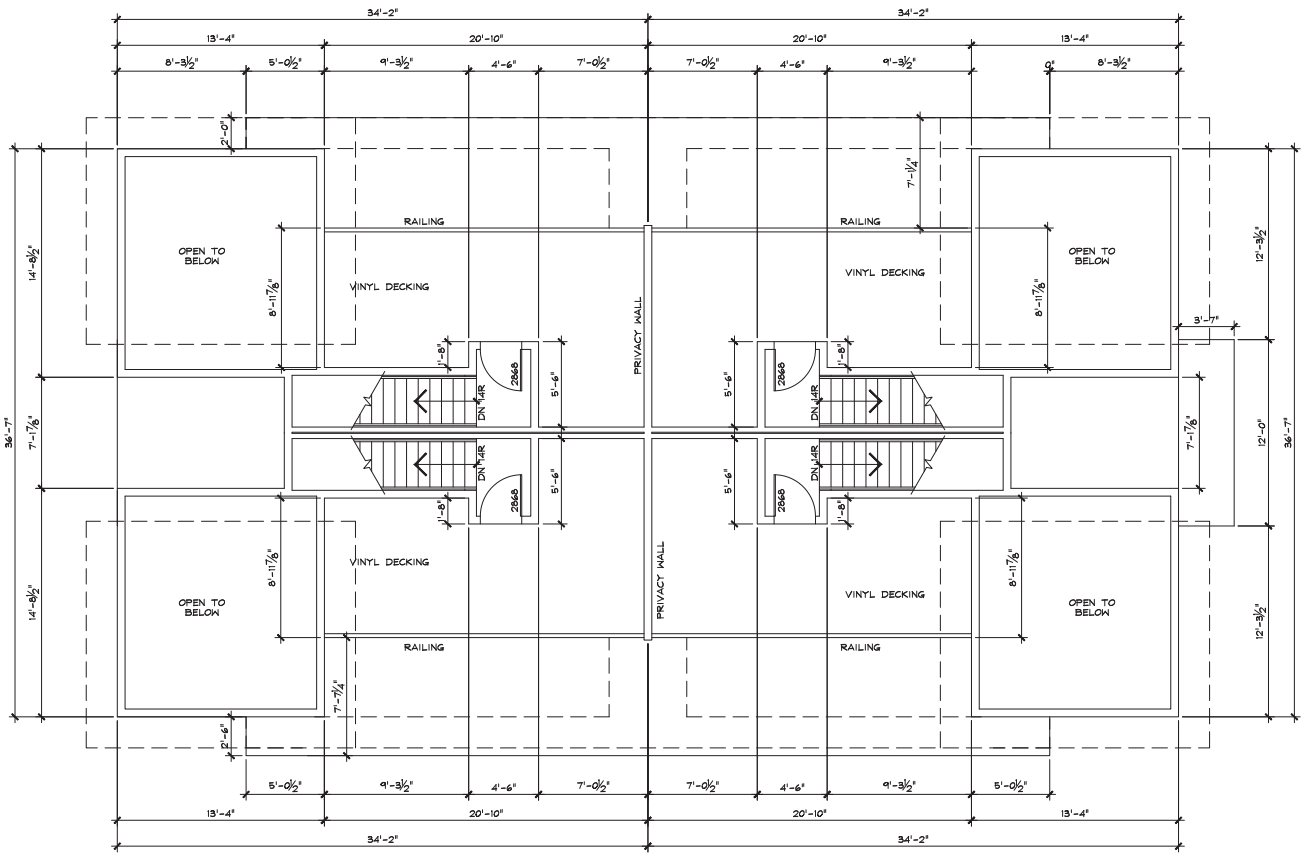
BLDG 'B'
966 SF (89.7m2)
483 SF (44.9m2)/UNIT

BLDG 'A'
966 SF (89.7m2)
483 SF (44.9m2)/UNIT

'Rose Avenue Project'
775 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
UPPER FLOOR PLAN
SHEET NO. A4



ROOF PATIO

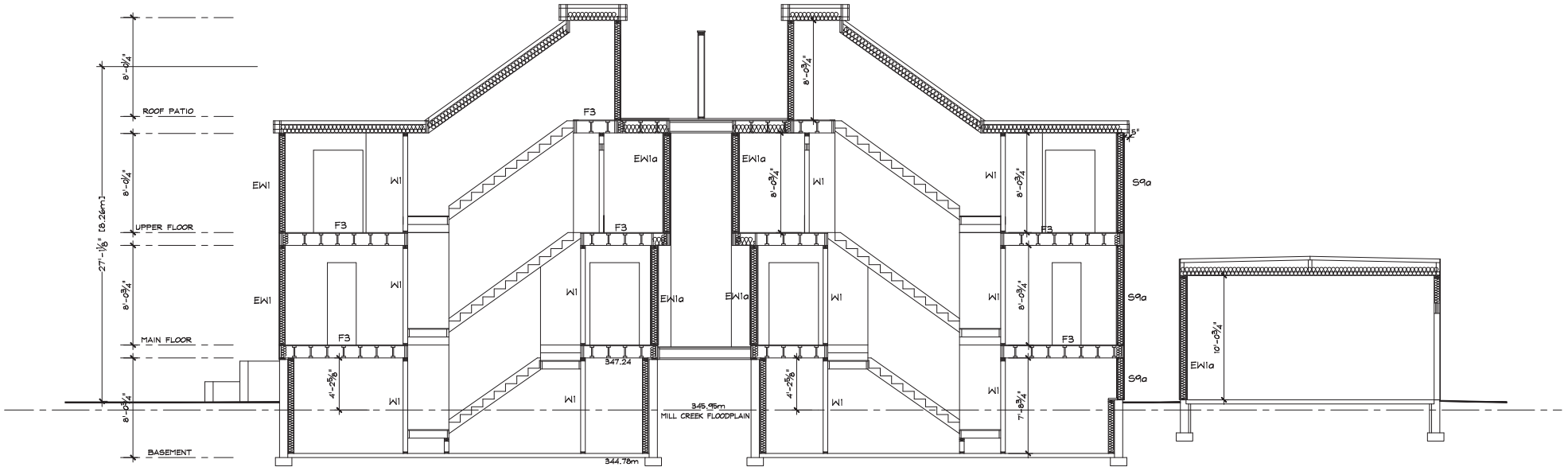
213 SF(19.87 m2)/UNIT

'Rose Avenue Project'

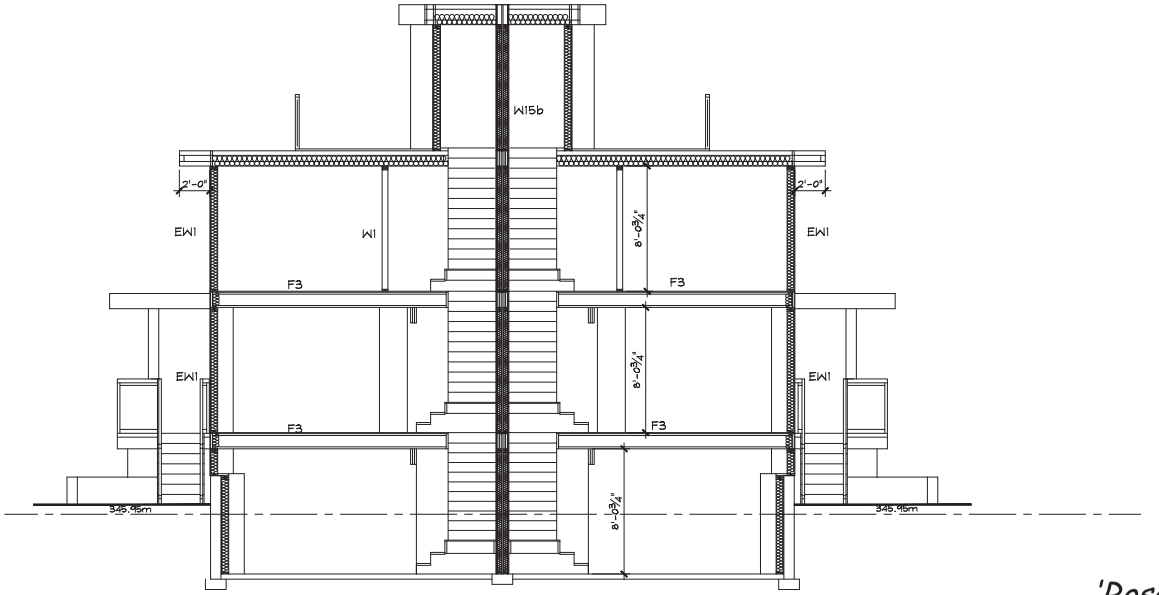
775 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
ROOF PLAN
SHEET NO. A5



SECTION 'A-A'



SECTION 'B-B'

'Rose Avenue Project'

775 ROSE AVE, KELOWNA, BC

TGM
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Tom Masters
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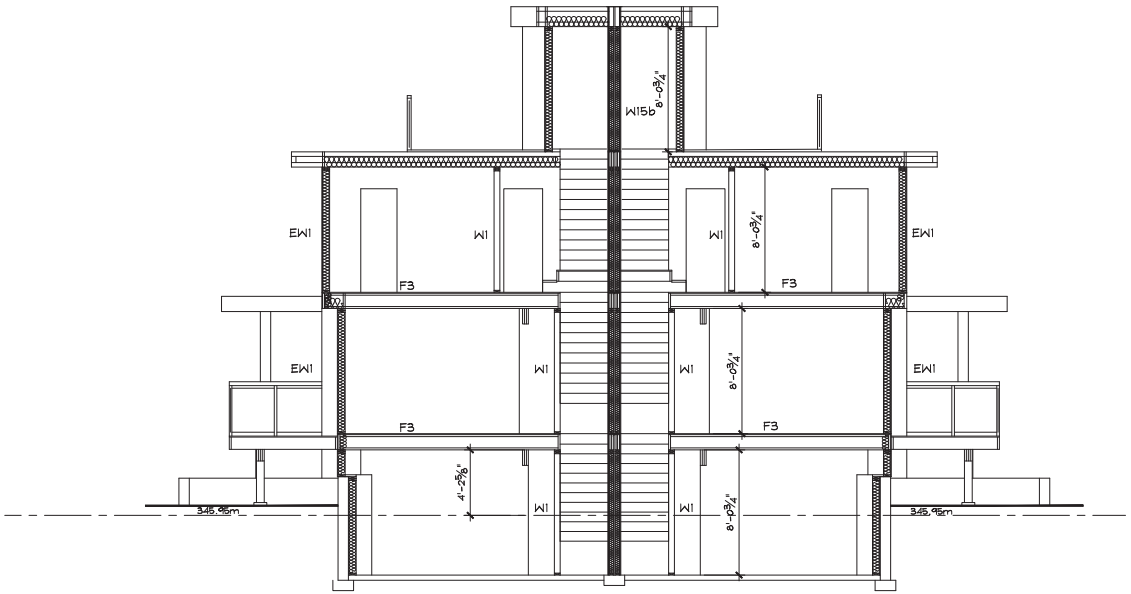
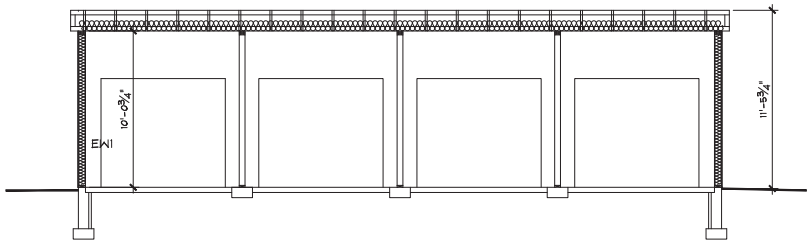
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
SECTIONS
SHEET NO. A8



SECTION 'C-C'



SECTION 'D-D'

WALL TYPES

W1
38 MM X 89 MM STUDS SPACED 400 MM OR 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL
1 LAYER OF GYPSUM BOARD ON EACH SIDE

W15
TWO ROWS 38 MM X 89 MM STUDS, EACH SPACED 400 MM
OR 600 MM O.C. ON SEPARATE 38 MM X 89 MM PLATES
SET 25 MM APART
WITH OR WITHOUT ABSORPTIVE MATERIAL
2 LAYERS OF GYPSUM BOARD ON EACH SIDE

W15b
W15 WITH
89 MM THICK ABSORPTIVE MATERIAL ON EACH SIDE(4)(8)
12.7 MM TYPE X GYPSUM BOARD(5) 1 HR FR

EW1
38 MM X 89 MM STUDS SPACED 400 MM OR 600 MM O.C.
89 MM THICK ABSORPTIVE MATERIAL(6)
1 OR 2 LAYERS OF GYPSUM BOARD ON INSIDE
EXTERIOR SHEATHING AND SIDING

EW1a
EW1 WITH
15.9 MM TYPE X GYPSUM BOARD(5)(9) 1 HR FR

F3
SUBFLOOR OF 15.5 MM PLYWOOD, OSB OR WAFERBOARD,
OR 17MM TONGUE AND GROOVE LUMBER
ON WOOD JOISTS CHANGE BEGIN OR WOOD I-JOISTS
CHANGE END SPACED NOT MORE THAN 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL IN CAVITY
1 LAYER OF GYPSUM BOARD ON CEILING SIDE

S9a
31 MM x 152 MM STEEL STUDS SPACED 400 MM OR 600 MM O.C.
2 LAYERS OF 12.7 MM TYPE X GYPSUM BOARD ON EACH SIDE
150 MM THICK ABSORPTIVE MATERIAL

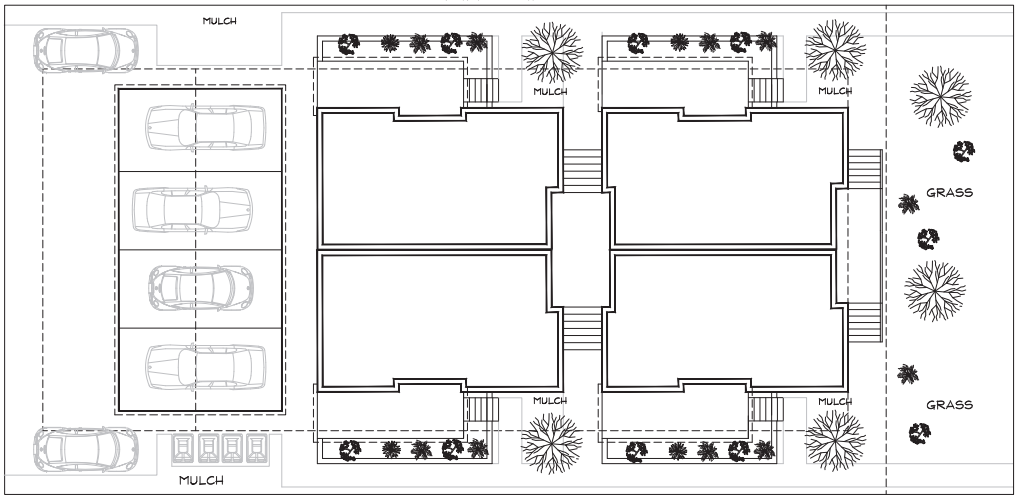
'Rose Avenue Project'
775 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: APR 24/17
SECTIONS
SHEET NO. A9


SUBARU

129.93' [39.60m]



MAPLE

JAPANESE MAPLE

NINE BARK

BARBERRY

SMALL PLANTS AND FLOWERS
WILL BE ADDED TO PLANTING BEDS

LOT INFORMATION

ZONING RU6	PROPOSED RM1
LEGAL DESCR.	LOT 7 , DL 16, ODYD PLAN 11487
CIVIC ADDRESS	775 ROSE AVE.

'Rose Avenue Project'

775 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"
DATE: APR 24/17
LANDSCAPE PLAN
SHEET NO. L1

REPORT TO COUNCIL

Date:	June 12, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (LK)		
Application:	Z17-0014	**Owner:**	Nadeem Hussain
Address:	300 & 310 Dougall Road	**Applicant:**	New Town Services Inc.
Subject:	Rezoning Application		
Existing OCP Designation:	MXR – Mixed Use (Residential/ Commercial)		
Existing Zone:	RU1 – Large Lot Housing		
Proposed Zone:	C4 – Urban Centre Commercial		

1.0 Recommendation

THAT Rezoning Application No. Z17-0014 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 20 Section 26 Township 26 ODYD Plan 5494 and Lot 21 Section 26 Township 26 ODYD Plan 5494, located at 300 Dougall Road and 310 Dougall Road, Kelowna, BC from the RU1 – Large Lot Housing zone to the C4 – Urban Centre Commercial zone, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated March 28, 2017;

AND THAT Council directs Staff as part of the Development Engineering Memorandum requirements to provide an enhanced boulevard treatment along Dougall Road and McIntosh Road to match existing enhancements recently provided along both road frontages. This shall include: decorative sidewalk treatment (including coloured concrete & coloured brick, boulevard planters, benches, and light standards) as set out in Schedule "B";

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to approval of the Ministry of Transportation and Infrastructure;

AND THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and Development Variance Permit for the subject properties.

2.0 Purpose

To rezone the subject property to facilitate the development of the proposed 5-storey mixed use building on the subject property.

3.0 Community Planning

Community Planning Staff supports the proposed rezoning application to the C4 – Urban Centre Commercial zone in order to accommodate the mixed use development on the subject properties. The proposed land use is consistent with the Official Community Plan (OCP) Future Land Use designation of MXR – Mixed Use (Residential/ Commercial). The ground oriented commercial units along both streets are a key component in achieving a retail street in the Rutland Town Centre.

Figure 1 – View at the intersection of McIntosh Rd and Dougall Rd.

The proposal consists of two parcels, which will be consolidated. They are located in the Rutland area at the intersection of Dougall Road and McIntosh Road. Adding density at this location will be supported by the nearby parks, schools, transit, bike routes and proximity to the Plaza 33 shopping area. The future extension of the Active Transportation Bike Network will be located directly in front of the subject site along McIntosh. Road dedications will be taken to accommodate its future development. The proposed project will help contribute to fulfilling the City's policy of 'Complete Communities' by increasing the residential density of the property and neighbourhood and complementary to several other multi-family buildings in the area. The project is also consistent with several other OCP Urban Infill policies including 'Compact Urban Form' and 'Sensitive Infill'.

In fulfillment of Council Policy No. 367, the applicant completed public notification and consultation with property owners within 50 m of the subject property.

4.0 Proposal

4.1 Project Description

The proposed development will consist of five commercial units which front onto both Dougall Road and McIntosh Road, 17 condo units above the commercial and 6 townhouse units. The unit breakdown comprises of 15 two-bedroom units, 1 one-bedroom unit and 1 bachelor unit. The 6 town homes are two-bedroom units. The unit sizes range from 470 sq ft – 1190 sq ft.

The commercial bays range in size from 260 sq ft – 620 sq ft.

The Zoning Bylaw Regulations for parking stall requirements have been met with the provision of 31 parking stalls. With the proximity to the bike routes, the amount of bicycle stalls provided exceeds the amount of bike stalls required.

Figure 2 – View from west lane towards the parkade entry and the courtyard above.

Rezoning

The two parcels are currently zoned RU1 – Large Lot Housing and the proposed zone is C4 – Urban Centre Commercial. The proposed development fits within the MXR – Mixed Use (Residential/Commercial) Future Land Use Designation and is consistent with the existing multi-residential in the area which provide similar densities.

The current proposal has one variance to the Zoning Bylaw Regulations to vary the maximum height from 15 m or 4 storeys to 15.5 m and 5 storeys proposed. Should Council support the Rezoning Application, the requested variance will come before Council at a later date.

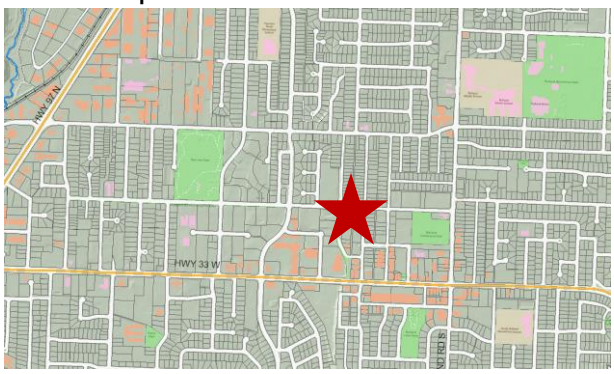
4.2 Site Context

The subject properties are located at the Southwest corner of the Dougall Road and McIntosh Road intersection. The parcels are currently bordered by single family development on all sides, with multi developments further south along Dougall Road and across the rear lane. The entire area is designated as MXR – Mixed Use (Residential/Commercial) and development in this direction is beginning to occur. The properties are within the Rutland Urban Centre and the Permanent Growth Boundary.

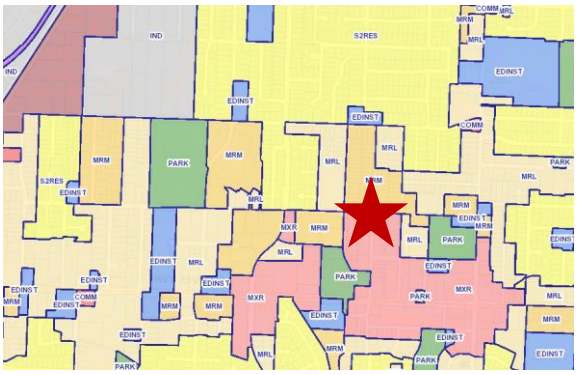
Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU2 – Medium Lot Housing	Single Dwelling Housing
East	RU1 – Large Lot Housing	Single Dwelling Housing
South	RU1– Large Lot Housing	Single Dwelling Housing
West	C4 – Urban Centre Commercial	Single Dwelling Housing

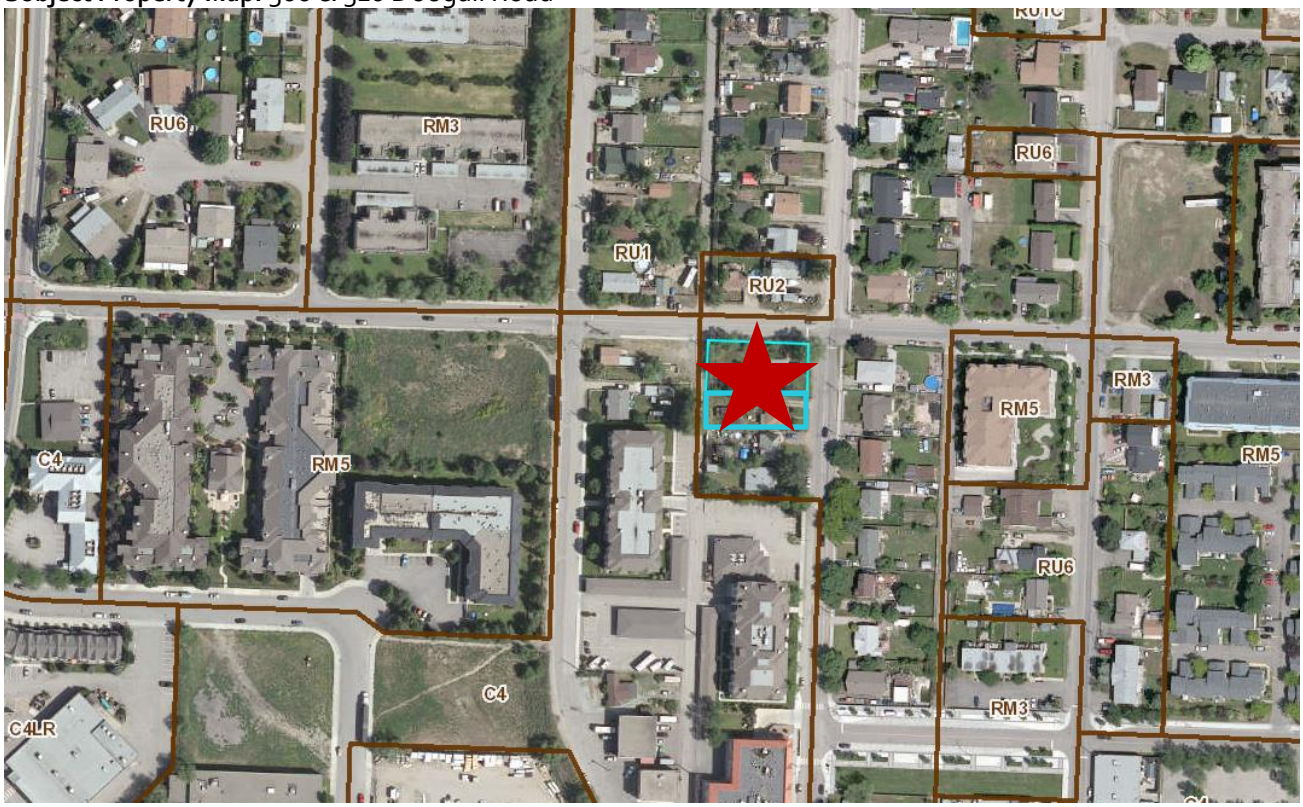
Context Map



Future Land Use



Subject Property Map: 300 & 310 Dougall Road



4.3 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**C4 ZONE REQUIREMENTS**	**PROPOSAL**
Existing Lot/Subdivision Regulations		
Lot Area	460 m^2	1667 m^2
Lot Width	13 m	37.7 m
Lot Depth	30 m	44.3 m
Development Regulations		
Floor Area Ratio	1.47	1.47
Site Coverage	75 %	63 %
Height	15 m or 4 storeys	15.5 m & 5 storeys❶
Front Yard (Dougall Rd)	0 m	0 m
Flanking Side Yard (McIntosh Rd)	0 m	0 m
Side Yard (south to lane)	0 m	1.3 m
Rear Yard	0 m	5.3 m
Other Regulations		
Minimum Parking Requirements	27 stalls	31 stalls
Bicycle Parking	Class I - 12 Class II - 4	Class I - 20 Class II - 6
Private Open Space	331 m^2	495 m^2
❶ Indicates a requested variance to the maximum height from 15 m and 4 storeys to 15.5 m and 5 storeys.		

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Rutland & Downtown Revitalization Tax Exemption.[1] Provide a revitalization tax exemption for the municipal portion of the annual taxes on improvements for development within the City Centre and Rutland Town Centre as per Revitalization Tax Exemption Bylaw No. 9561.

Complete Communities.[2] Support the development of complete communities with a minimum intensity of approximately 35-40 people and/or jobs per hectare to support basic transit service – a bus every 30 minutes. (approx. 206 people / hectare proposed).

Compact Urban Form.[3] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Streetscaping.[4] Urban Centre roads should be considered as part of the public space and streetscaped with full amenities (i.e. sidewalks, trees and other planting, furniture, bike facilities, boulevards, etc.).

Rutland Urban Centre.[5] Ensure that the urban design for Uptown Rutland clearly differentiates this commercial district from others in the City and interior of BC. This will be pivotal to making the bus exchange area and redevelopment of Rutland a success. To this end, redevelopment should:

- feature special architecture and/or landmarks that draw the interest of passers-by at the northeast and northwest corners of the Highway 33 and Dougall Road intersection as these are important sites that should be used to mark the entranceway to the pedestrian-oriented, commercial core of the TOD.

Sensitive Infill.[6] Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the character of the neighbourhood with respect to building design, height and siting.

Maximize Pedestrian / Cycling Connectivity.[7] Require that pedestrian and cyclist movement and infrastructure be addressed in the review and approval of all City and private sector developments, including provision of sidewalks and trails and recognition of frequently used connections and informal
pedestrian routes. With new developments, require dedication of on-site walking and cycling paths where necessary to provide links to adjacent parks, schools, transit stops, recreation facilities, employment nodes, cul-de-sacs and large activity areas.

[1] City of Kelowna Official Community Plan, Policy 5.1.3 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.2.4 (Development Process Chapter).
[3] City of Kelowna Official Community Plan, Policy 5.3.2 (Development Process Chapter).
[4] City of Kelowna Official Community Plan, Policy 5.8.1 (Development Process Chapter).
[5] City of Kelowna Official Community Plan, Policy 5.20.1 (Development Process Chapter).
[6] City of Kelowna Official Community Plan, Policy 5.22.6 (Development Process Chapter).
[7] City of Kelowna Official Community Plan, Policy 5.10.1 (Development Process Chapter).

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permit(s).
- Placement permits are required for any sales or construction trailers that will be on site. The location(s) of these are to be shown at time of development permit application.
- Demolition Permit required for any existing structures.
- HPO (Home Protection Office) approval or release is required at time of Building Permit application.
- A Hoarding permit is required and protection of the public from the staging area and the new building area during construction. Location of the staging area and location of any cranes should be established at time of DP.
- A Building Code analysis is required for the structure at time of building permit applications, but the following items may affect the form and character of the building(s):
    - Any alternative solution must be accepted by the Chief Building Inspector prior to the release of the Building Permit
    - Location, Heights, Colours of mechanical systems and the required screening are to be determined at time of DP
    - Any security system that limits access to exiting needs to be addressed in the code analysis by the architect.
    - Handicap Accessibility to the main floor levels to be provided, ramps may be required.
    - Additional man door is required from the parkade to the exterior of the building
    - Access to the roofs are required per NFPA and guard rails may be required and should be reflected in the plans if required
- A Geotechnical report is required to address the sub soil conditions and site drainage at time of building permit application. Minimum building elevations are required to be established prior to the release of the Development Permit. If a soil removal or deposit permit is required, this must be provided at time of Development Permit application.
- We strongly recommend that the developer have his professional consultants review and prepare solutions for potential impact of this development on adjacent properties. Any damage to adjacent properties is a civil action which does not involve the city directly. The items of potential damage claims by adjacent properties are items like settlement of foundations (preload), damage to the structure during construction, undermining & underpinning of existing foundation, additional snow drift on neighbour roofs, excessive noise from mechanical units, vibration damage during foundation preparation work etc.
- Size and location of all signage to be clearly defined as part of the development permit. This should include the signage required for the building addressing to be defined on the drawings per the bylaws on the permit application drawings.
- An exit analysis is required as part of the code analysis at time of building permit application. The exit analysis is to address travel distances within the units and all corridors, number of

required exits per area, door swing direction, handrails on each side of exit stairs, width of exits, spatial calculation for any windows in exit stairs, etc.

- Universal washroom requirements for CRU areas of the building are to be addressed in the building permit application. This will be addressed at time of building permit application. Washroom requirements for the commercial space of base building are to be addressed in the building permit application.
- Mechanical Ventilation inlet and exhausts vents are not clearly defined in these drawings for the enclosed parking storeys. The location and noise from these units should be addressed at time of Development Permit.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications. Please indicate how the requirements of Radon mitigation and NAFS are being applied to this complex at time of permit application.

6.2 Development Engineering Department

- Refer to Attachment A.

6.3 Fire Department

- Construction fire safety plan is required to be submitted and reviewed prior to construction and updated as required. Template at Kelowna.ca.
- Should a hydrant be required on this property it shall be operational prior to the start of construction and shall be deemed a private hydrant.
- This building shall be addressed off of the street it is accessed from (main entrance).
- A fire safety plan as per section 2.8 BCFC is required at occupancy. The fire safety plan and floor plans are to be submitted for approval in AutoCAD Drawing format on a CD.
- Fire Department access is to be met as per BCBC 3.2.5.
- Approved Fire Department steel lock box acceptable to the fire dept. is required by the fire dept. entrance and shall be flush mounted.
- All requirements of the City of Kelowna Fire and Life Safety Bylaw 10760 shall be met for communications.
- Fire alarm system is to be monitored by an agency meeting the CAN/ULC S561 Standard.
- Contact Fire Prevention Branch for fire extinguisher requirements and placement.
- Fire department connection is to be within 45M of a fire hydrant - unobstructed.
    1. ensure FD connection is clearly marked and visible from the street,
    2. sprinkler zone valves shall be accessible as per fire prevention bylaw (10760),
    3. standpipe connections to be on intermediate landings in stairwell.
    4. dumpster/refuse container must be 3 meters from structures or overhangs or in a rated room in the parking garage,
    5. Upon completion, an owners certificate and copy of NFPA 25 shall be provided for the sprinkler system,
    6. Upon completion, a certificate is required to verify CANULC 561 Compliance.

7.0 Application Chronology

Date of Application Received: February 16, 2017
Date Public Consultation Completed: February 27, 2017

Report Prepared by: Lydia Korolchuk, Planner

Reviewed by: Terry Barton, Urban Planning Manager

Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Attachment A: Development Engineering Memorandum
Site Plan
Conceptual Elevations
Landscape Plan

CITY OF KELOWNA

MEMORANDUM

Date: March 28, 2017

File No.: Z17-0014

To: Urban Planning Management (LK)

From: Development Engineering Manager (SM)

Subject: 300 & 310 Dougall Road N RU1 (2 lots) to C4

The Development Engineering Department has the following comments and requirements associated with this rezoning application to facilitate the development of ground level commercial and multiple dwelling housing on the subject properties. 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 Jason Ough

1. Domestic Water and Fire Protection

a) This development is within the service area of the Rutland Waterworks District (RWD). The developer is required to make satisfactory arrangements with the RWD for these items. All charges for service connection and upgrading costs, as well as any costs to decommission existing services are to be paid directly to RWD.

b) The developer must obtain the necessary permits and have all existing utility services disconnected prior to removing or demolishing the existing structures.

2. Sanitary Sewer

The subject properties are currently serviced with two 100mm sanitary services, 310 at Mclintosh Rd and 300 at Dougall Rd. The developer's consulting mechanical engineer will determine the development requirements of this proposed development and establish the service needs. Only one service will be permitted for this development. The applicant, at his cost, will arrange for the removal and disconnection of the existing services and the installation of one new larger service if necessary.

3. Storm Drainage

The developer must engage a consulting civil engineer to provide a storm water management plan for the site, which meets the requirements of the Subdivision, Development and Servicing Bylaw No. 7900. The storm water management plan must also include provision of lot grading plan, minimum basement elevation (MBE), if applicable, and provision of a storm drainage service for the development and / or recommendations for onsite drainage containment and disposal systems. The existing lot is serviced with a 150mm diameter storm service. Only one service will be permitted for this development. The applicant, at his cost, will arrange the installation of one overflow service if required.

4. Road Improvements

a) The applicant must have a civil engineering consultant submit a design for Dougall Road to be upgraded to an urban standard (SS-R5) along the full frontage of the subject property; including curb and gutter, sidewalk, street lighting, landscaped boulevard, storm drainage system, pavement removal and replacement and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. An estimate for public side works will be required, for bonding purposes, to be submitted by the applicants civil engineering consultant.

b) McIntosh Road is identified in the Pedestrian and Bicycle Master Plan (PBMP) for inclusion of a multi-use pathway (MUP). The applicant's civil engineering consultant will work with City staff to create a modified SS-R5 cross section to ensure the new curb alignment will match the future active transportation project corridor. One option is to leave a gravel soak away strip on the McIntosh Road frontage and provide a cash in lieu payment for curb and gutter to be constructed as part of the future active transportation project.

c) A 7.5m of commercial lane will be dedicated and constructed along the southern property line of 300 Dougall Road. This will include 6m corner rounding at both SE and SW corners.

5. Road Dedication and Subdivision Requirements

a) The subject properties are required to be consolidated as part of this development project.

b) Approximately 2.5m of road dedication is required along Dougall Road frontage to match the property line at 250-270 Dougall Road.

c) Approximately 3m of road dedication is required along McIntosh Road frontage to achieve a 20m Right of Way.

d) A 7.5m of commercial lane dedication is required along the southern property line of 300 Dougall Road.

e) Grant statutory rights-of-way if required for utility services.

6. Electric Power and Telecommunication Services

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.

7. 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 (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.

8. 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.

9. 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.

10. Geotechnical Report

a) Provide a comprehensive 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 development**.

- Overall site suitability for development.
- Presence of ground water and/or springs.
- Presence of fill areas.
- Presence of swelling clays.
- Presence of sulphates.
- Potential site erosion.
- Provide specific requirements for footings and foundation construction.
- Provide specific construction design sections for roads and utilities over and above the City's current construction standards

11. Development Permit and Site Related Issues

Access and Manoeuvrability

(i) Access to the site will be permitted from the lane only.

Steve Muenz, P. Eng.
Development Engineering Manager
jo

CITY OF KELOWNA

MEMORANDUM

Date: March 28, 2017

File No.: DP17-0033

To: Urban Planning Management (LK)

From: Development Engineering Manager (SM)

Subject: 300 & 310 Dougall Road N

The Development Engineering comments and requirements regarding this Development Permit application to evaluate form and character and to facilitate the development of ground level commercial and multiple dwelling housing on the subject properties are as follows:

1. General.

All the offsite infrastructure and services upgrades are addressed in the Rezoning Engineering Report under file Z17-0014.

Steve Muenz, P. Eng.
Development Engineering Manager

jo

CITY OF KELOWNA

MEMORANDUM

Date: March 28, 2017

File No.: DVP17-0034

To: Urban Planning Management (LK)

From: Development Engineering Manager (SM)

Subject: 300 & 310 Dougall Road N

The Development Engineering comments and requirements regarding this Development Variance Permit application to vary the maximum height from 15m and 4 storeys to 15.5m and 5 storeys to facilitate the development of ground level commercial and multiple dwelling housing on the subject properties are as follows:

1. General.

a) The proposed variance has no impact on existing municipal infrastructure.

b) All the offsite infrastructure and services upgrades are addressed in the Rezoning Engineering Report under file Z17-0014.

Steve Muenz, P. Eng.
Development Engineering Manager

jo

ATTACHMENT B

This forms part of application

Z17-0014

City of Kelowna
COMMUNITY PLANNING

Planner Initials LK

DOUGALL ROAD MIXED-USE DEVELOPMENT
DOUGALL ROAD KELOWNA, B.C.

BUILDING/SITE SUMMARY

PROPERTY #1

CIVIC ADDRESS: 300 DOUGALL ROAD, KELOWNA BC
LEGAL DESCRIPTION: LOT 20, SECTION 26, TOWNSHIP 26, ODYD, PLAN 5494, PID# 010-362-304

PROPERTY #2

CIVIC ADDRESS: 310 DOUGALL ROAD, KELOWNA BC
LEGAL DESCRIPTION: LOT 21, SECTION 26, TOWNSHIP 26, ODYD, PLAN 5494, PID# 005-086-108

SITE AREA: **1,666.92 m²** (BEFORE ROAD WIDENING)

PROPOSED NET FLOOR AREA: **2448.67 m²**

FLOOR AREA RATIO (FAR): 2448.67 / 1659.21 = **1.47**

PRIVATE OPEN SPACE SUMMARY:

BACHELOR (6.0m² EACH)	1 UNITS	= 6.0m²
1 BEDROOM (10m² EACH)	1 UNITS	= 10.0m²
2 BEDROOM (15m² EACH)	21 UNITS	= 315.0m²
	TOTAL REQUIRED:	**= 331.0m²**

PRIVATE OPEN SPACE PROPOSED: **= 5329.33 SF (495.11 m²)**

PARKING:

REQUIRED:

1 STALL PER DWELLING UNIT:	23 STALLS
1 STALL FOR EVERY 7 DWELLING UNITS DESIGNATED TO VISITOR PARKING:	3 STALLS
1.75 STALLS FOR EVERY 100m² GFA OF COMMERCIAL SPACE: 208.12 m² =	4 STALLS
TOTAL REQUIRED PARKING:	**30 STALLS**

PROVIDED:

25 STALLS IN PARKADE AND 6 STALL IN TOWNHOUSE GARAGES: **31 STALLS**

BICYCLE PARKING:

REQUIRED:

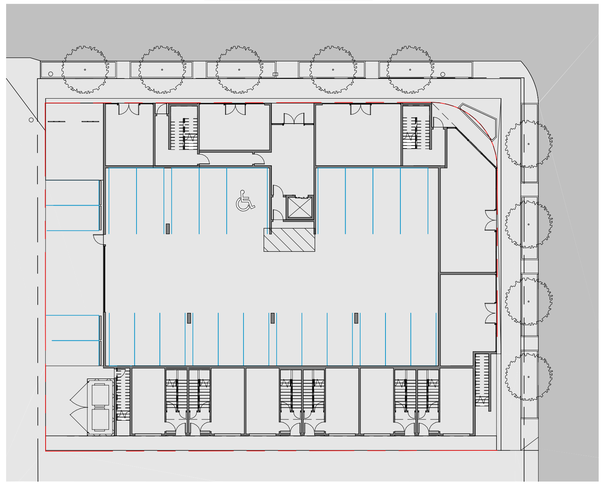
APARTMENT -	CLASS I - 0.5 PER DWELLING UNIT:	11.5
	CLASS II - 0.1 PER DWELLING UNIT:	2.3
COMMERCIAL -	CLASS I - 0.2 PER 100m² GLA OR 1 PER 10 EMPLOYEES:	0.42
	CLASS II - 0.6 PER 100m² GLA:	1.25

TOTAL CLASS I REQUIRED: 12 **TOTAL CLASS I PROVIDED: 20**
TOTAL CLASS II REQUIRED: 4 **TOTAL CLASS II PROVIDED: 6**

ZONING BYLAW SUMMARY

	REQUIRED	PROPOSED
ZONE:	C4	C4
PERMITTED USE:	MIXED USE	MIXED USE
MINIMUM LOT AREA:	460m²	1,666.92 m²
MINIMUM LOT DEPTH	30 m	44.3 m
MINIMUM LOT WIDTH	13.0 m	37.7 m
MAXIMUM FLOOR AREA RATIO:	1.47	1.3 + 0.17 (PARKING BONUS) = 1.47
MAXIMUM SITE COVERAGE:	75 %	79.8% AFTER WIDENING 63 % BEFORE WIDENING
MAXIMUM HEIGHT:	15 m OR 4 STOREYS	15.5 m OR 5 STOREYS
MINIMUM FRONT SETBACK:	0.0m (DOUGALL RD N)	0.0 m
MINIMUM SIDE SETBACK:	0.0 m (MCINTOSH RD)	0.0 m
MINIMUM SIDE SETBACK:	0.0 m	0.0 m
MINIMUM REAR SETBACK:	0.0 m (TO REAR LANE)	5.3 m

MCINTOSH ROAD



DOUGALL ROAD

KEYPLAN

ARCHITECTURAL:

NEWTOWN ARCHITECTURE & ENGINEERING

1464 ST. PAUL STREET KELOWNA, B.C. V1Y 2E6
PH. 250-860-8185

A0.00	COVER SHEET & DWG LIST
A1.01	BUILDING IMAGES
A1.02	BUILDING IMAGES
A2.00	SITE PLAN
A3.01	LEVEL 1 FLOOR PLAN
A3.02	LEVEL 2 FLOOR PLAN
A3.03	LEVEL 3 FLOOR PLAN
A3.04	LEVEL 4 FLOOR PLAN
A3.05	LEVEL 5 FLOOR PLAN
A3.06	ROOF PLAN
A3.07	TOWNHOUSE UNIT PLANS
A3.08	CONDO UNIT PLANS
A3.09	CONDO UNIT PLANS
A4.00	BUILDING ELEVATIONS
A4.01	BUILDING ELEVATIONS
A4.02	BUILDING ELEVATIONS
A5.00	BUILDING SECTIONS
A5.01	BUILDING SECTIONS
A5.02	BUILDING SECTIONS

CIVIL:

LANDSCAPE:

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Revisions

No	Date	Description
1	APR 13, 2017	Issued for DP

project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002
file

drawing title
COVER SHEET & DWG LIST

designed
scale As indicated
drawn J.F.
checked R.Y.
drawing no. **A0.00**

plotte NOV 28, 2016

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA

This drawing must not be scaled

Verify all dimensions and datums prior to commencement of work.

Report all errors and omissions to the Architect.

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project

DOUGALL RD MIXED-USE DEVELOPMENT

project address

DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title

BUILDING IMAGES

designed | scale

drawn J.F.

checked R.Y.

drawing no.

A1.01

plotte NOV 28, 2016

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA

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DOUGALL RD MIXED-USE DEVELOPMENT

project address

DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title

BUILDING IMAGES

designed | scale

drawn J.F.

checked R.Y.

drawing no.

A1.02

plotte NOV 28, 2016

1 SITE PLAN
1 : 100

NORTH

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project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
SITE PLAN

designed
scale 1 : 100
drawn J.F.
checked R.Y.

drawing no.
A2.00

plotte NOV 28, 2016

1 LEVEL 1
A4.00 3/16" = 1'-0"

NET FLOOR AREA: 3127.62 SF
GROSS FLOOR AREA: 5493.47 SF
PARKADE: 3369.18 SF

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project no. 4002

file

drawing title
LEVEL 1
FLOOR PLAN

designed
scale 3/16" = 1'-0"
drawn J.F.
checked R.Y.

drawing no.
A3.01

plotte NOV 28, 2016

1 LEVEL 2
3/16" = 1'-0"

NET FLOOR AREA: 7042.41 SF
GROSS FLOOR AREA: 7909.74 SF

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KELOWNA, BC

project no. 4002

file

drawing title
LEVEL 2
FLOOR PLAN

designe | scal 3/16" = 1'-0"
drawn J.F.
checke R.Y.
drawing no.

A3.02

plotte NOV 28, 2016 4/13/2017 1:17:38 PM

1 LEVEL 3
3/16" = 1'-0"

NET FLOOR AREA: 7558.74 SF
GROSS FLOOR AREA: 8197.57 SF

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project no. 4002

file

drawing title
LEVEL 3
FLOOR PLAN

designe
scal 3/16" = 1'-0"
drawn J.F.
checke R.Y.
drawing no.

A3.03

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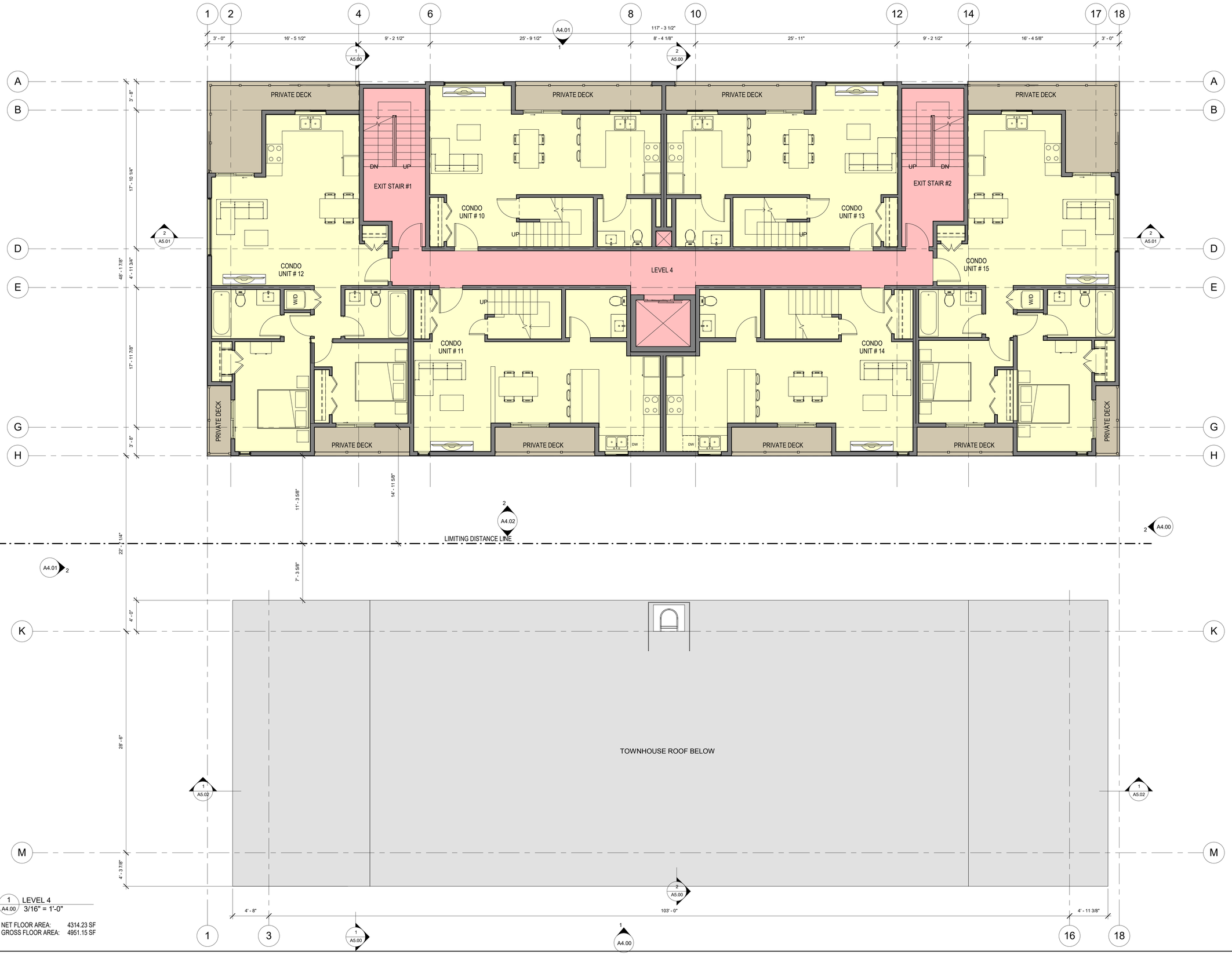

1 A4.00 LEVEL 4
3/16" = 1'-0"

NET FLOOR AREA: 4314.23 SF
GROSS FLOOR AREA: 4951.15 SF

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KELOWNA, BC

project no. 4002

file

drawing title
LEVEL 4
FLOOR PLAN

designe

scal 3/16" = 1'-0"

drawn J.F.

checke R.Y.

drawing no.
A3.04

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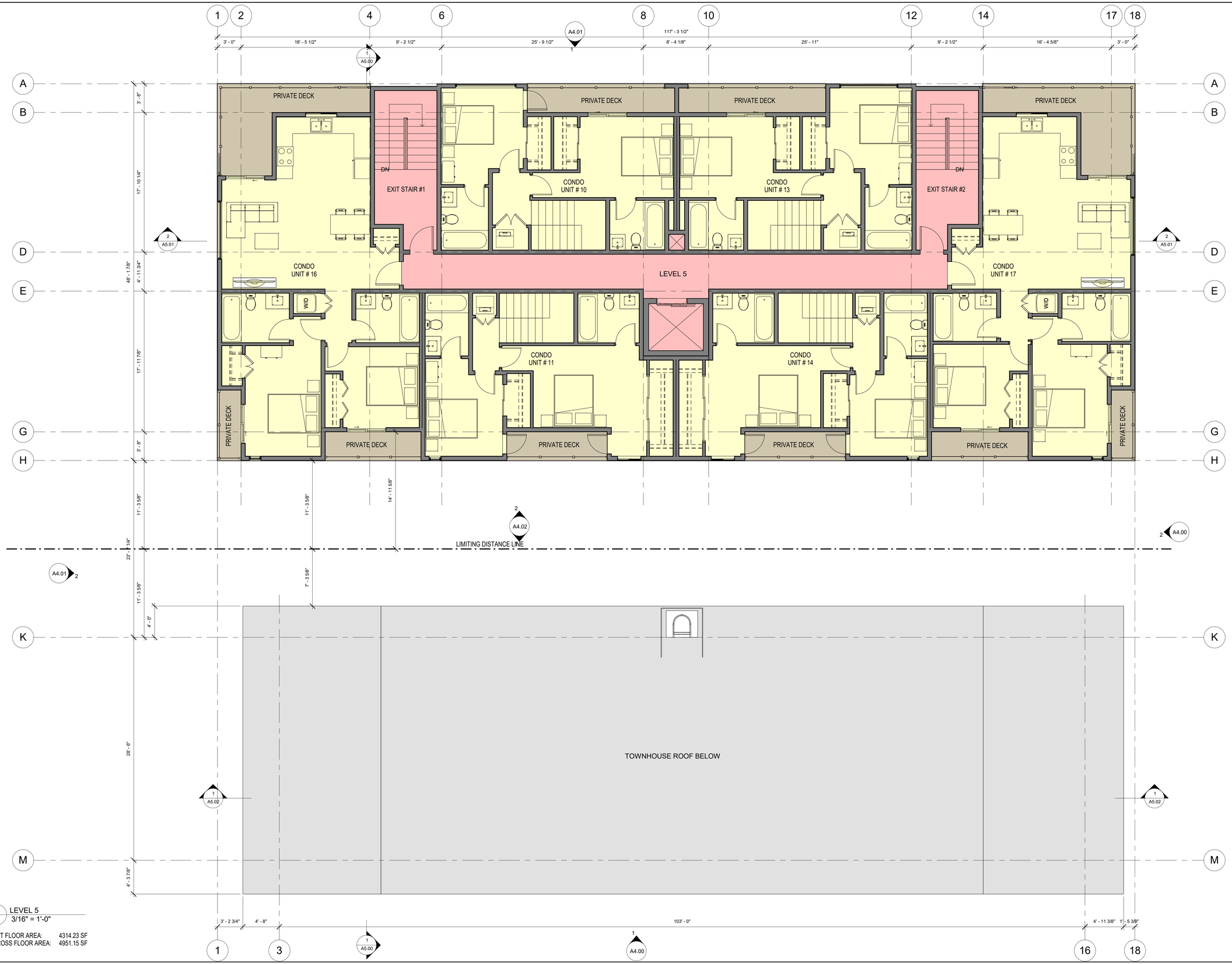

1 LEVEL 5
3/16" = 1'-0"

NET FLOOR AREA: 4314.23 SF
GROSS FLOOR AREA: 4951.15 SF

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project no. 4002

file

drawing title
LEVEL 5 FLOOR PLAN

designed

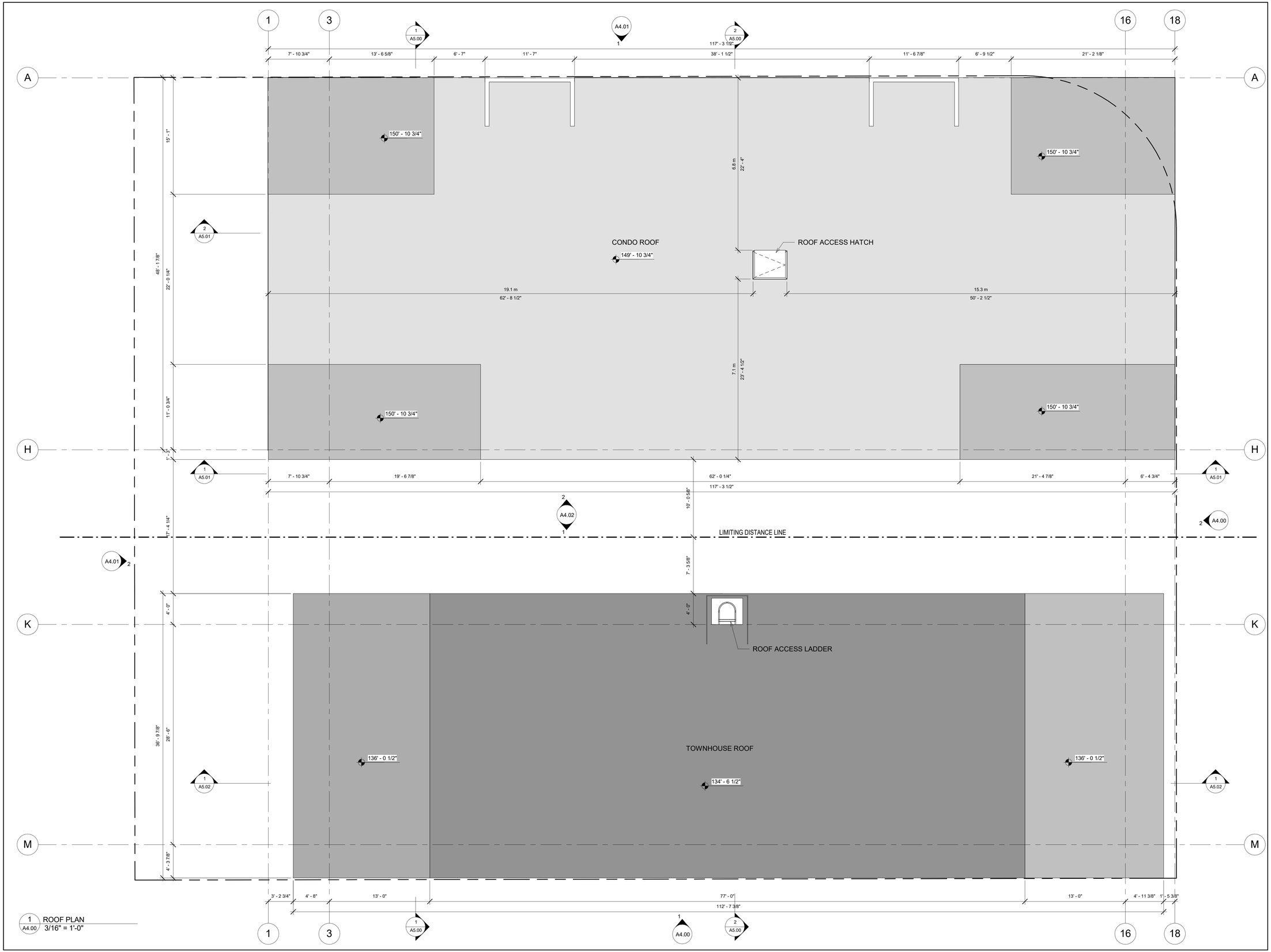
scale 3/16" = 1'-0"

drawn J.F.

checked R.Y.

drawing no. **A3.05**

plotte NOV 28, 2016



1 A4.00 ROOF PLAN
3/16" = 1'-0"

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KELOWNA, BC

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file

drawing title
ROOF PLAN

designed

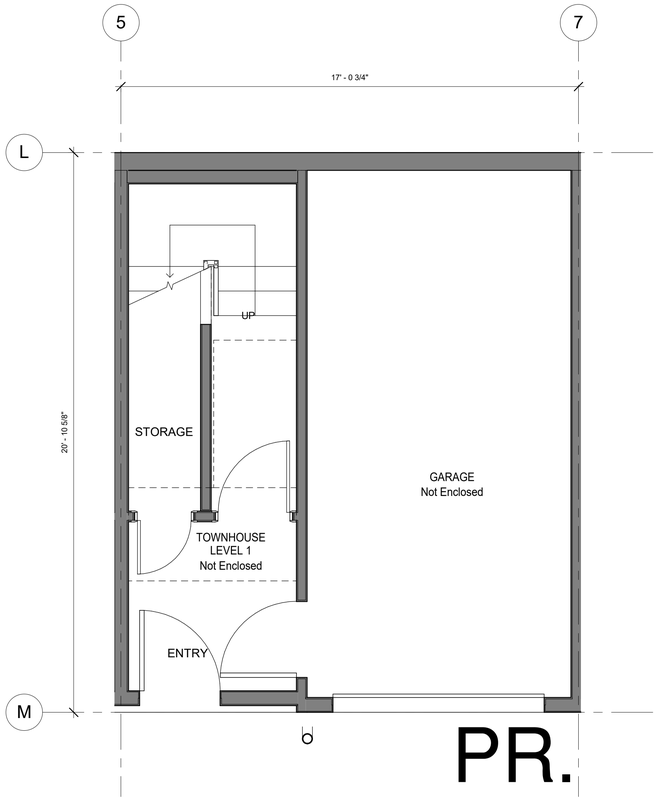
scale 3/16" = 1'-0"

drawn J.F.

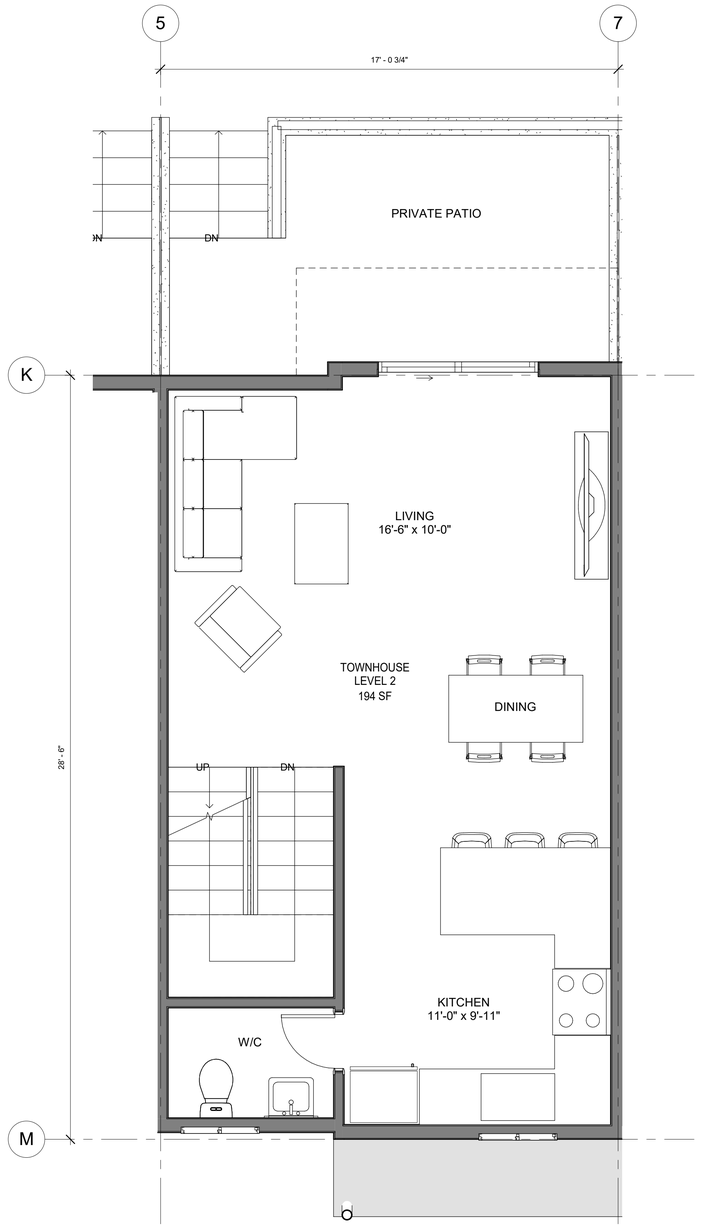
checked R.Y.

drawing no. **A3.06**

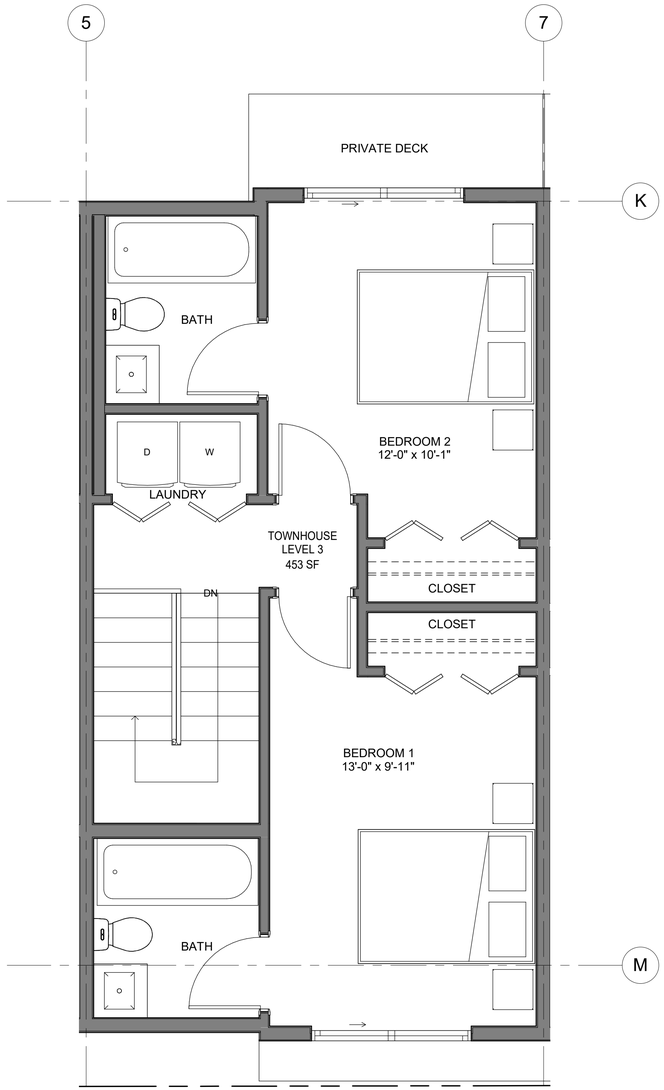
plotte NOV 28, 2016



2 A3.01 TOWNHOUSE UNIT LEVEL 1
3/8" = 1'-0"



1 A3.02 TOWNHOUSE UNIT LEVEL 2
3/8" = 1'-0"



3 A3.03 TOWNHOUSE UNIT LEVEL 3
3/8" = 1'-0"

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project no. 4002

file

drawing title
TOWNHOUSE UNIT PLANS

designed

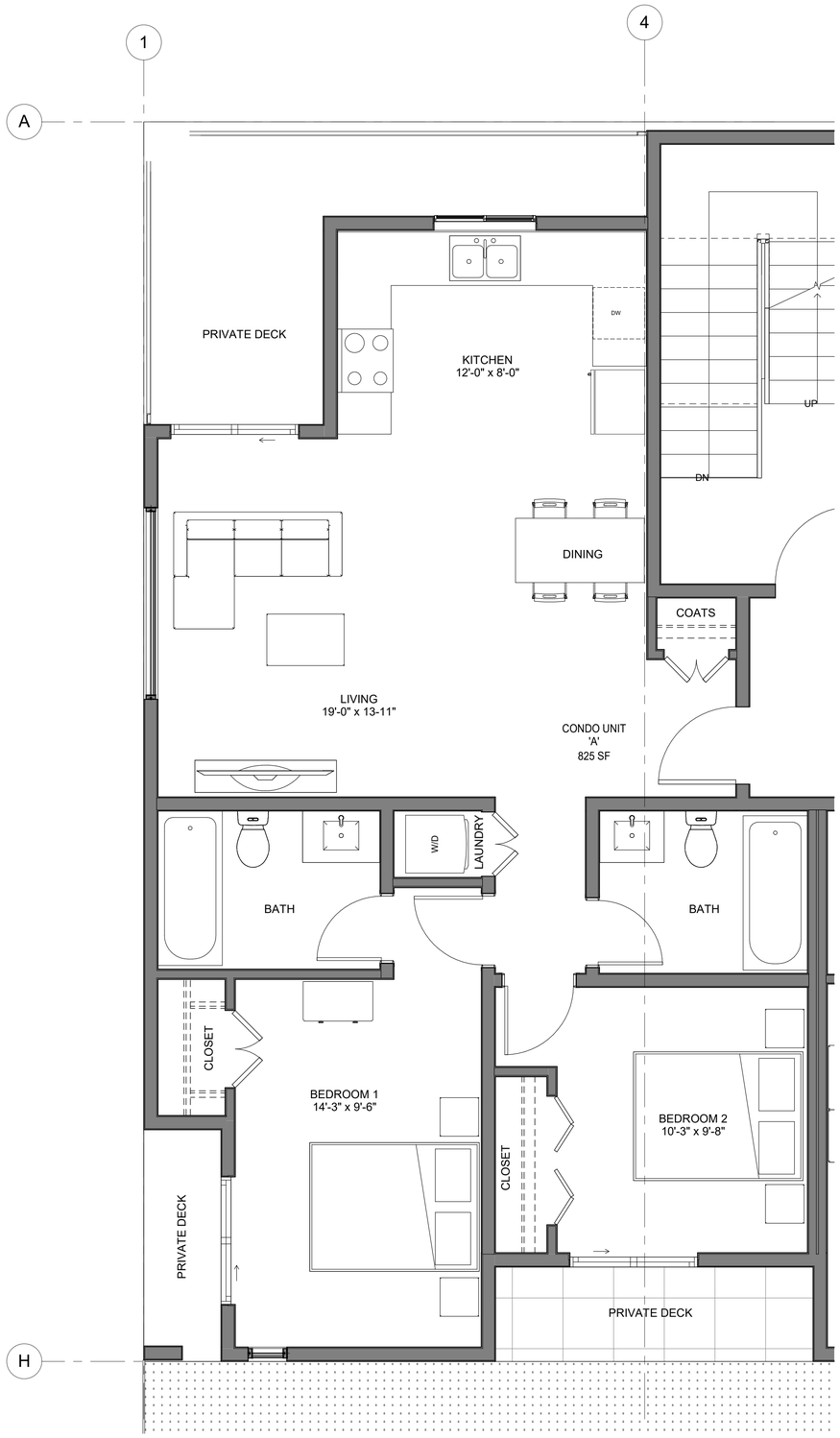
scale 3/8" = 1'-0"

drawn J.F.

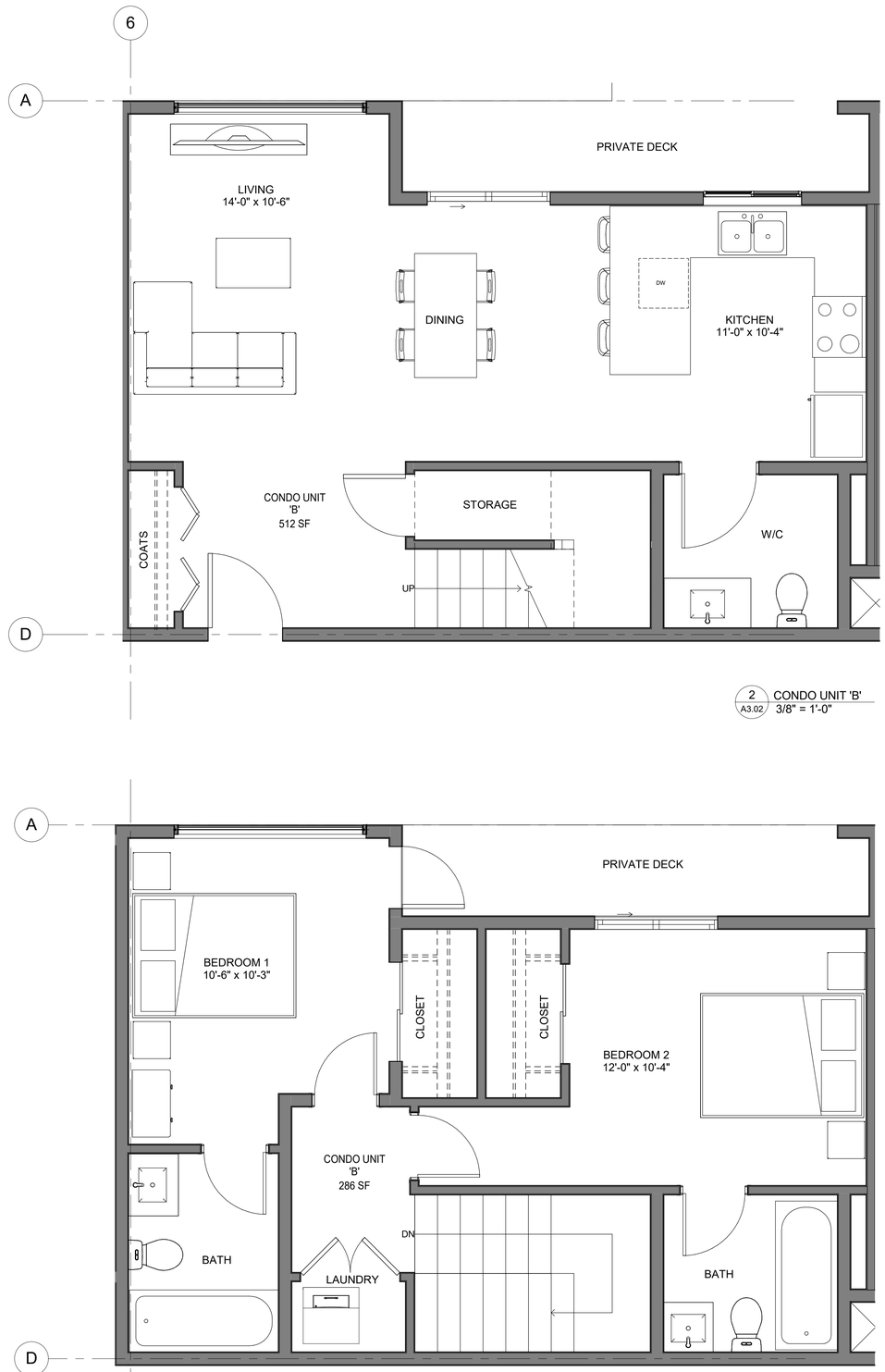
checked R.Y.

drawing no.
A3.07

plotte NOV 28, 2016



1 A3.02 CONDO UNIT 'A'
3/8" = 1'-0"



2 A3.02 CONDO UNIT 'B'
3/8" = 1'-0"

3 A3.03 CONDO UNIT 'B'
3/8" = 1'-0"

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project no. 4002

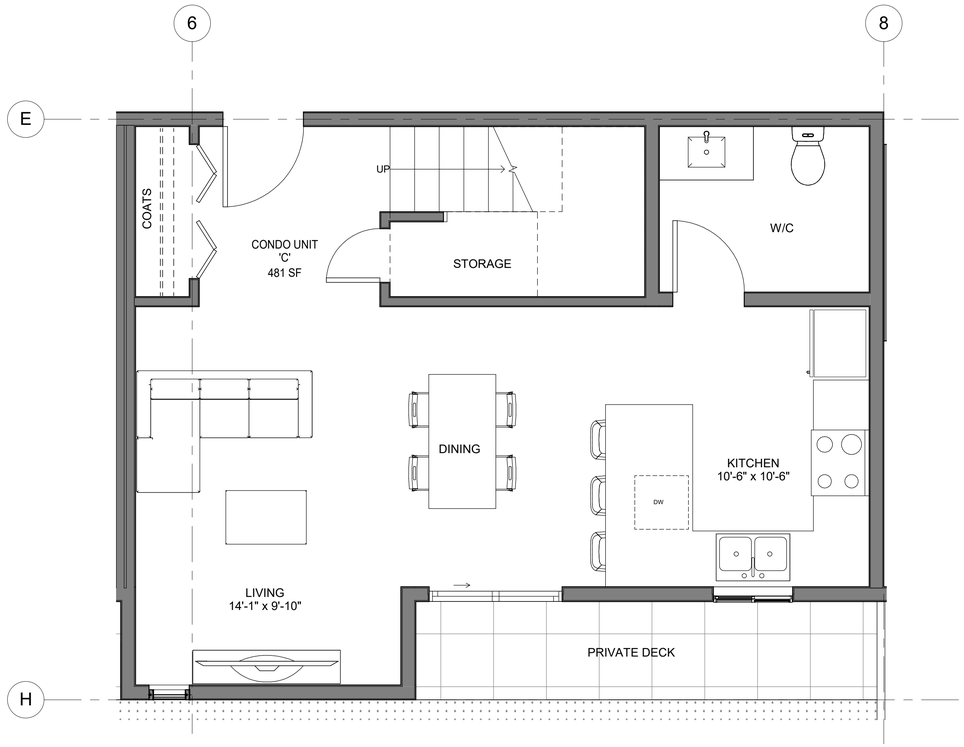
file

drawing title
CONDO UNIT PLANS

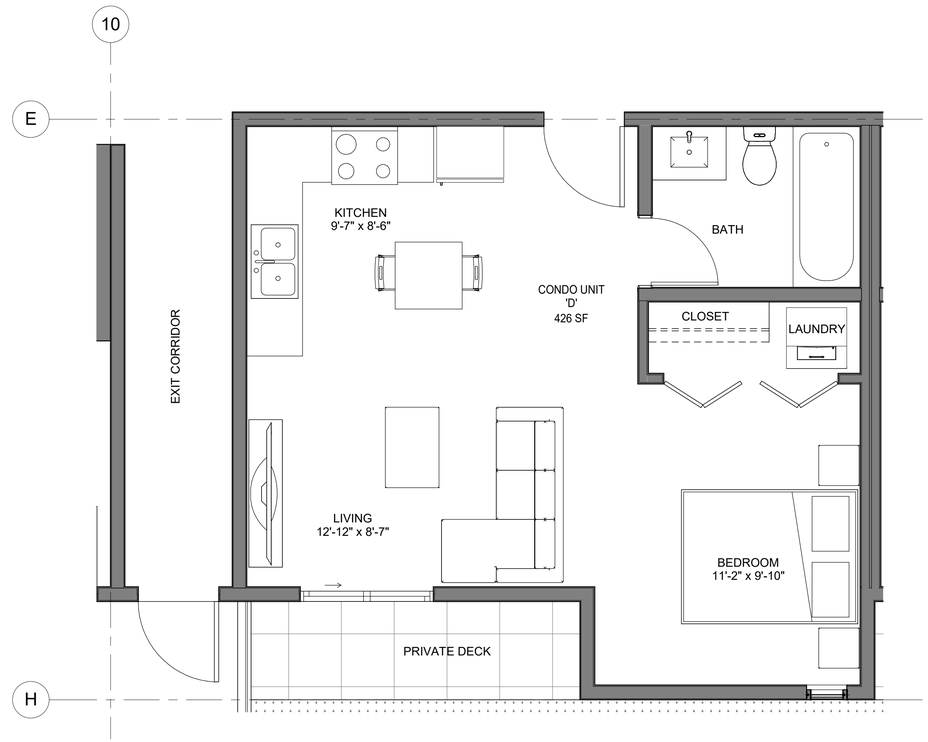
designed
scale 3/8" = 1'-0"
drawn J.F.
checked R.Y.

drawing no.
A3.08

plotte NOV 28, 2016



1 A3.02 CONDO UNIT 'C'
3/8" = 1'-0"



4 A3.02 CONDO UNIT 'D'
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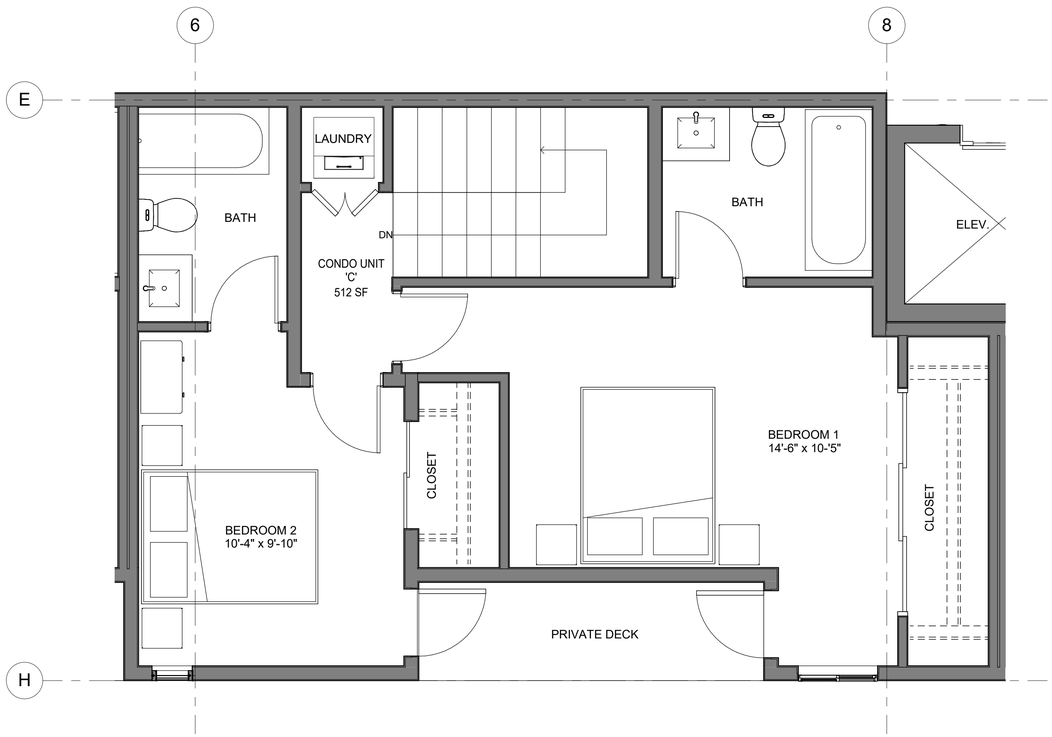

2 A3.03 CONDO UNIT 'C'
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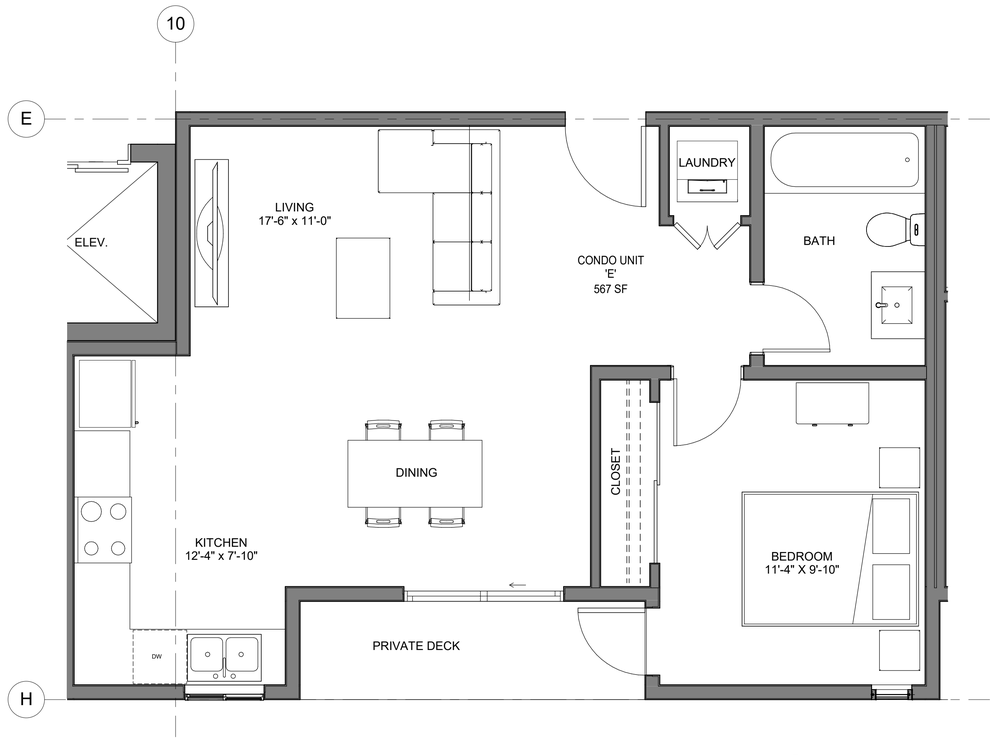

3 A3.03 CONDO UNIT 'E'
3/8" = 1'-0"

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Revisions

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project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
CONDO UNIT PLANS

designed

scale 3/8" = 1'-0"

drawn J.F.

checked R.Y.

drawing no.
A3.09

plotte NOV 28, 2016

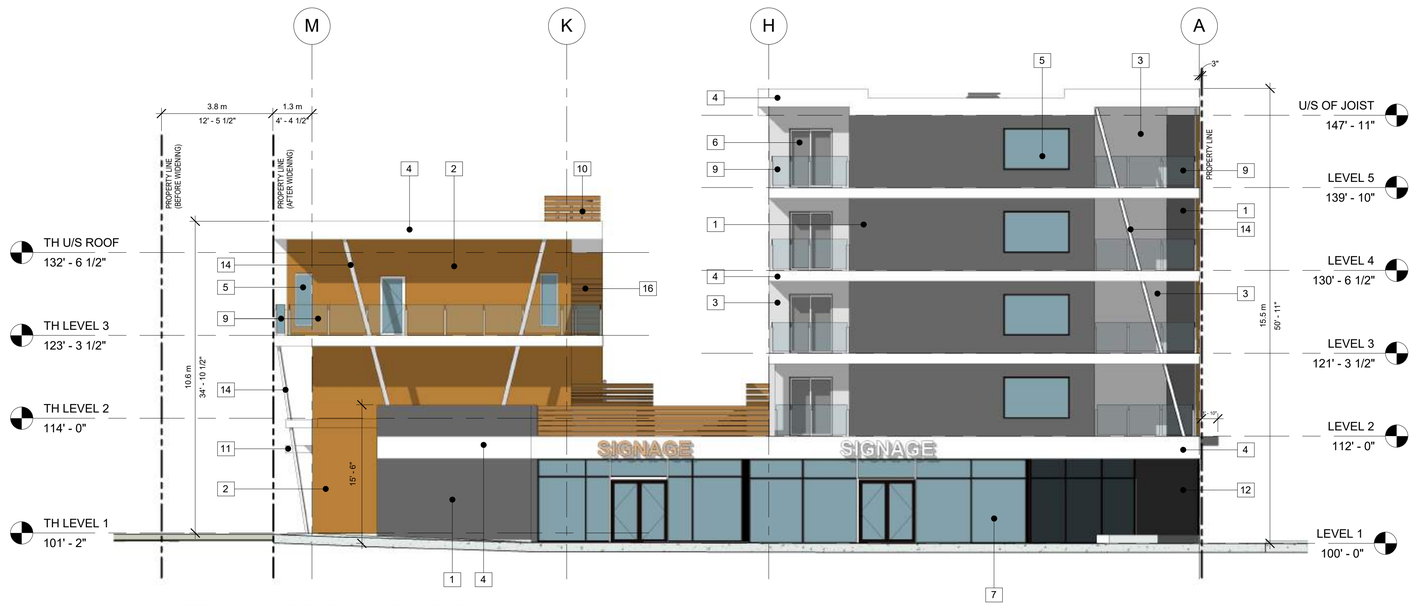
EXTERIOR MATERIAL LEGEND

- STUCCO - DARK GREY
  COLOUR: TBD
- STUCCO - BROWN
  COLOUR: TBD
- STUCCO - LIGHT GREY
  COLOUR: TBD
- CEMENT FIBER BOARD - SOLID WHITE
  COLOUR: TBD
- PARGED CEMENT WALL
  COLOUR: MED GREY
- PREFINISHED METAL FLASHING - WHITE
  COLOUR: TO MATCH WHITE FIBER CEMENT BOARD
- PREFINISHED METAL FLASHING - MEDIUM GREY
  COLOUR: TO MATCH CONCRETE

1 A3.01 SOUTH TOWNHOUSE ELEVATION
1/8" = 1'-0"

EXTERIOR MATERIAL LEGEND

1. STUCCO - DARK GREY
2. STUCCO - BROWN
3. STUCCO - LIGHT GREY
4. CEMENT FIBER BOARD - SOLID WHITE
5. WINDOWS - STYLE / MANUFACTURE TO BE CONFIRMED
6. SLIDING GLASS PATIO DOOR
7. ALUMINUM STORFRONT - GLAZING AND DOORS
8. PAINTED METAL DOORS
9. GLASS GUARDRAILS
10. WOOD GUARDRAILS
11. PREFINISHED METAL FLASHINGS
12. PARGED CONCRETE WALLS
13. FINISHED WOOD TRELLIS
14. EXPOSED STRUCTURAL SUPPORT - PAINTED
15. CONCRETE STAIRS / RAMPS
16. WOOD SCREENING
17. OVERHEAD PREFINISHED GARAGE DOOR



NOTE* SIGNAGE TO BE IN ACCORDANCE WITH THE CITY OF KELOWNA SIGN BYLAW

2 A3.01 EAST ELEVATION
1/8" = 1'-0"

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project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
BUILDING ELEVATIONS

designed
scale As indicated
drawn J.F.
checked R.Y.

drawing no. **A4.00**

plotte NOV 28, 2016

EXTERIOR MATERIAL LEGEND

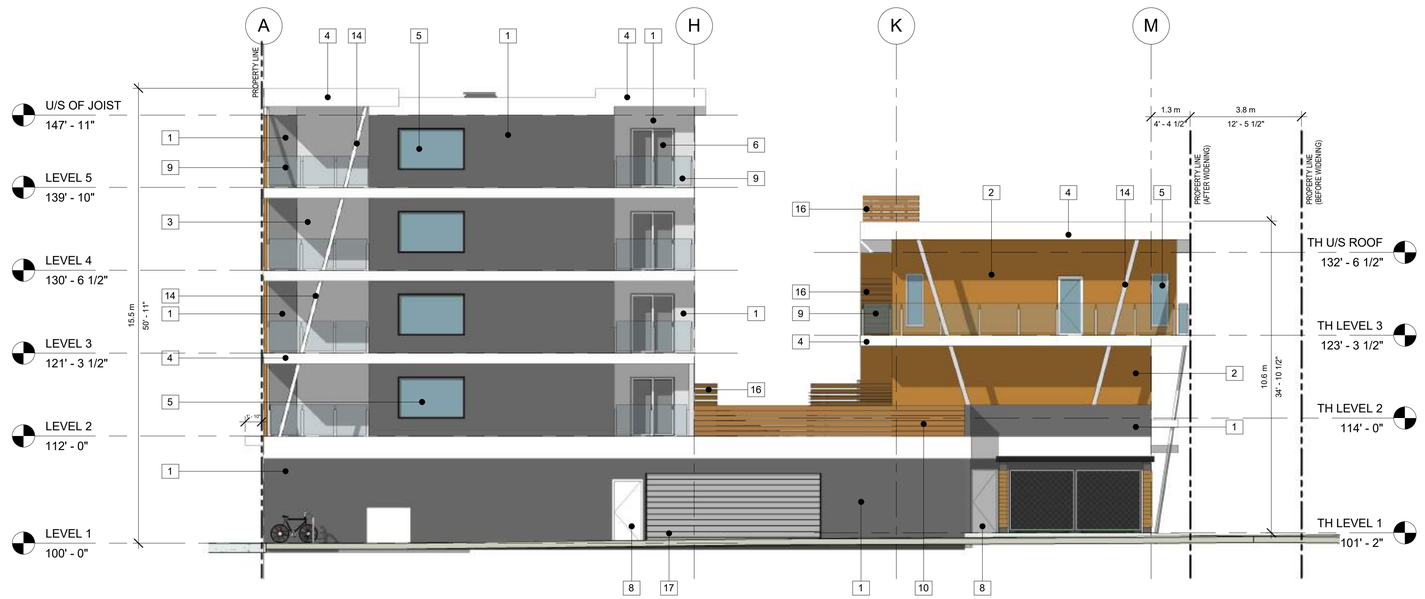
1. STUCCO - DARK GREY
2. STUCCO - BROWN
3. STUCCO - LIGHT GREY
4. CEMENT FIBER BOARD - SOLID WHITE
5. WINDOWS - STYLE / MANUFACTURE TO BE CONFIRMED
6. SLIDING GLASS PATIO DOOR
7. ALUMINUM STORFRONT - GLAZING AND DOORS
8. PAINTED METAL DOORS
9. GLASS GUARDRAILS
10. WOOD GUARDRAILS
11. PREFINISHED METAL FLASHINGS
12. PARGED CONCRETE WALLS
13. FINISHED WOOD TRELLIS
14. EXPOSED STRUCTURAL SUPPORT - PAINTED
15. CONCRETE STAIRS / RAMPS
16. WOOD SCREENING
17. OVERHEAD PREFINISHED GARAGE DOOR

NOTE* SIGNAGE TO BE IN ACCORDANCE WITH THE CITY OF KELOWNA SIGN BYLAW

1 / A3.01 NORTH CONDO ELEVATION
1/8" = 1'-0"

EXTERIOR MATERIAL LEGEND

- STUCCO - DARK GREY
  COLOUR: TBD
- STUCCO - BROWN
  COLOUR: TBD
- STUCCO - LIGHT GREY
  COLOUR: TBD
- CEMENT FIBER BOARD - SOLID WHITE
  COLOUR: TBD
- PARGED CEMENT WALL
  COLOUR: MED GREY
- PREFINISHED METAL FLASHING - WHITE
  COLOUR: TO MATCH WHITE FIBER CEMENT BOARD
- PREFINISHED METAL FLASHING - MEDIUM GREY
  COLOUR: TO MATCH CONCRETE



2 / A3.01 WEST ELEVATION
1/8" = 1'-0"

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DOUGALL RD MIXED-USE DEVELOPMENT

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KELOWNA, BC

project no. 4002

file

drawing title
BUILDING ELEVATIONS

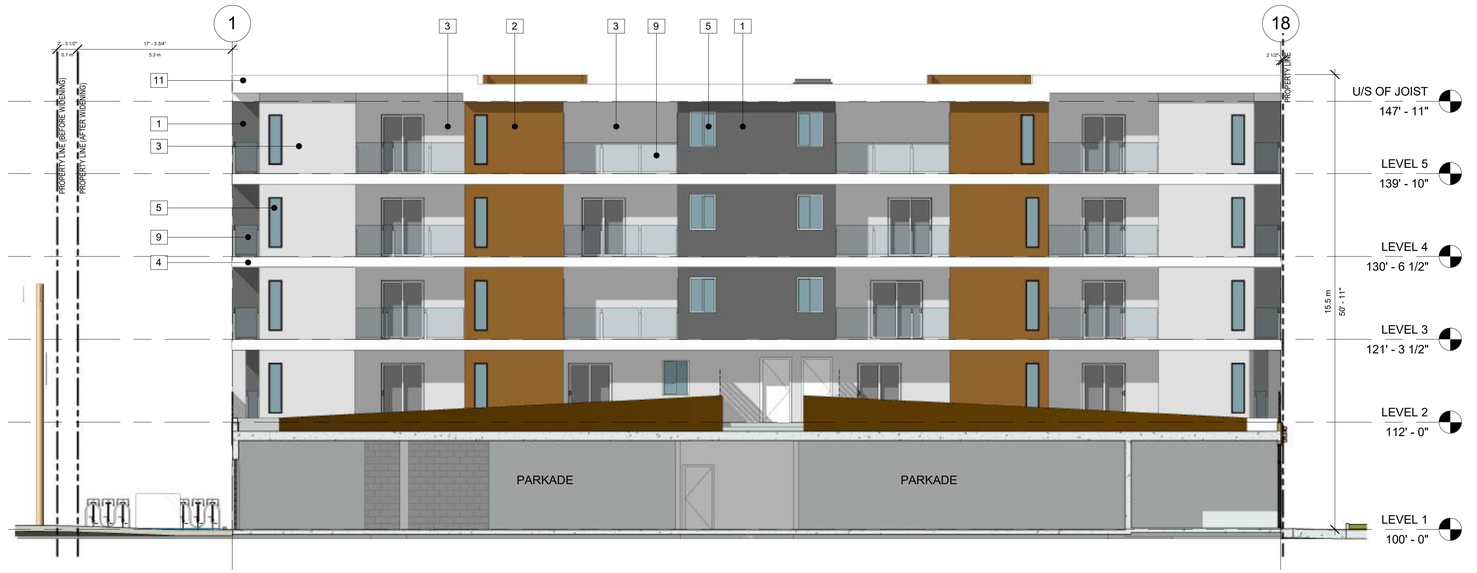
designed
scale As indicated
drawn J.F.
checked R.Y.

drawing no. **A4.01**

plottle NOV 28, 2016

EXTERIOR MATERIAL LEGEND

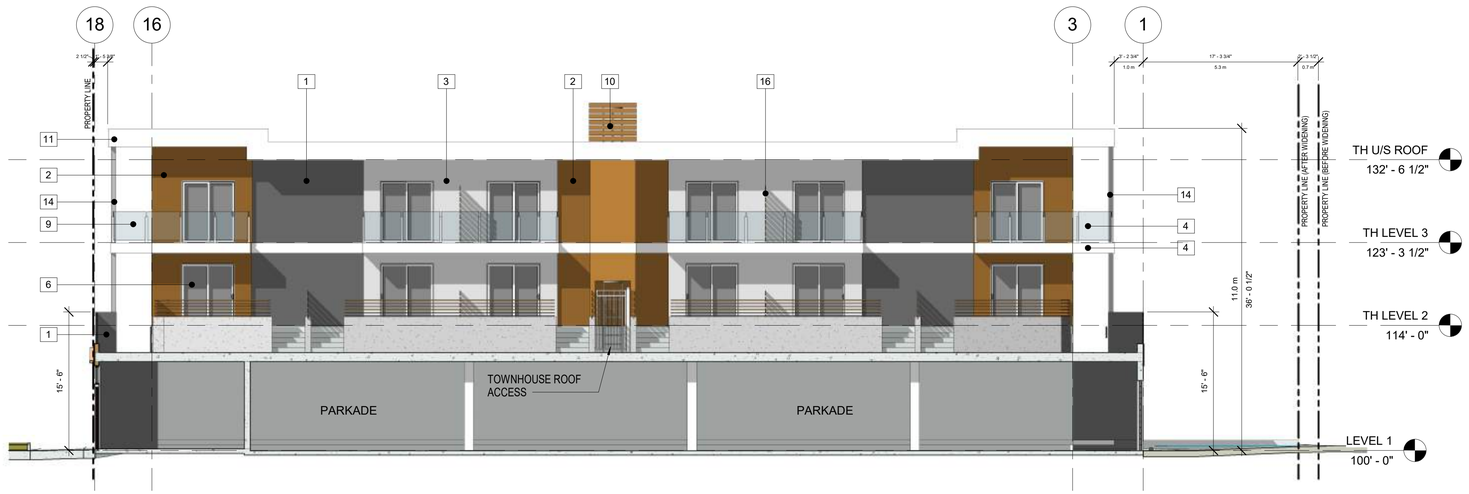
- STUCCO - DARK GREY
  COLOUR: TBD
- STUCCO - BROWN
  COLOUR: TBD
- STUCCO - LIGHT GREY
  COLOUR: TBD
- CEMENT FIBER BOARD - SOLID WHITE
  COLOUR: TBD
- PARGED CEMENT WALL
  COLOUR: MED GREY
- PREFINISHED METAL FLASHING - WHITE
  COLOUR: TO MATCH WHITE FIBER CEMENT BOARD
- PREFINISHED METAL FLASHING - MEDIUM GREY
  COLOUR: TO MATCH CONCRETE



2 A3.01 SOUTH CONDO ELEVATION
1/8" = 1'-0"

EXTERIOR MATERIAL LEGEND

1. STUCCO - DARK GREY
2. STUCCO - BROWN
3. STUCCO - LIGHT GREY
4. CEMENT FIBER BOARD - SOLID WHITE
5. WINDOWS - STYLE / MANUFACTURE TO BE CONFIRMED
6. SLIDING GLASS PATIO DOOR
7. ALUMINUM STORFRONT - GLAZING AND DOORS
8. PAINTED METAL DOORS
9. GLASS GUARDRAILS
10. WOOD GUARDRAILS
11. PREFINISHED METAL FLASHINGS
12. PARGED CONCRETE WALLS
13. FINISHED WOOD TRELLIS
14. EXPOSED STRUCTURAL SUPPORT - PAINTED
15. CONCRETE STAIRS / RAMPS
16. WOOD SCREENING
17. OVERHEAD PREFINISHED GARAGE DOOR



1 A3.01 NORTH TOWNHOUSE ELEVATION
1/8" = 1'-0"

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SEAL

Revisions

No	Date	Description
1	APR 13, 2017	Issued for DP

project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
BUILDING ELEVATIONS

designed

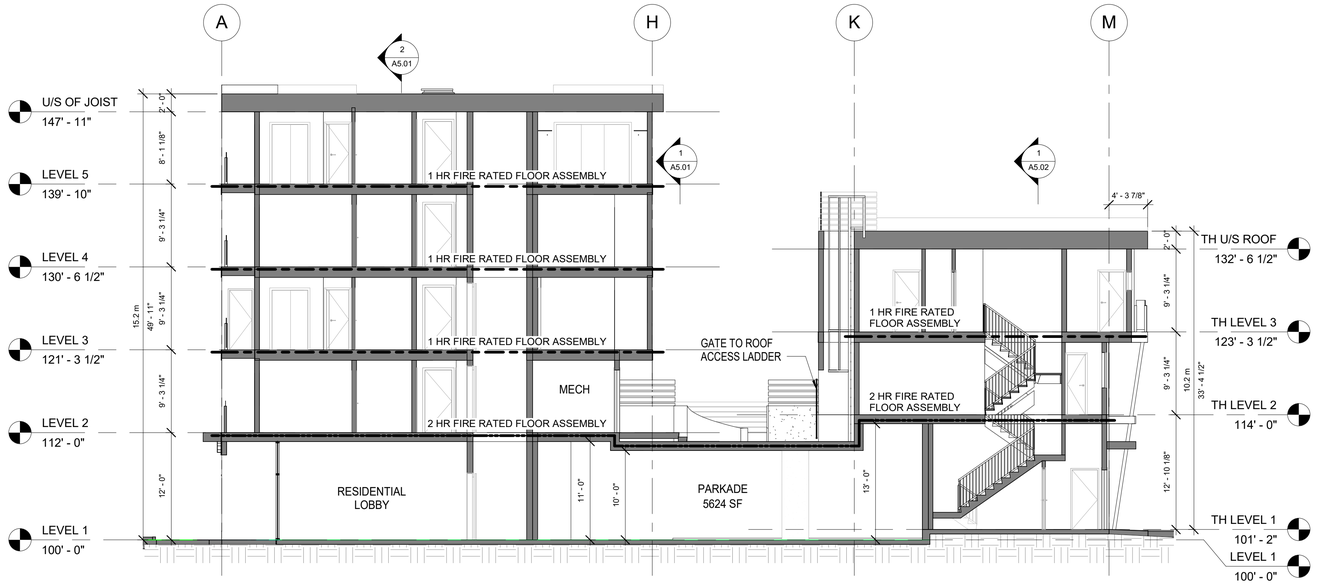
scale As indicated

drawn J.F.

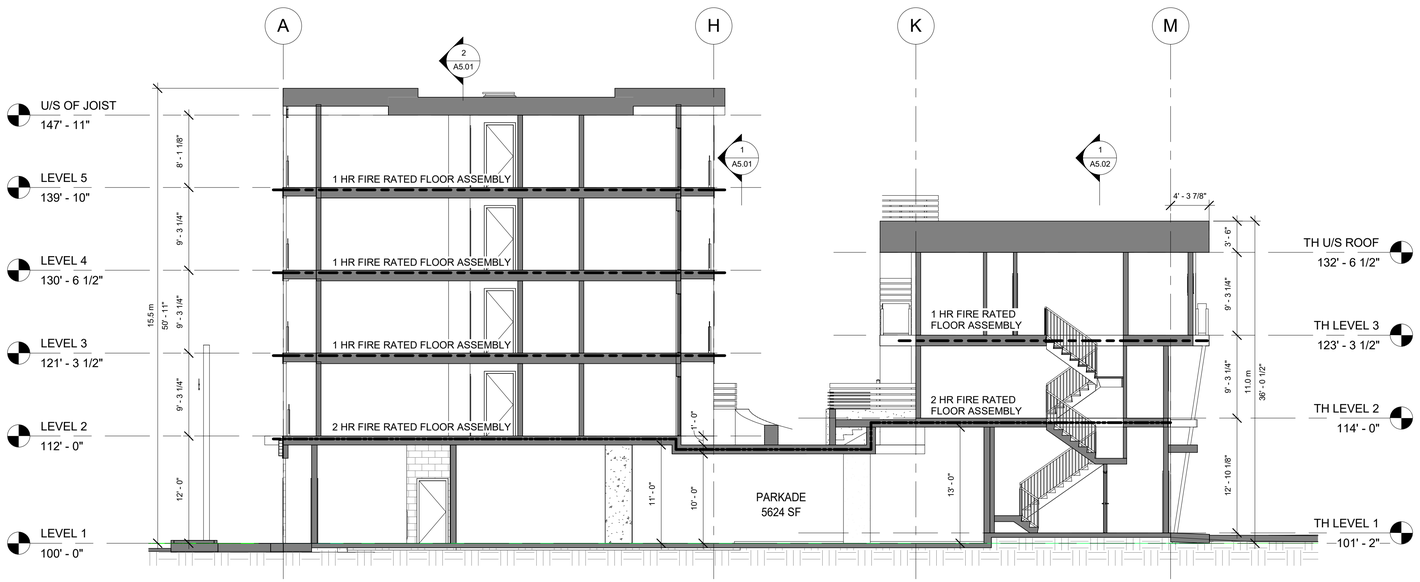
checked R.Y.

drawing no.
A4.02

plotte NOV 28, 2016



2 A3.01 BUILDING SECTION @ ELEVATOR
1/8" = 1'-0"



1 A3.01 BUILDING SECTIONG @ STAIRS
1/8" = 1'-0"

FIRE SEPARATION LEGEND

1 HR FRR

2 HRS FRR

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SEAL

Revisions

No	Date	Description
1	APR 13, 2017	Issued for DP

project

DOUGALL RD MIXED-USE DEVELOPMENT

project address

DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title

BUILDING SECTIONS

designed

scale As indicated

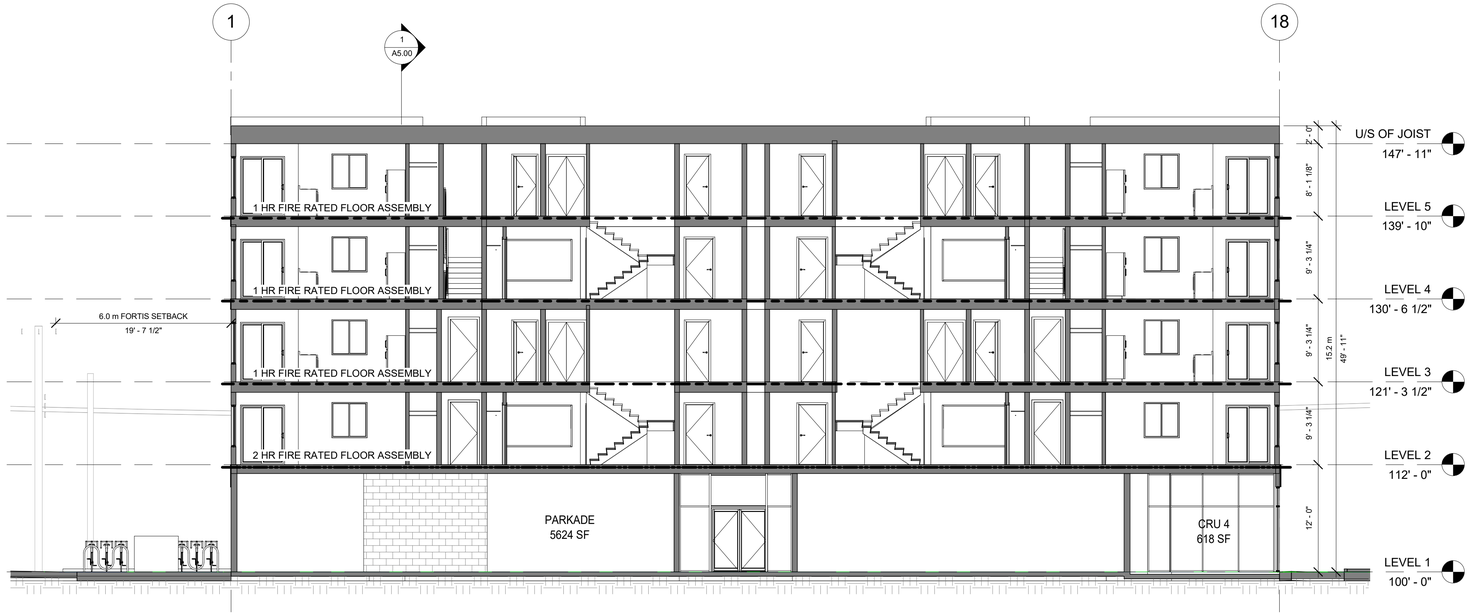
drawn J.F.

checked R.Y.

drawing no.

A5.00

plotte NOV 28, 2016



2 A3.01 BUILDING SECTION @ CONDO
1/8" = 1'-0"

1 A3.01 BUILDING SECTION @ PARKADE
1/8" = 1'-0"

FIRE SEPARATION LEGEND

1 HR FRR

2 HRS FRR

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SEAL

Revisions

No	Date	Description
1	APR 13, 2017	Issued for DP

project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
BUILDING SECTIONS

designed

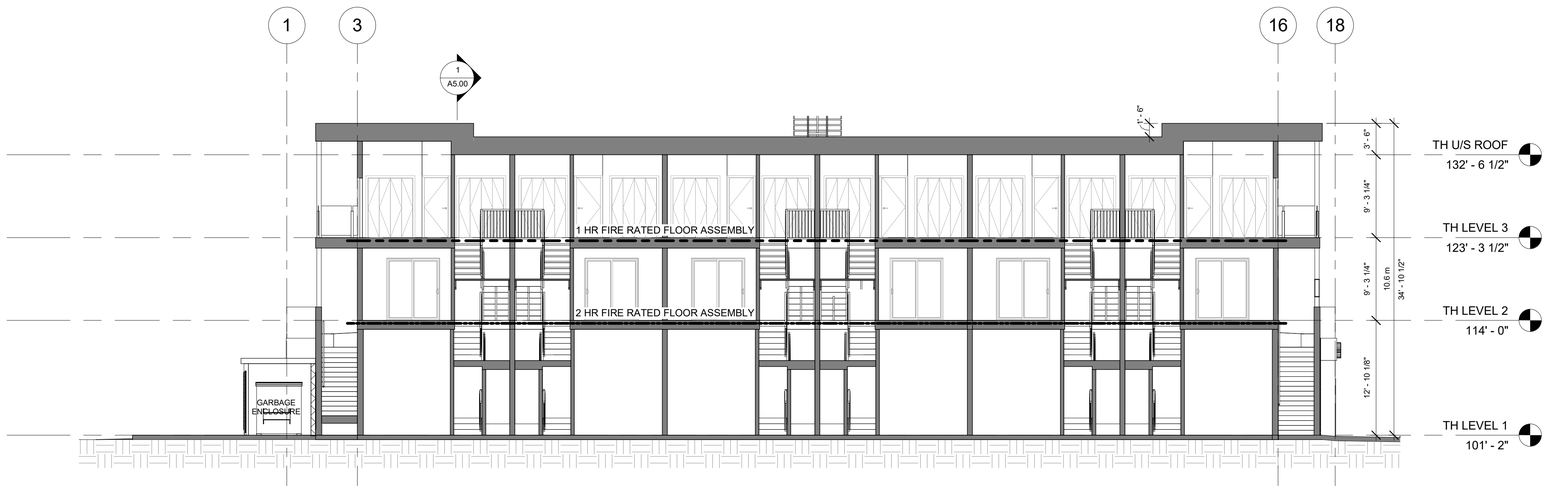
scale As indicated

drawn J.F.

checked R.Y.

drawing no. **A5.01**

plotte NOV 28, 2016



1 / A1 BUILDING SECTION @ TOWNHOUSE
1/8" = 1'-0"

FIRE SEPARATION LEGEND

1 HR FRR

2 HRS FRR

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SEAL

Revisions

No	Date	Description
1	APR 13, 2017	Issued for DP

project
DOUGALL RD MIXED-USE DEVELOPMENT

project address
DOUGALL RD.,
KELOWNA, BC

project no. 4002

file

drawing title
BUILDING SECTIONS

designed | scale As indicated

drawn J.F.

checked R.Y.

drawing no. **A5.02**

plotte NOV 28, 2016

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (TB)		
Application:	Z16-0022	**Owner:**	Paul Benjamin Neufeld Douglas Richard Kirk
Address:	815 Rose Avenue	**Applicant:**	Douglas Richard Kirk
Subject:	Rezoning Application		
Existing OCP Designation:	MRL – Multiple Unit Residential (Low Density)		
Existing Zone:	RU6 – Two Dwelling Housing		
Proposed Zone:	RM1 – Four Dwelling Housing		

1.0 Recommendation

THAT Rezoning Application No. Z16-0022 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 2, District Lot 136, ODYD, Plan 8116, located at 815 Rose Avenue, Kelowna, BC from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated May 29, 2017;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and Development Variance Permit for the subject property.

2.0 Purpose

To rezone the subject property to RM1 – Four Dwelling Housing to facilitate the development of four dwelling units.

3.0 Community Planning

Community Planning Staff supports the proposed rezoning application to facilitate the development of four dwelling units. The RM1 – Four Dwelling Housing zone is consistent with the Official Community Plan (OCP) Future Land Use Designation of MRL – Multiple Unit Residential (Low Density). The proposal is consistent with OCP policies for Compact Urban Form, and Sensitive Infill. Should Council support this rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading.

There are two other development applications on Rose Avenue that have been submitted to the City requesting the same zone to allow a four-plex with nearly identical floor plans. Staff have worked with the representatives from each project to ensure that differences in the materials and colour palette of each application provides variety and individuality.

4.0 Proposal

4.1 Background

The subject property features a 1 ½ storey single family dwelling that was constructed in 1960 and a small storage shed that will be demolished as part of this development. The applicants began this process in April 2016 with a proposal for a total of 3 units. Council passed 2nd and 3rd readings on the rezoning for that proposal on July 12th, 2016. The applicants asked to put their application on hold and have come up with a redesign and a new proposal for 4 units. This is a significant change and requires a new public hearing.

4.2 Project Description

The proposed rezoning would facilitate the development of a four-plex on the subject property. This is consistent with the OCP Future Land Use designation of Multiple Unit Residential Low Density. The proposal meets the OCP Policy of Compact Urban Growth by increasing density where infrastructure already exists.

The proposal involves the closure of the front driveway, and a 5.0m road reserve across the front property for future expansion of Rose Avenue. All parking will be located in the rear, with 4 covered parking stalls and 2 uncovered stalls. The project requires one variance to allow the additional 2 uncovered stalls to be located in the side yard setback. All other Zoning Bylaw requirements are met including provision of private outdoor space, height, setbacks, and site coverage.

The proposed design has front doors facing the street for the two front units, and side entry for the two rear units. The units feature full basements and as such a 219 Restrictive Covenant regarding the Mill Creek Floodplain Bylaw has been placed on title that indemnifies the City in the event of any flooding. Four units is the maximum allowed under the zone, and therefore secondary suites would not be permitted in the units.

The design as proposed meets the majority of the design guidelines, and should Council support the rezoning, a Development Permit and Development Variance Permit will be considered by Council prior to 4th reading. There are two other applications on Rose Avenue at this time that are also rezoning to a four-plex with nearly identical floor plans. The representatives from each project have taken care to ensure that differences in the materials and colour palette of each application provides variety and individuality of the projects. The three projects are located at 775 Rose Avenue, 815 Rose Avenue, and 861 Rose Avenue as shown in the map on Page 3.

Figure 1.0 – Current Zoning Applications along Rose Avenue

4.3 Site Context

The subject property is located in South Pandosy east of Richter Street and south of Ethel Street on the south side of Rose Avenue. The subject property is within walking distance to a variety of amenities including Guisachan Village, Cameron Park, Kelowna General Hospital, and is located on a bicycle corridor with access to the proposed Ethel Street Active Transportation Corridor.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU6 – Two Dwelling Housing	Residential
East	RU6 – Two Dwelling Housing	Residential
South	RU7 – Infill Housing	Residential
West	RU6 – Two Dwelling Housing	Residential

Subject Property Map: 815 Rose Avenue

4.4 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**RM1 ZONE REQUIREMENTS**	**PROPOSAL**
Development Regulations		
Floor Area Ratio	.60	.49
Site Coverage of Buildings	40%	35.5%
Site Coverage of Buildings, Parking, and Driveways	50%	47.2%
Height	2.5 storeys or 9.0m	2.5 storeys or 8.56m
Front Yard	4.5m	6.5m
Side Yard (east)	2.0m	2.75m
Side Yard (west)	2.0m	2.75m
Rear Yard	1.5m	4.5m
Other Regulations		
Minimum Parking Requirements	6 parking stalls	6 parking stalls
Setbacks to Parking		
Side Yard (east)	1.5m	0.3m ❶
Side Yard (west)	1.5m	0.3m ❷
Rear Yard	1.5m	1.5m
Private Open Space	>25m^2 per dwelling	>25m^2 per dwelling

❶ Indicates a requested variance to allow required parking in the east side yard setback.
❷ Indicates a requested variance to allow required parking in the west side yard setback.

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Sensitive Infill.[2] Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the character of the neighbourhood with respect to building design height and siting.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permit(s).
- A Geotechnical report is required to address the sub soil conditions and site drainage at time of building permit application. This property falls within the Mill Creek flood plain bylaw area and compliance is required. Minimum building elevations are required to be established prior to the

[1] City of Kelowna Official Community Plan, Policy 5.3.2 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.22.6 (Development Process Chapter).

release of the Development Permit. This minimum Geodetic elevation is required for all habitable spaces including parking garages. This building may be designed to low, which may affect the form and character of the building.

- Full Plan check for Building Code related issues will be done at time of Building Permit applications. Please indicate how the requirements of Radon mitigation and NAFS are being applied to this structure at time of permit application.

6.2 Development Engineering Department

- Please see attached Schedule "A" dated June 6, 2016

6.3 Fire Department

- Emergency access to the duplex (south) must be maintained - a laneway is not adequate for emergency access
- Requirements of section 9.10.19 Smoke Alarms and Carbon Monoxide alarms of the BCBC 2012 are to be met.
- If a fence is ever constructed between the dwellings a gate with a clear width of 1100mm is required.
- All units shall have a posted address on Rose Ave. for emergency response
- The fire department has no issues with the zoning

6.4 FortisBC Electric

- There are FortisBC Inc (Electric) ("FBC(E)") primary distribution facilities along Rose Avenue and within the lane adjacent the subject's south property line. The applicant is responsible for costs associated with any change to the subject property's existing service, if any, as well as the provision of appropriate land rights where required.
- Otherwise, FBC(E) has no concerns with this circulation.
- In order to initiate the design process, the customer must call 1-866-4FORTIS (1-866-436-7847). It should be noted that additional land rights issues may arise from the design process but can be dealt with at that time, prior to construction.

7.0 Application Chronology

Date of Application Received:	April 6, 2016
Date Public Consultation Completed:	April 9, 2016
Date of Public Hearing:	July 12, 2016
Revised Plans Received:	May 3, 2017
Date Revised Public Consultation Completed:	May 9, 2017

Report prepared by: Trisa Brandt, Planner

Reviewed by: Terry Barton, Urban Planning Manager

Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Schedule "A": Memorandum dated June 6, 2016
Site Plan and Floor Plans
Conceptual Renderings
Landscape Plan

SCHEDULE A

This forms part of application

Z16-0022

Planner Initials TB

City of Kelowna COMMUNITY PLANNING

CITY OF KELOWNA

MEMORANDUM

Date: May 18, 2016
File No.: Z16-0022

To: Community Planning (TB)

From: Development Engineering Manager(SM)

Subject: 815 Rose Ave RU6 to RM1

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 Sergio Sartori

1. **Domestic Water and Fire Protection**

The subject property is currently serviced with a 19mm water service. The developer will need to determine the domestic and fire protection requirements of this proposed development. Only one service will be permitted for this development. The applicant will arrange for the disconnection of existing service and the installation of a new service. The disconnection of the existing small diameter water services and the tie-in of a larger new service can be provided by City forces at the developer's expense. One metered water service will supply the development. The applicant will be required to sign a Third Party Work Order for the cost of the water service upgrades. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

2. **Sanitary Sewer**

Our records indicate that this property is currently serviced with a 100mm-diameter sanitary sewer service. An inspection chamber (IC) complete with brooks box must be installed on the service at the owner's cost. Service upgrades can be provided by the City at the applicant's cost. The applicant will be required to sign a Third Party Work Order for the cost of the service upgrade. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

3. **Road Improvements**

Rose Ave must be upgraded to an urban standard along the full frontage of this proposed development, including curb and gutter, drainage system including catch basins, manholes and pavement removal and replacement, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. A one-time cash payment in lieu of construction must be collected from the applicant for future construction by the City. The cash-in-lieu amount is determined to be **$7,227.00** not including utility service cost.

(a) Only the service upgrades must be completed at this time. The City wishes to defer the upgrades to Rose Ave fronting this development. Therefore, cash-in-lieu of immediate construction is required and the City will initiate the work later, on its own construction schedule.

Item	Cost
Drainage	$ 2,855.00
Curb &Gutter	$ 1,954.00
Road Fillet	$ 2,052.00
Blvd Landscaping	$ 366.00
Total	**$ 7,227.00**

4. Subdivision

(a) Grant Statutory Rights of Way if required for utility services.

(b) Dedicate 5.0m along the full frontage of Rose Avenue.

(c) If any road dedication or closure affects lands encumbered by a Utility right-of-way (such as Hydro, Telus, Gas, etc.) please obtain the approval of the utility. Any works required by the utility as a consequence of the road dedication or closure must be incorporated in the construction drawings submitted to the City's Development Manager

5. Development Permit and Site Related Issues

Direct the roof drains into on-site rock pits or splash pads.
Access is permitted from the lane only.

6. Electric Power and Telecommunication Services

The electrical and telecommunication services to this building must be installed in an underground duct system, and the building must be connected by an underground service. 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.

7. Bonding and Levy Summary

(a) Levies

1. Rose Ave frontage improvements **$7,227.00**

(b) Bonding

1. Service upgrades To be determined

Steve Muenz, P. Eng.
Development Engineering Manager

SS

SCHEDULE A
This forms part of application
Z16-0022
Planner Initials TB
City of Kelowna COMMUNITY PLANNING

CITY OF KELOWNA

MEMORANDUM

Date: May 18, 2016

File No.: DP16-0101

To: Community Planning (TB)

From: Development Engineer Manager (SM)

Subject: ~~580 Patterson Ave~~ 815 ROSE AVE

The Development Engineering comments and requirements regarding this Development Permit application are as follows:

1. **General.**

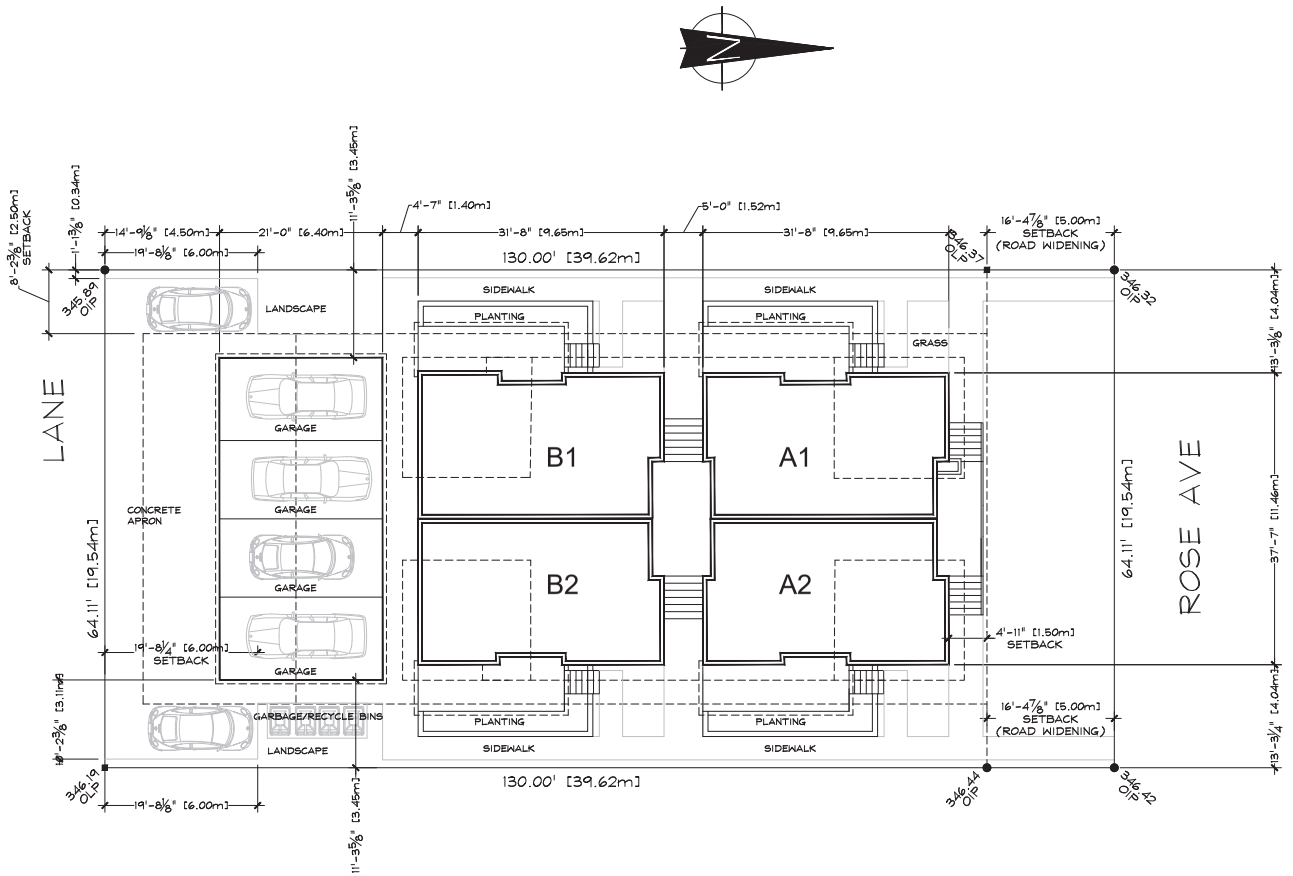
   a) All the offsite infrastructure and services upgrades are addressed in the Rezoning Engineering Report under file Z16-0022.

for Sergio Sartori

Steve Muenz, P. Eng.
Development Engineering Manager

SS

(O.K. FOR SERGIO SARTORI TO SIGN AS I APPROVED Z16-0022
STEVE M/LIENZ)



LOT INFORMATION

ZONING RU6 PROPOSED RM1
LEGAL DESCR. Lot 2 DL136 PLAN 8116
CIVIC ADDRESS 815 ROSE AVE.

LOT COVERAGE

BUILDING COVERAGE
MAIN FLOOR = 2,082 SF
GARAGE = 872 SF
= 2,954 SF

TOTAL LOT SQ/FT = 8,334 SF
TOTAL FOOTPRINT = 2,954 SF
TOTAL COVERAGE = 35.45%
MAX ALLOWED 40%

TOTAL SITE COVERAGE
MAIN FLOOR = 2,082 SF
GARAGE = 872 SF
PARKING/DRIVEWAY = 978 SF
= 3,932 SF

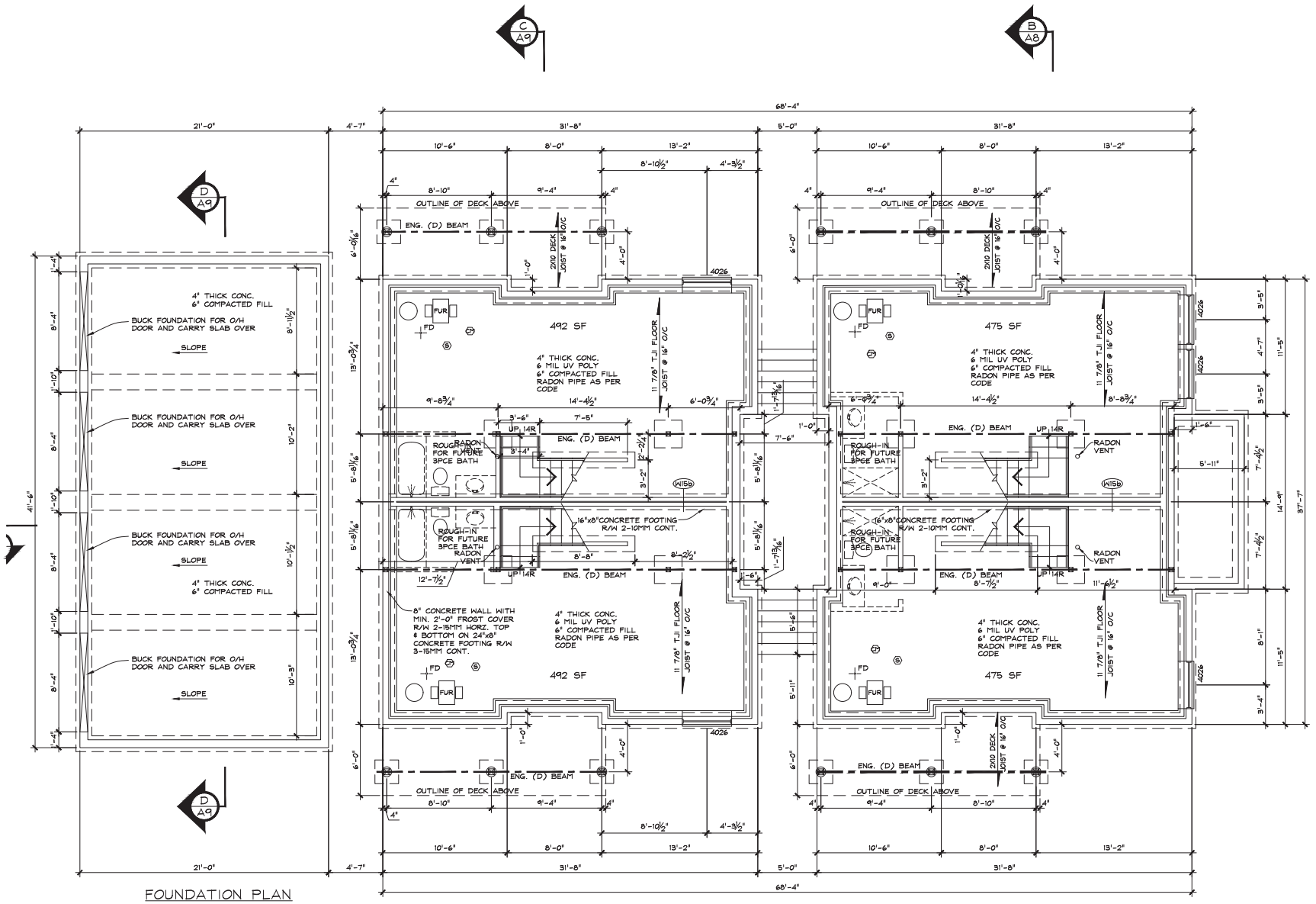
TOTAL LOT SQ/FT = 8,334 SF
TOTAL FOOTPRINT = 3,932 SF
TOTAL COVERAGE = 47.18%
MAX ALLOWED 50%

FLOOR AREA RATIO:
MAIN FLOOR = 2,082 SF
UPPER FLOOR = 1,992 SF
GARAGE = 872 SF
TOTAL SQ/FT 4,946 SF
LOT AREA = 8,334 SF
FAR = 0.59 MAX ALLOWED 0.60

'Rose Avenue Project'
815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"
DATE: MAY 1/17
SITE PLAN
SHEET NO. A1



FOUNDATION PLAN

SPECIFICATIONS

EXTERIOR WALL:

ACRYLIC STUCCO ON
PAPER & WIRE BASE W/SCRATCH COAT
½" SHEATHING
2x6 STUDS @ 16"O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (U.V. RESISTANT)
5/8" GYPSUM BOARD

GARAGE FLOOR:

CONCRETE SLAB
SLOPE 2" MIN FOR DRAINAGE

EXTERIOR FOUNDATION:

2 COATS ASPHALT EMULSION
8" CONCRETE FOUNDATION WALL
3" RIGID INSULATION TO
BELOW FROST LINE W/PROTECTION
MIN 24" BELOW FINISH GRADE
24"x8" CONCRETE FOOTING

INTERIOR FOUNDATION:

6" CONCRETE CURB
16" x 8" CONCRETE FOOTING

DRAINAGE:

6" MIN DRAIN ROCK COVER
4" DIA. DRAIN TILE

BELOW GRADE WALL ASSEMBLY

DESCRIPTION	NOMINAL	EFFECTIVE
8" FOUNDATION WALLS W/2X6 PWF @24"O.C. W/R-24 BATT INSULATION	RSI 2.66	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. DAMPROOFING/INTERIOR AIR FILM	0.33	1.9
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 2.99 (R-17.0)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS W/HRV		RSI 2.98 (R-16.92)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR BELOW GRADE WALLS		RSI 2.98 (R-16.92)

NOTES

PROVIDE FIRE STOPS IN ACCORDANCE WITH BC BUILDING CODE REFERENCE 9.10.15 AND SMOKE ALARMS IN ACCORDANCE WITH REFERENCE 9.10.18.

PROVIDE DAMPROOFING, WATERPROOFING AND SOIL GAS CONTROL IN ACCORDANCE WITH BC BUILDING CODE REFERENCE SECTION 9.13 & 9.16.2

FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.

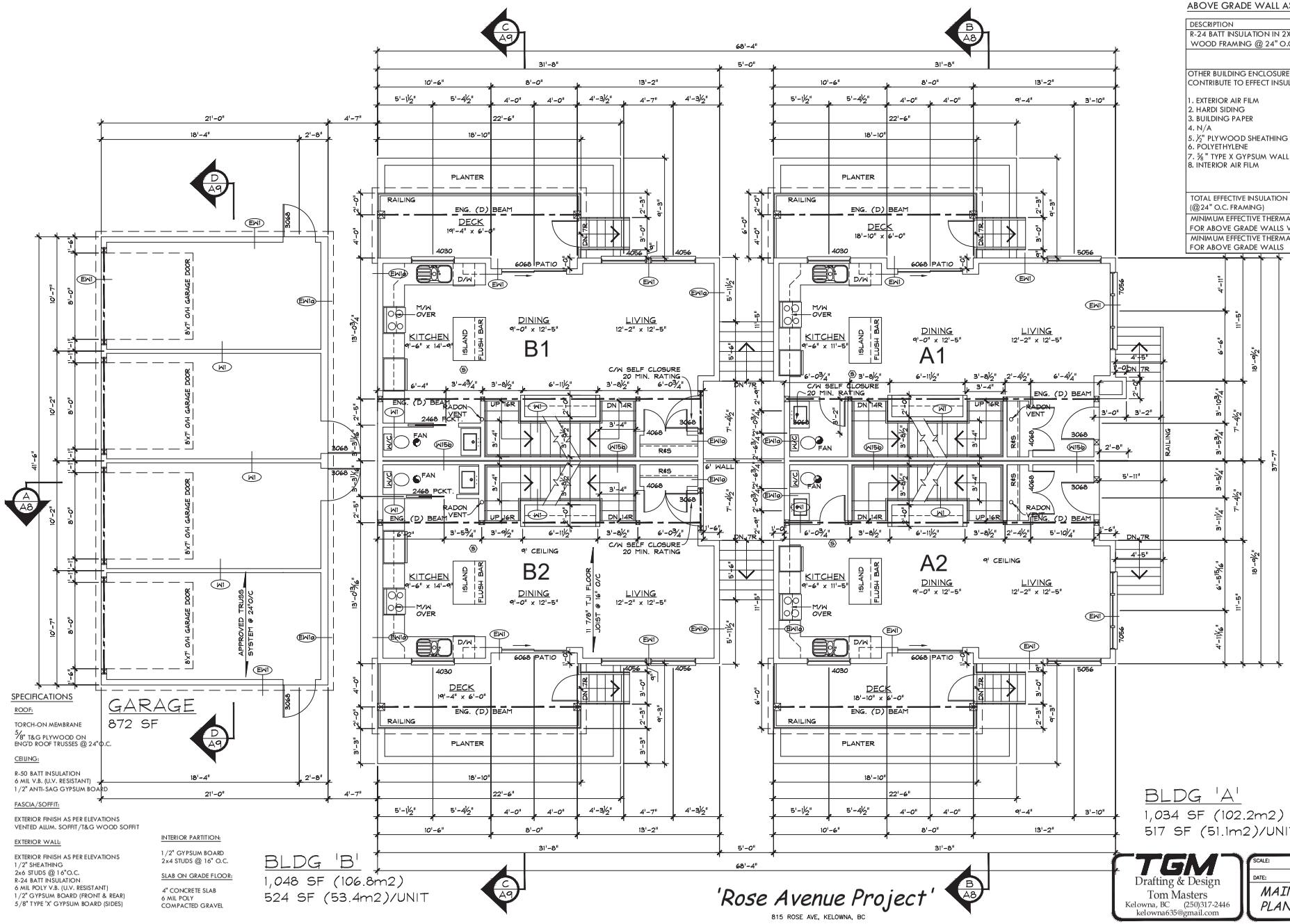
FOOTINGS ARE TO BE PLACED ON UNDISTURBED OR COMPACTED SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2000LBS/SQ.FT. OR GREATER.COMPACTION TO BE TESTED BY QUALIFIED PROFESSIONAL OR GEOTECHNICAL ENGINEER.

'Rose Avenue Project'

815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: MAY 1/17
BASEMENT PLAN
SHEET NO. A4



ABOVE GRADE WALL ASSEMBLY (HARDI SIDING)

DESCRIPTION	NOMINAL	EFFECTIVE
R-24 BATT INSULATION IN 2X6 WOOD FRAMING @ 24" O.C.	RSI 4.23	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. EXTERIOR AIR FILM	0.03	0.17
2. HARDI SIDING	0.03	0.11
3. BUILDING PAPER	0.00	0.00
4. N/A	N/A	N/A
5. ½" PLYWOOD SHEATHING	0.11	0.63
6. POLYETHYLENE	0.00	0.00
7. ⅝" TYPE X GYPSUM WALL BOARD	0.099	0.56
8. INTERIOR AIR FILM	0.12	0.68
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 4.42 (R-17.24)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS W/HRV		RSI 2.97 (R-16.86)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS		RSI 3.08 (R-17.49)

SPECIFICATIONS

ROOF:

TORCH-ON MEMBRANE
5/8" T&G PLYWOOD ON ENG'D ROOF TRUSSES @ 24" O.C.

CEILING:

R-50 BATT INSULATION
6 MIL V.B. (L.V. RESISTANT)
1/2" ANTI-SAG GYPSUM BOARD

FASCIA/SOFFIT:

EXTERIOR FINISH AS PER ELEVATIONS
VENTED ALUM. SOFFIT/T&G WOOD SOFFIT

EXTERIOR WALL:

EXTERIOR FINISH AS PER ELEVATIONS
1/2" SHEATHING
2x6 STUDS @ 16" O.C.
R-24 BATT INSULATION
6 MIL POLY V.B. (L.V. RESISTANT)
1/2" GYPSUM BOARD (FRONT & REAR)
5/8" TYPE 'X' GYPSUM BOARD (SIDES)

INTERIOR PARTITION:

1/2" GYPSUM BOARD
2x4 STUDS @ 16" O.C.

SLAB ON GRADE FLOOR:

4" CONCRETE SLAB
6 MIL POLY
COMPACTED GRAVEL

BLDG 'B'
1,048 SF (106.8m2)
524 SF (53.4m2)/UNIT

BLDG 'A'
1,034 SF (102.2m2)
517 SF (51.1m2)/UNIT

'Rose Avenue Project'
815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

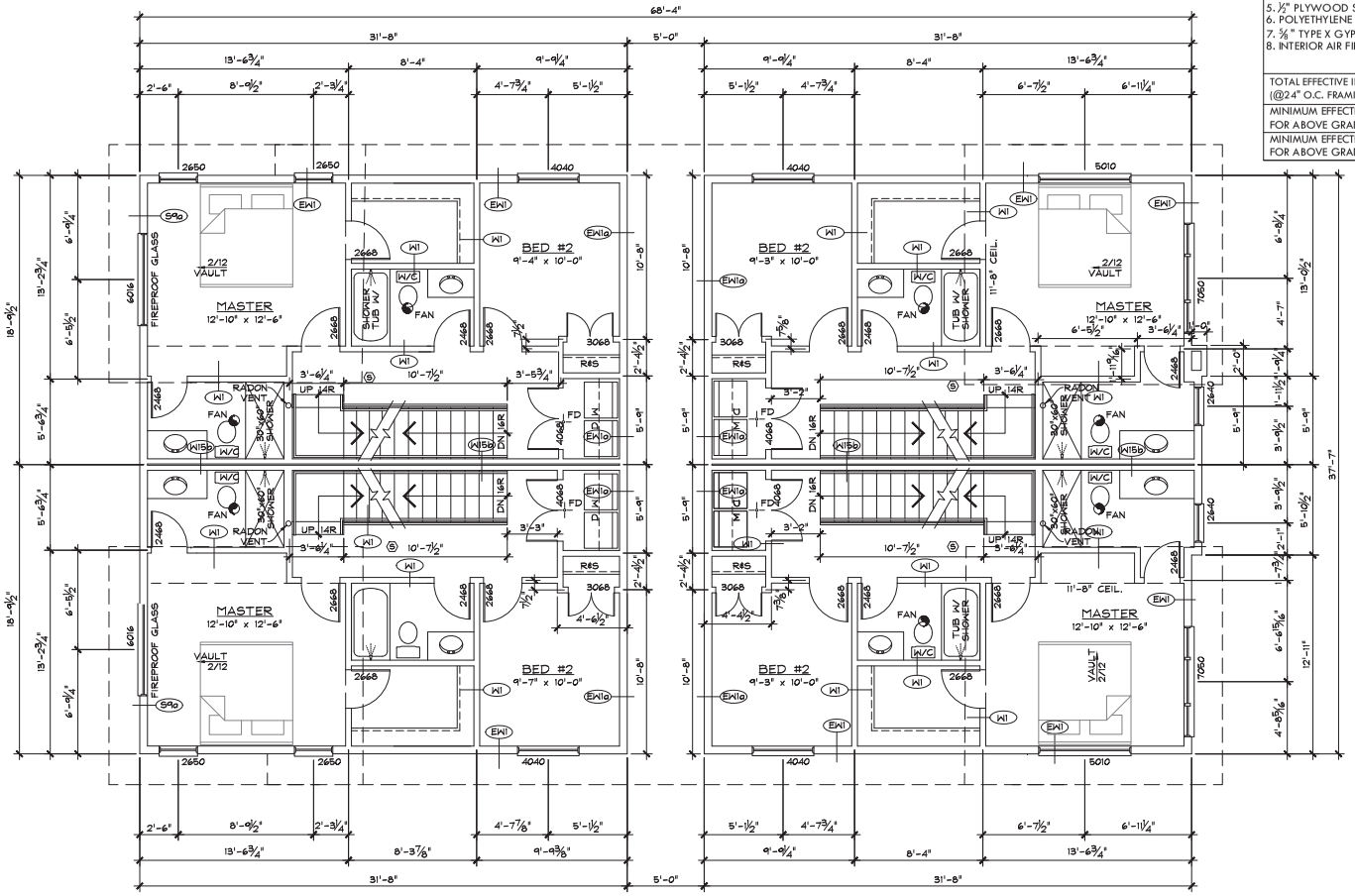
SCALE: 1/4"=1'-0"
DATE: MAY 1/17
MAIN FLOOR PLAN
SHEET NO. A3

ROOF ASSEMBLY - CATHEDRAL CEILINGS

DESCRIPTION	NOMINAL	EFFECTIVE
R-50 BATT INSULATION IN ENG. TRUSS @ 24" O.C.	RSI 8.81	(R-50.0)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. INTERIOR AIR FILM	0.12	0.68
2. ½" GYPSUM BOARD	0.08	0.45
3. 7/16 SHEATHING	0.11	0.62
4. ROOF FINISH	0.00	0.00
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 9.12 (R-51.75)
MINIMUM EFFECTIVE THERMAL RESISTANCE W/HRV		RSI 4.67 (R-26.5)
MINIMUM EFFECTIVE THERMAL RESISTANCE		RSI 4.67 (R-26.5)

ABOVE GRADE WALL ASSEMBLY (HARDI SIDING)

DESCRIPTION	NOMINAL	EFFECTIVE
R-24 BATT INSULATION IN 2X6 WOOD FRAMING @ 24" O.C.	RSI 4.23	(R-15.1)
OTHER BUILDING ENCLOSURE LAYERS CONTRIBUTE TO EFFECT INSUL:		
1. EXTERIOR AIR FILM	0.03	0.17
2. HARDI SIDING	0.03	0.11
3. BUILDING PAPER	0.00	0.00
4. N/A	N/A	N/A
5. ½" PLYWOOD SHEATHING	0.11	0.63
6. POLYETHYLENE	0.00	0.00
7. ⅝" TYPE X GYPSUM WALL BOARD	0.099	0.56
8. INTERIOR AIR FILM	0.12	0.68
TOTAL EFFECTIVE INSULATION VALUE (@24" O.C. FRAMING)		RSI 4.42 (R-17.24)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS W/HRV		RSI 2.97 (R-16.86)
MINIMUM EFFECTIVE THERMAL RESISTANCE FOR ABOVE GRADE WALLS		RSI 3.08 (R-17.49)



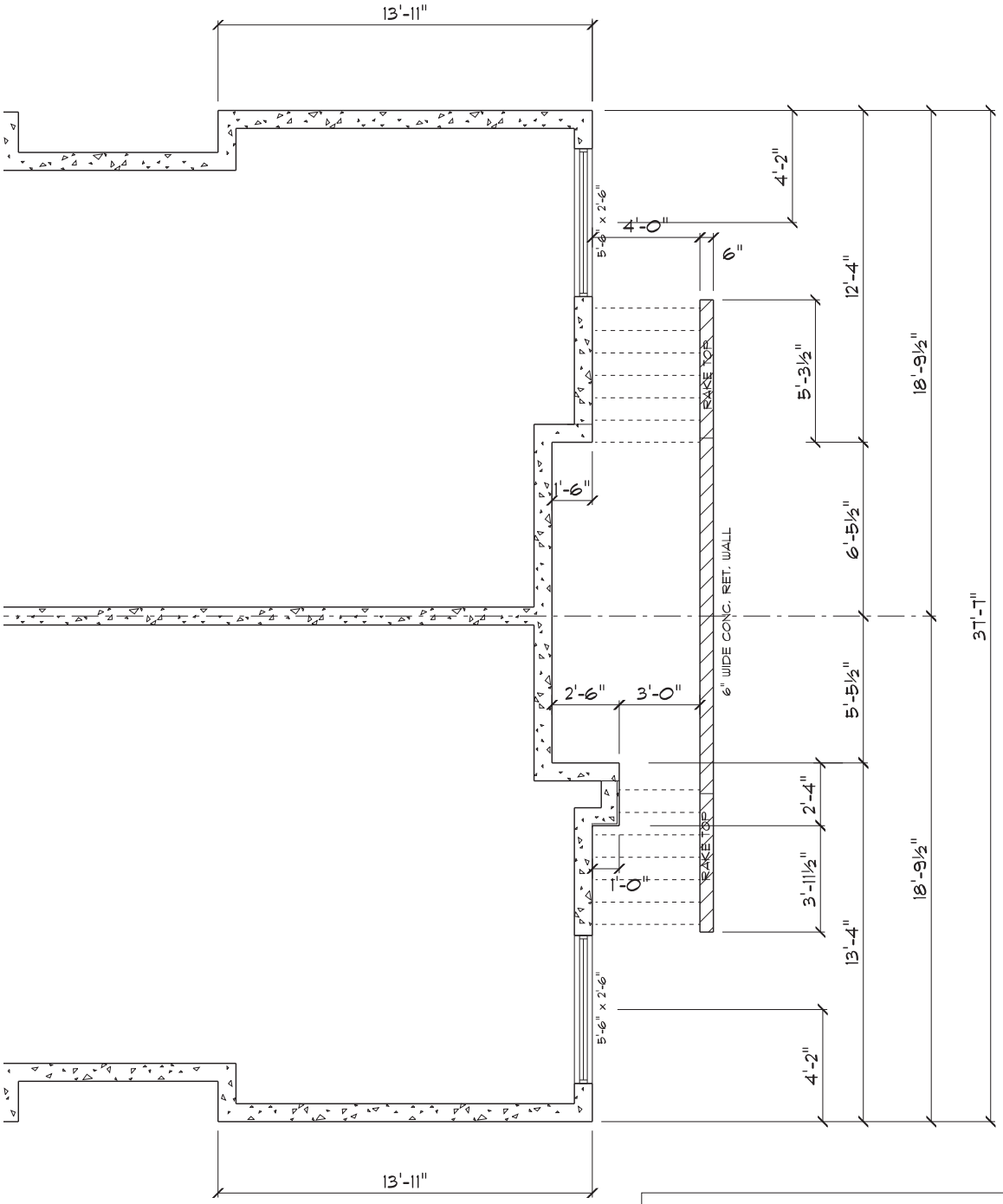
BLDG 'B'
996 SF (92.6m2)
498 SF (46.3m2)/UNIT

BLDG 'A'
996 SF (92.6m2)
498 SF (46.3m2)/UNIT

'Rose Avenue Project'
815 ROSE AVE, KELOWNA, BC

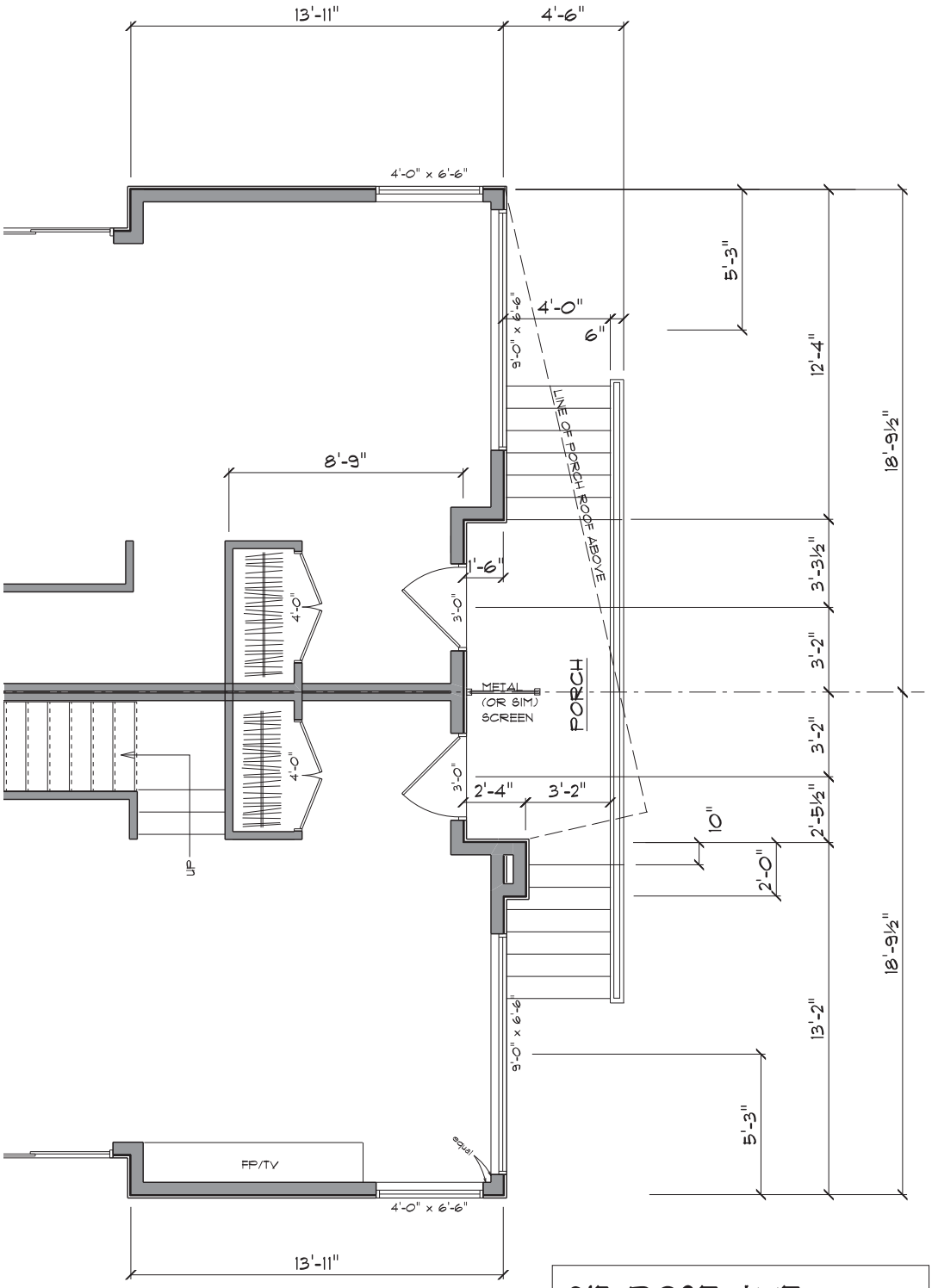
TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: MAY 1/17
UPPER FLOOR PLAN
SHEET NO. A4



815 ROSE AVE. ALTERNATE FACADE FOUNDATION PLAN

(MAR. 22, 2017) 1/4" = 1'0" ON 11X17



815 ROSE AVE. ALTERNATE FACADE MAIN FLOOR PLAN

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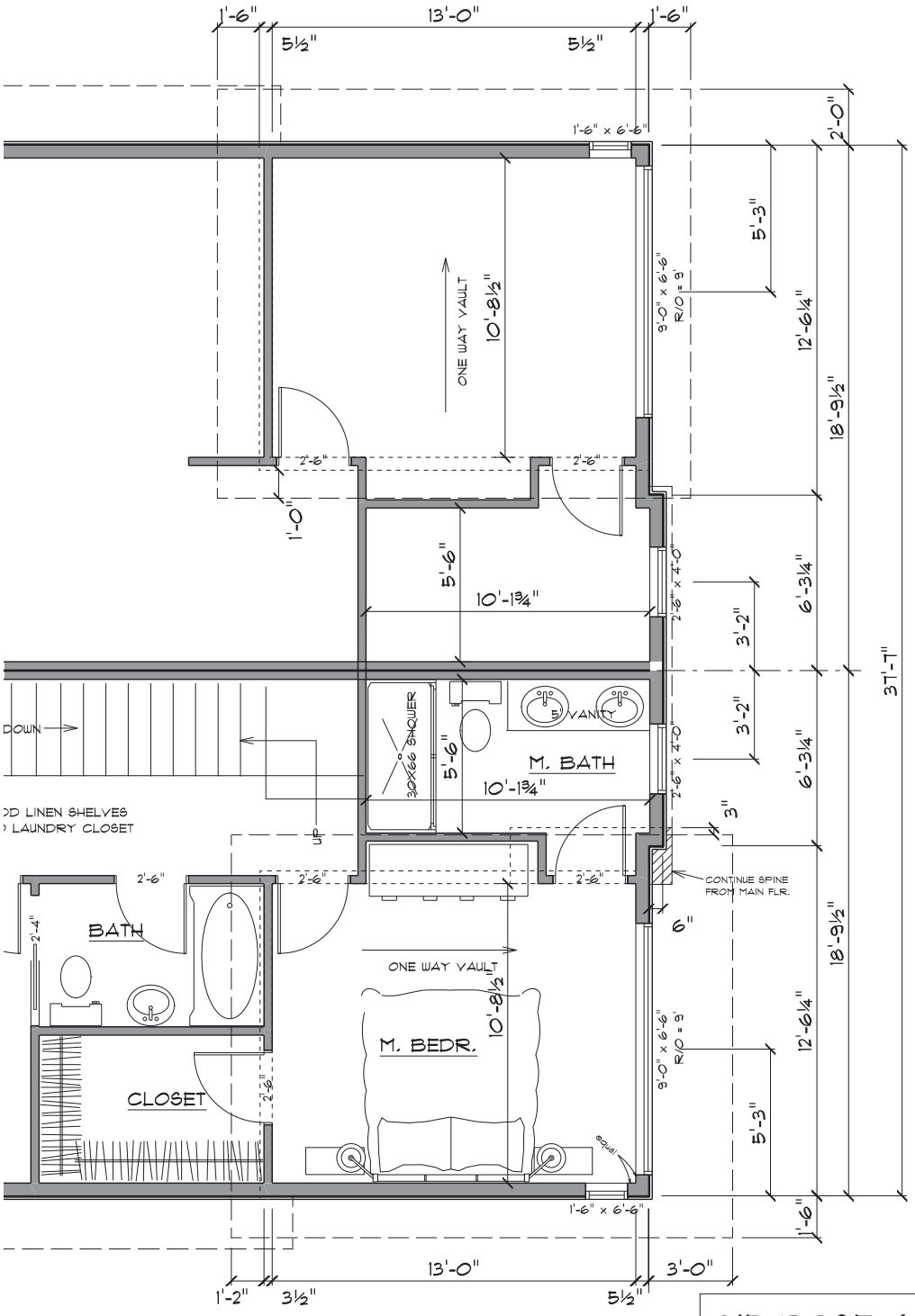
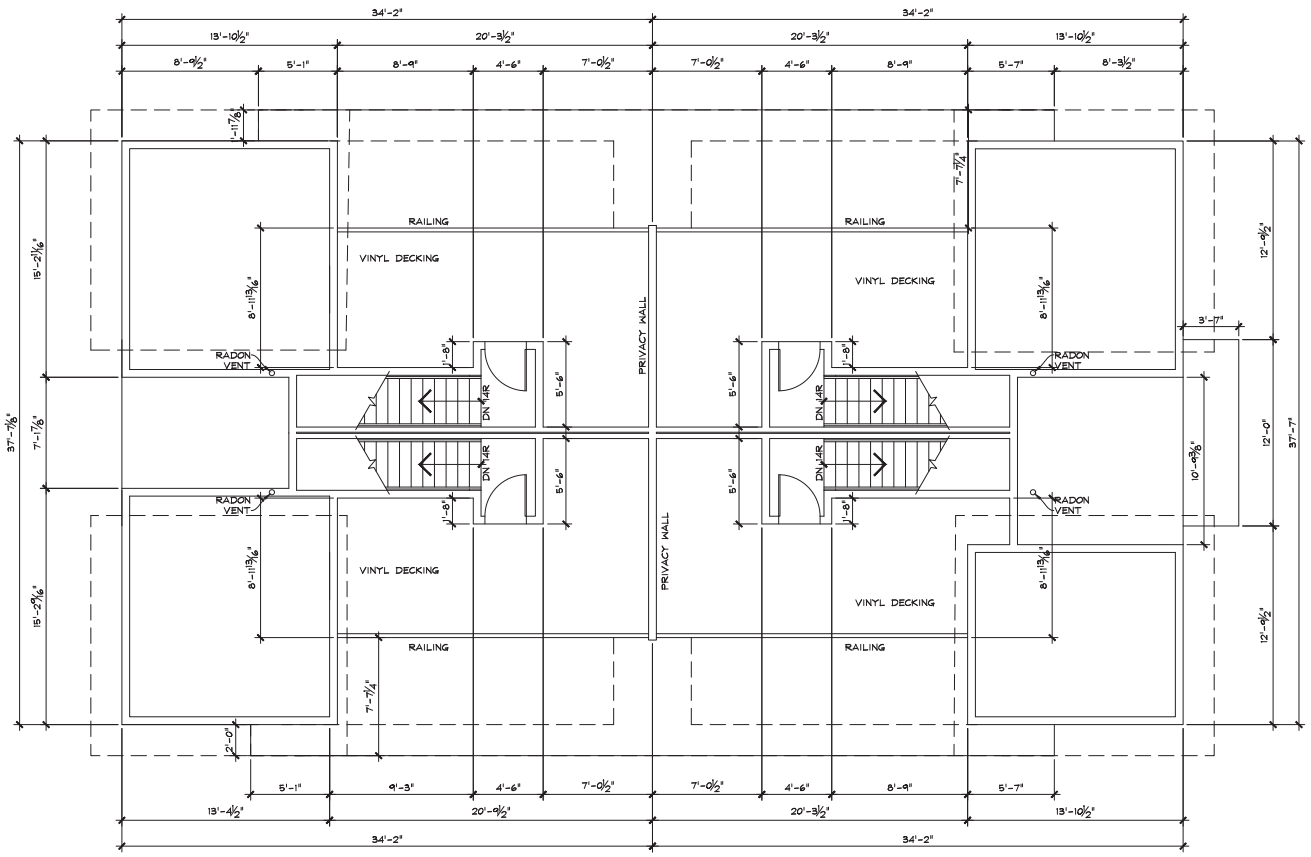


815 ROSE AVE.
ALTERNATE FACADE
SECOND FLOOR PLAN

(MAR. 22, 2017) 1/4" = 1'0" ON 11X17

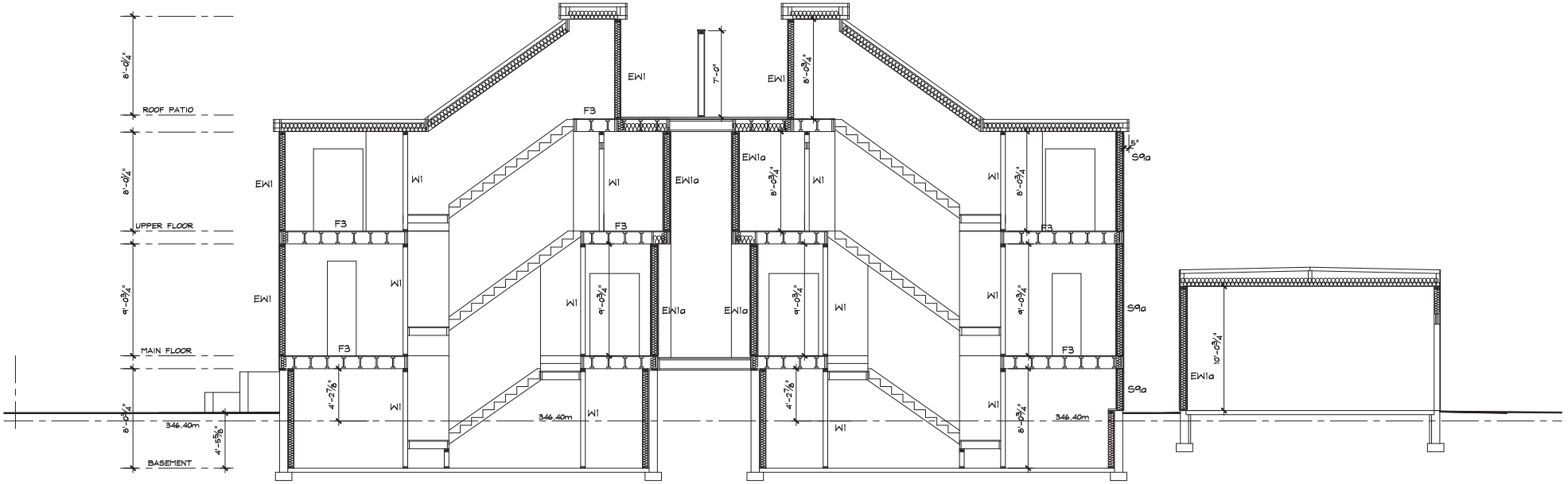


ROOF PATIO
213 SF(19.87 m2)/UNIT

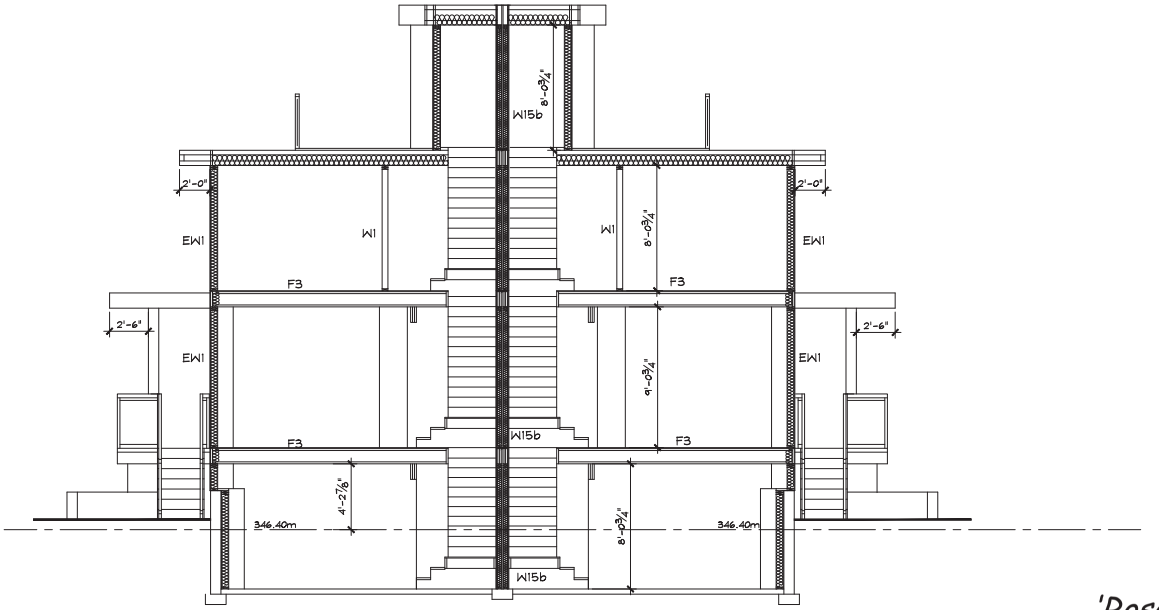
'Rose Avenue Project'
815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: MAY 1/17
ROOF PLAN
SHEET NO. A5



SECTION 'A-A'



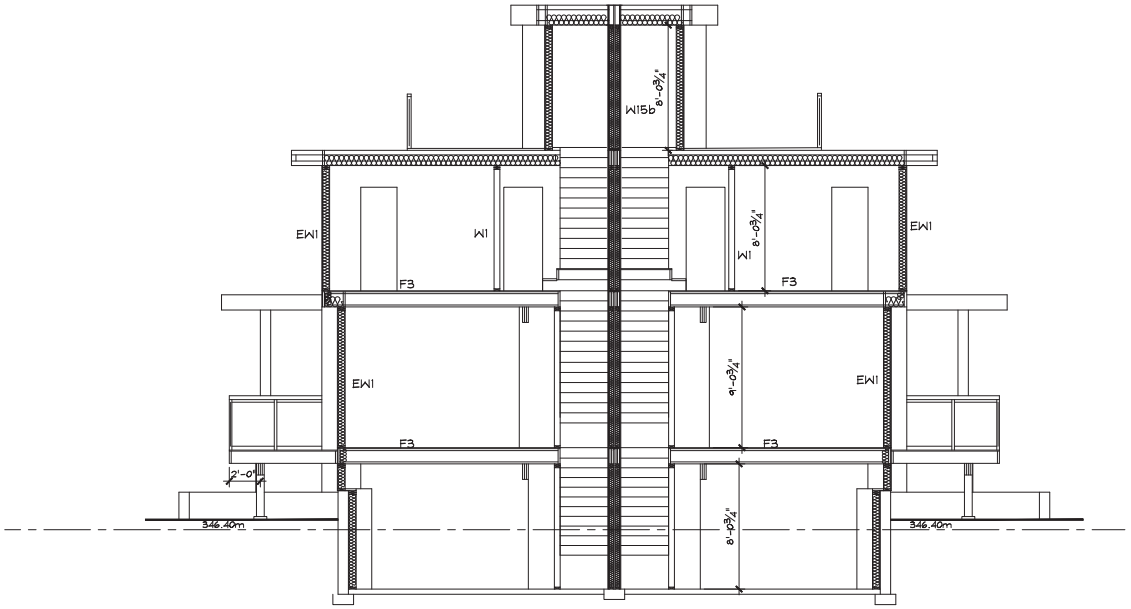
SECTION 'B-B'

'Rose Avenue Project'

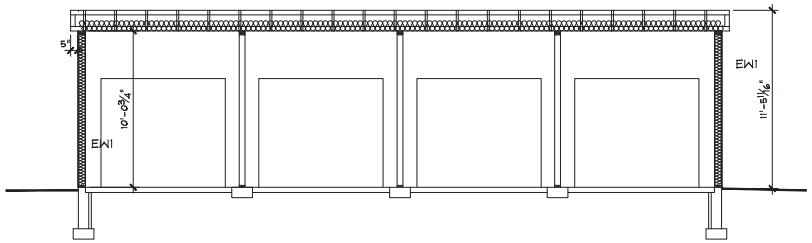
815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: MAY 1/17
SECTIONS
SHEET NO. A8



SECTION 'C-C'



SECTION 'D-D'

WALL TYPES

W1
38 MM X 89 MM STUDS SPACED 400 MM OR 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL
1 LAYER OF GYPSUM BOARD ON EACH SIDE

W15
TWO ROWS 38 MM X 89 MM STUDS, EACH SPACED 400 MM
OR 600 MM O.C. ON SEPARATE 38 MM X 89 MM PLATES
SET 25 MM APART
WITH OR WITHOUT ABSORPTIVE MATERIAL
2 LAYERS OF GYPSUM BOARD ON EACH SIDE

W15b
W15 WITH
89 MM THICK ABSORPTIVE MATERIAL ON EACH SIDE
12.7 MM TYPE X GYPSUM BOARD 1 H

EW1
38 MM X 140 MM STUDS SPACED 400 MM OR 600 MM O.C.
89 MM THICK ABSORPTIVE MATERIAL
1 LAYER OF 13 MM GYPSUM BOARD ON INSIDE
EXTERIOR SHEATHING AND SIDING

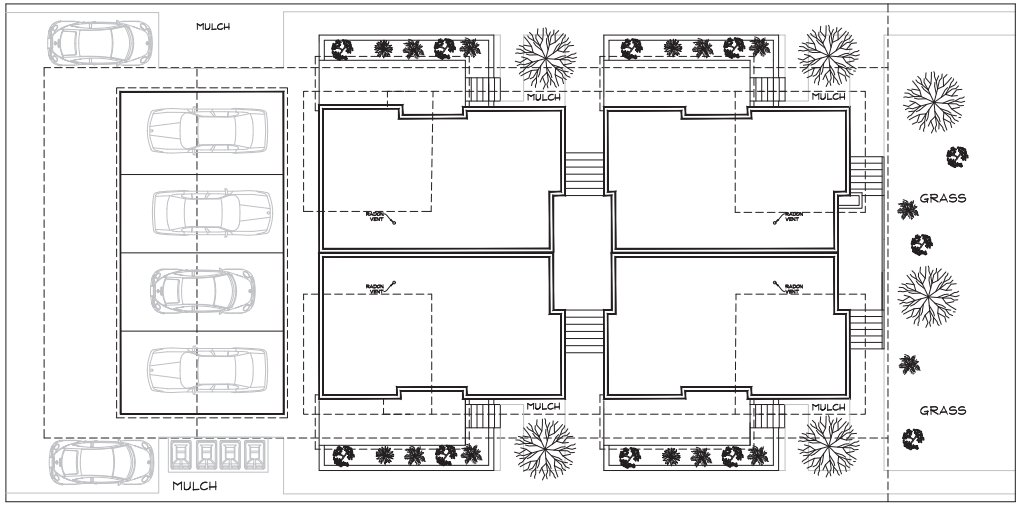
F3
SUBFLOOR OF 15.5 MM PLYWOOD, OSB OR WAFERBOARD,
OR 17MM TONGUE AND GROOVE LUMBER
ON WOOD JOISTS CHANGE BEGINOR WOOD I-JOISTS CHANGE
END SPACED NOT MORE THAN 600 MM O.C.
WITH OR WITHOUT ABSORPTIVE MATERIAL IN CAVITY
1 LAYER OF GYPSUM BOARD ON CEILING SIDE

S9a
91 MM x 152 MM STEEL STUDS SPACED 400 MM OR 600 MM O.C.

'Rose Avenue Project'
815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/4"=1'-0"
DATE: MAY 1/17
SECTIONS
SHEET NO. A9



MAPLE

JAPANESE MAPLE

NINE BARK

BARBERRY

SMALL PLANTS AND FLOWERS
WILL BE ADDED TO PLANTING BEDS

LOT INFORMATION

ZONING RU6	PROPOSED RM1
LEGAL DESCR.	LOT 2 DL136 PLAN 8116
CIVIC ADDRESS	815 ROSE AVE.

'Rose Avenue Project'

815 ROSE AVE, KELOWNA, BC

TGM
Drafting & Design
Tom Masters
Kelowna, BC (250)317-2446
kelowna635@gmail.com

SCALE: 1/8"=1'-0"

DATE: MAY 1/17

LANDSCAPE PLAN

SHEET NO. L1

REPORT TO COUNCIL

Date:	June 13, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (EW,TH)		
Application:	Z16-0070	**Owner:**	Brent Hancock & Whitney Smith
Address:	614 Barnaby Road	**Applicant:**	Whitney Smith
Subject:	Rezoning Application		
Existing OCP Designation:	S2RES – Single/Two Unit Residential		
Existing Zone:	RR1 – Rural Residential 1		
Proposed Zone:	RR1c – Rural Residential 1 with Carriage House		

1.0 Recommendation

That Rezoning Application No. Z16-0070 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 2, District Lot 357, SDYS, Plan 17353 located at 614 Barnaby Road Kelowna, BC from the RR1 – Rural Residential 1 zone to the RR1c – Rural Residential 1 with Carriage House zone be considered by Council;

AND THAT The Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT Final Adoption of the Rezoning Bylaw be considered subsequent the applicant required to post with the City a security deposit in the form of a Letter of Credit in the amount of $20,000.00 to be returned to the applicant upon completion of a Development Variance Permit and completion of a Building Permit to legally convert the existing accessory structure to a Carriage House as proposed.

2.0 Purpose

To rezone the subject property from the RR1 – Rural Residential 1 zone to the RR1c – Rural Residential 1 with Carriage House.

3.0 Community Planning

Community Planning are in support of the proposed application to rezone the subject parcel to permit a carriage house. The subject parcel is within the Permanent Growth Boundary. The proposed carriage house location does not impede on neighbouring private open space and the subject parcel is connected to City

sanitary services. The applicant has also agreed to a $20,000 security bond to ensure that the required permits are completed that would legalize the existing structure as a carriage house.

4.0 Proposal

4.1 Background

Map 1: Subject Property

The 1.86-acre property contains one single family dwelling, renovated in June 2014. An accessory building was constructed near the front property line in December 2012. The accessory structure was constructed with permits and met the zoning bylaw of the day.

An illegal suite investigation was conducted in early 2016 which determined that illegal construction to convert the accessory building to a carriage house had taken place by the current owners. The owners completed a decommission permit to remove all unpermitted works and the structure is currently vacant. The owners are now coming forward to Council with a Rezoning Application. Should the rezoning application be successful, a Development Variance Permit will be considered by Council, followed by a Building Permit to legalize the carriage house.

4.2 Project Description

The application is to rezone the subject parcel to add a "c" designation to the existing zone to permit a carriage house. The structure for the proposed carriage house exists on the property. The first floor consists of a double vehicle garage, with a stairwell that leads to an upper floor. The upper floor is the space proposed for the carriage house living area. The owners are proposing internal renovations to the second floor only in order to create the secondary suite within the accessory structure.

4.3 Variances

The conversion from an accessory structure to a carriage house will require three variances to Zoning Bylaw No. 8000, RR1c Zone:

Variance 1: 9.5b.1c *The principal dwelling unit shall be located between the front yard and the carriage house.* As the location of the principal dwelling and carriage house do not conform to this regulation, the first variance is triggered.

Variance 2: 9.5b.1e *The upper floor area of any carriage house is limited to 75% of the carriage house footprint. A*s the footprint of the proposed carriage house structure measures 100 m^2, and the upper floor area measures 106 m^2, the second variance is triggered.

Variance 3: 12.1.6 a *The maximum floor area of a carriage house shall be 90 m2 or 75% of the total floor area of the principal building*. As the floor area of the proposed carriage house is 106 m^2, the third variance is triggered. These variances would be presented to Council in a Development Variance Permit should this Rezoning application receive final adoption.

4.4 Security Bond

A condition of final adoption of the proposed RR1c zone includes a security bond in the amount of $20,000.00. The purpose of the security is to ensure that the appropriate permits are completed should the parcel receive final adoption of the RR1c zone. The appropriate permits include:

- A Development Variance Permit for the three identified variances.
- Obtaining Final Occupancy for the carriage house through a Building Permit.

This is a requirement of final adoption of the RR1c zone as the above noted permits may only be applied for once rezoning is complete. If the permits are not completed, the accessory structure may be misrepresented as a legal carriage house to future owners and existing neighbours. When legalizing existing structures, a security bond allows Council and Staff to be confident that an owner will follow through with any required permits or applications to complete a legalization process.

4.5 Site Context

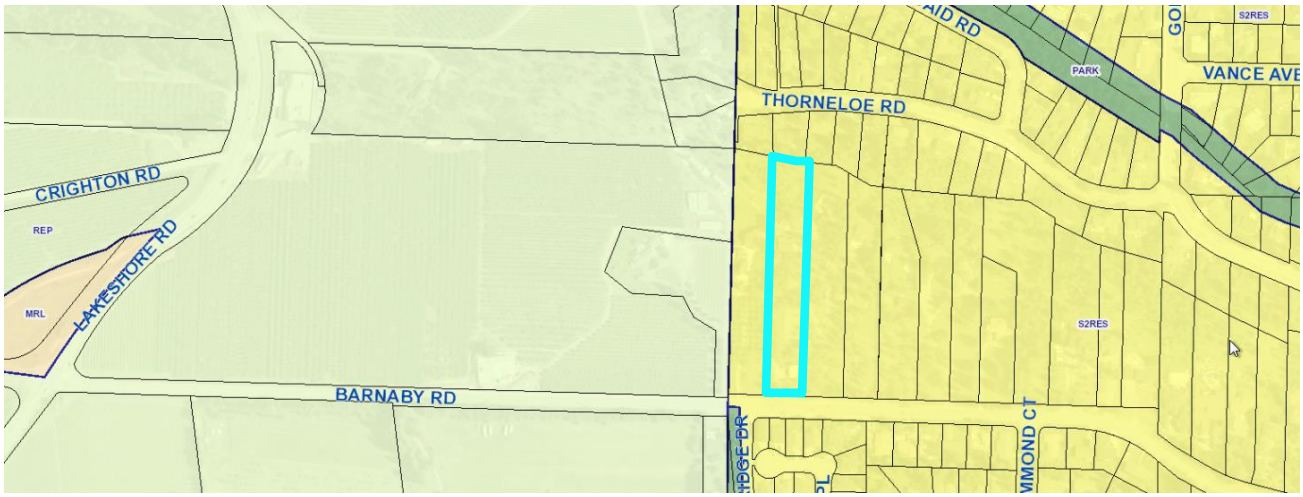
The subject property is located within the Southwest Mission Sector of the City on the north side of Barnaby Road between South Ridge Drive and Drummond Court. The subject parcel and adjacent parcels on adjacent sides have a Future Land Use designation of Single / Two Unit Residential. This property contains easement where an existing sanitary sewer main is located, and has a water service that connects to a City water main within Barnaby Road.

Adjacent land uses are as follows:

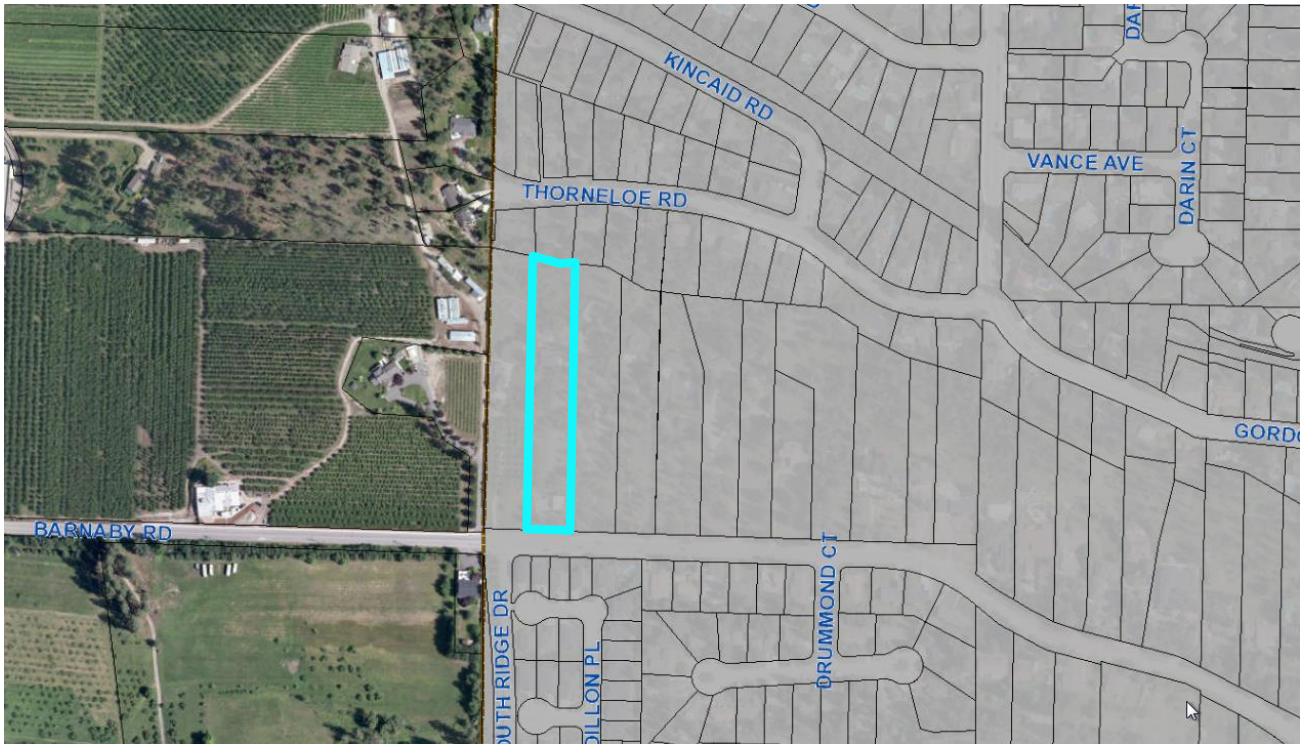
Orientation	Zoning	Land Use
North	RU1 – Urban Residential 1 zone	Residential
East	RR1 – Rural Residential 1 zone	Residential
South	RU2 - Urban Residential 2 zone	Residential
West	RR1 – Rural Residential 1 zone	Residential with agriculture

Map 2: Neighbourhood Context

Map 3: Future Land Use



Map 4: Permanent Growth Boundary



4.6 Zoning Analysis Table

This table illustrates where the proposed carriage house meets and does not meet the RR1c zoning regulations.

Zoning Analysis Table		
CRITERIA	**RR1c ZONE REQUIREMENTS**	**PROPOSAL**
Subdivision Regulations		
Lot Area	10,000 m^2 or 8000^2 m if connected to City sanitary sewer system	7527.42 m^2 & connected to City Sanitary
Lot Width	40 m	34 m
Lot Depth	30 m	220 m
Carriage House Development Regulations		
Maximum Site Coverage of all structures	10%	4.0%
Site coverage for accessory buildings or structures and carriage house	14%	1.5%
Max. Height (mid-point of roof)	6.0 m	5.48 m
Min. Front Yard Setback (to Barnaby Road)	6.0 m	18 m
Min. Sideyard Setback	3.0 m	3.0 m
Min. Sideyard Setback	3.0 m	> 3.0 m
Maximum floor area of carriage house	90 m^2 or 75% of the main floor of the accessory building	106 m^2 ❶
Maximum upper floor area of carriage house	75% of carriage house footprint	106% of carriage house footprint ❷
Minimum distance to principal building	3 m	+/-120 m
Location of carriage house	The principal dwelling shall be located between the front yard and the carriage house	The carriage house is located between the front yard and the principal dwelling ❸

❶ Indicates a requested variance for a carriage house living area more than 90 m^2 in size.
❷ Indicates a requested variance for a carriage house with the upper floor greater than 75% of the carriage house structure footprint.
❸ Indicates a requested variance for a carriage house to be located between the front property line and the principal dwelling.

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Future Land Use

Single/Two Unit Residential (S2RES).[1] Single detached homes for occupancy by one family, single detached homes with a secondary suite or carriage house, semi-detached buildings used for two dwelling units, modular homes, bareland strata, and those complementary uses (i.e. minor care centres, minor public services/utilities, convenience facility and neighbourhood parks), which are integral components of urban neighbourhoods.

Staff Notes: The subject parcel is S2RES with connections to city water and sanitary, the large lot size easily accommodates a secondary dwelling in the form of a carriage house.

Permanent Growth Boundary (PGB) [2] Lands within the permanent growth boundary may be considered for urban uses within the 20 year planning horizon ending 2030.. Lands outside the permanent growth boundary will not be supported for urban uses. Non-ALR land outside the Permanent Growth Boundary will not be supported for any further parcelization.

Staff Notes: The subject parcel is within the PGB. As the site is fully serviced and does not interfere with the private open space of neighbouring Rural Residential parcels, staff consider the c designation appropriate.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permits.
- The drawings submitted for Building Permit application is to indicate the method of fire separation between the suite and the garage.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications.

6.2 Development Engineering

- See memorandum (Attachment B).

[1] City of Kelowna Official Community Plan, Designation definitions (Future Land Use Chapter).
[2] City of Kelowna Official Community Plan, Designation definitions (Future Land Use Chapter).

7.0 Application Chronology

Date of Application Received: October 7, 2016
Date Public Consultation Completed: February 26, 2017

Report prepared by: Tracey Hillis & Emily Williamson, Planners

Reviewed by: Terry Barton, Urban Planning Manager

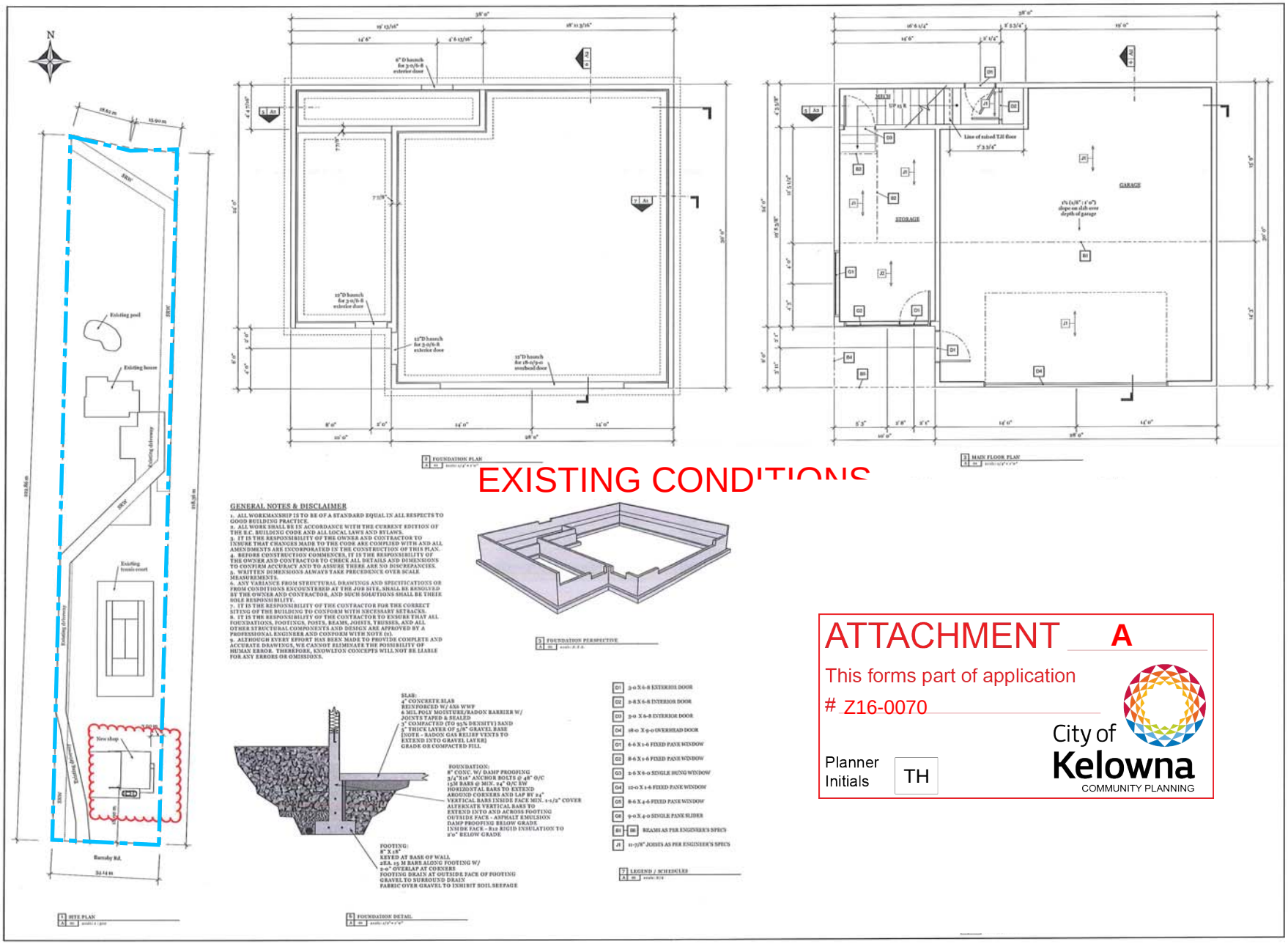
Reviewed by: Ryan Smith, Community Planning Department Manager

Approved for Inclusion: Doug Gilchrist, Divisional Director, Community Planning & Real Estate

Attachment A – Proposed Carriage House Plans

Attachment B – Development Engineering Memo


ATTACHMENT A
This forms part of application
Z16-0070
City of Kelowna
COMMUNITY PLANNING
Planner Initials TH
EXISTING CONDITIONS
Knowlton concepts Inc.
Architectural Drafting & Design
Phone: (250) 575 - 0128
www.knowltonconcepts.com
HANCOCK DETACHED GARAGE
614 Barnaby Rd. Kelowna, BC
Lot 2, Plan 17353, Sec 30, TWP 29
ELEVATIONS & SECTIONS
A
02


EXISTING CONDITIONS
GENERAL NOTES & DISCLAIMER
ATTACHMENT A
This forms part of application
Z16-0070
Planner Initials TH
City of Kelowna
COMMUNITY PLANNING
Knowlton concepts Inc.
Architectural Drafting & Design
Phone: (250) 575 - 0128
HANCOCK DETACHED GARAGE
614 Barnaby Rd. Kelowna, BC
Lot 2, Plan 17333, Sec 30, TWP 29
PLANS
A
01

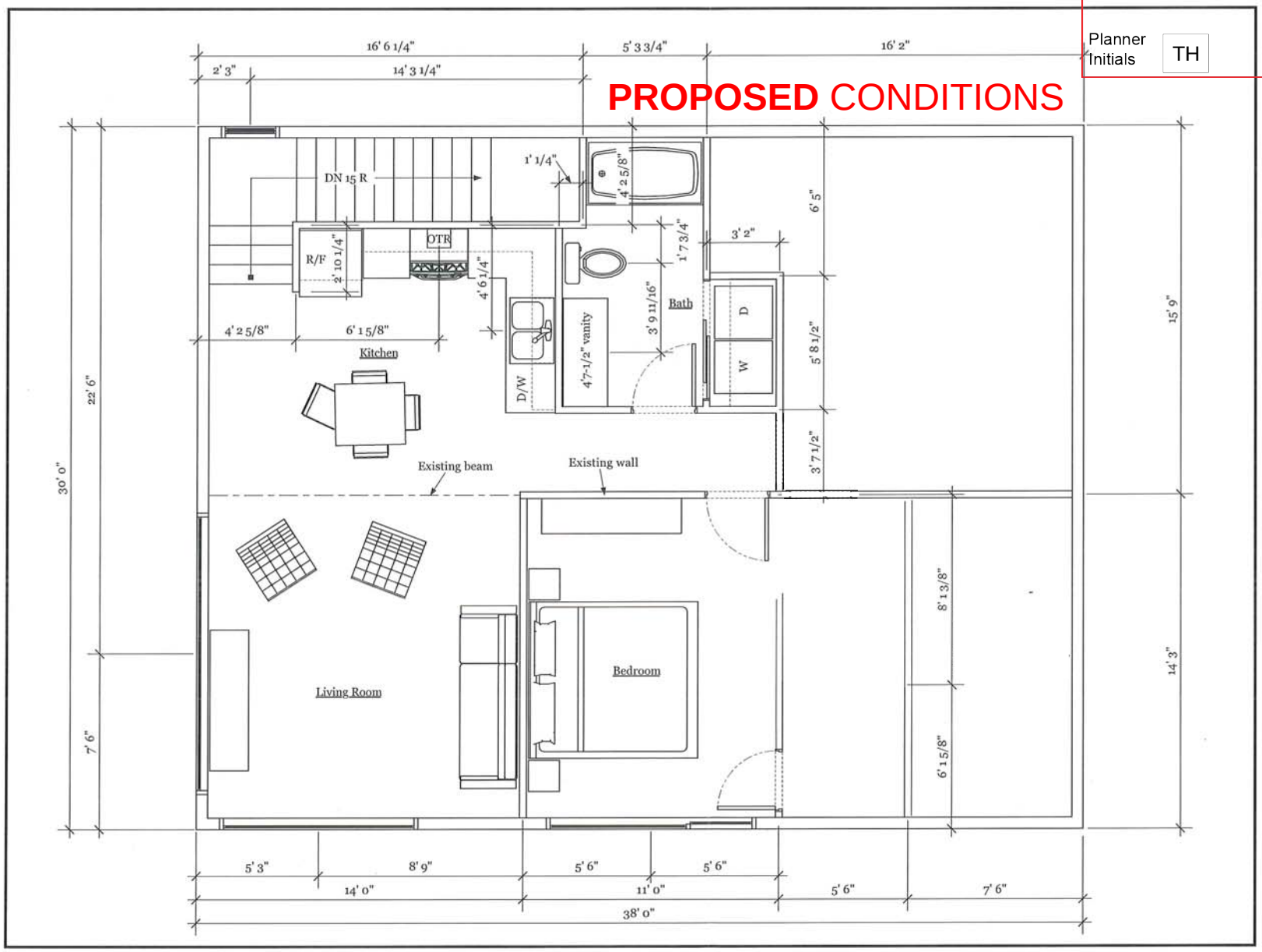
ATTACHMENT A

This forms part of application

Z16-0070

Planner Initials TH

City of Kelowna COMMUNITY PLANNING



Knowlton concepts

Architectural Drafting & Design

Phone: (250) 575 - 0128
www.knowltonconcepts.com

HANCOCK DETACHED GARAGE

614 Barnaby Rd.
Kelowna, BC
Lot 2, Plan 17353, Sec 30, TWP 29

(FUTURE)

UPPER FLOOR PLAN

scale: 1/4" = 1'0"

X	01

CITY OF KELOWNA

MEMORANDUM

Date: November 24, 2016
File No.: Z16-0070

To: Land Use Management Department (TH)

From: Development Engineering Manager

Subject: 914 Barnaby Road Lot 2 Plan 17353 Carriage House RU1c

Development Engineering has the following requirements associated with this application.

1. Domestic Water

   This property is currently serviced with a 19mm diameter Municipal Service that will service both the existing dwelling and proposed carriage house

2. Sanitary Sewer

   This property is currently serviced with a 100mm diameter Municipal Service complete with inspection chamber that will service both the existing dwelling and proposed carriage house

3. Electric Power and Telecommunication Services

   It is the applicant's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for service upgrades to these services which would be at the applicant's cost.

ATTACHMENT B
This forms part of application
Z16-0070
Planner Initials EW
City of Kelowna
COMMUNITY PLANNING

Steve Muenz, P. Eng.
Development Engineering Manager
JF/jf

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (MS)		
Application:	OCP16-0005 / Z16-0078	**Owners:**	Emil Anderson Construction Inc. 0935343 BC Ltd. (Tower Ranch Golf & Country Club)
Address:	1700 Tower Ranch Blvd and 1638 Tower Ranch Blvd	**Applicant:**	Greg Asling
Subject:	Official Community Plan Amendment and Rezoning Application		

Existing OCP Designation:	S2RES – Single / Two Unit Residential S2RESH – Single / Two Unit Residential – Hillside PARK – Major Park and Open Space (public) REC – Private Recreation
Proposed OCP Designation:	S2RES – Single / Two Unit Residential S2RESH – Single / Two Unit Residential – Hillside PARK – Major Park / Open Space (public) REC – Private Recreation
Existing Zone:	RU1h – Large Lot Housing (Hillside Area) RU2 – Medium Lot Housing RU2h – Medium Lot Housing (Hillside Area) RU4 – Low Density Cluster Housing RU6 – Two Dwelling Housing P3 – Parks and Open Space
Proposed Zone:	RU2h - Medium Lot Housing (Hillside Area) RU4h – Low Density Cluster Housing (Hillside Area) RU6 – Two Dwelling Housing P3 – Parks and Open Space

1.0 Recommendation

THAT Official Community Plan Map Amendment Application No. OCP16-0005 to amend Map 4.1 in the Kelowna 2030 – Official Community Plan Bylaw No. 10500 by changing the Future Land Use designation of *Lot 2 Section 31 TWP 27 ODYD Plan KAP80993*, located at 1700 Tower Ranch Boulevard, from the future land use designations identified in the OCP for the property (REC – Private Recreation, S2RES – Single/Two Unit Residential, S2RESH – Single/Two Unit Residential Hillside and PARK – Parks and Open Space) to the future land use designations (PARK – Parks and Open Space, S2RES – Single/Two Unit Residential and

S2RESH – Single/Two Unit Residential (Hillside)) as shown on Map "A" attached to the Report from the Community Planning Department dated May 29, 2017 , be considered by Council;

AND THAT Official Community Plan Map Amendment Application No. OCP16-0005 to amend Map 4.1 in the Kelowna 2030 – Official Community Plan Bylaw No. 10500 by changing the Future Land Use designation of portions of *Lot 1 Section 31 TWP 27 ODYD Plan DAP80993,* located at 1638 Tower Ranch Blvd, Kelowna, BC from S2RESH – Single/Two Unit Residential (Hillside) to REC – Private Recreation as shown on Map "A" attached to the Report from the Community Planning Department dated May 29, 2017 , be considered by Council;

AND THAT the Official Community Plan Map Amending Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT Council considers the public process to be appropriate consultation for the *Purpose* of Section 879 of the *Local Government Act*, as outlined in the Report from the Community Planning Department dated May 29, 2017;

THAT Rezoning Application No. Z16-0078 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of *Lot 2 Section 31 TWP 27 ODYD Plan KAP80993*, located at 1700 Tower Ranch Boulevard, Kelowna, BC, from (P3 – Parks and Open Space, RU1h – Large Lot Housing (Hillside Area), RU6 – Two Dwelling Housing) to (P3 – Parks and Open Space, RU2h - Medium Lot Housing (Hillside Area) and RU6 – Two Dwelling Housing) as shown on Map "B" attached to the Report from the Community Planning Department dated May 29, 2017), be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the release of Restrictive Covenant CA440802 and CA4540803 (Zoning Covenant).

2.0 Purpose

Official Community Plan amendment and rezoning application to amend the future land use designations and rezone portions of the subject property to facilitate a single and two unit residential subdivision with park space for 1700 Tower Ranch Boulevard, and make the future land use designation consistent with existing golf course use at 1638 Tower Ranch Boulevard.

3.0 Community Planning

Community Planning supports the proposed OCP and zone amendments. Key components to the amendments are:

- Including the hillside designation to all of the residential area;
- Refinement of the location of the neighbourhood park and natural park areas; and
- Correction of the golf course and residential areas with respect to property lines.

Staff believe the proposed amendments better align this portion of the development with the City's Hillside Development policies and natural open space/park objectives.

4.0 Proposal

4.1 Background

At the time of the adoption current OCP (approved in May 2011), the subject properties were owned by a previous developer. The configuration of future land use designations was designed in accordance with the

previous concept plan. The amendment responds to the current concept plan as well as the finalized property line of the Tower Ranch Golf Course.

In 2011, 1700 Tower Ranch Boulevard was purchased by Emil Anderson Construction Inc. (Emil Anderson). Emil Anderson has an interest in amending the configuration of the future land uses to better suit their concept and target market. A development permit for the current configuration was issued in 2008, and the site has been pregraded in accordance with this development permit. In addition, the amendment corrects the finalized property lines and location of the Tower Ranch Golf Course and park space.

In 2008, a neighbourhood park was planned for the area. This plan refines the location of the proposed neighbourhood park. In addition to this park, the amendment refines an area of steep natural open space that will also be designated as park.

The Agricultural Land Commission (ALC) allowed the graduated release of Tower Ranch Golf Course associated residential development from the Agricultural Land Reserve (ALR) through a number of resolutions, the most recent of which was Resolution #498/2006.

4.2 Project Description

The amendment changes the single / two unit residential (S2RES) to single / two unit (S2RESH) residential hillside, so that the development can better respond to the hillside conditions of the site. The location of the open park space is refined, and a neighbourhood park is designated within the development to be held for future development.

The zoning designation of RU2h - Medium Lot Housing (Hillside Area) will be applied to the residential lots in the eastern and central portions of the property. The designation of RU6 – Two Dweling Units will be applied along the western property line, to facilitate duplex units.

In 2008, a neighbourhood park was planned for the area. This plan refines the location of the proposed neighbourhood park. Our Real Estate Service's Department has had preliminary discussions with the owner regarding transfer of the parkland, and the parties are currently negotiating for the acquisition of the future park via Development Cost Charges (DCC) credit's to be issued as part of the overall development. The park areas will correspond to the new property lines with a zoning of P3 – Parks and Open Space.

In addition, the amendment refines an area of steep open space that will also be designated as park. A walkway connection from Tower Ranch Boulevard to 'Road D' providing connectivity to the development for pedestrians (see attached Plan PLR-01).

The amendment also corrects the private recreation future land use designation to the current property line of Tower Ranch Golf Course.

Fencing and landscape buffering along the ALR will be required when the area adjacent to the ALR at the north is subdivided, in accordance with the ALC requirements.

A restrictive covenant, in favour of the City of Kelowna, is registered on 1700 Tower Ranch Drive, which specifies that the parcel should be built to a RU2 – Medium Lot Housing zone. Given that this amendment will specify the proposed zone for the property, the covenant will be redundant. Staff recommends that this covenant and associated priority charge be discharged from title prior to the adoption of this bylaw.

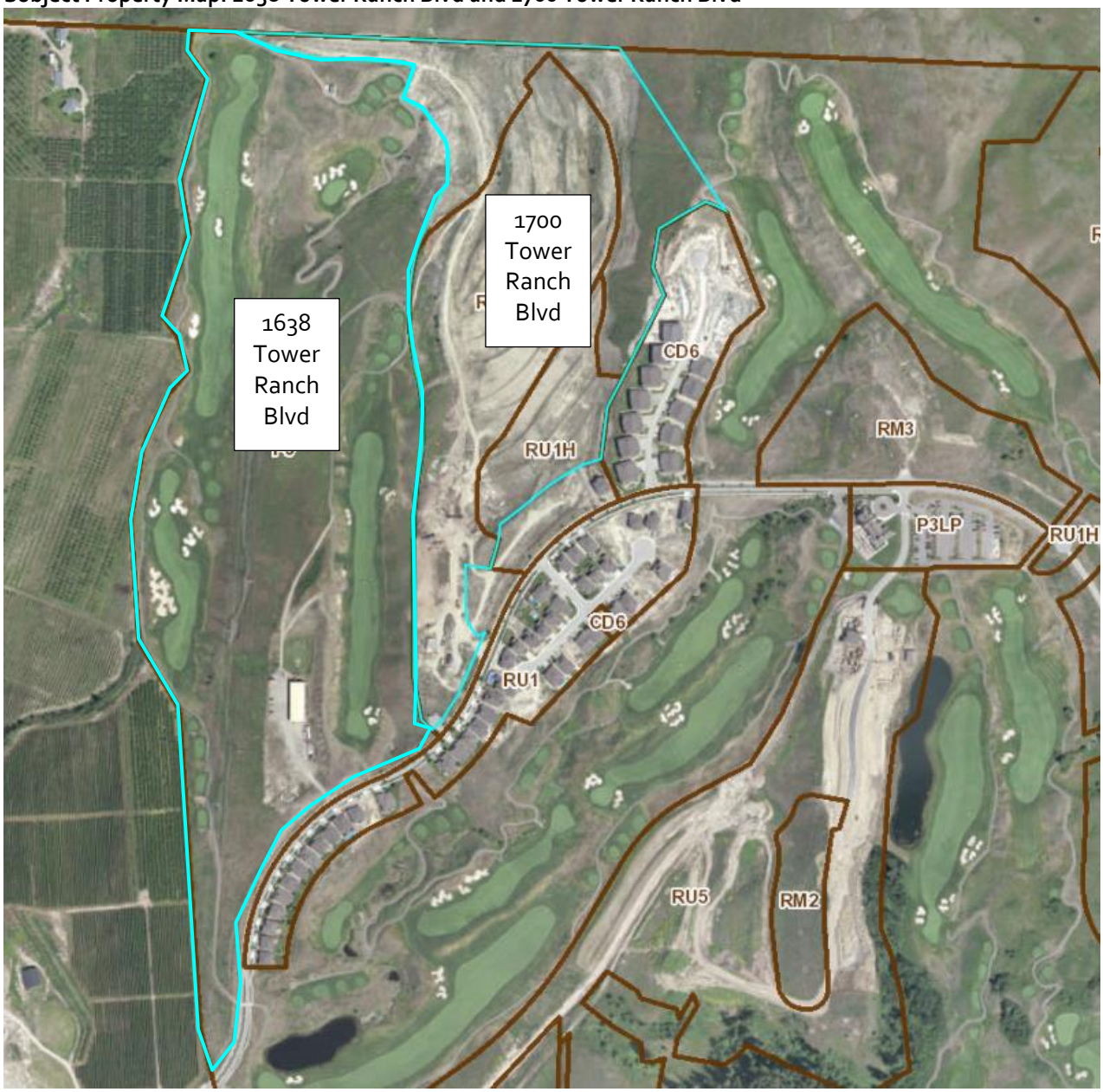
4.3 Site Context

The site is located on the upper McCurdy Bench in the Rutland Sector. Lands within the Agricultural Land Reserve (ALR) in the Regional District of the Central Okanagan (RDCO) lie to the north. The site is within the Tower Ranch Community Association Area.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	Agriculture 1 / ALR (RDCO)	Agriculture
East	P3 – Parks and Open Space / RU4 Cluster Housing(Hillside)	Golf Course / Residential
South	RU1 – Large Lot Housing	Residential
West	P3 – Parks and Open Space / A1 – Agriculture 1 (ALR)	Golf Course / Agriculture

Subject Property Map: 1638 Tower Ranch Blvd and 1700 Tower Ranch Blvd



5.0 Public Notification

Staff understands that the applicant has undertaken public notification in accordance with Council Policy #367. This included delivering a letter, including a map of the proposed OCP Amendments to neighbouring residents.

6.0 Current Development Policies

6.1 Kelowna Official Community Plan (OCP)

Development Process

Steep Slopes.[1] Prohibit development on steep slopes (+30% or greater for a minimum distance of 10 metres) except where provided for in ASPs adopted or subdivisions approved prior to adoption of OCP Bylaw 10500.

Design for People and Nature.[2] Structure new neighbourhoods around parks, pedestrian and bike routes, open spaces, and environmental areas, rather than around roadways and cars.

Develop parkland to respond to user needs.[3]Design parks to meet the needs of a variety of user groups, including families, youth, and seniors.

7.0 Technical Comments

7.1 Development Engineering Department

All offsite infrastructure and services upgrades are addressed in the Subdivision Application Engineering Report under file S16-0006.

7.2 Community Planning

The City has considered the City of Kelowna Financial Plan and the City of Kelowna Wastewater Management Plan as part of this amendment.

8.0 Application Chronology

Date of Complete Application Received:	August 9, 2016
Date Public Consultation Completed:	October 5, 2017
Date of Circulation Comments Received:	February 14, 2017

Report prepared by:

Melanie Steppuhn, Land Use Planner

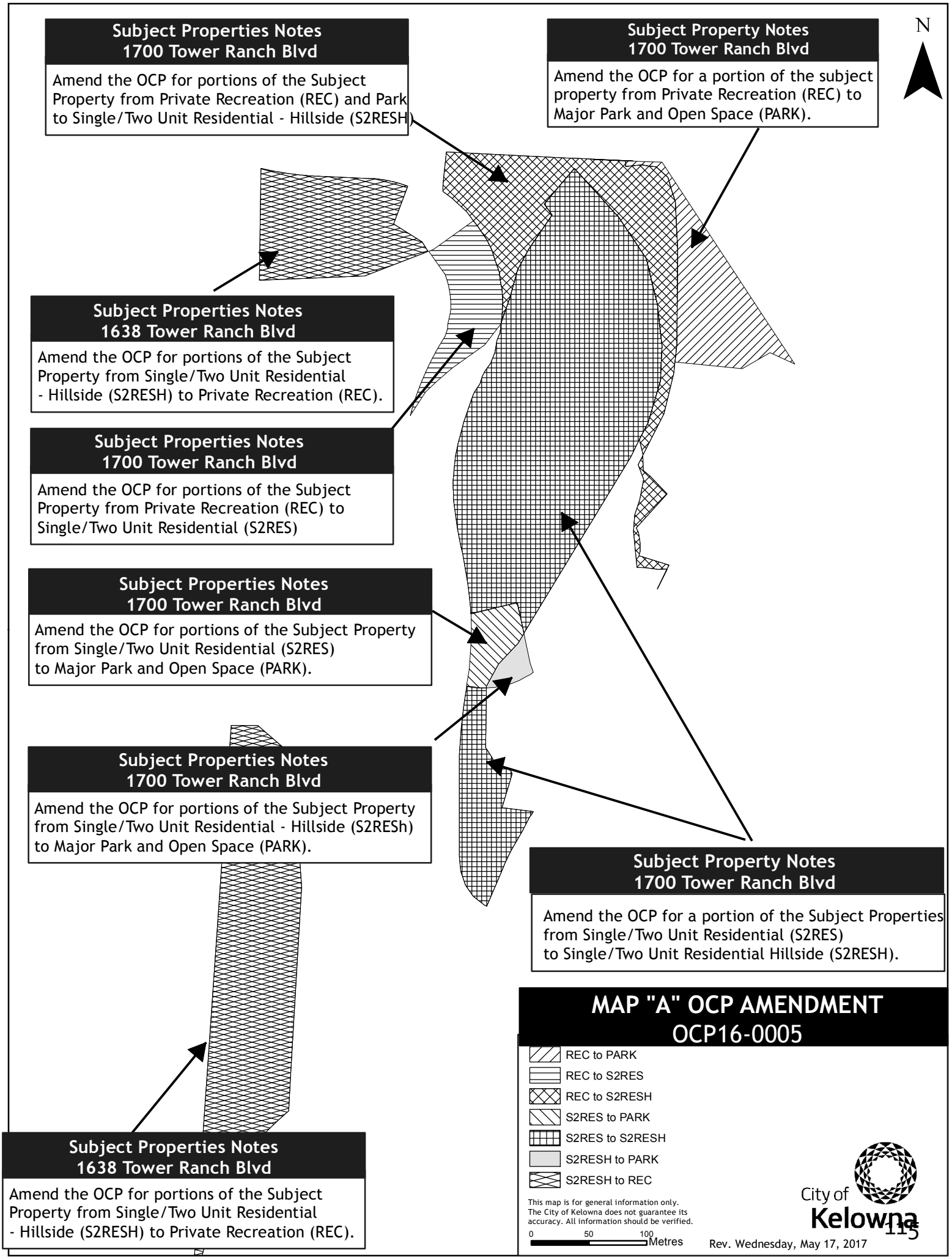
Reviewed by
Approved for Inclusion: ☐ Ryan Smith, Community Planning Department Manager

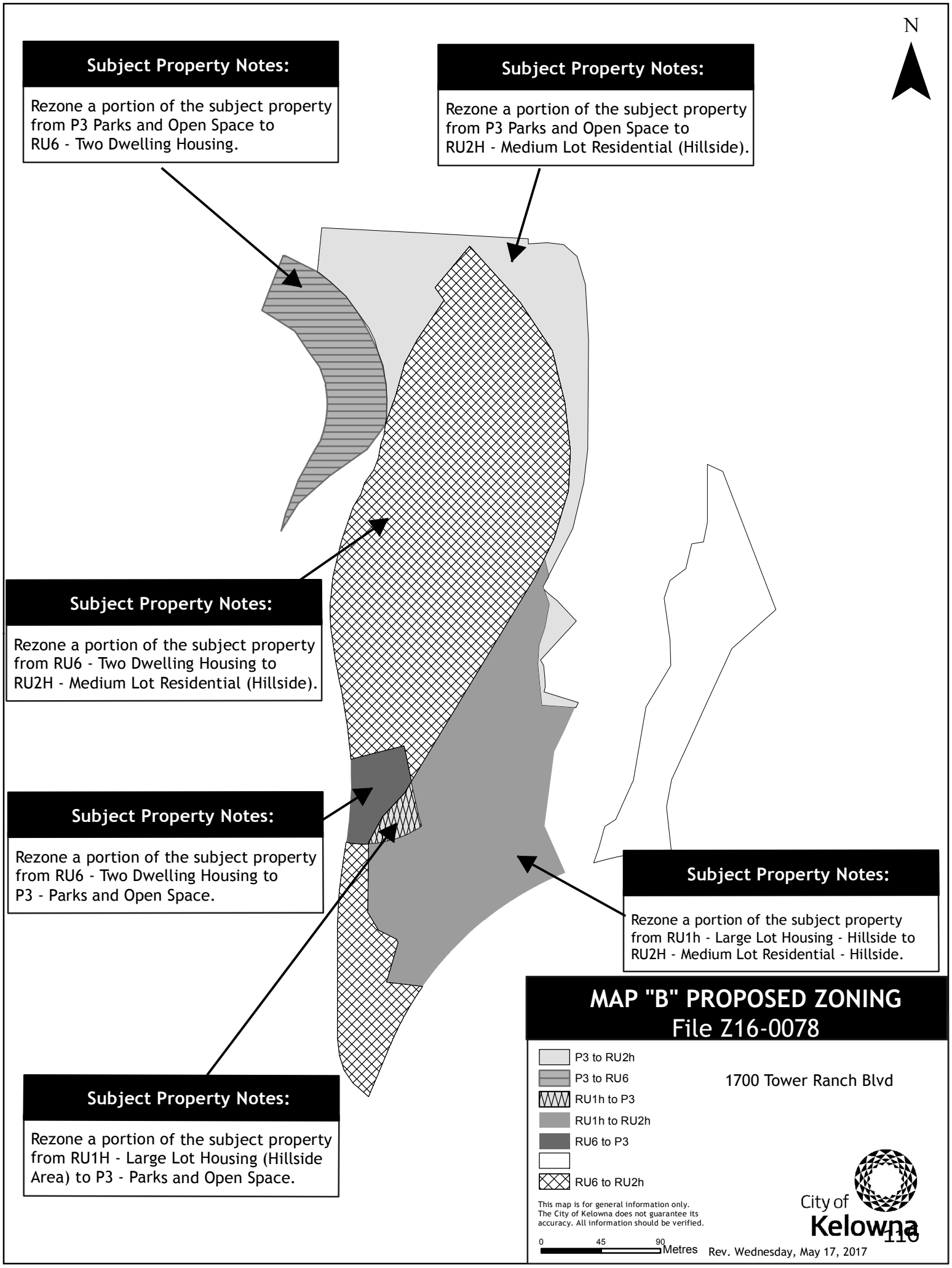
Approved for Inclusion: ☐ Doug Gilchrist, Divisional Director, Community Planning & Real Estate

Attachments:

Map A – OCP Amendment
Map B – Zoning Amendment
Subdivision Plan – 1700 Tower Ranch Boulevard

[1] City of Kelowna Official Community Plan, Policy 5.2.3 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.2.3 (Development Process Chapter).
[3] City of Kelowna Official Community Plan, Policy 7.16 (Infrastructure).


Subject Properties Notes
1700 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Private Recreation (REC) and Park to Single/Two Unit Residential - Hillside (S2RESH)
Subject Property Notes
1700 Tower Ranch Blvd
Amend the OCP for a portion of the subject property from Private Recreation (REC) to Major Park and Open Space (PARK).
N
Subject Properties Notes
1638 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Single/Two Unit Residential - Hillside (S2RESH) to Private Recreation (REC).
Subject Properties Notes
1700 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Private Recreation (REC) to Single/Two Unit Residential (S2RES)
Subject Properties Notes
1700 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Single/Two Unit Residential (S2RES) to Major Park and Open Space (PARK).
Subject Properties Notes
1700 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Single/Two Unit Residential - Hillside (S2RESh) to Major Park and Open Space (PARK).
Subject Property Notes
1700 Tower Ranch Blvd
Amend the OCP for a portion of the Subject Properties from Single/Two Unit Residential (S2RES) to Single/Two Unit Residential Hillside (S2RESH).
Subject Properties Notes
1638 Tower Ranch Blvd
Amend the OCP for portions of the Subject Property from Single/Two Unit Residential - Hillside (S2RESH) to Private Recreation (REC).
MAP "A" OCP AMENDMENT
OCP16-0005
REC to PARK
REC to S2RES
REC to S2RESH
S2RES to PARK
S2RES to S2RESH
S2RESH to PARK
S2RESH to REC
This map is for general information only. The City of Kelowna does not guarantee its accuracy. All information should be verified.
0 50 100 Metres
City of Kelowna
Rev. Wednesday, May 17, 2017


N
Subject Property Notes:
Rezone a portion of the subject property from P3 Parks and Open Space to RU6 - Two Dwelling Housing.
Subject Property Notes:
Rezone a portion of the subject property from P3 Parks and Open Space to RU2H - Medium Lot Residential (Hillside).
Subject Property Notes:
Rezone a portion of the subject property from RU6 - Two Dwelling Housing to RU2H - Medium Lot Residential (Hillside).
Subject Property Notes:
Rezone a portion of the subject property from RU6 - Two Dwelling Housing to P3 - Parks and Open Space.
Subject Property Notes:
Rezone a portion of the subject property from RU1h - Large Lot Housing - Hillside to RU2H - Medium Lot Residential - Hillside.
Subject Property Notes:
Rezone a portion of the subject property from RU1H - Large Lot Housing (Hillside Area) to P3 - Parks and Open Space.
MAP "B" PROPOSED ZONING
File Z16-0078
P3 to RU2h
P3 to RU6
RU1h to P3
RU1h to RU2h
RU6 to P3
RU6 to RU2h
1700 Tower Ranch Blvd
This map is for general information only. The City of Kelowna does not guarantee its accuracy. All information should be verified.
0
45
90
Metres
Rev. Wednesday, May 17, 2017
City of Kelowna

FUTURE LAND USE:
MAJOR PARK
SINGLE 2 UNIT RESIDENTIAL
PRIVATE RECREATION
SINGLE 2 UNIT RESIDENTIAL HILLSIDE
BORDER

LEGAL DESCRIPTION:
PROPOSED SUBDIVISION OF LOT 2, PLAN 80933, O.D.Y.D

PHASE 7 AREA: 30514m² (3.05 HECTARES)

LOCATION PLAN
SCALE 1: 20000

PRELIMINARY LAYOUT REVIEW

PRIVATE RECREATION
MAJOR PARK
SINGLE 2 UNIT RESIDENTIAL HILLSIDE
REM SINGLE FAMILY LOTS
DUPLEX LOTS
PRIVATE RECREATION
SINGLE 2 UNIT RESIDENTIAL HILLSIDE
PARK 2170m2
PH7
LOT 2 PLAN 80993
PLAN EPS1457
EPP50442

LANE 1
LANE 2
ROAD B
ROAD C
ROAD D SS-H12 (14.1m)
SS-H9 (15.1m) (PARKING BOTH SIDES)
SS-R5 (20.0m)
TOWER RANCH BLVD

3.00 ALR SETBACK

PROPOSED LIFT STATION

L:\General Data\Projects\06049-40 - Tower Ranch - Phase 3\4-CAD\ESIGN-SET\PLR\06049-40-PLR-01.dwg April 13, 2016 Jarvis Ronacher

No.	YY.MM.DD	By	Issued	Chkd
1	16.01.14	DC	PRELIMINARY LAYOUT REVIEW	ST
2	16.04.13	JR	ADJUSTED ROAD WIDTHS	ST
1	16.03.30	LT	ADJUSTED TO FUTURE LAND USE LINES	DC

Revision

D.D. CULLEN — PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — April 13 2016

CTQ PHONE: 250-979-1221

CITY FILE # 06049-40

Drawn JR
Design JR
Approved
Date JANUARY 2016
Scale 1:1500

THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

TOWER RANCH DEVELOPMENT
DILWORTH BLOCK PHASE 7
PRELIMINARY LAYOUT REVIEW

Division: MUNICIPAL
Drawing No.: PLR-01
Rev No.: 2

REPORT TO COUNCIL

Date:	June 12, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (TB)		
Application:	Z17-0008	**Owner:**	Bruno Joseph Guy Cloutier Christine Marie Cloutier
Address:	1420 Inkar Road	**Applicant:**	1017846 BC Ltd
Subject:	Rezoning Application		
Existing OCP Designation:	S2RES – Single/Two Unit Residential		
Existing Zone:	RU1 – Large Lot Housing		
Proposed Zone:	RU6 – Two Dwelling Housing		

1.0 Recommendation

THAT Rezoning Application No. Z17-0008 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot C, Section 19, Township 26, ODYD, Plan 23622, located at 1420 Inkar Road, Kelowna, BC from the RU1 – Large Lot Housing zone to the RU6 – Two Dwelling Housing zone, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated June 12, 2017.

2.0 Purpose

To rezone the subject property from RU1 – Large Lot Housing to RU6 – Two Dwelling Housing to facilitate the development of semi-detached housing.

3.0 Community Planning

Community Planning supports the proposed rezoning as the subject property is ample in size and well serviced by urban amenities. It is in close proximity to shopping, transit, commercial, employment and recreation amenities in the Capri-Landmark Urban Centre. The rezoning is supported by the Official

Community Plan (OCP) Future Land Use of S2RES – Single/Two Unit Residential, and Compact Urban Form by increasing density where services already exist.

4.0 Proposal

4.1 Background

The subject property features a single storey bungalow with an oversized single attached garage. The garage will be relocated to the south-east corner of the property to accommodate the conversion to semi-detached dwellings.

4.2 Project Description

The proposed addition to the single family dwelling has been sensitively designed to be 2 stories, modern, and reflect an updated character for the property. Located on the south west side of the property, parking for the new unit is provided in an attached garage. The new unit has direct access to the rear yard for private outdoor space. The existing residence will maintain access to the east rear yard for private outdoor space, and a relocated double garage will provide the required parking for the existing residence. All access to the property will be from an existing shared driveway and no variances are requested.

The proposed rezoning is consistent with the Future Land Use, and with the OCP Policy of Compact Urban Form by utilizing existing infrastructure to gradually increase density in an existing neighbourhood.

4.3 Site Context

The subject property is located in the Capri-Landmark Urban Centre, which is an area well serviced by transit, schools, parks, and with easy access to commercial and employment opportunities. Neighbourhood amenities include the Capri Mall, Landmark Towers, Orchard Plaza, and Parkinson's Recreation Centre.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU6 – Two Dwelling Housing	Residential
East	RU6 – Two Dwelling Housing	Residential
South	RU2 – Medium Lot Housing	Residential
West	RU1 – Large Lot Housing	Residential

Subject Property Map: 1420 Inkar Road

4.4 Zoning Analysis Table

Site Details:	**Zone Requirement**	**Proposal**
Site Area (m^2)	700 m^2	1781 m^2
Site Width (m)	18.0 m	28.8 m
Site Coverage of Building(s) (%)	40%	18.9%
Site Coverage of buildings, driveways, and parking (%)	50%	36.6%
Development Regulations:	**Zone Requirement**	**Proposal**
Total Number & Types of units	2	2
Building Height (storeys/metres)	2.5 storeys / 9.0 m	2 storeys / 6.56 m
Building(s) Setbacks (m):		
Front	6.0 m	6.0 m
Side (east)	2.0 m	2.0 m
Side (west)	2.3 m	4.5 m
Rear	7.5 m	16.5 m
Number of Parking Stalls/Loading Spaces	4 stalls	4 stalls

Private Open Space Area	30.0 m^2 per dwelling	30.0 m^2 per dwelling

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Single / Two Unit Residential.[2] Single detached homes for occupancy by one family, single detached homes with a secondary suite or carriage house, semi-detached buildings used for two dwelling units, modular homes, and those complementary uses (i.e. minor care centres, minor public services / utilities, and neighbourhood parks), which are integral components of urban neighbourhoods.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permits.
- The drawings submitted for Building Permit application is to indicate the method of fire separation between the new dwelling addition and the main dwelling.
- Range hood above the stove and the washroom to vent separately to the exterior of the building. The size of the penetration for this duct thru a fire separation is restricted by BCBC 12, so provide size of ducts and fire separation details at time of Building Permit Applications.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications.

6.2 Development Engineering Department

Please see attached Schedule "A" as attached to the Report from Community Planning.

[1] City of Kelowna Official Community Plan, Policy 5.2.3 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Chapter 4 (Future Land Use)

7.0 Application Chronology

Date of Application Received: January 23, 2017
Date Public Consultation Completed: February 24, 2017

Report prepared by: Trisa Brandt, Planner I

Reviewed by: Terry Barton, Urban Planning Manager

Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Schedule "A": Memorandum from Development Engineering Department
Site Plan
Proposed Floor Plans
Proposed Elevations and Renderings

SCHEDULE A
This forms part of application
Z17-0008
City of Kelowna
COMMUNITY PLANNING
Planner Initials TB

CITY OF KELOWNA

MEMORANDUM

Date: February 23, 2017
File No.: Z17-0008

To: Community Planning (TB)

From: Development Engineering Manager(SM)

Subject: 1420 Inkar Road RU1 to RU6

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 Sergio Sartori

1. Domestic Water and Fire Protection

This property is currently serviced with a 19mm-diameter copper water service. Two 19mm water services are required to meet current by-law requirements. An additional 19mm service can be provided by the City at the owner's cost. The applicant will be required to sign a Third Party Work Order for the cost of the water service upgrades. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

2. Sanitary Sewer

Our records indicate that this property is currently serviced with a 100mm-diameter sanitary sewer service. An inspection chamber (IC) complete with brooks box must be installed on the service at the owner's cost. Service upgrades can be provided by the City at the applicant's cost. The applicant will be required to sign a Third Party Work Order for the cost of the service upgrade. For estimate inquiry's please contact Sergio Sartori, by email ssartori@kelowna.ca or phone, 250-469-8589.

3. Road Improvements

(a) Inkar Road must be upgraded to an urban standard along the full frontage of this proposed development, including curb and gutter, sidewalk, and pavement removal and replacement, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. A one-time cash payment in lieu of construction must be collected from the applicant for future construction by the City. The cash-in-lieu amount is determined to be **$3,230.00** not including utility service cost.

(c) Only the service upgrades must be completed at this time. The City wishes to defer the upgrades to Inkar Road fronting this development. Therefore, cash-in-lieu of immediate construction is required and the City will initiate the work later, on its own construction schedule.

Item	Cost
Curb &Gutter	$ 938.00
Sidewalk	$1,800.00
Road Fillet	$ 492.00
Total	**$3,230.00**

4. Development Permit and Site Related Issues

Direct the roof drains into on-site rock pits or splash pads.

The existing driveway access exceeds the maximum width of 6m. No additional width is permitted.

5. Electric Power and Telecommunication Services

The electrical and telecommunication services to this building must be installed in an underground duct system, and the building must be connected by an underground service. 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.

7. Bonding and Levy Summary

(a) Levies

1. Christleton Ave frontage improvements **$3,230.00**

(b) Bonding

1. Service upgrades To be determined

Steve Muenz, P. Eng.
Development Engineering Manager

SS

ADDITIONS TO EXISTING RES. & DUPLEX

1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C; PLAN #: KAP23622; LD 41
PCLIO: 457-127; PID: 006-303-579; ZONING: RU6 (PROPOSED)

A100

Y-M-D:	16-12-23
REVISION:	0
SCALE:	
1/8" = 1'-0"	
SHEET:	

SITE PLAN

YY-MM-DD	ISSUED FOR
16-12-23	REVIEW
17-01-12	REVIEW
17-01-13	REVIEW
17-01-14	REVIEW
17-01-14	PERMIT

Knowlton concepts inc.

LOCATION	POINT	ELEVATION (m)
EXISTING RES.	A	353.24
EXISTING RES. ART STUDIO	B	352.64
EXISTING RES. ART STUDIO	C	352.81
EXISTING RES. ART STUDIO	D	352.67
EXISTING RES. ART STUDIO	E	352.74
EXISTING RES. GARAGE	F	352.89
EXISTING RES. GARAGE	G	352.85
EXISTING RES. GARAGE	H	352.74
EXISTING RES.	I	352.64
EXISTING RES.	J	352.75
EXISTING RES.	K	352.76
NEW DUPLEX	L	352.74
NEW DUPLEX	M	352.74
NEW DUPLEX	N	353.34
NEW DUPLEX	O	353.30
EXISTING RES.	P	353.5
EXISTING RES.	Q	353.26

AVERAGE GRADE AT EXISTING RES. ART STUDIO: 352.72 m
AVERAGE GRADE AT EXISTING RES. GARAGE: 352.83 m
AVERAGE GRADE AT NEW DUPLEX: 353.3. m

ADDITIONS TO EXISTING RES. & DUPLEX

1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C PLAN #: KAP23622, LD 41
FOLIO: 4571.127, PID: 006-303-579, ZONING: RU6 (PROPOSED)

Y-M-D:	16-12-23
REVISION:	0
SCALE:	1/4" = 1'-0"
SHEET:	A101

FOUNDATION PLAN

YY-MM-DD	ISSUED FOR
16-12-23	REVIEW
17-01-12	REVIEW
17-01-13	REVIEW
17-01-14	REVIEW
17-01-14	PERMIT

Knowlton concepts inc.

ADDITIONS TO EXISTING RES. & DUPLEX
1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C, PLAN #: KAP23622, LD 41
FOLIO: 457.127, PID: 006-303-579, ZONING: RU6 (PROPOSED)
MAIN FLOOR PLAN
A102
Y-M-D: 16-12-23
REVISION: 0
SCALE: 1/4" = 1'-0"
SHEET:
ISSUED FOR
YY-MM-DD
16-12-23 REVIEW
17-01-12 REVIEW
17-01-13 REVIEW
17-01-14 REVIEW
17-01-14 PERMIT
Knowlton concepts inc.
EXISTING RESIDENCE
WALL TO BE REMOVED AND REPLACED W/ BEAM AS PER STRUCTURAL ENGINEER SPEC'S
ART STUDIO ADDITION
GARAGE
GARAGE
POWDER
MUD RM
FOYER
KITCHEN
DINING
LIVING
STORAGE
OPEN ABOVE
TALL WALL
FLUSH BEAM
DROP BEAM
14" I-JOISTS @ 16" O/C
9 1/2" I-JOISTS @ 24" O/C
14" I-JOISTS @ 16" O/C
20'-0"
43'-0"
26'-0"
14'-0"
7'-0"
7'-0"
2'-4 1/2"
12'-0"
9'-6"
12'-0"
7'-6"
19'-2 1/2"
1'-2 1/2"
13'-0"
5'-0"
6'-6"
6'-6"
6'-8 1/4"
4'-6"
4'-3 1/2"
16'-0"
11'-6"
5'-2 1/2"
6'-3 1/2"
19'-8"
23'-0"
3'-4"
5'-0"
14'-11 1/2"
3'-9"
3 1/2"
26'-11 1/2"
10'-7 1/2"
3'-0"
11'-6"
69'-5 1/2"
46'-5 1/2"
8'-4 3/4"
8'-4 3/4"
1'-2 1/2"
16'-9 1/2"
1'-2 1/2"
19'-2 1/2"

BEDROOM-2
QUEEN
BATH
OPEN TO BELOW
MASTER BEDROOM
KING
MASTER ENSUITE
LAUNDRY
W.I.C.
OPEN TO BELOW
TALL WALL
ALL WALL
ALL WALL
14" I-JOISTS @ 16" O/C
19'-2 1/2"
38'-3 1/2"
34'-11 1/2"
26'-6"

1420 INKAR

ADDITIONS TO EXISTING RES. & DUPLEX

1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C, PLAN #: KAP23622, LD 41
FOLIO: 4571.127, PID: 006-303-579, ZONING: RU6 (PROPOSED)

SHEET:	R1
Y-M-D:	16-12-23
REVISION:	0
SCALE:	

YY-MM-DD	ISSUED FOR
16-12-23	REVIEW
17-01-12	REVIEW
17-01-13	REVIEW
17-01-14	REVIEW
17-01-14	PERMIT

knowlton concepts inc.

1 SOUTH ELEV. A201 SCALE: 1/4" = 1'-0"

2 NORTH ELEV. A201 SCALE: 1/4" = 1'-0"

3 EAST ELEV. A201 SCALE: 1/4" = 1'-0"

ADDITIONS TO EXISTING RES. & DUPLEX

1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C, PLAN #: KAP23622, LD 41
FOLIO: 4571.127, PID: 006-303-579, ZONING: RU6 (PROPOSED)

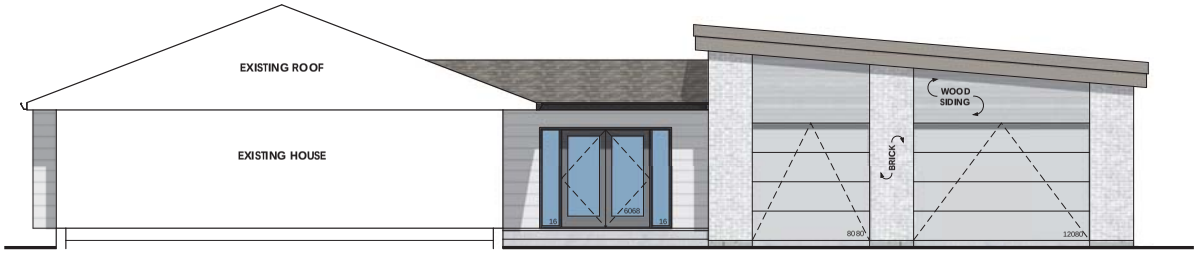
Y-M-D:	16-12-23
REVISION:	0
SCALE:	1/4" = 1'-0"
SHEET:	A201

EXTERIOR ELEVATIONS

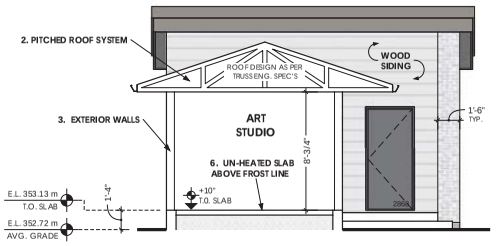
YY-MM-DD	ISSUED FOR
16-12-23	REVIEW
17-01-12	REVIEW
17-01-13	REVIEW
17-01-14	REVIEW
17-01-14	PERMIT

Knowlton concepts inc.

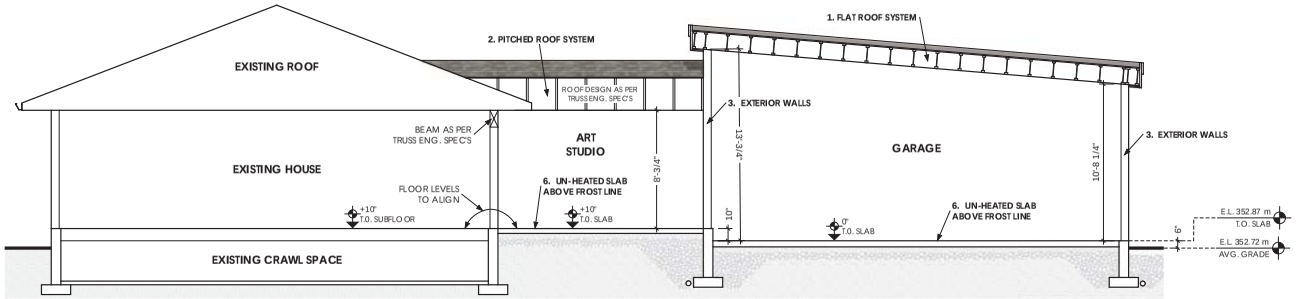
1 A202 WEST ELEV. (DUPLEX)
SCALE: 1/4" = 1'-0"



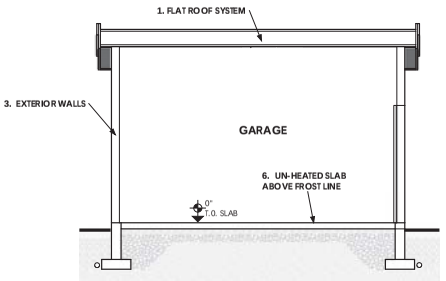
2 A202 WEST ELEV. (ART STUDIO & GARAGE)
SCALE: 1/4" = 1'-0"



3 A202 SECTION
SCALE: 1/4" = 1'-0"



4 A202 SECTION
SCALE: 1/4" = 1'-0"



5 A202 SECTION
SCALE: 1/4" = 1'-0"

1. FLAT & LOW SLOPE ROOF SYSTEM

ROOF DRAINS AS REQ'D (FLAT ROOF)
HIDDEN GUTTER (LOW SLOPE ROOF)
2-PLY SBS TORCH-ON MEMBRANE
24 GA PAINTED METAL FLASHING
3/4" PLYWOOD SHEATHING ROOF DECK
ENG. I-JOISTS AS PER TRUSS MFG'S SPEC'S
SPRAY FOAM TO UNDERSIDE OF ROOF DECK
BATT INSULATION
1/2" C.D. GYPSUM WALL BOARD
PAINTED LEVEL-4 FINISH

2. PITCHED ROOF SYSTEM

ROOF VENTS AS REQ'D TO ACHIVE 1:300 RATIO
FIBREGLASS SHINGLES
ROOFING FELT
1/2" PLYWOOD W/ H-CLIPS
ENG. TRUSSES AS PER TRUSS MFG'S SPEC'S
GLASS FIBRE LOOSE FILL INSULATION
6 MIL. POLY. AIR BARRIER
1/2" C.D. GYPSUM WALL BOARD
PAINTED LEVEL-4 FINISH
PERFORATED METAL SOFFIT
5" FASCIA GUTTER

3. EXTERIOR WALLS

COMBINATION OF WOOD SIDING & STUCCO
2 LAYERS ASPHALT BUILDING PAPER
1/2" STD. PLYWOOD SHEATHING
2x6 WOOD FRAMING W/ BATT INSULATION
6 MIL. POLY. AIR BARRIER
1/2" STANDARD GYPSUM WALL BOARD
PAINTED LEVEL-4 FINISH

4. FLOOR SYSTEM

FLOOR FINISH (AS PER HOME OWNER SPEC'S)
3/4" T&G SPRUCE PLYWOOD SHEATHING
14" I-JOISTS @ AS PER TRUSS TRUSS MFG'S SPEC'S
ENGINEERED BEAMS AS PER TRUSS TRUSS MFG'S SPEC'S
3 1/2" OF 2 LB. MED. DENSITY SPRAY FOAM TO JOIST ENDS
1/2" C.D. GYPSUM WALL BOARD

5. FOUNDATION

DAMP PROOFING BELOW GRADE
4" PERFORATED PVC PERIMETER DRAIN @ FOOTING
7 7/8" NORMAL DENSITY CONCRETE WALL ON FOOTING
2.5" XPS RIGID INSULATION

NOTE: REFER TO PLANS FOR EXISTING PORTION OF FOUNDATION TO BE USED PENDING ENGINEER APPROVAL

6. UNHEATED SLAB ABOVE FROST LINE

5" REINFORCED CONCRETE
6 MIL. POLY. AIR BARRIER
4" GRANULAR RADON FILL (W/ PIPE TO ROOF)
STRUCTURAL BACKFILL

Knowlton Concepts Inc.

Y-M-D:	ISSUED FOR
16-12-23	REVIEW
17-01-12	REVIEW
17-01-13	REVIEW
17-01-14	REVIEW
17-01-14	PERMIT

ADDITIONS TO EXISTING RES. & DUPLEX

EXTERIOR ELEVATIONS + SECTIONS

1420 INKAR RD, KELOWNA, BC V1Y 8H7
LOT: C, PLAN #: KAP23622, LD 41
FOLIO: 4571.127, PID: 006-303-579, ZONING: RU6 (PROPOSED)

Y-M-D: 16-12-23
REVISION: 0
SCALE:

SHEET:

A202

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (AC)		
Application:	Z17-0023	**Owner:**	Pannu, Gurpreet
Address:	1360 Belaire Ave	**Applicant:**	New Town Services Inc. (Jesse Alexander)
Subject:	Rezoning Application		
Existing OCP Designation:	MRM – Multiple Unit Residential (Medium Density)		
Existing Zone:	RU6 – Two Dwelling Housing		
Proposed Zone:	RM5 – Medium Density Multiple Housing		

1.0 Recommendation

THAT Rezoning Application No. Z17-0023 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 34 District Lot 137 ODYD Plan 10011, located at 1360 Belaire Ave, Kelowna, BC from the RU6 – Two Dwelling Housing to the RM5 – Medium Density Multiple Housing Zone, be NOT considered by Council;

2.0 Purpose

To consider a Staff recommendation to NOT rezone the subject property from RU6 – Two Dwelling Housing to the RM5 – Medium Density Multiple Housing Zone.

3.0 Community Planning

The Official Community Plan (OCP) designated the subject property as MRM – Multiple Unit Residential (Medium Density) with the vision of achieving large apartment style buildings under the RM5 zone. This land use vision is evident in the surrounding neighborhood with residential projects such as the Dorchester, the Murano, the recently approved Cambridge House and the numerous apartment buildings along Harvey Ave.

The proposed application for the subject property is not consistent with this vision as the applicant is proposing to utilize the RM5 zone on one small urban lot. The lot is 34% below the minimum subdivision regulation for new RM5 lots. This results in a significantly smaller apartment building form then the typical RM5 apartment building as well as a relatively low residential density as expressed with the proposed 0.6 Floor Area Ratio (FAR). Apartment buildings are typically in the 1.1 – 1.3 FAR range. As this proposal

represents the first major development along Belaire Avenue, staff do not feel deviating from the OCP vision appropriate. In addition, due to the fact that there is no lot consolidation, the proposal leaves one urban lot directly to the east minimizing its future development potential.

Overall, achieving a higher residential density is an important community objective in this Harvey Avenue area due to its close proximity to the downtown and surrounding urban amenities (e.g. parks, schools, transit, cycling routes, shops and services). Furthermore, if small apartment buildings are permitted on single urban lots, this may discourage other developers from land assembly and consolidating larger sites. As a consequence, the City would not achieve its residential density goals. Therefore, Staff do not support the proposed rezoning from RU6 zone to the RM5 zone.

4.0 Proposal

4.1 Project Description

The applicant has applied for a Rezoning and Development Permit application to facilitate a 17-unit multiple residential building located at 1360 Belaire Ave. The proposal is for 16 rental micro-suites with 1 care-taker unit. The project is within 400 metres of a bus stop and is located in an urban centre which is the prerequisite to allow micro-suite developments.

The subject property is 931m^2. The minimum lot size for subdivision in the RM5 zone is 1,400m^2. Although, the subdivision regulations are not required to be adhered to when rezoning a property, Staff do use the minimums as a guide to indicate whether a particular lot is large enough for the intended densities within that zone (in this case apartment housing).

If the rezoning is successful, the applicant has proposed to build a 4 storey building with 17 parking stalls. Staff are currently tracking two variances and would provide comprehensive comments on the form & character within the Development Permit Council report, should the zoning proceed.

4.2 Background

The subject property contains a restrictive covenant and building scheme registered on the property in 1959 that restricts the property owner to the following structures: single detached dwelling, duplex, garage, and carport. Further, the covenant restricts the property owner from developing a detached dwelling or duplex less than 750ft^2 in floor area. However, this is a private agreement without the municipality, regional district, or provincial government's involvement. Therefore, the City does not consider these private agreements relevant in terms of enforcement or allowable land uses.

4.3 Site Context

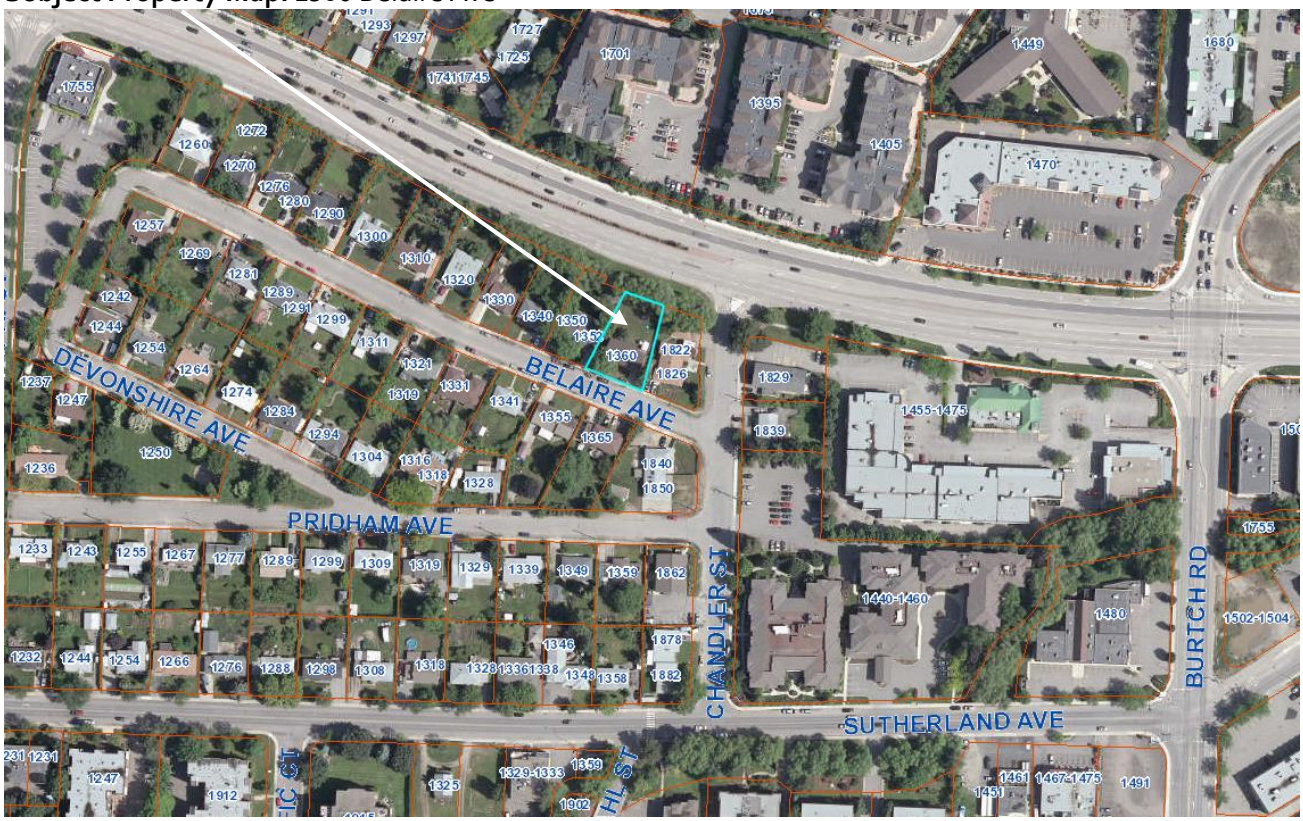
The subject property is located within the Capri-Landmark Urban Centre and within the Urban Core. Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RM5 – Medium Density Multiple Housing	Residential
East	RU6 – Two Dwelling Housing & C3 – Community Commercial	Residential & Commercial
South	RU6 – Two Dwelling Housing	Residential
West	RU6 – Two Dwelling Housing	Residential

4.4 Site Context

The applicant has met Council Policy No. 367 (Development Notification Policy) by mailing notices to all properties within a 50 metre radius.

Subject Property Map: 1360 Belaire Ave



4.5 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**RM5 ZONE REQUIREMENTS**	**PROPOSAL**
Development Regulations		
Height	18.0 m / 4.5 storeys	13.4 m / 4 storeys
Front Yard (south)	6.0m	6.0m
Side Yard (east)	4.5m below 2 ½ stories 7.0m above 2 ½ stories	4.5m below 2 ½ stories 7.0m above 2 ½ stories
Side Yard (west)	4.5m below 2 ½ stories 7.0m above 2 ½ stories	4.5m below 2 ½ stories 7.0m above 2 ½ stories
Rear Yard (north)	9.0m	9.0m
Site coverage of buildings	40 %	34%

Zoning Analysis Table		
CRITERIA	**RM5 ZONE REQUIREMENTS**	**PROPOSAL**
Site coverage of buildings, driveways & parking	65 %	62%
FAR	1.1 Max	0.6
Parking Regulations		
Minimum Parking Requirements	1 per bachelor unit = 17 stalls	17 stalls
Ratio of Parking Stalls	Full size: 50% Min Medium Size: 40% Max Small Size: 10% Max	Full size: 71% (12 stalls) Medium Size: 17% (4 stalls) Small Size: 6% (1 stall)
Minimum Drive Aisle Width	7.0m	6.0m / 6.5m ❶
Setback (Parking)	1.5 m	1.5m or greater
Parking stall size	0.2m wider when abutting an obstruction (e.g. column or wall)	0.0m ❷
	Measured to edge of column	Measured to centre of column ❷
Other Regulations		
Minimum Bicycle Parking Requirements	Class 1: 9 bikes Class 2: 2 bikes	Class 1: 10 bikes Class 2: 6 bikes
Private Open Space	127.5 m^2	134.8 m^2
Landscape Buffer	3.0m or opaque fence	6.0m front 1.5m side & rear & opaque fence
Potential Variances: ❶ Reduce minimum drive aisle widths; ❷ Reduce sizes of parking stalls;		

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Capri-Landmark.[2]. Generally, 4 storeys. Greater height (up to 12 storeys) may be supported on the Capri Shopping Centre site and in the area bordered by Dickson Avenue, Dayton Avenue, Springfield Road and Kirschner Road upon approval of a Council-endorsed comprehensive development plan for the site that provides for a variety of housing types (including but not limited

[1] City of Kelowna Official Community Plan, Policy 5.3.2 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.3.4 (Development Process Chapter).

to ground-oriented and rental apartment housing) and the provision of commercial space that is of an amount that, at minimum, equals that which existed in 2010.

6.0 Technical Comments

6.1 Building & Permitting Department

- No comment on rezoning.

6.2 Development Engineering Department

- See attached memorandum dated April 13, 2017.

6.3 Fire Department

- No comment on rezoning.

6.4 Ministry of Transportation

- With regard to the above noted zoning file, the Ministry has no objection. Please forward the final Bylaw once it has achieved third reading for Ministry approval. If you have any questions, please feel free to call Kelowna Development Approvals at (250) 712-3660.

7.0 Application Chronology

Date of Application Received:	March 9th 2017
Date Public Consultation Completed:	April 6th 2017

8.0 Alternate Recommendation

THAT Rezoning Application No. Z17-0023 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 34 District Lot 137 ODYD Plan 10011, located at 1360 Belaire Ave, Kelowna, BC from the RU6 – Two Dwelling Housing to the RM5 – Medium Density Multiple Housing Zone, be considered by Council;

AND THAT the Zone Amending Bylaw be forwarded to a Public Hearing for further consideration.

AND THAT final adoption of the Zone Amending Bylaw be subsequent to the following:

To the outstanding conditions identified in Attachment "A" associated with the report from the Community Planning Department dated April 13th 2017.

Report prepared by:	Adam Cseke, Planner Specialist
Reviewed by:	Terry Barton, Urban Planning Manager
Approved for Inclusion:	Ryan Smith, Community Planning Department Manager

Attachments:

ATTACHMENT 'A' - Development Engineering Memo dated April 13th 2017
ATTACHEMENT 'B' – Applicant's Rationale & Initial Architectural Drawing Package

CITY OF KELOWNA

MEMORANDUM

Date: April 13, 2017
File No.: Z17-0023

To: Community Planning (AC)

From: Development Engineering Manager(SM)

Subject: 1360 Belaire Ave RU6 to RM5

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 Sergio Sartori

1. Domestic Water and Fire Protection

(a) The subject property is currently serviced with a 13mm and a 19mm diameter water services. The developer's consulting mechanical engineer will determine the domestic and fire protection requirements of this proposed development and establish hydrant requirements and service needs. Only one service will be permitted for this development. The applicant, at his cost, will arrange for the disconnection of existing services and the installation of a new service if necessary.

(b) It is apparent that the existing 150mm diameter watermain within Belaire Avenue is substandard and will not support this development. The applicant, at his cost, will arrange for upgrading ~55m of waterman and the installation of a fire hydrant and one new larger water service. The estimated cost of this construction for bonding purposes is **$76,000.00.**

2. Sanitary Sewer

(a) The subject property is currently serviced with 100mm-diameter substandard sanitary service. The developer's consulting mechanical engineer will determine the development requirements of this proposed development and establish the service needs. Only one service will be permitted for this development. The applicant, at his cost, will arrange for the removal and disconnection of the existing services and the installation of one new larger service. The estimated cost of this construction for bonding purposes is **$12,000.00.**

3. Storm Drainage

The developer must engage a consulting civil engineer to provide a storm water management plan for these sites which meets the requirements of the City Subdivision Development and Servicing Bylaw 7900. The storm water management plan must also include provision of lot grading plans, minimum basement elevations (MBE), if applicable, and provision of a storm drainage service and recommendations for onsite drainage containment and disposal systems.

The lot is not serviced with storm sewer service. Only one service will be permitted for this development. Storm drainage systems for the site will be reviewed and approved by Engineering when design drawings are submitted.

4. Road Improvements

(a) Belaire Ave must be upgraded to an urban standard along the full frontage of this proposed development, including curb and gutter, sidewalk replacement, drainage system including catch basins, manholes and pavement removal and replacement, fillet pavement, boulevard landscaping, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. The estimated cost of this construction for bonding purposes is **$38,000.00**

(b) Harvey Ave adjacent to this development site will require curb and gutter to meet current standards. The cash in lieu of construction cost is **$3,000.00**

5. Road Dedication and Subdivision Requirements

(a) Grant statutory rights-of-way if required for utility services.

ATTACHMENT A
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

6. Electric Power and Telecommunication Services

a) The electrical services to this development must be installed in an underground duct system, and the building must be connected by an underground service. Existing distribution and service connections, on that portion of a road immediately adjacent to the site, are to be relocated and installed underground as this site is located within the Capri Landmark urban town centre.

b) 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.

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.

c) The City wishes to defer the upgrades to Harvey Ave fronting this development. Therefore, cash-in-lieu of immediate construction is required and the City will initiate the work later, on its own construction schedule.

Item	Cost
Curb &Gutter	**$ 3,000.00**

(d) Bonding

Water service upgrade	$76,000.00
Sanitary service upgrade	$12,000.00
Road Frontage Improvements	$38,000.00
Total Bonding	**$126,000.00**

NOTE: The bonding amounts shown above are comprised of estimated construction costs escalated by 140% to include engineering design and contingency protection and are provided for information purposes only. The owner should engage a consulting civil engineer to provide detailed designs and obtain actual tendered construction costs if he wishes to do so. Bonding for required off-site construction must be provided, and may be in the form of cash or an irrevocable letter of credit, in an approved format.
The owner must also enter into a servicing agreement in a form provided by the City.

e) Administration Charge

An administration charge will be assessed for processing of this application, review and approval of engineering designs and construction inspection. The administration charge is calculated as (3.5% of Total Off-Site Construction Cost plus GST).

11. Development Permit and Site Related Issues

(a) The proposed parking stalls must meet the zoning bylaw requirements.

(b) Access and Manoeuvrability

(i) An MSU standard size vehicle must be able to manoeuvre onto and off the site without requiring a reverse movement onto public roadways. If the development plan intends to accommodate larger vehicles movements should also be illustrated on the site plan.

Steve Muenz, P. Eng.
Development Engineering Manager

SS

ATTACHMENT A
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

NEW TOWN SERVICES

ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna COMMUNITY PLANNING

Proposal for Rezoning & Development Permit

1360 Belaire Ave

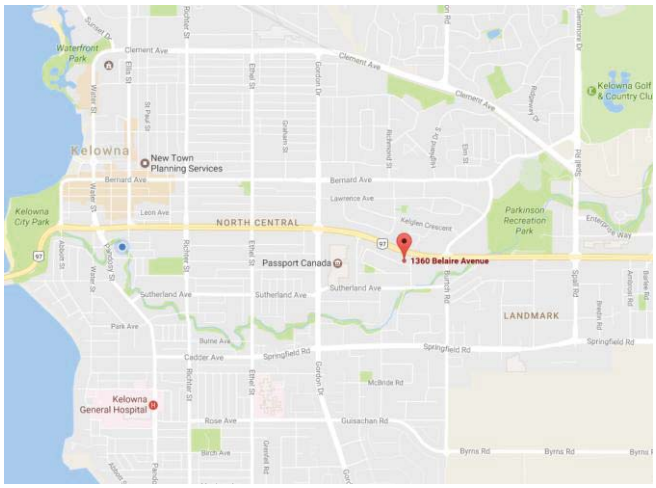
Introduction

This application is for re-zoning and development permit to accommodate a 17 unit multi-residential building located at 1360 Belaire Ave. This infill project is a very unique structure with contemporary architectural design and no variances.

Site Context

The subject site consists of a single lot roughly 0.24 acres in size that is located between Belaire Ave and Harvey Ave (Hwy97).

The property is zoned RU6, Two Dwelling Housing. The Future Land Use Designation is Medium Density Multiple Residential, as prescribed by the City of Kelowna OCP.



Site Location
Source: Google Map

Site Context
Source: Kelowna City Map

NEW TOWN
SERVICES

Overview

The owner is aiming to rezone the property to RM5, Medium Density Multiple Housing, and undertake a Development Permit to facilitate the construction of a 17 unit multi-residential building. The units in this building are anticipated to be primarily rental micro-units, with a single studio caretaker unit. In accordance with Section 9.11 in the City of Kelowna Zoning Bylaw, this project is well within 400m of several bus stops and is within the Capri/Landmark Urban Center, so is thus eligible to provide micro suites under the RM5 Zone.

The structure has been designed with significant contemporary influence and hosts sharp, clean lines like many other modern Okanagan buildings. The use of earth tones and wood textures is intended make the building appear friendly and warm. Exterior materials consist of wood toned fiber cement siding, stucco, and concrete. These high quality materials will create a durable and low maintenance building. The RM5 setback increases above 2 storeys which creates the opportunity for generously sized decks on this level. Additional amenity space is provided at-grade in a semi-private landscaped seating area adjacent to the building.

ATTACHMENT B
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

Parking is provided at-grade below the building and is screened from view of the street and neighboring properties. Screening will be provided by a fully opaque fence around the property, which will also serve as noise mitigation. All parking is setback a min of 1.5m from property boundaries. This 1.5m will be provided as a landscaped buffer with low shrubs and grasses to create a more inviting parking environment than a typical underground condo structure. Bike parking will be provided in excess of Zoning Bylaw requirements and will consist of outdoor bike racks and a locked room.

This property hosts many mature trees that are to be preserved and integrated into the design. There is a dense band of trees at rear of the property that serve as a buffer to Harvey Ave. These trees will be retained to dampen the noise and visual impact created by the Highway. Additionally, there are several large trees at the front of the property that will remain. These trees will enhance the street interface and create a feeling of the building being "tucked within" a small forest.

Conclusion

While smaller than many multi-family development projects in Kelowna, this building still makes excellent use of the site and fits within the RM5 zone with **no variances required**. The City of Kelowna has identified the need to increase density within existing single family neighborhoods by encouraging infill housing. Infill housing is a key tool to combat sprawl and low rental vacancy rates within the city. In keeping with that principle, this project will provide 17 much needed rental units within the landmark neighborhood. Furthermore, the rezoning to RM5 matches the intent of the City of Kelowna OCP Land Use Designation of Medium Density Multiple Residential. The combination of appropriate land use, the provisions of needed rental stock, and retention of existing trees makes this an appropriate infill project. The applicant requests support from staff and council for this application.

NOT FOR CONSTRUCTION

BELAIRE AVENUE CONDOMINIUM
BELAIRE AVE, KELOWNA, B.C.

ZONING BYLAW SUMMARY

	REQUIRED	PROPOSED
ZONE:	RM5	RM5
PERMITTED USE:	MEDIUM DENSITY MULTIPLE HOUSING	MEDIUM DENSITY MULTIPLE HOUSING
MAXIMUM FLOOR AREA RATIO:	1.1	0.60
MAXIMUM SITE COVERAGE:	40 %	34 %
MAXIMUM SITE COVERAGE OF BUILDINGS, DRIVEWAYS & PARKING:	65 %	62 %
MAXIMUM HEIGHT:	18 m OR 4.5 STOREYS	13.4 m OR 4.0 STOREYS
MINIMUM FRONT SETBACK:	6.0m (BELAIRE AVENUE)	6.0 m
MINIMUM SIDE SETBACK (BELOW 2.5 STOREYS):	4.5 m	4.5 m
MINIMUM SIDE SETBACK (ABOVE 2.5 STOREYS):	7.0 m	7.0 m
MINIMUM REAR SETBACK:	9.0 m	9.0 m

ARCHITECTURAL:

NEWTOWN ARCHITECTURE & ENGINEERING

1464 ST. PAUL STREET KELOWNA, B.C. V1Y 2E6
PH. 250-860-8185

A0.00 COVER SHEET & DWG LIST
A2.00 SITE PLAN
A2.01 BUILDING IMAGES
A2.02 BUILDING IMAGES
A2.03 BUILDING IMAGES
A3.01 LEVEL 1 FLOOR PLAN
A3.02 LEVEL 2 FLOOR PLAN
A3.03 LEVEL 3 FLOOR PLAN
A3.04 LEVEL 4 FLOOR PLAN
A3.05 ROOF PLAN
A3.06 LEVEL 2 UNIT PLANS
A3.07 LEVEL 2 UNIT PLANS
A3.08 LEVEL 3 & 4 UNIT PLANS
A3.09 LEVEL 3 & 4 UNIT PLANS
A4.01 BUILDING ELEVATIONS
A4.02 BUILDING ELEVATIONS
A5.00 BUILDING SECTIONS

BUILDING/SITE SUMMARY

PROPERTY #1

CIVIC ADDRESS: 1360 BELAIRE AVENUE, KELOWNA BC
LEGAL DESCRIPTION: LOT 34 DISTRICT LOT 137 ODYD PLAN 10011, PID # 005-193-851

SITE AREA: **951.69 m²**

PROPOSED NET FLOOR AREA: **571.1 m²**

PARKADE AREA: **481.5 m²**

FLOOR AREA RATIO (FAR): 571.1 / 951.69 = **0.60**

PRIVATE OPEN SPACE SUMMARY:

BACHELOR (7.5m² EACH) 17 UNITS = 127.5 m²
TOTAL REQUIRED: = 127.5 m²

PRIVATE OPEN SPACE PROPOSED: **= 1451.28 SF (134.83m²)**

PARKING: NOTE VARIANCE REQUIRED

REQUIRED:

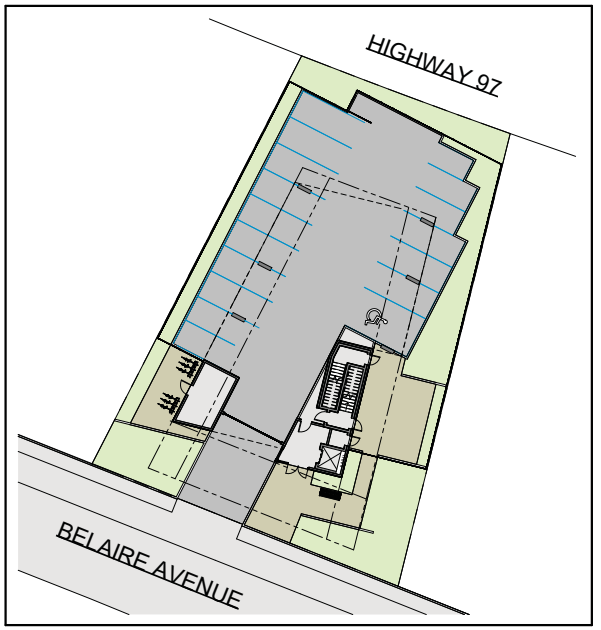
1 STALL PER DWELLING UNIT: 17 STALLS
TOTAL REQUIRED PARKING: 17 STALLS

PROVIDED:

ABOVE GROUND PARKING: **TOTAL PROVIDED: 17 STALLS**

BICYCLE PARKING

APARTMENT REQUIRED
CLASS I - 0.5 PER DWELLING UNIT: 9.5 **TOTAL PROVIDED CLASS I : 10**
CLASS II - 0.1 PER DWELLING UNIT: 1.9 **TOTAL PROVIDED CLASS II : 6**



KEYPLAN

ATTACHMENT **B**
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

SEAL

Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

file

drawing title
COVER SHEET & DWG LIST

designed | scale As indicated
drawn J.F.
checked R.Y.
drawing no. **A0.00**
plotte NOV 28, 2016

NOT FOR CONSTRUCTION

ATTACHMENT **B**

This forms part of application

Z17-0023

City of Kelowna
COMMUNITY PLANNING

Planner Initials AC

1 SITE PLAN
A4.01 1 : 100

TRUE NORTH

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

SEAL

Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
SITE PLAN

designed
drawn J.F.
checked R.Y.
scale 1 : 100
drawing no. **A2.00**
plotted NOV 28, 2016

NOT FOR CONSTRUCTION

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING IMAGES

designed | scale
drawn J.F.
checked R.Y.

drawing no.
A2.01

plotte NOV 28, 2016

ATTACHMENT **B**
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING

Planner Initials AC

NOT FOR CONSTRUCTION

ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

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ARCHITECTURE
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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING IMAGES

designed | scale
drawn J.F.
checked R.Y.

drawing no.
A2.02

plotte NOV 28, 2016

NOT FOR CONSTRUCTION

ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

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COMMUNITY PLANNING

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING IMAGES

designed | scale
drawn J.F.
checked R.Y.

drawing no.
A2.03

plotte NOV 28, 2016

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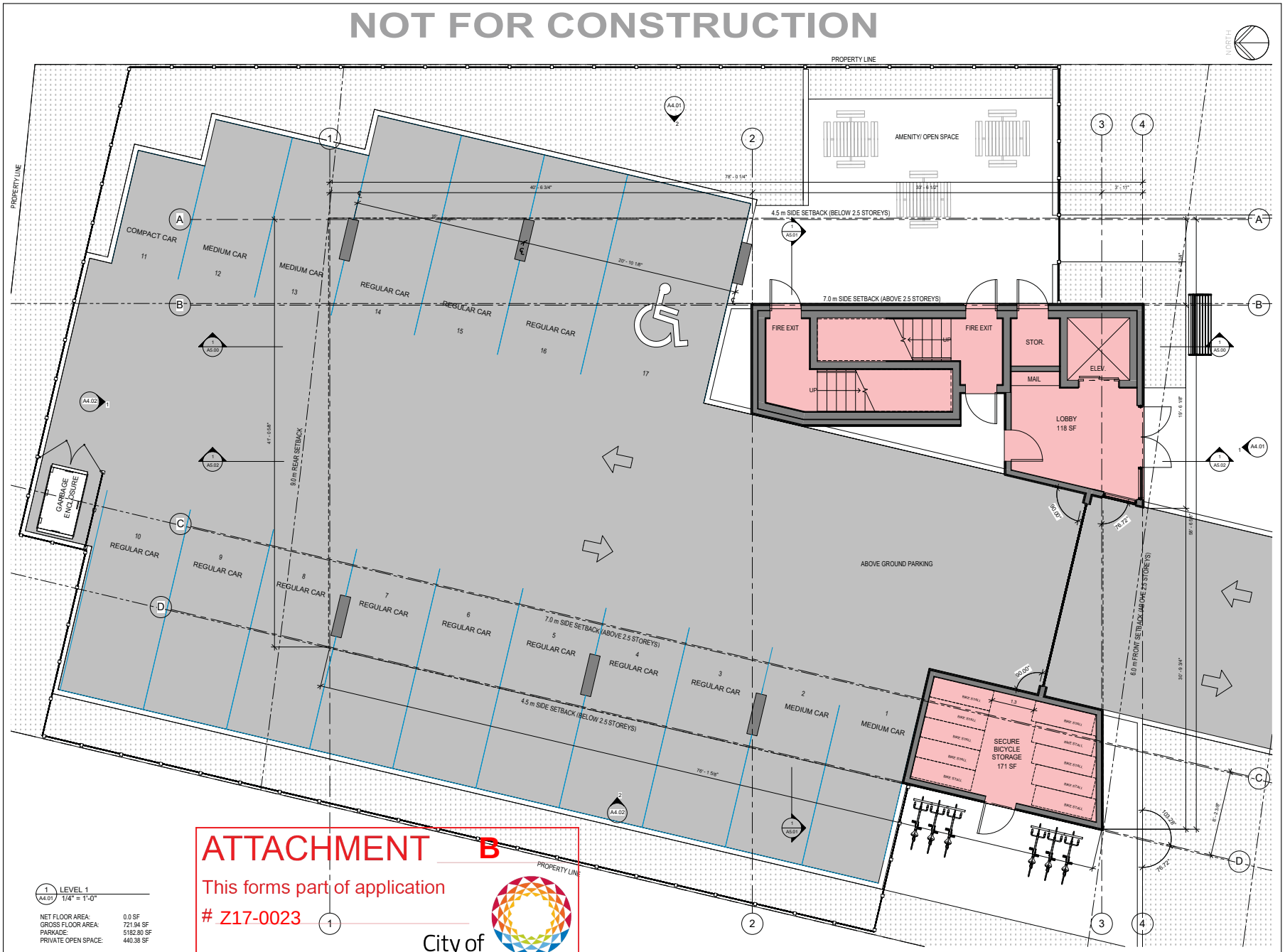

ATTACHMENT B
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

1 LEVEL 1
A4.01 1/4" = 1'-0"

NET FLOOR AREA:	0.0 SF
GROSS FLOOR AREA:	721.94 SF
PARKADE:	5182.80 SF
PRIVATE OPEN SPACE:	440.38 SF

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

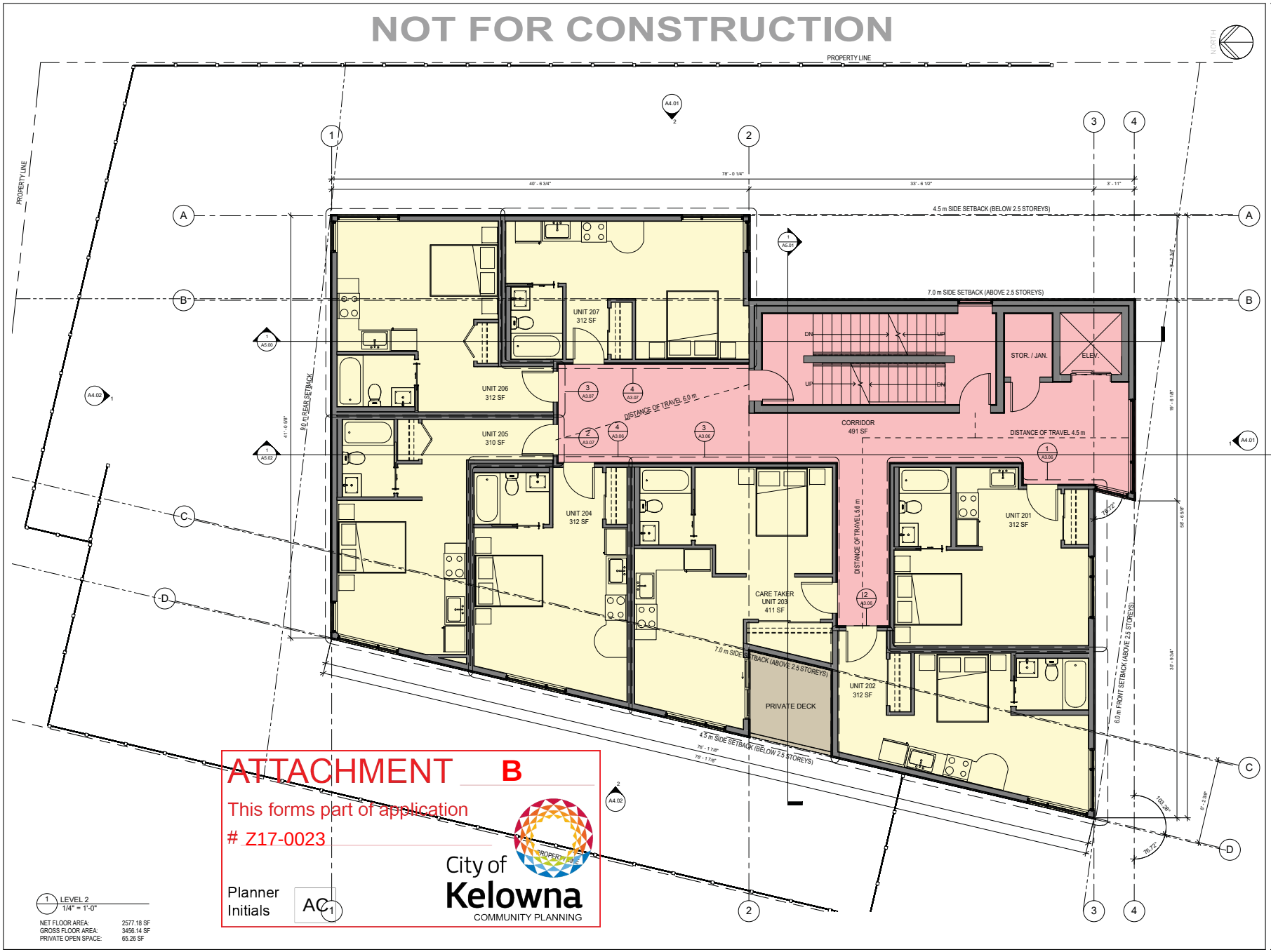
project no. 4010

drawing title
LEVEL 1 FLOOR PLAN

designed | scale 1/4" = 1'-0"
drawn J.F.
checked R.Y.

drawing no. A3.01

plotte NOV 28, 2016



ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

1 LEVEL 2
1/4" = 1'-0"

NET FLOOR AREA: 2577.18 SF
GROSS FLOOR AREA: 3456.14 SF
PRIVATE OPEN SPACE: 65.26 SF

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Verify all dimensions and datums prior to commencement of work.

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

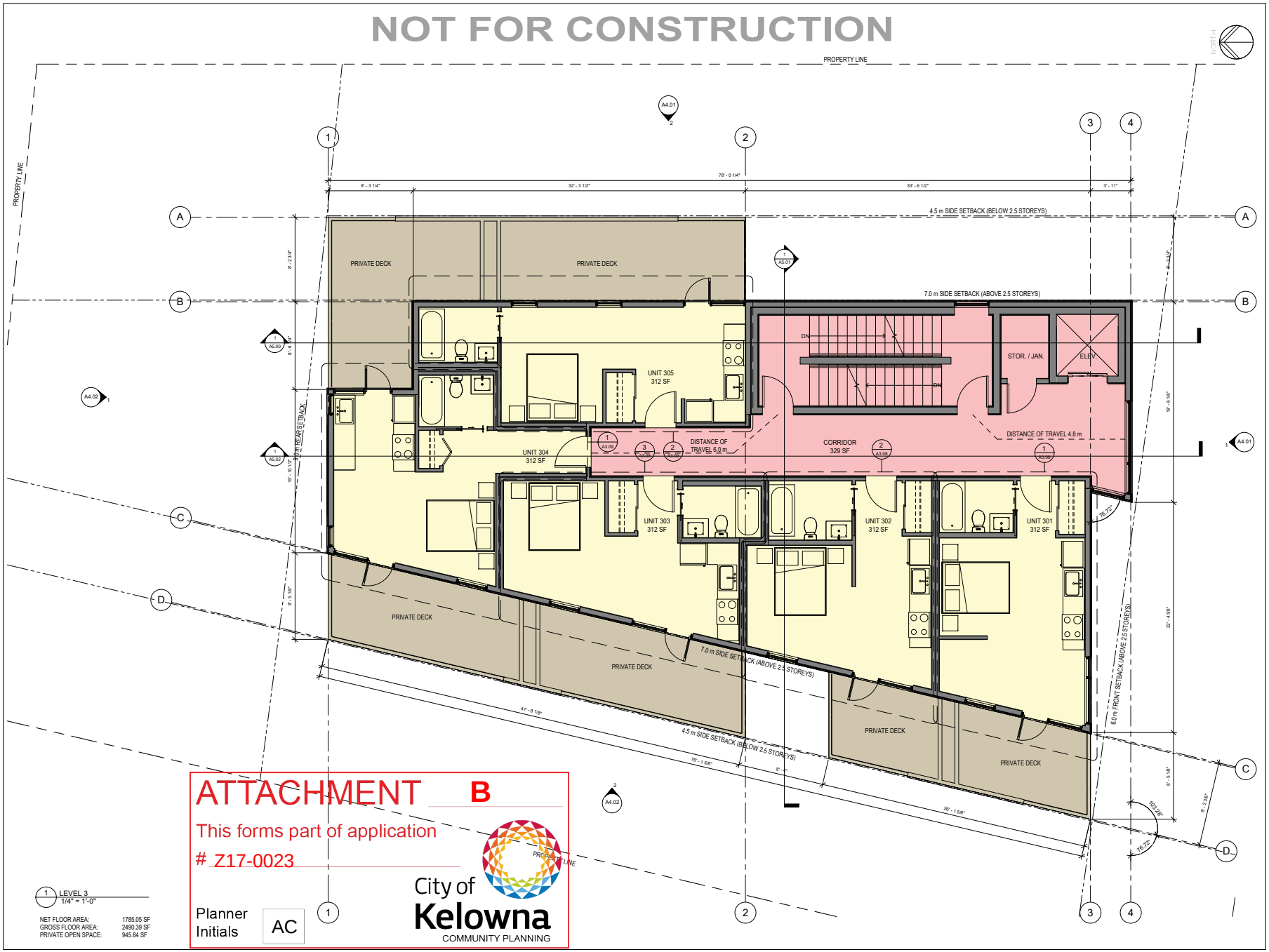
drawing title
LEVEL 2 FLOOR PLAN

designer | scale 1/4" = 1'-0"
drawn J.F.
checker R.Y.

drawing no. **A3.02**

plotted NOV 28, 2016 3/6/2017 10:20:22 AM

NOT FOR CONSTRUCTION



ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

1 LEVEL 3
1/4" = 1'-0"

NET FLOOR AREA:	1785.05 SF
GROSS FLOOR AREA:	2490.39 SF
PRIVATE OPEN SPACE:	945.64 SF

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Revisions

No	Date	Description
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project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

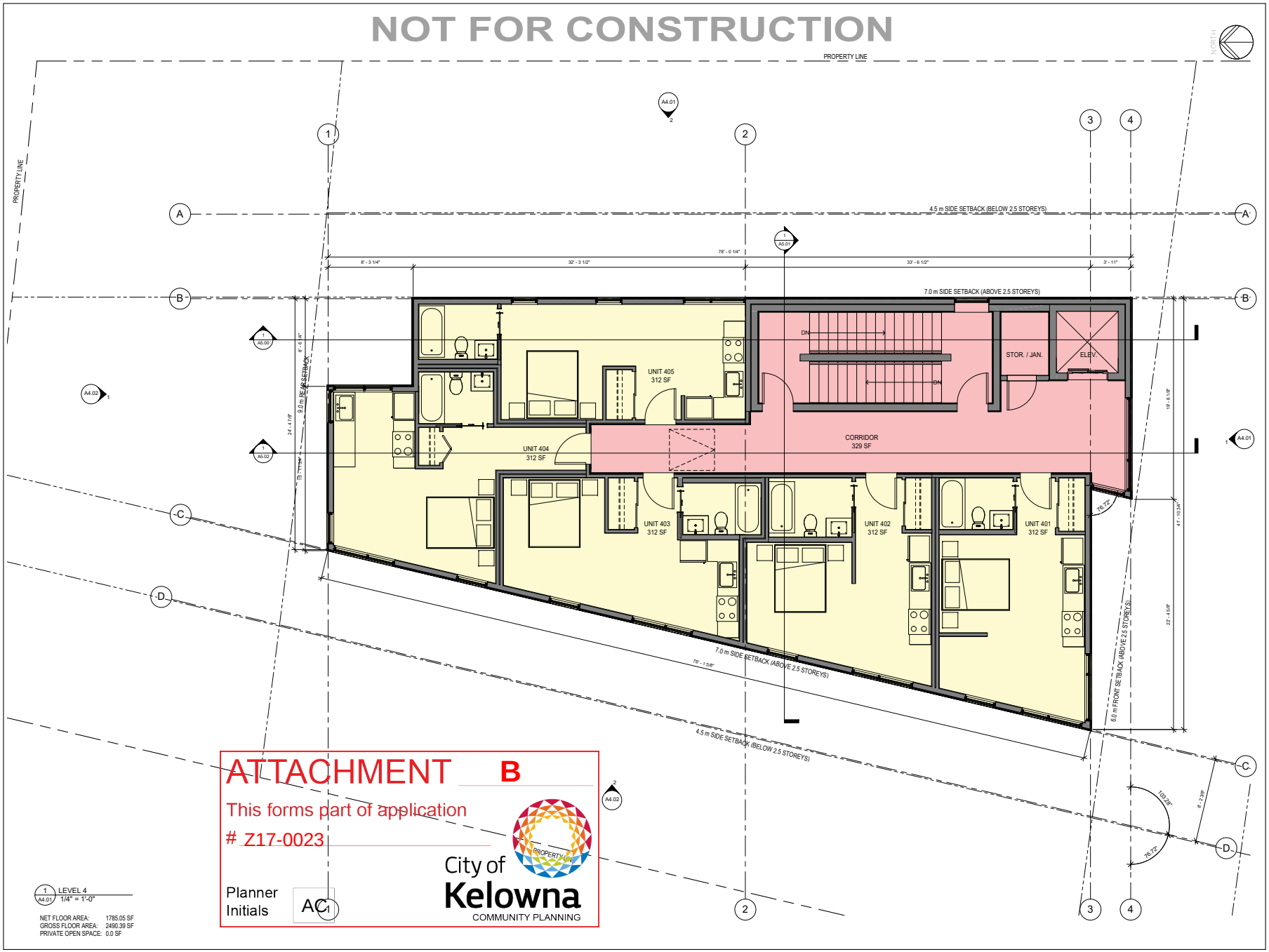
drawing title
LEVEL 3 FLOOR PLAN

designs | scale 1/4" = 1'-0"
drawn J.F.
checks R.Y.

drawing no. **A3.03**

plotted NOV 28, 2016 3/6/2017 10:20:24 AM

NOT FOR CONSTRUCTION



ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna
COMMUNITY PLANNING

1 / A4.01 LEVEL 4
1/4" = 1'-0"

NET FLOOR AREA: 1785.05 SF
GROSS FLOOR AREA: 2490.39 SF
PRIVATE OPEN SPACE: 0.0 SF

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

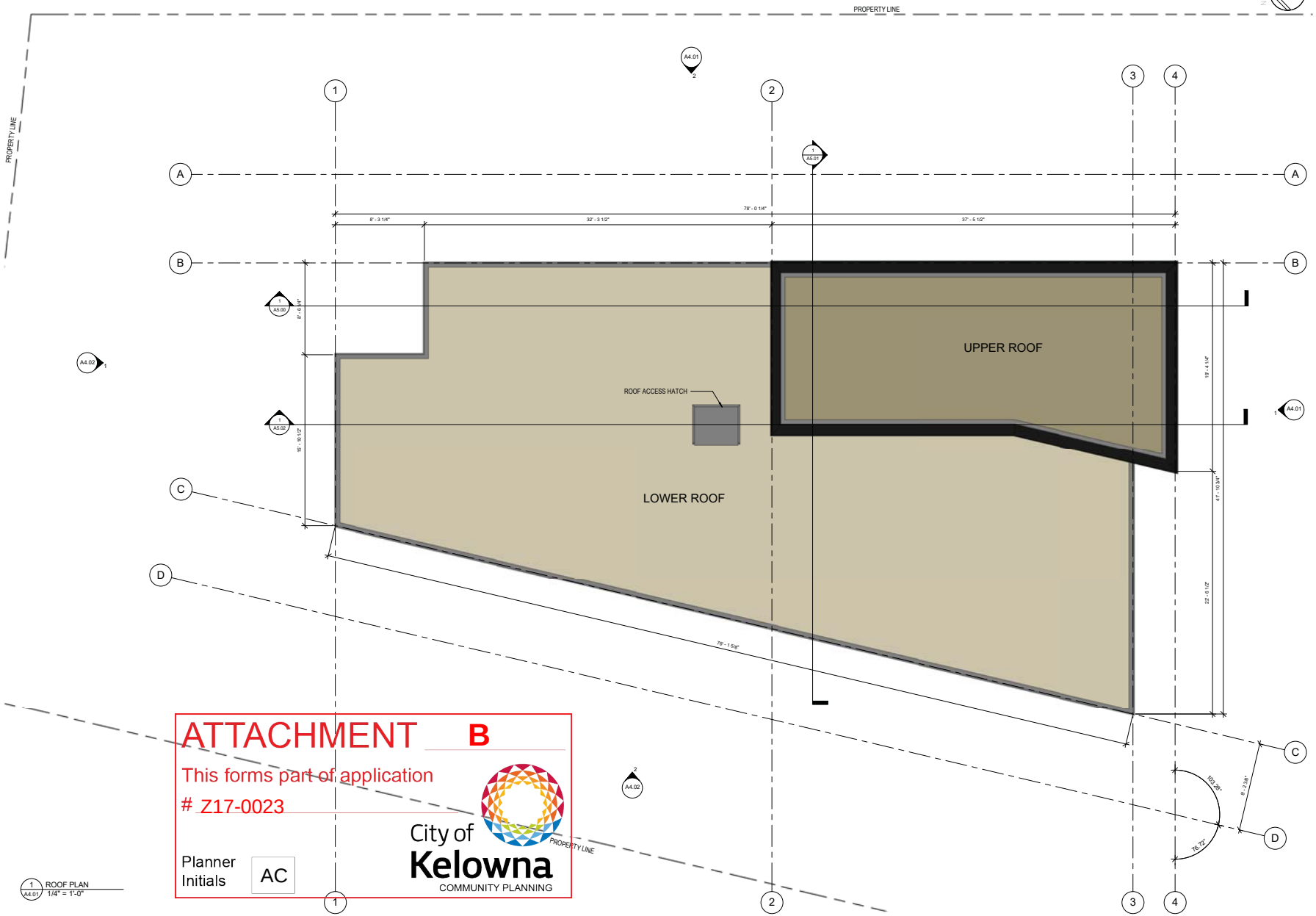
drawing title
LEVEL 4 FLOOR PLAN

designer | scale 1/4" = 1'-0"
drawn J.F.
checked R.Y.

drawing no. A3.04

plotted NOV 28, 2016 3/6/2017 10:20:27 AM

NOT FOR CONSTRUCTION



ATTACHMENT B
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City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

1 A4.01 ROOF PLAN 1/4" = 1'-0"

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA

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No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

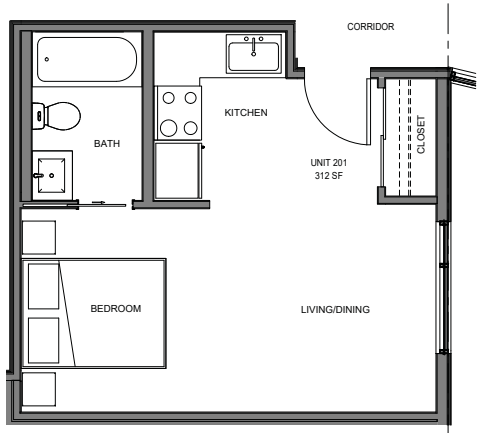
project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

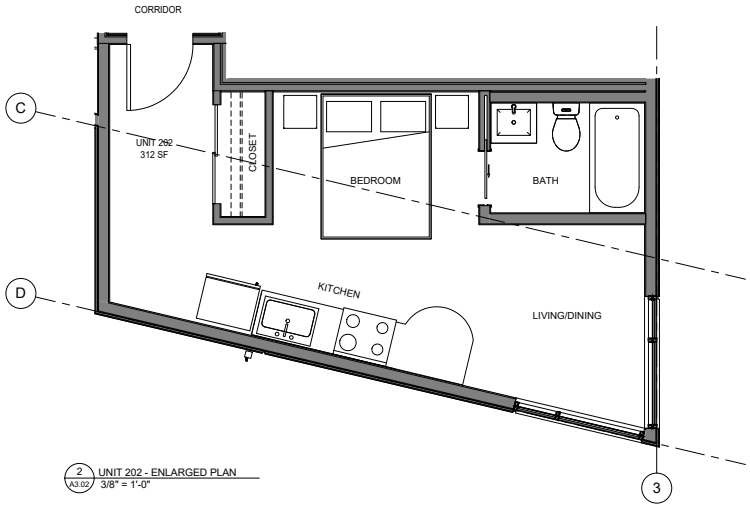
drawing title
ROOF PLAN

designed
scale 1/4" = 1'-0"
drawn J.F.
checked R.Y.
drawing no. A3.05
plotte NOV 28, 2016

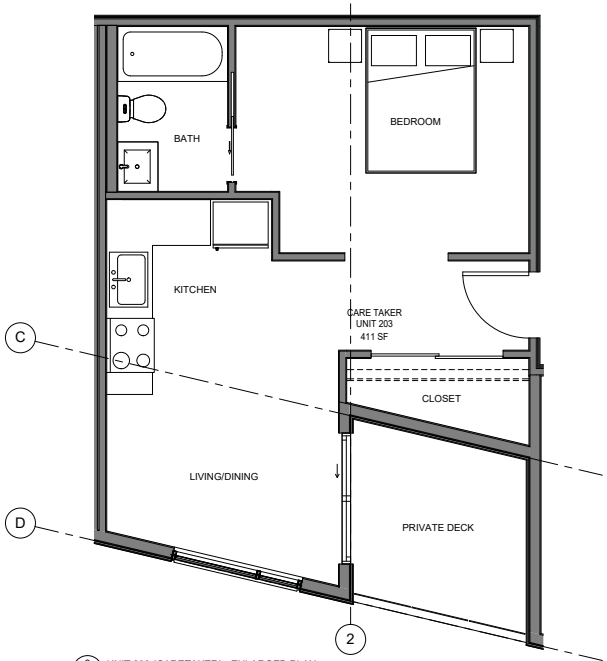
NOT FOR CONSTRUCTION



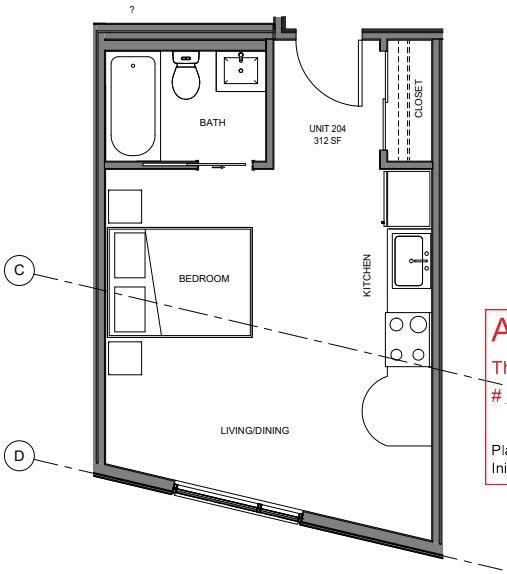
1 A3.02 UNIT 201 - ENLARGED PLAN
3/8" = 1'-0"



2 A3.02 UNIT 202 - ENLARGED PLAN
3/8" = 1'-0"



3 A3.02 UNIT 203 (CARETAKER) - ENLARGED PLAN
3/8" = 1'-0"



4 A3.02 UNIT 204 - ENLARGED PLAN
3/8" = 1'-0"

ATTACHMENT B
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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

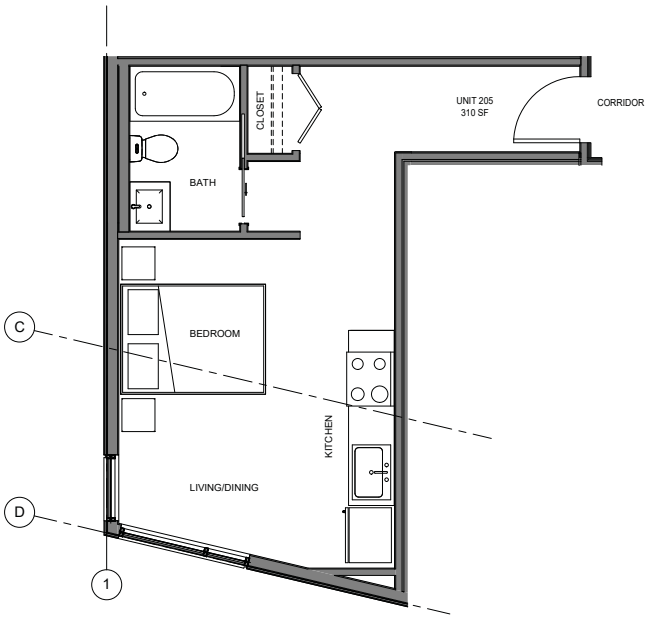
drawing title
LEVEL 2 UNIT PLANS

designed | scale 3/8" = 1'-0"
drawn J.F.
checked R.Y.

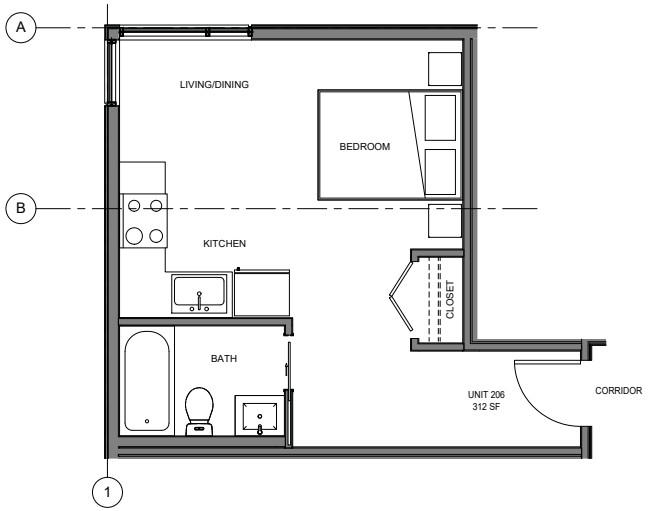
drawing no.
A3.06

plotte NOV 28, 2016

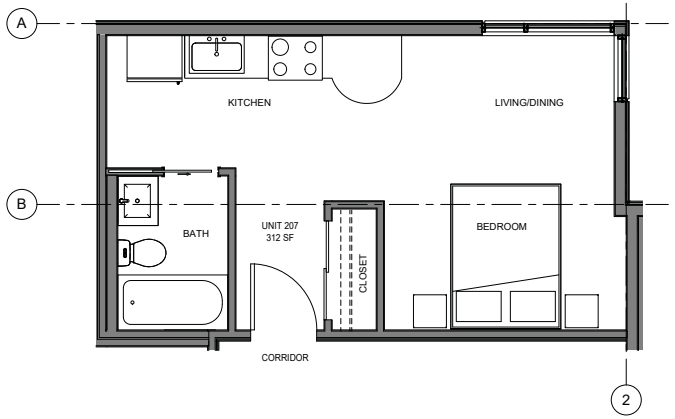
NOT FOR CONSTRUCTION



2 A3.02 UNIT 205 - ENLARGED PLAN
3/8" = 1'-0"



3 A3.02 UNIT 206 - ENLARGED PLAN
3/8" = 1'-0"



4 A3.02 UNIT 207 - ENLARGED PLAN
3/8" = 1'-0"

ATTACHMENT B
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

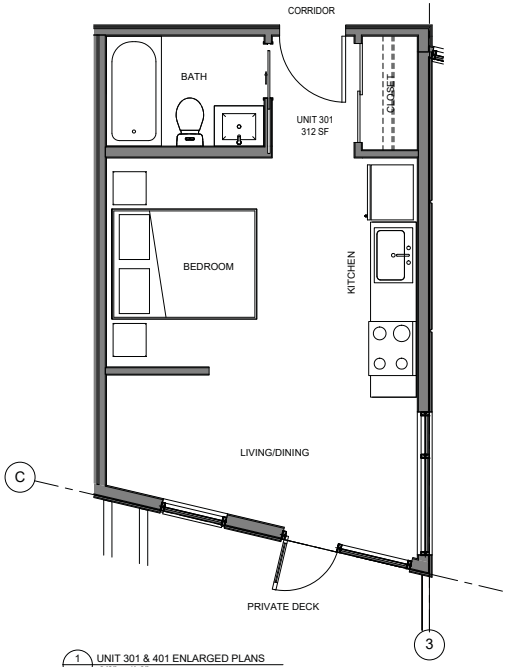
drawing title
LEVEL 2 UNIT PLANS

designed
scale 3/8" = 1'-0"
drawn J.F.
checked R.Y.

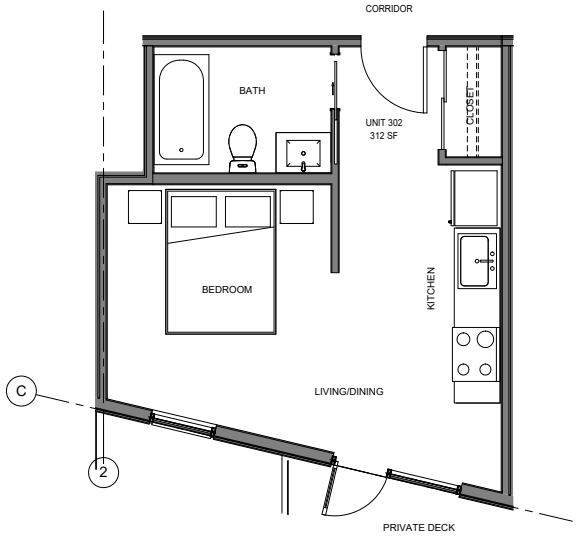
drawing no.
A3.07

plotte NOV 28, 2016

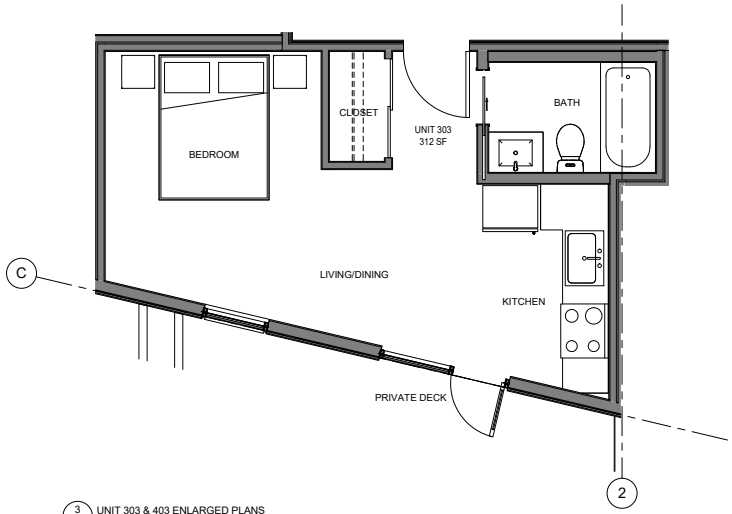
NOT FOR CONSTRUCTION



1 A3.03 UNIT 301 & 401 ENLARGED PLANS
3/8" = 1'-0"



2 A3.03 UNIT 302 & 402 ENLARGED PLANS
3/8" = 1'-0"



3 A3.03 UNIT 303 & 403 ENLARGED PLANS
3/8" = 1'-0"

ATTACHMENT B
This forms part of application
Z17-0023
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City of Kelowna
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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

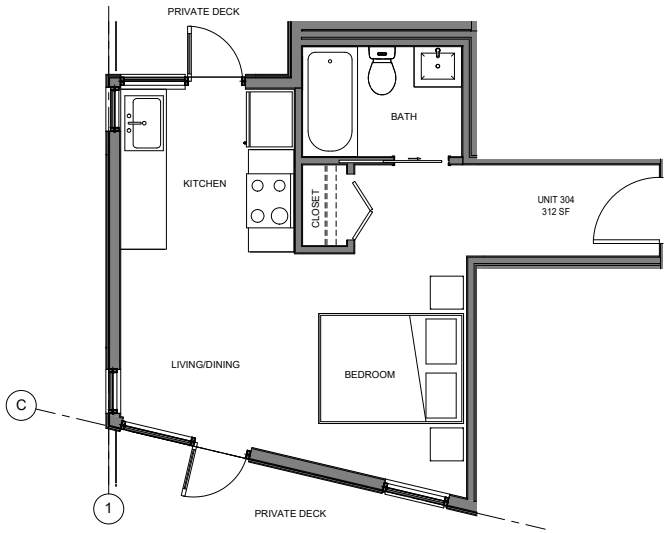
drawing title
LEVEL 3 & 4 UNIT PLANS

designed
drawn J.F.
checked R.Y.
scale 3/8" = 1'-0"

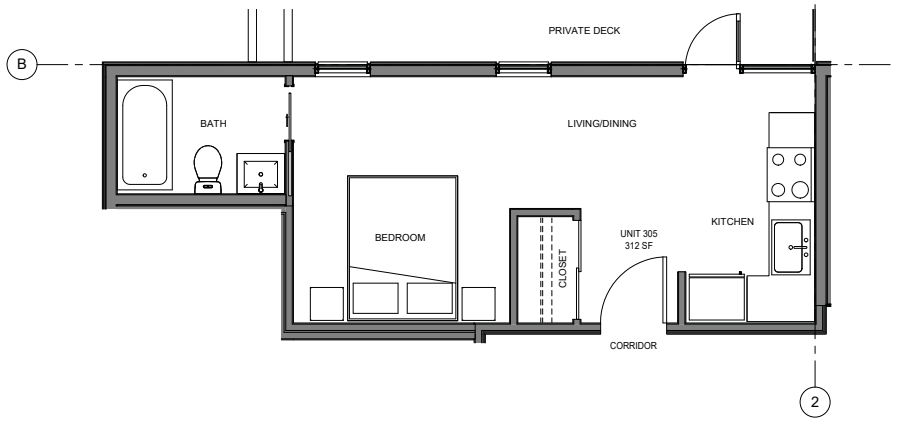
drawing no. A3.08

plotted NOV 28, 2016

NOT FOR CONSTRUCTION



1 A3.03 UNIT 304 & 404 ENLARGED PLANS
3/8" = 1'-0"



2 A3.03 UNIT 305 & 405 ENLARGED PLANS
3/8" = 1'-0"

ATTACHMENT **B**
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna
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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
LEVEL 3 & 4 UNIT PLANS

designed | scale 3/8" = 1'-0"
drawn J.F.
checked R.Y.

drawing no. **A3.09**

plotte NOV 28, 2016

NOT FOR CONSTRUCTION

EXTERIOR MATERIAL LEGEND

- STUCCO - LIGHT GREY/BEIGE
  COLOUR: TBD
- STUCCO - GRAY/BEIGE
  COLOUR: TBD
- CEMENT FIBER BOARD - WOOD GRAIN
  COLOUR: ALLURA, WOOD GRAIN, TBD
- CEMENT FIBER BOARD - SOLID BLACK
  COLOUR: TBD
- CEMENT COLUMN - PAINTED BLACK
  COLOUR: TBD
- PREFINISHED METAL FLASHING - BLACK
  COLOUR: TO MATCH BLACK FIBER CEMENT BOARD & WINDOWS/DOORS
- PREFINISHED METAL FLASHING - GRAY/BEIGE
  COLOUR: TO MATCH STUCCO FINISH
- GARAGE OVERHEAD DOOR - PAINTED TO MATCH EXTERIOR

ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

1 A1 FRONT ELEVATION
1/8" = 1'-0"

EXTERIOR MATERIAL LEGEND

1. STUCCO - LIGHT GREY/BEIGE
2. STUCCO - GREY/BEIGE
3. CEMENT FIBER BOARD - WOOD GRAIN
4. CEMENT FIBER BOARD - SOLID BLACK
5. WINDOWS - STYLE / MANUFACTURE TO BE CONFIRMED
6. GLASS PATIO DOOR
7. ALUMINUM STORFRONT - GLAZING AND DOORS
8. PAINTED METAL DOORS
9. ALUMINUM / GLASS GUARDRAILS
10. PREFINISHED METAL FLASHINGS
11. OVERHEAD PREFINISHED GARAGE DOOR
12. CONCRETE COLUMNS - PAINTED

2 A3.01 RIGHT SIDE ELEVATION
1/8" = 1'-0"

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING ELEVATIONS

designed
scale As indicated
drawn J.F.
checked R.Y.

drawing no.
A4.01

plotted NOV 28, 2016

NOT FOR CONSTRUCTION

EXTERIOR MATERIAL LEGEND

- STUCCO - LIGHT GREY/BEIGE
  COLOUR: TBD
- STUCCO - GRAY/BEIGE
  COLOUR: TBD
- CEMENT FIBER BOARD - WOOD GRAIN
  COLOUR: ALLURA, WOOD GRAIN, TBD
- CEMENT FIBER BOARD - SOLID BLACK
  COLOUR: TBD
- CEMENT COLUMN - PAINTED BLACK
  COLOUR: TBD
- PREFINISHED METAL FLASHING - BLACK
  COLOUR: TO MATCH BLACK FIBER CEMENT BOARD & WINDOWS/DOORS
- PREFINISHED METAL FLASHING - GRAY/BEIGE
  COLOUR: TO MATCH STUCCO FINISH
- GARAGE OVERHEAD DOOR - PAINTED TO MATCH EXTERIOR

ATTACHMENT **B**

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

1 A3.01 REAR ELEVATION
1/8" = 1'-0"

EXTERIOR MATERIAL LEGEND

1. STUCCO - LIGHT GREY/BEIGE
2. STUCCO - GREY/BEIGE
3. CEMENT FIBER BOARD - WOOD GRAIN
4. CEMENT FIBER BOARD - SOLID BLACK
5. WINDOWS - STYLE / MANUFACTURE TO BE CONFIRMED
6. GLASS PATIO DOOR
7. ALUMINUM STORFRONT - GLAZING AND DOORS
8. PAINTED METAL DOORS
9. ALUMINUM / GLASS GUARDRAILS
10. PREFINISHED METAL FLASHINGS
11. OVERHEAD PREFINISHED GARAGE DOOR
12. CONCRETE COLUMNS - PAINTED

2 A3.01 LEFT SIDE ELEVATION
1/8" = 1'-0"

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Revisions

No	Date	Description

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

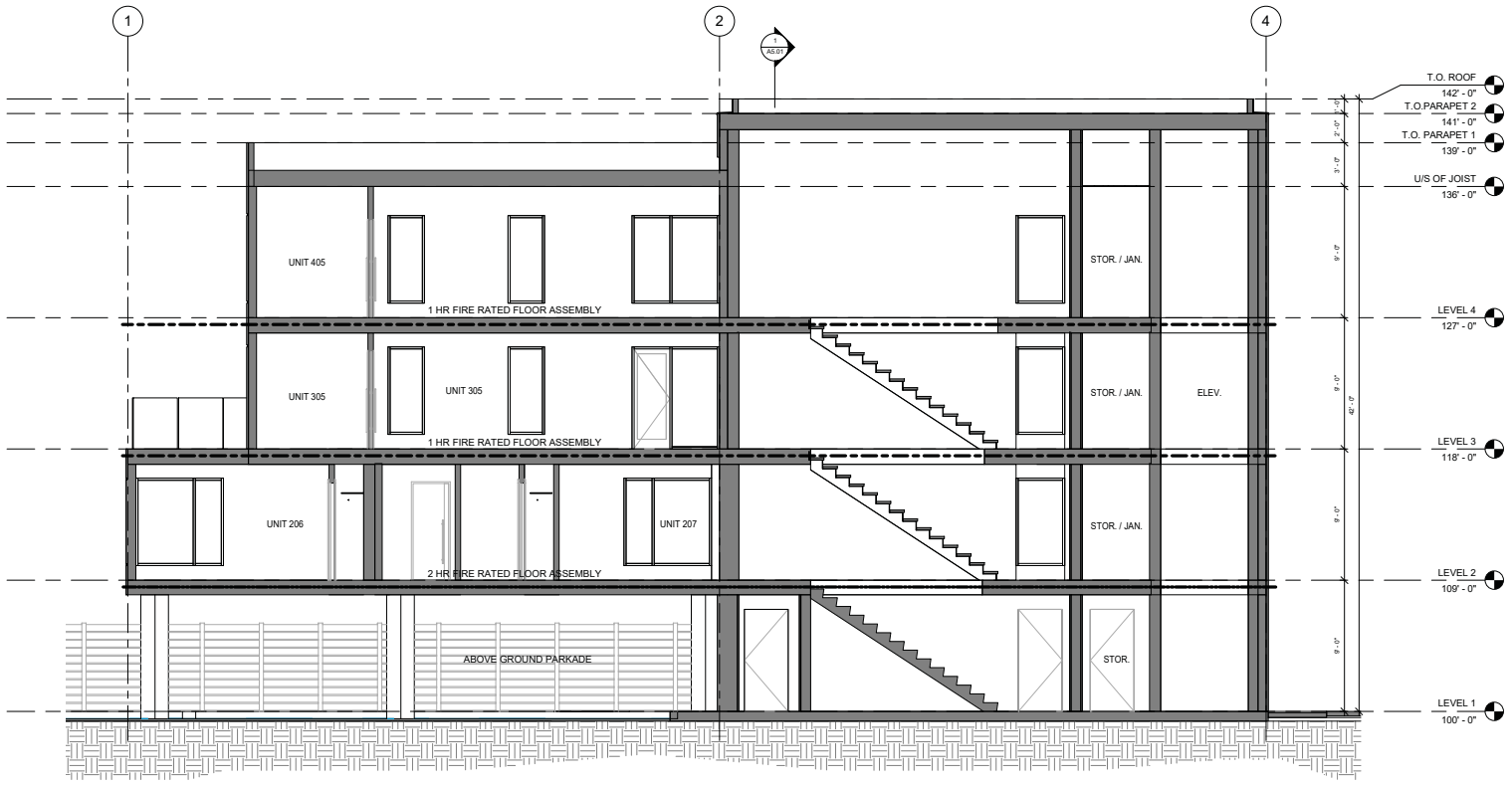
drawing title
BUILDING ELEVATIONS

designed
scale As indicated
drawn J.F.
checked R.Y.

drawing no.
A4.02

plotted NOV 28, 2016

NOT FOR CONSTRUCTION



1 A3.01 BUILDING SECTION @ STAIRWELL
1/4" = 1'-0"

ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
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FIRE SEPARATION LEGEND
1 HR FRR
2 HRS FRR

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Revisions

No	Date	Description
1	MAR 6, 2017	ISSUED FOR DP

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING SECTIONS

designed
scale As indicated
drawn J.F.
checked R.Y.
drawing no. **A5.00**
plotte NOV 28, 2016

NOT FOR CONSTRUCTION

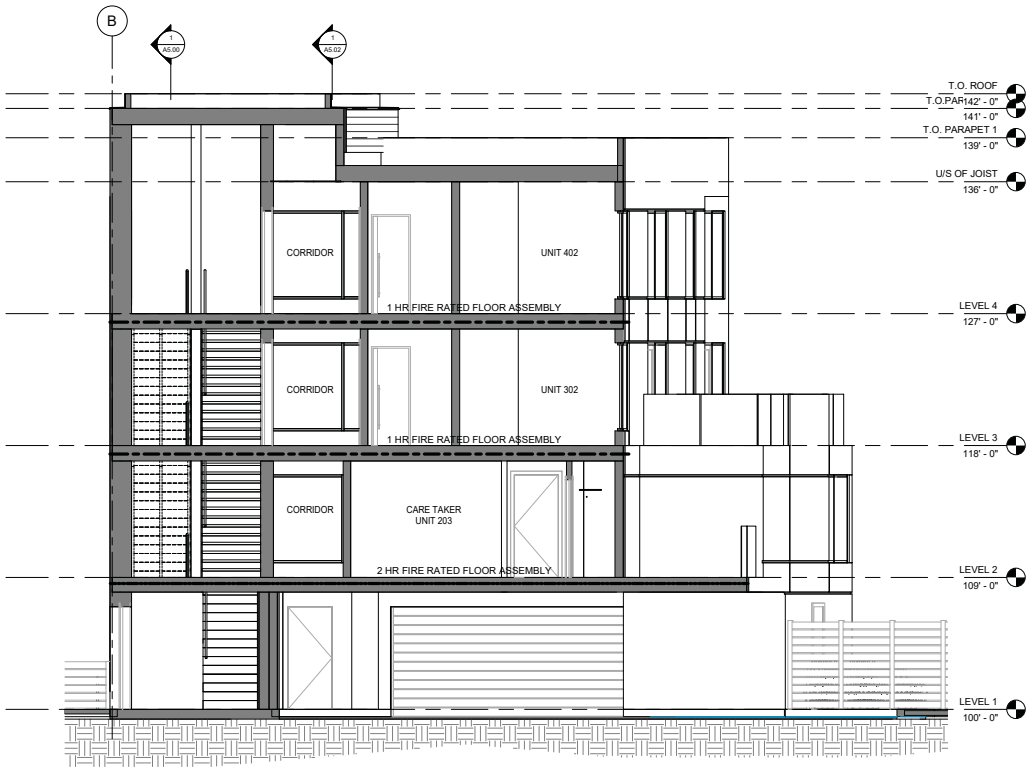
ATTACHMENT **B**

This forms part of application

Z17-0023

City of Kelowna
COMMUNITY PLANNING

Planner Initials AC



1 A3.01 BUILDING SECTION @ STAIRWELL
1/4" = 1'-0"

FIRE SEPARATION LEGEND

1 HR FRR

2 HRS FRR

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Revisions

No	Date	Description

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

file

drawing title
BUILDING SECTIONS

designed | scale As indicated

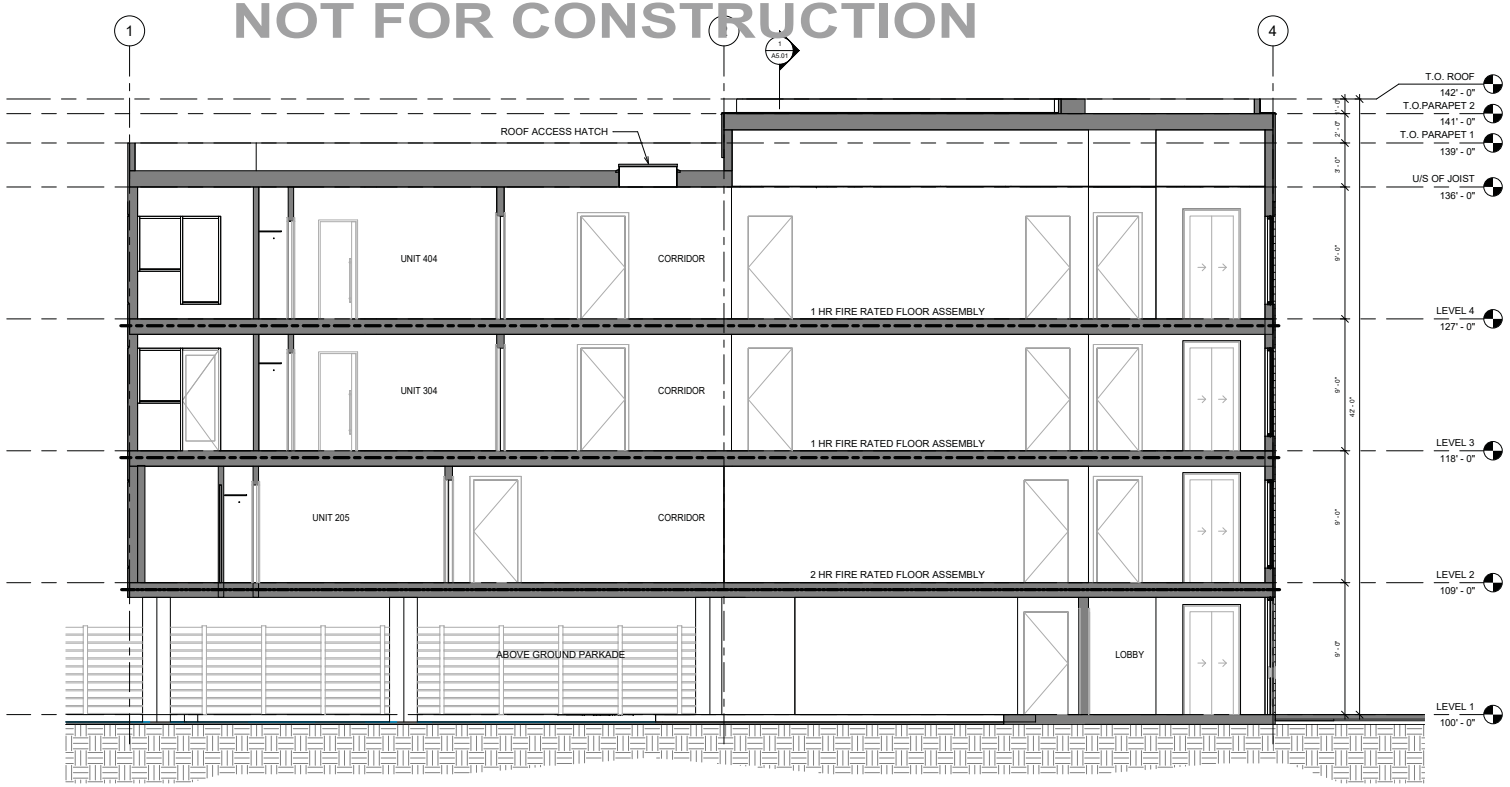
drawn J.F.

checked R.Y.

drawing no.
A5.01

plotte NOV 28, 2016

NOT FOR CONSTRUCTION



1 / A3.01 BUILDING SECTION @ CORRIDOR
1/4" = 1'-0"

ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna
COMMUNITY PLANNING

FIRE SEPARATION LEGEND
1 HR FRR
2 HRS FRR

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SEAL

Revisions

No	Date	Description

project
BELAIRE AVE CONDOMINIUM

project address
BELAIRE AVE, KELOWNA, BC

project no. 4010

drawing title
BUILDING SECTIONS

designed | scale As indicated
drawn J.F.
checked R.Y.

drawing no.
A5.02

plotte NOV 28, 2016

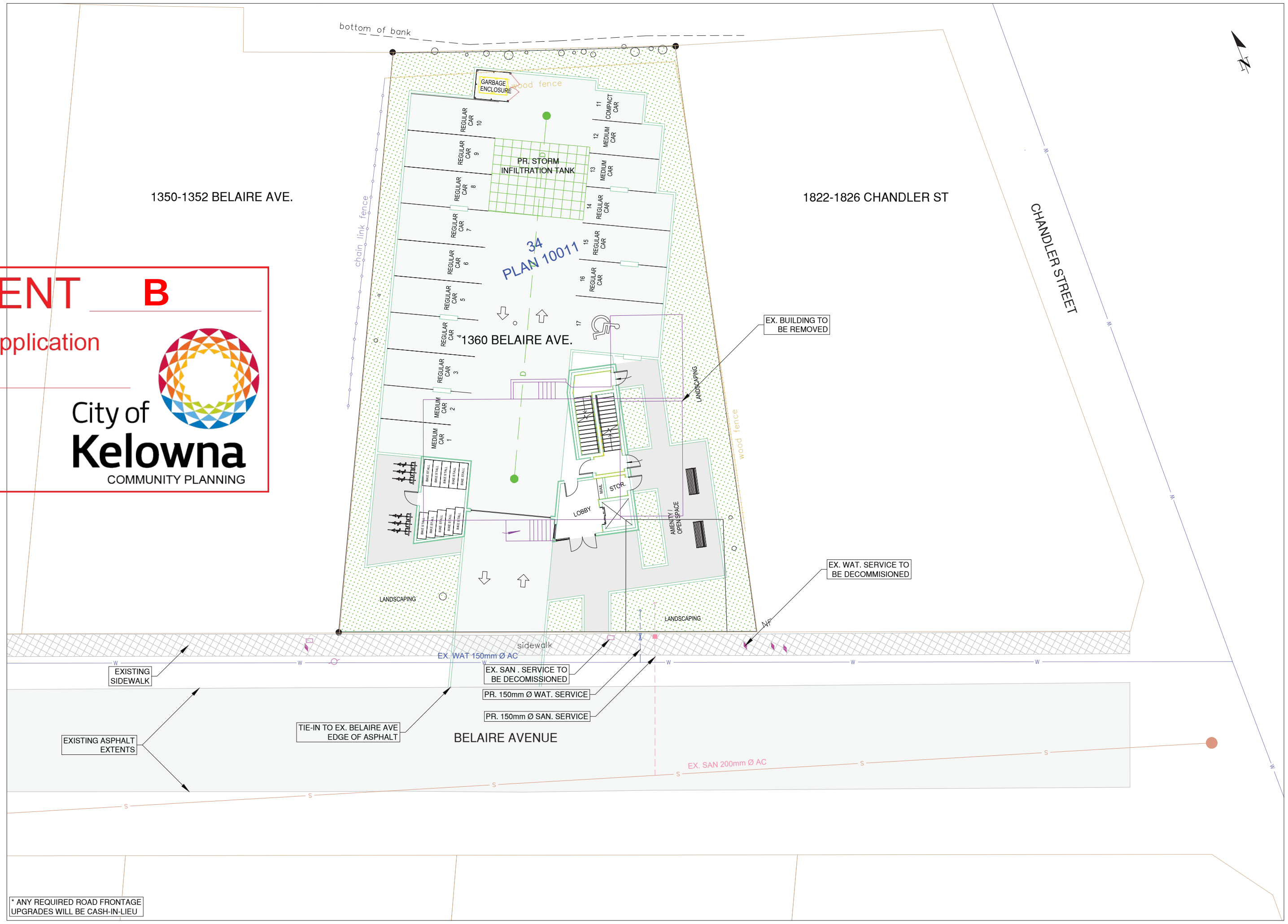
ATTACHMENT B

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING



NO.	YY/MM/DD	BY	REVISION	CH'KD

NEW TOWN
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BASE	JP
DESIGN	JP
APPROVED	JBK
DATE	2017/03/06
SCALE	1:150

CITY OF KELOWNA
DESIGN AND CONSTRUCTION

SERVICING PLAN
BELAIRE AVENUE CONDOMINIUM
BELAIRE AVE, KELOWNA, B.C.

The location of existing underground utilities are shown in an approximate way only & have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work, and agrees to be fully responsible for any and all damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.

DRAWING NO. 101
REV. NO. -

City of Kelowna

1435 Water Street
Kelowna, BC V1Y 1J4
250 469-8500
kelowna.ca

Landscape Water Conservation Report

LANDSCAPE WATER USE AREA

Applicant: Iniste Design | Address: 1360 Belaire Avenue Kelowna BC

Step 1: Measure Total Landscape Area (LA)

Area of site that will absorb water: 242 sq.m.

Note: Include boulevard, and proposed lawn, plants, mulch, pervious decks or paving stones. Do not include areas that are not pervious such as buildings, paved driveways, concrete patios etc.

Step 2: Divide Into Landscape Treatments*		Plant Factor	Irrig Efficiency	Hydrozone Area	% of Total LA	Estimated Water
Note: each of the areas below are a 'HYDROZONE'		(PF)	(IE)	(HA)		(WU)
Unwatered Pervious Areas (not impervious paving)						
Mulch (Stone, bark or sand)		N/A	N/A		0%	N/A
Pervious deck (Spaced wood deck)		N/A	N/A		0%	N/A
Pervious paving (ie: AquaPave, Rima Pave)		N/A	N/A		0%	N/A
Naturalized meadow (wildflowers)		N/A	N/A		0%	N/A
Naturalized area (Existing natural area)		N/A	N/A		0%	N/A
Other:		N/A	N/A		0%	N/A
Swimming or ornamental pool		1	1	0	0%	0
Watered Planting Beds (shrubs or groundcover)						
Planting Type	*Irrig Efficiency*					
Low water use plants	High (Drip or Bubbler)	0.3	0.9	63	26%	17
Low water use plants	Moderate (Spray orRotor)	0.3	0.7	38	16%	13
Moderate water use plants	High (Drip or Bubbler)	0.5	0.9	52	21%	23
Moderate water use plants	Moderate (Spray orRotor)	0.5	0.7		0%	0
High water use plants	High (Drip or Bubbler)	0.7	0.9		0%	0
High water use plants	Moderate (Spray orRotor)	0.7	0.7		0%	0
Watered Mown Lawn Areas	Low	1	0.7	89	37%	102
Special Landscape Areas (SLA)						
Vegetable Garden	High (Drip or Bubbler)	1	0.9		0%	0
Vegetable Garden	Moderate (Spray orRotor)	1	0.7		0%	0
Sports Lawn (Commercial / Parks)	Moderate (Spray orRotor)	1	0.7		0%	0
Rainwater or Recycled Water Use		0.3	1		0%	0
Totals				242	100%	155
Special Landscape Area (SLA) Sub total				0		

*If proposed design conditions are not shown on the form please contact Water Smart 250-460-0678

ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna COMMUNITY PLANNING

City of Kelowna

1435 Water Street
Kelowna, BC V1Y 1J4
250 469-8500
kelowna.ca

Landscape Water Conservation Report

Applicant:	see cover	Address:	see cover

CALCULATE & COMPARE WATER BUDGET TO ESTIMATED WATER USE

Total Landscape Area	242	sq.m.
Landscape Water Budget (WB)	194	cu.m./yr.
Estimated Landscape Water Use (WU)	155	cu.m./yr.
Under (-OVER) Budget (Must be under Water Budget WB)	39	cu.m./yr.
	OK	

ATTACHMENT **B**
This forms part of application
Z17-0023
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

I confirm by completing the attached Landscape Water Conservation Report, that the project will conform to industry best practices for landscape and irrigation installation in Kelowna. I also acknowledge that the landscape treatments of the project will conform to the Hydrozone areas as identified in the Landscape Area Water Use Area table.

Regan Hyde, CID — Name of Applicant (person submitting the form)

Date: 03-Mar-17

FOR CITY OF KELOWNA OFFICE USE ONLY

The calculations above satisfy the requirements of the Water Regulation Bylaw 10480 Section 4.4.2 and 4.4.3.and the application is hereby APPROVED with the signature of the Water Manager or designate.

Name of Kelowna Water Smart designate
For Water Manager

Date:

March 6, 2017

City of Kelowna
1435 Water Street
Kelowna, B.C. V1Y 1J4

SUBJECT: 1360 Belaire Avenue – Belaire Condominium Development Landscape Bonding

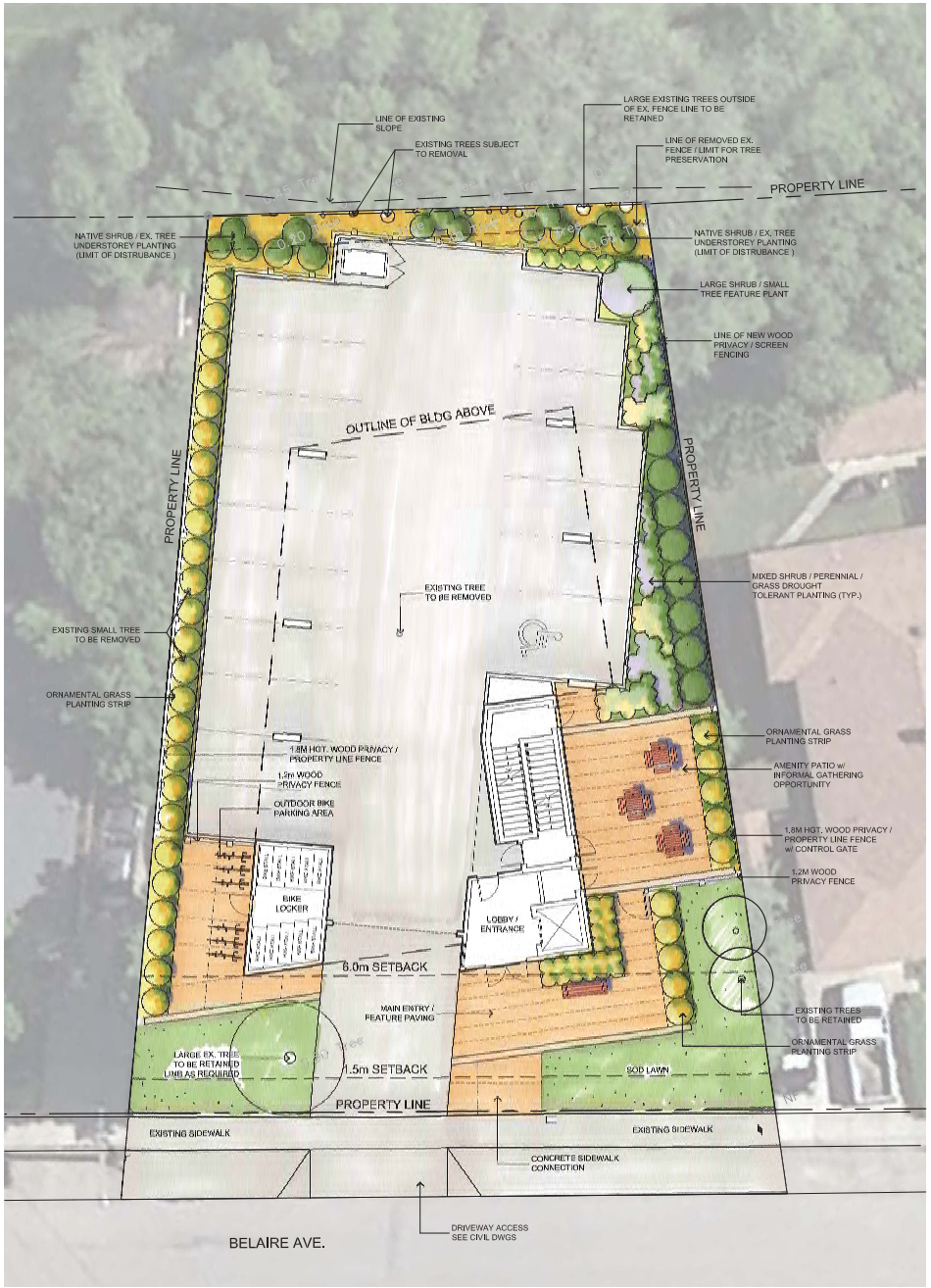
On behalf of New Town Services, INSITE DESIGN estimates a landscape development cost of **$16,643.00** for the supply and installation of soft landscaping components for above noted development. This cost includes: growing medium; shrubs and perennial landscaping; planting mulch and; automatic irrigation system. This cost is exclusive of any City multiplier for bonding.

Should you have any questions pertaining to this letter, please do not hesitate to contact the undersigned.

Yours truly,

David James, MBCSLA, M.L.Arch, B.E.S
Principal, INSITE DESIGN INC.

ATTACHMENT B
This forms part of application
Z17-0023
Planner Initials AC
City of Kelowna
COMMUNITY PLANNING



ATTACHMENT **B**

This forms part of application

Z17-0023

City of Kelowna
COMMUNITY PLANNING

Planner Initials AC

ISSUED FOR DP - NOT FOR CONSTRUCTION

BELAIRE CONDOMINIUMS - REPRESENTATIVE PLANT LIST

Qty	Botanical Name	Common Name	Size	Root	Mature Size (H x W)
	Shrubs				
6	*Cornus sericea 'Farrow'*	Arctic Fire Red Twig Dogwood	#02	Potted	1.25m x 1.0m
3	*Euonymus alatus 'Compactus'*	Compact Burning Bush	#02	Potted	1.5m x 1.75m
6	**Mahonia aquifolium*	Oregon Grape	#02	Potted	1.25m x 1.25m
1	**Sambucus racemosa 'Plumosa Aurea'*	Golden Plume Elder	#05	Potted	3.0m x 2.0m
8	**Syringa patula 'Miss Kim'*	Miss Kim Lilac	#02	Potted	1.5m x 1.5m
	Perennials / Groundcovers / Vines				
7	**Achillea millefolium 'Moonshine'*	Moonshine Yarrow	#01	Potted	0.6m x 0.6m
5	*Allium karataviense*	Purple Flowering Allium	#01	Potted	0.2m x 0.15m
15	*Arctostaphylos uva-ursi*	Kinnikinnick	#01	Potted	0.1m x 0.5m
8	*Echinacea purpurea 'Pow Wow'*	PowWow Purple Coneflower	#01	Potted	0.75m x 0.6m
7	**Hemerocallis 'Hyerion'*	Hyperion Daylily	#01	Potted	0.9m x 0.75m
13	*Perovskia atriplicifolia 'Little Spire'*	Little Spire Russian Sage	#01	Potted	0.5m x 0.6m
11	**Rudbeckia fulgida var. sullivantii 'Goldstrum'*	Goldstrum Coneflower	#01	Potted	0.75m x 0.6m
11	*Salvia x sylvestris ' Mainacht'*	May Night Salvia	#01	Potted	0.45m x 0.45m
	Ornamental Grasses				
19	**Calamagrostis acutiflora 'Karl Foerster'*	Karl Foerster	#01	Potted	1.5m x 0.75m
6	*Chasmanthium latifolium*	Northern Sea Oats	#01	Potted	1.0m x 0.75m
19	*Deschampsia caespitosa 'Bronzeschleier'*	Bronze Tufted Hair Grass	#01	Potted	1.0m x 0.6m
12	*Imperata cylindrica 'Red Baron'*	Japanese Blood Grass	#01	Potted	0.5m x 0.5m
6	**Miscanthus sinensis 'Purperascens'*	Flame Grass	#01	Potted	1.25m x 1.0m
8	*Pennisetum alopecuroides 'Little Bunny'*	Little Bunny Fountain Grass	#01	Potted	0.5m x 0.5m
5	**Saccharum ravennae*	Northern Pampas Grass	#01	Potted	2.5m x 1.2m

** Denotes 'Okanagan Inspired' plant species*

INSITE DESIGN
LANDSCAPE ARCHITECTURE ▪ URBAN DESIGN
P. 250.707.7804
C. 250.215.6079

NOTES

1. PLANT MATERIAL AND CONSTRUCTION SHALL MEET OR EXCEED B.C.L.N.A STANDARDS.
2. ALL PERENNIAL AND SHRUB PLANTING AREAS TO HAVE A MIN. 0.45m GROWING MEDIUM DEPTH.
3. ALL SOFT LANDSCAPE AREAS SHALL BE WATERED BY A TIMED AUTOMATIC UNDERGROUND IRRIGATION SYSTEM.
4. PLANT MATERIAL SELECTIONS ARE CONCEPTUAL ONLY. FINAL PLANT SELECTIONS MAY VARY DEPENDING ON AVAILABILITY.
5. ALL PLANTING BEDS SHALL HAVE A MINIMUM 50mm DEPTH OF APPROVED MULCH.
6. THIS DRAWING DEPICTS FORM AND CHARACTER AND IS TO BE USED FOR DEVELOPMENT PERMIT SUBMISSION ONLY. DRAWING IS NOT INTENDED FOR USE IN CONSTRUCTION.

NO.	Y/M/D	DESCRIPTION
1	17/03/08	ISSUED FOR DP
-	17/03/03	FOR CLIENT REVIEW

REVISIONS / ISSUED

CLIENT
NEW TOWN SERVICES
250-860-8185

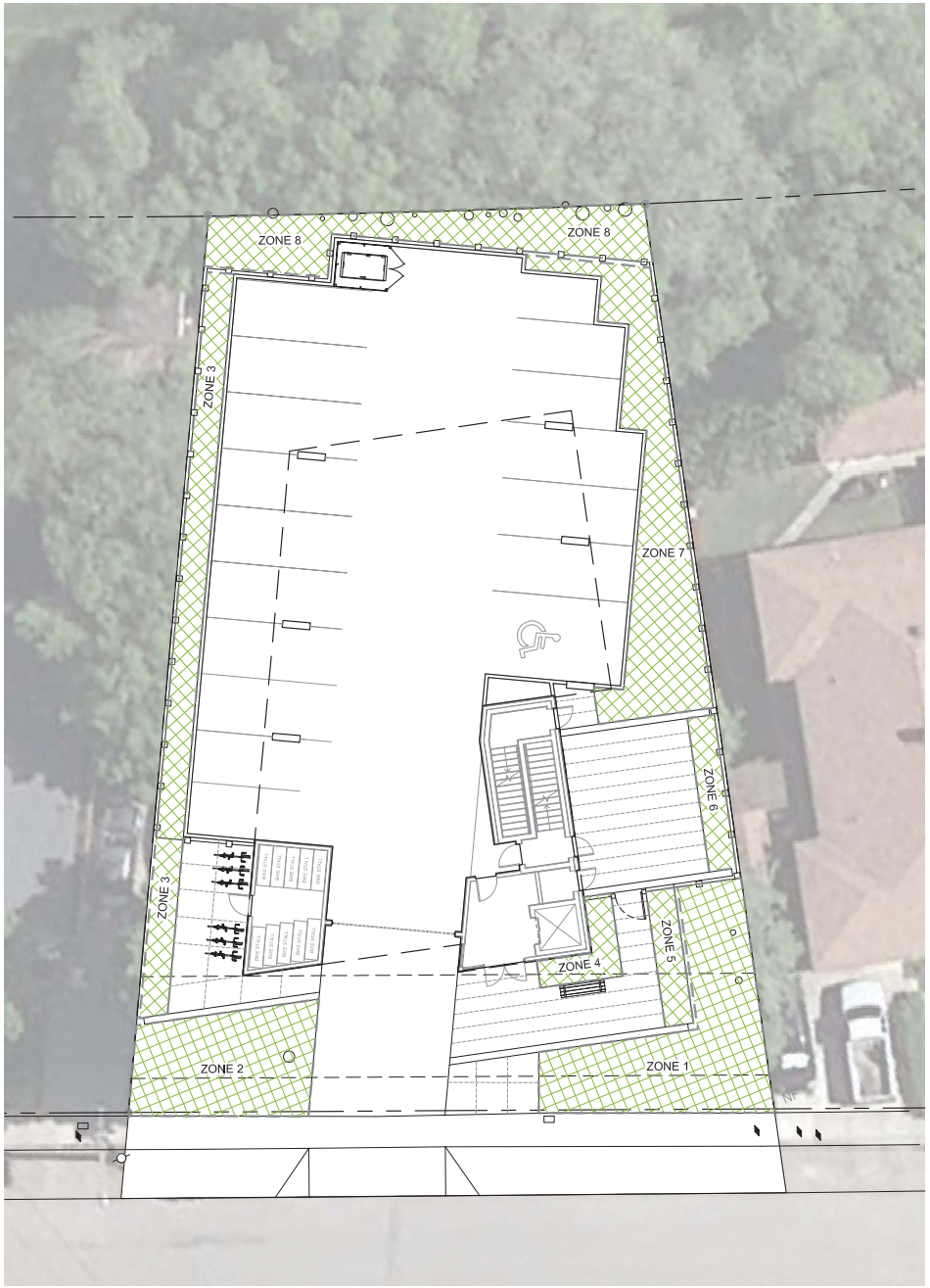
PROJECT
BELAIRE AVENUE
CONDOMINIUM DEVELOPMENT

1360 BELAIRE AVE.
KELOWNA, B.C.

DESIGN BY: DBJ
DRAWN BY: DBJ
CHECKED BY: DBJ
PROJECT NO.: 17-110
SCALE: 1:100

SHEET TITLE: LANDSCAPE PLAN

SHEET NO.: LDP-1



N

ATTACHMENT B

This forms part of application

Z17-0023

Planner Initials AC

City of Kelowna
COMMUNITY PLANNING

ISSUED FOR DP - NOT FOR CONSTRUCTION

IRRIGATION HYDROZONE

BELAIRE CONDOMINIUMS - HYDROZONES

*Hydrozone	Unit	Total	Landscape	Water Use	Mulch Type	Irrigation Comments
1,2 (on-site)	m2	89	Turf (Sod)	High	N/A	Low Volume Pop-Up Spray
3,4,5,6	m2	63	Grass / Perennial	Low	Bark	High Effeciency Subsurface Drip
7	m2	52	Shrub Hedge / Perennial	Moderate	Bark	High Effeciency Subsurface Drip
8	m2	38	Native Shrubs	Low	Bark	Temporary Irrigation

See Plan for Hydrozone Location

IRRIGATION HYDROZONE NOTES:

1. IRRIGATION SYSTEM TO HAVE HIGH-EFFECIENCY SPRAY, DRIPLINE AND EMITTER COMPONENTS.
2. IRRIGATION SYSTEM TO BE EQUIPPED WITH A BACKFLOW PREVENTION DEVICE, WATER METER, FLOW SENSOR AND SHUT-OFF VALVE.
3. SCH. 40 SLEEVING TO BE PROVIDED UNDER ALL HARD SURFACES AND FEATURES.
4. ALL IRRIGATION MAINLINES TO BE LOCATED ON PRIVATE PROPERTY.

INSITE DESIGN
LANDSCAPE ARCHITECTURE ▪ URBAN DESIGN

P. 250.707.7404
C. 250.215.6079

NOTES

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NO.	Y/M/D	DESCRIPTION
1	17/03/06	ISSUED FOR DP
-	17/03/03	FOR CLIENT REVIEW

REVISIONS / ISSUED

CLIENT
NEW TOWN SERVICES
250-860-8185

PROJECT
BELAIRE AVENUE
CONDOMINIUM DEVELOPMENT

1360 BELAIRE AVE.
KELOWNA, B.C.

DESIGN BY:	DBJ
DRAWN BY:	DBJ
CHECKED BY:	DBJ
PROJECT NO.:	17-110
SCALE:	1:100

SHEET TITLE: HYDROZONE PLAN

SHEET NO.: LDP-2

ATTACHMENT B

This forms part of application

Z17-0023

Planner Initials: AC

City of Kelowna
COMMUNITY PLANNING

NO.	YY/MM/DD	BY	REVISION	CH'KD

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

BASE	JP
DESIGN	JP
APPROVED	JBK
DATE	2017/03/06
SCALE	1:150

CITY OF KELOWNA
DESIGN AND CONSTRUCTION

GRADING PLAN
BELAIRE AVENUE CONDOMINIUM
BELAIRE AVENUE, KELOWNA, B.C.

The location of existing underground utilities are shown in an approximate way only & have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work, and agrees to be fully responsible for any and all damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.

DRAWING NO.	REV. NO.
102	-

REPORT TO COUNCIL

Date:	May 29, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (TB)		
Application:	Z17-0011	**Owner:**	Wayne Keith Henney Denise Alana Henney
Address:	2446 Harvard Road	**Applicant:**	Wayne Keith Henney
Subject:	Rezoning Application		
Existing OCP Designation:	REP – Resource Protection Area		
Existing Zone:	A1 – Agriculture 1		
Proposed Zone:	A1c – Agriculture 1 with Carriage House		

1.0 Recommendation

THAT Rezoning Application No. Z17-0011 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot A, Section 33, Township 29, ODYD, Plan 9442, located at 2446 Harvard Road, Kelowna, BC from the A1 – Agriculture 1 zone to the A1 – Agriculture 1 with Carriage House zone **NOT** be considered by Council.

2.0 Purpose

To consider a Staff recommendation to NOT rezone the subject property that would facilitate the conversion of an existing accessory building into a carriage house.

3.0 Community Planning

Community Planning does not recommend support for the proposed rezoning as the subject property is not located in an urban area of the City and is outside the Official Community Plan (OCP) Permanent Growth Boundary.

The property and the surrounding neighbourhood does not have adequate urban amenities (sidewalks, cycling lanes, transit, etc.) to support even a modest increase in density and represents an inefficient use of the land. While the 3.43 acre property is not farmed today, it does have potential in the future for agricultural production and a proposed carriage house partially erodes this possibility. Further, the property is immediately adjacent to the ALR and other actively farmed properties, and so the increased density may place further pressure and conflict on the operations of these farms.

The City's Agricultural Plan reinforces this urban/rural conflict and states:

> *Policy .8 Housing in Agricultural Areas*. Discourage residential development (both expansions and new developments) in areas isolated within agricultural environments (both ALR and non-ALR).

An Alternate Recommendation of support has been included in the report under Section 8.0 for Council's consideration.

4.0 Proposal

4.1 Background

The subject property is 3.43 acres and is currently zoned A1 – Agriculture. The property is not located within the Agricultural Land Reserve (ALR), but is adjacent to ALR Lands on the north east property line. The existing accessory building was constructed in 2001 and met the Zoning Bylaw requirements at that time for an accessory building. To convert the accessory building to a carriage house triggers three variances based on the different zoning requirements for an accessory building versus a carriage house.

The property is not currently actively farmed and does not have Farm Status through BC Assessment.

4.2 Project Description

The subject property is located outside of the Permanent Growth Boundary, and the Official Community Plan (OCP) Future Land Use is Resource Protection Area.

The applicants are proposing to rezone to A1c – Agriculture with Carriage House to convert the existing accessory building to a carriage house for family use. The habitable area of the carriage house would be on the upper floor while the lower floor would remain as a garage plus workshop area. The accessory building is already connected to power, water, and septic field. Access would be from the existing driveway and the carriage house would meet the parking and private outdoor space requirements.

The proposal is inconsistent with several OCP Policies. The OCP Policy regarding designated growth areas is firm in that growth and density should only occur within the Permanent Growth Boundary in order to contain urban growth and protect and preserve agricultural land. While this land is not actively being farmed, it is immediately adjacent to the ALR and is well outside the Permanent Growth Boundary. Further, the OCP Policy of Compact Urban Form encourages density where infrastructure already exists and is well serviced with amenities and transportation options. Finally, the Future Land Use is Resource Protection Area, which is a designation that does not support subdivision or further densification. This rezoning effectively increases density by allowing a second dwelling unit on the property in the form of a Carriage House.

The City of Kelowna Agriculture Plan reflects the OCP policies mentioned above and recommends against allowing isolated development that is within agricultural areas, regardless of ALR status. The Plan also directs urban uses (such as carriage house development) to urban areas in order to reduce pressure on the rural-agricultural boundary to prevent further development and speculative pressure. There is a precedent of conflict that can occur along urban-agricultural interfaces including complaints of noise, spray, tractor traffic, and prospective development encroaching on agricultural land.

The Agricultural Advisory Committee reviewed the application on March 13, 2017 and recommended support for the rezoning subject to the applicant registering a 219 Restrictive Covenant on-title restricting

any additional dwelling units on the property, including any potential additional suites or mobile home. The committee recognized that the property was not currently being used for agriculture and was not immediately adjacent to prominent ALR land and therefore would have minimal impact on agriculture in the area.

4.3 Variances Requested

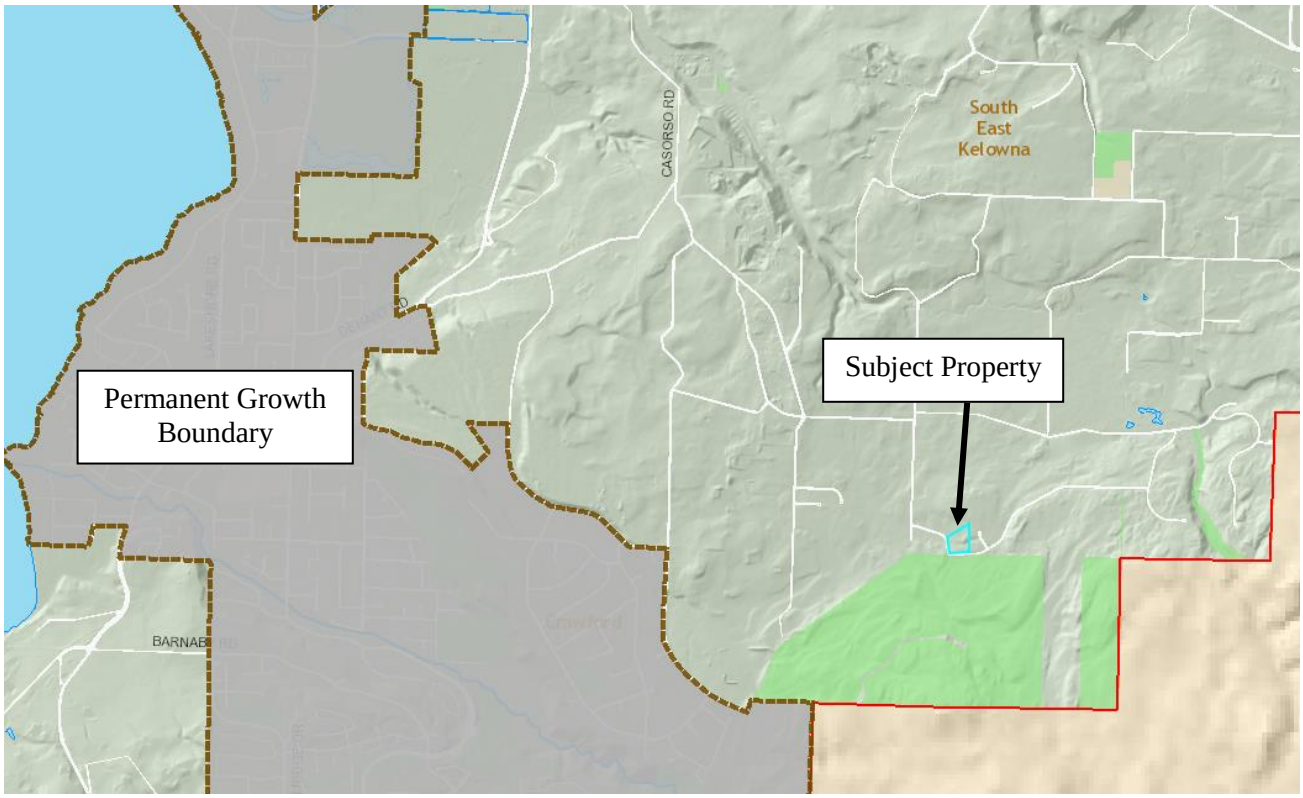
Should Council approve the rezoning, the following variances will need to be considered prior to 4th reading for the conversion of the accessory building into a carriage house. The first variance is due to the location of the accessory building being more than 10m away from the primary dwelling (10.0m required, 21.5m existing). This provision in the Zoning Bylaw was created to encourage carriage houses on agricultural land to be located close to the existing dwelling, using a residential homeplating footprint so as to have minimal impact on viable agricultural land.

The second variance is to vary the maximum height relative to the primary dwelling at peak. The Zoning Bylaw states that the carriage house must be less than the primary dwelling at mid-point and at peak. The main dwelling has an overall height at peak of 6.9m and the existing accessory dwelling as an overall height at peak of 7.43m.

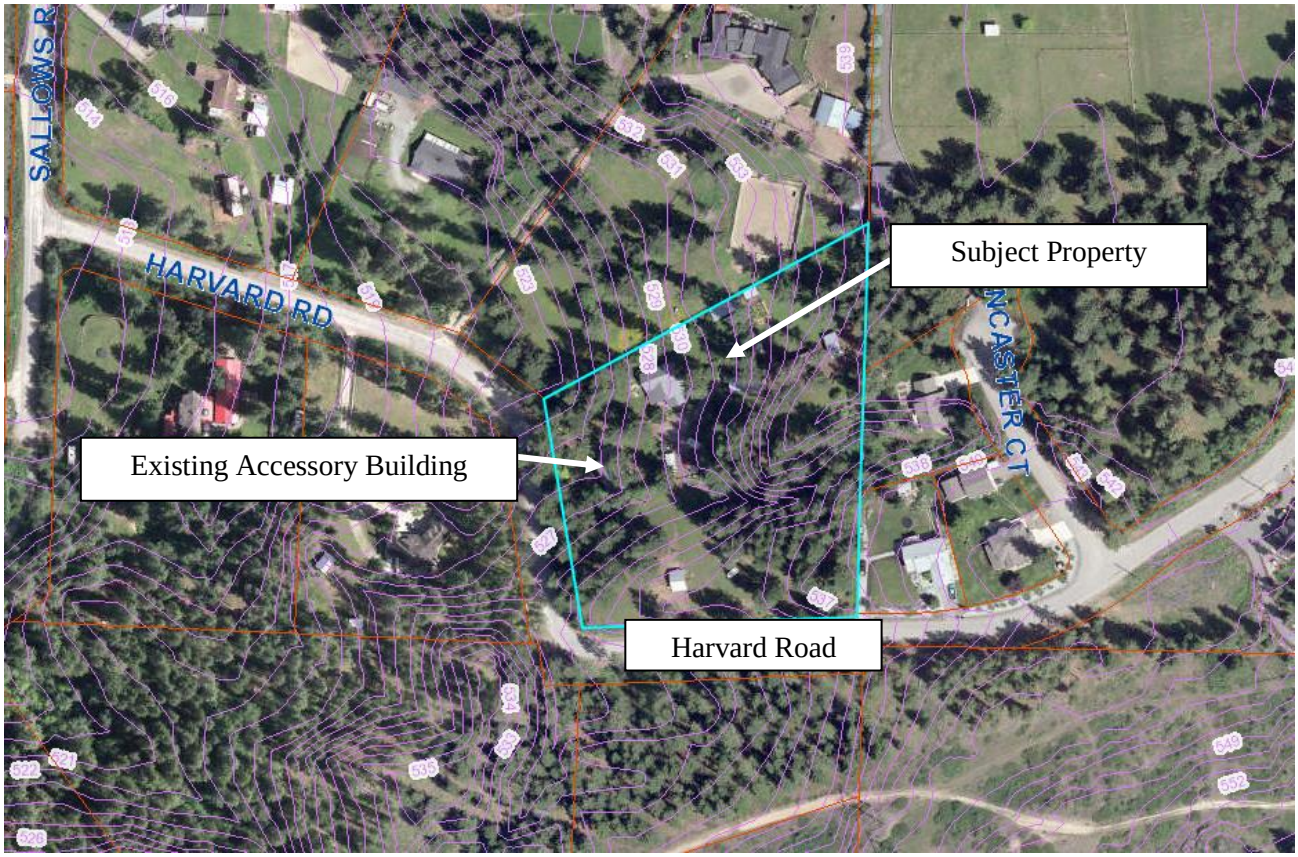
The third variance is to vary the maximum footprint of a carriage house from 90m² (required) to 118.9m² (existing). The habitable floor area of the carriage house *does* meet the requirements as only the upper floor will be used as habitable space.

4.4 Maps

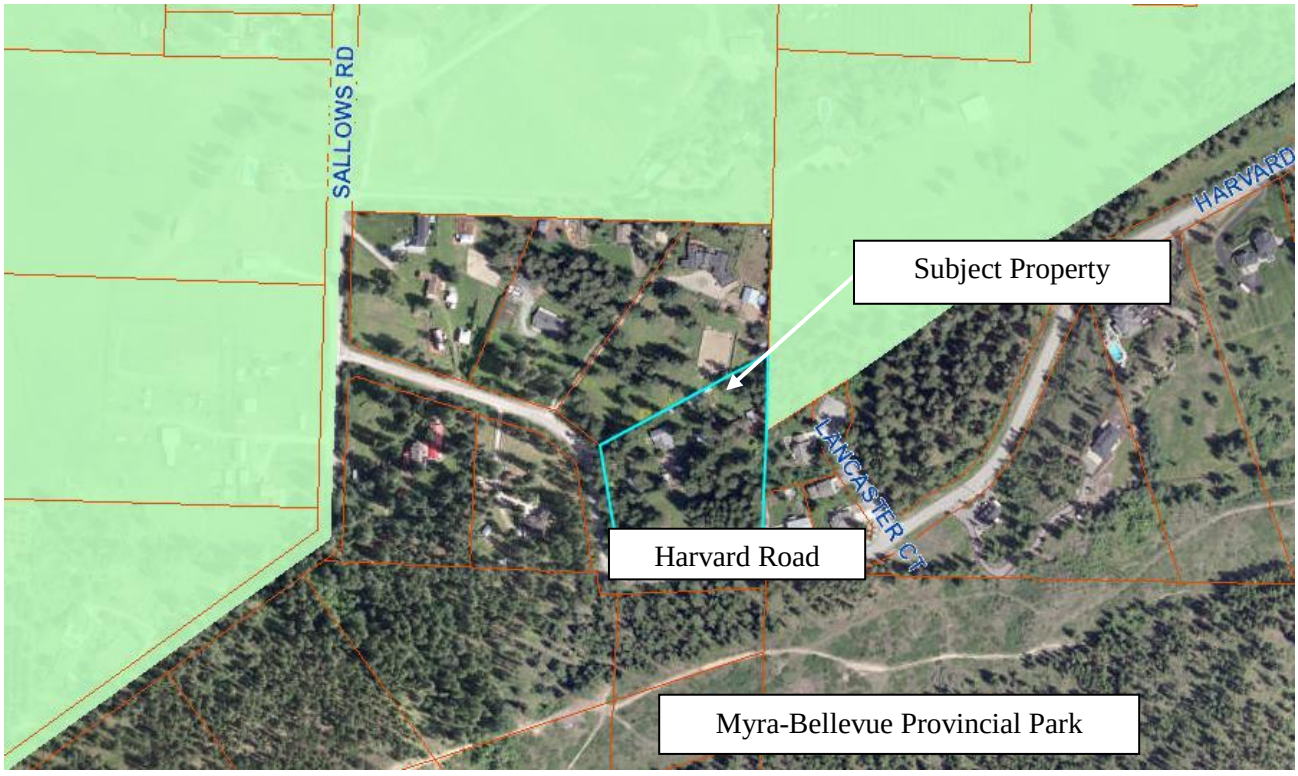
Map 1 – Context Map



Map 2 – Neighbourhood



Map 3 – Agricultural Land Reserve



4.5 Neighbourhood Context

The subject property lies within the Southeast Kelowna Sector. It is located east of Sallows Road and north of Myra-Bellevue Park. The property is not located within the Permanent Growth Boundary and is adjacent ALR Land.

Orientation	Zoning	Land Use
North	A1 – Agriculture	Rural Residential
South	A1 - Agriculture	Park
East	A1 – Agriculture RR3 – Rural Residential 3	Agriculture Rural Residential
West	RR1 – Rural Residential 1	Rural Residential

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

OCP Chapter 1: Introduction
Goals for a Sustainable Future
Contain Urban Growth. Reduce greenfield urban sprawl and focus growth in compact, connected and mixed-use (residential and commercial) urban and village centres.

OCP Chapter 4: Future Land Use
Permanent Growth Boundary (PGB)
Lands within the permanent growth boundary may be considered for urban uses within the 20-year planning horizon ending 2030. Lands designated as Future Urban Reserve within the permanent growth boundary may be considered for urban uses beyond 2030. Lands outside the permanent growth boundary will not be supported for urban uses. Non-ALR land outside the Permanent Growth Boundary will not be supported for any further parcelization.

Objective 5.3 Focus development to designated growth areas
Policy .2 Compact Urban Form. Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns.

Objective 5.33 Protect and enhance local agriculture
*Policy .3 Urban Uses***.** Direct urban uses to lands within the urban portion of the Permanent Growth Boundary, in the interest of reducing development and speculative pressure on agricultural lands.

*Policy .8 Housing in Agricultural Areas***.** Discourage residential development (both expansions and new developments) in areas isolated within agricultural environments (both ALR and non-ALR).

OCP Chapter 15: Farm Protection DP Guidelines
Objectives
- Protect farm land and farm operations;
- Minimize the impact of urban encroachment and land use conflicts on agricultural land;
- Minimize conflicts created by activities designated as farm use by ALC regulation and non-farm uses within agricultural areas.

Guidelines

- On properties located adjacent to agricultural lands, design buildings to reduce impact from activities associated with farm operations.
- On agricultural and non-agricultural lands, establish and maintain a landscape buffer along the agricultural and/or property boundary, except where development is for a permitted farm use that will not encourage public attendance and does not concern additional residences (including secondary suites).
- Design any subdivision or urban development of land to reduce densities and the intensity of uses gradually towards the boundary of agricultural lands.

5.2 Agriculture Plan (1998)

Transportation Policies

New Growth Areas. Discourage the establishment of new growth areas within or beyond agricultural areas that create additional traffic pressure on the local rural road network.

Urban-Rural/Agricultural Boundary Policies

*Farmland Preservation***.** Direct urban uses to land within the urban portion of the defined urban – rural / agricultural boundary, in the interest of reducing development and speculative pressure, toward the preservation of agricultural lands and discourage further extension of existing urban areas into agricultural lands.

Isolated Development. In general, not support extensions to existing development or new development isolated within agricultural areas, regardless of ALR status.

6.0 Technical Comments

6.1 Building & Permitting Department

- Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permits.
- Operable bedroom windows required as per the 2012 edition of the British Columbia Building Code (BCBC 12).
- Provide the City of Kelowna Bulletin #12-03 (Secondary Suites Requirements in a single family dwelling) for minimum requirements. The drawings submitted for Building Permit application is to indicate the method of fire separation between the suite and the garage.
- Range hood above the stove and the washroom to vent separately to the exterior of the building. The size of the penetration for this duct thru a fire separation is restricted by BCBC 12, so provide size of ducts and fire separation details at time of Building Permit Applications.
- A fire rated exit stairwell is required from the suite to the exterior c/w fire rated doors that open into the stairwell and a fire rating on the bottom of the stairs. Please provide these details on the building permit drawing sets.
- Full Plan check for Building Code related issues will be done at time of Building Permit applications.

6.2 Development Engineering Department

- Please see attached Schedule "A" dated March 14, 2017

6.3 Bylaw Services

- No Bylaw files pertaining to property address 2446 Harvard Rd.

6.4 Central Okanagan Regional District

- RDCO staff has reviewed the below-noted referral and advises that the RDCO's interests are unaffected. Thank you for the opportunity to comment.

6.5 Fire Department

- No concerns with the zoning. Because this site is in a Wildland Urban Interface area, vinyl siding would not be the best choice for building material.

6.6 Irrigation District – South East Kelowna Irrigation District

We have reviewed the above referenced application for water supply requirements. A copy of the technical review from our consulting engineers is attached for your information. Water service is available upon payment of the following fee:

Capital Expenditure Charge, Secondary Suite	$1,200.00
Total:	$1,200.00

7.0 Application Chronology

Date of Application Received:	January 30, 2017
Date Public Consultation Completed:	March 22, 2017
Agricultural Advisory Committee	March 13, 2017

The above noted application was reviewed by the Agricultural Advisory Committee at the meeting held on March 13, 2017 and the following recommendations were passed:

Moved by Keith Duhaime/**Seconded by** Tarsem Goraya

THAT the Agricultural Advisory Committee recommends that Council support Rezoning Application No. Z17-0011 for the property located at 2446 Harvard Road, Kelowna, BC to rezone the subject property from the A1 - Agriculture 1 zone to the A1c - Agriculture 1 with Carriage House zone for the purposes of converting an existing accessory building to a carriage house;

AND THAT the Agricultural Advisory Committee recommends that Council support Development Variance Application No. DVP17-0027 for the property located at 2446 Harvard Road, Kelowna, BC to vary:

- the distance from primary dwelling;
- the height relative to peak of primary dwelling; and

- the maximum footprint of from 90m² required to 118.9m² existing.

Carried

ANCEDTAL COMMENTS:
The Agricultural Advisory Committee recommends that a covenant be registered on title to the subject property restricting any additional dwelling units on the property, including any potential additional suite or mobile home.

8.0 Alternate Recommendation

THAT Rezoning Application No. Z17-0011 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot A, Section 33, Township 29, ODYD, Plan 9442, located at 2446 Harvard Road, Kelowna, BC from the A1 – Agriculture 1 zone to the A1c – Agriculture 1 with Carriage House zone, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated May 29, 2017;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the applicant registering a 219 Restrictive Covenant on title restricting any additional dwelling units on the property including any additional suites or mobile home;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Variance Permit for the subject property.

Report prepared by:	Trisa Brandt, Planner
Reviewed by:	Todd Cashin, Subdivision, Suburban and Rural Planning Manager
Reviewed by:	Ryan Smith, Community Planning Department Manager
Approved for Inclusion:	Doug Gilchrist, Divisional Director, Community Planning & Real Estate

Attachments:

Attachment "A": Applicant's Application Package
Attachment "B": Photos
Schedule "A": Development Engineering Memorandum

WEST ELEVATION | SOUTH ELEVATION

EAST ELEVATION | NORTH ELEVATION

ELEVATIONS

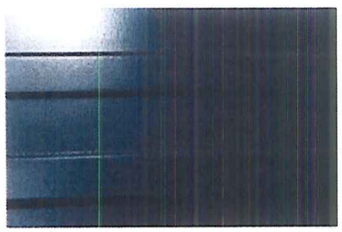
PARKING AREA AT TOP OF DRIVEWAY | FRONT OF HOUSE (PRINCIPLE BUILDING)

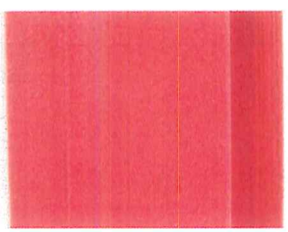
DRIVEWAY FROM FRONT GATE | VIEW OF HOUSE AND ACCESSORY BLDG. FROM N.W. CORNER

SITE VIEWS

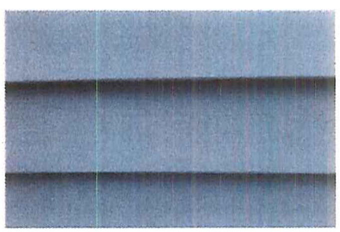
WHITE (DOORS, WINDOWS, GUTTERS)

CHARCOAL (METAL ROOFING)





RED BRICK (FACIA, TRIM, CASING)



CANYON CLAY (VINYL SIDING)

COLOUR BOARD

1. USE WOULD BE LOW IMPACT AND MINIMAL ADDITIONAL TRAFFIC: Suite intended for single family member living in suite two to three weeks out of every six to eight weeks during time off work or as either a guest or caretaker suite for future assistance in property maintenance. Not intended for a rental suite.

2. HISTORY OF PREVIOUS STRUCTURES AFFECTS B.C. ASSESSMENT CLASSIFICATION: Property is classified as Actual Use 060, two acres or more, Single Family Dwelling, Duplex. This classification may be based on two previous structures.
A small cabin removed in 2001. and a mobile home just below the accessory building location circa 1960 -'70's were both connected to current second septic system now in use for a toilet and sink in the garage.

3. CURRENT BUILDING BUILT TO ZONING BYLAWS AT TIME OF CONSTRUCTION: Under Zoning Bylaw 8000, the building was built below the maximum height for an accessory building and at the time of construction there wasn't a regulation specifying maximum footprint or distance from the principal building.

4. BUILDING IS CURRENTLY SERVICED AND READY FOR DEVELOPMENT: The building is serviced with power fed underground to a sub-panel from the main house as are telephone and cable. A second service could be added if necessary. The building is plumbed with water and has a septic tank and field.

5. NEIGHBOURING PROPERTIES ZONING AND USE : Property is in a small pocket of A1, RR1 and RR3 zoned properties not in the ALR. There are three A1c zoned properties within approximately 100 m. and 10 "c" zoned properties within 1.6 km. The Myra-Bellevue Provincial Park across the street has frequent visitors. Other neighbours include the Botegga Boutique Hotel and Nagging Doubt Winery on Sallows Rd. The hotel occasionally attracts large volumes of traffic and the winery will also increase traffic as it develops. The attached South Perimeter Road extension map shows our location and future road improvements to help with increased traffic from the thousand new housing units planned for the South Slopes. Bedford to Benvoulin is our main route to town. The accessory building is located within an "inner yard" area with the house of approximately .3 ha. The remaining portion of the property, 1.1 ha.,is used as horse and small animal pasture and contains a small barn and three horse shelters. It is moderately treed with 75' to 100' (22 to 30 m.) fir trees as shown on the attached 2015 aerial view. Due to elevation changes and a large gully through the middle of the property, it is not suitable for most other agricultural uses.

6. SUMMERY: There will be minimal impact on the area. One additional vehicle part-time, parked in the garage, no increases in building footprint, and no visual changes to the property. Simply finishing the existing storage area to make it habitable is all that is required.

DESIGN RATIONALE

Willow CADD Services
1071 ORCHARD DRIVE, KELOWNA, B.C. V1Y 3V1
PH. (778) 215-0967

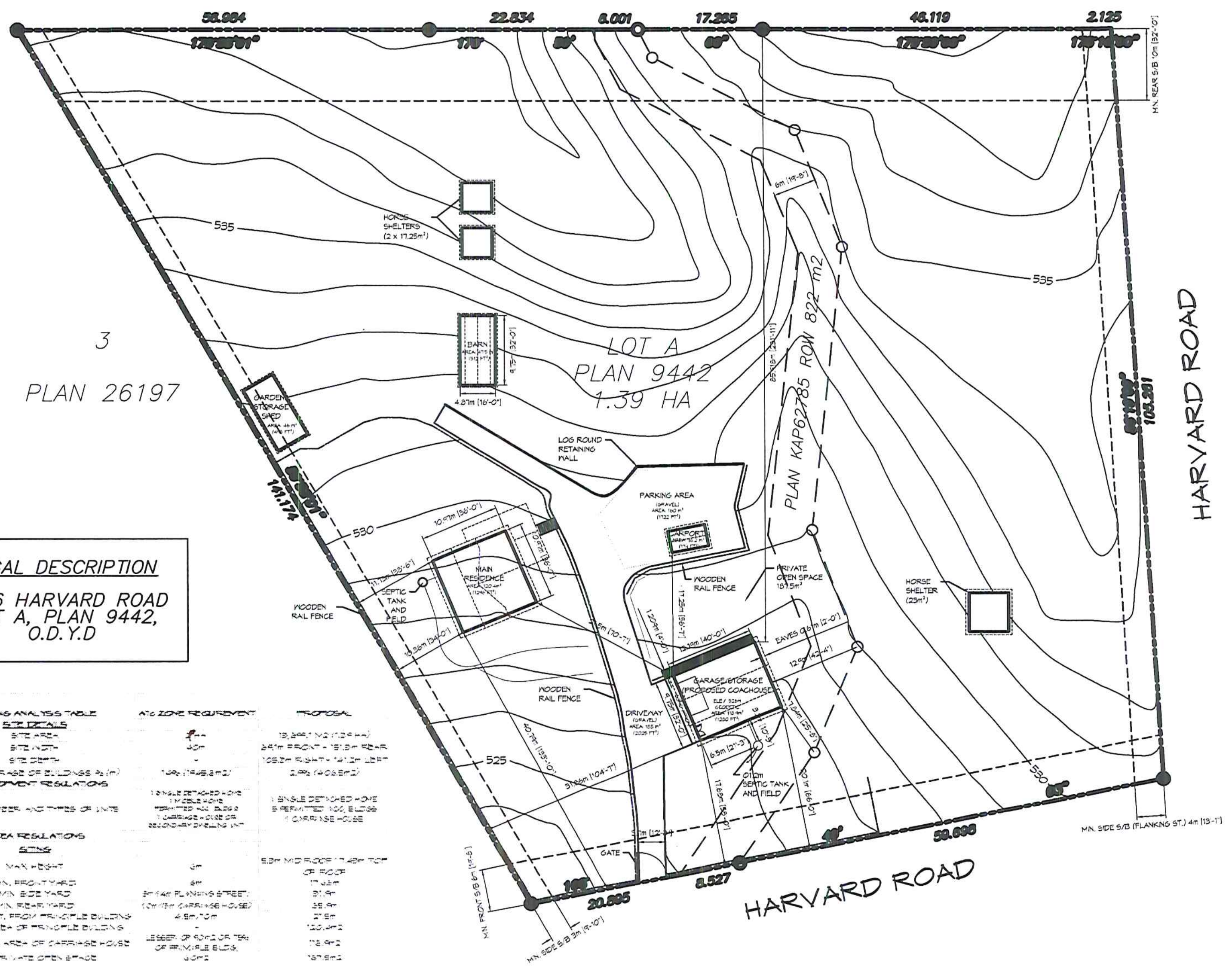
No.	REVISIONS	DATE

JOB TITLE: PROPOSED COACHHOUSE AT 2446 HARVARD ROAD
W. Henney 250-7644777

DRAWING TITLE: EXISTING SITE PHOTOS, COLOUR BOARD, AND DESIGN RATIONALE

DATE: DEC. 2016
DRAWN BY: D.B.
JOB No.: WCS 10-16
SCALE: N.T.S.
DRAWING No.: A0

ATTACHMENT A
This forms part of application
Z17-0011
DVP17-0027
Planner Initials: TB
City of Kelowna
COMMUNITY PLANNING



LEGAL DESCRIPTION

2446 HARVARD ROAD
LOT A, PLAN 9442,
O.D.Y.D

ZONING ANALYSIS TABLE	A1c ZONE REQUIREMENT	PROPOSAL
SITE DETAILS		
SITE AREA	[illegible]	[illegible] M2 (1.39 HA)
SITE WIDTH	40m	84.1m FRONT + 151.9m REAR
SITE DEPTH	-	105.2m RIGHT + 141.2m LEFT
SITE COVERAGE OF BUILDINGS % (m²)	10% (1445.8m2)	2.9% (406.5m2)
DEVELOPMENT REGULATIONS		
TOTAL NUMBER AND TYPES OF UNITS	1 SINGLE DETACHED HOME 1 MOBILE HOME PERMITTED ACC. BLDGS & 1 CARRIAGE HOUSE OR SECONDARY DWELLING UNIT	1 SINGLE DETACHED HOME 5 PERMITTED ACC. BLDGS 1 CARRIAGE HOUSE
AREA REGULATIONS		
SITING		
MAX. HEIGHT	9m	5.3m MID ROOF / 7.48m TOP OF ROOF
MIN. FRONT YARD	6m	17.68m
MIN. SIDE YARD	3m (4m FLANKING STREET)	31.9m
MIN. REAR YARD	10m (15m CARRIAGE HOUSE)	35.9m
MIN./MAX. DIST. FROM PRINCIPLE BUILDING	4.5m/70m	27.5m
FLOOR AREA OF PRINCIPLE BUILDING	-	120.4m2
MAX. FLOOR AREA OF CARRIAGE HOUSE	LESSER OF 90m2 OR 75% OF PRINCIPLE BLDG.	78.9m2
MIN. PRIVATE OPEN SPACE	30m2	187.5m2

Willow CADD Services
1371 ORCHARD DRIVE, KELOWNA, B.C. V1Y 3V1
PH. (770)215-0461

No.	REVISIONS	DATE

JOB TITLE
DEVELOPMENT PERMIT 2446 HARVARD ROAD KELOWNA

DRAWING TITLE
SITE PLAN AND SITE COVERAGE

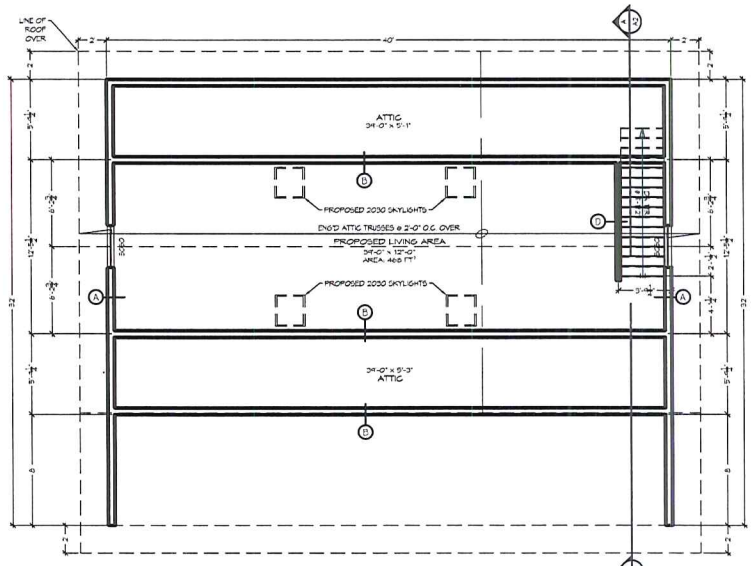
DATE DEC.5/2016

DRAW BY D.P.

JOB No. WCS 10-16

SCALE 1:250

DRAWING No. A1



LOFT (PROPOSED LIVING AREA) FLOOR PLAN

GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF FRAMING OR CENTER OF FRAMING U.N.O.

A — TYP. EXT. WALL
NORD. 8" VINYL SIDING
BUILDING PAPER
2x6 STUDS @ 2'-0" O.C.
R20 BATT INSUL.
6 MIL. POLY. VAP. BARRIER
7/16" O.S.B. SHEATHING

B — TYP. ATTIC TRUSS INT. WALL
1/2" GYP. WALL BOARD
6 MIL. POLY. VAP. BARRIER
END'D TRUSSES @ 2'-0" O.C.
R24 BATT INSUL.

C — INSULATED/STRUCTURAL INT. 2x4 WALL
7/16" O.S.B. SHEATHING
2x4 @ 16" O.C. C/W PRESS. TREATED BOTTOM PLATE
R12 FIBREGLASS BATT INSULATION
6 MIL. VAPOUR BARRIER
7/16" O.S.B. SHEATHING

D — UNINSULATED/NONSTRUCTURAL INT. 2x4 WALL
2x4 @ 1'-4" O.C.
1/2" G.W.B. ON BOTH SIDES

C — TYP. FOUNDATION WALL
8" CONC. FOUNDATION WALL
W. 10M REBAR @ 2'-0" O.C. GRID
W. BITUMINOUS DAMP-PROOFING APPLIED TO EXTERIOR FROM GRADE LINE TO BOTTOM OF FOOTINGS

F — ATTIC TRUSS FLOOR
FINISHED FLOORING (LIVING AREA ONLY)
3/4" T&G PLY SUBFLOOR (LIVING AREA ONLY)
END'D ATTIC TRUSSES @ 2'-0" O.C.
R40 F.G. BATT INSULATION
6 MIL. VAPOUR BARRIER
½" GYP. BOARD CEILING

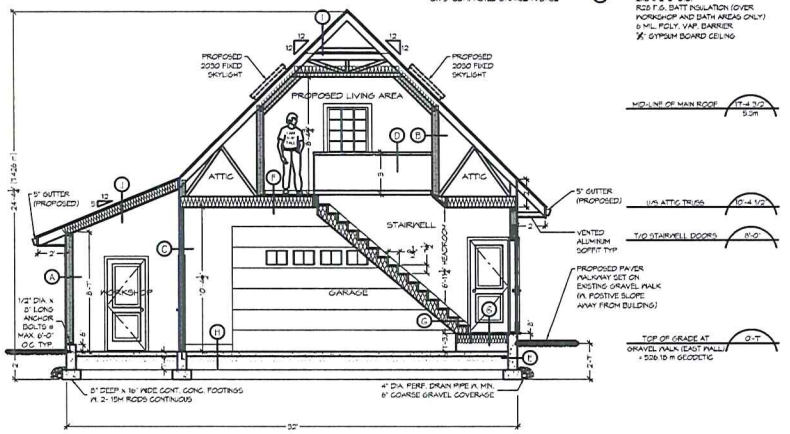
C — STAIRS
13 RISERS @ 7-1/2" / 17 RUNS @ 8-1/2"
9-1/2" W. x 1" THK. O.S.B. TREADS (1" NOSING)
7-1/2" W. x 3/4" THK. PLYWOOD RISERS
2- 2x12 STRINGERS
R20 INSULATION
5/8" G.W.B. ON UNDERSIDE OF STRINGERS
STAIR LANDING:
3/4" PLYWOOD ON
2x6 @ 1'-4" O.C. FRAME

H — BASEMENT SLAB FLOOR
4" CONC. SLAB C/W CONTINUOUS THERMAL BREAK AT WALLS
W. 10M REBAR ON 2'-0" GRID
ON 6 MIL. POLY. VAP. BARRIER
ON 5" COMPACTED GRANULAR BASE

I — ATTIC TRUSS ROOF
METAL ROOFING
ON #15 FELT PAPER
W. #30 FELT AT EAVES
ON ½" O.S.B. SHEATHING
END'D TRUSSES @ 2'-0" O.C.
R40 F.G. BATT INSUL. (FLAT CEILING)
R28 F.G. BATT INSUL. (SLOPED CEILING)
6 MIL. POLY. VAP. BARRIER
½" GYPSUM BOARD CEILING

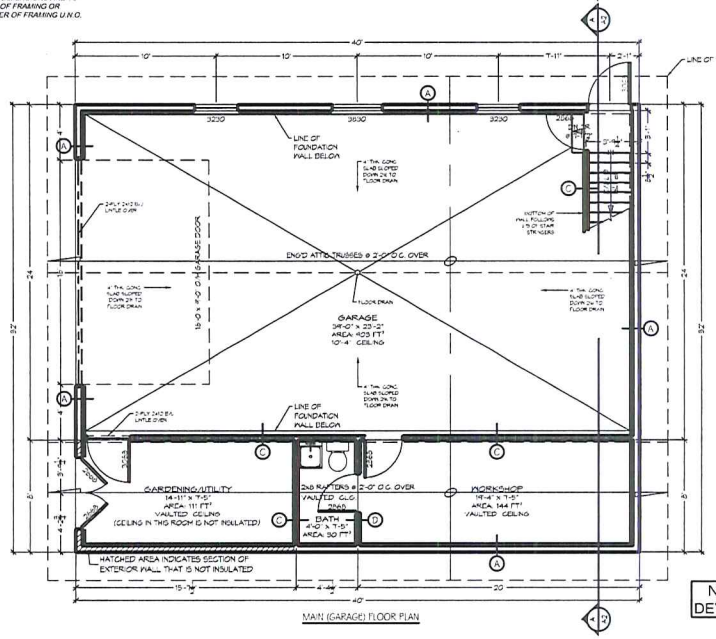
J — WORKSHOP/BATH FRAMED ROOF
METAL ROOFING
ON #15 FELT PAPER
W. #30 FELT AT EAVES
ON ½" O.S.B. SHEATHING
2x10 @ 2'-0" O.C.
R28 F.G. BATT INSULATION (OVER WORKSHOP AND BATH AREAS ONLY)
6 MIL. POLY. VAP. BARRIER
½" GYPSUM BOARD CEILING

24'-4 1/2" T/O TRUSSES 7.43m
18'-0 1/2" U/S OF FLAT ATTIC C.L.G.
11'-2 1/2" T/O ATTIC FLOOR SHEATHING
11'-1" TOP OF HEAT EXT. WALL
10'-5" T/O DOORS & WINDOWS (NOT STAIRWELL DOORS)
1'-3" TOP OF STAIR LANDING AND EAST FND. WALL
0'-0" TOP OF GARAGE SLAB = 520.11 m GEODETIC
-2'-0" U/S HOUSE FOOTINGS = 518.21 m GEODETIC

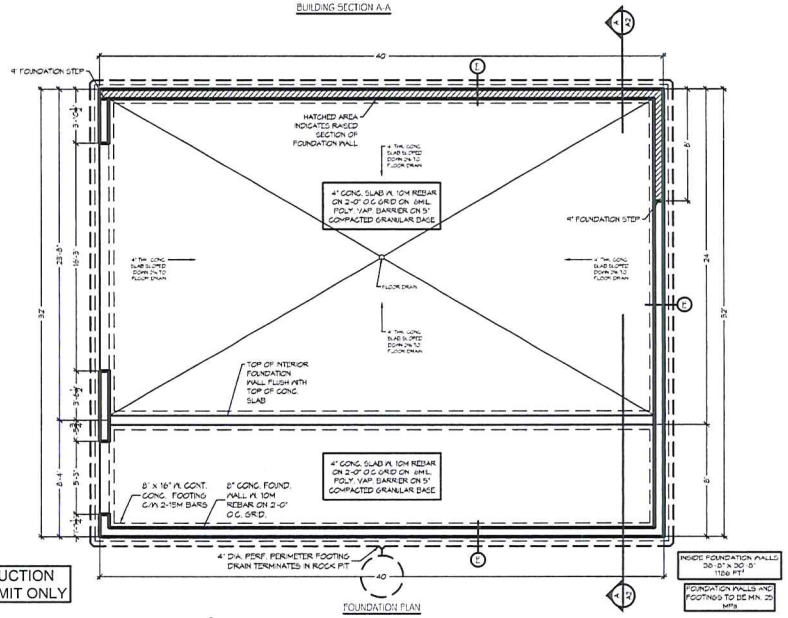


BUILDING SECTION A-A

MID-LINE OF MAIN ROOF 17'-4 1/2" 5.3m
U/S ATTIC TRUSS 10'-4 1/2"
T/O STAIRWELL DOORS 8'-0"
TOP OF GRADE AT GRAVEL WALK (EAST WALL) = 520.16 m GEODETIC 0'-7"



MAIN (GARAGE) FLOOR PLAN



FOUNDATION PLAN

NOT FOR CONSTRUCTION
DEVELOPMENT PERMIT ONLY

Willow CADD Services
1371 ORCHARD DRIVE,
KELOWNA, B.C. V1Y 3V1
PH. (778) 215-0167

No.	REVISIONS	DATE

JOB TITLE
PROPOSED COACHOUSE AT 2446 HARVARD ROAD

DRAWING TITLE
UPPER FLOOR, GARAGE & FOUNDATION PLANS AND BLDG. SECTION

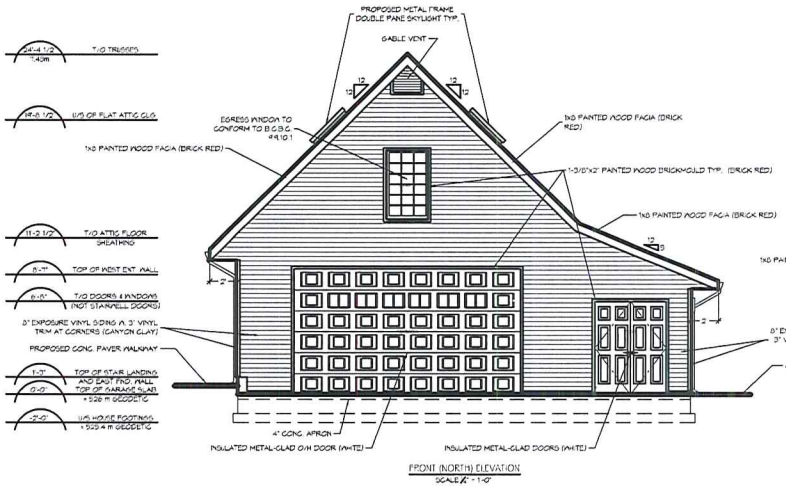
DATE
DEC. 1/2016

DRAWN BY
D.P.

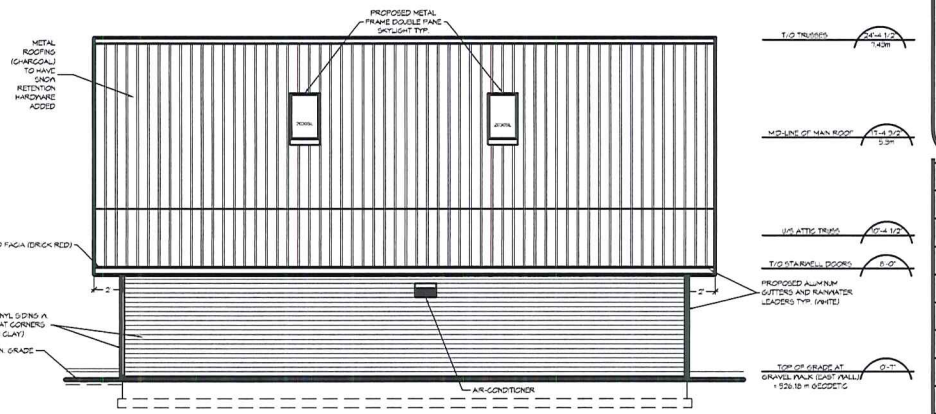
JOB No.
WCS 10-16

SCALE
1/4" = 1'-0"

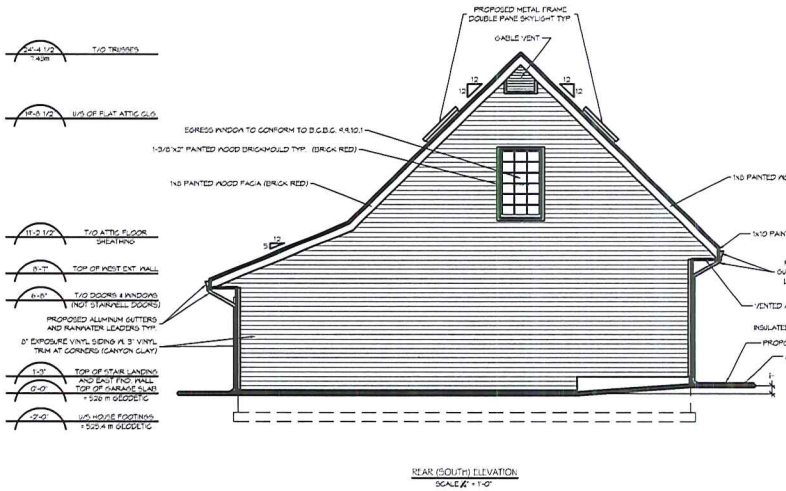
DRAWING No.
A2



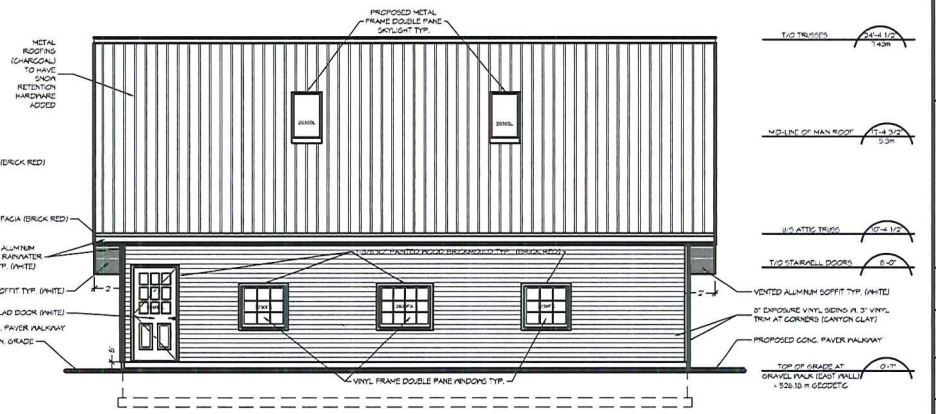
FRONT (NORTH) ELEVATION
SCALE 1/4" = 1'-0"



LEFT (WEST) ELEVATION
SCALE 1/4" = 1'-0"



REAR (SOUTH) ELEVATION
SCALE 1/4" = 1'-0"



RIGHT (EAST) ELEVATION
SCALE 1/4" = 1'-0"

NOT FOR CONSTRUCTION
DEVELOPMENT PERMIT ONLY

Willow CADD Services
1371 ORCHARD DRIVE,
KELOWNA, B.C. V1Y 3V1
PH. (778) 215-0467

No.	REVISIONS	DATE

JOB TITLE
PROPOSED COACHOUSE AT 2446 HARVARD ROAD

DRAWING TITLE
BUILDING ELEVATIONS

DATE DEC. 1/2016

DRAWN BY D.P.

JOB No. WCS 10-16

SCALE 1/4" = 1'-0"

DRAWING No. A3

PLAN OF STATUTORY RIGHT-OF-WAY FOR THE CITY OF KELOWNA IN LOTS 1 & 4 PLAN KAP_____ SEC. 33 TP. 29 and in LOT A PLAN 9442 SEC. 33 TP. 29 all in O.D.Y.D.

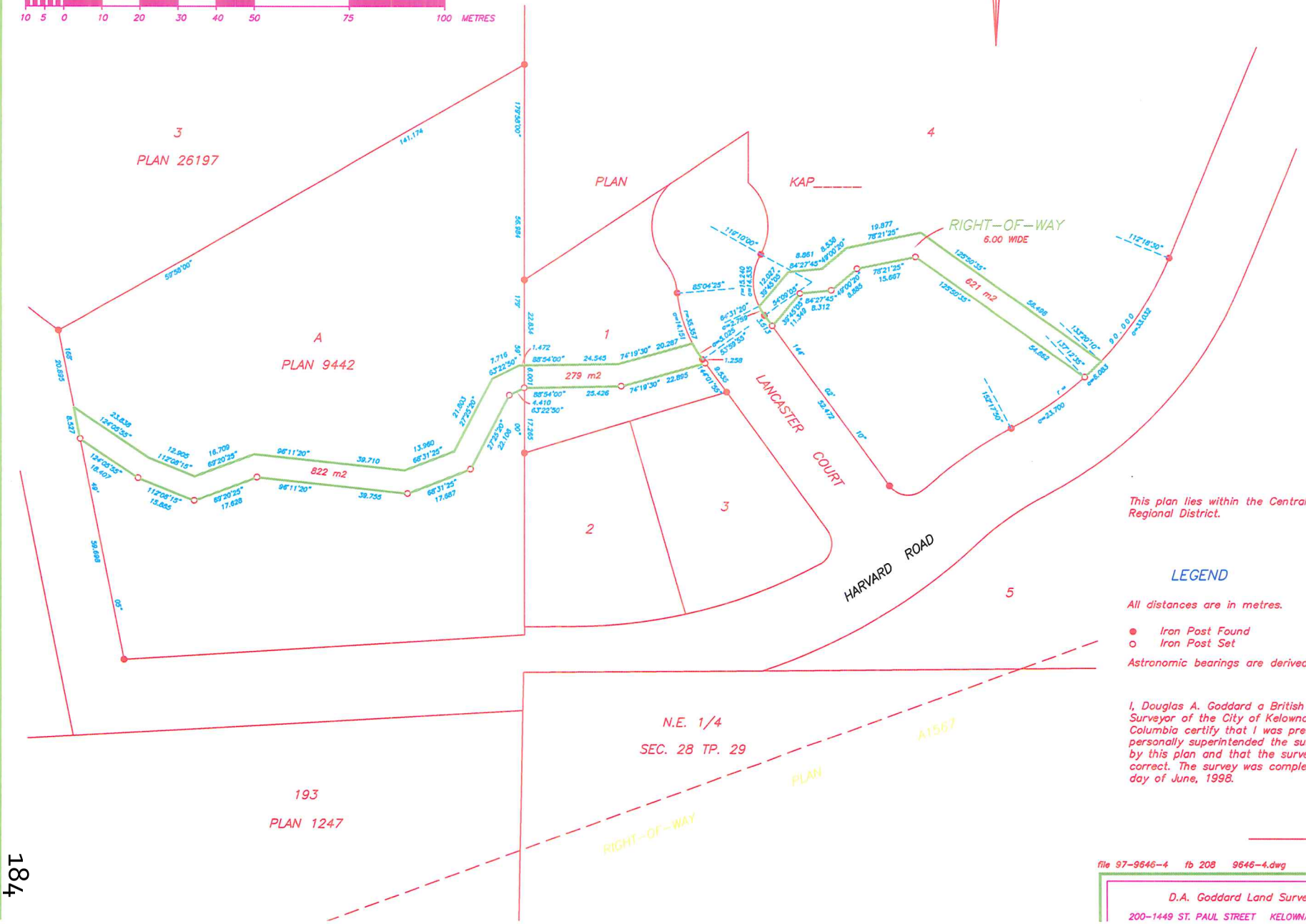
PLAN No. KAP62785

Deposited in the Land Title Office at Kamloops, B.C.
this day of , 19 .

Registrar

SCALE 1:750 BCGS 82E.083

10 5 0 10 20 30 40 50 75 100 METRES



This plan lies within the Central Okanagan Regional District.

LEGEND

All distances are in metres.

- ● Iron Post Found
- ○ Iron Post Set

Astronomic bearings are derived from plan KAP_____.

I, Douglas A. Goddard a British Columbia Land Surveyor of the City of Kelowna in British Columbia certify that I was present at and personally superintended the survey represented by this plan and that the survey and plan are correct. The survey was completed on the 12th day of June, 1998.

B.C.L.S.

file 97-9646-4 fb 208 9646-4.dwg

D.A. Goddard Land Surveying Inc.
200-1449 ST. PAUL STREET KELOWNA PHONE 763-3733

CITY OF KELOWNA

MEMORANDUM

Date: March 14 2017

File No.: Z17-0011

To: Subdivision, Agriculture & Environment (TB)

From: Development Engineering Manager

Subject: 2446 Harvard Road Lot A Plan 9442 A1c

Development Engineering has the following comments and requirements associated with this application to rezone from A1 to A1C to convert an accessory building to a carriage house.

Domestic water and fire protection.

The subject property is within the service area of the South East Kelowna Irrigation District (SEKID). On-site servicing including the utilisation of existing or proposed services as well as fire protection will be reviewed by Building & Permitting.

Sanitary Sewer.

This subject property is currently not within the City service area. Sanitary sewage is handled by on-site wastewater disposal system(s). The existing on-site system(s) are not shown in detail on the submitted Site Plan. The application will be reviewed by a Licenced Wastewater Practitioner and Building & Permitting to ensure that the septic field for the carriage house does not encroach into the City Statutory Right-of Way Plan KAP62785 .

Access

Foliage shall be kept cleared in both directions to ensure that sightlines are not obstructed.

Steve Muenz, P.Eng.
Development Engineering Manager
JF

REPORT TO COUNCIL

Date:	June 12, 2016		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (AC)		
Application:	Z16-0077	**Owner:**	Sunset Drive Properties Ltd.
Address:	1187 Sunset Drive	**Applicant:**	North American Development Group (Russ Watson)
Subject:	Rezoning Application		
Existing OCP Designation:	MXR – Mixed Use (Residential/Commercial)		
Existing Zone:	C4 – Urban Centre Commercial		
Proposed Zone:	C7 – Central Business Commercial		

1.0 Recommendation

THAT Rezoning Application No. Z16-0077 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 1, District Lot 139, ODYD Plan KAP76304, located at 1187 Sunset Dr, Kelowna, BC from the C4 – Urban Centre Commercial Zone to the C7 – Central Business Commercial Zone, be considered by Council;

AND THAT the Zone Amending Bylaw be forwarded to a Public Hearing for further consideration.

AND THAT final adoption of the Zone Amending Bylaw be subsequent to the following:

- To the outstanding conditions identified in Attachment "A" associated with the report from the Community Planning Department dated May 29th 2017.
- Discharge the restrictive land use covenant (LA11939) from Title.

2.0 Purpose

To consider a rezoning application on the subject property from the C4 – Urban Centre Commercial Zone to the C7 – Central Business Commercial Zone.

3.0 Community Planning

Staff support the rezoning from the C4 zone to the C7 zone. The Official Community Plan (OCP) designates the property as MXR – Mixed Use (Residential/Commercial) and encourages the C7 zoning on most

downtown lots including the subject property. The applicant intends to utilize the C7 zone to realize a mixed-use development with commercial at-grade, and two residential towers with a structured parkade.

If the rezoning is successful, Staff will review the form and character of the proposed building within a Development Permit report. Currently, Staff are tracking two variances associated with the current proposal. One minor variance to increase the maximum allowable parking stalls and a major variance to significantly increase the maximum height. Staff have asked the applicant to provide architectural justification including an urban design rationale for various tower heights as well as shadow study and skyline analysis. The merit of the variances will be reviewed and analyzed within a Development Variance Permit report, if the rezoning is successful.

There is a restrictive covenant on title related to the previous hotel proposal registered with the City of Kelowna limiting the project to "a mixed-use building containing both hotel and apartment hotel uses." Staff recommends this be discharged prior to granting 4th reading. Discharging this covenant will ensure that the proposed development can maintain a high degree of flexibility with regard to land use.

The rezoning triggered a traffic impact assessment. 'Bunt & Associates Engineering Ltd' produced a report dated May 17th 2017 which is attached to this report. The main conclusion was due to high southbound delays at the intersection of Sunset Drive and Water Street, this intersection currently warrants an intersection upgrade. A signalized intersection was recommended, which can be coordinated with the adjacent signal at Ellis Street and Clement Avenue. The applicant has agreed to pay for the intersection improvement subject to registering a latecomer agreement on all future benefiting properties.

4.0 Proposal

4.1 Project Description

If the rezoning is successful, the applicant has proposed to build a mixed commercial use development with:

- ground floor retail;
- 3 floors of parking;
- 2 residential towers upper;
    - North Tower proposed at 29 stories;
    - South Tower proposed at 36 stories;
- 399 residential units proposed in the towers with 6 live/work units proposed along Ellis Street;
- Proposed daycare located on 3rd floor;
- Parkade rooftop amenities including:
    - Sports courts;
    - Adult pool;
    - Children's pool;
    - Bbq area;
    - Landscape area;
    - Dog run / dog park;
- Access from Sunset Drive and from Ellis Street.

If Council supports the rezoning, the applicant will finalize the design and staff will update the project description within the Development Permit Council report.

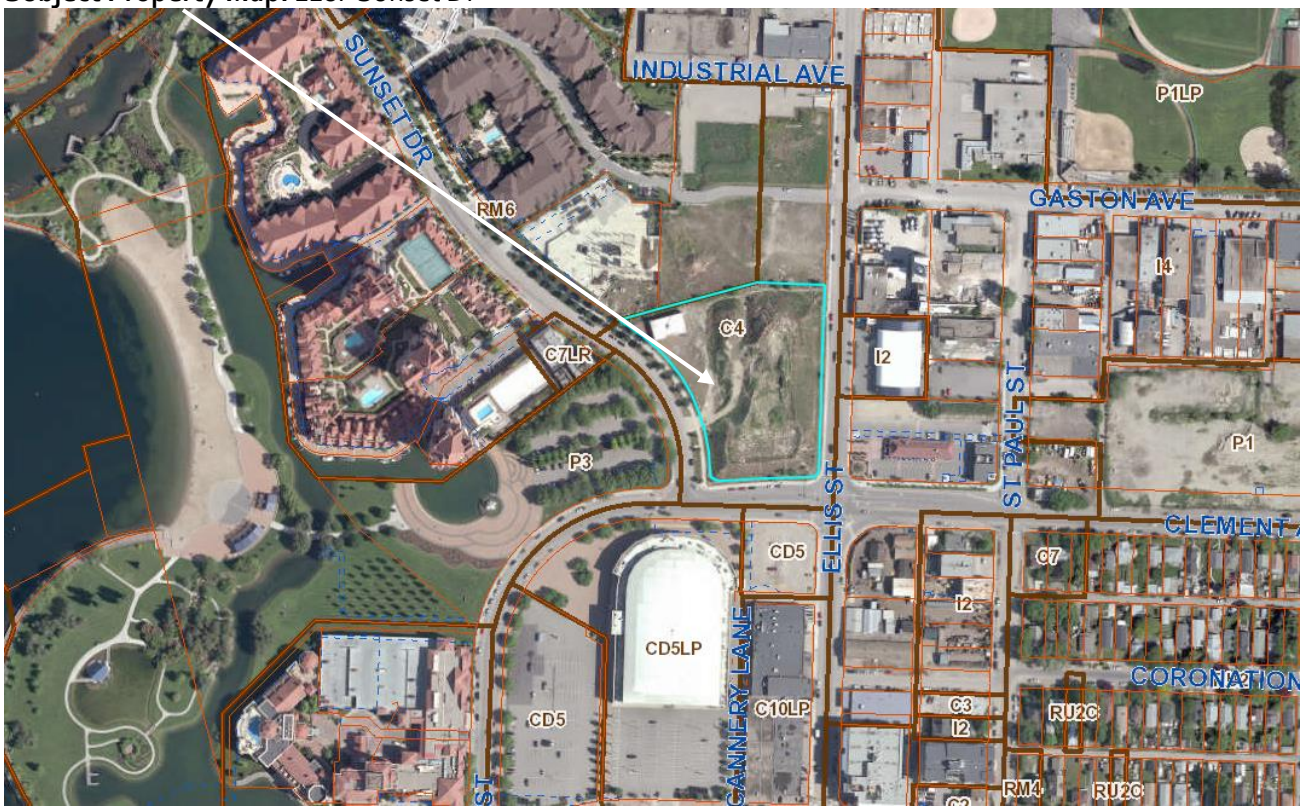
4.2 Site Context

The subject property is located at the north end of downtown. The site is located across from Prospera Arena and is located on a street that has many residential towers.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	C4 – Urban Centre Commercial & RM6 – High Rise Apartment Housing	Vacant & Residential
East	I2 – General Industrial I4 – Central Industrial	Industrial & Commercial
South	CD5 – Multi-Purpose Facility	Arena & Parking Lot
West	RM6 – High Rise Apartment Housing; C7 – Central Business Commercial; & P3 - Parks	Mixed use (residential / commercial) Residential Park

Subject Property Map: 1187 Sunset Dr



4.3 Zoning Analysis Table

The zoning analysis table shows the requirements of the C7 zone compared to the proposal:

Zoning Analysis Table			
CRITERIA	**ZONE REQUIREMENTS**		**PROPOSAL**
	C7	Draft C7*	
Existing Lot/Subdivision Regulations			
Max. Height	44.0m	76.5m (~26 stories)	29 storey tower (~99m) & 36 storey tower (~123m) ❶
Development Regulations			
Max. Floor Area Ratio	9.0	9.0	~4.8
Min. setback front	0.0m	0.0m	0.0m
Min. setback Side	0.0m	0.0m	0.0m
Min. Setback Rear	0.0m	0.0m	0.0m
Setback above 15 metres	(north) 4.0 m	n/a	tbd
	(east) 3.0 m	n/a	tbd
	(south) 4.0 m	n/a	tbd
	(west) 3.0 m	n/a	tbd
Setbacks above 12 metres	n/a	(north) 4.0 m	tbd
	n/a	(east) 3.0 m	tbd
	n/a	(south) 4.0 m	tbd
	n/a	(west) 3.0 m	tbd
Max. floor plate above 15.0 m	676 m^2	n/a	tbd
Max. floor plate	n/a	956 m^2	~ 649 m2 (north tower) ~ 649 m2 (south tower)
Max. angle of setback above 15.0m	80 degrees	n/a	tbd
Max. continuous horizontal dimension above 15.0m	26.0 m	n/a	tbd
Max. diagonal dimension for a floor plate above 15.0m	39.0m	n/a	tbd
Other Regulations (The Draft C7 zone would not affect this section)			
Min. Parking Stalls	~444 stalls		559 stalls ❷
Min. Class I Bicycle Stalls	~207		208
Min. Class II Bicycle Stalls	56		56
Two-drive aisle minimum	7.0m		7.0m
Min. Loading Spaces	1 stall		1 stall
Minimum Parking ratio	Full size: Min 50% Medium Size: Max 40% Compact Car: Max 10%		tbd

Potential variances being tracked:
❶ A height variance will be required.
❷ Zoning Bylaw has a maximum number of parking stalls (125% of the minimum required). This may need a 4 stall variance.

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Development Process

Compact Urban Form.[1] Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Downtown Development.[2] Support rezoning to C7 use in the downtown Urban Centre area only where properties are surrounded on a minimum of 3 sides by existing C7 zoning. The intent of this policy is to support intensification within the existing core areas of Downtown.

Commercial Land Use Policies.[3] Encourage mixed-use commercial development.

Residential Land Use Policies.[4]

- Support a greater mix of housing unit size, form and tenure in new multi-unit residential and mixed use developments.
- Ensure context sensitive housing development.

Building Height.[5] In determining appropriate building height, the City will take into account such factors as:

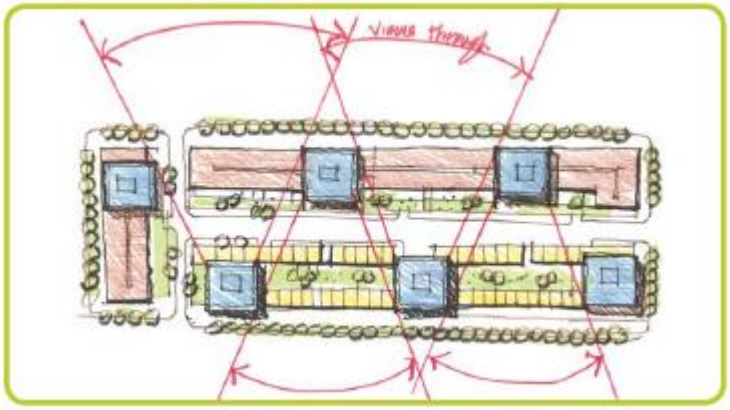
- Contextual fit into the surrounding urban fabric;
- Shadowing of the public realm;
- View impacts;
- Overlook and privacy impacts on neighbouring buildings;
- Impacts on the overall skyline;
- Distance between adjacent buildings above 22m in height;
- Impacts on adjacent or nearby heritage structures;
- Building form and massing to mitigate negative impacts of buildings over 22m in height.

For all properties where height variances are required, a minimum separation distance of 36.5 m (120 ft.) will be sought between adjacent towers where there are floor plates larger than 697 sq. m (7,500 sq. ft.) and a minimum separation distance of 30.5 m (100 ft) will be sought between towers where floor plates are less than 697 sq. m. (7500 sq. ft.). In addition, where a height variance is required, adequate view corridors shall be provided between towers. For blocks a minimum of

[1] City of Kelowna Official Community Plan, Policy 5.3.2 (Development Process Chapter).
[2] City of Kelowna Official Community Plan, Policy 5.3.4 (Development Process Chapter).
[3] City of Kelowna Official Community Plan, Objective 5.24 (Development Process Chapter).
[4] City of Kelowna Official Community Plan, Objective 5.22 (Development Process Chapter).
[5] City of Kelowna Official Community Plan, Objective 5.5 (Development Process Chapter).

100m in width, any portion of a building above 44.0m should be sited to afford existing surrounding tower development on the same block a 40 degree panoramic view, measured from the closest building face parallel to the lot line fronting a street. (See Diagram 5.1)

Diagram 5.1



6.0 Technical Comments

6.1 Building & Permitting Department

No comment on rezoning.

6.2 Development Engineering Department

See attached memorandum dated May 29th 2017.

6.3 Fire Department

No comment on rezoning.

7.0 Application Chronology

Date of Application Received: October 5th 2016
Date Public Consultation Completed: January 3rd 2016

Report prepared by: Adam Cseke, Planner 2
Reviewed by: Terry Barton, Urban Planning Manager
Approved for Inclusion: Ryan Smith, Community Planning Department Manager

Attachments:

Attachment 'A' Development Engineering Memo dated May 29th 2017
Initial Architectural Drawing Package
Attachment 'B' Traffic Impact Assessment dated May 17th 2017

ATTACHMENT A
This forms part of application
Z16-0077
Planner Initials AC
City of Kelowna COMMUNITY PLANNING

CITY OF KELOWNA

MEMORANDUM

Date: *May 29, 2017*
File No.: Z16-0077

To: *Community Planning (AC)*

From: Development Engineering Manager (SM)

Subject: *1187 Sunset Drive* ***REVISED COMMENTS*** Mixed Use Development

Development Engineering Department have the following comments and requirements associated with this 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 Jason Angus.

General

a) Where there is a possibility of a high water table or surcharging of storm drains during major storm events, non-basement buildings may be required. This must be determined by the engineer and detailed on the Lot Grading Plan required in the drainage section.

b) Provide easements as may be required.

c) The rezoning triggered a traffic impact assessment. 'Bunt & Associates Engineering Ltd' submitted a report dated May 17th 2017. The main conclusion was due to high southbound delays at the intersection of Sunset Drive and Water Street, this intersection currently warrants an intersection upgrade. A signalized intersection was recommended, which can be coordinated with the adjacent signal at Ellis Street and Clement Avenue. The applicant has agreed to pay for the intersection improvement subject to registering a latecomer agreement on all future benefiting properties.

1. Domestic Water and Fire Protection

(a) The existing lot is currently not serviced with a water service. The developer's consulting mechanical engineer will determine the domestic and fire protection requirements of this proposed development and establish hydrant requirements and service needs.

(b) A water meter is mandatory for this development and must be installed inside the buildings on the water service inlet as required by the City Plumbing Regulation and Water Regulation bylaws. The developer or building contractor must purchase the meter from the City at the time of application for a building permit from the Inspection Services Department, and prepare the meter setter at his cost. Boulevard landscaping, complete with underground irrigation system, must be integrated with the on-site irrigation system.

2. Sanitary Sewer

(a) The developer's consulting mechanical engineer will determine the requirements of this proposed development and establish the required size and preferred location of the new service. Only one service will be permitted for this development. The applicant, at his cost, will arrange for the removal of all existing small diameter services and the installation of a new larger service.

(b) A downstream flow analysis check is required by a consulting civil engineer to determine the impact of additional flow contributions on the existing pipe system. If it is determined that upgrades to the existing facilities must be made, additional bonding will be required.

3. 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 Subdivision, Development and Servicing Bylaw No. 7900. The storm water management plan must also include provision of lot grading plan, minimum basement elevation (MBE), if applicable, and provision of a storm drainage service for the development and / or recommendations for onsite drainage containment and disposal systems.

(b) On site storm drainage systems and overflow service 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.

4. Road Improvements

(a) Sunset Drive fronting this development site is urbanized complete with existing curb & gutter, sidewalk, boulevard and trees. The condition of this infrastructure must be maintained through the construction process. A tree covenant will be required for proper care of the trees during construction. If the proposed accesses require tree removal, compensation will be triggered to the City's tree reserve fund.

(b) Ellis Street is classified as an arterial road and must be upgraded to current urban standards along the full frontage of this proposed development, including curb and gutter if it is in a deteriorated state, a new separate sidewalk complete with landscaped boulevard and street trees and pavement removal and replacement, traffic signal upgrades/re-location, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction.

(c) Water Street is classified as an arterial road and must be upgraded to current urban standards along the full frontage of this proposed development, including curb and gutter if it is in a deteriorated state, replacement for the existing curb let-downs, a new separate sidewalk complete with landscaped boulevard and street trees and pavement removal and replacement, street lighting and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction.

(d) Landscaped boulevards, complete with underground irrigation design drawings as per bylaw, is required on Ellis Street & Water Street.

5. Electric Power and Telecommunication Services

a) The electrical services to this development must be installed in an underground duct system, and the building must be connected by an underground service. 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) Make servicing applications to the respective Power and Telecommunication utility companies. The utility companies are required to obtain the City's approval before commencing construction.

c) Re-locate existing poles and underground utilities, where necessary.

6. Engineering

a) Provide all necessary Statutory Rights-of-Way for any utility corridors required, including those on proposed or existing City Lands.

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.

c) Road and utility construction design, construction supervision, and quality control supervision of all off-site and site services including on-site ground recharge drainage collection and disposal systems, must be performed by an approved consulting civil engineer. Designs must be submitted to the city engineering department for review and marked "issued for construction" by the city engineer before construction may begin.

7. 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 Works & Utilities 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.

8. Servicing Agreements for Works and Services

(a) A Servicing Agreement is required for all 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.

9. Geotechnical Report

As a requirement of this application the owner must provide a geotechnical report prepared by a Professional Engineer qualified in the field of hydro-geotechnical survey to address the following:

(a) Area ground water characteristics.

(b) Site suitability for development, unstable soils, etc.

(c) Drill and / or excavate test holes on the site and install pisometers 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.

(d) List extraordinary requirements that may be required to accommodate construction of roads and underground utilities as well as building foundation designs.

(e) Additional geotechnical survey may be necessary for building foundations, etc.

12. Development Permit and Site Related Issues

Access and Manoeuvrability

(i) Sunset Dr Access; The sidewalk must be continuous and maintained across the access point to reinforce the "pedestrian first" atmosphere that the downtown area is striving for. All movements and pick-up/drop-offs must be done on-site and not within the City ROW. The design will also impact on-street parking and will also eliminate boulevard trees. The approved movements will be determined by the TIA.

(ii) Ellis Street Access; The sidewalk must be continuous and maintained across the access point to reinforce the "pedestrian first" atmosphere that the downtown area is striving for. All movements and pick-up/drop-offs must be done on-site and not within the City ROW. The design will also

impact on-street parking No access will be permitted on Ellis Street as per bylaw. The approved movements will be determined by the TIA.

(ii) A MSU standard size vehicle must be able to manoeuvre onto and off the site without requiring a reverse movement onto public roadways. If the development plan intends to accommodate larger vehicles movements should also be illustrated on the site plan. Indicate on the site plan, the locations of the garbage and recycle bins.

(iii) Perimeter access must comply with the BC Building Code. Fire Truck access designs and proposed hydrant locations will be reviewed by the Fire Protection Officer.

for Steve Muenz, P. Eng.
Development Engineering Manager

SS

ATTACHMENT A
This forms part of application
Z16-0077
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

onewaterstreet

RE-ZONING APPLICATION

FILE # Z16-0077

1187 SUNSET DRIVE, KELOWNA

ISSUED FOR: RE-ZONING

DATE: APRIL 10, 2017

CLIENT

North American Development Group
302 Lakeshore Rd
Kelowna, BC V1W 3S9
T: 250-575-0550

Kerkhoff Construction Ltd.
202-45389 Luckakuck Way
Chilliwack, BC V2R 3V1
T: 604-824-4122 F: 604-824-4171
info@kerkhoff.ca

ARCHITECT

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Calgary, AB Canada T2G 0H7
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www.kasian.com

Sheet List		
Sheet Number	Sheet Revision Number	Sheet Name
A0.00		COVER PAGE
A0.01		PROJECT INFORMATION
A0.02		CONTEXT PLAN
A0.03		CONTEXT RENDERINGS
A0.04		ZONING
A0.05		SURVEY
A0.06		SITE PLAN
A1.01		LEVEL 1 FLOOR PLAN
A1.02		LEVEL 2 FLOOR PLAN
A1.03		LEVEL 3 FLOOR PLAN
A1.05		TOWER UNIT PLANS
A2.01		WEST ELEVATION
A3.01		RENDERINGS
A3.02		PROJECT INSPIRATIONS

kasian

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REV.	YYYY-MM-DD	REVISION / DRAWING ISSUE	REVIEW
1	2017/04/10	ISSUED FOR REZONING	

CONSULTANT

PERMIT STAMP

SEAL

PROJECT

ONE WATER STREET

1187 Sunset Drive
Kelowna, British Columbia, Canada

DRAWING TITLE

COVER PAGE

DRAWING ISSUE

PROJECT NO.	PLOT DATE	DRAWN
190104	2017/04/10	Author
	SCALE: AS NOTED	REVIEWED: Checker

DRAWING NO. A0.00

REVISION 1

PROJECT INFORMATION

PROJECT ADDRESS: 1187 SUNSET DRIVE, KELOWNA
LEGAL ADDRESS: LOT 1, DISTRICT LOT 139, ODYD
PLAN KAP76304

PROPOSED ZONING: C7
PROPOSED USES: APARTMENT / RETAIL / LIVE-WORK
PROPOSED HEIGHT: SOUTH TOWER - 35 STOREYS / 116.15m
NORTH TOWER - 27 STOREYS / 92.15m

SITE COVERAGE: GROUND FLOOR BUILDING FOOTPRINT = 8,306.36m²
BUILDING FOOTPRINT + DRIVEWAYS = 9,390.76m²

SITE FOOTPRINT: = 11,490.00m²

SITE COVERAGE = 72.3%
SITE COVERAGE (INCL. DRIVEWAYS) = 81.73%

South Tower Area Matrix

Level	Unit # and Area (sf)															Total # of Units	Studio	1 Bed	1 Bed + Den	Jr 2 Bed	2 Bed	2 Bed + Den	3 Bed
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
35	3395.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
34	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
33	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
32	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
31	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
30	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
29	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
28	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
27	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
26	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
25	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
24	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
23	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
22	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
21	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
20	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
19	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
18	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
17	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
16	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
15	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
14	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
13	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
12	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
11	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1
10	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-
9	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-
8	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-
7	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-
6	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-
5	338.5	1175.2	1164	1136.2	1343	1132.1										1	1	-	-	-	-	-	-
4	338.5															6	1	-	-	-	-	-	5
																Totals	214	7	10	52	26	62	21	36

North Tower Area Matrix

Level	Unit # and Area (sf)															Total # of Units	Studio	1 Bed	1 Bed + Den	Jr 2 Bed	2 Bed	2 Bed + Den	3 Bed	3 Bed Townhouse
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
27	3395.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
26	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3	-
25	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3	-
24	1914.8	1990.8	1909.4	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3	-
23	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
22	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
21	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
20	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
19	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
18	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
17	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
16	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
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12	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
11	806.9	856.9	1046.3	576.2	593.5	879.4	1154.9	-	-	-	-	-	-	-	-	7	-	-	2	1	2	1	1	-
10	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-	-
9	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-	-
8	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-	-
7	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-	-
6	465.9	462.1	788.7	316.7	745.1	573.4	592.3	698.6	464.5	740.8	-	-	-	-	-	10	1	2	2	1	4	-	-	-
5	338.5	1175.2	1164	1136.2	1343	1132.1	1187.8	1196	1271.6	1260.2	1196	1187.8	-	-	-	1	1	-	-	-	-	-	-	-
4	338.5															12	1	-	-	-	-	-	5	6
																Totals	164	7	10	36	18	46	13	28	6

Parking

City Required Residential Parking:	1 Stall per unit
City Required Visitor Parking:	1 Stall per 7 units (included in City requirement above)
Parking Requirement by Owner:	1.4 Stalls per unit
Commercial Parking:	1.3 Stalls per 100m2
Residential Bicycle Parking:	0.5/dwelling unit - Class 1; 0.1/dwelling unit - Class 2
Commercial Bicycle Parking:	0.2/100m2 - Class 1; 0.6/100m2 - Class 2
Restaurant Bicycle Parking:	0.1/100m2 - Class 1

Parking Requirement

	North Tower	South Tower	Live/Work Units	Total Units / Area	Factor	Parking Required
# of Units	164	214	10	388	1	388
Commercial Space (m2)				1330.96	1.3/100m2	17
Total						405

Bicycle Parking Requirement

	# of units	Total Area(m2)	Factor	Class 1 Spaces	Class 2 Spaces
Residential Class 1	388		0.5	194	
Residential Class 2			0.1		39
Commercial Class 1		713.39	0.2/100m2	1	
Commercial Class 2			0.6/100m2		4
Restaurant Class 1		617.57	0.1/100m2	1	
Total				196	43

Parking Provided

Level	# of Vehicle Spaces	# of C1 Bike Spaces	# of C2 Bike Spaces
Level 1	146	264	49
Level 2	169	0	0
Level 3	190	0	0
Total	505	264	49

Area Calculations (sf)

	South Tower		North Tower		Podium	
Level	Gross Area	Net Area	Gross Area	Net Area	Gross Area	Net Area
35	6982.8	6031.5	-	-	-	-
34	7445.7	6212.5	-	-	-	-
33	7445.7	6212.5	-	-	-	-
32	7445.7	6212.5	-	-	-	-
31	7438.0	6198.0	-	-	-	-
30	7438.0	6198.0	-	-	-	-
29	7438.0	6198.0	-	-	-	-
28	7438.0	6198.0	-	-	-	-
27	7438.0	6198.0	6982.8	6031.5	-	-
26	7438.0	6198.0	7445.7	6212.5	-	-
25	7438.0	6198.0	7445.7	6212.5	-	-
24	7438.0	6198.0	7445.7	6212.5	-	-
23	7438.0	6198.0	7438.0	6198.0	-	-
22	7438.0	6198.0	7438.0	6198.0	-	-
21	7438.0	6198.0	7438.0	6198.0	-	-
20	7438.0	6198.0	7438.0	6198.0	-	-
19	7438.0	6198.0	7438.0	6198.0	-	-
18	7438.0	6198.0	7438.0	6198.0	-	-
17	7438.0	6198.0	7438.0	6198.0	-	-
16	7438.0	6198.0	7438.0	6198.0	-	-
15	7438.0	6198.0	7438.0	6198.0	-	-
14	7438.0	6198.0	7438.0	6198.0	-	-
13	7438.0	6198.0	7438.0	6198.0	-	-
12	7438.0	6198.0	7438.0	6198.0	-	-
11	7438.0	6198.0	7438.0	6198.0	-	-
10	7596.9	6358.6	7596.9	6358.6	-	-
9	7596.9	6358.6	7596.9	6358.6	-	-
8	7596.9	6358.6	7596.9	6358.6	-	-
7	7596.9	6358.6	7596.9	6358.6	-	-
6	7596.9	6358.6	7596.9	6358.6	-	-
5	7679.8	6704.0	7679.8	6704.0	-	-
4	7679.8	6704.0	7679.8	6704.0	-	-
3	-	-	-	-	94,390.9	80,232.3
2	-	-	-	-	94,390.9	80,232.3
1	-	-	-	-	94,390.9	80,232.3
Total	238,862.0	200,028.0	179,358.0	150,444.0	283,172.7	240,696.8

Total Net Area	591,168.8
Site Area	123,709.6
FAR	4.8
FAR Permitted	9

*Net Area in Podium Assumed to be 85% of Gross until more detail is known

Private Open Space

Area Required			
Unit Type	# of Units	Area Required/unit	Area Required(m2)
Studio	14	6m2	84
1 Bed	108	10m2	1080
2 + Bed	260	15m2	3900
Total	382		5064

Area Provided (m2)			
Balconies	Indoor Amenity	Outdoor Amenity	**Total**
6379	989	5120	12,488

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SEAL

PROJECT

1187 Sunset Drive Condos Kelowna - TOWER 1

CITY, PROVINCE, COUNTRY

DRAWING TITLE

PROJECT INFORMATION / STATISTICS

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		Checker

DRAWING NO. A0.01

REVISION

SITE CONTEXT _VIEW FROM EAST

SITE CONTEXT _VIEW FROM SOUTH

SITE CONTEXT _VIEW FROM WEST

CONTEXT PLAN

CURRENT ZONING

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CONTEXT PLAN

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RENDERING KEYPLAN

N

1. CONTEXT RENDERING _DOWNTOWN KELOWNA

2. CONTEXT RENDERING _KNOX MOUNTAIN

3. CONTEXT RENDERING _OKANAGAN LAKE

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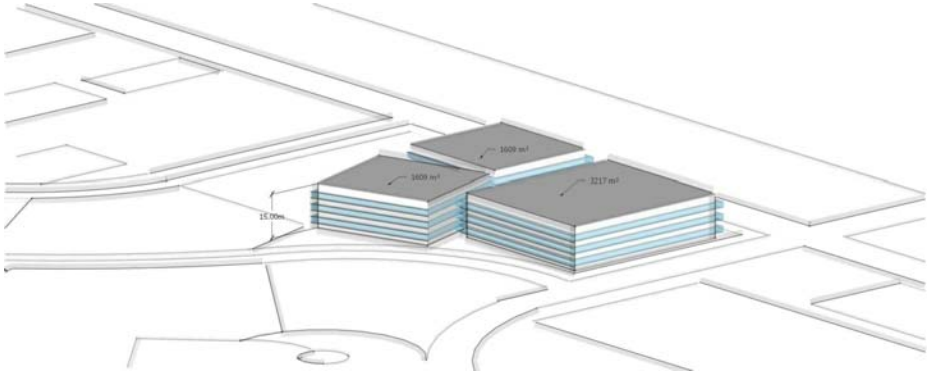
REVISION

C4 MASSING

max far w/ bonusing: 1.68
max height 15m = 3 floors
max site coverage 75%

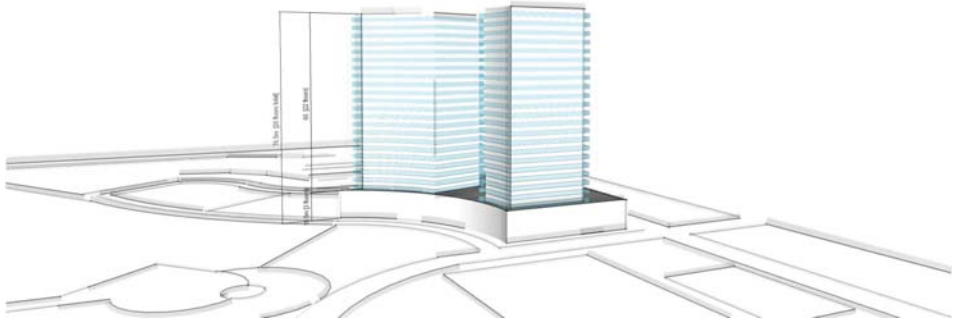


C7 MASSING

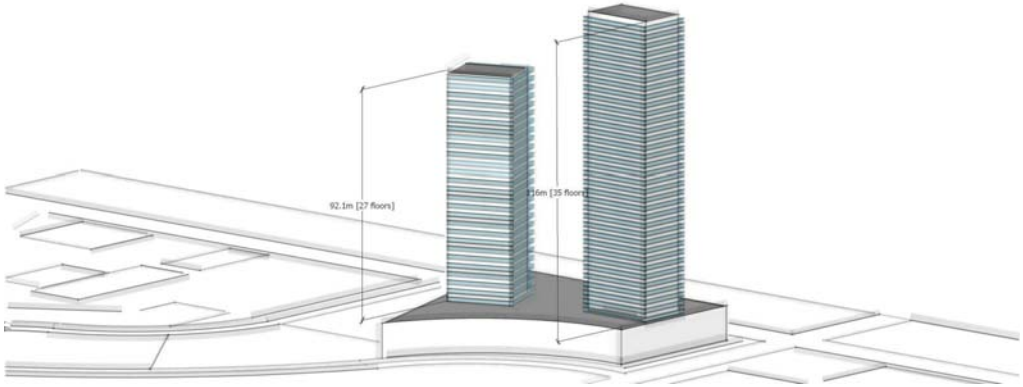
as of right zoning: C7

2 towers with total max.
floor plate of 1,221 m2

site area: 11,490m2
max far: 9.0/103 410m2



C7 PROPOSED MASSING



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REVISION

1 A0.05 EXISTING SURVEY
SCALE: 1 : 500

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SURVEY

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1 A0.06 SITE PLAN
SCALE: 1 : 250

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SITE PLAN

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Department Legend

- Bicycle Storage
- Live/Work
- Lobby
- Restaurant
- Retail

1 / A1.01 LEVEL 1
SCALE: 1 : 250

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LEVEL 1 FLOOR PLAN

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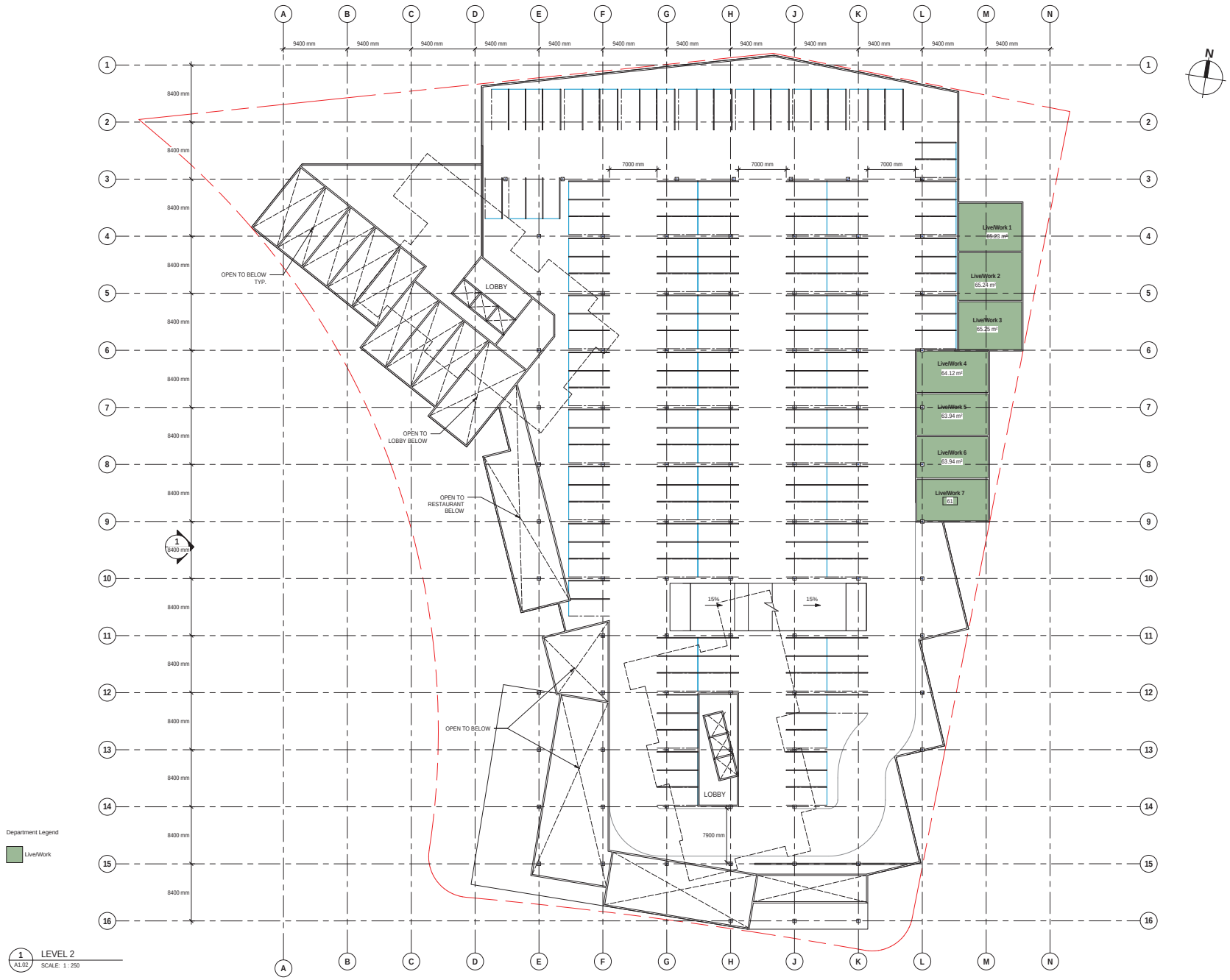

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DRAWING TITLE

LEVEL 2 FLOOR PLAN

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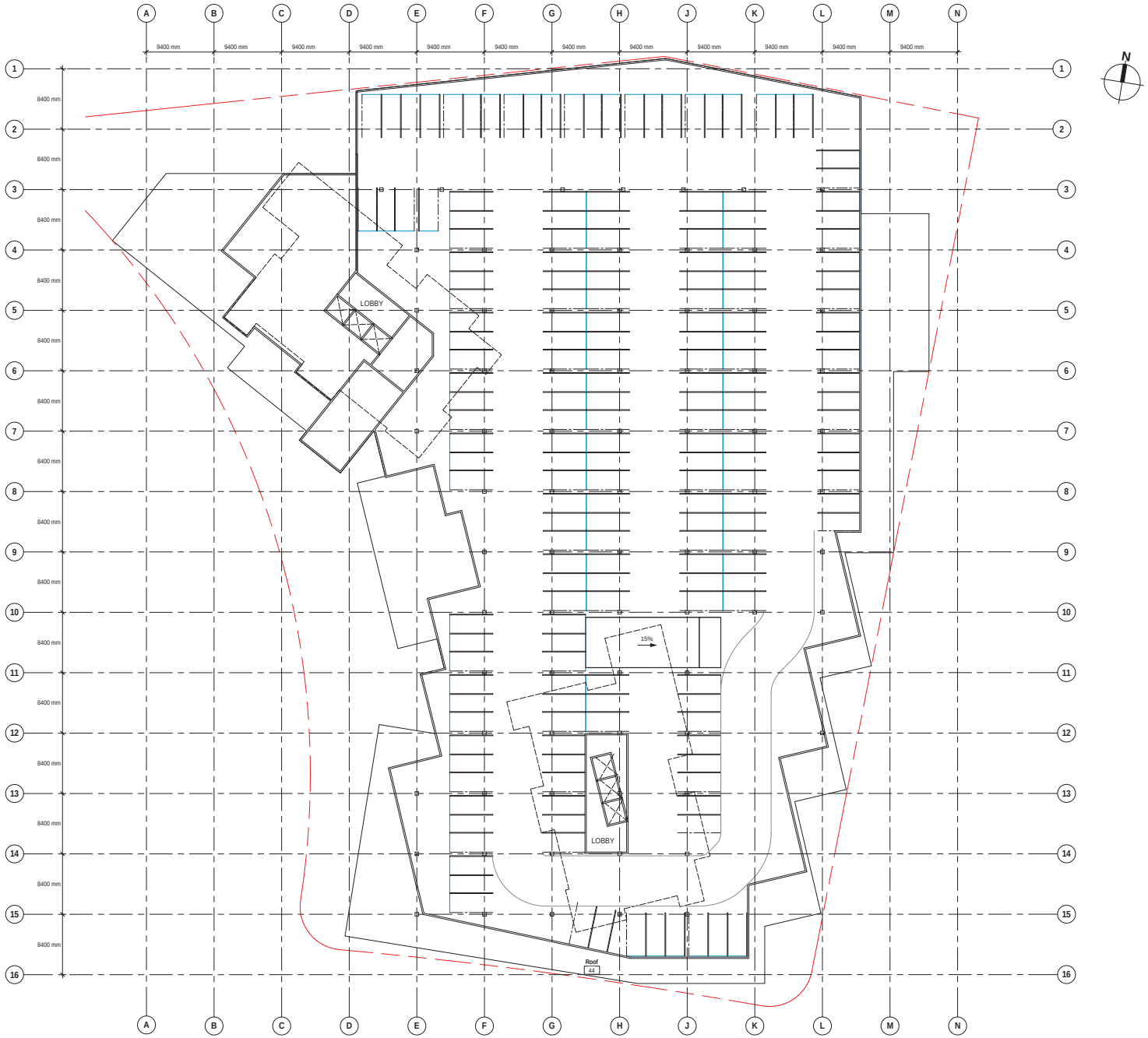

1 LEVEL 3
A1.03 SCALE: 1 : 250

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LEVEL 3 FLOOR PLAN

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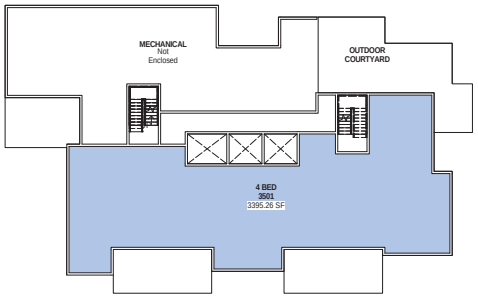
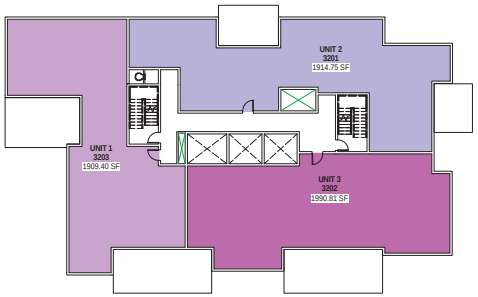
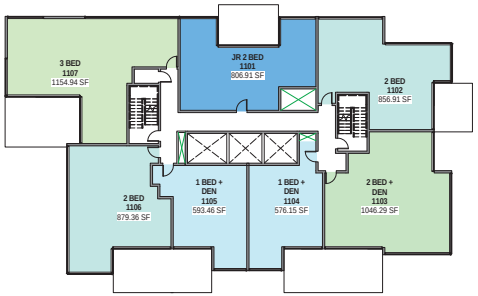


6 A1.05 LEVEL 35 (SOUTH TOWER)
LEVEL 27 (NORTH TOWER)
SCALE: 1 : 200



5 A1.05 LEVEL 32-34 (SOUTH TOWER)
LEVEL 23-26 (NORTH TOWER)
SCALE: 1 : 200



4 A1.05 LEVEL 11-31 (SOUTH TOWER)
LEVEL 11-23 (NORTH TOWER)
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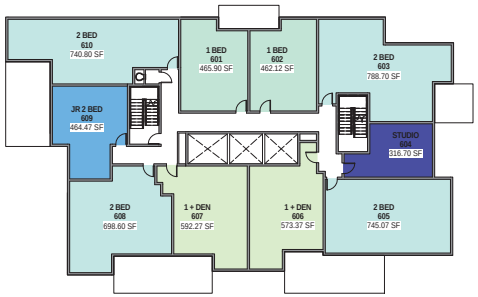

3 A1.05 LEVEL 6-10 (NORTH + SOUTH TOWERS)
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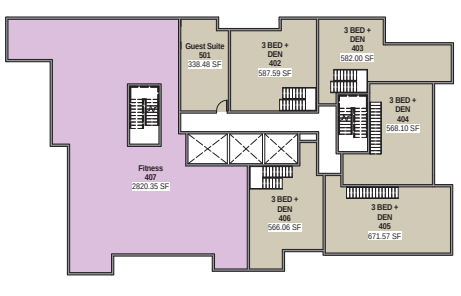

2 A1.05 LEVEL 5 (NORTH + SOUTH TOWERS)
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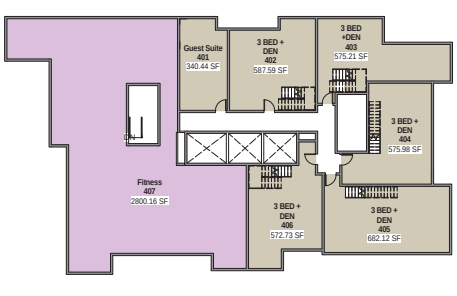

1 A1.05 LEVEL 4 (NORTH + SOUTH TOWERS)
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TOWER UNIT PLANS

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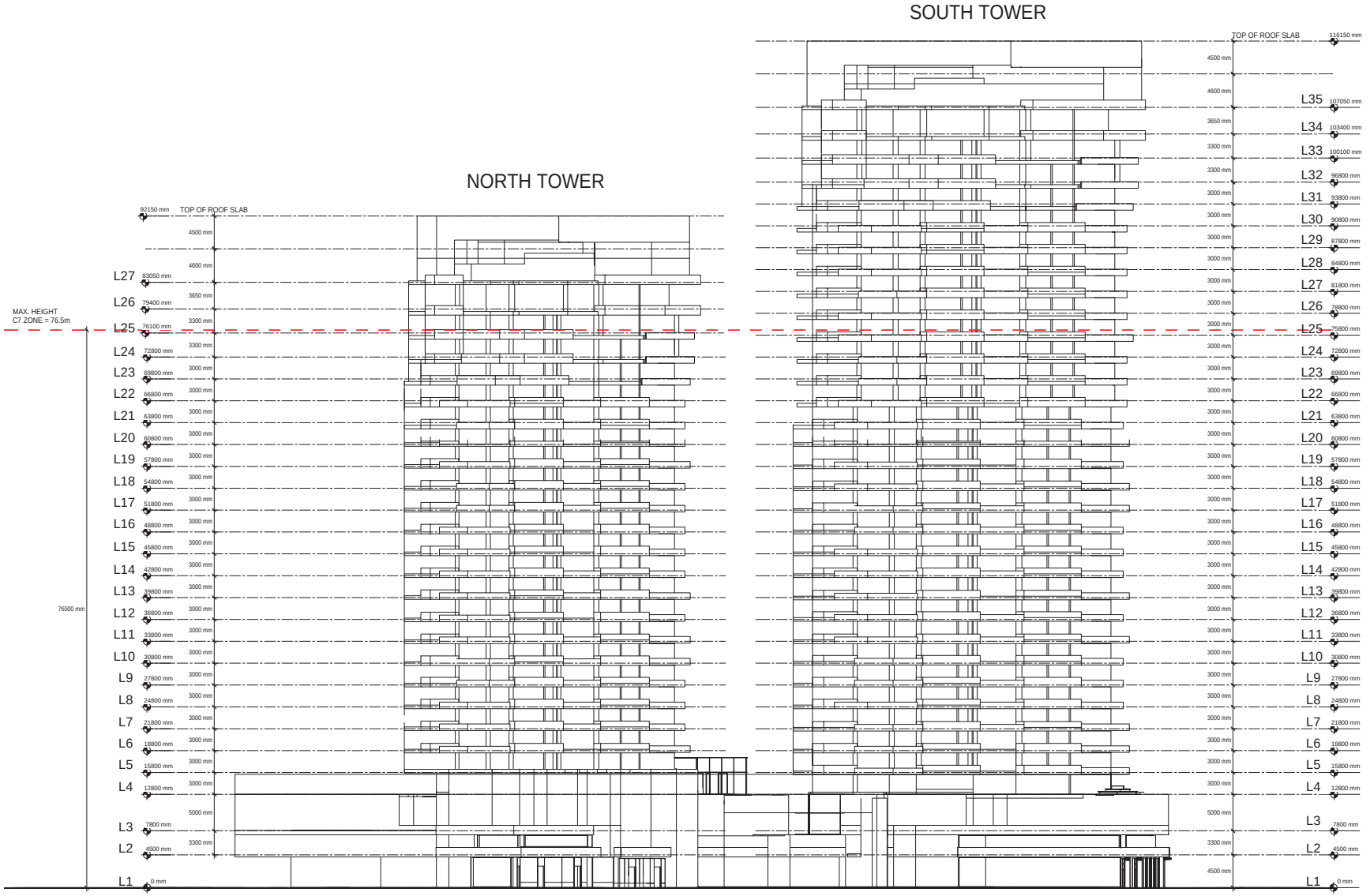

1 / A2.01 WEST ELEVATION
SCALE: 1 : 250

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WEST ELEVATION

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WEST AERIAL ELEVATION

SOUTH-WEST STREETSCAPE

WEST AERIAL PERSPECTIVE

PODIUM WATER FEATURES

PENTHOUSE AERIAL PERSPECTIVE

PODIUM AMENITY SPACE

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RENDERINGS

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LIFESTYLE _INDOOR / OUTDOOR

LIFESTYLE _OKANAGAN MODERN

LIFESTYLE _FOOD CULTURE

LIFESTYLE _LAKE LIFE

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PROJECT INSPIRATIONS

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REVISION

TRANSPORTATION PLANNERS AND ENGINEERS

bunt & associates

ATTACHMENT B
This forms part of application
Z16-0077
City of Kelowna
COMMUNITY PLANNING
Planner Initials AC

1187 Sunset Drive Mixed Use Development

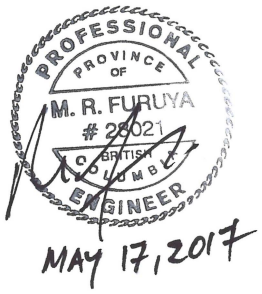
Transportation Impact Assessment

Final Report

Prepared for:	North American Development Group
Date:	May 17, 2017
Prepared by:	Bunt & Associates Engineering (Alberta) Ltd.
Project No.:	1498-02

CORPORATE AUTHORIZATION

This document entitled "*1187 Sunset Drive Mixed Use Development - Transportation Impact Assessment*" was prepared by Bunt & Associates for the benefit of the client to whom it is addressed. The information and data in the report reflects Bunt & Associates best professional judgement in light of the knowledge and information available to Bunt & Associates at the time of preparation. Except as required by law, this report and the information and the data contained are to be treated as confidential and may be used and relied upon only by the client, its officers, and employees. Any use which a third party makes of this report, or any reliance on or decisions based on it, are the responsibilities of such third parties. Bunt & Associates accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



Responsible Engineer

TABLE OF CONTENTS

1. INTRODUCTION 1
1.1 SCOPE OF WORK 1
2. EXISTING CONDITIONS 2
2.1 SITE LOCATION AND CONTEXT 2
2.2 STREET NETWORK 5
2.3 EXISTING TRAFFIC VOLUMES 5
2.4 EXISTING INTERSECTION CAPACITY ANALYSIS 8
2.5 WALKING 12
2.6 CYCLISTS 12
2.7 TRANSIT 13
3. DEVELOPMENT PLAN 16
3.1 LAND USE 16
3.2 VEHICLE ACCESS 16
3.3 TRIP GENERATION 17
3.4 TRIP DISTRIBUTION & ASSIGNMENT 19
3.4.1 Distribution 19
3.4.2 Assignment 19
4. FUTURE TRAFFIC CONDITIONS 24
4.1 BACKGROUND OPERATIONS 24
4.2 POST DEVELOPMENT OPERATIONS 29
4.2.1 Northbound Left Turns Permitted at the Ellis Street Access 29
4.2.2 Northbound Left Turn Restricted at Ellis Street Access 34
4.2.3 Northbound Left Turn at Ellis Street Site Access Summary 37
5. PARKING & LOADING 39
5.1 VEHICLE PARKING 39
5.2 BICYCLE PARKING 39
5.3 LOADING REQUIREMENT 40
5.4 VEHICLE CIRCULATION 40
6. CONCLUSION & SUMMARY 44

APPENDIX A Scope Correspondence
APPENDIX B Existing Signal Timing Plans
APPENDIX C Traffic Counts
APPENDIX D Synchro & Sidra Outputs
APPENDIX E TAC Signal Warrant
APPENDIX F NCHRP Internal Capture
APPENDIX G 1190 Richter Street (RCMP Headquarters) TIA
APPENDIX H Background Development Site Trips

EXHIBITS

Exhibit 2.1 Site Context 3
Exhibit 2.2 Site Plan 4
Exhibit 2.3 Existing Lane Configurations & Traffic Control 6
Exhibit 2.4 Existing Balanced Traffic Volumes 7
Exhibit 2.5 Active Transportation Network 15
Exhibit 3.1 Proposed Lane Configurations & Traffic Control 21
Exhibit 3.2 Development Site Trips 22
Exhibit 3.3 Development Site Trips with Restricted Northbound Left Turn at Ellis Street Access 23
Exhibit 4.1 Background 2020 Traffic Volumes 25
Exhibit 4.2 Background 2030 Traffic Volumes 26
Exhibit 4.3 Post Development 2020 Traffic Volumes 30
Exhibit 4.4 Post Development 2030 Traffic Volumes 31
Exhibit 4.5 Post Development 2030 Traffic Volumes with Restricted Northbound Left Turn at Ellis Street Access 35
Exhibit 5.1 Vehicle Turning Analysis – External Loading 41
Exhibit 5.2 Vehicle Turning Analysis – Internal Loading 42
Exhibit 5.3 Vehicle Turning Analysis – Passenger Vehicle On-site Manoeuvring 43

TABLES

Table 2.1: Intersection Level of Service Thresholds 8
Table 2.2: Existing Operations 9
Table 2.3: Sunset Drive & Water Street / Clement Avenue Mitigated Operations 10
Table 2.4: Existing Pedestrian Volumes 12
Table 2.5: Existing Cyclist Volumes 13
Table 2.6: Bus Transit Service 14
Table 3.1: Proposed Land Use Densities 16
Table 3.2: Development Site Trip Generation 18
Table 3.3: Vehicle Trip Distribution 19
Table 4.1: Background 2020 27
Table 4.2: Background 2030 Operations 28
Table 4.3: Post Development 2020 Operations 32
Table 4.4: Post Development 2030 Operations 33
Table 4.5: Post Development 2030 Operations with Restricted NBL at Ellis Street Access 36
Table 5.1: Bylaw Required Vehicle Parking 39
Table 5.2: Bylaw Required Bicycle Parking 40

FIGURES

Figure 4.1: Driveway Design 38
Figure 4.2: Driveway Design 2 38

1. INTRODUCTION

North American Development Group (NADG) is proposing a mixed-use commercial and residential development at the northeast corner of Sunset Drive and Water Street/Clement Avenue. Bunt & Associates (Bunt) has been retained to prepare a Transportation Impact Assessment for this proposed development. Bunt recently completed a TIA in 2014 for a similar proposed development located at 1000 Manhattan Drive, which is approximately 500 metres northwest of the proposed study site, and this study summarized the current transportation operations and highlighted future mitigation measures that were likely to be required. This study is therefore intended as an "update" to the previous TIA, and it considers a similar study area but with a different development site.

The proposed develop will include approximately 17,083 ft^2 of retail area, 9 live work townhomes and 397 residential condo units. The retail area will be primarily located along Clement and Sunset Avenue, while the townhomes will be on Ellis Street. The residential condo units will be located in two towers, one on the south edge of the site and one on the northwest corner.

This study follows the general form and content of the previous Bunt TIA as agreed by the City of Kelowna Transportation staff with a couple of amendments. A summarized version of the scope is shown below, while the detailed scope and correspondence attached in **Appendix A.**

1.1 Scope of Work

The scope of work for this study was confirmed to include the following:

- Determine expected site generated traffic volumes for the proposed uses at Opening Day based on ITE data. Assign expected site generated traffic volumes to the road network based on the distributions used in the previous TIA.
- Complete capacity analysis for Existing, Opening Day and Opening Day + 10 year Background and Post Development horizons during the weekday AM and PM peak hours at the following intersections:
    - Sunset Drive & Water Street / Clement Avenue
    - Ellis Street & Clement Avenue
    - All site accesses
- Review active transportation for a 400m radius around the site.
- Review the site plan, accesses, loading bays and site circulation.
- Determine the bylaw parking requirements and adequacy of the proposed parking supply.

2. EXISTING CONDITIONS

2.1 Site Location and Context

The site is located just north of downtown Kelowna and is currently zoned as C4. It is proposed to be re-zoned to C7 through the redevelopment. The site is bounded by Clement Avenue to the south, Sunset Drive to the west, Ellis Street to the east and lot 1147 Sunset Drive to the north which is currently being developed with a residential tower.

The proposed development is to consist of a podium with approximately 17,100 ft^2 of retail, 9 live/work townhomes, and two mid-rise towers with 397 condo units. The two towers will rest on a three level above ground podium with internal parking and external commercial on the west, south and east sides.

Vehicular access to the development will be provided from two separate locations, with one access on Sunset Drive and one access on Ellis Street, and the development will be accessible to pedestrians on the west, east and south frontages.

In the surrounding neighbourhood there are a number of varying uses. Directly south of the site is the Prospera Place Arena, which shares a block with some light industrial and retail uses. Directly west of the site is a surface level parking lot, and to the north on Sunset Drive are a number of hotels and vacation rental developments. East of the site is primarily a light industrial area with some restaurants and entertainment uses.

The study area and adjacent external road network is illustrated in **Exhibit 2.1**, and the site plan is illustrated in **Exhibit 2.2**.

Base Map Source: Google Maps

Exhibit 2.1

Site Context

Base Map Source: Kasian Architecture Interior Design and Planning Ltd.

Exhibit 2.2

Site Plan

2.2 Street Network

This section outlines the study area street network, and describes roadway function, design characteristics and intersection controls. The studied intersections are illustrated in **Exhibit 2.3** and summarized below:

- Sunset Drive and Water Street/Clement Avenue (southbound stop control on Sunset Drive)
- Clement Avenue and Ellis Street (traffic signal control)

Sunset Drive is classified as a major collector road, and connects Water Street/Clement Avenue in the south to Manhattan Drive, then continuing two blocks further north as Guy Street. There is pay parallel parking (two hour maximum duration of stay) available on both sides of Sunset Drive fronting the proposed development. The road surface is approximately 11m wide. Along the east side of Sunset Drive there is a 3.5m wide continuous sidewalk and the sidewalk along the west side of Sunset Drive is approximately 1.5m wide.

Water Street, west of Sunset Drive, has one lane of travel in the westbound direction and is 10m wide at its narrowest point. In the eastbound direction to Ellis Street, Water Street becomes Clement Avenue, an arterial road, with a four-lane cross-section (including storage lanes) and on-street parking on south site block face, being 23m at its widest point. The road is classified as a two lane arterial west of Sunset Drive and a four lane arterial east of Sunset Drive. On the northern edge of Water Street / Clement Avenue there is a wide, continuous sidewalk (approximately 2.5m), while the southern edge borders Prospera Place, which has a wide public realm area for pedestrians.

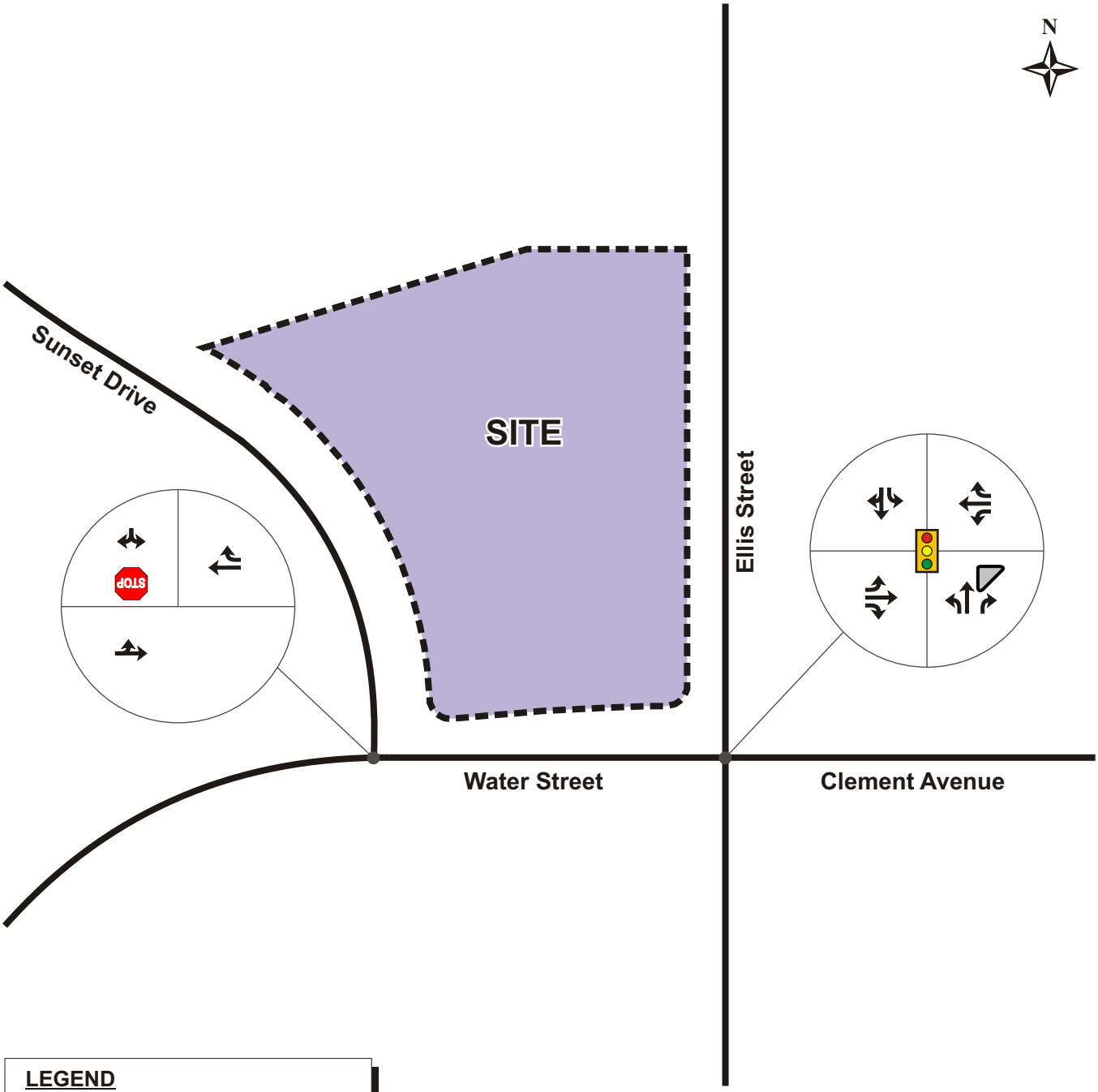
Ellis Street is an arterial road, with one lane of travel in either direction (not including turning storage bays), and north of Clement Avenue there is unrestricted on-street parking. A continuous sidewalk is provided on the both sides of Clement Avenue near the study site.

2.3 Existing Traffic Volumes

Traffic volumes were obtained from the City of Kelowna for the study intersections. Bunt balanced the through volumes between the intersections based on comments from the City and conducted the analysis using these updated volumes. The adjusted turning movement volumes are summarized in **Exhibit 2.4,** and the original data that Bunt received from the City is located in **Appendix C**.

The pedestrian and bicycle volumes that were used in the following sections were from previous counts and are noted below. The raw data for these counts is also attached in Appendix C.

- Sunset Drive & Water Street / Clement Avenue – Tuesday/Wednesday May 13th-14th, 2014 (Bunt)
- Ellis Street & Clement Avenue – Wednesday July 11th, 2012 (City of Kelowna)

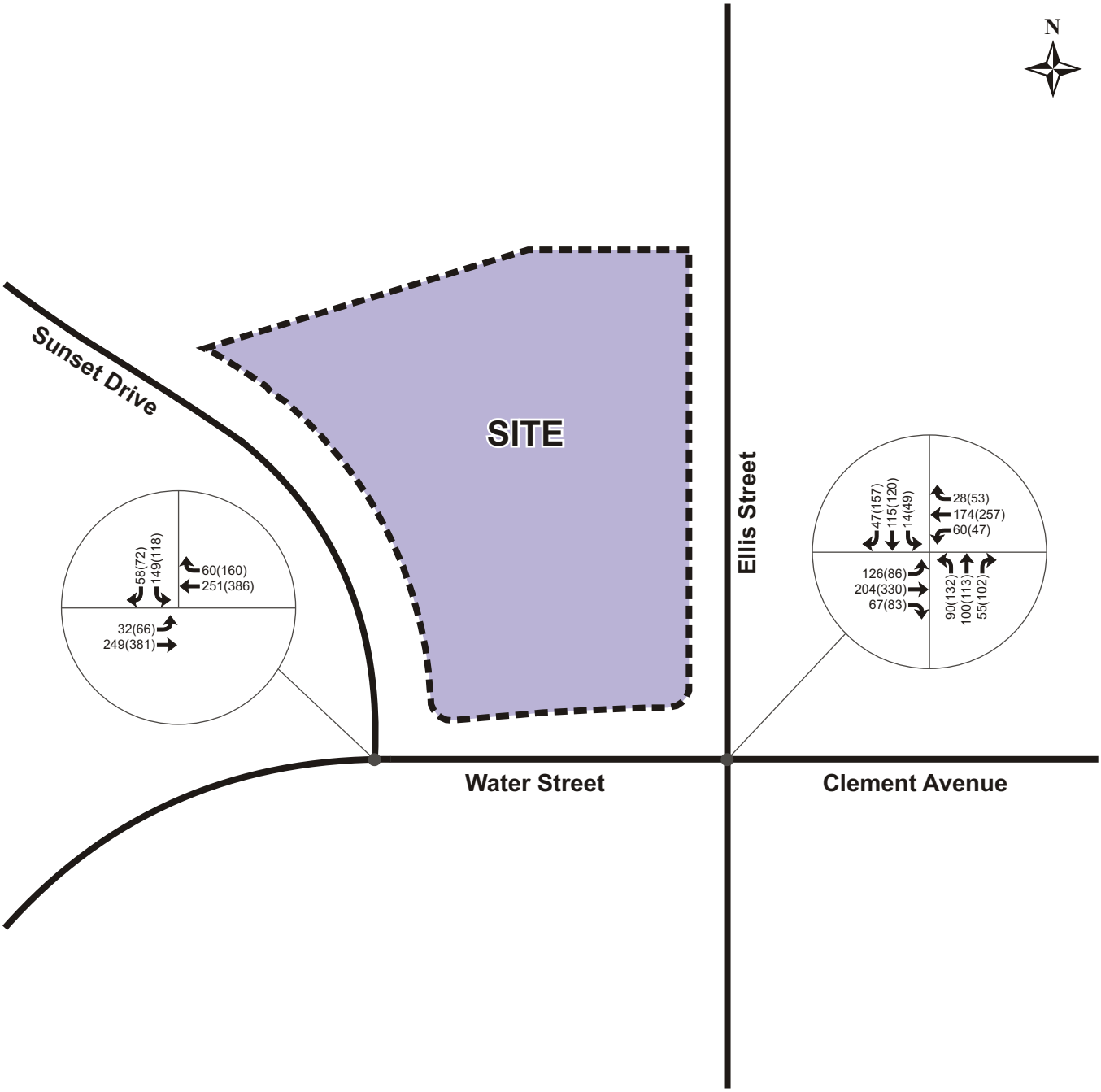


LEGEND

- Lane Configuration
- Signalized Intersection
- Stop Controlled
- Right Turn Channelization

Exhibit 2.3

Existing Lane Configurations & Traffic Control



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 2.4

Existing Balanced Traffic Volumes

2.4 Existing Intersection Capacity Analysis

All study network intersections were assessed based on the methods outlined in the Highway Capacity Manual (HCM), using the Synchro 9.0 analysis software. The traffic operations were assessed using the performance criteria (as calculated by the software) of Level of Service (LOS), volume-to-capacity (v/c) ratio and delay.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. A LOS "A" represents optimal, minimal delay conditions while a LOS "F" represents an over-capacity condition with considerable congestion and/or delay. Delay is calculated in seconds and is based on the average movement/intersection delay per vehicle. **Table 2.1** below summarizes the LOS thresholds for both the signalized and unsignalized intersections.

Table 2.1: Intersection Level of Service Thresholds

Level of Service	Average Control Delay per Vehicle (Seconds)	
	Signalized	Unsignalized
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

The volume to capacity (v/c) ratio of an intersection represents the ratio between the demand volume and the available capacity. A v/c ratio less than 0.85 indicates that there is generally sufficient capacity to accommodate demand. A v/c value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a v/c ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions.

The performance thresholds that were used to trigger consideration of roadway or traffic control improvements to support roadway or traffic control improvements employed in this study are listed below:

Signalized Intersections:

- Overall intersection Level of Service must not be worse than LOS D;
- Overall intersection v/c ratio should not exceed 0.85;
- Individual movement Level of Service must not be worse than LOS E; and,
- Individual movement v/c ratio should not exceed 0.90.

Unsignalized Intersections:

- Individual movement Level of Service should be LOS D or better, unless the volume is very low in which case LOS E can be considered acceptable.

Table 2.2 presents the current operation of the study intersections, and the detailed Synchro summaries for the existing intersections are provided in **Appendix D**.

Note that the Synchro laning was modeled to reflect driver behavior, as some lanes are wide enough to accommodate more than one movement. At the Sunset Drive / Clement Avenue intersection, the westbound leg was modeled with the separate through and right lane because right turning vehicles have the space to perform this movement despite a formal lane not being marked.

Table 2.2: Existing Operations

Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (SB Stop)	EB	1	0.03	A	1	1	0.08	A	2	2
	WB	1	0.16	A	0	0	0.25	A	0	0
	SB	1	0.47	C	19	19	0.70	E	41	37
	Int. Summary		-	A	5	-	-	B	7	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.30	B	10	14	0.23	B	11	13
	EBT	1	0.31	A	9	19	0.52	B	13	42
	EBR	1	0.12	A	3	4	0.15	A	3	6
	WBL	1	0.15	A	9	7	0.14	A	10	8
	WBT	1	0.26	A	9	17	0.40	B	11	32
	WBR	1	0.05	A	3	3	0.10	A	4	5
	NBL	1	0.18	A	10	11	0.40	B	15	22
	NBT	1	0.13	A	9	12	0.19	B	11	17
	NBR	1	0.08	A	4	5	0.19	A	4	7
	SBL	1	0.03	A	8	3	0.12	B	11	9
	SBTR	1	0.21	A	8	15	0.46	A	9	26
	Int. Summary		-	A	8	-	-	B	10	-

The southbound movement at the intersection of Sunset Drive and Water Street is currently operating with a LOS E and moderately high delay during the PM peak hour. The northbound left turn at the intersection of Ellis Street and Clement Avenue is exceeding its' storage length of 20m by 2m. This is a small amount, and represents less than one vehicle. No changes are recommended for this northbound left movement at this time. The remaining movements and study area intersections are currently operating within acceptable capacity parameters and no other intersection improvements are required to accommodate existing volumes. Mitigation measures for the Sunset Drive & Water Street intersection are discussed below.

To mitigate the existing operational issue for the southbound movement at the intersection of Sunset Drive and Water Street, a number of intersection configuration upgrades have been considered, and these are listed below.

- Separated southbound left and right turn lanes
- Separated southbound left and right turn lanes, and three-way stop control
- Roundabout with shared southbound right and left laning
- Traffic signal control with shared southbound right and left laning

The performance results for the alternative traffic control types for the Sunset Drive / Water Street intersection are summarized in **Table 2.3.** The values displayed are from Synchro analysis, although Sidra traffic analysis software was used to assess the roundabout performance. The detail analysis outputs are attached in Appendix D.

Table 2.3: Sunset Drive & Water Street / Clement Avenue Mitigated Operations

Mitigated Intersection Type	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Separated SB Lanes	EB	1	0.03	A	1	1	0.08	A	2	2
	WB	1	0.16	A	0	0	0.25	A	0	0
	SBL	1	0.38	C	19	13	0.57	E	40	24
	SBR	1	0.09	B	10	2	0.13	B	13	4
	Int. Summary		-	A	5	-	-	A	6	-
Three Way Stop Control	EB	1	0.47	B	13	-	0.79	D	27	-
	WB	1	0.43	B	12	-	0.69	C	20	-
	SBL	1	0.30	B	11	-	0.27	B	12	-
	SBR	1	0.10	A	8	-	0.14	A	9	-
	Int. Summary		-	B	12	-	-	C	20	-
Roundabout	WB	1	0.32	A	7	12	0.58	B	11	31
	SB	1	0.27	A	7	8	0.29	A	8	9
	EB	1	0.33	A	7	11	0.50	A	10	22
	Int. Summary		0.33	A	7	-	0.58	A	10	-
Signalization	EB	1	0.28	A	8	38	0.46	A	10	68
	WB	1	0.23	A	7	32	0.35	A	7	48
	SB	1	0.58	C	24	32	0.56	C	22	27
	Int. Summary		-	B	11	-	-	A	10	-

The separate southbound movement option has a failing level of service and moderately high delay, while the eastbound movement for the three-way stop control option is near the performance threshold of 0.85 at 0.79. The other two intersections are well within the performance thresholds, and given the background growth anticipated in the area including the new RCMP building and 1147-1157 Sunset Drive, only the roundabout and signalization options are anticipated to be able to accommodate the forecasted vehicle demand.

Both the roundabout and traffic signal options would provide adequate capacity to accommodate the existing balanced volumes. Note that both of these options would require the relocation of the Route #2 bus stop from its current location directly south of Sunset Drive on the south side of Clement Avenue.

Signalization of the intersection is considered to be the more appropriate choice for this location over the roundabout for the following reasons:

- There are no other roundabouts on Water Street and a signal would maintain consistency with the nearby intersections.
- The adjacent Prospera Place is likely to cause surges of traffic before and after major events, and a signal will be more able to accommodate these high vehicle volumes
- Signals are typically preferred for applications were there are frequent pedestrians. Given the ground-oriented retail proposed for the site, and the pedestrian nature of the area, and signal would be more appropriate for accommodating pedestrians. Additionally, high pedestrian volumes before and after major events at Prospera Place would significantly reduce the capacity of a roundabout as pedestrians would have the un-restricted right to cross traffic flows.
- A roundabout would require a larger footprint than is currently available at this location.

For these reasons a signal is recommended to be installed at this location, and due to its' close proximity to the intersection of Ellis Street and Clement Avenue, it is recommended that these two intersections are coordinated.

A TAC signal warrant analysis was also conducted at the intersection in question, and the detail results are shown in **Appendix E.** The existing volumes do not currently warrant a traffic signal based on the TAC warrant analysis, with the intersection achieving a score of 72 points (50 vehicle and 22 pedestrian) with 100 points generally required to warrant a signal. Nevertheless a signal is still warranted from a traffic operations perspective, and is recommended to mitigate the existing operational issues.

2.5 Walking

The existing pedestrian network near the study site is shown in **Exhibit 2.5**. The site is generally well connected to downtown Kelowna due to close proximity and sidewalks along most streets. The intersection of Sunset Drive with Water Street currently has a pedestrian crossing on only the eastbound leg, although crossings are permitted on the southbound leg. It is recommended that a crossing be added on the westbound leg of the intersection. This will improve pedestrian access to the site from the south and the plaza surrounding Propsera Place. There are marked pedestrian crossings with push buttons at all legs at the intersection of Clement Avenue and Ellis Street, and these are illustrated in Exhibit 2.5.

The cumulative (includes all four legs) peak hour pedestrian volumes at the study area intersections are summarized in **Table 2.4**.

Table 2.4: Existing Pedestrian Volumes

Intersection	AM Peak Hour	PM Peak Hour
Sunset Drive/Clement Avenue	20	48
Ellis Street/ Clement Avenue	19	45

Sidewalks are located along most of the streets near the study site, but there are some areas east of the site where sidewalks are still missing. Marked pedestrian crossings are also missing at many of the intersections east of the site.

2.6 Cyclists

The existing cycling network in the vicinity of the proposed development is illustrated in Exhibit 2.5.

As indicated, the proposed development site is moderately well connected to the existing cycling network through both the Recreation Avenue bike route north of the site, and the Cawston Avenue bicycle path to the south. Although there are not any sharrows (a street marking typically placed in the centre of the vehicle travel lane to indicate that a cyclist may use the full lane) or other cycling facilities on Sunset Drive, its' wide cross-section it is still generally considered an attractive route for cyclists. Sunset Drive then connects to the Water Street bike lanes to the south, which feed to the Abbot Street separated bike lane and the Cawston Avenue Pathway, which is the primary east-west bike route in the area.

The City has recently added cycle tracks on Ethel Street between Cawston and Bernard Avenues, and plans on adding bicycle lanes on Ellis Street in the near future.

Existing cycling volumes (total from all four legs) for the study area intersections are illustrated in **Table 2.5.**

Table 2.5: Existing Cyclist Volumes

Intersection	AM Peak Hour	PM Peak Hour
Sunset Drive/Clement Avenue	12	17
Ellis Street/Clement Avenue	17	20

For the traffic analysis portion of this study, a minimum value of 5 bicycle trips was used for each movement. Due to the imminent addition of the Ellis Street cycle tracks, 20 bph were assumed for each direction on Ellis Street. These values were used for the existing analysis, and were grown by 2% annually for the future horizons.

2.7 Transit

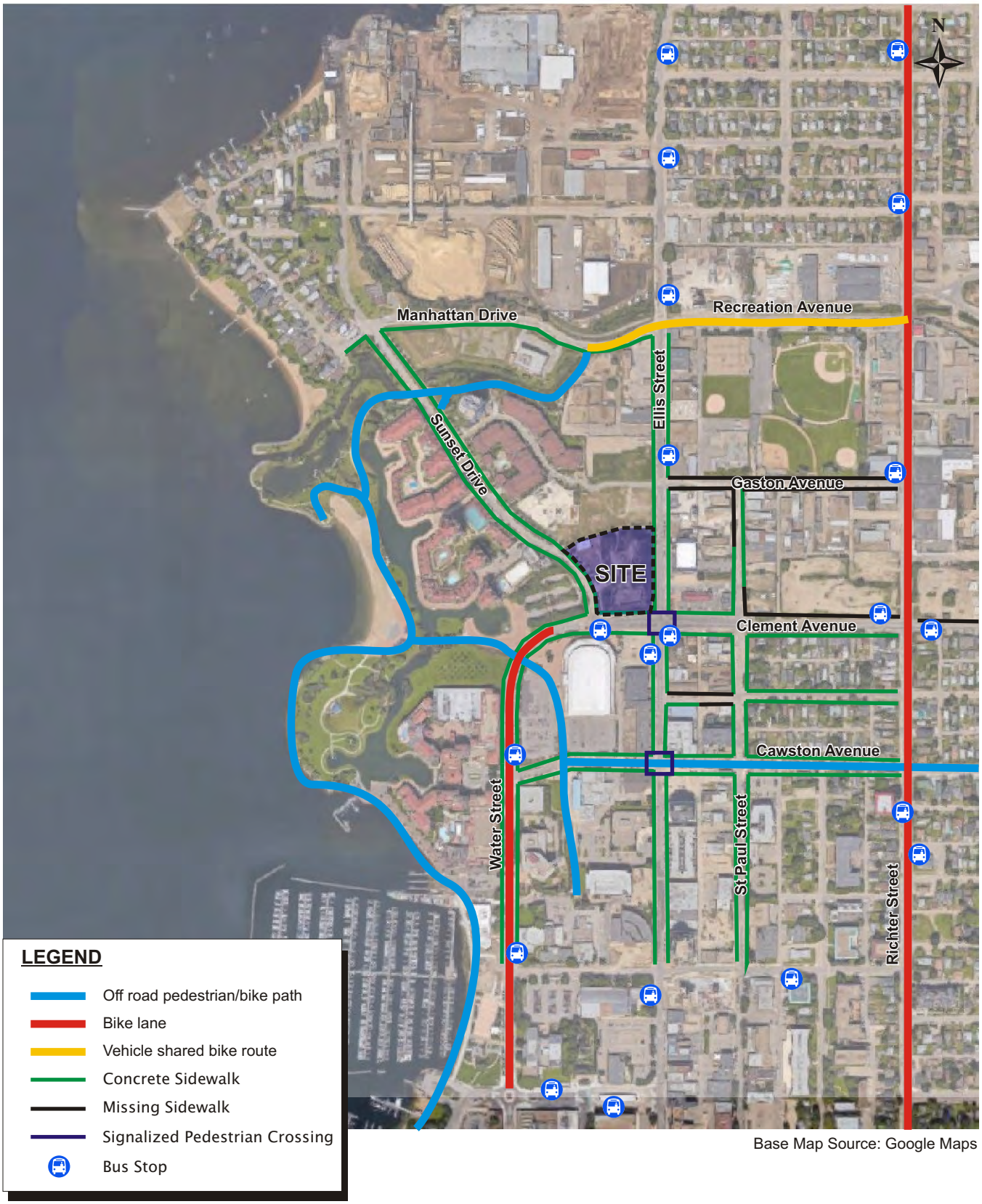
The site is located close the northbound bus stop for the Route 2 shuttle, which is located directly south of the site on Clement Avenue, and the bus Route 5 with stops near the intersection of Clement Avenue and Ellis Street. The Route 2 shuttle travels from the nearby stop northbound, and does a loop to/from the Queensway Exchange, while the Route 5 travels from the Queensway Exchange south to the Mission Recreation Park.

The existing Queensway Exchange is a significant destination and transfer point in downtown Kelowna, and is located approximately 800m south of the site, or approximately a 10-minute walk away. **Table 2.6** summarizes the bus transit routes near the study site and at the Queensway Exchange. The exchange is also the terminus for the RapidBus service implemented as Phase I of the RapidBus project.

Table 2.6: Bus Transit Service

Type	Bus Route	Destination	Duration	AM Peak Frequency	PM Peak Frequency	SAT Frequency
Adjacent Route	2	Queensland Exchange / Cambridge Avenue	15	35	25	30
	5	Mission Recreation Exchange	25	30	30	30
Routes available through transfer at Queensway Exchange	1	Okanagan College / Mission Recreation Exchange	25	15	15	30
	6	University of British Columbia Okanagan	35	NA	55	NA
	7	Orchard Park Mall	35	18	15	30
	9	Orchard Park Mall	20	NA	NA	NA
	10	Fitzpatrick & Findlay Rd	45	15	15	30
	11	Craig Rd & McCurdy Rd	40	15	15	30
	97	Westbank Exchange and University of British Columbia Okanagan	50	15	15	30

As illustrated in Table 2.6, the site is well connected to a variety of other bus services through the Queensway transit exchange, which is accessible via a 10-minute walk or a transfer from Route 2. However, given the existing 30-minute frequency of Route 3 during peak activity periods, transit is not anticipated to be a substantial mode of travel to and from the site with the current transit scheduling.



Base Map Source: Google Maps

Exhibit 2.5

Active Transportation Network

3. DEVELOPMENT PLAN

3.1 Land Use

The proposed development uses and densities are summarized in **Table 3.1**.

Table 3.1: Proposed Land Use Densities

Land Use	Density
Commercial	10,034 ft²
Restaurant	7,048 ft²
Residential – Townhouse	9 units
Residential - Condo	397 units
Total	**733,116 ft²**

3.2 Vehicle Access

The proposed lane configurations and traffic control for the development site accesses and the study network are shown in **Exhibit 3.1**. As shown, there are two vehicle access points to the site, a full movement access on Sunset Drive and a partial movement access on Ellis Street. Each site access is described in detail below:

Access on Sunset Drive

Located on the north end of the site and spaced approximately 115m from Clement Avenue, this access meets the City of Kelowna and TAC access spacing requirements from Clement Avenue. This access is proposed to be a full movement access, with both inbound and outbound left and right turns permitted.

Access on Ellis Street

This access is approximately 115m away from Clement Avenue and also meets the City of Kelowna and TAC access spacing requirements. However, the City bylaw also states that residential driveway accesses are not permitted on arterial streets. Despite this, the City has indicated their tentative approval of a right in / right out access at this location.

The client also seeks to have the northbound left turn movement allowed at the Ellis Street access as well, as a significant portion of future site traffic is anticipated to come from the south and east directions on Clement Avenue and Ellis Street. To better understand the impacts of permitting or restricting the northbound left turn movement at this access, the City has requested that a sensitivity analysis be conducted.

This sensitivity analysis is included in **Section 4.2**. The Post Development analysis with the northbound left turn ***permitted*** is shown for the 2020 and 2030 horizon years in **Section 4.2.1**, and Post Development analysis with the northbound left turn ***restricted*** has been shown for the 2030 horizon in **Section 4.2.2**. **Section 4.2.3** summarizes the differences between the two analyses and highlights the pros and cons of each.

3.3 Trip Generation

Traffic generation estimates for the proposed development were based on trip rates reported in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. Trip rates and the subsequent trips generation for the AM and PM peak hour periods is presented in **Table 3.2**

ITE trip generation data is predominately based on suburban locations which are typically considered more car dependent than would be the case for the proposed development located within walking/cycling distance to the downtown Kelowna area and near to higher density residential land uses. Although the proposed site location has access to transit, and significant cycling and pedestrian connections, for a conservative estimate the reported ITE trip rates were used as a base with discounts applied as described below. The City of Kelowna has approved the site trip generation methodology.

Table 3.2: Development Site Trip Generation

Use	Quantity (ft^2 or units)	Source	Peak Hour	Total Trip Rate (per 1000 ft^2 or unit)	# Trips In	# Trips Out	Total Trips
Commercial	10,034	ITE 820	AM	0.96	6	4	10
			PM	3.71	18	19	37
Restaurant	7,048	ITE 931	AM	0.81	4	2	6
			PM	7.49	35	17	53
Residential – Live/Work	9 units	ITE 230	AM	0.44	1	3	4
			PM	0.52	3	2	5
Residential - Condo	397 units	ITE 230	AM	0.44	30	145	175
			PM	0.52	138	68	206
Sub Total			**AM**		**40**	**154**	**194**
			PM		**195**	**106**	**301**
Internal Capture Reduction (NCHRP 684 procedure)			AM		4	2	6
			PM		26	26	52
10% Active Transportation Reduction			AM		4	15	19
			PM		17	8	25
Total			**AM**		**33**	**136**	**169**
			PM		**152**	**72**	**224**

Internal capture for the development was based on the National Cooperative Highway Research Program (NHCRP) Report 684: Enhancing Internal Trip Capture Estimate for Mixed Use Developments. The methodology takes into account the different land uses and calculates individual internal capture reductions for each use during the peak hour periods. The sum of the individual internal capture reductions are shown in Table 4.1 for simplicity, and the detailed calculations for can be found in **Appendix F**.

A 10% active transportation reduction was applied to all the site trips to take account for the site's proximity to transit and the downtown, and was based on mode share data from the Central Okanagan – Regional Active Transportation Master Plan, which states that the overall active transportation mode share is 15%. The typical ITE rate is 5%, and so the difference of 10% was applied as a reduction. This is considered to be a conservative estimate, as the site is centrally located and likely to have a higher transit and active mode share than a typical site in Kelowna.

3.4 Trip Distribution & Assignment

3.4.1 Distribution

Based on a conversation with City staff on May 2nd, 2014, and confirmed on April 11, 2017, it is anticipated that the majority of site generated vehicle trips will be to and from the south. The traffic distribution and assignment patterns for the development were based on this, as well as existing traffic patterns. The AM and PM trip distributions are shown in **Table 3.3.**

Table 3.3: Vehicle Trip Distribution

Direction	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
To/from the south on Ellis Street	55%	55%	40%	50%
To/from the north on Ellis Street	10%	10%	10%	10%
To/from the west on Water Street	10%	10%	10%	15%
To/from the east on Clement Avenue	25%	25%	40%	25%
To/from the north on Sunset Drive	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

3.4.2 Assignment

With the Northbound Left Turn Movement at the Ellis Street Access Permitted

Vehicles were distributed to the site accesses based on the anticipated commercial / residential site access distribution and the convenience of using each access. 50% of all commercial trips and all residential trips to/from Water Street were assigned to use the access on Sunset Drive. A percentage of 50% was used for the commercial trips because the commercial/retail component will be focused on the southwest corner of the site and is likely to attract people to the Sunset Drive access, even if they approach the development from the south or east.

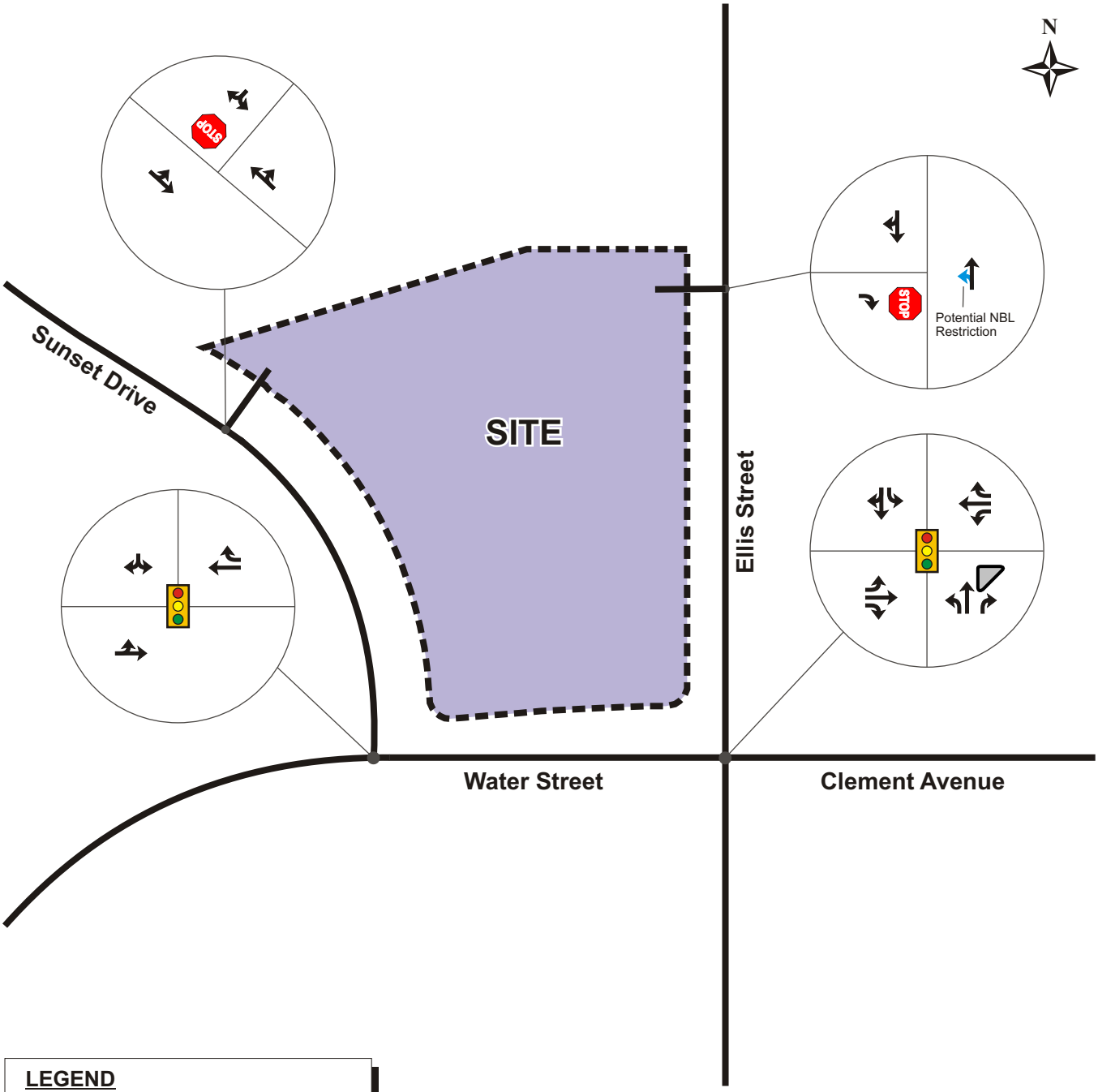
The overall access assignment to the Sunset Drive access ranged between 11 – 28% of the total site trips, and varied for inbound/outbound movements based on the time of day, and the proportional differences between commercial and residential trips. **Exhibit 3.2** shows the development site trips on the study network with some site trips assigned to the northbound left turn movement at the Ellis Street access.

With the Northbound Left Turn Movement at the Ellis Street Access Restricted

As noted earlier, the City of Kelowna has asked that the northbound left turn movement from Ellis Street into the site access be restricted. Site trip assignment for this scenario was conducted in an identical manner to the scenario with the northbound left permitted (as described above), except for the following:

- Northbound through site vehicles at the intersection of Ellis Street and Clement Avenue have been rerouted to turn northbound left and use the Sunset Drive access.
- Westbound right turning site vehicles at the intersection of Ellis Street and Clement Avenue have been rerouted to westbound through to use the Sunset Drive access.
- The Eastbound left turning vehicles at Ellis Street and Clement Avenue have instead been assigned to turn eastbound left at the intersection of Sunset Drive and Water Street, and then routed to the Sunset Drive access.

Exhibit 3.3 shows the development site trips for the scenario with the northbound left turn movement banned, based on the above changes.

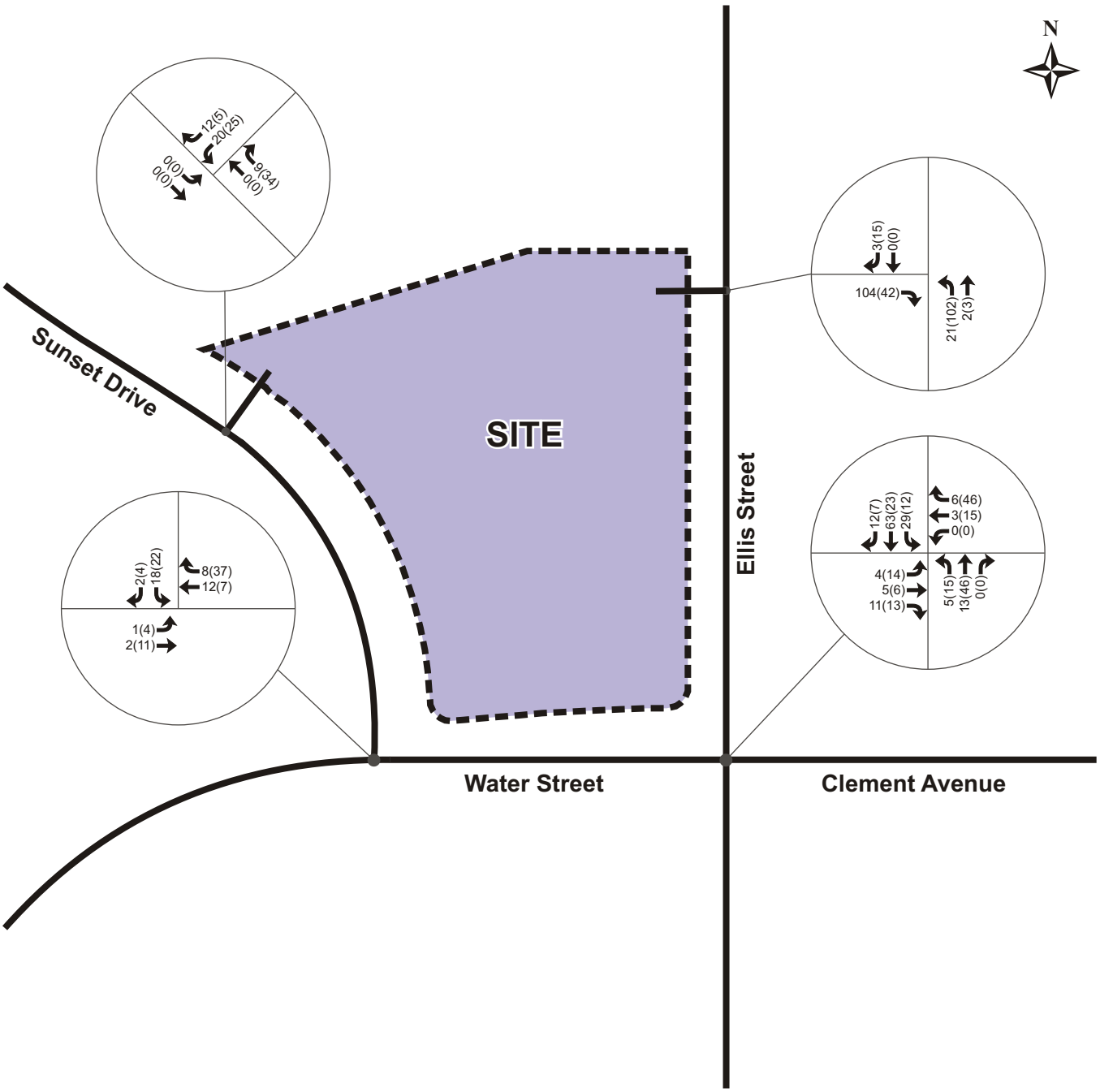


LEGEND

- Lane Configuration
- Signalized Intersection
- Stop Controlled
- Right Turn Channelization

Exhibit 3.1

Proposed Lane Configurations & Traffic Control

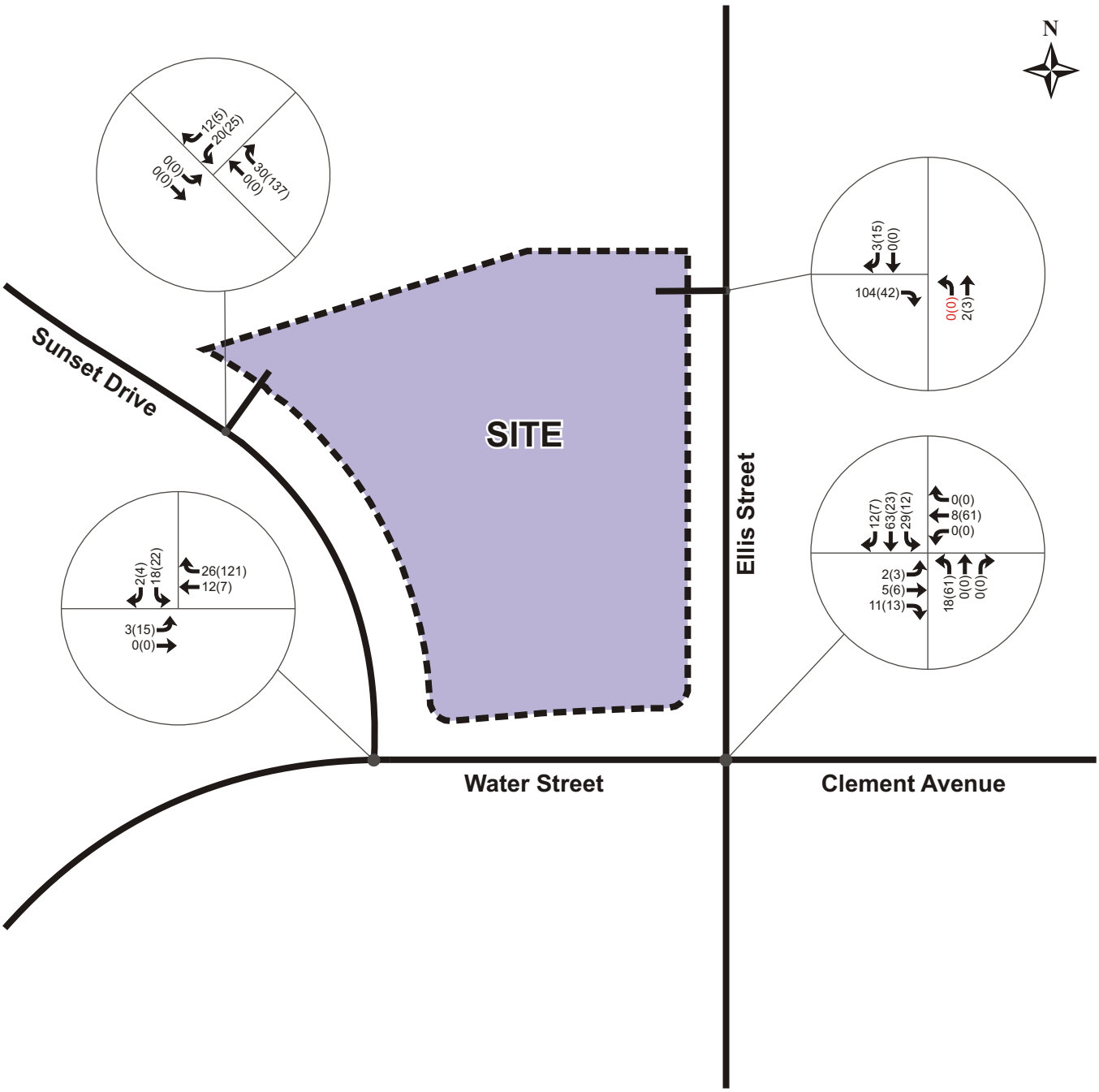


LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 3.2

Development Site Trips



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 3.3

Development Site Trips with Restricted Northbound Left Turn at Ellis Street Access

4. FUTURE TRAFFIC CONDITIONS

To develop the future Background Traffic volumes, the existing volumes were grown at an annual growth rate of 2% (as requested by the City of Kelowna), and pedestrian and cycling trips were also increased at this growth rate. The mitigation measures recommended in Section 2.0 were also carried through to the future analysis (Background and Post Development), and the updated network was used as a base for following analysis.

In addition, background traffic was added for the nearby approved developments of 1147-1157 Sunset Drive (93 residential units) and 1190 Richter Street (new RCMP headquarters). Trip generation and distribution for the 1147-1157 Sunset Drive development was calculated in a similar manner to the trip generation and distribution for the study site, and the site was forecasted to generate a total of 37 AM trips (6 In, 31 Out) and 44 PM trips (29 In, 14 Out).

Trips for the soon to be completed RCMP development were taken from the TIA for the site, which was completed in March 2013 by EBA. The trip generation for the 2018 EBA horizon were used for the 2020 horizon, while the 2035 horizon was used for the 2030 horizon in this study. This report has been included in **Appendix G** for reference.

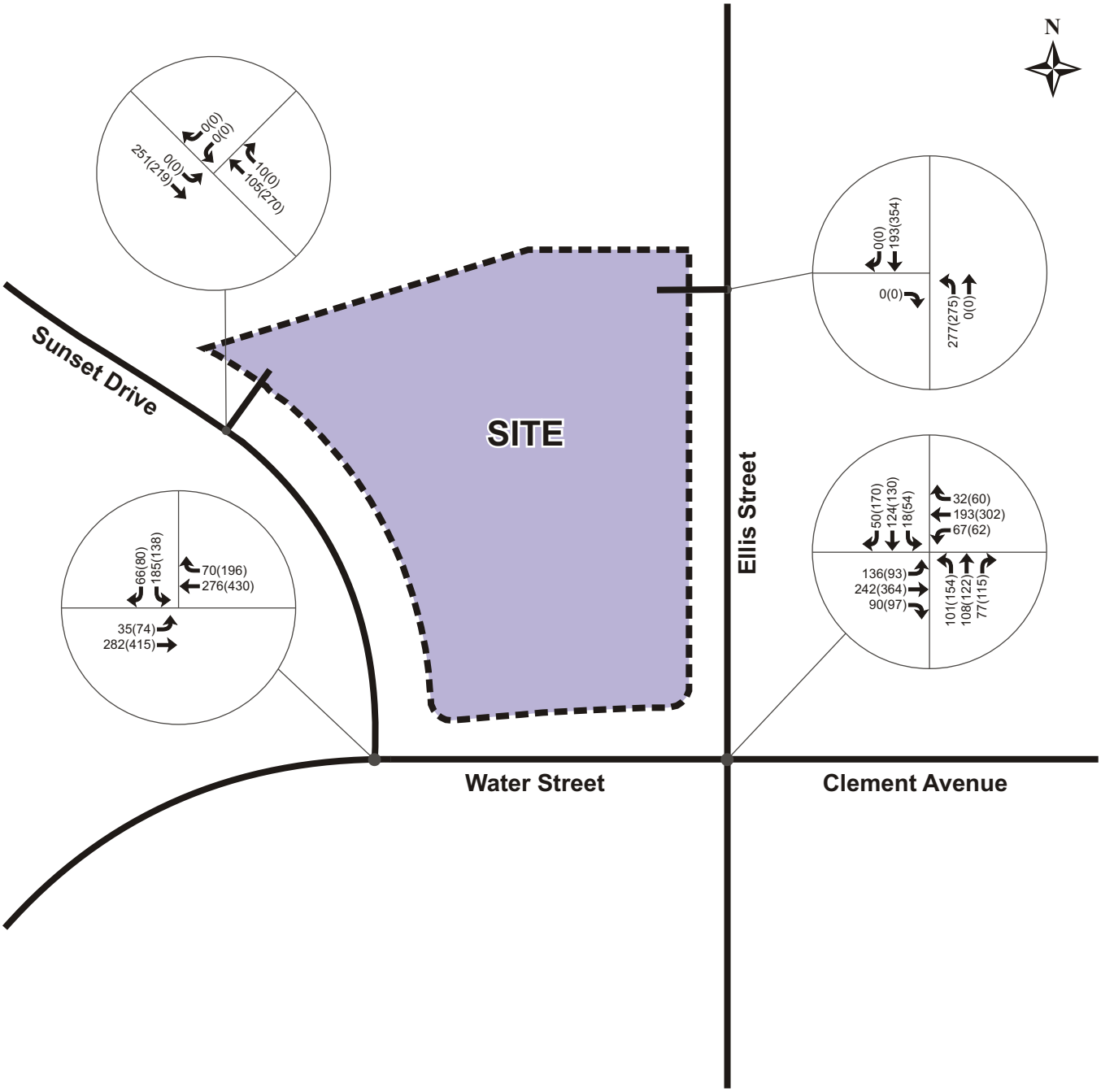
The combined background trips for both of these sites were added together and are shown on the study area intersections in **Appendix H.1 & H.2**. These trips were then added to the grown background traffic volumes for each horizon year to come up with the 2020 and 2030 Background Volumes (Exhibit 2.4 + 2% annual growth + Appendix H.1 or H.2).

It is noted that the 2% blanket growth rate likely includes a portion of the two approved developments, and therefore there is some inherent conservativeness in the resulting 2020 and 2030 Background Traffic volumes.

Finally, it is also acknowledged that while a signal was recommended for the intersection of Sunset Drive & Water Street based on the existing volumes, the current southbound stop controlled configuration could suffice for a number of years without the proposed development. However, the addition of the proposed development necessitates the upgrading of this intersection, and development should be considered a contributing factor to the requirement of a signal even though it has been assumed for the future Background and Post Development horizons.

4.1 Background Operations

Traffic volumes for the Background 2020 (estimated Opening Day) and Background 2030 (Opening Day plus 10 year) horizons are summarized in **Exhibit 4.1 and 4.2**. As noted above, these were based on the existing balanced traffic volumes, grown by 2% annually and include additional traffic from the nearby approved developments. The intersection capacity analysis for these Background horizons are summarized in **Table 4.1 and 4.2**.

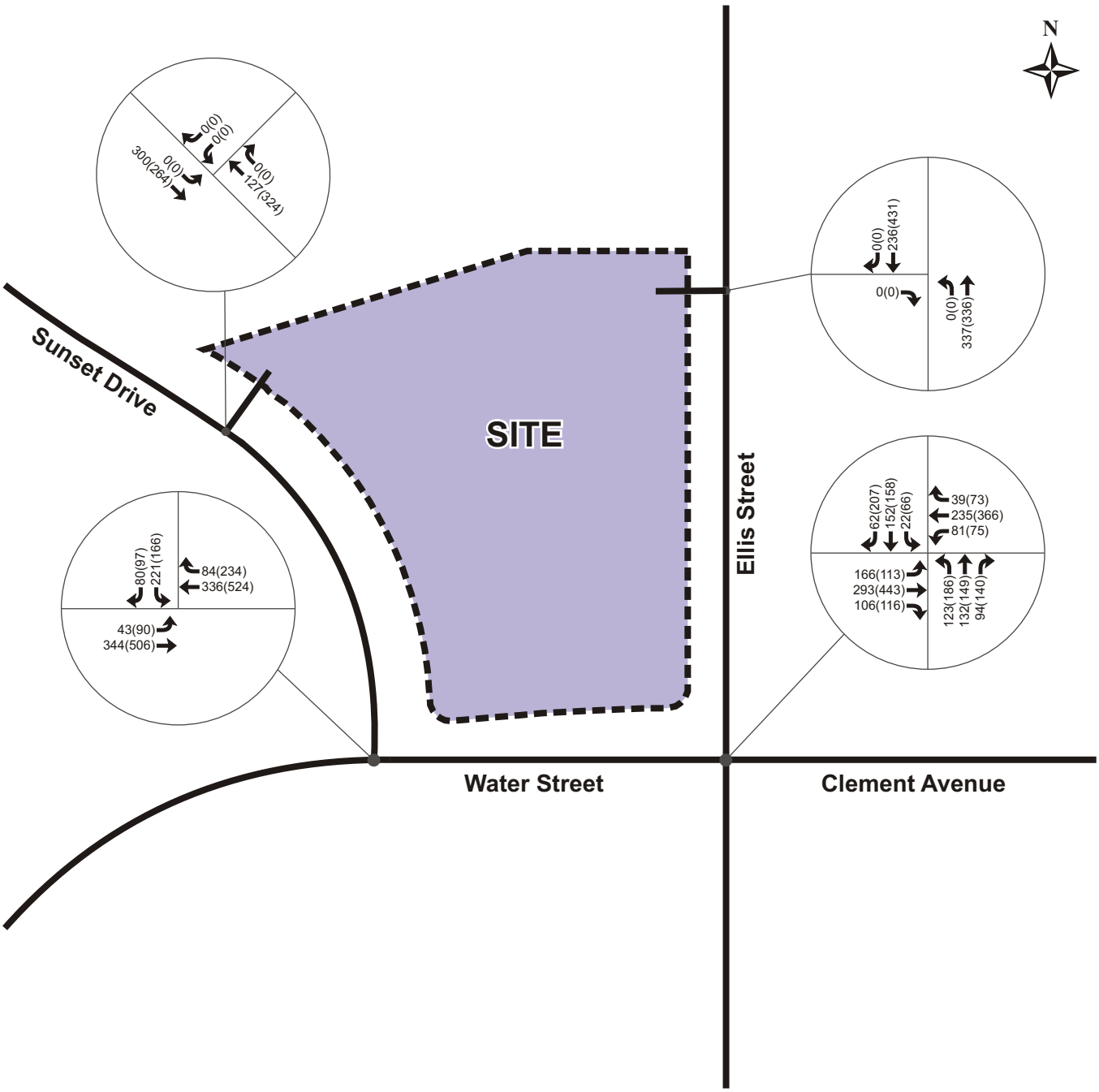


LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 4.1

Background 2020 Traffic Volumes



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 4.2

Background 2030 Traffic Volumes

Table 4.1: Background 2020

Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (Signalized)	EB	1	0.31	A	8	42	0.48	A	10	74
	WB	1	0.26	A	7	32	0.37	A	6	47
	SB	1	0.67	C	30	45	0.68	C	35	45
	Int. Summary		-	B	13	-	-	B	12	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.22	A	10	16	0.21	B	12	17
	EBT	1	0.24	A	9	25	0.42	B	14	66
	EBR	1	0.11	A	4	4	0.13	A	2	2
	WBL	1	0.11	A	9	11	0.16	B	15	15
	WBT	1	0.19	A	9	26	0.35	B	15	57
	WBR	1	0.04	A	0	0	0.08	A	1	1
	NBL	1	0.35	C	20	19	0.51	C	21	24
	NBT		0.25	C	22	25	0.23	C	21	25
	NBR	1	0.19	A	6	8	0.23	A	5	10
	SBL	1	0.06	B	16	6	0.15	B	15	10
	SBTR	1	0.55	C	28	34	0.76	C	32	54
	Int. Summary		-	B	13	-	-	C	17	-

At the Ellis Street and Clement Avenue intersection the northbound left turn queue increased to approximately 40m due to the increase in background traffic, and a separate phase for the northbound and southbound left turn movements was implemented to reduce the northbound queue. With these mitigation measures, the northbound left turn queue is still exceeding the storage length, but only by 4m or approximately 1 vehicles.

The remaining movements are all within the capacity thresholds.

Table 4.2: Background 2030 Operations

Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (Signalized)	EB	1	0.41	B	10	54	0.64	B	13	106
	WB	1	0.33	B	13	57	0.47	A	7	57
	SB	1	0.74	C	32	55	0.75	D	38	56
	Int. Summary		-	B	17	-	-	B	14	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.30	A	9	23	0.31	B	13	17
	EBT	1	0.31	A	9	36	0.53	B	15	74
	EBR	1	0.13	A	2	4	0.16	A	2	2
	WBL	1	0.16	B	11	15	0.25	B	18	20
	WBT	1	0.25	B	11	35	0.44	B	17	71
	WBR	1	0.05	A	1	1	0.10	A	4	8
	NBL	1	0.41	B	19	21	0.75	C	34	32
	NBT		0.30	C	22	28	0.28	C	22	30
	NBR	1	0.22	A	6	10	0.27	A	5	11
	SBL	1	0.06	B	14	6	0.16	B	14	12
	SBTR	1	0.62	C	29	40	0.81	C	34	67
	Int. Summary		-	B	13	-	-	B	19	-

At the Ellis Street and Clement Avenue intersection the northbound left turn 95th percentile queue now exceeds the available storage in the AM peak hour, and exceeds the storage by 12 metres (approximately 2 vehicles) in the PM peak hour. For reference the 50th percentile queue for the northbound left turn is at 20 metres in the PM peak hour.

There may be an opportunity to increase the northbound left storage to approximately 45 metres, which would fit the anticipated queues. This would however require a realignment of the centre line, and potentially the removal of parking spaces on the east side of Ellis Street to achieve the entrance taper. It is recommended that queues are monitored for this movement, and that the possibility of increasing the storage length is reviewed if queues are observed to routinely exceed the available storage.

The eastbound through movement at this intersection has a reported 95th percentile queue of 74 metres, which would extend back into the intersection of Sunset Drive / Water Street as there is only 70 metres of space between the two intersections. While this is not ideal, coordinating the intersections will help to ensure that sufficient green bands are provided for the both the eastbound and westbound though movements during the peak hours (which will help limit spill back between the intersections). The 74-metre queue (approximately 9 vehicles) will be able to clear in one cycle, and the queue is only anticipated to reach 74 metres once or twice during the PM peak hour.

If and when the eastbound though queue does extend into the Sunset Drive / Water Street intersection, there is no northbound movement at this intersection to be blocked, and the southbound left turning vehicles will be able to wait until the queue clears before entering the intersection. It should be noted that the roundabout would not be advantageous over the signal in this scenario, as the eastbound queue would back up through the roundabout and block the south movements just the same.

Finally, widening the eastbound through movement to two lanes is considered unfeasible, as a second lane would not line up with the downstream side of Ellis Street, and widening the road would be counterintuitive to the active transportation goals outlined in Kelowna On the Move: Pedestrian and Bicycle Master Plan, especially given the close proximity of the study area to downtown. It is therefore recommended that the eastbound through movement be coordinated as best possible, and the operation of the intersections be monitored regularly to ensure sufficient operation.

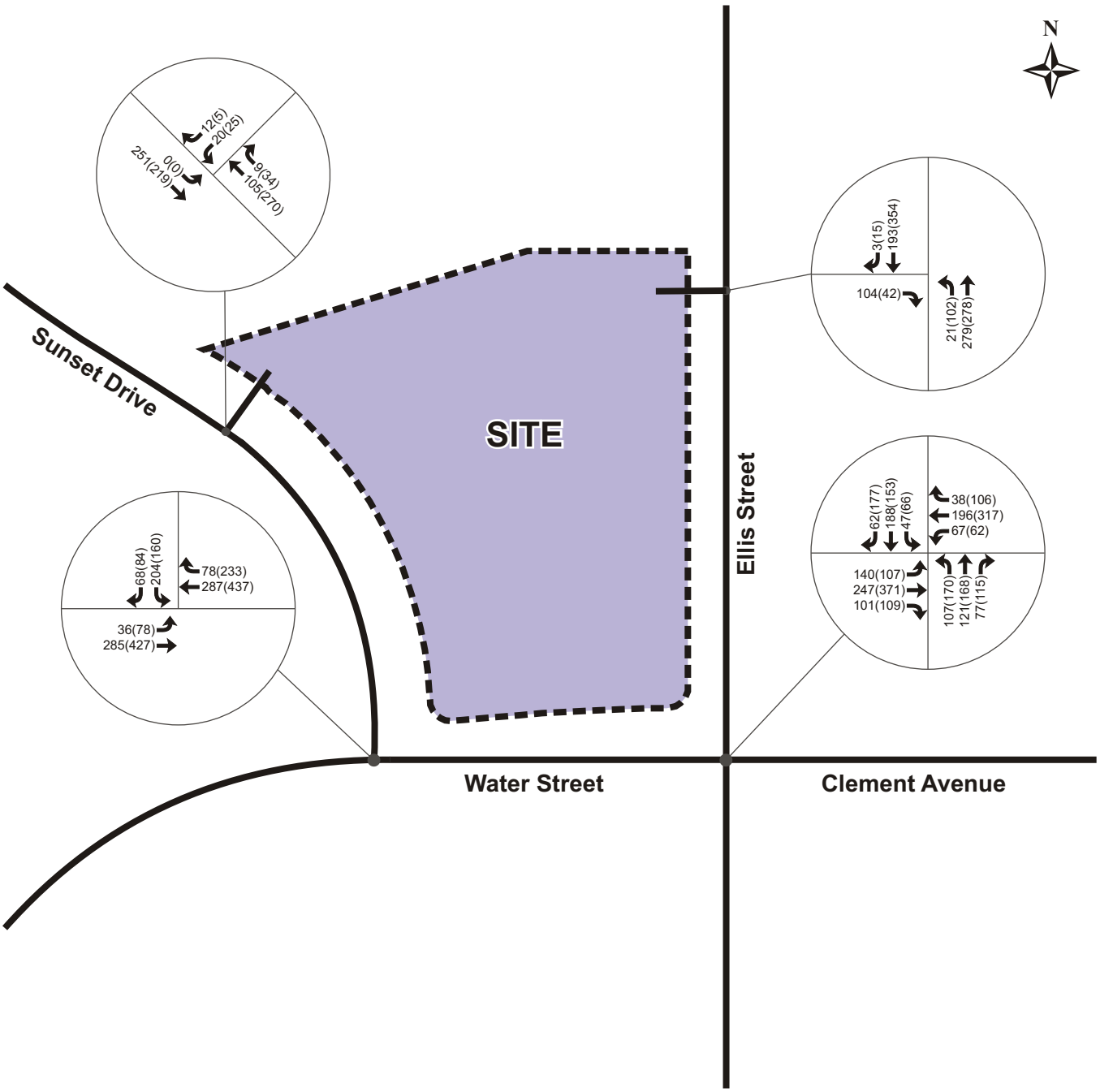
4.2 Post Development Operations

As noted earlier, analysis for the Post Development horizons has been split into two different sections, one with the northbound left turn at the Ellis Street site access permitted (4.2.1), and one with it banned (4.2.2). Section 4.2.3 compares the two scenarios, and describes the pros and cons of each.

For all Post Development scenarios, the traffic volumes shown are the result of the addition of the future total Background Volumes (Exhibits 4.1 and 4.2) plus the forecasted site traffic (Exhibits 3.2 and 3.3).

4.2.1 Northbound Left Turns Permitted at the Ellis Street Access

Post Development traffic volumes with the northbound left turn permitted for Opening Day (est. 2020) and the Opening Day plus 10 year horizon (2030) are shown in **Exhibits 4.3 and 4.4**. The Intersection capacity analysis for these horizons is shown in **Tables 4.3 and 4.4.**

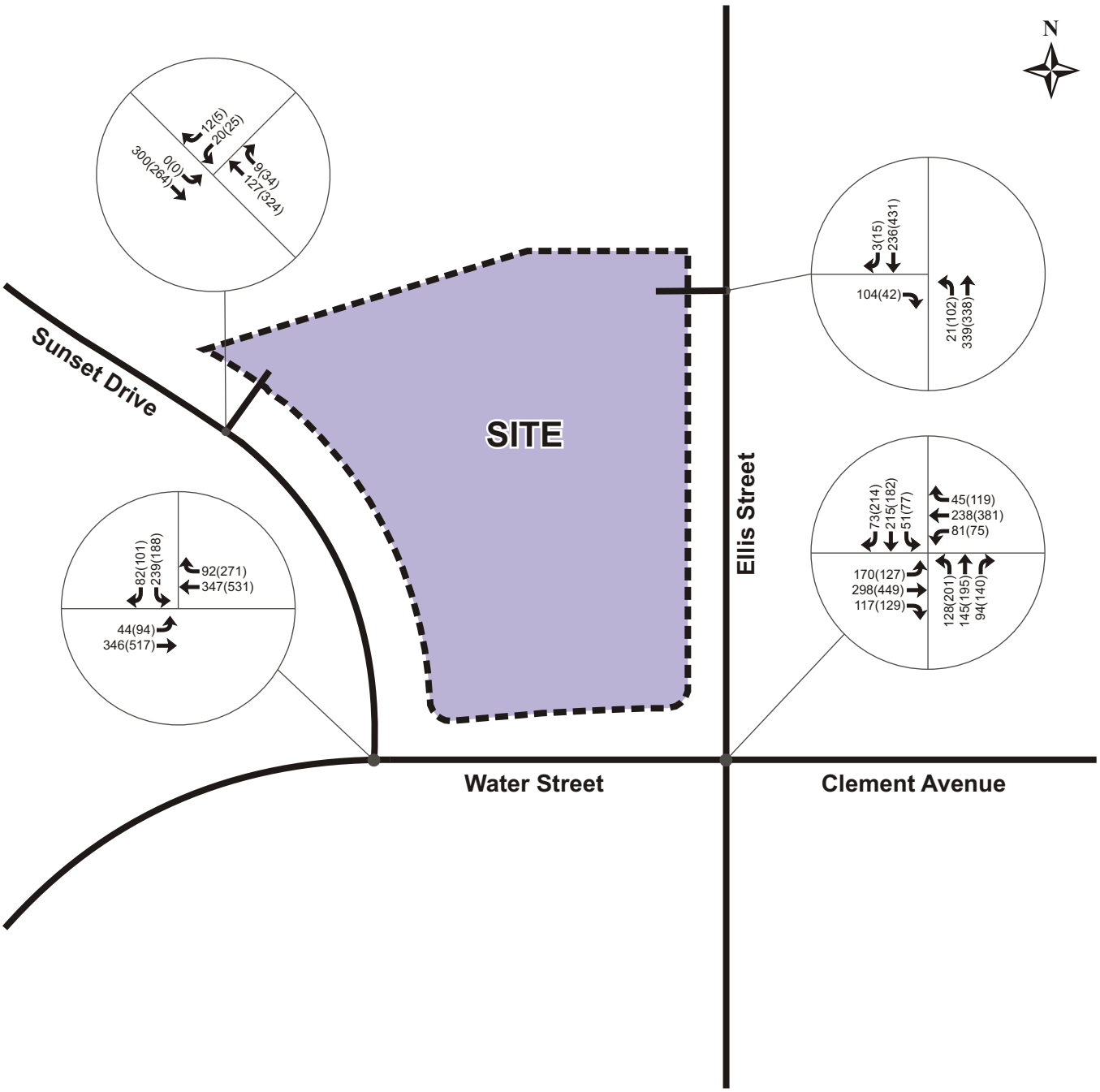


LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 4.3

Post Development 2020 Traffic Volumes



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 4.4

Post Development 2030 Traffic Volumes

Table 4.3: Post Development 2020 Operations

Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (Signalized)	EB	1	0.32	A	9	43	0.51	B	10	72
	WB	1	0.27	A	8	32	0.38	A	6	43
	SB	1	0.70	C	31	49	0.74	D	39	54
	Int. Summary		-	B	14	-	-	B	13	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.25	B	11	19	0.26	B	13	22
	EBT	1	0.27	B	11	30	0.44	B	16	71
	EBR	1	0.13	A	4	6	0.15	A	3	4
	WBL	1	0.13	B	12	13	0.17	B	15	15
	WBT	1	0.22	B	12	31	0.37	B	16	58
	WBR	1	0.05	A	1	1	0.14	A	4	9
	NBL	1	0.36	B	17	17	0.62	C	25	28
	NBT		0.28	C	22	25	0.33	C	23	35
	NBR	1	0.18	A	5	7	0.24	A	5	10
	SBL	1	0.13	B	14	9	0.18	B	15	12
	SBTR	1	0.66	C	30	46	0.79	D	35	63
	Int. Summary		-	B	15	-	-	B	18	-
Sunset Drive Access (WB Stop Control)	WB	1	0.05	B	11	1	0.07	B	13	2
	NB	1	0.00	A	0	0	0.00	A	0	0
	SB	1	0.07	A	0	0	0.19	A	0	0
	Int. Summary		-	A	1	-	-	A	1	-
Ellis Street Access (EB Stop Control)	EB	1	0.14	B	10	4	0.07	B	11	2
	NB	1	0.02	A	1	0	0.10	A	3	3
	SB	1	0.13	A	0	0	0.24	A	0	0
	Int. Summary		-	-	-	-	-	A	2	-

At the intersection of Ellis Street and Clement Avenue, the eastbound and northbound left turn 95th percentile queues are anticipated to exceed the available storage. As noted in the previous section, the eastbound through queue is anticipated to be manageable with the coordination of the two intersections. The northbound left queue will exceed the 20-metre storage by 8 metres (approximately 1 vehicle), which is only 4 metres more than the background scenario. It is recommended that the northbound left turn queue be monitored, and the option to increase the storage length be reviewed if the queues materialize.

Both of the site accesses are anticipated to operate well within the performance thresholds. The southbound 95th percentile queues at both of the signalized intersections on Clement Avenue do not extend back to either of the site access, and the accesses are anticipated to have little if any impact on the performance of the signalized intersections on Clement Avenue.

Table 4.4: Post Development 2030 Operations

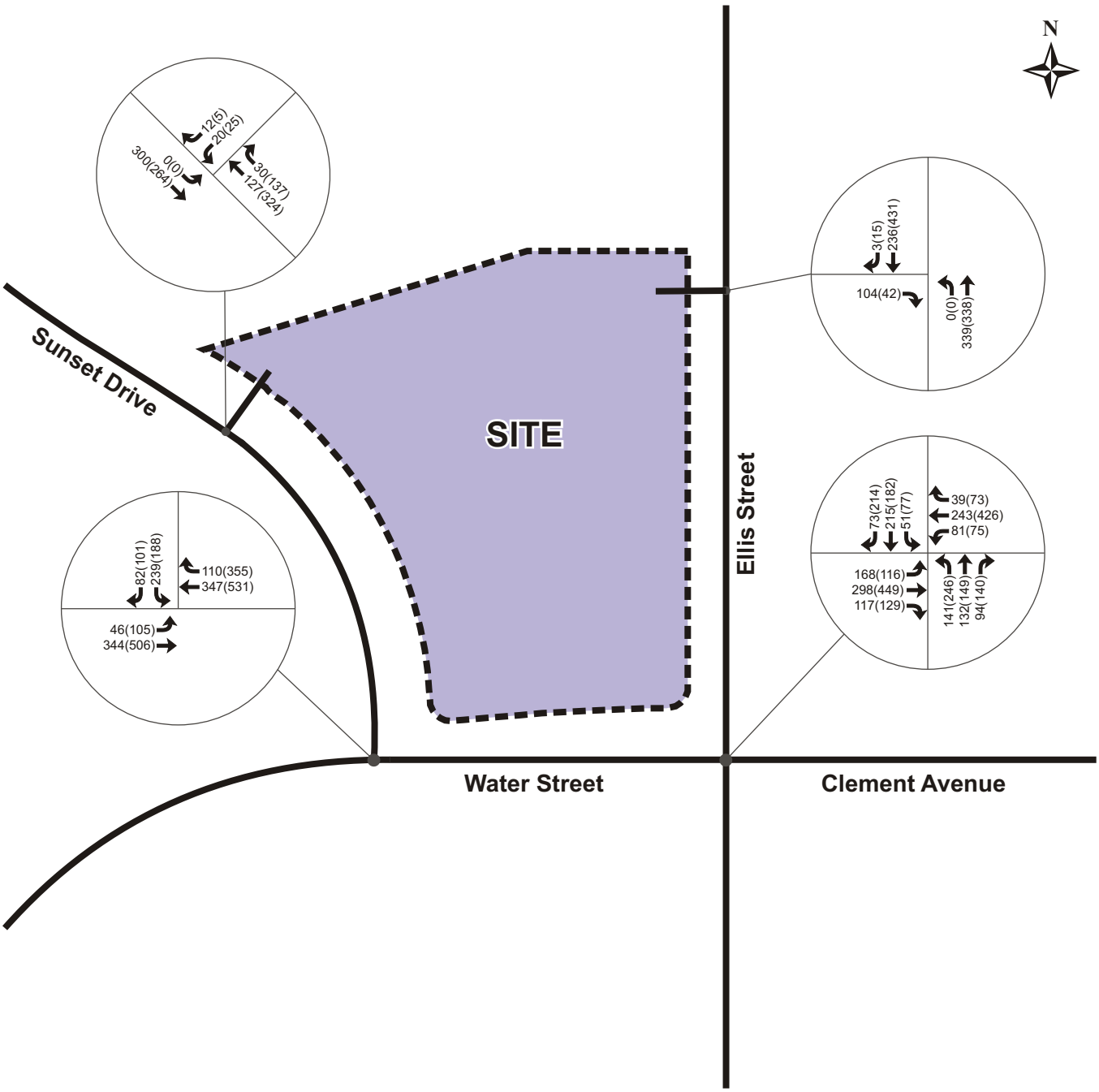
Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (Signalized)	EB	1	0.42	B	11	54	0.68	B	15	106
	WB	1	0.34	A	8	37	0.48	B	10	63
	SB	1	0.76	C	33	60	0.81	D	43	69
	Int. Summary		-	B	16	-	-	B	17	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.33	B	13	33	0.40	B	19	22
	EBT	1	0.33	B	13	47	0.57	C	21	81
	EBR	1	0.15	A	4	6	0.19	A	4	6
	WBL	1	0.17	B	13	17	0.29	B	20	20
	WBT	1	0.27	B	13	39	0.49	B	19	74
	WBR	1	0.06	A	1	2	0.17	A	4	10
	NBL	1	0.48	B	20	19	0.75	C	32	36
	NBT		0.32	C	22	28	0.34	C	21	38
	NBR	1	0.22	A	6	9	0.25	A	4	11
	SBL	1	0.13	B	13	9	0.19	B	13	13
	SBTR	1	0.70	C	30	51	0.84	D	37	79
	Int. Summary		-	B	16	-	-	C	21	-
Sunset Drive Access (WB Stop Control)	WB	1	0.06	B	11	1	0.08	B	15	2
	NB	1	0.00	A	0	0	0.00	A	0	0
	SB	1	0.09	A	0	0	0.23	A	0	0
	Int. Summary		-	A	1	-	-	A	1	-
Ellis Street Access (EB Stop Control)	EB	1	0.15	B	11	4	0.08	B	12	2
	NB	1	0.02	A	1	0	0.11	A	3	3
	SB	1	0.15	A	0	0	0.28	A	0	0
	Int. Summary		-	A	2	-	-	A	2	-

The eastbound through movement 95th percentile queue at the intersection of Ellis Street and Clement Avenue is 81 metres, and continues to exceed the available distance between the two intersections of 70 metres. There is little opportunity to improve this movement as additional lanes cannot be provided without widening the road, and widening the road in this area, especially west of Sunset Drive on Water Street is not anticipated to be desired by the City. It is therefore recommended that the coordination at this location be closely monitored when implemented to ensure that the two intersections operate efficiently. The northbound left turn movement 95th percentile queue at the same intersection continues to exceed the available storage, and monitoring the queue is still the recommended course of action.

The operation at both of the site access are again within performance thresholds, and southbound queuing from the two signalized intersections will not reach back to the site accesses which are both offset over 100 metres from Clement Avenue. SimTraffic observations also show that the proposed site accesses are effectively outside of the signal's functional areas, and do not have an impact on their operations.

4.2.2 Northbound Left Turn Restricted at Ellis Street Access

As noted earlier, the City of Kelowna has asked that the northbound left turn from Ellis Street into the site access be restricted. A sensitivity analysis has been conducted for the 2030 Post Development horizon where the northbound left turn movement into the Ellis Street access is restricted. The total volumes for this scenario are shown in **Exhibit 4.5**, and the analysis results are presented in **Table 4.5.**



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Exhibit 4.5

Post Development 2030 Traffic Volumes with Restricted Northbound Left Turn at Ellis Street Access

Table 4.5: Post Development 2030 Operations with Restricted NBL at Ellis Street Access

Intersection	Movement & # of Lanes		AM Peak Hour				PM Peak Hour			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Sunset Drive & Water Street / Clement Avenue (Signalized)	EB	1	0.42	B	11	54	0.72	B	16	113
	WB	1	0.34	A	8	38	0.48	A	8	53
	SB	1	0.76	C	33	60	0.81	D	43	69
	Int. Summary		-	B	15	-	-	B	17	-
Ellis Street & Clement Avenue (Signalized)	EBL	1	0.34	B	14	32	0.46	C	22	20
	EBT	1	0.35	B	13	47	0.60	C	20	86
	EBR	1	0.16	A	4	6	0.19	A	5	5
	WBL	1	0.18	B	13	17	0.32	C	22	21
	WBT	1	0.28	B	13	40	0.57	C	22	87
	WBR	1	0.05	A	1	1	0.11	A	1	3
	NBL	1	0.50	C	20	21	0.80	C	34	50
	NBT	1	0.27	C	21	25	0.24	B	19	29
	NBR	1	0.20	A	5	9	0.24	A	4	11
	SBL	1	0.12	B	13	9	0.18	B	13	13
	SBTR	1	0.70	C	30	51	0.85	D	39	83
	Int. Summary		-	B	16	-	-	C	23	-
Sunset Drive Access (WB Stop Control)	WB	1	0.06	B	11	1	0.08	C	15	2
	NB	1	0.00	A	0	0	0.01	A	0	0
	SB	1	0.10	A	0	0	0.29	A	0	0
	Int. Summary		-	A	1	-	-	A	1	-
Ellis Street Access (EB Stop Control)	EB	1	0.15	B	11	4	0.08	B	12	2
	NB	1	0.00	A	0	0	0.00	A	0	0
	SB	1	0.15	A	0	0	0.28	A	0	0
	Int. Summary		-	A	2	-	-	A	1	-

The intersection of Sunset Drive and Water Street operates approximately the same as the previous scenario. The operation at the intersection of Ellis Street and Clement Avenue has worsened slightly, with longer eastbound through and northbound left turning 95th percentile queues (81 to 86 metres and 36 to 50 metres accordingly). Operational performance at the site accesses is relatively unchanged.

4.2.3 Northbound Left Turn at Ellis Street Site Access Summary

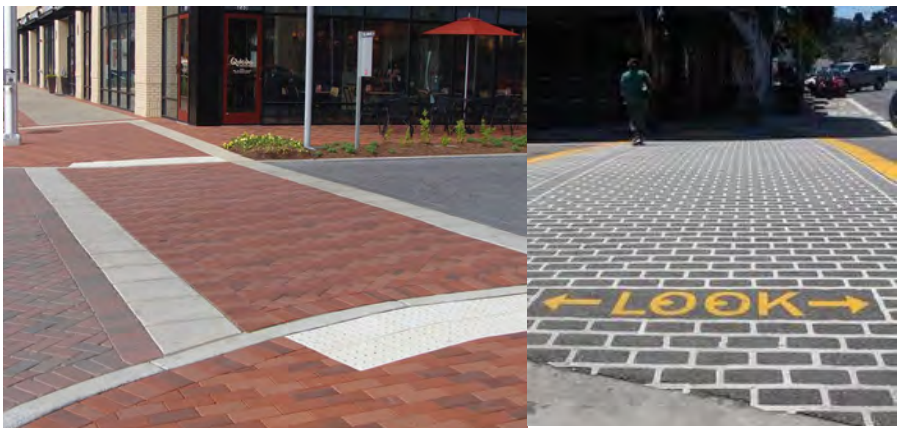
Based on the analysis presented above, and a general review of the proposed site access locations, the following points are noted in regards to the proposed northbound left turn restriction at the Ellis Street site access:

- Site accesses on arterial streets in Kelowna are generally restricted.
- The northbound left turn movement at the Ellis Street site access will generally have the highest impact on Ellis Street traffic operations compared to the eastbound right out and southbound right in movements (the eastbound left turn movement out of the site will be restricted).
- Permitting the northbound left turn at the Ellis Street access will increase the number conflicting vehicle / cyclist movements if / when a cycling route is established on Ellis Street.
- The loading bays for the proposed development are located near the Sunset Drive access, and so the northbound left turn movement at Ellis Street is not required from a loading access perspective.
- The majority of the site traffic (75-80%) is forecasted to come from the south or east (via Ellis Street and Clement Avenue), and the Ellis Street access would be the most direct route to the site parking from these directions.
- Restricting the northbound left turn movement would add more site traffic to:
    - The northbound left turn movement at the intersection of Ellis Street and Clement Avenue, and will result in a 95th percentile queue that is more than double the available storage (50 vs. 20 metres).
    - Sunset Drive, which is located near the Kelowna Waterfront and is intended to be lower volume road than Ellis Street (collector vs. arterial).
    - The intersection of Sunset Drive & Water Street, which has a moderate amount of available capacity.
- The increase in traffic to the northbound left and westbound through movements at the intersection of Ellis Street and Clement Avenue results is marginally worse operations at the intersection.
- The more circuitous routing for inbound traffic with the northbound left turn banned results in more potential pedestrian conflict points due to the inbound vehicles having to travel through more intersections.
- Operational observations in SimTraffic show that the northbound left turn traffic at the Ellis Street site access generally does not impede the northbound through traffic on Ellis Street, and does not cause northbound through traffic to back up to Clement Avenue. A separate northbound left turn lane is not required from a traffic operations perspective.
- The northbound left turn restriction into the site access may be difficult to enforce without physical barriers.

Permitting or restricting the northbound left turn movement into the proposed site access on Ellis Street has pros and cons. Based on the analysis conducted in this study and points noted above, Bunt considers it to be more beneficial for the surrounding street network and the site in general if the northbound left turn movement is permitted at the Ellis Street site access. This is because allowing the northbound left turn movement will work from a traffic operations perspective, will result in less circuitous inbound vehicle routing, and less traffic at the study intersections.

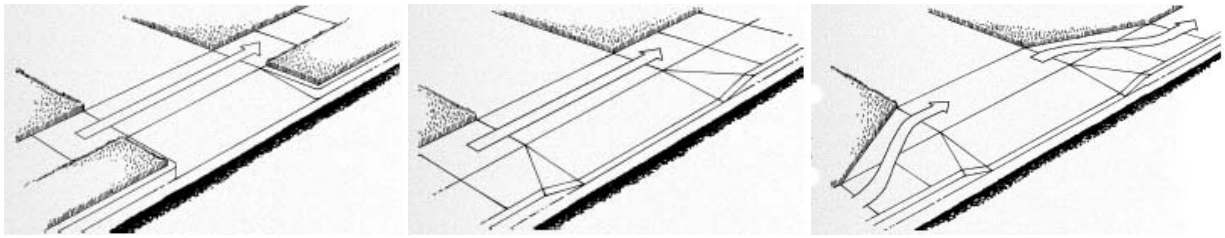
It is noted thought that the design of the Ellis Street site access will be an important consideration, especially with the planned addition of a bicycle route on Ellis Street. It is recommend that the driveway be designed to slow down inbound drivers and visually alert all users of the potential vehicle to pedestrian/cyclist conflicts through the use of grade changes and visual queues such as texture or colour. **Figures 4.1** and **4.2** show examples of driveway designs that prioritize pedestrians and cyclists and help to alert all road users of the potential conflicts.

Figure 4.1: Driveway Design



Source: NACTO Sidewalks

Figure 4.2: Driveway Design 2



Source: Designing Walkable Urban Thoroughfares (ITE & Congress of New Urbanism)

There may also be non-traffic related reasons and justifications for retaining or restricting this movement, but those are outside of the scope of this study.

5. PARKING & LOADING

5.1 Vehicle Parking

The study site is currently zoned as C4, and a C7 zoning is being sought as part of the application. The proposed parking supply was compared with the City of Kelowna's bylaw requirement to determine if the proposed supply meets the parking bylaw, and this comparison is shown in **Table 5.1.**

Table 5.1: Bylaw Required Vehicle Parking

Uses	Density (GFA m^2 or units)	Bylaw Requirement			Proposed
		Parking Ratio	Min. Stalls	Max Stalls	
Commercial	1,905 m^2	1.30 stalls/ 100 m^2	21	26	Allocation currently un-specified
Residential – Live Work	9 units	1 stall/unit (1/7 of these spaces to be classified as visitor parking	9	11	
Residential - Condos	397 units		397	496	
Total			**427**	**533**	**569**

The bylaw motor vehicle parking requirement is between 427 and 533 stalls, and the proposed bylaw parking amount of 569 exceeds the parking requirement by 36 stalls. The maximum bylaw parking supply is based on the City of Kelowna's objectives for Transportation Demand Management (TDM), and the policy specifies that the maximum number of parking spaces for each use is 125% the minimum number. A bylaw parking relaxation may be required to allow for the additional 36 spaces.

1/7 or 88 of the residential stalls provided will be classified as visitor parking spaces.

5.2 Bicycle Parking

The bicycle parking provided on-site will include Class I Long Term and Class II Short Term parking. **Table 5.2** summarizes the bylaw required bicycle parking compared to the proposed amount.

Table 5.2: Bylaw Required Bicycle Parking

Use	Bylaw Required		Proposed	
	Class I	Class II	Class I	Class II
Commercial	2	6	Allocation currently un-specified	Allocation currently un-specified
Restaurant	1	0		
Residential – Live Work	5	1		
Residential - Condos	198	40		
Total	**206**	**47**	**218**	**49**

The development is proposing to slightly exceed the bicycle parking requirements for both Class I and Class II bicycle parking. The Class I bicycle parking spaces will be located on the ground floor level within the podium, and are shown on the site plan in Exhibit 2.2. The storage areas are relatively close to the podium access points and tower elevators, and a separate storage room is provided for each tower and the commercial uses.

5.3 Loading Requirement

Loading spaces are required for the commercial component of the development at a rate of 1 space per 1900 m^2, and at a rate of 1 space per 2800 m^2 for the restaurant component. No spaces are required for the residential uses. Based on the size of the commercial and restaurant uses, the loading requirement for the proposed development is 0.7 loading bays. The development is proposing to meet the loading bylaw by providing 1 full sized loading bay (3.0 x 9.5 metres), and two additional loading bays for smaller vehicles. The full sized loading bay is located off of the Sunset Drive access, just before the parkade entrance. One of the smaller loading bays will be located to the east of the larger loading bay, while the other one is located inside the parkade on the south end. The locations of the loading bays are shown in Exhibit 2.2.

5.4 Vehicle Circulation

Exhibits 5.1 and 5.2 show the swept paths for loading truck access to the loading bays and general manoeuvring within the parkade. The full sized loading bay is accessible by an SU9 truck, while the two smaller loading bays are accessible by smaller deliver van.

A high-level review of the underground parking area is shown in **Exhibit 5.3**, which demonstrates that the parkade and the parking stalls are generally accessible by a mid-sized passenger car (2017 Ford Fusion).

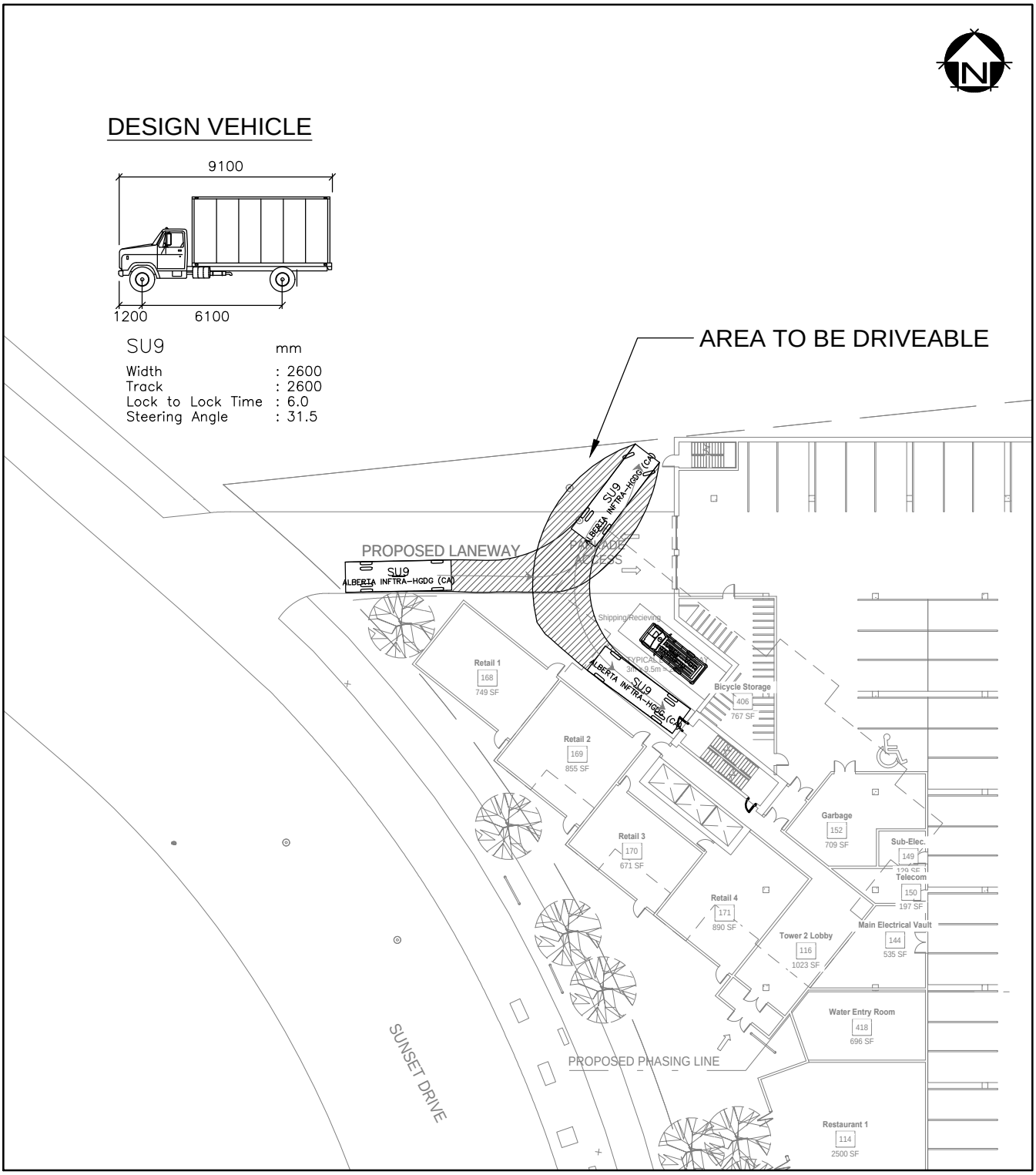


EXHIBIT 5.1

Vehicle Turning Analysis - External Loading

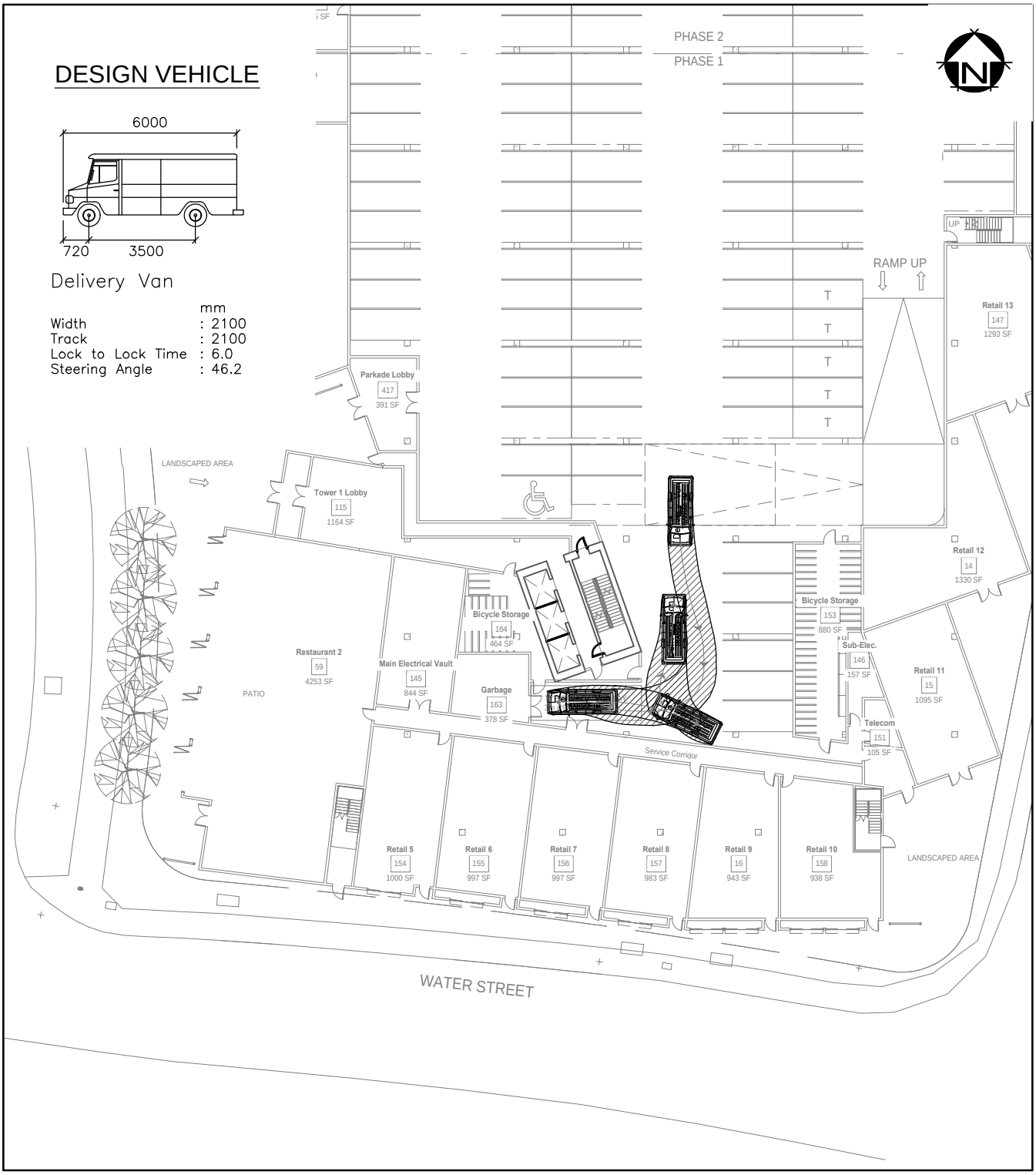
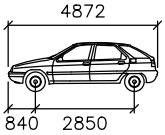


EXHIBIT 5.2

Vehicle Turning Analysis - Internal Loading

DESIGN VEHICLE



2017 Ford Fusion

Width	: 2121
Track	: 1592
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

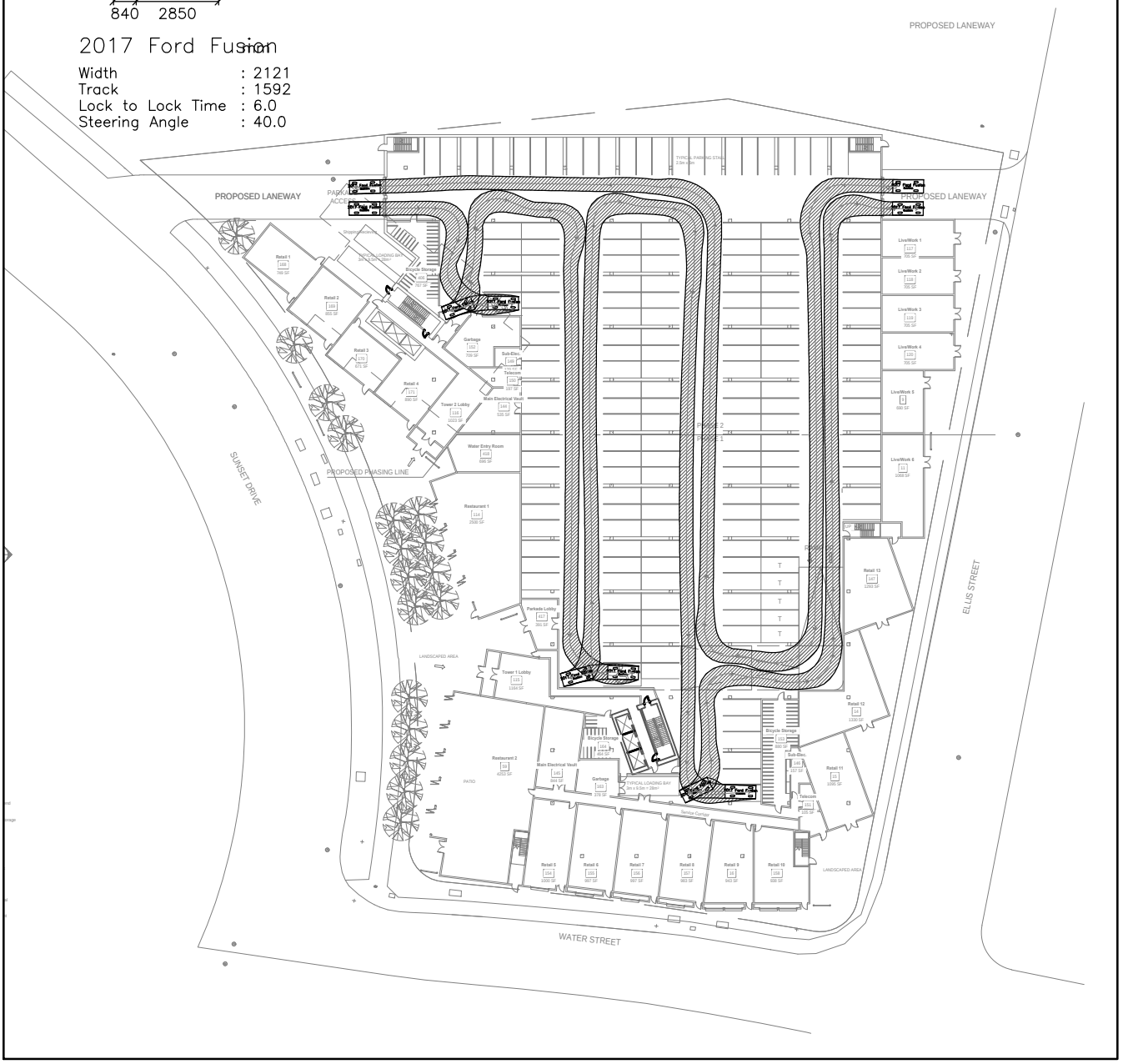


EXHIBIT 5.3

Vehicle Turning Analysis - Passenger Vehicle On-site Maneuvering

bunt & associates
TRANSPORTATION PLANNERS AND ENGINEERS

6. CONCLUSION & SUMMARY

North American Development Group is proposing to rezone a currently vacant site located at the north end of downtown Kelowna and build a mixed-use commercial and residential development. The site is proposed to consist of approximately 10,000 ft^2 ground oriented commercial, 7,050 ft^2 of restaurant and 6 live/work town homes within a three storey podium. Two mid-rise towers above the podium will accommodate and additional 397 residential units. Access to the site is proposed to be provided off of Sunset Drive and Ellis Street, and the a review of the transportation impact of the development was conducted and is summarized below:

- The site is generally well connected to downtown and the waterfront, and the proposed ground level retail will help to activate the adjacent streets and further encourage walking near the site.
- The site is generally well connected to the bicycle network in Kelowna, and the development is proposing to provide moderate surpluses of both Class I and Class II bicycle parking spaces, which will help facilitate and encourage future residents and employees to cycle to the site. Ellis Street is also slated to receive bicycle lanes in the near future, which will further improve cycling in the area.
- The Queensland Transit Exchange is located within walking distance, and there are two bus routes that pass by the site, however the frequencies of these routes are quite low. Transit is anticipated to be a feasible mode of transportation to and from the site, but is not anticipated to account for a large percentage of future trips.
- The existing vehicle transportation network was reviewed, and high southbound delays at the intersection of Sunset Drive and Water Street currently warrant an intersection upgrade. A signalized intersection is recommended, which can be coordinated with the adjacent signal at Ellis Street and Clement Avenue.
- Future Background and Post Development traffic analyses were conducted for the 2020 and 2030 horizon years, and the future site traffic was estimated and distributed to the study intersections. The future background traffic volumes are noted to be inherently conservative due to the use of a 2% blanket growth rate and the simultaneous addition of site trips for adjacent approved developments.
- In both the future Background and Post Development scenarios, queuing between the two signalized intersections was noted, and northbound and southbound left turn phases were recommended at the intersection of Ellis Street and Clement Avenue. The option of extending the northbound left turn storage bay at this intersection was also noted, but as this would likely require the removal of some on-street parking spaces, it is recommended that that queues be monitored at this time.
- The option of restricting the northbound left turn movement at the Ellis Street site access was reviewed, and it was concluded that maintaining the northbound left turn movement would be more beneficial for the site and the surrounding study network.
- The vehicle parking and loading bylaw requirements were calculated for the proposed uses, and the proposed development exceeds the bylaw maximum for parking supply and meets the loading bylaw requirement.
- On-site circulation and access to the loading bays has been initially reviewed, and all loading bays and parking spaces that were tested are accessible.

APPENDIX A

Scope Correspondence

Subject: RE: 1187 Sunset Dr. Development
Date: Tuesday, 11 April, 2017 11:01:20 AM Mountain Daylight Time
From: Sergio Sartori
To: Lynn Machacek
CC: James Kay, Chad Williams, Ryan Roycroft

Hi Lynn,

Please see Chad's email below and proceed as directed.

Thanks,
Sergio

From: Chad Williams
Sent: Tuesday, April 11, 2017 8:54 AM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: James Kay <JKay@kelowna.ca>; Gordon Foy <GFoy@kelowna.ca>
Subject: RE: 1187 Sunset Dr. Development

Thank you for getting this to us.

We have reviewed the provided information and have some minor comments as seen below.
Traffic Distribution

1) All NB trips from the site should use Sunset Dr as there is no left out on to Ellis,
2) Ellis (North), PM IN should also be around 10%. The additional 10% can be distributed based on the comment below,
3) Based on the Regional Household Travel Survey Data SB and EB trips are approximately split equally. Almost all these EB trips are via Clement. Water St distribution look appropriate, so please reallocate some trips from Ellis to Clement to align with this data.

Sensitivity analysis

4) For the proposed sensitivity analysis please clearly provide assumed changes in traffic volumes and where these are being redistributed to and a clear comparison of the results.
5) Please take note of other public impacts such as loss of parking, conflicts with pedestrians and cyclists, arterial/truck route operation etc.

Background Traffic Balancing

6) EB traffic volumes, at Water/Sunset, have been substantial factored up (AM - 132%) to accommodate lane balancing. We understand that this is to align with the background traffic counts provided by the City, however a more balanced approach maybe to have the volumes meet somewhere in the middle
7) Note if there is available time in the process, it would be ideal to complete new traffic counts to resolve this discrepancy. The original counts where provided by the city due to the construction that was taking place last year, as the project is complete and the development process has been delayed this should be considered.

If anyone has any questions, please let us know. Once these edits have been accommodated the consultant may proceed.

On another note, we would like to see the developer install curb extensions along the Water St frontage. We

have developed a concept sketch of this design as seen below.

Thank you,

Chad Williams, EIT
Transportation Planning Engineer | City of Kelowna

From: Sergio Sartori
Sent: Friday, April 07, 2017 11:05 AM
To: Chad Williams <CWilliams@kelowna.ca>
Cc: James Kay <JKay@kelowna.ca>; Gordon Foy <GFoy@kelowna.ca>
Subject: FW: 1187 Sunset Dr. Development

Hi Chad,

For your review and comments if any.

Thanks,
Sergio

From: Lynn Machacek [mailto:LMachacek@bunteng.com]
Sent: Friday, April 07, 2017 8:33 AM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: James Kay <JKay@kelowna.ca>
Subject: Re: 1187 Sunset Dr. Development

Hi Sergio,

Please find our proposed trip generation, distribution and assignment attached. Both are generally consistent with what was proposed for the 1000 Manhattan Drive. In regards to traffic balancing assumptions, we have balanced up the existing counts along Clement Avenue as discussed with transportation earlier in the process (see attached).

Please review and provide any comments before we being with our post development analysis.

Thanks,

Lynn Machacek, EIT | Transportation Analyst
Bunt & Associates Engineering Ltd.
Suite 400 – 11012 Macleod Trail SE, Calgary, AB Canada T2J 6A5
p 403 252 3343 Ext 7586 f 403 252 3323 | www.bunteng.com

From: Lynn Machacek <lmachacek@bunteng.com>
Date: Thursday, 6 April, 2017 3:54 PM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: James Kay <JKay@kelowna.ca>
Subject: Re: 1187 Sunset Dr. Development

Hi Sergio,

Thanks for the response. This scope is acceptable to us, and we will resume our TIA study shortly. One thing to note is that we plan on conducting a sensitivity analysis within the TIA to explore the impacts of either allowing or not allowing the northbound left turn into the site from Ellis Street. This is to address the comment highlighted in blue below.

As an FYI, we will be updating our trip generation and distribution assumptions in the next day or two, and will send them to you for review before we proceed with the post development analysis.

In the mean time, can you please provide me with the details (uses and areas) of any major developments currently approved in the area, including the new RCMP building. This will be added to the background traffic. If available, please provided the TIAs for these development, as this will enable us maintain consistency between our analysis and any trip generation and distribution assumption for previous analyses.

Thanks,

Lynn Machacek, EIT | Transportation Analyst
Bunt & Associates Engineering Ltd.
Suite 400 – 11012 Macleod Trail SE, Calgary, AB Canada T2J 6A5
p 403 252 3343 Ext 7586 f 403 252 3323 | www.bunteng.com

From: Sergio Sartori <SSartori@kelowna.ca>
Date: Wednesday, 5 April, 2017 9:35 AM
To: Lynn Machacek <lmachacek@bunteng.com>
Cc: James Kay <JKay@kelowna.ca>
Subject: FW: 1187 Sunset Dr. Development

Hi Lynn,

Please see Transportation comments in the email below.

Thanks,
Sergio

From: Chad Williams
Sent: Wednesday, April 05, 2017 7:59 AM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: Gordon Foy <GFoy@kelowna.ca>; Ryan Roycroft <RRoycroft@kelowna.ca>; James Kay <JKay@kelowna.ca>; Ryan Smith <rsmith@kelowna.ca>
Subject: RE: 1187 Sunset Dr. Development

Hello Sergio,

We wanted to provide the feedback, that the consultant had requested, now that the new Site Plan has be provided.
The City will allow the TIS to proceed for 1187 Sunset Dr if the same general assumptions, methodologies and level of analysis as was used for the 1000 Manhattan Drive TIS are used. Any deviation from standard procedures should be justified in the report.
The scope for the current TIS can be modified to include the intersections of Water/Sunset and Clement/Ellis, as well as site circulation and access. Review of active transportation should be completed for a 400m network radius despite the reduced scope for intersection analysis.
Traffic capacity analysis for existing, opening day and opening day + 10 year (background & post development) analysis using a background annual growth rate of 2%.
The Traffic counts as previously provided can be used. Any lane balancing or adjustments must be justified in the report.
Planning to identify any major developments currently approved in the area including RCMP building to be added to background traffic.
Please make sure that all assumptions for trip generation, distribution, trip reductions, traffic balancing, and assignment are submitted to the City for approval prior to commencing detailed work. This will prevent work having to be revisited later in the process.
The TIS report will present analysis for each scenario in a table presenting delay, LOS and 95 percentile queue.
Site Plan – We appreciated the developer addressing some of transportations original comments in the new site plan, such as pedestrian connectivity between Sunset and Ellis. We anticipate this lane to be built with CPTED standards with a pedestrian facility and easement to preserve this long term connection. With this proposed site layout, the developer also shows an access at Ellis, this access will be RIRO restricted unless the TIS process finds that the NBL is required for the operation of the development and a left turn lane will be required to reduce conflicts along this truck route.
There may be an opportunity to expand the pedestrian space along Water St with Curb extensions as part of the frontage improvements.
The streetscaping along Ellis is lacking and 1.8 m sidewalk should be provided on PL to allow for BLVD and trees.
Site plan comments are subject to review of the finalized design.
If there are any questions we would be happy to discuss.

Thank you,

Chad Williams, EIT
Transportation Planning Engineer | City of Kelowna

From: Sergio Sartori
Sent: Wednesday, March 08, 2017 8:10 AM
To: 'Lynn Machacek' <lmachacek@bunteng.com>
Cc: Chad Williams <CWilliams@kelowna.ca>
Subject: RE: 1187 Sunset Dr. Development

Hi Lynn,

Do you have an updated site plan? Transportation would like to have the site plan so they can comment on your bullet points.

Thanks,
Sergio

From: Lynn Machacek [mailto:lmachacek@bunteng.com]
Sent: Friday, February 17, 2017 10:29 AM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: Chad Williams <CWilliams@kelowna.ca>; Mike Furuya <mfuruya@bunteng.com>
Subject: Re: 1187 Sunset Dr. Development

Hi Sergio,

As I am sure you are aware, we are having a bit of a re-start on our 1187 Sunset Drive project, and I would like to get the ball rolling again in terms of our TIA. It is my understanding that at this point we are proposing the following:

~400 residential units
~15,000 sf of commercial
Likely two site accesses, with one on Sunset Drive, and one on Ellis Street. The site plan is still in the works, but this is what I am expecting thus far.

There were also a couple of outstanding items pertaining to the previous TIA scope that had yet to be confirmed. To simplify things, I have pared down the previous email and **propose the following scope:**

- Follow the same general assumptions, methodologies and level of analysis as used for the 1000 Manhattan Drive TIS.
- Utilize City traffic counts for the background volumes (these have already been received)
- City to provide Bunt with information on approved developments in the area to be included in the future background
- Analyze the intersection of Water/Sunset and Clement/Ellis as well as the proposed site accesses (one on Sunset Drive and one on Ellis Street)
- Traffic capacity analysis for existing, opening day and opening day + 10 year (background & post development) analysis using a background annual growth rate of 2%.
- Review site circulation
- Review the active transportation network within a 400m radius of the site
- Parking Review - If parking bylaws are met, then only a brief summary of the bylaw parking requirements and proposed parking supply will be provided. If parking bylaw relaxations are requested, then a more detailed parking review will be provided.

Can you please confirm / comment on the items above. Once the scope is confirmed, we will provide our proposed trip generation, distribution and assignment for review before completing our analysis.

Thanks,

Lynn Machacek, EIT | Transportation Analyst
Bunt & Associates Engineering (AB) Ltd.
Suite 400 – 11012 Macleod Trail SE, Calgary, AB Canada T2J 6A5
p 403 252 3343 Ext 7586 f 403 252 3323 | www.bunteng.com

From: Sergio Sartori <SSartori@kelowna.ca>
Date: Monday, 5 December, 2016 10:17 AM
To: Lynn Machacek <lmachacek@bunteng.com>
Subject: FW: 1187 Sunset Dr. Development

Hi Lynn,

Please see Chad's email below in response to your Nov 22, 2016 email.

Thanks,

Sergio Sartori,
Development Engineering |City of Kelowna
250 469-8589 ssartori@kelowna.ca

From: Chad Williams
Sent: Thursday, December 01, 2016 10:43 PM
To: Sergio Sartori <SSartori@kelowna.ca>
Cc: Mahesh Tripathi <mtripathi@kelowna.ca>; Rafael Villarreal Pacheco <RVillarreal@kelowna.ca>
Subject: Fwd: 1187 Sunset Dr. Development

Hello Sergio,

The TIS for 1187 Sunset can be based on the study for 1000 Manhattan Drive and utilize the same general assumptions, methodologies and level of analysis. Any deviation from standard procedures should be justified in the report.

The scope for the current TIS can be modified to include the intersections of Water/Sunset and Clement/Ellis, as well as site circulation and access. Review of active transportation should be completed for a 400m network radius despite the reduced scope for intersection analysis.

Vehicular site access is only permitted from Sunset Drive, and should be moved further north from the current location. Public access should be provided along the north side of the property from Ellis St to Sunset Dr.

The City has conducted traffic counts at these intersections and provided background traffic volumes - in the attached spreadsheet- to keep the process moving with construction beginning the area and the end of counting season for the Winter.

Please make sure that all assumptions for trip generation, distribution, trip reductions, traffic balancing, and assignment are submitted to the City for approval prior to commencing detailed work. This will prevent work having to be revisited later in the process.

Has the option of presenting the developer with the requirements for the previous TIA and some site specific requirements, in Lieu of a TIS, been considered? Due to the similarities in location and scale of the development it would seem reasonable to apply the current requirement as well as some additional requirements to ensure City policy is being followed for this specific site.

Please let me know if you have any questions. Please forward TIS comments to the developer if that is the intended approach.

Thank you,

Chad Williams, EIT
Transportation Planning Engineer
Transportation Engineering
250-469-8568 | CWilliams@kelowna.ca

APPENDIX B

Existing Signal Timing Plans

Clement Ave & Ellis St

City of Kelowna — **Area / Int:** 1 = 10 — **INT #:** 47

Signal Timings - Development

PEDESTRIAN CLEARANCE	Distance in meters	Pedestrian Walking Speed (m/s)	Ped Xing Time (sec)	CALL
Estimated distance across East Leg	25.4	1.2	17.8	18
Estimated distance across West Leg	29.2	1.2	20.9	21
Estimated distance across North Leg	21.0	1.2	14.1	15
Estimated distance across South Leg	18.4	1.2	11.9	12

Phase	Direction
1	SB Left
2	NB
3	WB Left
4	EB
5	NB Left
6	SB
7	EB Left
8	WB

Data Entered by:	Sylvie Laporte
Date of Data Entry:	06-Jul-11
Time of Implementation:	12:00
Date of Implementation:	24-Jul-11
Implemented by:	BB

WALK - All walk times have been set at 8 seconds
Minimum Green - All Minimum Greens are set to 10 Seconds for Throughs and 7 Seconds for Left Turns
Veh. Extension - All Vehicle Extensions are set to 3.0 seconds for through movements and 2.5 seconds left turn movements
Veh. Maximums - All Vehicle Maximums are to be determined using HCS to identify best splits for each period
- AM Peak is to be MAX 1, PM Peak is to be MAX 2, MAX 3 is to be used where deemed necessary

VEHICLE CLEARANCE TIMES	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
(w) Cross Street Width (m)	0	18	0	21	0	18	0	21
(v) Approach Speed (Km/h)	50	50	50	50	50	50	50	50
(L) Assumed Vehicle Length (m)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
(t) Driver Perception Time (s)	1	1	1	1	1	1	1	1
(a) Average Deceleration (m/s2)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
(g) Acceleration due to gravity (m/s2)	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81
(G) Grade of approach (%)	0%	0%	0%	0%	0%	0%	0%	0%
Yellow Interval	0.0	3.4	0.0	3.4	0.0	3.4	0.0	3.4
Red Clearance Interval	0.0	1.9	0.0	2.1	0.0	1.9	0.0	2.1
	LTurn		LTurn		LTurn		LTurn	

Signal Timings - Base Timings

Intersection : **Clement Ave & Ellis St**

RING	1	2	3	4	-	-	-	-
Phase	-	-	-	-	5	6	7	8
Direction		NB		EB		SB		WB
MIN GRN	-	10	-	10	-	10	-	10
Bike MIN GRN	-	-	-	-	-	-	-	-
Cond. Serv.	-	-	-	-	-	-	-	-
WALK	-	8	-	8	-	8	-	8
PED CLR	-	18	-	12	-	21	-	15
VEH EXT.	-	3	-	3	-	3	-	3
ALT VEH EXT.	-	-	-	-	-	-	-	-
MAX EXT.	-	5	-	5	-	5	-	5
MAX 1	-	20	-	25	-	20	-	25
MAX 2	-	-	-	-	-	-	-	-
MAX 3	-	30	-	30	-	30	-	30
DET. Fail MAX	-	20	-	20	-	20	-	20
YELLOW INTERVAL	-	3.4	-	3.4	-	3.4	-	3.4
RED CLR INTERVAL	-	1.9	-	2.1	-	1.9	-	2.1
RED REVERT	-	-	-	-	-	-	-	-
Min GRN Ped/Clear)		*31.3*		*25.5*		*34.3*		*28.5*

Phases in Use	-	X	-	X	-	X	-	X
Recall	-	X	-	-	-	X	-	-

change phase 2 recall to max recall if it must match phase 6

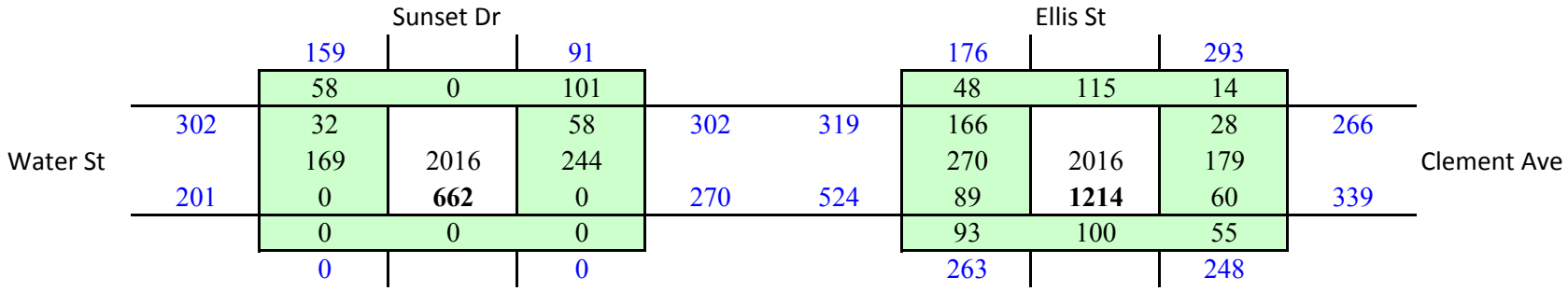
Split Times (sec)	*1*	*2***	*3*	*4*	*5*	*6***	*7*	*8*	Cycle Length	Offset to **
AM (plan 10)										
NOON (plan 20)										
PM (plan 30)										
Special (plan 40)										

COMMENTS: Camera's are installed; timings to be installed once SB stop bars is in place
1) measured crosswalk lengh; timing adjustment required for the walk & don't walk
2) re-instate max time before loops were removed
2. Pedestrian clearance and intergreen clearance times as per City of Kelwona standards

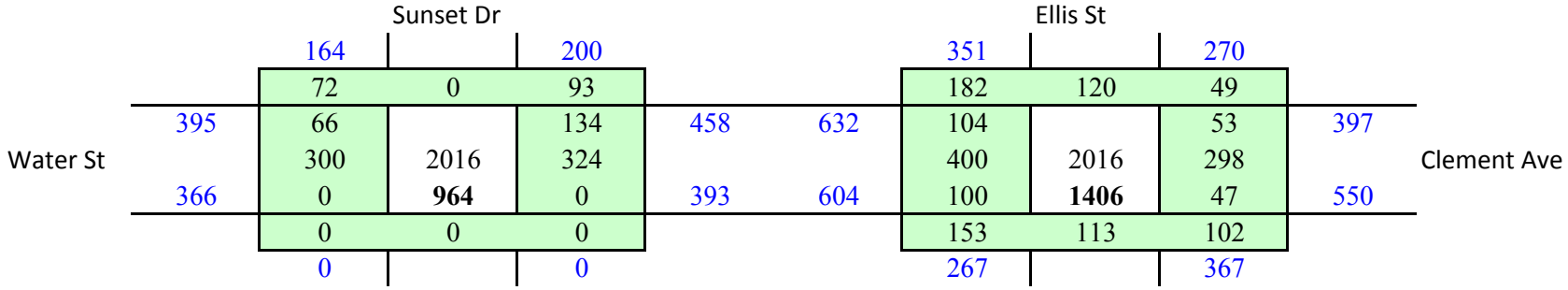
APPENDIX C

Traffic Counts

AM Background Traffic Data



PM Background Traffic Data



APPENDIX D

Synchro & Sidra Outputs

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	249	251	60	149	58
Future Volume (vph)	32	249	251	60	149	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.962	
Flt Protected		0.994			0.965	
Satd. Flow (prot)	0	1872	1883	1601	1748	0
Flt Permitted		0.994			0.965	
Satd. Flow (perm)	0	1872	1883	1601	1748	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	10			10	10	10
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	271	273	65	162	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	306	273	65	225	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	249	251	60	149	58
Future Volume (Veh/h)	32	249	251	60	149	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	271	273	65	162	63
Pedestrians		10	10		10	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			87			
pX, platoon unblocked	1.00				1.00	1.00
vC, conflicting volume	348				634	293
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345				631	289
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				62	91
cM capacity (veh/h)	1200				423	735

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	306	273	65	225
Volume Left	35	0	0	162
Volume Right	0	0	65	63
cSH	1200	1700	1700	480
Volume to Capacity	0.03	0.16	0.04	0.47
Queue Length 95th (m)	0.7	0.0	0.0	18.7
Control Delay (s)	1.2	0.0	0.0	18.9
Lane LOS	A			C
Approach Delay (s)	1.2	0.0		18.9
Approach LOS				C

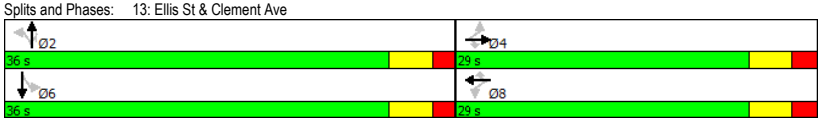
Intersection Summary				
Average Delay		5.3		
Intersection Capacity Utilization		50.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	204	67	60	174	28	90	100	55	14	115	47
Future Volume (vph)	126	204	67	60	174	28	90	100	55	14	115	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.96	0.99		0.96	0.99		0.96	0.99	0.99	
Frt			0.850			0.850			0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1782	0
Flt Permitted	0.639			0.620			0.646			0.687		
Satd. Flow (perm)	1190	1883	1535	1154	1883	1539	1206	1883	1537	1280	1782	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			39			60		43	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			10			10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	222	73	65	189	30	98	109	60	15	125	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	222	73	65	189	30	98	109	60	15	176	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	34.3	34.3	34.3	34.3	34.3	
Total Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	36.0	36.0	36.0	36.0	36.0	
Total Split (%)	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	55.4%	55.4%	55.4%	55.4%	55.4%	
Maximum Green (s)	23.5	23.5	23.5	23.5	23.5	23.5	30.7	30.7	30.7	30.7	30.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.3	5.3	5.3	5.3	5.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0	18.0	18.0	18.0	21.0	21.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	
Act Effct Green (s)	11.4	11.4	11.4	11.4	11.4	11.4	13.7	13.7	13.7	13.7	13.7	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	
v/c Ratio	0.30	0.31	0.12	0.15	0.26	0.05	0.18	0.13	0.08	0.03	0.21	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	10.3	9.3	3.2	8.6	9.0	3.1	9.6	8.8	3.6	8.3	7.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.3	9.3	3.2	8.6	9.0	3.1	9.6	8.8	3.6	8.3	7.5	
LOS	B	A	A	A	A	A	A	A	A	A	A	
Approach Delay		8.6			8.3			7.9			7.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	4.9	7.9	0.0	2.2	6.6	0.0	3.3	3.6	0.0	0.5	4.5	
Queue Length 95th (m)	14.0	19.4	4.4	7.4	16.6	2.5	11.4	11.5	4.5	2.9	14.8	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	926	1465	1211	898	1465	1206	1152	1799	1471	1223	1704	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.15	0.15	0.06	0.07	0.13	0.02	0.09	0.06	0.04	0.01	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 29.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	381	386	160	118	72
Future Volume (vph)	66	381	386	160	118	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.949	
Flt Protected		0.993			0.970	
Satd. Flow (prot)	0	1870	1883	1601	1734	0
Flt Permitted		0.993			0.970	
Satd. Flow (perm)	0	1870	1883	1601	1734	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	22			22	28	20
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	414	420	174	128	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	486	420	174	206	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	381	386	160	118	72
Future Volume (Veh/h)	66	381	386	160	118	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	414	420	174	128	78
Pedestrians		20	28		22	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	2		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			87			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	616				1028	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	588				1013	429
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				44	87
cM capacity (veh/h)	939				227	585

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	486	420	174	206
Volume Left	72	0	0	128
Volume Right	0	0	174	78
cSH	939	1700	1700	295
Volume to Capacity	0.08	0.25	0.10	0.70
Queue Length 95th (m)	1.9	0.0	0.0	36.7
Control Delay (s)	2.1	0.0	0.0	41.1
Lane LOS	A			E
Approach Delay (s)	2.1	0.0		41.1
Approach LOS				E

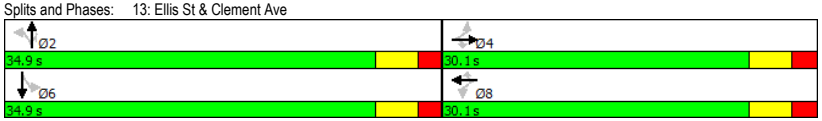
Intersection Summary				
Average Delay		7.4		
Intersection Capacity Utilization		66.5%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	330	83	47	257	53	132	113	102	49	120	157
Future Volume (vph)	86	330	83	47	257	53	132	113	102	49	120	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.96	0.99		0.95	0.99	0.97	
Frt			0.850			0.850			0.850		0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1671	0
Flt Permitted	0.588			0.532			0.577			0.678		
Satd. Flow (perm)	1097	1883	1526	990	1883	1539	1074	1883	1524	1264	1671	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90			58			111		134	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	10		14	14		10	16		10	10		16
Confl. Bikes (#/hr)			5			5			20			20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	359	90	51	279	58	143	123	111	53	130	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	359	90	51	279	58	143	123	111	53	301	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	34.3	34.3	34.3	34.3	34.3	
Total Split (s)	30.1	30.1	30.1	30.1	30.1	30.1	34.9	34.9	34.9	34.9	34.9	
Total Split (%)	46.3%	46.3%	46.3%	46.3%	46.3%	46.3%	53.7%	53.7%	53.7%	53.7%	53.7%	
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6	24.6	29.6	29.6	29.6	29.6	29.6	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.3	5.3	5.3	5.3	5.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0	18.0	18.0	18.0	21.0	21.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	
Act Effct Green (s)	13.9	13.9	13.9	13.9	13.9	13.9	12.8	12.8	12.8	12.8	12.8	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.34	0.34	0.34	0.34	0.34	
v/c Ratio	0.23	0.52	0.15	0.14	0.40	0.10	0.40	0.19	0.19	0.12	0.46	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	10.6	12.9	3.4	9.7	11.3	3.7	14.5	10.8	3.8	10.7	8.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.6	12.9	3.4	9.7	11.3	3.7	14.5	10.8	3.8	10.7	8.8	
LOS	B	B	A	A	B	A	B	B	A	B	A	
Approach Delay		10.9			10.0			10.2			9.1	
Approach LOS		B			A			B			A	
Queue Length 50th (m)	3.3	14.2	0.0	1.7	10.5	0.0	6.0	4.8	0.0	2.0	6.7	
Queue Length 95th (m)	13.0	41.6	6.0	8.1	31.7	4.9	21.5	16.5	7.4	9.0	26.2	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	742	1274	1061	669	1274	1060	874	1533	1261	1029	1385	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.13	0.28	0.08	0.08	0.22	0.05	0.16	0.08	0.09	0.05	0.22	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 38.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 10.1		Intersection LOS: B	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	249	251	60	149	58
Future Volume (vph)	32	249	251	60	149	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected		0.994			0.950	
Satd. Flow (prot)	0	1872	1883	1601	1789	1601
Flt Permitted		0.994			0.950	
Satd. Flow (perm)	0	1872	1883	1601	1789	1601
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	10			10	10	10
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	271	273	65	162	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	306	273	65	162	63
Sign Control		Stop	Stop		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	32	249	251	60	149	58
Future Volume (vph)	32	249	251	60	149	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	271	273	65	162	63

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	306	273	65	162	63
Volume Left (vph)	35	0	0	162	0
Volume Right (vph)	0	0	65	0	63
Hadj (s)	0.06	0.03	-0.67	0.53	-0.67
Departure Headway (s)	5.5	5.6	4.9	6.7	5.5
Degree Utilization, x	0.47	0.43	0.09	0.30	0.10
Capacity (veh/h)	627	616	697	495	605
Control Delay (s)	13.3	11.6	7.2	11.4	7.9
Approach Delay (s)	13.3	10.7		10.4	
Approach LOS	B	B		B	

Intersection Summary				
Delay	11.6			
Level of Service	B			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	249	251	60	149	58
Future Volume (vph)	32	249	251	60	149	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.98	
Frt				0.850	0.962	
Flt Protected		0.994			0.965	
Satd. Flow (prot)	0	1872	1883	1601	1730	0
Flt Permitted		0.947			0.965	
Satd. Flow (perm)	0	1782	1883	1540	1712	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				62	35	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	10			10	10	10
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	271	273	65	162	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	306	273	65	225	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	35.0	35.0	35.0	35.0	30.0	
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	
Maximum Green (s)	29.5	29.5	29.5	29.5	24.5	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		40.3	40.3	40.3	13.7	
Actuated g/C Ratio		0.62	0.62	0.62	0.21	
v/c Ratio		0.28	0.23	0.07	0.58	

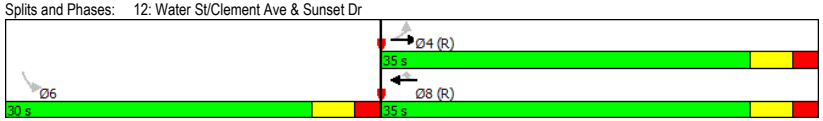
12: Water St/Clement Ave & Sunset Dr
5/11/2017
AM Peak Hour
Existing Mitigated - Signalized

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		7.9	6.3	2.3	24.3	
Queue Delay		0.0	0.4	0.0	0.0	
Total Delay		7.9	6.7	2.3	24.3	
LOS		A	A	A	C	
Approach Delay		7.9	5.9		24.3	
Approach LOS		A	A		C	
Queue Length 50th (m)		13.9	4.8	0.0	20.9	
Queue Length 95th (m)		37.6	32.3	6.4	31.8	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1106	1168	979	667	
Starvation Cap Reductn		0	489	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.28	0.40	0.07	0.34	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 24 (37%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 11.3 Intersection LOS: B
Intersection Capacity Utilization 61.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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Synchro 9 Report
LM

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	249	251	60	149	58
Future Volume (vph)	32	249	251	60	149	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected		0.994			0.950	
Satd. Flow (prot)	0	1872	1883	1601	1789	1601
Flt Permitted		0.994			0.950	
Satd. Flow (perm)	0	1872	1883	1601	1789	1601
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	10			10	10	10
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	271	273	65	162	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	306	273	65	162	63
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	249	251	60	149	58
Future Volume (Veh/h)	32	249	251	60	149	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	271	273	65	162	63
Pedestrians		10	10		10	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			87			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	348				634	293
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	338				627	283
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				62	91
cM capacity (veh/h)	1200				424	737

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	306	273	65	162	63
Volume Left	35	0	0	162	0
Volume Right	0	0	65	0	63
cSH	1200	1700	1700	424	737
Volume to Capacity	0.03	0.16	0.04	0.38	0.09
Queue Length 95th (m)	0.7	0.0	0.0	13.4	2.1
Control Delay (s)	1.2	0.0	0.0	18.7	10.3
Lane LOS	A			C	B
Approach Delay (s)	1.2	0.0		16.3	
Approach LOS				C	

Intersection Summary				
Average Delay		4.6		
Intersection Capacity Utilization		47.8%	ICU Level of Service	A
Analysis Period (min)		15		

MOVEMENT SUMMARY

Site: Existing AM Mitigated

Sunset Drive & Water Street / Clement Avenue
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Clement Avenue											
6	T	273	2.0	0.316	6.5	LOS A	1.5	11.5	0.16	0.06	21.0
16	R	65	2.0	0.316	6.5	LOS A	1.5	11.5	0.16	0.06	19.9
Approach		338	2.0	0.316	6.5	LOS A	1.5	11.5	0.16	0.06	20.8
North: Sunset Drive											
7	L	162	2.0	0.268	7.2	LOS A	1.1	8.4	0.43	0.54	20.5
14	R	63	2.0	0.268	7.2	LOS A	1.1	8.4	0.43	0.36	18.9
Approach		225	2.0	0.268	7.2	LOS A	1.1	8.4	0.43	0.49	20.1
West: Water Street											
5	L	35	2.0	0.325	7.3	LOS A	1.5	11.3	0.36	0.50	20.6
2	T	271	2.0	0.325	7.3	LOS A	1.5	11.3	0.36	0.25	20.3
Approach		305	2.0	0.325	7.3	LOS A	1.5	11.3	0.36	0.28	20.3
All Vehicles		868	2.0	0.325	7.0	LOS A	1.5	11.5	0.30	0.25	20.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	381	386	160	118	72
Future Volume (vph)	66	381	386	160	118	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected		0.993			0.950	
Satd. Flow (prot)	0	1870	1883	1601	1789	1601
Flt Permitted		0.993			0.950	
Satd. Flow (perm)	0	1870	1883	1601	1789	1601
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	22			22	28	20
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	414	420	174	128	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	486	420	174	128	78
Sign Control		Stop	Stop		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	66	381	386	160	118	72
Future Volume (vph)	66	381	386	160	118	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	414	420	174	128	78

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	486	420	174	128	78
Volume Left (vph)	72	0	0	128	0
Volume Right (vph)	0	0	174	0	78
Hadj (s)	0.06	0.03	-0.67	0.53	-0.67
Departure Headway (s)	5.8	5.9	5.2	7.7	6.5
Degree Utilization, x	0.79	0.69	0.25	0.27	0.14
Capacity (veh/h)	486	595	673	427	520
Control Delay (s)	26.9	19.8	8.7	12.3	9.3
Approach Delay (s)	26.9	16.5		11.2	
Approach LOS	D	C		B	

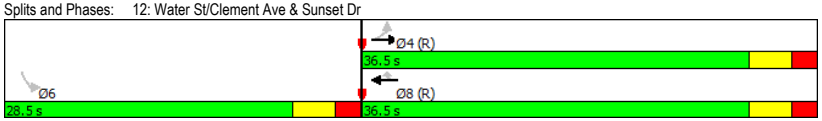
Intersection Summary			
Delay	19.6		
Level of Service	C		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	381	386	160	118	72
Future Volume (vph)	66	381	386	160	118	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.95	0.96	
Frt				0.850	0.949	
Flt Protected		0.993			0.970	
Satd. Flow (prot)	0	1870	1883	1601	1699	0
Flt Permitted		0.890			0.970	
Satd. Flow (perm)	0	1672	1883	1514	1657	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				113	52	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	22			22	28	20
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	414	420	174	128	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	486	420	174	206	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	36.5	36.5	36.5	36.5	28.5	
Total Split (%)	56.2%	56.2%	56.2%	56.2%	43.8%	
Maximum Green (s)	31.0	31.0	31.0	31.0	23.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		41.3	41.3	41.3	12.7	
Actuated g/C Ratio		0.64	0.64	0.64	0.20	
v/c Ratio		0.46	0.35	0.17	0.56	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		9.6	6.5	2.3	22.1	
Queue Delay		0.0	0.6	0.0	0.0	
Total Delay		9.6	7.1	2.3	22.1	
LOS		A	A	A	C	
Approach Delay		9.6	5.7		22.1	
Approach LOS		A	A		C	
Queue Length 50th (m)		24.0	16.1	0.0	17.0	
Queue Length 95th (m)		67.8	48.0	11.8	27.2	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1061	1195	1002	619	
Starvation Cap Reductn		0	413	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.46	0.54	0.17	0.33	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 25 (38%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 73.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	381	386	160	118	72
Future Volume (vph)	66	381	386	160	118	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected		0.993			0.950	
Satd. Flow (prot)	0	1870	1883	1601	1789	1601
Flt Permitted		0.993			0.950	
Satd. Flow (perm)	0	1870	1883	1601	1789	1601
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	22			22	28	20
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	414	420	174	128	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	486	420	174	128	78
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	381	386	160	118	72
Future Volume (Veh/h)	66	381	386	160	118	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	414	420	174	128	78
Pedestrians		20	28		22	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		2	2		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			87			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	616				1028	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	577				1007	417
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				43	87
cM capacity (veh/h)	936				226	588

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	486	420	174	128	78
Volume Left	72	0	0	128	0
Volume Right	0	0	174	0	78
cSH	936	1700	1700	226	588
Volume to Capacity	0.08	0.25	0.10	0.57	0.13
Queue Length 95th (m)	1.9	0.0	0.0	23.7	3.5
Control Delay (s)	2.2	0.0	0.0	39.9	12.1
Lane LOS	A			E	B
Approach Delay (s)	2.2	0.0		29.4	
Approach LOS				D	

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: Existing PM Mitigated

Sunset Drive & Water Street / Clement Avenue
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Clement Avenue											
6	T	420	2.0	0.576	11.0	LOS B	4.0	30.9	0.35	0.19	17.4
16	R	174	2.0	0.576	11.0	LOS B	4.0	30.9	0.35	0.19	16.1
Approach		593	2.0	0.576	11.0	LOS B	4.0	30.9	0.35	0.19	17.1
North: Sunset Drive											
7	L	128	2.0	0.286	8.4	LOS A	1.1	8.6	0.53	0.66	19.7
14	R	78	2.0	0.286	8.4	LOS A	1.1	8.6	0.53	0.50	17.8
Approach		207	2.0	0.286	8.4	LOS A	1.1	8.6	0.53	0.60	19.1
West: Water Street											
5	L	72	2.0	0.500	9.8	LOS A	2.9	22.2	0.41	0.50	18.9
2	T	414	2.0	0.500	9.8	LOS A	2.9	22.2	0.41	0.27	18.2
Approach		486	2.0	0.500	9.8	LOS A	2.9	22.2	0.41	0.30	18.3
All Vehicles		1286	2.0	0.576	10.2	LOS B	4.0	30.9	0.40	0.30	17.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

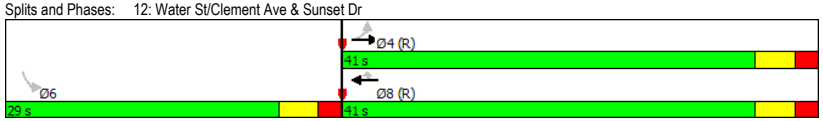
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	282	276	70	185	66
Future Volume (vph)	35	282	276	70	185	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.98	
Frt				0.850	0.964	
Flt Protected		0.995			0.964	
Satd. Flow (prot)	0	1874	1883	1601	1731	0
Flt Permitted		0.944			0.964	
Satd. Flow (perm)	0	1776	1883	1537	1710	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				68	28	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	11			11	11	11
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	307	300	76	201	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	345	300	76	273	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	41.0	41.0	41.0	41.0	29.0	
Total Split (%)	58.6%	58.6%	58.6%	58.6%	41.4%	
Maximum Green (s)	35.5	35.5	35.5	35.5	23.5	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		43.3	43.3	43.3	15.7	
Actuated g/C Ratio		0.62	0.62	0.62	0.22	
v/c Ratio		0.31	0.26	0.08	0.67	

12: Water St/Clement Ave & Sunset Dr AM Peak Hour
5/11/2017 Background 2020

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		8.4	6.6	2.5	29.8	
Queue Delay		0.0	0.4	0.0	0.0	
Total Delay		8.4	7.0	2.5	29.8	
LOS		A	A	A	C	
Approach Delay		8.4	6.1		29.8	
Approach LOS		A	A		C	
Queue Length 50th (m)		18.5	15.0	0.0	29.4	
Queue Length 95th (m)		42.1	32.4	5.4	44.7	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1098	1164	976	592	
Starvation Cap Reductn		0	466	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.31	0.43	0.08	0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 26 (37%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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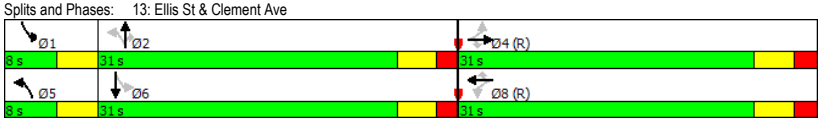
Synchro 9 Report LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	242	90	67	193	32	101	108	77	18	124	50
Future Volume (vph)	136	242	90	67	193	32	101	108	77	18	124	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.96	0.99		0.96	0.99		0.95	0.99	0.99	
Frt			0.850			0.850			0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1779	0
Flt Permitted	0.626			0.596			0.493			0.682		
Satd. Flow (perm)	1164	1883	1531	1108	1883	1535	918	1883	1527	1268	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			90			94		33	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	11		11	11		11	11		11	11		11
Confl. Bikes (#/hr)			5			5			11			11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	263	98	73	210	35	110	117	84	20	135	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	263	98	73	210	35	110	117	84	20	189	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	31.0	31.0	31.0	31.0	31.0	31.0	8.0	31.0	31.0	8.0	31.0	
Total Split (%)	44.3%	44.3%	44.3%	44.3%	44.3%	44.3%	11.4%	44.3%	44.3%	11.4%	44.3%	
Maximum Green (s)	25.5	25.5	25.5	25.5	25.5	25.5	4.5	25.7	25.7	4.5	25.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	40.4	40.4	40.4	40.4	40.4	40.4	19.9	17.2	17.2	17.8	12.4	
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.28	0.25	0.25	0.25	0.18	
v/c Ratio	0.22	0.24	0.11	0.11	0.19	0.04	0.35	0.25	0.19	0.06	0.55	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	9.7	9.3	3.7	9.0	8.8	0.1	20.2	22.0	5.7	15.6	27.5	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.7	9.7	3.7	9.0	8.8	0.1	20.2	22.0	5.7	15.6	27.5	
LOS	A	A	A	A	A	A	C	C	A	B	C	
Approach Delay		8.6			7.9			17.0			26.3	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	8.6	15.3	1.1	4.0	12.2	0.0	10.5	11.7	0.0	1.8	18.9	
Queue Length 95th (m)	15.8	24.6	4.4	11.4	26.0	0.3	19.0	25.1	8.3	5.5	33.9	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	672	1087	925	639	1087	924	316	691	620	355	674	
Starvation Cap Reductn	0	427	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.22	0.40	0.11	0.11	0.19	0.04	0.35	0.17	0.14	0.06	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 40 (57%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	74	415	430	196	138	80
Future Volume (vph)	74	415	430	196	138	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.94	0.94	
Frt				0.850	0.950	
Flt Protected		0.993			0.969	
Satd. Flow (prot)	0	1870	1883	1601	1693	0
Flt Permitted		0.873			0.969	
Satd. Flow (perm)	0	1640	1883	1498	1637	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				123	37	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	24			24	30	22
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	451	467	213	150	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	531	467	213	237	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	51.0	51.0	51.0	51.0	29.0	
Total Split (%)	63.8%	63.8%	63.8%	63.8%	36.3%	
Maximum Green (s)	45.5	45.5	45.5	45.5	23.5	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		53.5	53.5	53.5	15.5	
Actuated g/C Ratio		0.67	0.67	0.67	0.19	
v/c Ratio		0.48	0.37	0.20	0.68	

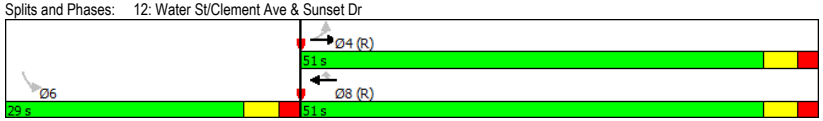
12: Water St/Clement Ave & Sunset Dr
5/11/2017
PM Peak Hour
Background 2020

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		9.5	6.0	2.3	34.5	
Queue Delay		0.1	0.7	0.3	0.0	
Total Delay		9.6	6.7	2.7	34.5	
LOS		A	A	A	C	
Approach Delay		9.6	5.4		34.5	
Approach LOS		A	A		C	
Queue Length 50th (m)		33.7	20.4	0.0	28.5	
Queue Length 95th (m)		73.5	47.3	6.3	45.1	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1096	1258	1042	507	
Starvation Cap Reductn		0	458	433	0	
Spillback Cap Reductn		54	0	0	1	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.51	0.58	0.35	0.47	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 65 (81%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.7 Intersection LOS: B
Intersection Capacity Utilization 78.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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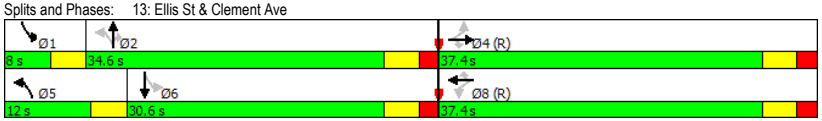
Synchro 9 Report
LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	364	97	62	302	60	154	122	115	54	130	170
Future Volume (vph)	93	364	97	62	302	60	154	122	115	54	130	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.96	0.99		0.94	0.99	0.96	
Frt			0.850			0.850			0.850		0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1653	0
Flt Permitted	0.507			0.443			0.271			0.672		
Satd. Flow (perm)	945	1883	1515	823	1883	1532	503	1883	1506	1247	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127			125		86	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	11		15	15		11	17		11	11		17
Confl. Bikes (#/hr)			5			5			22			22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	396	105	67	328	65	167	133	125	59	141	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	396	105	67	328	65	167	133	125	59	326	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	37.4	37.4	37.4	37.4	37.4	37.4	12.0	34.6	34.6	8.0	30.6	
Total Split (%)	46.8%	46.8%	46.8%	46.8%	46.8%	46.8%	15.0%	43.3%	43.3%	10.0%	38.3%	
Maximum Green (s)	31.9	31.9	31.9	31.9	31.9	31.9	8.5	29.3	29.3	4.5	25.3	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	39.8	39.8	39.8	39.8	39.8	39.8	31.2	24.6	24.6	23.9	17.6	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.39	0.31	0.31	0.30	0.22	
v/c Ratio	0.21	0.42	0.13	0.16	0.35	0.08	0.51	0.23	0.23	0.15	0.76	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	12.1	13.9	1.7	14.9	15.1	0.5	20.6	21.2	4.8	14.5	32.3	
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.1	14.7	1.7	14.9	15.1	0.5	20.6	21.2	4.8	14.5	32.3	
LOS	B	B	A	B	B	A	C	C	A	B	C	
Approach Delay		12.0			13.0			16.1			29.5	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	8.2	44.0	0.8	5.3	28.9	0.0	16.6	15.9	0.0	5.5	34.3	
Queue Length 95th (m)	17.3	66.1	1.8	15.2	56.5	1.1	24.4	25.2	9.9	10.4	54.2	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	470	936	817	409	936	826	332	689	630	402	581	
Starvation Cap Reductn	0	263	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.59	0.13	0.16	0.35	0.08	0.50	0.19	0.20	0.15	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 72.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Ellis St & Clement Ave



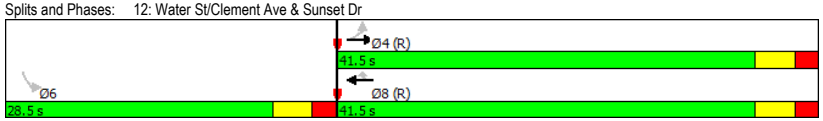
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	344	336	84	221	80
Future Volume (vph)	43	344	336	84	221	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.97	
Frt				0.850	0.964	
Flt Protected		0.994			0.965	
Satd. Flow (prot)	0	1872	1883	1601	1730	0
Flt Permitted		0.930			0.965	
Satd. Flow (perm)	0	1749	1883	1530	1705	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				68	28	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	13			13	13	13
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	374	365	91	240	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	421	365	91	327	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	41.5	41.5	41.5	41.5	28.5	
Total Split (%)	59.3%	59.3%	59.3%	59.3%	40.7%	
Maximum Green (s)	36.0	36.0	36.0	36.0	23.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		41.6	41.6	41.6	17.4	
Actuated g/C Ratio		0.59	0.59	0.59	0.25	
v/c Ratio		0.41	0.33	0.10	0.74	

12: Water St/Clement Ave & Sunset Dr AM Peak Hour
5/11/2017 Background 2030

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		10.1	12.8	5.7	31.8	
Queue Delay		0.0	0.6	0.0	0.0	
Total Delay		10.1	13.4	5.7	31.8	
LOS		B	B	A	C	
Approach Delay		10.1	11.8		31.8	
Approach LOS		B	B		C	
Queue Length 50th (m)		26.5	23.2	0.6	35.7	
Queue Length 95th (m)		53.6	56.5	7.5	55.0	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1039	1119	937	579	
Starvation Cap Reductn		0	418	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.41	0.52	0.10	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



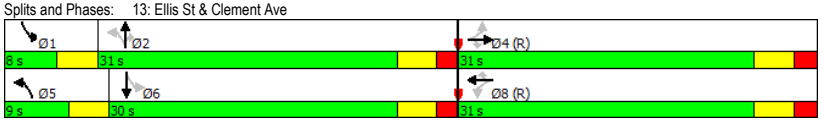
\\SERVERCAL3\Project Files\1498 North American Development\02 1187 Sunset Drive Mixed Use Dev Kelowna\A\Synchro & Sidra\4 - Background 2
Synchro 9 Report LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	293	106	81	235	39	123	132	94	22	152	62
Future Volume (vph)	166	293	106	81	235	39	123	132	94	22	152	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.95	0.99		0.95	0.99	0.99	
Frt			0.850			0.850			0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1776	0
Flt Permitted	0.600			0.540			0.427			0.666		
Satd. Flow (perm)	1115	1883	1522	1004	1883	1527	794	1883	1520	1236	1776	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			90			102		32	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	13		13	13		13	13		13	13		13
Confl. Bikes (#/hr)			7			7			13			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	318	115	88	255	42	134	143	102	24	165	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	180	318	115	88	255	42	134	143	102	24	232	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	31.0	31.0	31.0	31.0	31.0	31.0	9.0	31.0	31.0	8.0	30.0	
Total Split (%)	44.3%	44.3%	44.3%	44.3%	44.3%	44.3%	12.9%	44.3%	44.3%	11.4%	42.9%	
Maximum Green (s)	25.5	25.5	25.5	25.5	25.5	25.5	5.5	25.7	25.7	4.5	24.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	38.2	38.2	38.2	38.2	38.2	38.2	21.8	17.8	17.8	19.2	13.8	
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55	0.55	0.31	0.25	0.25	0.27	0.20	
v/c Ratio	0.30	0.31	0.13	0.16	0.25	0.05	0.41	0.30	0.22	0.06	0.62	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	8.8	8.1	1.6	11.2	10.8	0.7	19.4	22.2	6.2	13.8	29.0	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.8	8.5	1.6	11.2	10.8	0.7	19.4	22.2	6.2	13.8	29.0	
LOS	A	A	A	B	B	A	B	C	A	B	C	
Approach Delay		7.3			9.8			16.9			27.5	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	11.7	21.2	1.3	5.5	16.9	0.0	12.2	13.6	0.0	2.1	24.2	
Queue Length 95th (m)	23.1	35.9	m4.2	15.0	35.0	1.1	20.5	27.6	9.6	5.6	40.3	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	609	1028	883	548	1028	875	325	691	622	373	647	
Starvation Cap Reductn	0	332	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.46	0.13	0.16	0.26	0.05	0.41	0.21	0.16	0.06	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 13.3		Intersection LOS: B	
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 13: Ellis St & Clement Ave



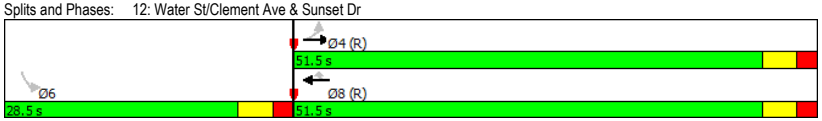
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	90	506	524	234	166	97
Future Volume (vph)	90	506	524	234	166	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.93	0.93	
Frt				0.850	0.950	
Flt Protected		0.992			0.969	
Satd. Flow (prot)	0	1868	1883	1601	1687	0
Flt Permitted		0.838			0.969	
Satd. Flow (perm)	0	1574	1883	1483	1619	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				122	37	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		240.0	
Travel Time (s)		24.2	6.5		18.0	
Confl. Peds. (#/hr)	29			29	37	26
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	550	570	254	180	105
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	648	570	254	285	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	51.5	51.5	51.5	51.5	28.5	
Total Split (%)	64.4%	64.4%	64.4%	64.4%	35.6%	
Maximum Green (s)	46.0	46.0	46.0	46.0	23.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		51.7	51.7	51.7	17.3	
Actuated g/C Ratio		0.65	0.65	0.65	0.22	
v/c Ratio		0.64	0.47	0.25	0.75	

12: Water St/Clement Ave & Sunset Dr PM Peak Hour
5/11/2017 Background 2030

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		13.4	7.3	2.8	37.7	
Queue Delay		0.5	0.9	0.4	0.0	
Total Delay		13.9	8.2	3.1	37.7	
LOS		B	A	A	D	
Approach Delay		13.9	6.6		37.7	
Approach LOS		B	A		D	
Queue Length 50th (m)		52.8	37.5	0.3	35.2	
Queue Length 95th (m)		105.6	57.3	m10.8	55.8	
Internal Link Dist (m)		298.7	63.2		216.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1017	1216	1001	491	
Starvation Cap Reductn		0	363	371	0	
Spillback Cap Reductn		108	0	0	2	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.71	0.67	0.40	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 64 (80%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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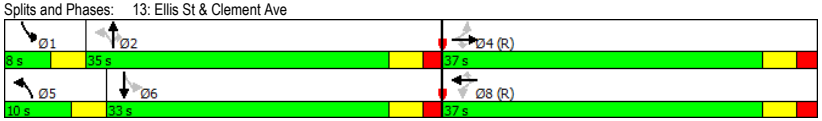
Synchro 9 Report LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	443	116	75	366	73	186	149	140	66	158	207
Future Volume (vph)	113	443	116	75	366	73	186	149	140	66	158	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.94	0.99		0.95	0.99		0.93	0.98	0.95	
Frt			0.850			0.850			0.850		0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1645	0
Flt Permitted	0.438			0.361			0.218			0.654		
Satd. Flow (perm)	816	1883	1502	671	1883	1523	404	1883	1496	1211	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126			79			152		90	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			454.1	
Travel Time (s)		6.5			13.6			15.4			34.1	
Confl. Peds. (#/hr)	13		18	18		13	21		13	13		21
Confl. Bikes (#/hr)			7			7			26			26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	482	126	82	398	79	202	162	152	72	172	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	482	126	82	398	79	202	162	152	72	397	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	10.0	35.0	35.0	8.0	33.0	
Total Split (%)	46.3%	46.3%	46.3%	46.3%	46.3%	46.3%	12.5%	43.8%	43.8%	10.0%	41.3%	
Maximum Green (s)	31.5	31.5	31.5	31.5	31.5	31.5	6.5	29.7	29.7	4.5	27.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	38.6	38.6	38.6	38.6	38.6	38.6	31.2	24.2	24.2	26.9	20.6	
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.39	0.30	0.30	0.34	0.26	
v/c Ratio	0.31	0.53	0.16	0.25	0.44	0.10	0.75	0.28	0.27	0.16	0.81	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	12.9	14.6	1.8	17.5	17.1	4.3	33.7	21.9	4.6	13.8	34.0	
Queue Delay	0.0	1.6	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.4	
Total Delay	12.9	16.2	1.8	17.5	17.1	4.3	34.7	21.9	4.6	13.8	34.4	
LOS	B	B	A	B	B	A	C	C	A	B	C	
Approach Delay		13.1			15.3			21.8			31.2	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	9.5	51.1	0.6	7.1	38.3	0.0	19.8	19.0	0.0	6.5	43.7	
Queue Length 95th (m)	m17.4	74.4	m1.8	19.5	70.9	7.6	#32.0	29.7	10.8	11.8	67.0	
Internal Link Dist (m)		63.2			156.9			180.7			430.1	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	393	907	789	323	907	775	270	699	650	440	628	
Starvation Cap Reductn	0	251	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	9	0	0	0	39	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.31	0.73	0.16	0.25	0.44	0.10	0.77	0.23	0.23	0.16	0.67	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 13: Ellis St & Clement Ave



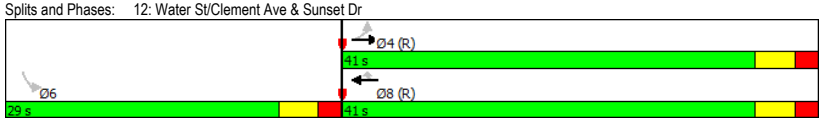
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	36	285	287	78	204	68
Future Volume (vph)	36	285	287	78	204	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.98	
Frt				0.850	0.966	
Flt Protected		0.994			0.964	
Satd. Flow (prot)	0	1872	1883	1601	1736	0
Flt Permitted		0.941			0.964	
Satd. Flow (perm)	0	1770	1883	1537	1714	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				73	26	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		120.1	
Travel Time (s)		24.2	6.5		9.0	
Confl. Peds. (#/hr)	11			11	11	11
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	310	312	85	222	74
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	349	312	85	296	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	41.0	41.0	41.0	41.0	29.0	
Total Split (%)	58.6%	58.6%	58.6%	58.6%	41.4%	
Maximum Green (s)	35.5	35.5	35.5	35.5	23.5	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		42.6	42.6	42.6	16.4	
Actuated g/C Ratio		0.61	0.61	0.61	0.23	
v/c Ratio		0.32	0.27	0.09	0.70	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		8.8	7.7	3.5	30.8	
Queue Delay		0.0	0.4	0.0	0.0	
Total Delay		8.8	8.1	3.5	30.8	
LOS		A	A	A	C	
Approach Delay		8.8	7.2		30.8	
Approach LOS		A	A		C	
Queue Length 50th (m)		19.7	19.1	0.8	32.5	
Queue Length 95th (m)		42.7	31.9	6.3	49.2	
Internal Link Dist (m)		298.7	63.2		96.1	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1076	1144	962	592	
Starvation Cap Reductn		0	426	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.32	0.43	0.09	0.50	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 62 (89%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	247	101	67	196	38	107	121	77	47	188	62
Future Volume (vph)	140	247	101	67	196	38	107	121	77	47	188	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.96	0.99		0.96	0.99		0.96	0.99	0.99	
Frt			0.850			0.850			0.850		0.963	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1796	0
Flt Permitted	0.625			0.585			0.391			0.673		
Satd. Flow (perm)	1163	1883	1531	1088	1883	1535	729	1883	1537	1251	1796	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			110			90			94		26	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	11		11	11		11	11		11	11		11
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	268	110	73	213	41	116	132	84	51	204	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	268	110	73	213	41	116	132	84	51	271	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	30.7	30.7	30.7	30.7	30.7	30.7	9.0	31.3	31.3	8.0	30.3	
Total Split (%)	43.9%	43.9%	43.9%	43.9%	43.9%	43.9%	12.9%	44.7%	44.7%	11.4%	43.3%	
Maximum Green (s)	25.2	25.2	25.2	25.2	25.2	25.2	5.5	26.0	26.0	4.5	25.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	36.8	36.8	36.8	36.8	36.8	36.8	22.7	17.6	17.6	20.6	15.2	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.32	0.25	0.25	0.29	0.22	
v/c Ratio	0.25	0.27	0.13	0.13	0.22	0.05	0.36	0.28	0.18	0.13	0.66	

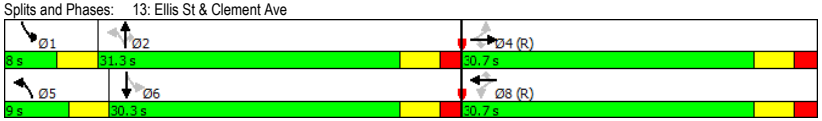
13: Ellis St & Clement Ave
5/11/2017

AM Peak Hour
PD 2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	11.2	10.7	3.7	11.8	11.5	0.6	17.2	21.7	5.1	13.6	30.1	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.2	11.0	3.7	11.8	11.5	0.6	17.2	21.7	5.1	13.6	30.1	
LOS	B	B	A	B	B	A	B	C	A	B	C	
Approach Delay		9.6			10.2			15.9			27.5	
Approach LOS		A			B			B			C	
Queue Length 50th (m)	10.7	18.8	1.6	4.8	14.6	0.0	10.0	14.4	0.0	4.2	29.5	
Queue Length 95th (m)	19.0	29.6	5.5	13.4	31.1	1.1	17.1	24.6	7.4	9.0	46.4	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	611	990	857	572	990	850	319	699	629	402	658	
Starvation Cap Reductn	0	341	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.41	0.13	0.13	0.22	0.05	0.36	0.19	0.13	0.13	0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 66.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Ellis St & Clement Ave



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Synchro 9 Report
LM

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	20	12	5	251	105	9
Future Volume (vph)	20	12	5	251	105	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.950				0.989	
Flt Protected	0.970			0.999		
Satd. Flow (prot)	1736	0	0	1882	1863	0
Flt Permitted	0.970			0.999		
Satd. Flow (perm)	1736	0	0	1882	1863	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	120.1	
Travel Time (s)	14.7			8.3	9.0	
Confl. Peds. (#/hr)			11			11
Confl. Bikes (#/hr)		5				5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	13	5	273	114	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	278	124	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

14: Sunset Dr & Sunset Drive Access AM Peak Hour
5/11/2017 PD 2020

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	20	12	5	251	105	9
Future Volume (Veh/h)	20	12	5	251	105	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	13	5	273	114	10
Pedestrians	11					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					120	
pX, platoon unblocked						
vC, conflicting volume	413	130	135			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	413	130	135			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	588	911	1436			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	35	278	124
Volume Left	22	5	0
Volume Right	13	0	10
cSH	677	1436	1700
Volume to Capacity	0.05	0.00	0.07
Queue Length 95th (m)	1.2	0.1	0.0
Control Delay (s)	10.6	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	104	21	279	193	5
Future Volume (vph)	0	104	21	279	193	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.997	
Flt Protected				0.996		
Satd. Flow (prot)	0	1629	0	1876	1878	0
Flt Permitted				0.996		
Satd. Flow (perm)	0	1629	0	1876	1878	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	61.0			121.6	332.5	
Travel Time (s)	4.6			9.1	24.9	
Confl. Peds. (#/hr)			11			11
Confl. Bikes (#/hr)		5				5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	113	23	303	210	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	113	0	326	215	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Access AM Peak Hour
5/11/2017 PD 2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	104	21	279	193	5
Future Volume (Veh/h)	0	104	21	279	193	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	113	23	303	210	5
Pedestrians	11					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.94					
vC, conflicting volume	572	224	226			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	517	224	226			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	86	98			
cM capacity (veh/h)	476	808	1330			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	326	215
Volume Left	0	23	0
Volume Right	113	0	5
cSH	808	1330	1700
Volume to Capacity	0.14	0.02	0.13
Queue Length 95th (m)	3.7	0.4	0.0
Control Delay (s)	10.2	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	78	427	437	233	160	84
Future Volume (vph)	78	427	437	233	160	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.94	0.94	
Frt				0.850	0.954	
Flt Protected		0.992			0.968	
Satd. Flow (prot)	0	1868	1883	1601	1699	0
Flt Permitted		0.866			0.968	
Satd. Flow (perm)	0	1626	1883	1499	1635	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				155	32	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		121.3	
Travel Time (s)		24.2	6.5		9.1	
Confl. Peds. (#/hr)	24			24	30	22
Confl. Bikes (#/hr)				5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	464	475	253	174	91
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	549	475	253	265	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	26.5	
Total Split (s)	53.5	53.5	53.5	53.5	26.5	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	33.1%	
Maximum Green (s)	48.0	48.0	48.0	48.0	21.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	13.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		52.7	52.7	52.7	16.3	
Actuated g/C Ratio		0.66	0.66	0.66	0.20	
v/c Ratio		0.51	0.38	0.24	0.74	

12: Water St/Clement Ave & Sunset Dr PM Peak Hour
5/11/2017 PD 2020

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		10.0	6.1	2.2	38.6	
Queue Delay		0.1	0.8	0.4	0.0	
Total Delay		10.1	6.9	2.7	38.6	
LOS		B	A	A	D	
Approach Delay		10.1	5.4		38.6	
Approach LOS		B	A		D	
Queue Length 50th (m)		38.2	25.3	0.0	33.1	
Queue Length 95th (m)		72.2	43.4	9.5	54.2	
Internal Link Dist (m)		298.7	63.2		97.3	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1071	1241	1041	452	
Starvation Cap Reductn		0	457	409	0	
Spillback Cap Reductn		64	0	0	1	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.55	0.61	0.40	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 63 (79%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 79.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr

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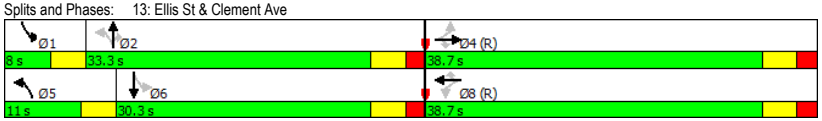
Synchro 9 Report LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	371	109	62	317	106	170	168	115	66	153	177
Future Volume (vph)	107	371	109	62	317	106	170	168	115	66	153	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.96	0.99		0.94	0.99	0.96	
Frt			0.850			0.850			0.850		0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1666	0
Flt Permitted	0.492			0.437			0.235			0.642		
Satd. Flow (perm)	917	1883	1515	812	1883	1532	437	1883	1505	1193	1666	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			118			115			125		76	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	11		15	15		11	17		11	11		17
Confl. Bikes (#/hr)			5			5			22			22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	116	403	118	67	345	115	185	183	125	72	166	192
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	403	118	67	345	115	185	183	125	72	358	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	38.7	38.7	38.7	38.7	38.7	38.7	11.0	33.3	33.3	8.0	30.3	
Total Split (%)	48.4%	48.4%	48.4%	48.4%	48.4%	48.4%	13.8%	41.6%	41.6%	10.0%	37.9%	
Maximum Green (s)	33.2	33.2	33.2	33.2	33.2	33.2	7.5	28.0	28.0	4.5	25.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	39.3	39.3	39.3	39.3	39.3	39.3	31.3	23.5	23.5	25.2	18.9	
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.39	0.29	0.29	0.32	0.24	
v/c Ratio	0.26	0.44	0.15	0.17	0.37	0.14	0.62	0.33	0.24	0.18	0.79	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	13.3	14.8	2.8	14.9	15.5	3.5	24.9	23.3	5.0	14.7	35.2	
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.3	15.6	2.8	14.9	15.5	3.5	24.9	23.3	5.0	14.7	35.2	
LOS	B	B	A	B	B	A	C	C	A	B	D	
Approach Delay		12.8			12.8			19.3			31.8	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	10.2	46.7	1.0	5.4	31.4	0.0	18.2	22.1	0.0	6.6	40.2	
Queue Length 95th (m)	m21.6	71.2	m4.2	14.7	57.9	8.7	27.8	34.6	10.2	12.4	63.4	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	450	925	804	399	925	811	297	659	608	408	572	
Starvation Cap Reductn	0	268	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.26	0.61	0.15	0.17	0.37	0.14	0.62	0.28	0.21	0.18	0.63	

Intersection Summary		
Area Type:	Other	
Cycle Length: 80		
Actuated Cycle Length: 80		
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green		
Natural Cycle: 70		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.79		
Intersection Signal Delay: 18.2	Intersection LOS: B	
Intersection Capacity Utilization 74.4%	ICU Level of Service D	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	25	5	5	219	270	34
Future Volume (vph)	25	5	5	219	270	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979				0.985	
Flt Protected	0.960			0.999		
Satd. Flow (prot)	1770	0	0	1882	1855	0
Flt Permitted	0.960			0.999		
Satd. Flow (perm)	1770	0	0	1882	1855	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	121.3	
Travel Time (s)	14.7			8.3	9.1	
Confl. Peds. (#/hr)			30			30
Confl. Bikes (#/hr)		5				5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	5	5	238	293	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	0	243	330	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	25	5	5	219	270	34
Future Volume (Veh/h)	25	5	5	219	270	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	5	238	293	37
Pedestrians	30					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	3					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					121	
pX, platoon unblocked						
vC, conflicting volume	590	342	360			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590	342	360			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	456	683	1168			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	32	243	330
Volume Left	27	5	0
Volume Right	5	0	37
cSH	481	1168	1700
Volume to Capacity	0.07	0.00	0.19
Queue Length 95th (m)	1.6	0.1	0.0
Control Delay (s)	13.0	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	42	102	278	354	15
Future Volume (vph)	0	42	102	278	354	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.995	
Flt Protected				0.987		
Satd. Flow (prot)	0	1629	0	1859	1874	0
Flt Permitted				0.987		
Satd. Flow (perm)	0	1629	0	1859	1874	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	65.2			121.6	332.5	
Travel Time (s)	11.7			9.1	24.9	
Confl. Peds. (#/hr)			17			17
Confl. Bikes (#/hr)		5				22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	46	111	302	385	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	0	413	401	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Access PM Peak Hour
5/11/2017 PD 2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	42	102	278	354	15
Future Volume (Veh/h)	0	42	102	278	354	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	46	111	302	385	16
Pedestrians	17					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.92					
vC, conflicting volume	934	410	418			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	887	410	418			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	90			
cM capacity (veh/h)	258	632	1124			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	413	401
Volume Left	0	111	0
Volume Right	46	0	16
cSH	632	1124	1700
Volume to Capacity	0.07	0.10	0.24
Queue Length 95th (m)	1.8	2.5	0.0
Control Delay (s)	11.1	3.0	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	3.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

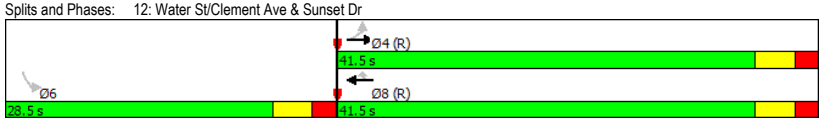
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	346	347	92	239	82
Future Volume (vph)	44	346	347	92	239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.97	
Frt				0.850	0.966	
Flt Protected		0.994			0.964	
Satd. Flow (prot)	0	1872	1883	1601	1733	0
Flt Permitted		0.927			0.964	
Satd. Flow (perm)	0	1744	1883	1530	1707	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				72	26	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		121.2	
Travel Time (s)		24.2	6.5		9.1	
Confl. Peds. (#/hr)	13			13	13	13
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	376	377	100	260	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	424	377	100	349	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	41.5	41.5	41.5	41.5	28.5	
Total Split (%)	59.3%	59.3%	59.3%	59.3%	40.7%	
Maximum Green (s)	36.0	36.0	36.0	36.0	23.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		40.9	40.9	40.9	18.1	
Actuated g/C Ratio		0.58	0.58	0.58	0.26	
v/c Ratio		0.42	0.34	0.11	0.76	

12: Water St/Clement Ave & Sunset Dr AM Peak Hour
5/11/2017 PD 2030

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		10.6	8.0	3.1	32.8	
Queue Delay		0.0	0.4	0.0	0.0	
Total Delay		10.6	8.4	3.1	32.8	
LOS		B	A	A	C	
Approach Delay		10.6	7.3		32.8	
Approach LOS		B	A		C	
Queue Length 50th (m)		28.0	23.9	2.4	38.6	
Queue Length 95th (m)		54.2	37.0	6.2	59.7	
Internal Link Dist (m)		298.7	63.2		97.2	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1019	1101	924	578	
Starvation Cap Reductn		0	342	0	0	
Spillback Cap Reductn		16	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.42	0.50	0.11	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 59 (84%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 15.5		Intersection LOS: B	
Intersection Capacity Utilization 72.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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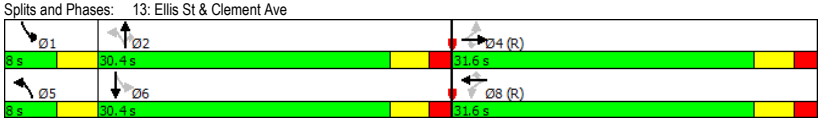
Synchro 9 Report LM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	298	117	81	238	45	128	145	94	51	215	73
Future Volume (vph)	170	298	117	81	238	45	128	145	94	51	215	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.95	0.99		0.95	0.99	0.99	
Frt			0.850			0.850			0.850		0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1789	0
Flt Permitted	0.592			0.528			0.362			0.657		
Satd. Flow (perm)	1100	1883	1522	982	1883	1527	674	1883	1519	1219	1789	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			90			102		27	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	13		13	13		13	13		13	13		13
Confl. Bikes (#/hr)			7			7			13			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	324	127	88	259	49	139	158	102	55	234	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	324	127	88	259	49	139	158	102	55	313	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	8.0	30.4	30.4	8.0	30.4	
Total Split (%)	45.1%	45.1%	45.1%	45.1%	45.1%	45.1%	11.4%	43.4%	43.4%	11.4%	43.4%	
Maximum Green (s)	26.1	26.1	26.1	26.1	26.1	26.1	4.5	25.1	25.1	4.5	25.1	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	36.1	36.1	36.1	36.1	36.1	36.1	22.8	18.3	18.3	22.1	16.7	
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.33	0.26	0.26	0.32	0.24	
v/c Ratio	0.33	0.33	0.15	0.17	0.27	0.06	0.48	0.32	0.22	0.13	0.70	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	13.2	12.1	3.7	13.2	12.6	1.3	19.7	21.6	5.5	12.9	30.1	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.2	12.5	3.7	13.2	12.6	1.3	19.7	21.6	5.5	12.9	30.1	
LOS	B	B	A	B	B	A	B	C	A	B	C	
Approach Delay		11.0			11.3			16.8			27.5	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	12.0	21.1	1.8	6.0	18.7	0.0	11.9	17.2	0.0	4.5	34.2	
Queue Length 95th (m)	m32.6	47.0	m5.6	16.8	39.4	2.3	18.9	27.5	8.9	8.9	51.0	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	567	970	846	505	970	830	291	675	610	421	658	
Starvation Cap Reductn	0	286	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.33	0.47	0.15	0.17	0.27	0.06	0.48	0.23	0.17	0.13	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 70.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	20	12	5	300	127	9
Future Volume (vph)	20	12	5	300	127	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.950				0.991	
Flt Protected	0.970			0.999		
Satd. Flow (prot)	1736	0	0	1882	1866	0
Flt Permitted	0.970			0.999		
Satd. Flow (perm)	1736	0	0	1882	1866	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	121.2	
Travel Time (s)	14.7			8.3	9.1	
Confl. Peds. (#/hr)			13			13
Confl. Bikes (#/hr)		7				7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	13	5	326	138	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	331	148	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	20	12	5	300	127	9
Future Volume (Veh/h)	20	12	5	300	127	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	13	5	326	138	10
Pedestrians	13					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					121	
pX, platoon unblocked						
vC, conflicting volume	492	156	161			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	492	156	161			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	528	880	1402			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	35	331	148
Volume Left	22	5	0
Volume Right	13	0	10
cSH	620	1402	1700
Volume to Capacity	0.06	0.00	0.09
Queue Length 95th (m)	1.4	0.1	0.0
Control Delay (s)	11.2	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	11.2	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	104	21	339	236	5
Future Volume (vph)	0	104	21	339	236	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.997	
Flt Protected				0.997		
Satd. Flow (prot)	0	1629	0	1878	1878	0
Flt Permitted				0.997		
Satd. Flow (perm)	0	1629	0	1878	1878	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	65.2			121.6	332.5	
Travel Time (s)	4.9			9.1	24.9	
Confl. Peds. (#/hr)			13			13
Confl. Bikes (#/hr)		13				13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	113	23	368	257	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	113	0	391	262	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Access AM Peak Hour
5/11/2017 PD 2030

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	104	21	339	236	5
Future Volume (Veh/h)	0	104	21	339	236	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	113	23	368	257	5
Pedestrians	13					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.91					
vC, conflicting volume	686	272	275			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606	272	275			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	85	98			
cM capacity (veh/h)	407	758	1274			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	391	262
Volume Left	0	23	0
Volume Right	113	0	5
cSH	758	1274	1700
Volume to Capacity	0.15	0.02	0.15
Queue Length 95th (m)	4.0	0.4	0.0
Control Delay (s)	10.6	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	517	531	271	188	101
Future Volume (vph)	94	517	531	271	188	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.93	0.93	
Frt				0.850	0.953	
Flt Protected		0.992			0.969	
Satd. Flow (prot)	0	1868	1883	1601	1692	0
Flt Permitted		0.813			0.969	
Satd. Flow (perm)	0	1527	1883	1483	1614	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				148	33	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		121.0	
Travel Time (s)		24.2	6.5		9.1	
Confl. Peds. (#/hr)	29			29	37	26
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	562	577	295	204	110
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	664	577	295	314	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	26.5	
Total Split (s)	53.5	53.5	53.5	53.5	26.5	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	33.1%	
Maximum Green (s)	48.0	48.0	48.0	48.0	21.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	13.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		51.0	51.0	51.0	18.0	
Actuated g/C Ratio		0.64	0.64	0.64	0.22	
v/c Ratio		0.68	0.48	0.30	0.81	

12: Water St/Clement Ave & Sunset Dr PM Peak Hour
5/11/2017 PD 2030

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		14.8	9.5	3.9	42.6	
Queue Delay		0.2	0.9	0.5	3.3	
Total Delay		15.0	10.5	4.4	45.9	
LOS		B	B	A	D	
Approach Delay		15.0	8.4		45.9	
Approach LOS		B	A		D	
Queue Length 50th (m)		60.8	38.3	8.0	39.7	
Queue Length 95th (m)		106.2	62.7	m15.4	#68.7	
Internal Link Dist (m)		298.7	63.2		97.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		973	1200	999	448	
Starvation Cap Reductn		0	355	356	0	
Spillback Cap Reductn		36	0	0	66	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.71	0.68	0.46	0.82	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 3 (4%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 91.6% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr

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Synchro 9 Report LM

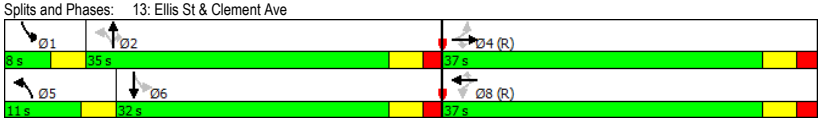
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	449	129	75	381	119	201	195	140	77	182	214
Future Volume (vph)	127	449	129	75	381	119	201	195	140	77	182	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.94	0.99		0.95	0.99		0.93	0.98	0.96	
Frt			0.850			0.850			0.850		0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1655	0
Flt Permitted	0.406			0.334			0.195			0.625		
Satd. Flow (perm)	757	1883	1502	621	1883	1523	362	1883	1496	1159	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140			129			152		79	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	13		18	18		13	21		13	13		21
Confl. Bikes (#/hr)			7			7			26			26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	488	140	82	414	129	218	212	152	84	198	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	488	140	82	414	129	218	212	152	84	431	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	11.0	35.0	35.0	8.0	32.0	
Total Split (%)	46.3%	46.3%	46.3%	46.3%	46.3%	46.3%	13.8%	43.8%	43.8%	10.0%	40.0%	
Maximum Green (s)	31.5	31.5	31.5	31.5	31.5	31.5	7.5	29.7	29.7	4.5	26.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	36.2	36.2	36.2	36.2	36.2	36.2	34.4	26.6	26.6	28.3	22.0	
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.43	0.33	0.33	0.35	0.28	
v/c Ratio	0.40	0.57	0.19	0.29	0.49	0.17	0.75	0.34	0.25	0.19	0.84	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	18.7	17.9	4.1	19.8	19.2	3.8	32.0	21.3	4.3	13.2	37.0	
Queue Delay	0.0	2.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	
Total Delay	18.7	20.5	4.1	19.8	19.5	3.8	32.0	21.3	4.3	13.2	37.1	
LOS	B	C	A	B	B	A	C	C	A	B	D	
Approach Delay		17.2			16.3			20.9			33.2	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	11.1	40.3	0.8	7.8	43.6	0.0	20.0	24.2	0.0	7.1	49.8	
Queue Length 95th (m)	m21.9	80.5	m5.6	20.0	74.4	9.6	#36.2	38.3	10.8	13.4	78.7	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	342	851	755	280	851	758	289	699	650	446	604	
Starvation Cap Reductn	0	241	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	105	0	0	0	0	0	4	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.40	0.80	0.19	0.29	0.55	0.17	0.75	0.30	0.23	0.19	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.1 Intersection LOS: C
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	25	5	5	264	324	34
Future Volume (vph)	25	5	5	264	324	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979				0.987	
Flt Protected	0.960			0.999		
Satd. Flow (prot)	1770	0	0	1882	1859	0
Flt Permitted	0.960			0.999		
Satd. Flow (perm)	1770	0	0	1882	1859	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	121.0	
Travel Time (s)	14.7			8.3	9.1	
Confl. Peds. (#/hr)			37			37
Confl. Bikes (#/hr)		7				7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	5	5	287	352	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	0	292	389	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

14: Sunset Dr & Sunset Drive Access PM Peak Hour
5/11/2017 PD 2030

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	25	5	5	264	324	34
Future Volume (Veh/h)	25	5	5	264	324	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	5	287	352	37
Pedestrians	37					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	3					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					121	
pX, platoon unblocked						
vC, conflicting volume	704	408	426			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704	408	426			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	100			
cM capacity (veh/h)	388	623	1097			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	32	292	389
Volume Left	27	5	0
Volume Right	5	0	37
cSH	413	1097	1700
Volume to Capacity	0.08	0.00	0.23
Queue Length 95th (m)	1.9	0.1	0.0
Control Delay (s)	14.5	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	14.5	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	42	102	338	431	15
Future Volume (vph)	0	42	102	338	431	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.996	
Flt Protected				0.989		
Satd. Flow (prot)	0	1629	0	1863	1876	0
Flt Permitted				0.989		
Satd. Flow (perm)	0	1629	0	1863	1876	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	65.5			121.6	332.5	
Travel Time (s)	11.8			9.1	24.9	
Confl. Peds. (#/hr)			21			21
Confl. Bikes (#/hr)		7				26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	46	111	367	468	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	0	478	484	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Site Access PM Peak Hour
5/11/2017 PD 2030

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	42	102	338	431	15
Future Volume (Veh/h)	0	42	102	338	431	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	46	111	367	468	16
Pedestrians	21					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.90					
vC, conflicting volume	1086	497	505			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1038	497	505			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	89			
cM capacity (veh/h)	201	563	1041			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	478	484
Volume Left	0	111	0
Volume Right	46	0	16
cSH	563	1041	1700
Volume to Capacity	0.08	0.11	0.28
Queue Length 95th (m)	2.0	2.7	0.0
Control Delay (s)	12.0	3.0	0.0
Lane LOS	B	A	
Approach Delay (s)	12.0	3.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

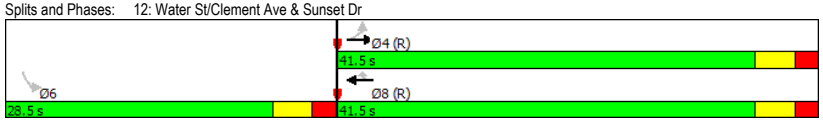
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	344	347	110	239	82
Future Volume (vph)	46	344	347	110	239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.96	0.97	
Frt				0.850	0.966	
Flt Protected		0.994			0.964	
Satd. Flow (prot)	0	1872	1883	1601	1733	0
Flt Permitted		0.923			0.964	
Satd. Flow (perm)	0	1736	1883	1530	1707	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				87	26	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		121.2	
Travel Time (s)		24.2	6.5		9.1	
Confl. Peds. (#/hr)	13			13	13	13
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	374	377	120	260	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	424	377	120	349	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	
Total Split (s)	41.5	41.5	41.5	41.5	28.5	
Total Split (%)	59.3%	59.3%	59.3%	59.3%	40.7%	
Maximum Green (s)	36.0	36.0	36.0	36.0	23.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		40.9	40.9	40.9	18.1	
Actuated g/C Ratio		0.58	0.58	0.58	0.26	
v/c Ratio		0.42	0.34	0.13	0.76	

12: Water St/Clement Ave & Sunset Dr
5/11/2017
AM Peak Hour
PD 2030 No NBL at Ellis Access

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		10.6	7.9	3.1	32.8	
Queue Delay		0.0	0.5	0.0	0.0	
Total Delay		10.6	8.4	3.1	32.8	
LOS		B	A	A	C	
Approach Delay		10.6	7.1		32.8	
Approach LOS		B	A		C	
Queue Length 50th (m)		28.0	24.6	3.0	38.6	
Queue Length 95th (m)		54.3	37.8	7.1	59.7	
Internal Link Dist (m)		298.7	63.2		97.2	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		1015	1101	931	578	
Starvation Cap Reductn		0	348	0	0	
Spillback Cap Reductn		14	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.42	0.50	0.13	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 59 (84%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 72.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr



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Synchro 9 Report
LM

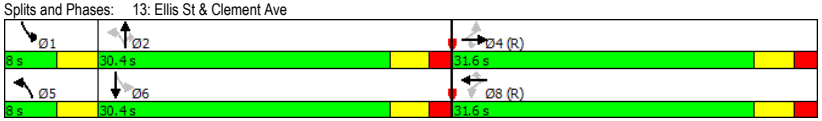
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	298	117	81	243	39	141	132	94	51	215	73
Future Volume (vph)	168	298	117	81	243	39	141	132	94	51	215	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.95	0.99		0.95	0.99		0.95	0.99	0.99	
Frt			0.850			0.850			0.850		0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1789	0
Flt Permitted	0.581			0.520			0.357			0.666		
Satd. Flow (perm)	1080	1883	1522	967	1883	1527	665	1883	1519	1236	1789	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			90			102		27	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	13		13	13		13	13		13	13		13
Confl. Bikes (#/hr)			7			7			13			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	324	127	88	264	42	153	143	102	55	234	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	324	127	88	264	42	153	143	102	55	313	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	8.0	30.4	30.4	8.0	30.4	
Total Split (%)	45.1%	45.1%	45.1%	45.1%	45.1%	45.1%	11.4%	43.4%	43.4%	11.4%	43.4%	
Maximum Green (s)	26.1	26.1	26.1	26.1	26.1	26.1	4.5	25.1	25.1	4.5	25.1	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	24.4	19.9	19.9	23.0	16.7	
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.35	0.28	0.28	0.33	0.24	
v/c Ratio	0.34	0.35	0.16	0.18	0.28	0.05	0.50	0.27	0.20	0.12	0.70	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	13.7	12.6	3.8	13.3	12.9	0.8	20.1	20.6	5.3	12.8	30.1	
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.7	13.1	3.8	13.3	12.9	0.8	20.1	20.6	5.3	12.8	30.1	
LOS	B	B	A	B	B	A	C	C	A	B	C	
Approach Delay		11.4			11.7			16.5			27.5	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	11.9	21.1	1.8	6.0	19.2	0.0	13.2	15.4	0.0	4.5	34.2	
Queue Length 95th (m)	m32.3	47.0	m5.7	16.9	40.2	1.2	20.5	25.4	8.9	8.9	51.0	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	532	927	814	476	927	797	304	675	610	441	658	
Starvation Cap Reductn	0	286	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.51	0.16	0.18	0.28	0.05	0.50	0.21	0.17	0.12	0.48	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 71.0% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Ellis St & Clement Ave



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	20	12	5	300	127	30
Future Volume (vph)	20	12	5	300	127	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.950				0.974	
Flt Protected	0.970			0.999		
Satd. Flow (prot)	1736	0	0	1882	1834	0
Flt Permitted	0.970			0.999		
Satd. Flow (perm)	1736	0	0	1882	1834	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	121.2	
Travel Time (s)	14.7			8.3	9.1	
Confl. Peds. (#/hr)			13			13
Confl. Bikes (#/hr)		7				7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	13	5	326	138	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	331	171	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

14: Sunset Dr & Sunset Drive Access AM Peak Hour
5/11/2017 PD 2030 No NBL at Ellis Access

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	20	12	5	300	127	30
Future Volume (Veh/h)	20	12	5	300	127	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	13	5	326	138	33
Pedestrians	13					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					121	
pX, platoon unblocked						
vC, conflicting volume	504	168	184			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504	168	184			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	520	867	1375			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	35	331	171
Volume Left	22	5	0
Volume Right	13	0	33
cSH	611	1375	1700
Volume to Capacity	0.06	0.00	0.10
Queue Length 95th (m)	1.4	0.1	0.0
Control Delay (s)	11.3	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	11.3	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report LM

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	104	0	339	236	5
Future Volume (vph)	0	104	0	339	236	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1629	0	1883	1878	0
Flt Permitted						
Satd. Flow (perm)	0	1629	0	1883	1878	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	65.2			121.6	332.5	
Travel Time (s)	4.9			9.1	24.9	
Confl. Peds. (#/hr)			13			13
Confl. Bikes (#/hr)		13				13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	113	0	368	257	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	113	0	368	262	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Access
5/11/2017
AM Peak Hour
PD 2030 No NBL at Ellis Access

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	104	0	339	236	5
Future Volume (Veh/h)	0	104	0	339	236	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	113	0	368	257	5
Pedestrians	13					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.92					
vC, conflicting volume	640	272	275			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	565	272	275			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	85	100			
cM capacity (veh/h)	442	758	1274			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	368	262
Volume Left	0	0	0
Volume Right	113	0	5
cSH	758	1274	1700
Volume to Capacity	0.15	0.00	0.15
Queue Length 95th (m)	4.0	0.0	0.0
Control Delay (s)	10.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

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Synchro 9 Report
LM

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	105	506	531	355	188	101
Future Volume (vph)	105	506	531	355	188	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	12.0			12.0	0.0	0.0
Storage Lanes	0			1	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.93	0.93	
Frt				0.850	0.953	
Flt Protected		0.991			0.969	
Satd. Flow (prot)	0	1866	1883	1601	1692	0
Flt Permitted		0.775			0.969	
Satd. Flow (perm)	0	1455	1883	1483	1614	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				194	33	
Link Speed (k/h)		48	48		48	
Link Distance (m)		322.7	87.2		121.0	
Travel Time (s)		24.2	6.5		9.1	
Confl. Peds. (#/hr)	29			29	37	26
Confl. Bikes (#/hr)				7		7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	550	577	386	204	110
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	664	577	386	314	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	26.5	
Total Split (s)	53.5	53.5	53.5	53.5	26.5	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	33.1%	
Maximum Green (s)	48.0	48.0	48.0	48.0	21.0	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	13.0	
Pedestrian Calls (#/hr)	10	10	10	10	10	
Act Effct Green (s)		51.0	51.0	51.0	18.0	
Actuated g/C Ratio		0.64	0.64	0.64	0.22	
v/c Ratio		0.72	0.48	0.38	0.81	

12: Water St/Clement Ave & Sunset Dr
5/11/2017
PM Peak Hour
PD 2030 No NBL at Ellis Access

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Control Delay		16.3	8.4	3.8	42.6	
Queue Delay		0.3	1.3	0.6	4.9	
Total Delay		16.6	9.7	4.4	47.4	
LOS		B	A	A	D	
Approach Delay		16.6	7.6		47.4	
Approach LOS		B	A		D	
Queue Length 50th (m)		63.3	31.1	9.5	39.7	
Queue Length 95th (m)		113.4	m53.1	m17.6	#68.7	
Internal Link Dist (m)		298.7	63.2		97.0	
Turn Bay Length (m)				12.0		
Base Capacity (vph)		927	1200	1015	448	
Starvation Cap Reductn		0	397	322	0	
Spillback Cap Reductn		35	0	0	80	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.74	0.72	0.56	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 3 (4%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 91.6% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Water St/Clement Ave & Sunset Dr

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	449	129	75	426	73	246	149	140	77	182	214
Future Volume (vph)	116	449	129	75	426	73	246	149	140	77	182	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		45.0	26.0		70.0	20.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.94	0.99		0.95	0.99		0.94	0.98	0.96	
Frt			0.850			0.850			0.850		0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1654	0
Flt Permitted	0.342			0.317			0.191			0.654		
Satd. Flow (perm)	638	1883	1502	590	1883	1523	355	1883	1497	1211	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140			127			152		78	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		87.2			180.9			204.7			121.6	
Travel Time (s)		6.5			13.6			15.4			9.1	
Confl. Peds. (#/hr)	13		18	18		13	21		13	13		21
Confl. Bikes (#/hr)			7			7			26			26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	488	140	82	463	79	267	162	152	84	198	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	488	140	82	463	79	267	162	152	84	431	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	28.5	28.5	28.5	8.0	30.3	30.3	8.0	30.3	
Total Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	13.0	36.0	36.0	8.0	31.0	
Total Split (%)	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	16.3%	45.0%	45.0%	10.0%	38.8%	
Maximum Green (s)	30.5	30.5	30.5	30.5	30.5	30.5	9.5	30.7	30.7	4.5	25.7	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.4	
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	1.9	1.9	0.0	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	3.5	5.3	5.3	3.5	5.3	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Min	Min	None	Min	
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	
Flash Dont Walk (s)	12.0	12.0	12.0	15.0	15.0	15.0		17.0	17.0		17.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0	0		0	
Act Effct Green (s)	34.4	34.4	34.4	34.4	34.4	34.4	36.6	28.4	28.4	28.1	21.8	
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.46	0.36	0.36	0.35	0.27	
v/c Ratio	0.46	0.60	0.19	0.32	0.57	0.11	0.80	0.24	0.24	0.18	0.85	

13: Ellis St & Clement Ave
5/11/2017

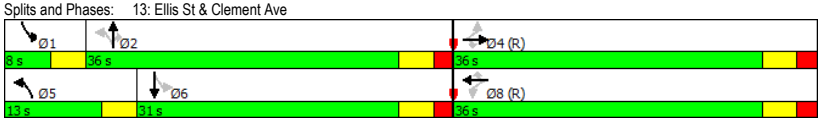
PM Peak Hour
PD 2030 No NBL at Ellis Access

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	22.4	20.1	4.7	21.7	21.9	1.4	33.5	18.9	4.1	12.5	38.5	
Queue Delay	0.0	3.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	22.4	23.6	4.7	21.7	22.2	1.4	33.5	18.9	4.1	12.5	38.5	
LOS	C	C	A	C	C	A	C	B	A	B	D	
Approach Delay		19.9			19.5			21.7			34.3	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	11.3	44.6	0.9	8.3	53.3	0.0	23.8	17.1	0.0	6.7	49.8	
Queue Length 95th (m)	m20.2	85.6	m4.9	20.9	86.9	3.0	#50.1	29.1	10.5	13.0	#83.2	
Internal Link Dist (m)		63.2			156.9			180.7			97.6	
Turn Bay Length (m)	45.0		45.0	26.0		70.0	20.0			50.0		
Base Capacity (vph)	274	809	725	253	809	727	332	722	668	457	584	
Starvation Cap Reductn	0	227	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	54	0	0	0	0	0	1	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.84	0.19	0.32	0.61	0.11	0.80	0.22	0.23	0.18	0.74	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 86.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Ellis St & Clement Ave



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Synchro 9 Report
LM

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	25	5	5	264	324	137
Future Volume (vph)	25	5	5	264	324	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979				0.960	
Flt Protected	0.960			0.999		
Satd. Flow (prot)	1770	0	0	1882	1808	0
Flt Permitted	0.960			0.999		
Satd. Flow (perm)	1770	0	0	1882	1808	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	81.8			110.1	121.0	
Travel Time (s)	14.7			8.3	9.1	
Confl. Peds. (#/hr)			37			37
Confl. Bikes (#/hr)		7				7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	5	5	287	352	149
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	0	292	501	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.3%	ICU Level of Service A	
Analysis Period (min)	15		

14: Sunset Dr & Sunset Drive Access PM Peak Hour
5/11/2017 PD 2030 No NBL at Ellis Access

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (veh/h)	25	5	5	264	324	137
Future Volume (Veh/h)	25	5	5	264	324	137
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	5	287	352	149
Pedestrians	37					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	3					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					121	
pX, platoon unblocked						
vC, conflicting volume	760	464	538			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	464	538			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	99	99			
cM capacity (veh/h)	360	580	998			

Direction, Lane #	WB 1	SE 1	NW 1
Volume Total	32	292	501
Volume Left	27	5	0
Volume Right	5	0	149
cSH	383	998	1700
Volume to Capacity	0.08	0.01	0.29
Queue Length 95th (m)	2.1	0.1	0.0
Control Delay (s)	15.3	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.3	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

\\SERVERCAL3\Project Files\1498 North American Development\02 1187 Sunset Drive Mixed Use Dev Kelowna\A\Synchro & Sidra\7 - PD 2030 No N
Synchro 9 Report LM

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	42	0	338	431	15
Future Volume (vph)	0	42	0	338	431	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1629	0	1883	1876	0
Flt Permitted						
Satd. Flow (perm)	0	1629	0	1883	1876	0
Link Speed (k/h)	20			48	48	
Link Distance (m)	65.5			121.6	332.5	
Travel Time (s)	11.8			9.1	24.9	
Confl. Peds. (#/hr)			21			21
Confl. Bikes (#/hr)		7				26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	46	0	367	468	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	0	367	484	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

15: Ellis St & Ellis Street Site Access
5/11/2017

PM Peak Hour
PD 2030 No NBL at Ellis Access

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	42	0	338	431	15
Future Volume (Veh/h)	0	42	0	338	431	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	46	0	367	468	16
Pedestrians	21					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				122		
pX, platoon unblocked	0.93					
vC, conflicting volume	864	497	505			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816	497	505			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	316	563	1041			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	367	484
Volume Left	0	0	0
Volume Right	46	0	16
cSH	563	1041	1700
Volume to Capacity	0.08	0.00	0.28
Queue Length 95th (m)	2.0	0.0	0.0
Control Delay (s)	12.0	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.0	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

\\SERVERCAL3\Project Files\1498 North American Development\02 1187 Sunset Drive Mixed Use Dev Kelowna\A\Synchro & Sidra\7 - PD 2030 No N
Synchro 9 Report
LM

APPENDIX E

TAC Signal Warrant

City of Kelowna - Traffic Signal Warrant Analysis

Main Street (name)	Water St / Clement Ave	Direction (EW or NS)	EW
Side Street (name)	Sunset Dr	Direction (EW or NS)	NS
Quadrant / Int #		Comments	Note: Summed the Existing Balanced AM and PM peak hours and factored them up by 2.61 to represent average 6 hour peak volumes.
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET		

Road Authority:	City of Kelowna
City:	Kelowna
Analysis Date:	2017 May 08, Mon
Count Date:	NA - Data provided by City of Kelowna
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Water St / Clement Ave	WB	0				1		73	1
Water St / Clement Ave	EB		1					860	1
Sunset Dr	NB								
Sunset Dr	SB				1				
							n		
Are the Sunset Dr SB right turns significantly impeded by through movements? (y/n)							n		

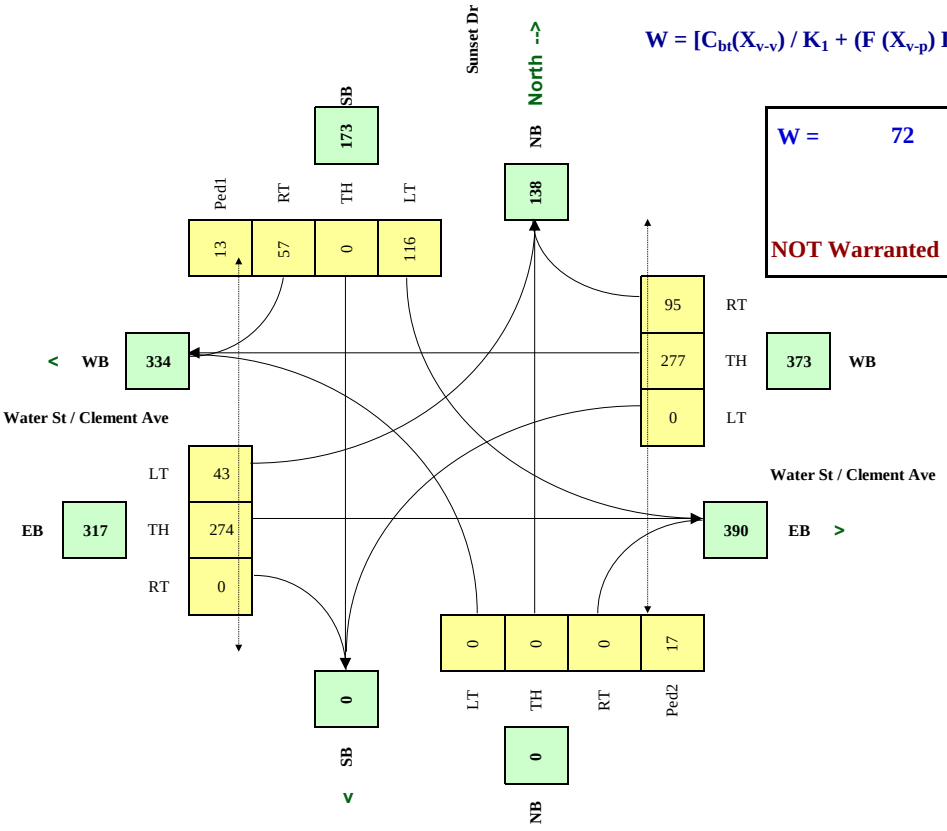
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	y
Pathway to School	(y/n)	n
Metro Area Population	(#)	179,839
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Water St / Clement Ave	EW	50	2.0%	y	0.0
Sunset Dr	NS		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
press 'Set Peak Hours' Button to set the peak hour periods				696		339		1663	572	256	1643		78	99	84	
Total (6-hour peak)	0	0	0	696	0	339	0	1,663	572	256	1,643	0	78	99	84	0
Average (6-hour peak)	0	0	0	116	0	57	0	277	95	43	274	0	13	17	14	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	72	50	22
		Veh	Ped

NOT Warranted

RESET SHEET

APPENDIX F

NCHRP Internal Capture

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	1187 Sunset Drive	**Organization:**	Bunt & Associates
Project Location:	Kelowna, BC	**Performed By:**	Lynn Machacek
Scenario Description:	AM Peak Hour	**Date:**	May 8 , 2017
Analysis Year:	2020 & 2030	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				10	6	4
Restaurant				6	4	2
Cinema/Entertainment				0		
Residential				179	31	148
Hotel				0		
All Other Land Uses[2]				0		
Total				195	41	154

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	4%	9%	1.25	4%	9%
Restaurant						
Cinema/Entertainment						
Residential	1.25	4%	9%	1.25	4%	9%
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		1	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	243	51	192
Internal Capture Percentage	3%	8%	2%
External Vehicle-Trips[3]	165	33	132
External Transit-Trips[4]	9	2	7
External Non-Motorized Trips[4]	20	4	16

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	13%	40%
Restaurant	50%	0%
Cinema/Entertainment	N/A	N/A
Residential	3%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	1187 Sunset Drive	**Organization:**	Bunt & Associates
Project Location:	Kelowna, BC	**Performed By:**	Lynn Machacek
Scenario Description:	PM Peak Hour	**Date:**	May 8 , 2017
Analysis Year:	2020 & 2030	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				37	18	19
Restaurant				52	35	17
Cinema/Entertainment				0		
Residential				211	141	70
Hotel				0		
All Other Land Uses[2]				0		
Total				300	194	106

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	4%	9%	1.25	4%	9%
Restaurant						
Cinema/Entertainment						
Residential	1.25	4%	9%	1.25	4%	9%
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					100	
Restaurant						
Cinema/Entertainment						
Residential		100				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		7	0	6	0
Restaurant	0	7		0	3	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	5	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	363	234	129
Internal Capture Percentage	17%	13%	23%
External Vehicle-Trips[3]	221	149	72
External Transit-Trips[4]	11	8	3
External Non-Motorized Trips[4]	24	16	8

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	39%	54%
Restaurant	34%	59%
Cinema/Entertainment	N/A	N/A
Residential	5%	8%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

APPENDIX G

1190 Richter Street (RCMP Headquarters) TIA

CITY OF KELOWNA

KELOWNA RCMP DETACHMENT TRAFFIC IMPACT ASSESSMENT (PHASE 2)

REPORT – PHASE 2

MARCH 2013
ISSUED FOR REVIEW
EBA FILE: 704-V31203051-01

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LIMITATIONS OF REPORT

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Table of Contents

1 EXECUTIVE SUMMARY 1
2 INTRODUCTION 2
3 BACKGROUND TRAFFIC CONDITIONS 3
3.1 Road Network 3
3.2 Intersection Configurations 3
3.3 Pedestrian Facilities 4
3.4 Bicycle Facilities 4
3.5 Transit Services 5
3.6 Background Volumes 5
3.7 Future Network Changes 6
3.8 Intersection Analysis 6
Opening Horizon Year 8
2030 Horizon Year 8
3.9 Effect of Widening Clement Avenue 9
4 SITE TRAFFIC 10
4.1 Overview of Development Plan 10
4.2 Trip Generation 10
4.3 Trip Distribution 12
4.4 Trip Assignment 12
5 SITE IMPACT ANALYSIS 15
5.1 Combined Traffic Volumes 15
5.2 Combined Intersection Analysis 15
Opening Year Analysis 16
2030 Combined Results 16
5.3 Effect of Widening Clement Avenue 17
6 SITE ACCESS 18
6.1 Site Access Review 18
6.2 Safety 18
7 TRANSIT ACCESS 19
7.1 Transit Service Review 19
7.2 Transit Access Review 19
8 PEDESTRIAN AND BICYCLE ACCESS 20
8.1 Pedestrian Facilities Review 20
8.2 Bicycle Facilities Review 20

9 CONCLUSIONS & RECOMMENDATIONS 21
9.1 Background Conditions 21
9.2 Site Traffic 21
9.3 Combined Traffic Conditions 21
9.4 Site Access 22
9.5 Transit Access 22
9.6 Pedestrian and Bicycle Access 22

10 CLOSURE 23

FIGURES

Figure 1. Site Location
Figure 2. Intersection Lane Configurations
Figure 3. Transit and Bicycle Facilities
Figure 4. 2013 Background Traffic Volumes
Figure 5. 2030 Background Traffic Volumes
Figure 6. Site Traffic Volumes (Build Out 2035)
Figure 7. 2013 Combined Traffic Volumes
Figure 8. 2030 Combined Traffic Volumes

TABLES

Table 1. Existing Intersection Configuration
Table 2. Pedestrian Facilities
Table 3. Intersection Level Of Service
Table 4. 2013 Background Traffic Conditions
Table 5. 2030 Background Traffic Conditions
Table 6. 2030 Traffic Conditions – With Clement Improvements
Table 7. Employee Breakdown
Table 8. Trip Generation - 2018
Table 9. Trip Generation - 2035
Table 10. Trip Distribution
Table 11. 2013 Combined Traffic Conditions
Table 12. 2030 Combined Traffic Conditions
Table 13. 2030 Combined Traffic Conditions – With Clement Improvements

1 EXECUTIVE SUMMARY

To be provided in IFU report.

2 INTRODUCTION

The City of Kelowna is planning to construct a new RCMP detachment on the north side of Clement Avenue between St. Paul Street and Richter Street just north of downtown Kelowna. This detachment will replace the existing Doyle Avenue facility. The figure below illustrates the location of the site.

Figure 1. Site Location

The transportation assessment for the site covers two phases:

1. Phase 1: An on-site transportation review covering expected traffic levels, the potential role of Transportation Demand Management and establishing an appropriate parking supply.
2. Phase 2: A detailed analysis of the impact of site traffic on the surrounding road network.

This report covers *Phase 2*, and includes:

- A review of background traffic conditions.
- A review of combined traffic conditions to determine the need for improvements to mitigate the impact of site traffic on the adjacent road network.
- An assessment of the site access points.
- An assessment of transit, pedestrian and bicycle access to the site

3 BACKGROUND TRAFFIC CONDITIONS

3.1 Road Network

The figure below presents the road network in the vicinity of the site. The key roads are summarized as follows:

- **Clement Avenue**: This arterial road runs east-west from Water Street in the west to Glenmore Drive/Spall Road in the east. It is currently one lane in each direction in the vicinity of the site, and two lanes per direction east of Graham Street.
- **Doyle Avenue**: This major collector connects Water Street in the west to Richter Street in the east.
- **Stockwell Avenue**: This major collector connects Lombardy Square, east of Gordon Drive, in the east to Richter Street.
- **Ellis Street**: Ellis Street is a two lane arterial connecting Highway 97 in the south to Broadway Avenue in the north.
- **St. Paul Street**: This local road runs parallel to Ellis Street between Gaston Avenue north of the site and Bernard Avenue in the south.
- **Richter Street**: Richer Street is classified as an arterial road south of Clement Avenue and a collector street to the north. It runs from Broadway Avenue in the north to Lakeshore Road in the south. The City is proposing the main site access point on this street.
- **Ethel Street**: Ethel Street is classified as a collector road south of Clement Avenue and a local street to the north.
- **Graham Street**: This is a local north-south road between Ethel Street and Gordon Drive.
- **Gordon Drive**: south of Clement Avenue this is an arterial road running south to Crest Drive, while to the north of Clement Avenue it is a minor arterial road running to Trench Place.
- **Cerise Drive**: Cerise Drive is a minor collector running north from Clement Avenue to Mountain Avenue.
- **Clifton Road**: Clifton Road is a two lane arterial road that the city intends to upgrade to four lanes in the future. It runs north from Clement Avenue.
- **Spall Road/Glenmore Road**: This four lane arterial runs from Winfield in the north to Springfield Road in the south. It is known as Spall Road south of Bernard Avenue and Glenmore Road to the north.

3.2 Intersection Configurations

EBA analyzed 11 intersections as part of this study including five signalized and five unsignalized intersections and one pedestrian signal. The next table and figure summarise and illustrate the lane configuration and traffic control for each of these intersections.

Table 1. Existing Intersection Configuration

Direction		Eastbound			Westbound			Northbound			Southbound			Comments
East-west	North-south	L	T	R	L	T	R	L	T	R	L	T	R	Control
Clement Avenue	Ellis Street	1	1	1	1	1	1	>	1	1	1	1	<	Signal
Clement Avenue	St Paul Street	>	1	<	>	1	<	>	1	<	>	1	<	N-S Stop
Clement Avenue	Richter Street	1	1	<	1	1	<	>	1	1	>	1	<	Signal
Clement Avenue	Ethel Street	1	1	<	1	1	<	>	1	<	>	1	<	N-S Stop
Clement Avenue	Graham Street	1	1	<	1	2	<	>	1	<	>	1	<	N-S Stop
Clement Avenue	Gordon Drive	1	2	<	1	2	<	1	1	1	1	1	<	Signal
Clement Avenue	Cerise Drive	1	2	x	x	2	<	x	x	x	x	x	<	Ped Signal; SB Stop
Clement Avenue	Clifton Road	1	2	x	x	2	1	x	x	x	2	x	1	Signal
Clement Avenue	Spall Road	2	x	1	x	x	x	1	2	x	x	2	1	Signal
Doyle Avenue	Richter Street	1	x	1	x	x	x	>	1	x	x	1	<	EB Stop
Stockwell Avenue	Richter Street	x	x	x	1	x	<	x	1	<	>	1	x	WB Stop

*Note: '>' or '<' = shared with adjacent lane; 'X' = no such movement

3.3 Pedestrian Facilities

Pedestrian facilities exist along many of the street surrounding the site. The following table summarizes these facilities in the vicinity of the site. Pedestrian crosswalks are provided at the intersections of Clement Avenue/Ellis Street to the west of the site and Clement Avenue/Richter Street to the east of the site.

Table 2. Pedestrian Facilities

Street	Location	Sidewalks
Clement Avenue	East of St. Paul	South Side
Clement Avenue	West of St. Paul	Both Sides
Ellis Street		Both Sides
St. Paul Street	North of Clement Avenue	West Side
St. Paul Street	South of Clement Avenue	Both Sides
Richter Street	North of Clement Avenue	None
Richter Street	South of Clement Avenue	Both Sides
Ethel Street	North of Clement Avenue	None
Ethel Street	South of Clement Avenue	Both Sides

3.4 Bicycle Facilities

There are bicycle facilities provided on Richter Street and on Cawston Avenue. The next figure shows the existing bicycle facilities in the vicinity of the study area.

LEGEND

- Signalized Intersection
- Stop Control

NOTES

STATUS
ISSUED FOR REVIEW

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City of Kelowna

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RCMP Detachment - Phase II

Build Out Site Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V31203051-01	YT	MM	MM	0

OFFICE: EBA-VANC
DATE: February 6, 2013

Figure 2

Figure 3. Transit and Bicycle Facilities

3.5 Transit Services

The figure above also shows the transit routes in the vicinity of the RCMP development. The routes serving the site are:

(a) **Route 2 – Downtown Connector**: This route runs between the Queensway Exchange in downtown Kelowna and Cambridge Avenue in the north end. It operates approximately every 30 minutes Monday to Saturday during the day, and hourly evenings and Sundays.

(b) **Route #6 – Glenmore/UBCO Express**: This express route connects the Queensway Exchange to the UBC Okanagan Exchange. Service is provided during peak hours only: northbound in the a.m. peak hours and southbound in the p.m. peak hours plus one trip in the a.m. peak hour.

(c) **Route #7 – Glenmore**: This route connects the Queensway Exchange to the Orchard Park Exchange via Union and Glenmore. Service is provided every 15 minutes during peak hours, 60 minutes evenings and Sundays and every 30 minutes at other times.

Since the proposed location is further away from the Queensway Exchange than today, any staff members using transit will likely use a bus to connect between the Queensway Exchange and the new site.

3.6 Background Volumes

The City provided its most recent traffic count data for all but one of the study intersections, and these volumes were used as the basis for this study. No traffic count data was available for the intersection of Clement Avenue/Cerise Drive, so turning movement traffic at this location was estimated based on projected volumes in the City's EMME model, as well as the traffic count data at adjacent intersections.

The City's recent traffic counts are the basis for the existing traffic volumes on the surrounding road network. Next, Kelowna's EMME Transportation Model was reviewed to establish growth rates which are in turn used to project future traffic volumes.

The resulting annual growth rate as determined through this methodology was 1.4% per year. This rate was used to factor up the most recent count data for the various intersections to the 2013 and to the 2030 values. The 2013 and 2030 volumes are shown in Figures 4 and 5 respectively.

3.7 Future Network Changes

The City has plans to widen Clement Avenue to a four lane road with centre median. As part of this widening, the north leg of St. Paul Street is to be restricted to right-in/right-out, while the south leg is to be right-in/right-out/left in. The Richter Street intersection will be upgraded to provide left turn lanes on both the north and south legs. The Ethel Street intersection will be signalized. At Graham Street, the existing movements from the north and south leg will be restricted to right turns. Bicycle lanes are to be provided along Clement Avenue on both sides.

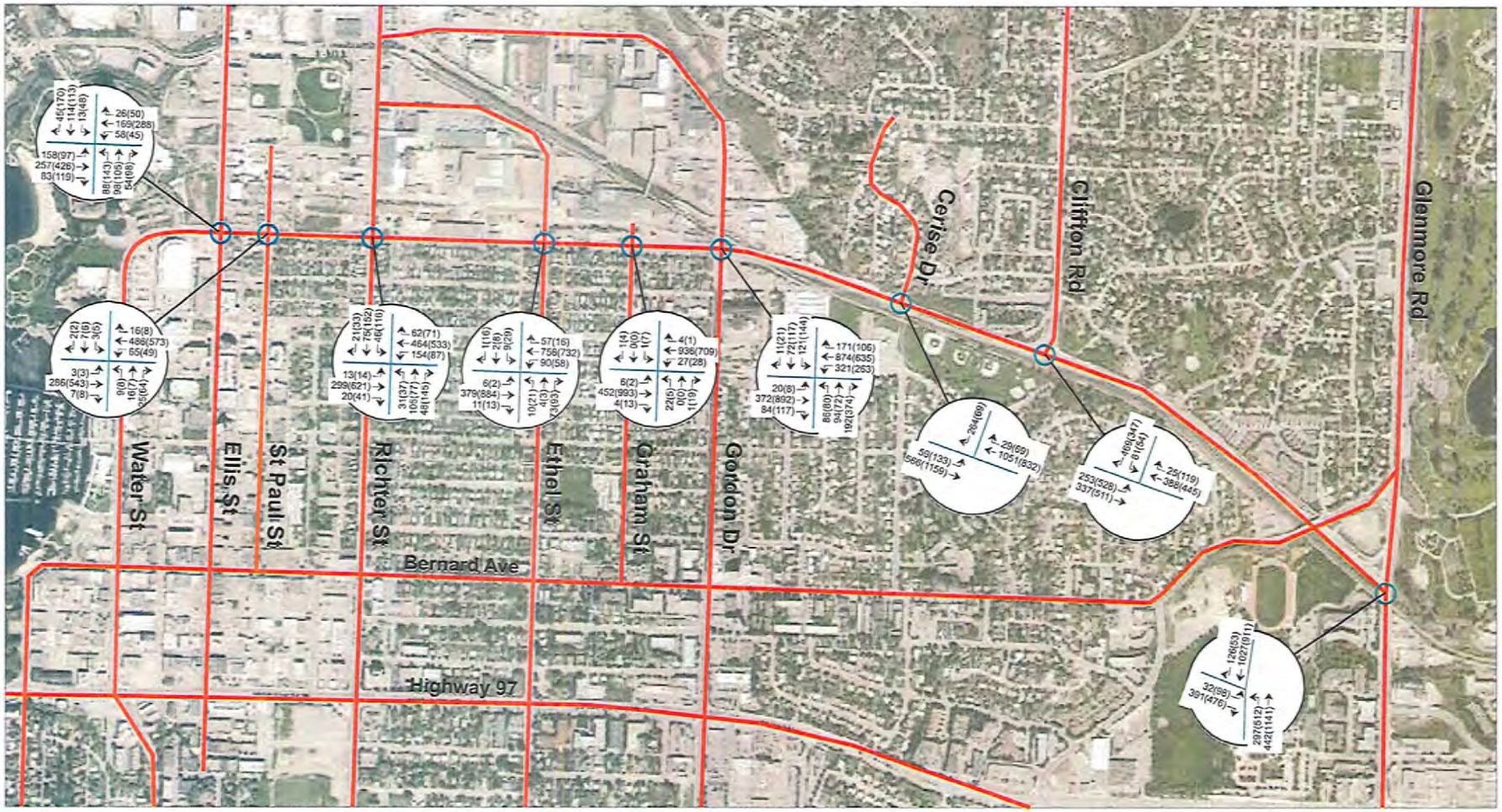
Clement Avenue is to be extended eastwards to Highway 33 as the Central Okanagan Multi-Use Corridor (COMC). EMME results show only a small change in traffic volumes at the study area intersections as a result of this change. In the a.m. peak hour, the increase in traffic volumes along Clement Avenue is less than 100 vehicles per hour west of Gordon Drive and between 100 and 200 vehicles per hour between Gordon Drive and Spall Road. The volumes between Gordon Drive and Spall Road are higher in the p.m. peak hour at approximately 100 vehicles per hour westbound and 275 vehicles per hour eastbound.

3.8 Intersection Analysis

The calculation for Level of Service (LoS) at the key intersections follows the Highway Capacity Manual (HCM) method. For signalised intersections, the operational analysis methodology gives three indicators for the overall performance of an intersection and for the individual turning movements:

3. **First:** *volume to capacity ratio (v/c)* where the volume is the number of vehicles making a certain movement, and capacity is the maximum number of vehicles accommodated in one hour. This takes into account (for the movement): lanes available, protected or permitted operation, conflicting traffic, cycle length, and amount of green time. *The higher the v/c ratio, the more congested the intersection becomes.* When the v/c ratio is greater than *1.00*, more vehicles are trying to make a given movement than there is capacity for.
4. **Second:** *average delay per vehicle*, based on the cycle length, the green time for each movement and the v/c ratios.
5. **Third:** level of service, as a function of average delay. The larger the average delay - and the higher the v/c ratio - the worse is the level of service. The next table shows the relationship between level of service, delay and v/c ratio.

As prescribed in the City's Terms of Reference, one of the objectives is to identify improvements for any movements exceeding v/c ratios of 0.90 for the 2017 horizon year and 1.00 for the 2030 horizon year, or a Level of Service F in both cases.



LEGEND

XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOTES

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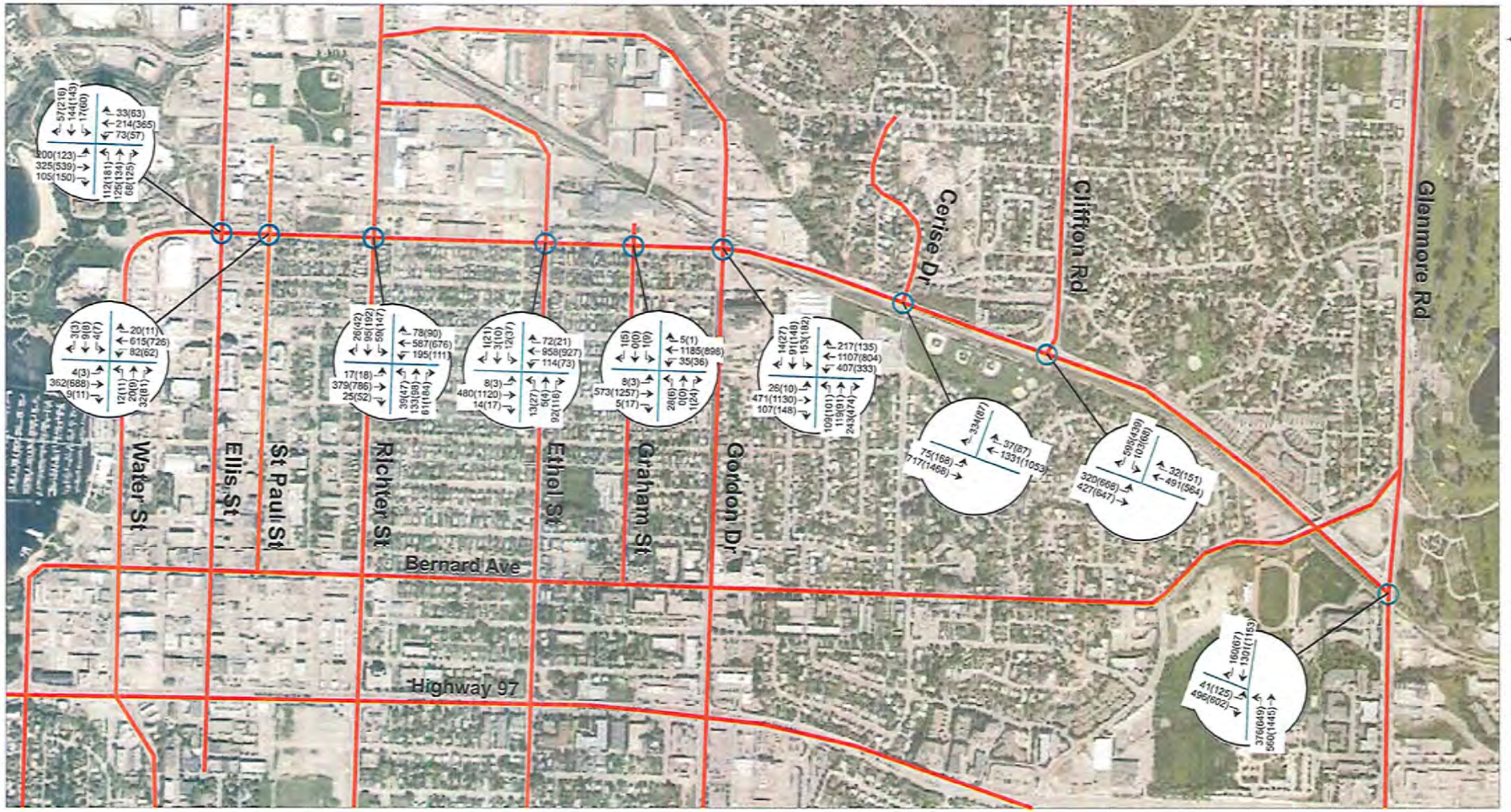
RCMP Detachment - Phase II

2013 Background Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V31203051-01	YT	MM	MM	0
OFFICE: EBA-VANC	DATE: March 2013			

Figure 4



LEGEND

XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOTES

STATUS
ISSUED FOR REVIEW

CLIENT
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RCMP Detachment - Phase II

2030 Background Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V312030051-01	YT	MM	MM	0
OFFICE: EBA-VANC	DATE: March 2013			

Figure 5

Table 3. Intersection Level Of Service

Level of Service (LoS)	Signalised Intersection Stopped Delay/Vehicle (s/veh)	Delay criteria	Unsignalised Intersection Average. Total Delay (sec)
A	≤ 10	Little or no delays	≤ 10
B	> 10 and ≤ 20	Short traffic delays	> 10 and ≤ 15
C	> 20 and ≤ 35	Average traffic delays	>15 and ≤ 25
D	> 35 and ≤ 55	Long traffic delays	>25 and ≤ 35
E	> 55 and ≤ 80	Very long traffic delays	> 35 and ≤ 50
F	> 80	Failure	> 50

The HCM also prescribes the methodology for measuring performance of unsignalized intersections. The methodology estimates the capacity of each movement from the conflicting pedestrian and traffic volumes. The capacity less the actual volume is the *reserve capacity*. This represents the additional traffic volume each movement can accommodate, which determines the operational LoS for the movement.

While the level of service and delay for an unsignalized intersection provide a measure of overall performance, it is commonly specific turning movements which are of most interest. With only low turning volumes to or from the minor road, and high through volumes on the main road, delays to turning vehicles can become excessive. As delays increase, turning vehicles will attempt to turn across unacceptable gaps provoking conflicts.

We used the *Highway Capacity Manual* Operational Method, as implemented in Synchro 8, using the City's Synchro parameters, to analyse the key intersections under 2013, 2017, and 2030 background traffic conditions. The following table summarises the results. We can remark the following:

Table 4. 2013 Background Traffic Conditions

Intersection	a.m. peak hour		p.m. peak hour		Comments
	v/c	LoS	v/c	LoS	
Clement Avenue/Ellis Street	0.45	B	0.70	B	
Clement Avenue/St Paul Street	0.14	A	0.18	A	
Clement Avenue/Richter Street	0.53	B	0.82	B	
Clement Avenue/Ethel Street	0.52	A/F	1.02	B/F	
Clement Avenue/Graham Street	0.39	A	0.60	A/F	
Clement Avenue/Gordon Street	0.75	C	0.82	C	
Clement Avenue/Cerise Street	0.59	A	0.36	A	
Clement Avenue/Clifton Street	0.76	B	0.70	B	
Clement Avenue/Spall Street	0.79	B	0.93	C	
Doyle Avenue/Richter Street	0.20	A	0.49	A	
Stockwell Avenue/Richter Street	0.13	A	0.18	A	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

Second letter indicates one or more movements individually operates at LoS F

Table 5. 2030 Background Traffic Conditions

Intersection	a.m. peak		p.m. peak		Comments
	v/c	LoS	v/c	LoS	
Clement Avenue/Ellis Street	0.57	B	0.87	C	
Clement Avenue/St Paul Street	0.21	A	0.28	A	
Clement Avenue/Richter Street	0.67	B	0.96	C	
Clement Avenue/Ethel Street	0.55	A/F	4.44	F	
Clement Avenue/Graham Street	0.49	A	0.58	A/F	
Clement Avenue/Gordon Drive	1.05	C	1.15	E/F	
	0.82	C	0.90	C	a.m.: signal timing changes p.m.: EB LT advance only
			0.93	D	Add eastbound right turn lane
Clement Avenue/Cerise Drive	0.65	A	0.45	A	
Clement Avenue/Clifton Road	0.88	B	0.92	B	
Clement Avenue/Spall Road	1.08	D	1.17	D/F	
	0.88	C	0.89	C	a.m.: timing changes p.m.: second northbound left turn lane
Doyle Avenue/Richter Street	0.28	A	0.70	B	
Stockwell Avenue/Richter Street	0.17	A	0.22	A	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

Second letter indicates one or more movements individually operates at LoS F

Opening Horizon Year

In the 2013 horizon year, almost all movements at the analyzed intersections are anticipated to operate with acceptable Levels of Service and v/c ratios. Exceptions are noted below.

- Clement Avenue/Ethel Street: In the a.m. peak hour the southbound movements are anticipated to operate at Level of Service F. In the p.m. peak hour the southbound movements operate at a v/c of greater than 1.00 and at Level of Service F, while in the northbound direction, movements operate at Level of Service F. Adding an additional southbound lane would reduce the v/c ratio, but would not improve the Level of Service due to the high volume of traffic on Clement Avenue. In addition, the southbound volumes are very small.
- Clement Avenue/Graham Street: The southbound movements at this intersection operate at Level of Service F in the p.m. peak hour. Given the low volume of such traffic, no improvements are recommended.

2030 Horizon Year

In the 2023 horizon year, almost all movements at the analyzed intersections are anticipated to operate with acceptable Levels of Service and v/c ratios. Exceptions are noted below.

- Clement Avenue/Richter Street: This intersection is anticipated to operate at a maximum v/c ratio of 0.96 in the p.m. peak hour, just below the 1.00 threshold.
- Clement Avenue/Ethel Street: In the p.m. peak hour the northbound and southbound movements operate at a v/c of greater than 1.00 and at Level of Service F, while in the a.m. peak hour, the northbound southbound

movements operate at Level of Service F, but with a v/c ratio of less than 1.00. Adding an additional southbound lane would reduce the v/c ratio, but would not improve the Level of Service due to the high volume of traffic on Clement Avenue.

- Clement Avenue/Graham Street: The northbound and southbound movements at this intersection operate at Level of Service F in the p.m. peak hour. Given the low volume of such traffic, no improvements are recommended.
- Clement Avenue/Gordon Drive: In the p.m. peak hour this intersection is anticipated to operate at a v/c ratio of 1.15. Retiming the signal and removing the westbound, northbound and southbound left turn phases would reduce the v/c ratio and Level of Service to acceptable levels. As an alternative, an eastbound right turn lane could be added. In the a.m. peak hour, timing adjustments would be sufficient to reduce the v/c ratios.
- Clement Avenue/Spall Road: This intersection is anticipated to operate over capacity in both peak hours. In the a.m. peak hours, signal timing changes will be sufficient to reduce the v/c ratio to less than 1.00, while in the p.m. peak hour a second northbound left turn lane will be needed.

In summary, at the 2030 horizon year, implementing signal phasing changes at Clement Avenue/Gordon Drive and a second northbound left turn lane at Clement Avenue/Spall Road will improve intersection operations so as to meet the City's threshold values.

3.9 Effect of Widening Clement Avenue

The intersection analysis results shown above did not take into account the widening of Clement Avenue to four lanes. If this occurs, then there will be considerable improvement in the v/c ratios at a number of intersections. The following table presents the 2030 results with the widening of Clement Avenue in place (including signal timing revisions) and key results are noted as follows:

Table 6. 2030 Traffic Conditions – With Clement Improvements

Intersection	v/c	LoS	v/c	LoS	Comments
Clement Avenue/St Paul Street	0.26	A	0.30	A	
Clement Avenue/Richter Street	0.35	A	0.63	B	
Clement Avenue/Ethel Street	0.56	A	0.57	A	Signal
Clement Avenue/Graham Street	0.49	A	0.50	A	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

- Clement Avenue/Richter Street: The operation of this intersection would improve operations, reducing the v/c ratio to 0.35 in the a.m. peak hour and 0.63 in the p.m. peak hour.
- Clement Avenue/Ethel Street: With this intersection signalized, the v/c ratios will be reduced to 0.56 in the a.m. peak hour and 0.57 in the p.m. peak hour with all movements operating at Level of Service C or better, including those that are now currently stop controlled.
- Clement Avenue/Graham Street: At this intersection, the high delay left turn and through movements have been eliminated, thus the intersection is anticipated to operate well.

In summary, the proposed widening of Clement Avenue, and related changes, will improve intersection operations between Ellis Street and Gordon Drive such that no further improvements will be needed.

4 SITE TRAFFIC

The trip generation and distribution for site traffic was determined and documented in the Phase I report. For ease of reference, this is presented again in this section.

4.1 Overview of Development Plan

The development of the new RCMP detachment, just north of downtown Kelowna, has the following characteristics:

- Area: an 86,000 ft^2 (7,990 m^2) site
- Other use: the possibility of adding a fire station or other municipal services to the site.
- Access: right-in / right-out turn on Clement Avenue, and all movements on Richter Street.

The Queensway transit exchange is located only a short distance away from the existing facility. The new RCMP building will be located approximately 900 metres, or an 11 minute walk, away from the exchange.

The facility will replace the existing facility located in downtown. Parking for current RCMP officers occurs both on the current Doyle Street site, as well as in adjacent municipal parking lots.

4.2 Trip Generation

Analysis of the traffic impacts from a new development is typically based on application of standard trip generation rates such as those published by the Institute of Transportation Engineers (ITE). This development is not a standard development that falls under an ITE category. The closest category that could apply is an *office building*.

As an office building, based on the ITE rates, the RCMP building would generate between 160 and 170 vehicles trips during the weekday peak hours, with trips being predominantly inbound in the morning and outbound in the afternoon. The peak time for trips in this category occurs between 7 and 9 a.m. and between 4 to 6 p.m.

The peak hours for the site are expected to be around 7 a.m., when most shifts start, and 3 p.m., when most shifts end. Thus the peak trip generation may not coincide with the street peak hours. This report presents the estimate for trip generation for the *site's* peak hours.

Staff at the RCMP detachment fall into three categories: Officers actively working in the field, Officers working primarily in the office, and Civilian/government employees.

Preliminary data provided by the City indicates that 228 staff will be based at this detachment during the peak shift in 2018, increasing to 279 in 2035.

Table 7. Employee Breakdown

Type	Shift Time	Staff (2018)	Staff (2035)
On Duty Officers (field)	6 a.m. to 6 p.m.	11	11
	7 a.m. to 7 p.m.	11	11
	6 p.m. to 5 a.m.	11	11
	7 p.m. to 6 a.m.	11	11
Other Officers	7 a.m. to 3 p.m.	102	130

Peak Shift Officers	7 a.m. to 3 p.m.	124	152
Office Staff	7 a.m. to 3 p.m.	104	127
Total	**7 a.m. to 3 p.m.**	**228**	**279**

Note: There may be some additional staff present outside the 7 to 3 peak hours.

There will be two 'watches' split into four general duty shifts: 6 a.m. to 6 p.m., 7 a.m. to 7 p.m., 6 p.m. to 5 a.m. and 7 p.m. to 6 a.m. On each of these shifts there are 11 officers. The shift that starts at 7 a.m. will generate two trips per officer, one as they arrive in their vehicle and the other as they leave in the police car. The remaining watches will generate only a small number of trips.

The majority of the staff works from 7 a.m. to 3 p.m. For trip generation purposes, for the remaining officers and staff, we applied a rate of 0.80 trips per person (a.m. peak) and 0.75 trips per person (p.m. peak). This accounts for some employees not driving, some arriving earlier or later than the peak hour, and some off sick or on holidays. The total number of officers on duty during the peak shift in 2018 will be approximately 124, increasing to 152 in 2030, including the remaining general duty officers. Other staff will amount to approximately 104 in 2018, increasing to 127 in 2035.

This study applies a combination of ITE rates and rates estimated from "first principals." These take into account the types and number of employees and their expected arrival and departure times. The next two tables summarize the trip generation for 2018 and 2035.

Table 8. Trip Generation - 2018

Staff	No of employees	a.m. peak hour					p.m. peak hour				
		Rate	%in	Total	In	Out	Rate	%in	Total	In	Out
General Duty Shifts											
- 700-1900	11	2.00	50	22	11	11	0.20	50	2	1	1
- 600-1800	11	0.20	50	2	1	1	0.20	50	2	1	1
- 1900-600	11	0.20	50	2	1	1	0.20	50	2	1	1
- 1800-500	11	0.20	50	2	1	1	0.20	50	2	1	1
Other Officers	102	0.80	89	82	73	9	0.75	15	77	11	65
Other Staff	104	0.80	89	83	74	9	0.75	15	78	12	66
Total	**356**			**193**	**161**	**32**			**163**	**28**	**136**

Note: Peak hours are approximately 6:30 to 7:30 a.m. and 2:30 to 3:30 p.m.

Table 9. Trip Generation - 2035

Direction	No of employees	a.m. peak hour					p.m. peak hour				
		Rate	%in	Total	In	Out	Rate	%in	Total	In	Out
General Duty Shifts											
- 700-1900	11	2.00	50	22	11	11	0.20	50	2	1	1
- 600-1800	11	0.20	50	2	1	1	0.20	50	2	1	1
- 1900-600	11	0.20	50	2	1	1	0.20	50	2	1	1
- 1800-500	11	0.20	50	2	1	1	0.20	50	2	1	1
Other Officers	130	0.80	89	104	93	11	0.75	15	98	15	83
Other Staff	127	0.80	89	102	90	116	0.75	15	95	14	81
Total	**288**			**234**	**197**	**37**			**202**	**33**	**168**

Note: Peak hours are approximately 6:30 to 7:30 a.m. and 2:30 to 3:30 p.m.

Overall, at build-out (2035) the development should generate 234 vehicle trips in the morning peak hour and 202 trips in the afternoon peak. Opening day trip generation (2018) should be 193 and 163 trips in the morning and afternoon peak hours respectively.

4.3 Trip Distribution

The trip distribution for the zone with the RCMP facility in the regional EMME model provided the potential origin-destination structure of site traffic. This model contains assignments for both the a.m. and p.m. peak hours. The following table presents a summary of the results.

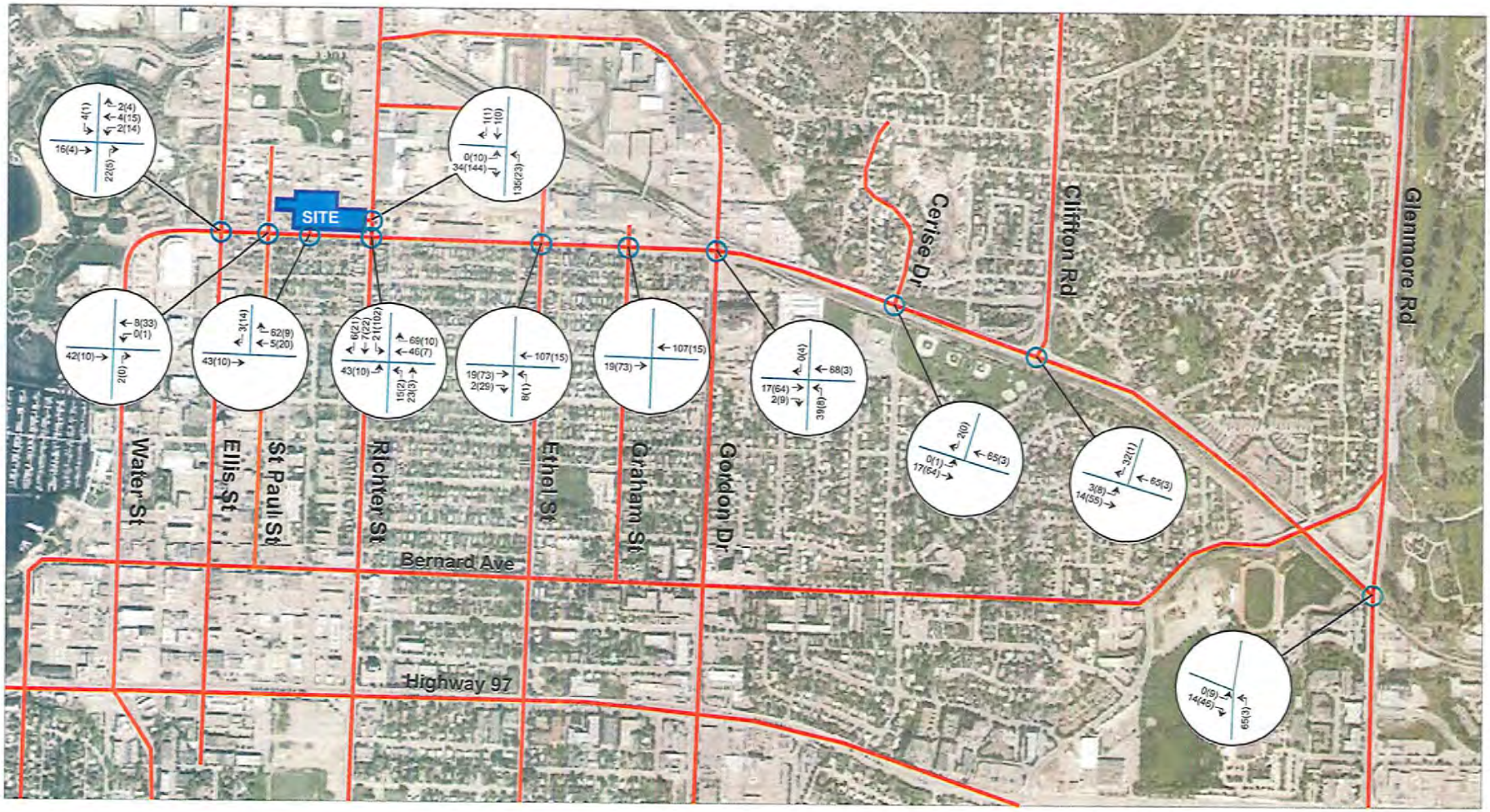
Table 10. Trip Distribution

Direction	a.m. peak hour		p.m. peak hour	
	Inbound	Outbound	Inbound	Outbound
Clement West	8%	11%	12%	9%
Clement East	58%	57%	49%	61%
Ellis North	2%	6%	3%	2%
Ellis South	11%	6%	15%	8%
Richter North	1%	0%	3%	6%
Richter South	19%	20%	17%	13%
St. Paul South	1%	0%	1%	1%
Total	100%	100%	100%	100%

The orientation of the majority of site traffic should be to and from the east. The next highest approach will be to and from the south (20-30%).

4.4 Trip Assignment

The above trip generation and distribution was applied to the site traffic and assigned to the road network, taking into account the proposed location access (see the next figure).



LEGEND

XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOTES

STATUS
ISSUED FOR REVIEW

CLIENT
City of Kelowna

eba
A TETRA TECH COMPANY

RCMP Detachment - Phase II

Build Out Site Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V31203051-01	YT	MM	MM	0
OFFICE: EBA-VANC	DATE: March 2013			

Figure 6

The analysis does not make any specific reduction for the closing of the existing RCMP facility on Doyle Avenue. These results are, therefore, somewhat conservative as they include trips to and from that facility. When the RCMP moves out of the Doyle Avenue facility, either a new tenant may move in, or the site could be re-developed. In either case, there will be new trips replacing the RCMP trips.

5 SITE IMPACT ANALYSIS

5.1 Combined Traffic Volumes

The combined traffic volumes for the 2013 and 2030 horizon years come from superimposing the site traffic volume onto the background traffic volumes. The figures on the next pages illustrate the resulting combined traffic volumes for the two horizon years.

5.2 Combined Intersection Analysis

At this point the key intersections in the vicinity of the site required a new analysis under combined traffic conditions for the two horizon years. The tables below present the results with the following key findings:

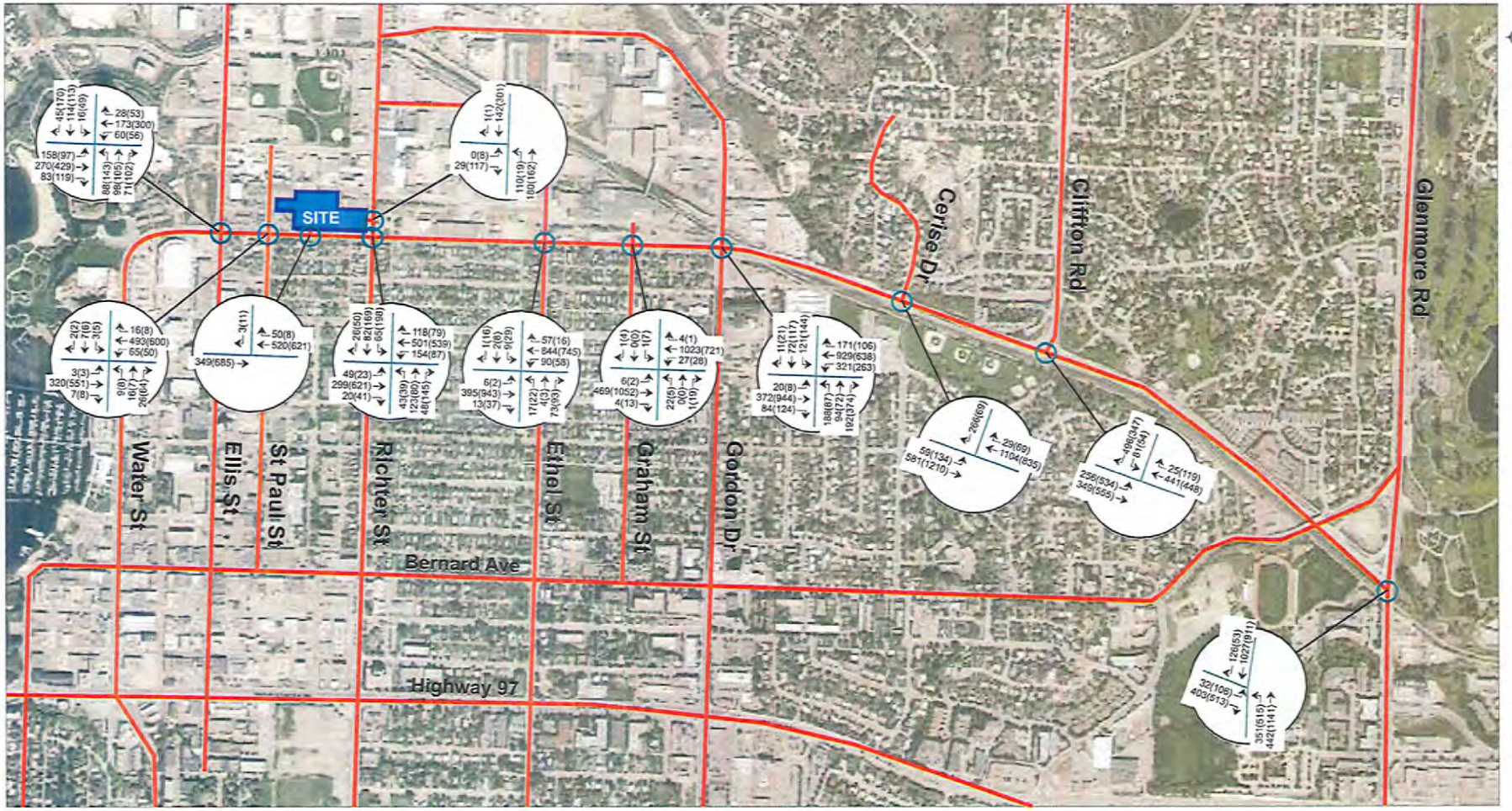
Table 11. 2013 Combined Traffic Conditions

Intersection	a.m. peak		p.m. peak		Comments
	v/c	LoS	v/c	LoS	
Clement Avenue/Ellis Street	0.47	B	0.70	B	
Clement Avenue/St Paul Street	0.14	A	0.18	A	
Clement Avenue/Richter Street	0.67	B	1.08	C/F	
			0.87	C	Timing changes
Clement Avenue/Ethel Street	0.21	A/F	1.20	C/F	
Clement Avenue/Graham Street	0.42	A	0.64	A/F	
Clement Avenue/Gordon Drive	0.77	C	0.87	C	
Clement Avenue/Cerise Drive	0.56	A	0.37	A	
Clement Avenue/Clifton Road	0.77	B	0.70	B	
Clement Avenue/Spall Road	0.86	C	0.93	C	
			0.90	C	Timing changes
Doyle Avenue/Richter Street	0.21	A	0.50	A	
Stockwell Avenue/Richter Street	0.15	A	0.18	A	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

Second letter indicates one or more movements individually operates at LoS F



LEGEND

XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOTES

STATUS
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CLIENT
City of Kelowna

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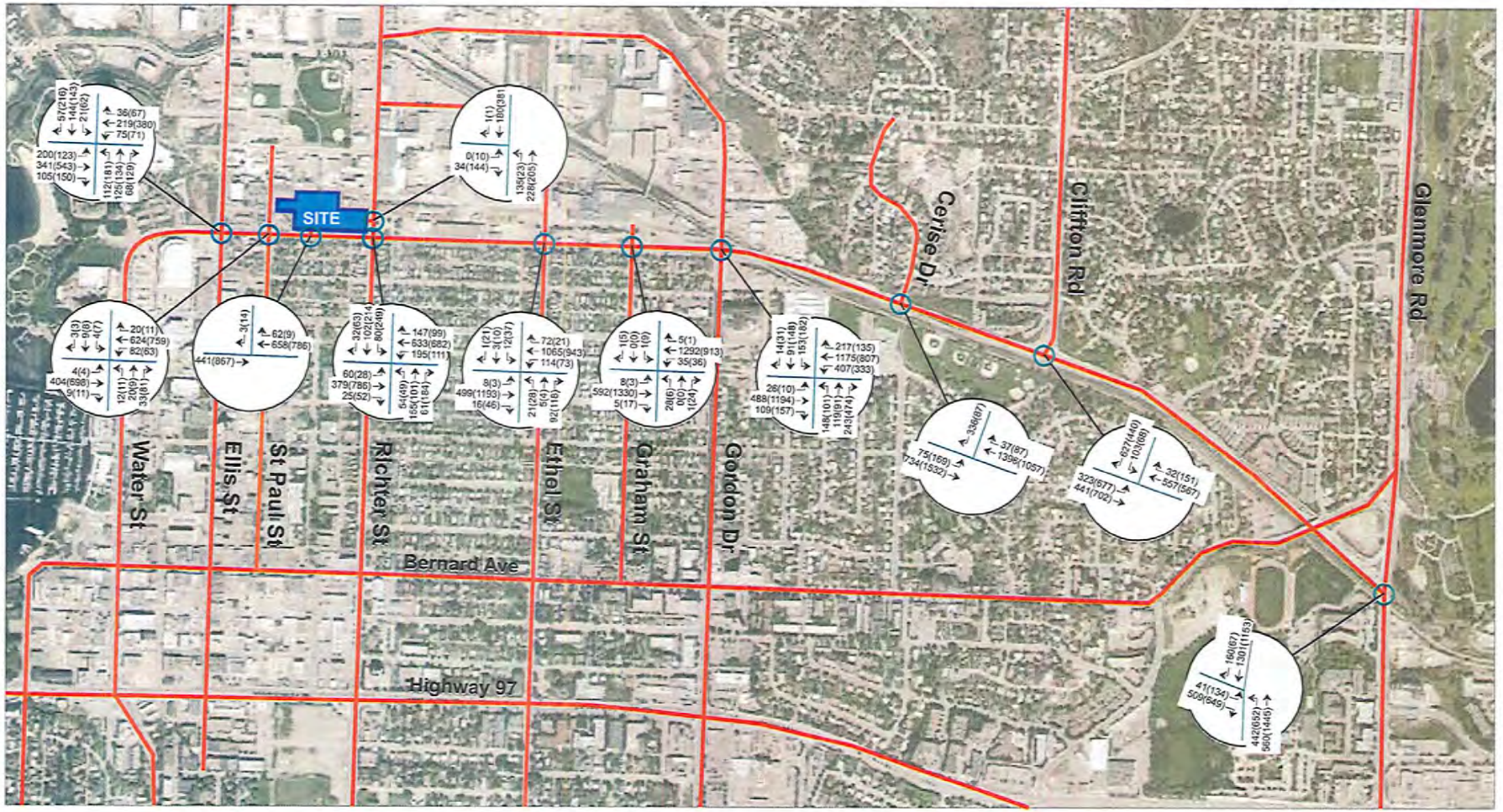
RCMP Detachment - Phase II

2013 Combined Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V31203051-01	YT	MM	MM	0

OFFICE: EBA-VANC
DATE: March 2013

Figure 7



LEGEND

XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOTES

STATUS
ISSUED FOR REVIEW

CLIENT
City of Kelowna

eba
A TETRA TECH COMPANY

RCMP Detachment - Phase II

2030 Combined Traffic Volumes

PROJECT NO.	DWN	CKD	APVD	REV
704-V31203051-01	YT	MM	MM	0
OFFICE: EBA-VANC	DATE: March 2013			

Figure 8

Table 12. 2030 Combined Traffic Conditions

Intersection	a.m. peak		p.m. peak		Comments
	v/c	LoS	v/c	LoS	
Clement Avenue/Ellis Street	0.57	B	0.88	C	
Clement Avenue/St Paul Street	0.22	A	0.29	A	
Clement Avenue /Richter Street	0.82	B	1.39	E	
			0.94	D	NBL, SBL, SB ADV
Clement Avenue /Ethel Street	0.87	A/F	6.07	F	
Clement Avenue /Graham Street	0.53	A	0.81	A/F	
Clement Avenue /Gordon Drive	1.05	D	1.22	E/F	
	0.86	C	0.91	C	a.m.: signal timing revisions; p.m.: signal timing revisions and phasing changes
			0.98	D	Add eastbound right turn lane, no phasing changes
Clement Avenue /Cerise Drive	0.58	A	0.47	A	
Clement Avenue /Clifton Road	0.91	B	0.93	B	
Clement Avenue /Spall Road	1.08	D	1.17	D/F	
	0.89	C	0.99	C	a.m.: signal timing changes p.m.: Add second northbound left turn lane
Doyle Avenue /Richter Street	0.28	A	0.74	E	
Stockwell Avenue/Richter Street	0.19	A	0.23	C	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

Second letter indicates one or more movements individually operate at LoS F.

Opening Year Analysis

- Clement Avenue/Richter Street: In the p.m. peak hour, the critical movements are anticipated to be the southbound movements. Signal timing changes can reduce the v/c ratio to less than 0.90.
- Clement Avenue/Ethel Street: As with background traffic conditions, the northbound and southbound movements will operate at Level of Service F, with the southbound movements operating over capacity. Providing additional lanes will increase capacity, but would not reduce delays to an acceptable level. The volume of through and left turns from the site street are relatively low.
- Clement Avenue/Graham Street: As with background traffic conditions, the southbound movement is anticipated to operate at Level of Service F in the p.m. peak hour. Due to the low volume of traffic making this movement, no improvements are recommended.
- Clement Avenue/Spall Road: Using the existing signal timings, the v/c ratio is anticipated to reach 0.93 in the p.m. peak hour. Minor signal timing changes could reduce this to 0.90.

In summary, implementing signal timing changes at selected intersections at the 2013 horizon year will improve operations to as to meet the City's thresholds.

2030 Combined Results

For the 2030 horizon the target v/c ratio is increased to 1.00.

- Clement Avenue/Richter Street: This intersection is anticipated to operate at a maximum v/c ratio of 1.39 in the p.m. peak hour. Adding a southbound left turn lane and reconfiguring the south leg to provide a left turn lane along with a shared through and right turn lane would reduce the v/c ratio to 0.94.
- Clement Avenue/Ethel Street: In the p.m. peak hour the northbound and southbound movements operate at a v/c of greater than 1.00 and at Level of Service F. As with background conditions, providing an additional southbound lane would reduce the v/c ratio, but would not improve the Level of Service due to the high volume of traffic on Clement Avenue.
- Clement Avenue/Graham Street: The northbound and southbound movements at this intersection operate at Level of Service F in the p.m. peak hour. Given the low volume of such traffic, no improvements are recommended.
- Clement Avenue/Gordon Drive: In the p.m. peak hour this intersection is anticipated to operate at a v/c ratio of 1.15. As with background conditions, retiming the signal and removing the westbound, northbound and southbound left turn phases would reduce the v/c ratio and Level of Service to acceptable levels. An alternative would be to provide an eastbound right turn lane. In the a.m. peak hour, timing adjustments would be sufficient to reduce the v/c ratios.
- Clement Avenue/Spall Road: This intersection is anticipated to operate over capacity in both peak hours. In the a.m. peak hours, signal timing changes will be sufficient to reduce the v/c ratio to less than 0.90, while in the p.m. peak hour a second northbound left turn lane will be needed.

In summary, at all but three intersections, no more than signal timing changes will be needed. At Clement Avenue/Richter Street adding northbound and southbound left turn lanes, along with a southbound left turn phase will be needed if Clement Avenue is not widened. At the intersection of Clement Avenue/Spall Road a second northbound left turn lane will be required, while at Clement Avenue/Gordon Drive either signal phasing changes will need to be made or an eastbound right turn lane added. With these changes, the City's thresholds will be met.

5.3 Effect of Widening Clement Avenue

The results presented above do not take into account the potential widening for Clement Avenue. Results with this widening in place will be improved. The following table presents the results, and key results are summarized below.

Table 13. 2030 Combined Traffic Conditions – With Clement Improvements

Intersection	a.m. peak		p.m. peak		Comments
	v/c	LoS	v/c	LoS	
Clement Avenue/St Paul Street	0.26	A	0.31	A	
Clement Avenue/Richter Street	0.40	A	0.73	B	
Clement Avenue/Ethel Street	0.61	A	0.73	B	Signal
Clement Avenue/Graham Street	0.53	A	0.53	A	

v/c = maximum v/c ratio;

LoS = overall Level of Service.

Second letter indicates one or more movements individually operates at LoS F

- Clement Avenue/Richter Street: With the proposed improvement in place this intersection is projected to operate at a v/c ratio of 0.65 and at Level of Service B in the p.m. peak hour. No further improvements will be needed.
- Clement Avenue/Ethel Street: With the widening of Clement Avenue through this intersection and its signalization, the v/c ratio will be improved to 0.73 in the p.m. peak hour with a Level of Service B.
- Clement Avenue/Graham Street: With Clement Avenue widened, and the left turn and through movements restricted, operations will be improved, with the intersection operating at a v/c ratio of 0.53.

In summary, with the Clement Avenue upgrades in place, the operations at the intersections between Ellis Street and Gordon Drive such that no further improvements will be needed.

6 SITE ACCESS

6.1 Site Access Review

The City if planning to upgrade Clement Avenue in the future to a four lane divided road. With this upgrade, the site access to Clement Avenue will be restricted to right-in/right-out due to the planned median on Clement Avenue. This access will operate well through to the 2030 horizon with this configuration. A magazine storage length of 15 metres will be needed along with a single entrance lane and a single exit lane.

At the main Richter Street access, a magazine storage length of 23 metres is needed due to the higher volume of traffic entering and exiting here; however, a single entrance and exit lane can serve the projected traffic.

6.2 Safety

Transportation Association of Canada (TAC) guidelines recommend the minimum distances between accesses and signalized intersections. For Clement Avenue, an arterial road, a clearance distance of 70 metres is needed between Richter Avenue and the site access. The site access point should be located east of the taper for the proposed westbound to southbound left turn lane on Clement Avenue at St. Paul Street.

To provide for good traffic flow and clearance to the Clement Avenue intersection, the Richter Avenue access should be located opposite Vaughan Avenue. This will provide the clearance needed to Clement Avenue – 55 metres based on TAC – while limiting conflicts with traffic turning in and out of Vaughan Avenue.

Once a site plan has been established, the recommendations in this section should be reviewed.

7 TRANSIT ACCESS

7.1 Transit Service Review

Transit services were reviewed as part of Phase 1 of this project. Details of the existing transit services are provided above. The following presents a summary of these results as they pertain to RCMP trips.

Since the proposed location is further away from the Queensway Exchange, any staff members using transit will likely use a bus to connect between the Queensway Exchange and the new site.

- The first #2 North End Shuttle bus of the day – the nearest route to the site – leaves the downtown Queensway Exchange at 7:31 a.m., making it inconvenient for those arriving for start times earlier than 8 a.m. For officers finishing at 5 a.m. or 6 a.m., there would be a considerable wait for this bus.
- Routes #6 and #7 stop at Richter Street/Cawston Street to the south of the site and provide a connection to the Queensway exchange in downtown Kelowna.
- On Route #6, the first trip leaves downtown at 6:25 a.m., while the first route #7 trip leaves at 6:53 a.m., probably too late for a 7 a.m. start.
- Connections to these services at the Queensway Exchange are only possible from some routes, depending on their arrival times. Four routes provide a connection with the #6 or #7 and four routes do not.

7.2 Transit Access Review

As noted in the Phase I report, accessing the site via transit can be difficult due to the fact that shift changes for RCMP officers occur before the typical a.m. peak hour. Consideration should be given to providing both earlier service to Queensway Exchange, which would benefit RCMP as well as other downtown uses, and providing earlier service on Routes #2, the North End Shuttle to serve these early arrivals and departures by providing a connection between the Queensway Exchange and the site. This is a relatively short route compared to routes #6, and #7, so providing an additional trip would not be as onerous.

8 PEDESTRIAN AND BICYCLE ACCESS

8.1 Pedestrian Facilities Review

It is important that pedestrians travelling to and from the site are provided with good facilities so that they can safely access the site. In addition, good facilities will make it not only safe, but desirable, to walk to and from the site.

In order to provide access to adjacent pedestrian facilities, sidewalks will be needed along the Clement Avenue and Richter Street frontages of the site. This would provide a connection to the existing sidewalk on the north side of Clement Avenue west of St. Paul Street, which in turn connects to the signalized intersection of Clement Avenue/Ellis Street where crosswalks are provided across all four legs. On Ellis Street, there are sidewalks on both sides as there are on Richter Street south of Clement Avenue.

For pedestrians connecting to bus services, route #2 can be accessed at the Clement Avenue/Ellis Street intersection, while Routes #6 and #7 can be access via the sidewalks on Richter Street to connect to these services at Cawston Avenue.

8.2 Bicycle Facilities Review

The site is currently served with good bicycle routes, namely Richter Street in the north-south direction adjacent to the site, and Cawston Avenue, in the east-west direction south of the site. The proposed upgrading of Clement Avenue to a four lane road will include bicycle lanes passing in front of the site. These three routes combined will provide good access to the development.

Our Phase 1 Report provided recommendations regarding on-site bicycle facilities and end of trip facilities. Ten Class I spaces at opening year and 12 Class I spaces at build out are needed for the development. End of trip facilities such as lockers and showers would also be needed to encourage bicycle usage.

9 CONCLUSIONS & RECOMMENDATIONS

Based on the various analyses, our conclusions and recommendations are as follows:

9.1 Background Conditions

- Clement Avenue/Ethel Street: With no Clement Avenue upgrades the Ethel Street traffic is anticipated to operate at Level of Service F by 2030. In the short term, due to the low volume of traffic making these movements, no changes are recommended. With the planned upgrade of Clement Avenue and the signalization of the intersection, this problem will be solved.
- Clement Avenue/Graham Street: The Graham Street movements at this intersection operate at Level of Service F in both peak hours by 2030. Given the low volume of such traffic, no improvements are recommended. With the proposed Clement Avenue upgrade, Graham Street traffic will be restricted to right out, thus reducing the delays.
- Clement Avenue/Gordon Drive: In the 2030 p.m. peak hour this intersection is anticipated to operate at a v/c ratio of 1.15. Retiming the signal and removing the westbound, northbound and southbound left turn phases would reduce the v/c ratio and Level of Service to acceptable levels as would adding an eastbound right turn lane.
- Clement Avenue/Spall Road: This intersection is anticipated to operate over capacity in both peak hours. A second northbound left turn lane would be needed by 2030 to improve the intersection's operations.
- Other Intersections: As the remaining intersections are anticipated to operate well, no improvements are required.

9.2 Site Traffic

- Based on a review of the various components of the site, at build out the site will generate 234 vehicles trips in the a.m. peak hour and 202 vehicle trips in the p.m. peak hour. Details of the trip generation were provided in the Phase I report.

9.3 Combined Traffic Conditions

- Clement Avenue/Richter Street: This intersection is anticipated to operate at a maximum v/c ratio of 1.39 in the p.m. peak hour of 2030. Adding a southbound left turn lane and reconfiguring the south leg to provide a left turn lane along with a shared through and right turn lane would reduce the v/c ratio to 0.94. The planned upgrades to Clement Avenue, which include the noted left turn lanes, would also improve intersection operation to below the threshold levels.
- Clement Avenue/Ethel Street: In the p.m. peak hour the northbound and southbound movements are projected to operate at a v/c of greater than 1.00 and at Level of Service F. The proposed upgrading of Clement Avenue and signalization of this intersection would improve this intersection's operations significantly.
- Clement Avenue/Graham Street: The northbound and southbound movements at this intersection operate at Level of Service F in the p.m. peak hour. Once the Clement Avenue improvements are in place, including the restriction of movements, these high delays will be rectified.
- Clement Avenue/Gordon Drive: In the p.m. peak hour this intersection is anticipated to operate at a v/c ratio of 1.15. As with background conditions timing the signal and removing the westbound, northbound and

southbound left turn phases would reduce the v/c ratio and Level of Service to acceptable levels. An alternative would be to provide an eastbound right turn lane.

- Clement Avenue/Spall Road: This intersection is anticipated to operate over capacity in both peak hours. In the a.m. peak hours, signal timing changes will be sufficient to improve operations while in the p.m. peak hour a second northbound left turn lane will be needed.

9.4 Site Access

- At the Clement Avenue and Richter Avenue site access points, one entrance lane and one exit lane should be provided. The Clement Avenue access will be restricted to right-in/right out.
- A magazine storage length of 15 metres should be provided at the Clement Avenue access and 23 metres at the Richter Avenue access.
- The Clement Access should be located east of the proposed westbound to southbound left turn lane and taper at St. Paul Street and at least 70 metres west of Richter Street.
- The Richter Avenue Access should be located opposite Vaughan Avenue.

9.5 Transit Access

- Consideration should be given to providing an earlier #2 North End Shuttle trip to serve early morning arrivals and departures. Additional early service on other routes to Queensway exchange would benefit RCMP employees and downtown employees.

9.6 Pedestrian and Bicycle Access

- In order to provide access to adjacent pedestrian facilities, sidewalks will be needed along the Clement Avenue and Richter Street frontages of the site. This would provide a connection to the existing sidewalk on the north side of Clement Avenue west of St. Paul Street, which in turn connects to the signalized intersection of Clement Avenue/Ellis Street where crosswalks are provided across all four legs.
- The site is currently served with good bicycle routes, namely Richter Street in the north-south direction adjacent to the site, and Cawston Avenue, in the east-west direction south of the site. The proposed upgrading of Clement Avenue to a four lane road will include bicycle lanes passing in front of the site.
- Our Phase 1 Report recommended ten Class I bicycle spaces at opening year and 12 Class I spaces at build out in addition to end of trip facilities such as lockers and showers.

10 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Sincerely,

EBA Engineering Consultants Ltd.

Prepared by:

Issued for Review

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Reviewed by:

Issued for Review

Stephen Gardner, M.Sc.
Transportation Specialist
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APPENDIX A
EBA GENERAL CONDITIONS

GENERAL CONDITIONS

TRAFFIC/TRANSPORTATION REPORT

This Traffic/Transportation Report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This Traffic/Transportation Report pertains to a specific site, a specific development, and a specific scope of work. The Traffic/Transportation Report may include plans, drawings, profiles and other support documents that collectively constitute the Traffic/Transportation Report. The Report and all supporting documents are intended for the sole use of EBA's Client. EBA does not accept any responsibility for the accuracy of any of the data, analyses or other contents of the Traffic/Transportation Report when it is used or relied upon by any party other than EBA's Client, unless authorized in writing by EBA. Any unauthorized use of the Traffic/Transportation Report is at the sole risk of the user.

All reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

2.0 ALTERNATIVE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. EBA's instruments of professional service will be used only and exactly as submitted by EBA.

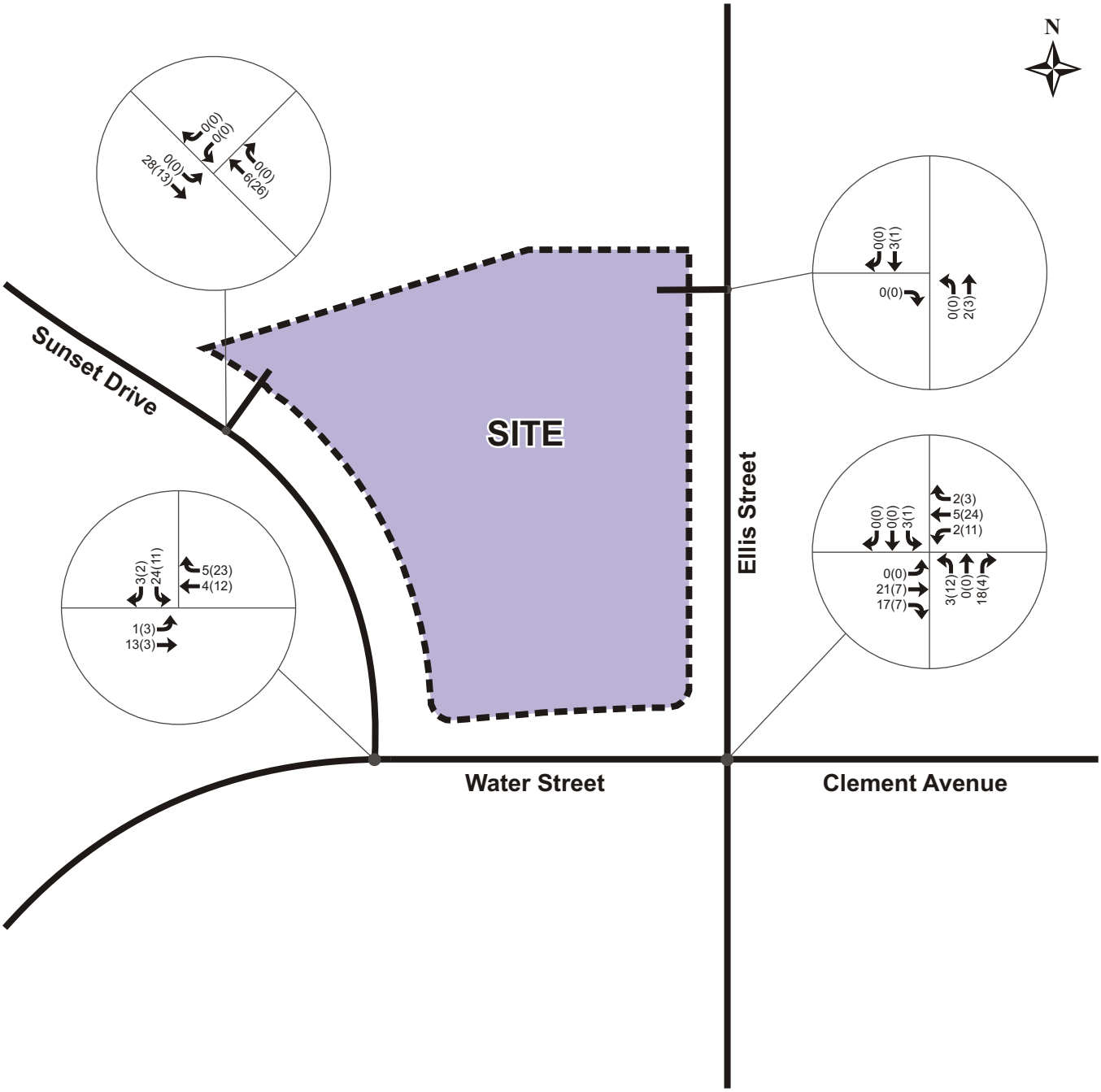
Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX H

Background Development Site Trips

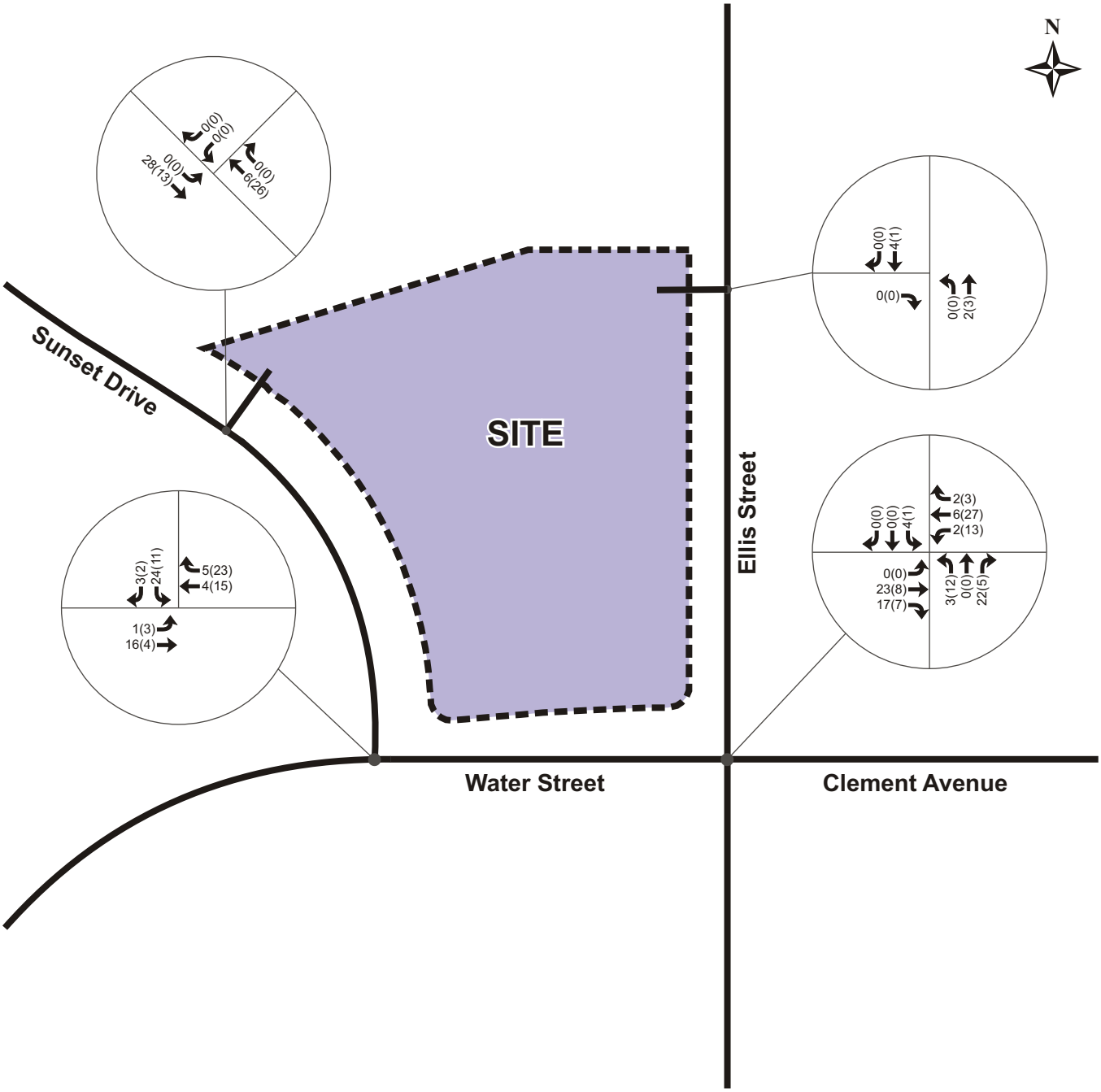


LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Appendix H.1

Background 2020 Development Trips



LEGEND

↰ ↑ ↱	Vehicle Volumes
XX	AM Peak Hour
(ZZ)	PM Peak Hour

Appendix H.2

Background 2030 Development Trips

REPORT TO COUNCIL

Date:	June 12, 2017		
RIM No.	1250-30		
To:	City Manager		
From:	Community Planning Department (LB)		
Application:	OCP16-0017 / Z16-0058	**Owner:**	Vincent & Pamela Blaskovich
Address:	4975 Buckhaven Court	**Applicant:**	Dave Lange, Mair Developments Ltd.
Subject:	Official Community Plan Amendment and Rezoning		

Existing OCP Designation:	MRC – Multiple Unit Residential (Cluster Housing) PARK – Major Park and Open Space S2RESH – Single / Two Unit Residential - Hillside
Proposed OCP Designation:	PARK – Major Park and Open Space S2RESH – Single / Two Unit Residential - Hillside
Existing Zone:	A1 – Agriculture 1
Proposed Zone:	P3 – Parks and Open Space RU1h – Large Lot Housing (Hillside Area) RH1 – Hillside Large Lot Residential

1.0 Recommendation

THAT Official Community Plan Map Amendment Application No. OCP16-0017 to amend Map 4.1 in the Kelowna 2030 – Official Community Plan Bylaw No. 10500 by changing the Future Land Use designation of portions of Lot A Sections 20 and 29 Township 29 SDYD Plan KAP44335 Except Plans KAP92565, EPP23066, EPP31364 and EPP51781, located at 4975 Buckhaven Court, Kelowna, BC, from the:

- MRC – Multiple Unit Residential (Cluster Housing) designation to the PARK – Major Park and Open Space designation;
- from the MRC – Multiple Unit Residential (Cluster Housing) designation to the S2RESH – Single / Two Unit Residential – Hillside designation;
- from the PARK – Major Park and Open Space designation to the S2RESH – Single / Two Unit Residential – Hillside designation; and
- from the S2RESH – Single / Two Unit Residential – Hillside designation to the PARK – Major Park and Open Space designation

as shown on Map "A" attached to the Report from the Community Planning Department dated June 12, 2017, be considered by Council;

AND THAT the Official Community Plan Map Amending Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT Council considers the Public Hearing public process to be appropriate consultation for the purpose of Section 475 of the *Local Government Act*, as outlined in the Report from the Community Planning Department dated June 12, 2017;

AND THAT Rezoning Application No. Z16-0058 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of portions of Lot A Sections 20 and 29 Township 29 SDYD Plan KAP44335 Except Plans KAP92565, EPP23066, EPP31364 and EPP51781, located at 4975 Buckhaven Court, Kelowna, BC, from the:

- A1 – Agriculture 1 zone to the P3 – Parks and Open Space zone;
- from the A1 – Agriculture 1 zone to the RU1h – Large Lot Housing (Hillside Area) zone;
- from the A1 – Agriculture 1 zone to the RH1 – Hillside Large Lot Residential zone; and
- from the P3 – Parks and Open Space zone to the RU1h – Large Lot Housing (Hillside Area) zone

as shown on Map "B" attached to the Report from the Community Planning Department dated June 12, 2017, be considered by Council;

AND FURTHER THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration.

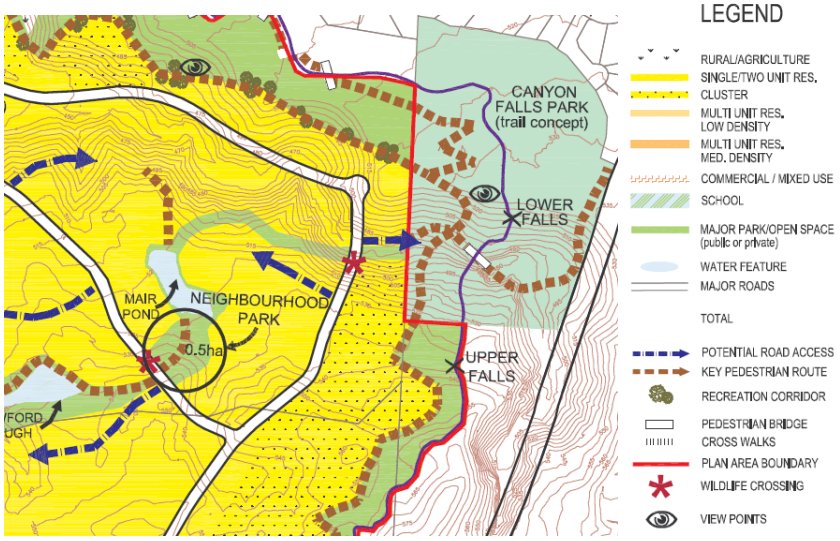
2.0 Purpose

To amend the Official Community Plan to change the future land use designation and to rezone portions of the subject property to facilitate a residential subdivision with park and natural open space areas.

3.0 Community Planning

Staff support the proposed OCP Amendment and Rezoning application to facilitate the next phase of development of The Ponds Bellevue. The application is generally consistent with the Neighbourhood 3 Area Structure Plan (ASP) that directs the vision and objectives for development of the area. Staff have reviewed the proposal in conjunction with the related Subdivision and Development Permit applications and have worked with the applicant to address concerns and identify conditions for subdivision.

The intent of the ASP is generally met through the provision of a wildlife corridor connecting the pond system to Bellevue Creek, park space, trail connections, and single / two unit residential development. The development concept in the ASP is shown to the right, and the entire ASP Development Concept and Parks and Pathway Plan are shown in attachments to this report. In addition to the defined wildlife corridor that would be designated and zoned as park and open space, small portions of adjacent lots will



have restrictions on building or disturbing land that abuts the corridor, further increasing the buffer for this natural open space between Mair Pond and Bellevue Creek. Additional natural open space is being provided north of Fawn Run Drive, adjacent to Bellevue Creek Regional Park and Canyon Falls Park.

The proposed amendments involve adjusting the boundaries of the existing Future Land Use designations and rezoning the site based on more detailed site investigations and servicing requirements that inform the subdivision layout. A portion of the area designated for cluster housing would be amended to single or two unit hillside residential, with two single dwelling housing lots proposed in this location. The slopes in this portion of the site are less severe than the remainder of the cluster housing site, making it appropriate for individual lots accessed from a short cul-de-sac. The remainder of the cluster housing site will be addressed through future development phases. Key considerations for future development south and southwest of the subject site will be the cluster housing area, the extension of Steele Road, the neighbourhood park, and the interface with Canyon Falls Park and wildlife corridors.

Staff representing various departments worked with the applicant to address matters related to park and trail access, site grading, road and servicing standards, and emergency access, in addition to the proposed land uses. All servicing requirements are a condition of subdivision approval, and environmental and hazardous condition requirements are noted in the related Development Permit. As part of this subdivision phase, the trail at the top of the south bank of Bellevue Creek will be extended, connecting The Ponds Community Park with the western portion of Canyon Falls Park. Staff are working with the developer on a partnership agreement to develop this section of trail, pending further budget approvals by Council.

Public consultation and notification was not required since no privately owned properties were within 50 m of the subject site at time of application. The development is part of a master planned community and is generally consistent with the ASP and development plan for the area.

Staff have reviewed this application, and it may move forward without affecting either the City's Financial Plan or Waste Management Plan.

4.0 Proposal

4.1 Background

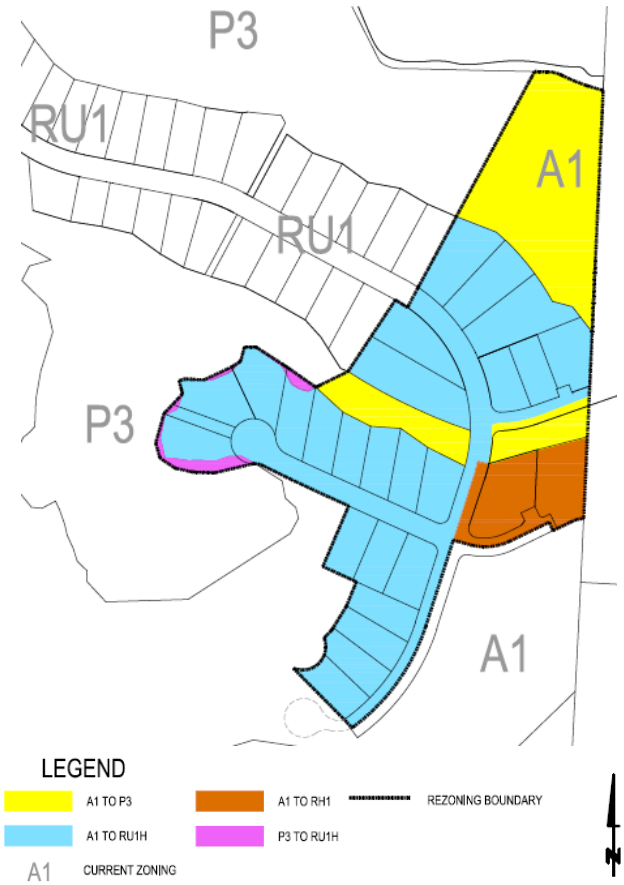
The Neighbourhood 3 ASP and related OCP amendments were adopted by Council on April 3, 2007. Neighbourhood 3 was identified within the 1994 Southwest Okanagan Mission Sector Plan and covers the entirety of the area now known as The Ponds. The Ponds Bellevue is part of this larger master planned community.

The Plan envisions a logical pattern of development for the Neighbourhood 3 area that would result in a high quality, attractive and complete community including the objectives of: providing a mix of housing types and densities suitable for a variety of households, age groups, income levels and preferences; and, through its inter-connection of natural spaces, parks, pathways encourages respect for nature. The ASP notes that the development concept has been formulated to work harmoniously with the topography and to retain the integrity of water features and their surroundings.

4.2 Project Description

This OCP Amendment and Rezoning application is for the next phase of The Ponds Bellevue, known as Phase 2 of Fawn Run at The Ponds. The related subdivision proposes 26 residential lots, park and natural open space areas, and a remainder parcel for future development phases. The Approving Officer issued the Preliminary Layout Review Letter for the subdivision on May 10, 2017, subject to these OCP Amendments and Rezoning, among other conditions.

The site is currently designated S2RESH – Single / Two Residential – Hillside, MRC – Multiple Unit Residential (Cluster Housing), and PARK – Major Park / Open Space (Public), and the existing zoning is A1 – Agriculture 1. The OCP Amendment proposes adjusting the boundaries of the existing Future Land Use designations in several locations, including refining the wildlife corridor identified in the ASP and increasing natural area parkland in other areas. Additionally, the Future Land Use for one of the development areas would change from MRC to S2RESH, removing any multiple unit cluster housing from this phase. The proposed zoning of P3 – Parks and Open Space, RU1h – Large Lot Housing (Hillside Area) and RH1 – Hillside Large Lot Residential aligns with the proposed Future Land Use designations, and would allow for single dwelling residential on large hillside lots within the development areas. The proposed zoning amendments and lot layout are shown to the right.



The main proposed vehicle access is via extension of Fawn Run Drive, terminating in a temporary cul-de-sac that will eventually intersect with the future extension of Steele Road. Fawn Run Drive is built to a local road standard, and it is anticipated the Steele Road extension will be a collector road. A trail north of Fawn Run Drive will also function as an emergency access route for the area.

The ASP identifies a 0.5 hectare neighbourhood park site south of Mair Pond. While this proposed park is not part of this OCP Amendment and Rezoning application, it is adjacent to the subject site. The extension of Steele Road is currently shown to bisect the park site, and staff are discussing the location with the developer as part of the subdivision for this and future phases to ensure the provision of a neighbourhood park is not compromised by the road or lot layout. The park area would be exclusive of any required environmental setbacks.

4.3 Site Context

The subject property is located within the Okanagan Mission Sector of the City, east of the intersection of Gordon Drive and Steele Road, and west of Canyon Falls Park / Bellevue Creek. It is located within the Permanent Growth Boundary, and is generally known as The Ponds.

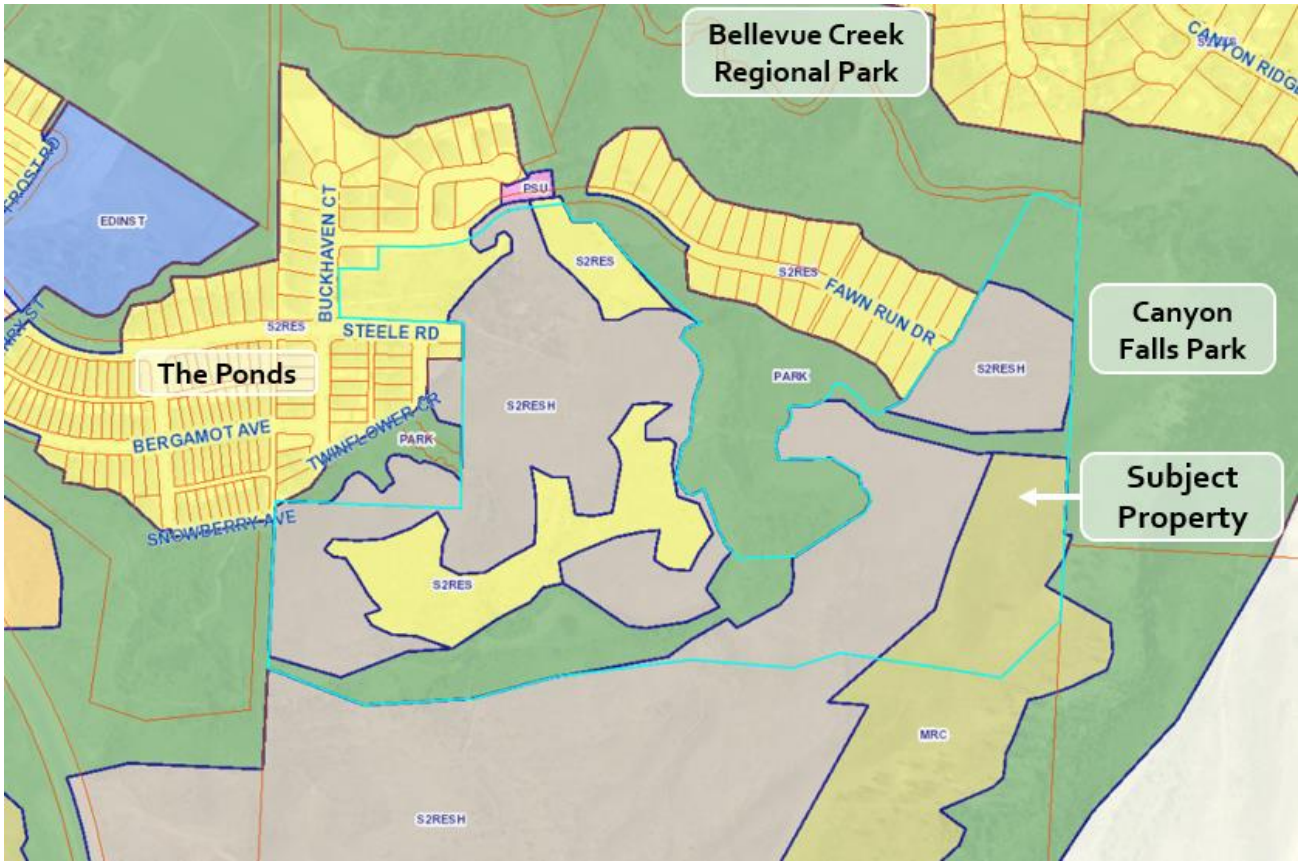
The portion of the subject parcel under consideration contains a mix of Future Land Use designations, including: S2RESH – Single / Two Unit Residential – Hillside; MRC – Multiple Unit Residential (Cluster Housing); and PARK – Major Parks and Open Space (Public).

The adjacent properties to the north and east have a Future Land Use designation of PARK – Major Park and Open Space (Public). To the south, the remainder of this property and adjacent properties have Future Land Use designations of MRC – Multiple Unit Residential (Cluster Housing) and S2RESH – Single / Two Unit Residential – Hillside. To the west, the remainder of this parcel has Future Land Use designations of PARK – Major Park and Open Space and S2RESH - Single / Two Unit Residential – Hillside.

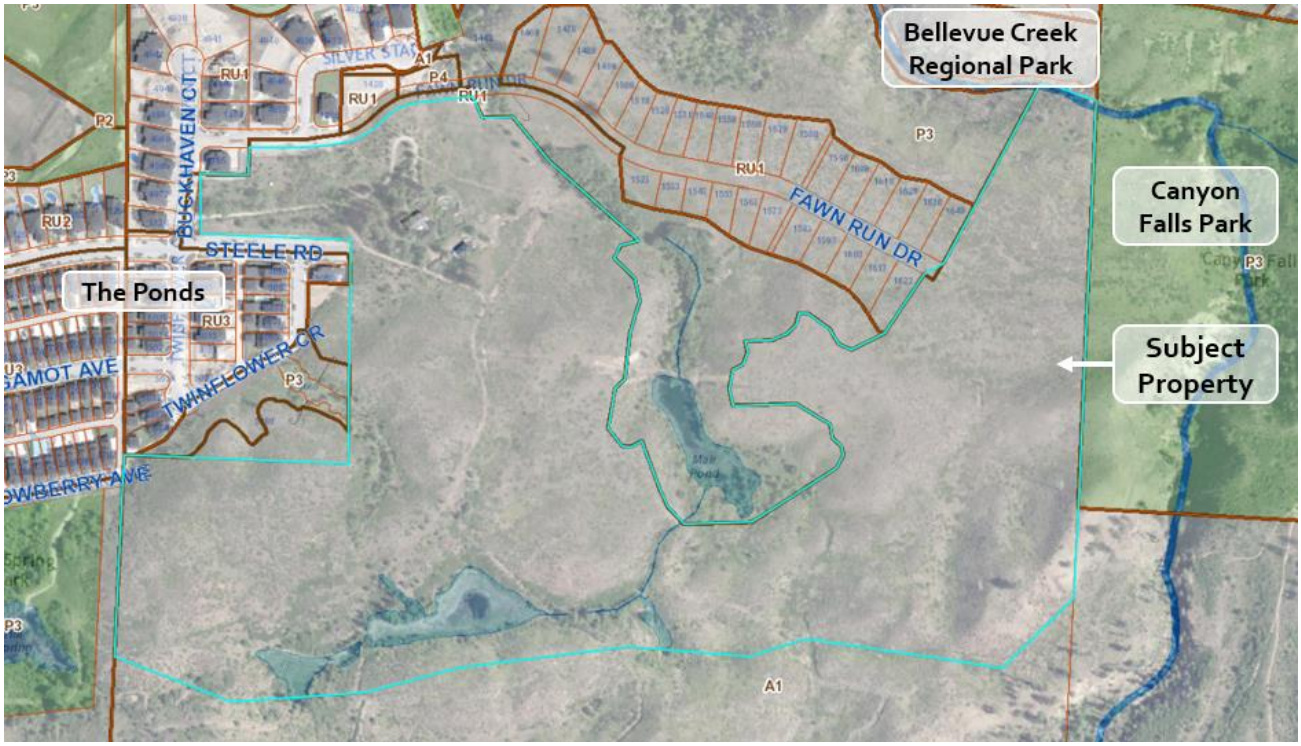
Adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	P3 – Parks and Open space A1 – Agriculture	Natural open space (future Bellevue Creek Linear Trail and Bellevue Creek Regional Park)
East	P3 – Parks and Open Space	Canyon Falls Park
	A1 - Agriculture	Vacant / open space
South	A1 - Agriculture	Vacant / open space
West	A1 - Agriculture	Vacant / open space
	P3 – Parks and Open space	Open space / storm water detention pond
	RU1 – Large Lot Residential	Residential under development

Map 1: Neighbourhood Context & Existing Future Land Use Designations



Map 2: Subject Property & Existing Zoning



5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Chapter 5: Development Process

Policy 5.2.5 Integrated Land Uses. Integrate land use approaches wherever possible to improve opportunities for biodiversity, ecosystem connectivity, recreation, agriculture and local food production, while reducing conflicts.

Policy 5.14.2 Dedication of Linear Parks. At subdivision and rezoning for all development types secure a minimum 10-metre wide linear corridor for public access as included in Table 5.1 Linear Park – Public Access and/or are shown on Map 5.9 – Linear Corridors / Paths. The 10-metre wide corridor may be in addition to, and outside, any riparian management area requirements imposed through the Environmental Development Permit (see Chapter 12) requirements of the OCP. Linear trail corridors can have the following tenure which will be determined by staff at the time of subdivision or rezoning:

- Titled property in the name of the city as a park, protected area, or
- Road reserve right of way; or
- Statutory right of way.

Policy 5.15.3 Environmentally Sensitive Area Linkages. Ensure that development activity does not compromise the ecological function of environmentally sensitive areas and maintains the integrity of plant and wildlife corridors.

Policy 5.15.13 Access Through Steep Slopes. Discourage roads (public or private) through +30% slope areas intended to access lands beyond, except in cases where it can be demonstrated the road will be sensitively integrated (visual and aesthetic impacts minimized) with the natural environment and will

present no hazards to persons or property, environmental threats or unreasonable servicing or maintenance challenges.

Policy 5.36.3 Design for People and Nature. Structure new neighbourhoods around parks, pedestrian and bike routes, open spaces, and environmental areas, rather than around roadways and cars.

Chapter 7: Infrastructure

Policy 7.6.2 Complete Streets. Ensure new roads are built as complete streets that incorporate sidewalks and on street bike lanes on arterial and major collector roads and off-road bike paths as per the Active Transportation Plan and provides for efficient transit service, as well as sufficient space to include landscaping.

Policy 7.8.3 New Residential Developments. Ensure that new residential developments and subdivisions have active transportation links to the nearest arterial or major collector roads at developer cost.

Policy 7.12.2 Natural Area Parks and Open Spaces. Provide a city-wide network of natural area parks which meet the following criteria:

- Contains representative Okanagan ecosystems;
- Contains areas of outstanding natural beauty (including areas with high visual sensitivity and high visual vulnerability, such as rocky outcrops, ridge lines, hilltops, silt slopes, canyons, and water edges);
- The land area is contiguous and forms part of a larger open space network;
- Contains conservation areas;
- Protects viewshed corridors; and
- Where appropriate, trails which maximize public safety while minimizing human impact on the most sensitive and vulnerable areas.

Policy 7.15.1 Partnerships. The City will create community and enhance quality-of-life through partnerships with developers, residents' associations, property owners, non-profit organizations, private enterprise, user groups and individuals, on the acquisition and construction of all classes of parks. The City will also pursue joint use agreements and partnerships with School District 23, Regional District of the Central Okanagan, and the University of British Columbia Okanagan.

6.0 Technical Comments

6.1 Development Engineering

- All requirements are addressed through Subdivision Application No. S16-0101.

6.2 School District No. 23

- No objections to the application as proposed.

7.0 Application Chronology

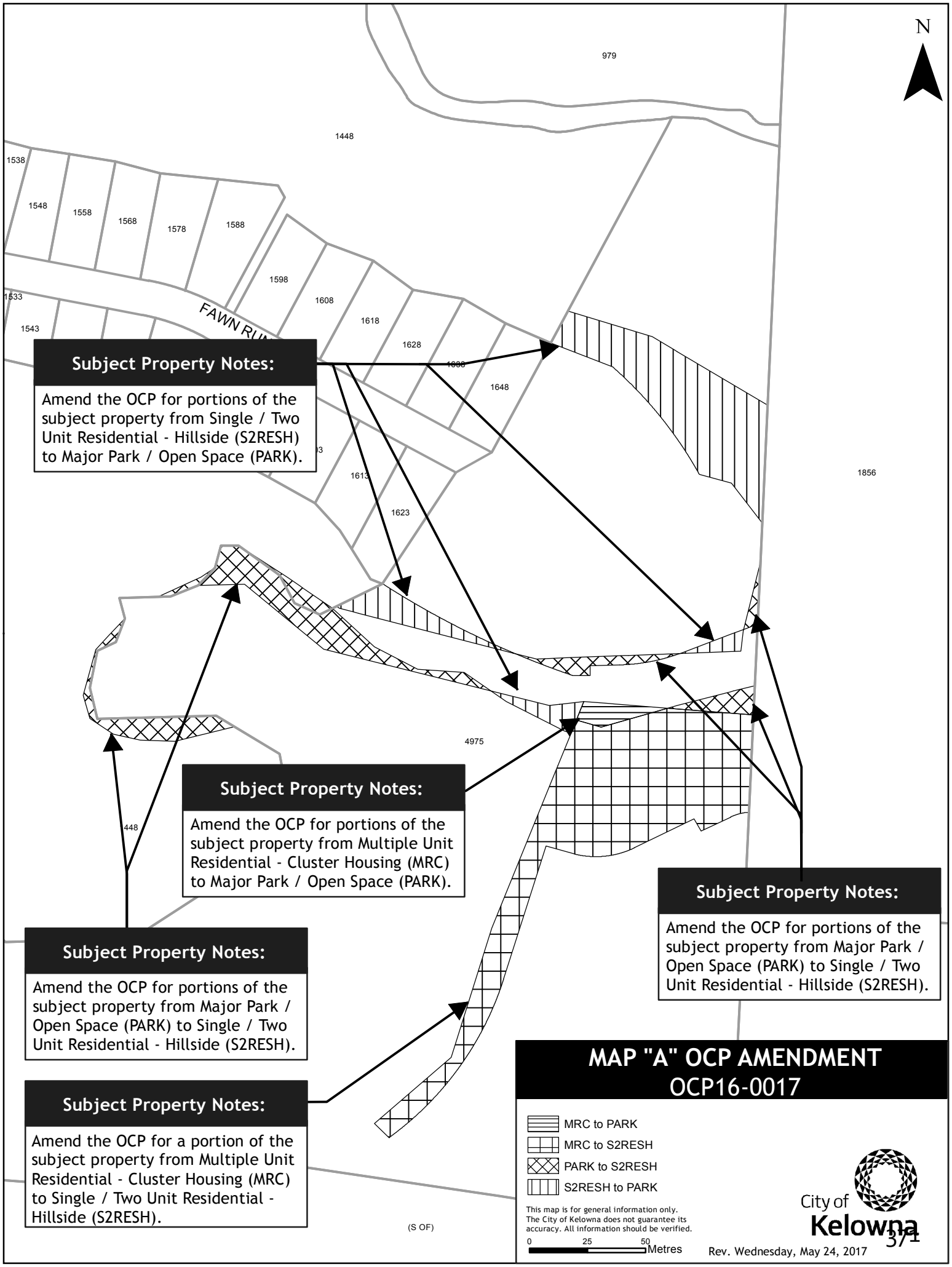
Neighbourhood 3 ASP:	January 31, 2007
Date of Application Received:	September 14, 2016
Date of PLR Issuance:	May 10, 2017

Report prepared by: Laura Bentley, Planner II

Reviewed & Approved for Inclusion by: Ryan Smith, Community Planning Department Manager

Attachments:

Map "A"
Map "B"
Attachment 1: ASP Map 8 Development Concept
Attachment 2: ASP Map 10 Parks and Pathways Plan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4975
448
Subject Property Notes:
Amend the OCP for portions of the subject property from Single / Two Unit Residential - Hillside (S2RESH) to Major Park / Open Space (PARK).
Subject Property Notes:
Amend the OCP for portions of the subject property from Multiple Unit Residential - Cluster Housing (MRC) to Major Park / Open Space (PARK).
Subject Property Notes:
Amend the OCP for portions of the subject property from Major Park / Open Space (PARK) to Single / Two Unit Residential - Hillside (S2RESH).
Subject Property Notes:
Amend the OCP for portions of the subject property from Major Park / Open Space (PARK) to Single / Two Unit Residential - Hillside (S2RESH).
Subject Property Notes:
Amend the OCP for a portion of the subject property from Multiple Unit Residential - Cluster Housing (MRC) to Single / Two Unit Residential - Hillside (S2RESH).
(S OF)
MAP "A" OCP AMENDMENT
OCP16-0017
MRC to PARK
MRC to S2RESH
PARK to S2RESH
S2RESH to PARK
This map is for general information only.
The City of Kelowna does not guarantee its accuracy. All information should be verified.
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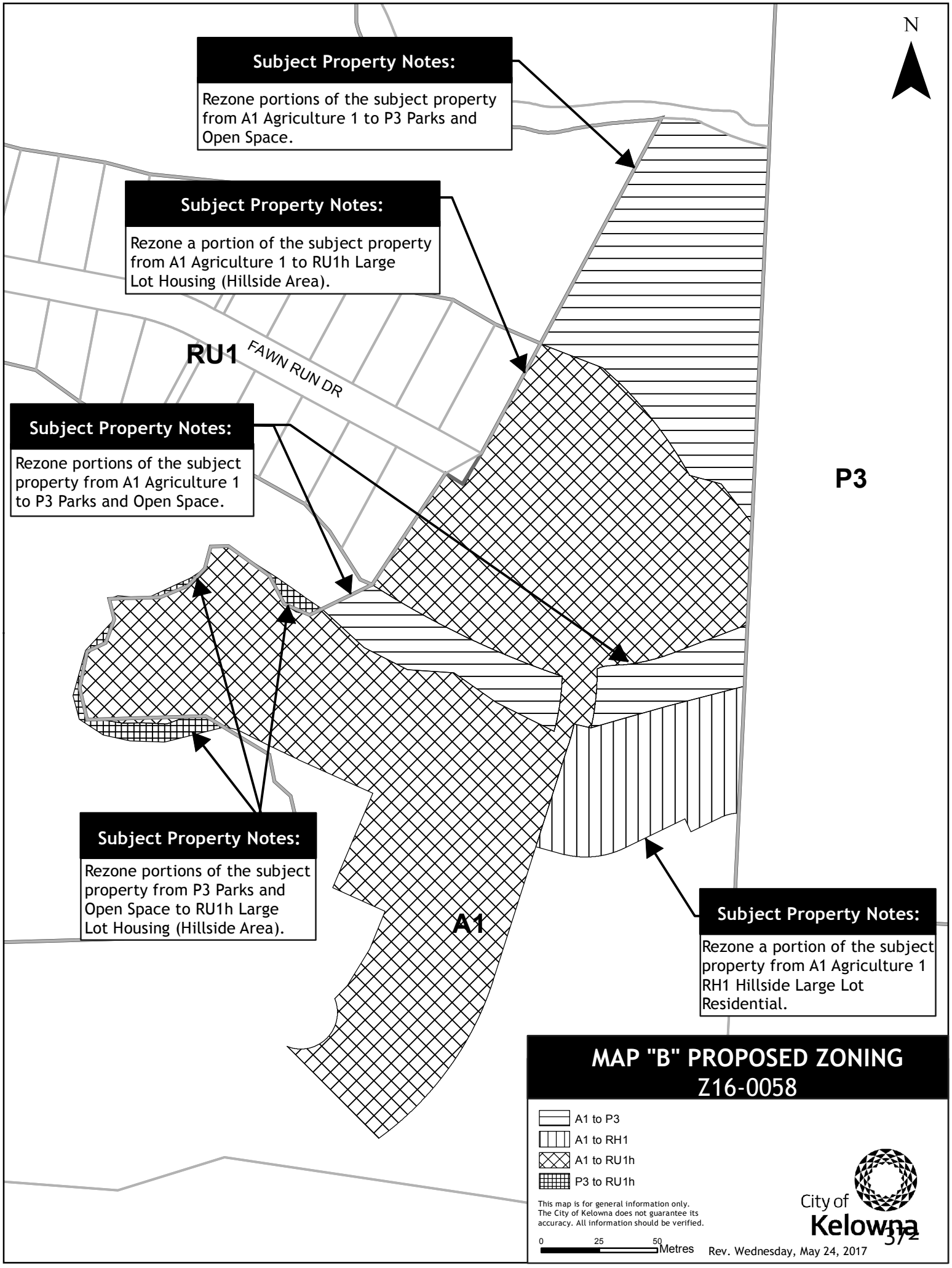
Metres
City of Kelowna
Rev. Wednesday, May 24, 2017
3/4


N
Subject Property Notes:
Rezone portions of the subject property from A1 Agriculture 1 to P3 Parks and Open Space.
Subject Property Notes:
Rezone a portion of the subject property from A1 Agriculture 1 to RU1h Large Lot Housing (Hillside Area).
RU1
FAWN RUN DR
Subject Property Notes:
Rezone portions of the subject property from A1 Agriculture 1 to P3 Parks and Open Space.
P3
Subject Property Notes:
Rezone portions of the subject property from P3 Parks and Open Space to RU1h Large Lot Housing (Hillside Area).
A1
Subject Property Notes:
Rezone a portion of the subject property from A1 Agriculture 1 RH1 Hillside Large Lot Residential.
MAP "B" PROPOSED ZONING
Z16-0058
A1 to P3
A1 to RH1
A1 to RU1h
P3 to RU1h
This map is for general information only.
The City of Kelowna does not guarantee its accuracy. All information should be verified.
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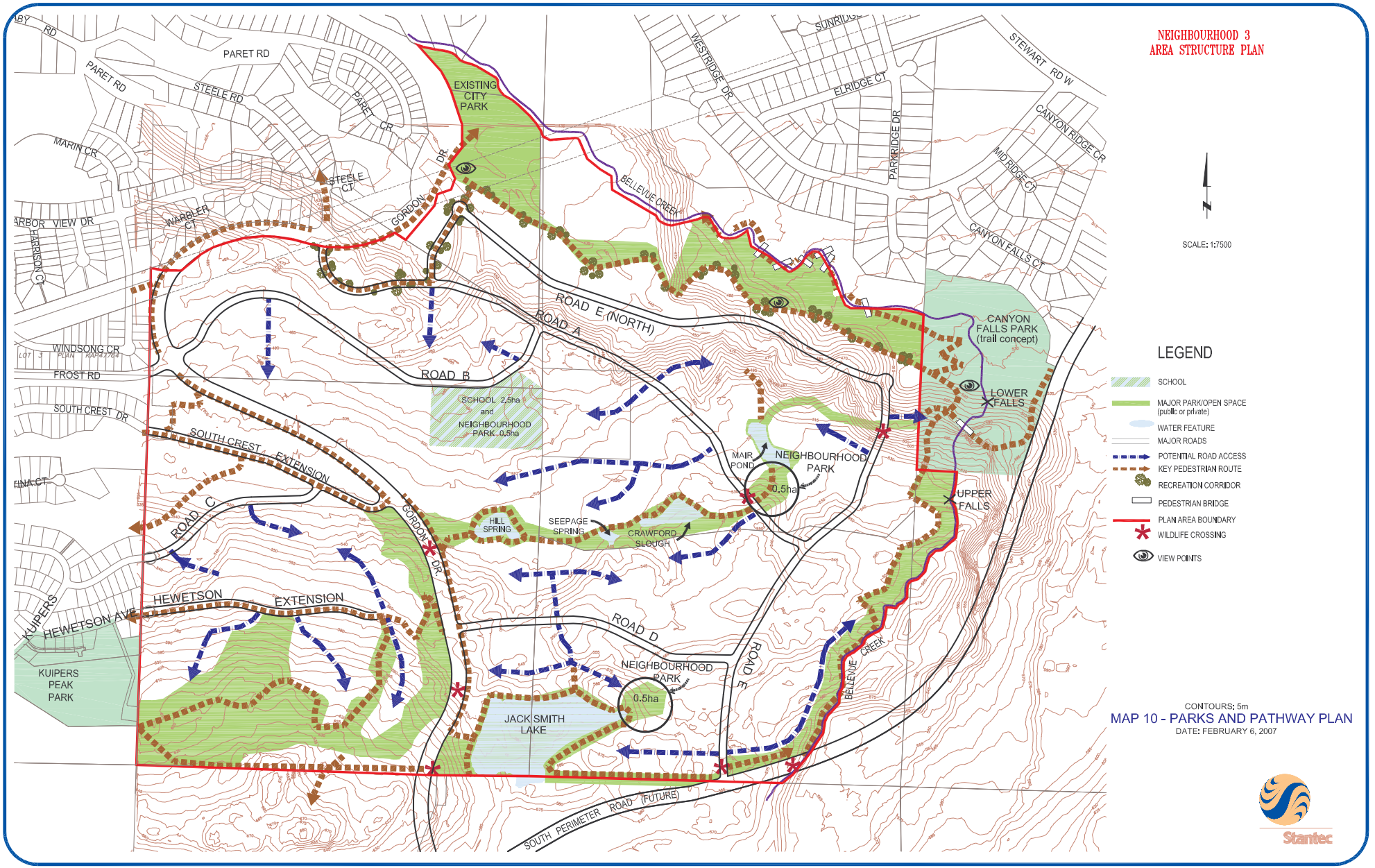
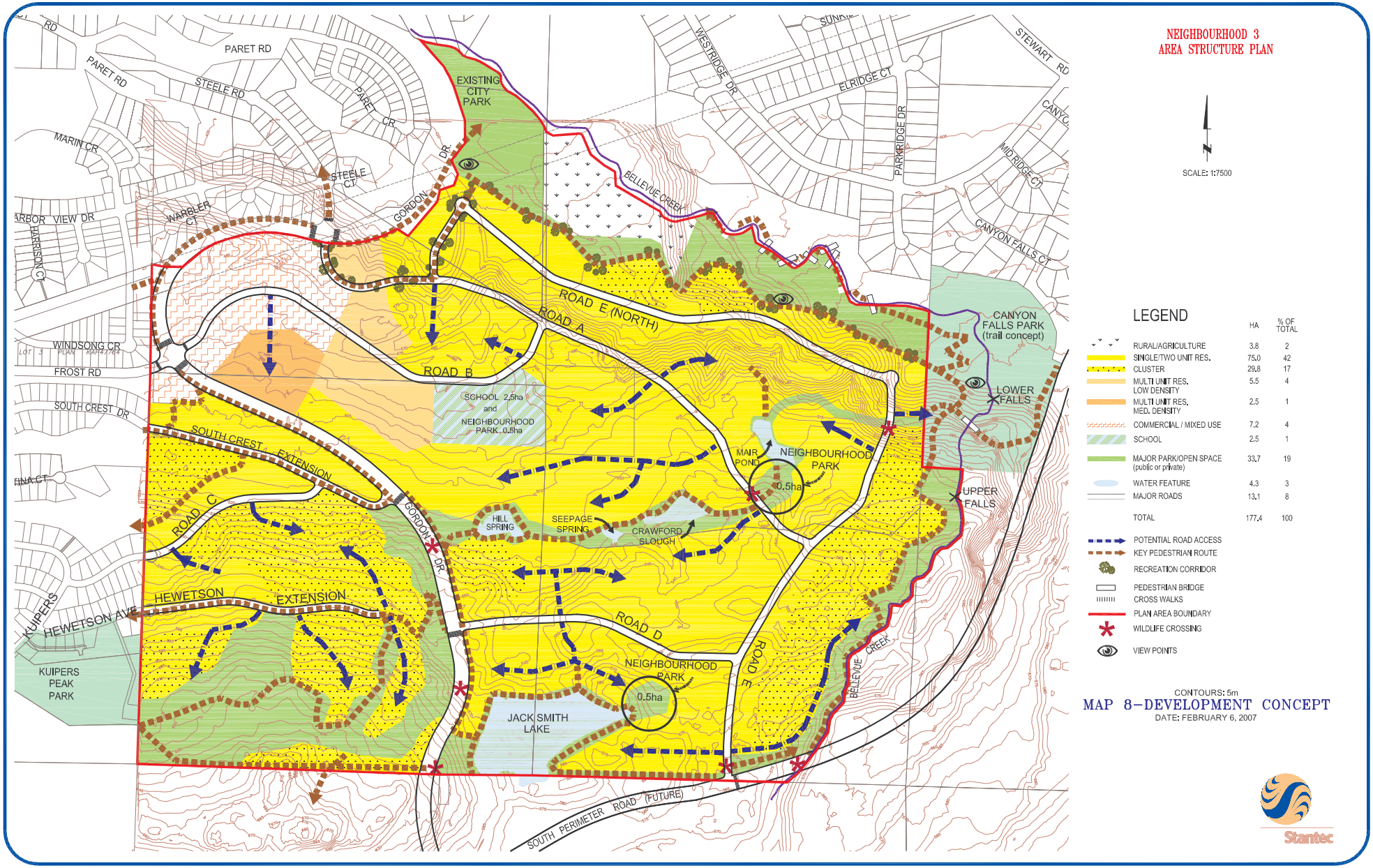
City of Kelowna
Rev. Wednesday, May 24, 2017


NEIGHBOURHOOD 3
AREA STRUCTURE PLAN
SCALE: 1:7500
LEGEND
SCHOOL
MAJOR PARK/OPEN SPACE (public or private)
WATER FEATURE
MAJOR ROADS
POTENTIAL ROAD ACCESS
KEY PEDESTRIAN ROUTE
RECREATION CORRIDOR
PEDESTRIAN BRIDGE
PLAN AREA BOUNDARY
WILDLIFE CROSSING
VIEW POINTS
CONTOURS: 5m
MAP 10 - PARKS AND PATHWAY PLAN
DATE: FEBRUARY 6, 2007
Stantec
EXISTING CITY PARK
PARET RD
STEELE RD
PARET CR
STEELE CT
MARIN CR
GORDON DR
WARBLER CT
HARRISON CT
ARBOR VIEW DR
WINDSONG CR
FROST RD
SOUTH CREST DR
SOUTH CREST EXTENSION
FINA CT
ROAD C
HEWETSON AVE
HEWETSON EXTENSION
KUIPERS
KUIPERS PEAK PARK
SCHOOL 2.5ha and NEIGHBOURHOOD PARK 0.5ha
ROAD B
ROAD A
ROAD E (NORTH)
BELLEVUE CREEK
WESTRIDGE DR
SUNRIDGE
ELRIDGE CT
PARKRIDGE DR
STEWART RD W
CANYON RIDGE CR
MID RIDGE CT
CANYON FALLS CT
CANYON FALLS PARK (trail concept)
LOWER FALLS
UPPER FALLS
MAIR POND
NEIGHBOURHOOD PARK 0.5ha
HILL SPRING
SEEPAGE SPRING
CRAWFORD SLOUGH
ROAD D
ROAD E
NEIGHBOURHOOD PARK 0.5ha
JACK SMITH LAKE
SOUTH PERIMETER ROAD (FUTURE)


NEIGHBOURHOOD 3
AREA STRUCTURE PLAN
SCALE: 1:7500
PARET RD
STEELE RD
MARIN CR
STEELE CT
WARBLER CT
HARRISON CT
WINDSONG CR
FROST RD
SOUTH CREST DR
SOUTH CREST EXTENSION
ROAD C
HEWETSON AVE
HEWETSON EXTENSION
KUIPERS
KUIPERS PEAK PARK
EXISTING CITY PARK
GORDON DR
BELLEVUE CREEK
WESTRIDGE DR
ELRIDGE CT
PARKRIDGE DR
STEWART RD
MIDRIDGE CT
CANYON FALLS CT
ROAD E (NORTH)
ROAD A
ROAD B
SCHOOL 2.5ha and NEIGHBOURHOOD PARK 0.5ha
CANYON FALLS PARK (trail concept)
LOWER FALLS
UPPER FALLS
MAIR POND
NEIGHBOURHOOD PARK
0.5ha
HILL SPRING
SEEPAGE SPRING
CRAWFORD SLOUGH
ROAD D
ROAD E
NEIGHBOURHOOD PARK
0.5ha
JACK SMITH LAKE
SOUTH PERIMETER ROAD (FUTURE)
LEGEND
HA
% OF TOTAL
RURAL/AGRICULTURE 3.8 2
SINGLE/TWO UNIT RES. 75.0 42
CLUSTER 29.8 17
MULTI UNIT RES. LOW DENSITY 5.5 4
MULTI UNIT RES. MED. DENSITY 2.5 1
COMMERCIAL / MIXED USE 7.2 4
SCHOOL 2.5 1
MAJOR PARK/OPEN SPACE (public or private) 33.7 19
WATER FEATURE 4.3 3
MAJOR ROADS 13.1 8
TOTAL 177.4 100
POTENTIAL ROAD ACCESS
KEY PEDESTRIAN ROUTE
RECREATION CORRIDOR
PEDESTRIAN BRIDGE
CROSS WALKS
PLAN AREA BOUNDARY
WILDLIFE CROSSING
VIEW POINTS
CONTOURS: 5m
MAP 8–DEVELOPMENT CONCEPT
DATE: FEBRUARY 6, 2007
Stantec

REPORT TO COUNCIL

Date:	June 12, 2017		
RIM No.	1250-04		
To:	City Manager		
From:	Community Planning Department (JR)		
Application:	TA17-0007	**Owner:**	Carbon Capture Mini Storage (Kelowna) GP Ltd.
Address:	437 Bay Avenue	**Applicant:**	DiStefano Jaud Architecture
Subject:	Text Amendment Application		
Existing OCP Designation:	IND - Industrial		
Existing Zone:	I4 – Central Industrial		

1.0 Recommendation

THAT Zoning Bylaw Text Amendment No. TA17-0007 to amend City of Kelowna Zoning Bylaw No. 8000 by amending principle uses to include commercial storage as outlined in Schedule "A" of the report from the Urban Planning Department dated June 12, 2017, be considered by Council.

AND THAT the Text Amendment Bylaw be forwarded to a Public Hearing for further consideration.

AND FURTHER THAT, subsequent to fourth reading of the above bylaw, a Development Permit and Development Variance Permit will be required as outlined in the report from the Community Planning Department dated June 12, 1017.

2.0 Purpose

To consider amendments to the Zoning Bylaw in order to allow commercial storage as a permitted use in the I4 – Central Industrial zone.

3.0 Community Planning

Staff are supportive of the proposed Text Amendment application to facilitate the development of commercial storage at 437 Bay Avenue and within the I4 – Central Industrial zone. Currently, commercial storage is not a permitted use in the I4 zone, however, commercial storage is a permitted use in the other industrial zones. Commercial storage does not have any significant negative externalities on surrounding properties and therefore, staff feel the use is appropriate for the I4 zone in relation to all the other allowable industrial uses.

4.0 Proposal

4.1 Project Description

The application is for a Text Amendment to allow commercial storage as a permitted use in the I4 – Central Industrial zone to facilitate the development of a personal storage facility at 437 Bay Avenue.

The initial proposal is a five story, 10,270 m^2 personal storage facility for individuals and businesses. The design of the building is contemporary with a two-story storefront which activates the side along Ellis Street. The building strives to meet the highest environmental standards by planning for net-zero energy along with additional environmentally sustainable measures being implemented. The project seeks Petal-level Living Building Challenge (LBC) certification (exceeds LEED) and has applied to the Canada Green Building Council Zero Carbon Pilot Program. Further details on the form and character of the proposal will be examined at the development permit stage should Council approve the Text Amendment.

Currently, the proposal has two variances that are being tracked:

1) to reduce the number of parking stalls from 206 to 16;
2) to reduce the number of bicycle class 2 stalls from 31 to 16;

4.2 Site Context

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	I4 – Central Industrial	Fruit and Vegetable Storage
East	I2 – General Industrial	Commercial
South	I4 – Central Industrial	Boat Storage
West	I4 – Central Industrial	Industrial - Vacant

Subject Property: 437 Bay Avenue

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Chapter 5: Development Process

North End Industrial (High Tech and Incubator)[1]. Encourage the redevelopment of industrially designated lands north of the Downtown Urban Centre for high-tech projects and buildings, including the potential for "incubator space" for smaller businesses.

6.0 Technical Comments

6.1 Development Engineering Department

- No comments on the Text Amendment

7.0 Application Chronology

Date of Application Received: March 17, 2017

Prepared by: Adam Cseke and Jenna Ratzlaff, Planners

Reviewed by: Terry Barton, Urban Planning Manager

Reviewed by: Ryan Smith, Community Planning Department Manager

Attachments:

Schedule 'A': Proposed Text Amendment
Attachment B: EcoLock Design Rationale Statement
Attachment C: Site Plan, Landscape Plan and Renders

[1] City of Kelowna Official Community Plan, Policy 5.21.6 (Development Process Chapter).

SCHEDULE A
This forms part of application
TA17-0007
DP17-0073
Planner Initials AC
City of Kelowna COMMUNITY PLANNING

SCHEDULE A – PROPOSED TEXT AMENDMENTS TO ZONING BYLAW 8000 – TA17-0007

Zoning Bylaw 8000				
No.	**Section**	**Existing Text**	**Proposed Text**	**Rationale**
1.	15.4 – I4 Central Industrial 15.4.2 Principal Uses	**Principal Uses** The **principal uses** in this **zone** are: (a) **analytical testing** (b) **animal clinics, major** (c) **auctioneering establishments** (d) **automotive and equipment repair shops** (e) **automotive and minor recreation vehicle sales/rentals** (f) **breweries and distilleries, major** (g) **breweries and distilleries, minor** (h) **broadcasting studios** (i) **bulk fuel depots** (j) **child care centre, major** (k) **concrete and asphalt plants** (l) **contractor services, limited** (m) **contractor services, general** (n) **custom indoor manufacturing** (o) **equipment rentals** (p) **fleet services** (q) **food primary establishment** (r) **gas bars** (s) **general industrial uses** (t) **industrial high technology research and product design** (u) **liquor primary establishment, minor** (v) **medical marihuana production facilities**	**Principal Uses** The **principal uses** in this **zone** are: (a) **analytical testing** (b) **animal clinics, major** (c) **auctioneering establishments** (d) **automotive and equipment repair shops** (e) **automotive and minor recreation vehicle sales/rentals** (f) **breweries and distilleries, major** (g) **breweries and distilleries, minor** (h) **broadcasting studios** (i) **bulk fuel depots** (j) **child care centre, major** (k) **commercial storage** (l) **concrete and asphalt plants** (m) **contractor services, limited** (n) **contractor services, general** (o) **custom indoor manufacturing** (p) **equipment rentals** (q) **fleet services** (r) **food primary establishment** (s) **gas bars** (t) **general industrial uses** (u) **industrial high technology research and product design** (v) **liquor primary establishment, minor** (w) **medical marihuana production**	See Report

		(w) **mobile catering food services** (x) **non- accessory parking** (y) **participant recreation services, indoor** (z) **pawnshop** (aa) **private clubs** (bb) **rapid drive-through vehicle services** (cc) **recycled materials drop-off centres** (dd) **service stations, major** (ee) **service stations, minor** (ff) **temporary parking lot** (gg) **utility services, minor impact** (hh) **warehouse sales**	**facilities** (x) **mobile catering food services** (y) **non- accessory parking** (z) **participant recreation services, indoor** (aa) **pawnshop** (bb) **private clubs** (cc) **rapid drive-through vehicle services** (dd) **recycled materials drop-off centres** (ee) **service stations, major** (ff) **service stations, minor** (gg) **temporary parking lot** (hh) **utility services, minor impact** (ii) **warehouse sales**	

SCHEDULE A
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DP17-0073
Planner Initials AC
City of Kelowna
COMMUNITY PLANNING

EcoLock Design Rationale Statement

EcoLock is a five story, 10,270 m^2 personal-storage facility proposed for Kelowna, British Columbia, Canada that uses a new model to support responsible urban living. The building provides remote storage for individuals and businesses in an environment designed to the highest environmental standard for buildings and communities while enhancing neighborhood character with cutting edge architecture and material use. The structure is planned for net-zero energy, along with other achievements that provide a model for a low carbon construction, water conservation and stewardship, high performance, waste diversion, healthy materials, support for local culture and the arts, biodiversity enhancement, and best practices for low impact development (LID) at the site level. The project aspires to achieve Petal-level Living Building Challenge (LBC) certification (the world's most stringent green building program that exceeds LEED), and has applied to the Canada Green Building Council Zero Carbon Pilot Program.

Figure 1 Ellis Street Elevation

The following describes the project in more detail:

Urban Design

The five-story project uses a compact form, and is rational in plan. Making the most of its corner site, the design provides an active, two-story storefront along Ellis Street to activate the pedestrian realm, with vehicular access, loading and parking to the north. The two-story storefront along Ellis accommodates lobby spaces, office and sales, along with educational components that describe the green features of the building. The EcoLock business model also provides multiple positive amenities for users in the way of touch down spaces and two meeting rooms, which allow customers to interact with other users in a relaxed setting and to facilitate community and personalization. These spaces intend to create a vibrant, active storefront along the majority of Ellis Street to enhance Kelowna's downtown and create a new model for similar facilities that raise the bar aesthetically and functionally.

At the south corner of the Ellis Street façade, three display windows are provided to support local artists, an ethos that is important to the Ecolock brand. In the center of the block along Ellis, pivot doors in the facade allow patrons to access outdoor seating. On the northeast corner of the site, the lobby extends beyond the building, forming a prow-like terraced seating element that contains a large water cistern, providing storage for collected rainwater from roof surfaces as part of the building's advanced water conservation goals. This element provides a human-scaled feature at the most visible corner of the site and helps celebrate Kelowna's important connection to water and agricultural uses.

Along the north side of the building, off-street parking and loading spaces, along with a screened trash enclosure create an orderly back of house area. The loading areas are protected from the elements by the building above. All areas are designed with no concealed spaces for urban pedestrian safety. The facility office area has direct views along the north facade and east facing lobby helping to create 'eyes on the street' which will help make the neighborhood safer. The south and west facades being boxed in by future buildings are simple and plain, close to the property line, and fenced against unauthorized entry.

The site landscaping approach incorporates drought tolerant native landscaping, storm water diversion bio-swales, grey water irrigation, permeable pavers and a 35 m^2 urban agriculture component – a Living Building Challenge requirement. This project will focus on fruits for human consumption that also support pollinators and migratory birds.

Design and Construction

The design of the building is contemporary, with a two-story lobby on the north-half facing Ellis Street. Like a museum or theater that does not require windows programmatically, the project uses glazing and windows, where they do occur, for maximum benefit and design effect. Above the lobby, and on the upper levels along the north façade, internal corridors are expressed with full height glass. These vertical bands of glazing provide orientation and a sense of safety to users of the facility. Each floor will use color for wayfinding. This color, expressed through the widows, is a primary design element for the building. Utilizing the clean flat nature of the interlocking carbon sequestering blocks, the façade is a series of modern simple plaster finished surfaces between the windows creating an effect of sculptural blocks stacked up as a building. In the spirit of showcasing all of the integrated sustainable building systems and materials, additional ornamentation has been kept to a minimum, instead expressing and celebrating the building as an inspirational example of the Living Building Challenge and ecologically responsible design. Projected canopies protect tall glass surfaces along Ellis street, with the south facing photovoltaic array on the high roof expressed along the parapet line. The building is designed according to universal design principles. A ramp is provided from the parking area to the lobby. The second-floor composting toilets are accessed via elevator.

Energy, Conservation and Materials

The project is being designed to exceed its own yearly net energy demand through a net metered photovoltaic array making the building 'net positive' and carbon free in its operations. It will be a combustion free and smoke free facility with exemplary air quality. The building enclosure will be high performance, low carbon, and free of toxic materials. The large lime plaster surfaces use a new high performance building material, designed, patented and made in Canada. this material, called Just Bio-Fiber, is an autoclaved cellular block comprised of

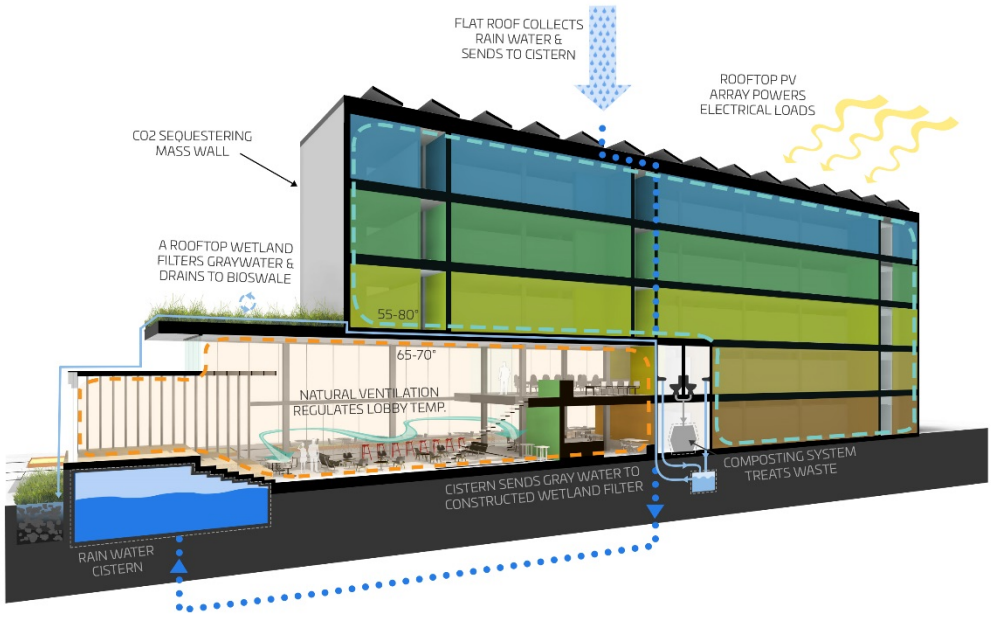

Figure 2 Ecolock Sustainability Diagram

industrial hemp, lime and a composite structural skeleton. This block sequesters substantial amounts of CO2 in manufacture and gradually over time, and has passed rigorous standardized testing and approvals, including the Living Building Challenge Declare label for material transparency. Windows are also Declare labeled high performance pultruded fiberglass insulated units that open for natural ventilation. Metal surfaces feature high performance coatings on the building, and weathered steel when in contact with the ground.

The mechanical systems will consume considerably less energy than comparable facilities due to the high-performance envelope. Energy Recovery Ventilation (ERV) units will use exhaust ventilation to temper incoming air. Electrical lighting will use occupancy sensing LED sources. Water, as a precious resource will be used wisely. The acoustically private toilet rooms are designed for individual use, with a unisex shared lavatory zone. The toilets are positioned on level two to facilitate a gravity based foam flush composting toilet system for maximum water conservation and to demonstrate cutting edge water and waste systems. A shower is provided on the ground floor for bicycle commuters. A rainwater and grey water system will further reduce potable water use to minimal amounts during the driest part of the year.

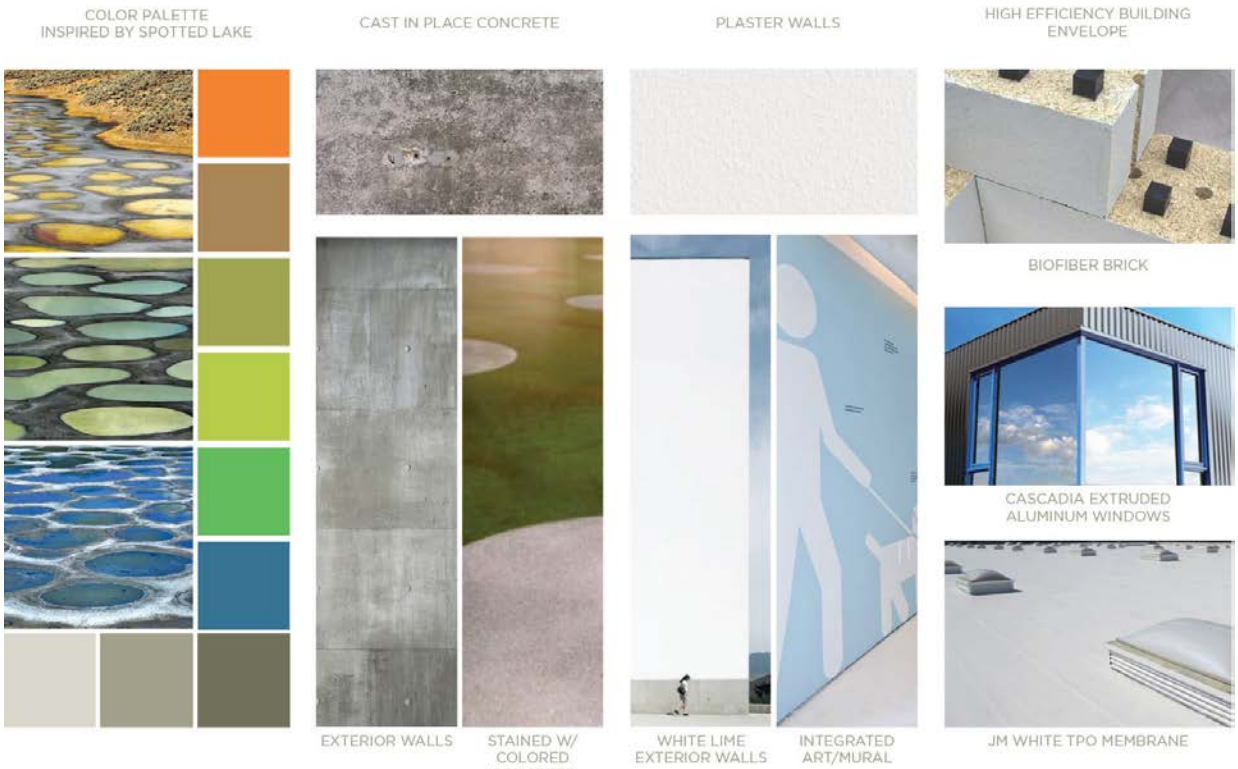

Figure 3 Colors inspired by the Spotted Lakes

Arts and Place

The Okanagan Valley has a rich history of abundance in minerals and fertile soils. The internal and exterior color scheme is inspired by the Spotted Lake, 131 Km south of Kelowna. the lake is unique in how local weather patterns and the deposition of minerals has resulted in a vivid color palette and a refuge for migratory birds. First Nations people called the lakes Kliluk.

Like the lakes, The EcoLock building also collects water over varied surfaces, and supports biodiversity. At the lobby, a literal interpretation will occur in large colored patterns on the stained concrete floor.

Education about the Living Building Challenge and carbon sequestering bio-fiber block will occur in the lobby, inviting the public to learn and encourage others to adopt similar environmentally responsible strategies for the built environment. The local arts will be celebrated through the 3 display windows. The initial programs focus will be themed-based, such as the artistry of heirlooms, or everyday objects when displayed artfully, can be transformative. Building ownership intends to work with local arts coalitions to offer space to emerging artists as well as established ones and thus help cultivate an even stronger community of local art than currently.

ATTACHMENT C
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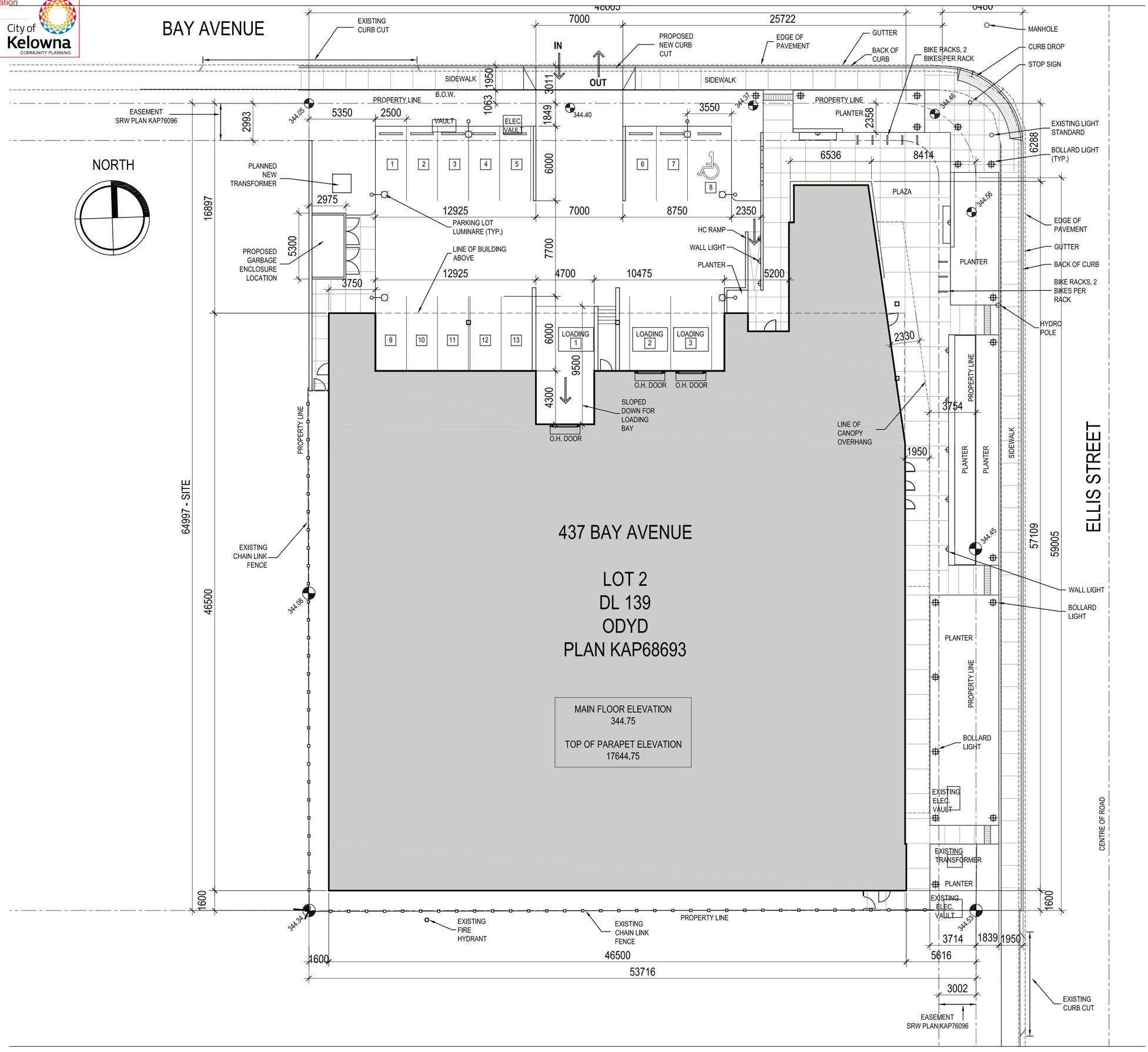

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EcoLock Self Storage

437 Bay Avenue
Kelowna, BC, V1Y 7S3

Architect of Record:

DiStefano Jaud Architecture

3 -1331 Ellis Street
Kelowna, BC, V1Y 1Z9
t 250 868 9278

Design Consultant:

McLennan Design

175 Parfitt Way SW, Suite N160
Bainbridge Island, WA 98110
t 206 219 5365

Key Plan

Professional Seals

No.	Issue Description	YYYY-MM-DD
01	DPA	2017-03-17

No.	Revision Description	YYYY-MM-DD

Drawn by CAD Reviewed by DJA

Project No. 16032

Sheet Title:

Site Plan

Scale: 1:200

Original drawing is 18x24. Do not scale contents of this drawing.

Sheet Number:

A-101

ATTACHMENT C
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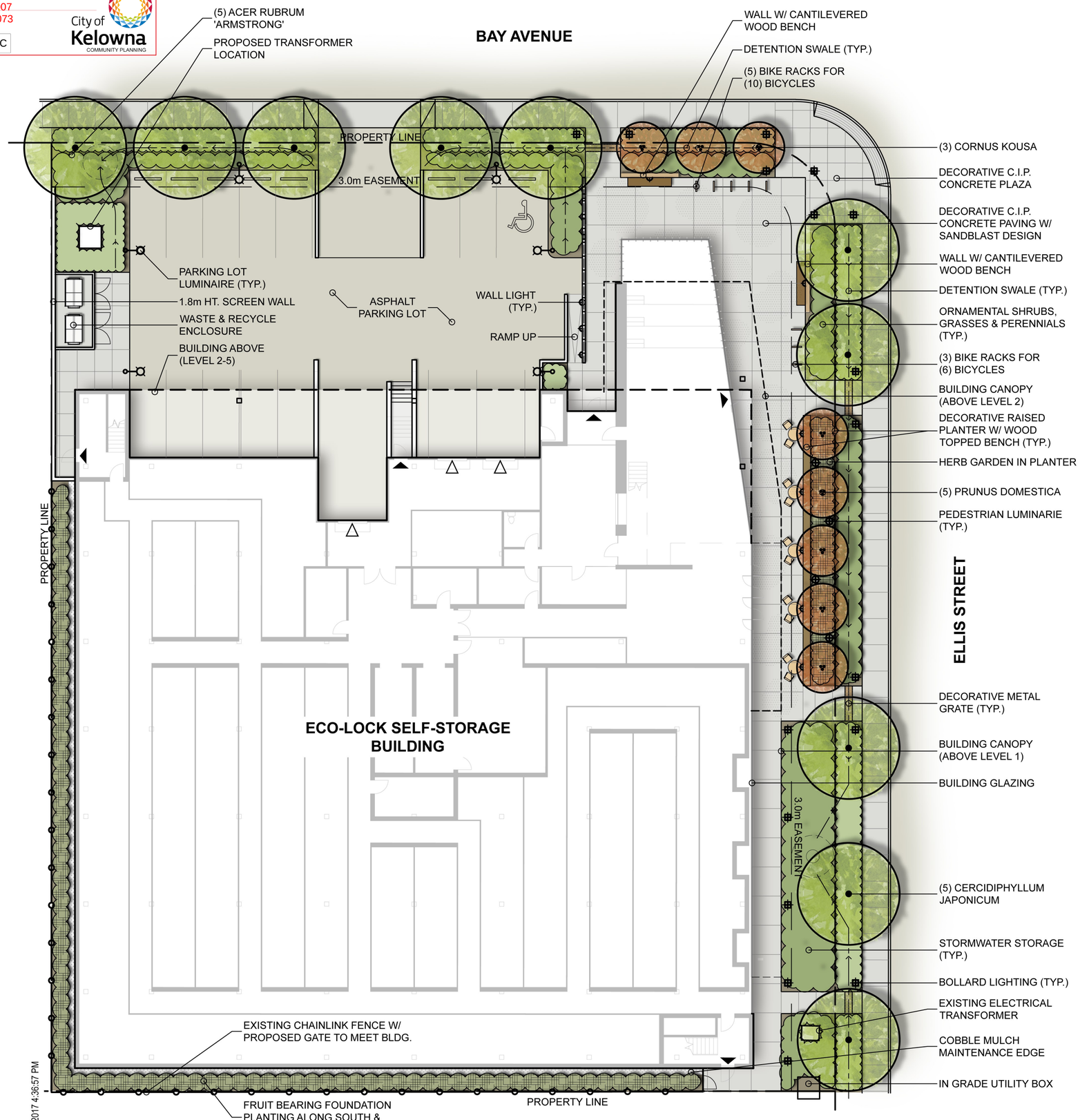
Planner Initials AC



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DEVELOPMENT PERMIT NOTES:

A PLANT MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO MINIMUM STANDARDS ESTABLISHED IN THE LATEST EDITION OF THE B.C. LANDSCAPE STANDARDS, PUBLISHED BY B.C.N.T.A. AND B.C.S.L.A. AS WELL AS THE CITY OF KELOWNA LANDSCAPE STANDARDS IN BYLAW 7900.
B THE LANDSCAPE DESIGN DESIGNATED HEREIN IS CONCEPTUAL BUT REFLECTS THE MINIMUM CITY OF KELOWNA FORM AND CHARACTER REQUIREMENTS
C PLANT MATERIAL SELECTIONS ARE CONCEPTUAL ONLY. FINAL PLANTING SELECTIONS MAY VARY DEPENDING UPON AVAILABILITY AT THE TIME OF CONSTRUCTION.
D TREES SHALL BE INSTALLED IN DEFINED SOIL PITS OR PLANTING BED AREAS. ADEQUATE SOIL VOLUME SHALL BE PROVIDED BASED ON THE SPECIFIED TREE SPECIES AND LOCATION.
E ORNAMENTAL SHRUB, GRASS AND PERENNIAL CLUSTERS ARE TO BE PLACED WITHIN DEFINED PLANTING BEDS. ALL PLANTING BEDS SHALL HAVE A MIN. OF 450mm (18") IMPORTED GROWING MEDIUM AND 75mm (3") OF COMPOSTED MULCH OR APPROVED EQUAL.
J A HIGH EFFICIENCY IRRIGATION SYSTEM SHALL BE INSTALLED FOR ALL ORNAMENTAL LANDSCAPE AREAS AND SHALL CONFORM TO THE CITY OF KELOWNA'S IRRIGATION STANDARDS IN BYLAW 7900.

LEGEND:

DECIDUOUS STREET TREE
LOW FLOWERING TREE
ORNAMENTAL SHRUBS, GRASSES & PERENNIALS
DETENTION SWALE
URBAN AGRICULTURE (145m2)
DECORATIVE C.I.P. CONCRETE PAVING
MAIN BUILDING ENTRANCE
LOADING DOCK ENTRANCE

ORNAMENTAL PLANT LIST:

TREES

Botanical Name	Common Name	Size	Root
Acer rubrum 'Armstrong'	Armstrong red maple	6cm Cal.	B&B
Cercidiphyllum japonicum	Katsura tree	6cm Cal.	B&B
Cornus kousa	Japanese dogwood	4cm Cal.	B&B
Prunus domestica	Italian prune plum tree	3cm Cal.	B&B

SHRUBS

Botanical Name	Common Name	Size	Root
Cornus stolonifera 'Farrow'	Arctic Fire dogwood	#03 Cont./1.2m O.C.	Potted
Mahonia aquifolium	Oregon grape	#03 Cont./1.2m O.C.	Potted
Rosa rugosa 'Hansa'	Hansa rose	#03 Cont./1.5m O.C.	Potted

PERENNIALS & BULBS

Botanical Name	Common Name	Size	Root
Allium aflatunense 'Purple Sensation'	Purple Sensation ornamental onion	Bulbs	Potted
Achillea millefolium 'Terracotta'	Terra Cotta common yarrow	#01 Cont./0.6m O.C.	Potted
Aruncus aethusifolius	Dwarf Korean goat's beard	#01 Cont./0.45m O.C.	Potted
Bergenia cordifolia 'Winter Glow'	Heartleaf bergenia	#01 Cont./0.45m O.C.	Potted
Coreopsis verticillata 'Zagreb'	Threadleaf coreopsis	#01 Cont./0.45m O.C.	Potted
Eupatorium dubium 'Little Joe'	Dwarf Joe-pye weed	#01 Cont./0.9m O.C.	Potted
Iris sibirica 'Butter & Sugar'	Yellow & White Siberian iris	#01 Cont./0.6m O.C.	Potted
Salvia nemorosa 'Caradonna'	Caradonna meadow sage	#01 Cont./0.6m O.C.	Potted
Perovskia atriplicifolia 'Little spire'	Little Spire Russian sage	#01 Cont./1.0m O.C.	Potted
Tulipa 'Princess Irene'	Princess Irene triumph tulip	Bulbs	Potted

GRASSES

Botanical Name	Common Name	Size	Root
Deschampsia flexuosa 'Aurea'	Crinkled hair grass	#01 Cont./0.6m O.C.	Potted
Miscanthus sinensis 'Gracillimus'	Maiden grass	#01 Cont./1.0m O.C.	Potted
Panicum virgatum 'Northwind'	Northwind switch grass	#01 Cont./0.45m O.C.	Potted
Sesleria autumnalis	Autumn moor rass	#01 Cont./0.45m O.C.	Potted
Sporobolus heterolepsis 'Tara'	Prairie dropseed	#01 Cont./0.75m O.C.	Potted

HERBS

Botanical Name	Common Name	Size	Root
Allium schoenoprasum	Chives	#01 Cont./0.3m O.C.	Potted
Anthriscus cerefolium	Chervil	#01 Cont./0.45m O.C.	Potted
Artemisia dracunculus	Tarragon	#01 Cont./0.6m O.C.	Potted
Melissa officianlis	Lemon balm	#01 Cont./0.3m O.C.	Potted
Petroselinum neapolitanum	Italian parsley	#01 Cont./0.3m O.C.	Potted
Rumex acetosa	Blood veined sorrel	#01 Cont./0.45m O.C.	Potted

EcoLock Self Storage
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t 250 868 9278

Design Consultant:

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175 Parfitt Way SW, Suite N160
Bainbridge Island, WA 98110
t 206 219 5365

Key Plan

N

Professional Seals

No.	Issue Description	YYYY-MM-DD
1	ISSUED FOR CONCEPT REVIEW	FEB 07/17
2	ISSUED FOR CONCEPT REVIEW	FEB 20/17
3	ISSUED FOR CONCEPT REVIEW	MAR 09/17
4	ISSUED FOR DEVELOPMENT PERMIT	MAR 17/17

No.	Revision Description	YYYY-MM-DD

Drawn by LP Reviewed by KN

Project No. 16-044

Sheet Title:

LANDSCAPE PLAN

SCALE: 1 : 200

Original drawing is 18x24. Do not scale contents of this drawing.

Sheet Number:

L-101

ATTACHMENT C
This forms part of application
TA17-0007
DP17-0073
Planner Initials AC
City of Kelowna
COMMUNITY PLANNING

EcoLock Self Storage

Comprehensive Development Permit Application to the City of Kelowna
17 March, 2017

PROJECT ADDRESS: 437 Bay Avenue, Kelowna, BC V1Y 7S3

LEGAL DESCRIPTION: Lot 1 and 2, DL 139, ODYD, Plan KAP68693

3/17/2017 12:11:47 PM

EcoLock Self Storage

437 Bay Avenue
Kelowna, BC, V1Y 7S3

Architect of Record:

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3 -1331 Ellis Street
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Key Plan

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01	DPA	2017-03-17

No.	Revision Description	YYYY-MM-DD

Drawn by BG Reviewed by DJA

Project No. 16032

Sheet Title:

COVER SHEET

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Sheet Number:

G-001

ecoLOCK SELF STORAGE

COLOUR & MATERIALS BOARD