
CITY OF KELOWNA
MEMORANDUM

ATTACHMENT A

This forms part of application

Z18-0002

Planner
Initials AC



Date: January 15, 2018
File No.: Z18-0002

To: Community Planning (AC)

From: Development Engineering Manager (JK)

Subject: 1471 St. Paul St.,

C4 to C7

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 Jason Angus

1. General

- a. The proposed Development triggers a traffic impact assessment. The applicant's transportation engineer shall contact the City's Transportation & Mobility group who will determine the terms of reference for the study. Recommendations from the Traffic Impact Analysis (TIA) will become requirements of rezoning.

2. Domestic Water and Fire Protection

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

3. Sanitary Sewer

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

4. Storm Drainage

- a. The developer must engage a consulting civil engineer to provide a storm water management plan for the site, which meets the requirements of the City Storm Water Management Policy and Design Manual. The storm water management plan must also include provision of lot grading plan, minimum basement elevation (MBE), if applicable, and recommendations for onsite drainage containment and disposal systems.
- b. On site storm drainage systems for the site will be reviewed and approved by Engineering when a site servicing design is submitted.



- c. There is a possibility of a high water table or surcharging of storm drains during major storm events. This should be considered in the design of the onsite system.

5. Road Improvements

- a. St. Paul St. fronting this development site is urbanized but the existing curb and sidewalk are in a deteriorated state. The existing driveway letdown will need to be removed and replaced with barrier curb and gutter and sidewalk. The upgrades to St. Paul St. that are required are curb, gutter, boulevard street trees, driveway letdown and sidewalk removal and reconstruction, as well as the re-location or adjustment of any existing utility appurtenances if required to accommodate the upgrading construction.
- b. The laneways fronting this development have already been upgraded to an asphalt standard therefore, the only upgrades that are required is the pavement widening and a storm drainage system.

6. Road Dedication and Subdivision Requirements

- a. By Registered plan to provide the following
 - i. Dedicate 0.8m width along the North-South full lane frontage
 - ii. Dedicate 1.6m width along the West-East full lane frontage
 - iii. Dedication of a south east corner cut to match the East side of the laneway is required unless proven truck movements show otherwise
 - iv. Grant statutory rights-of-way if required for utility services
 - v. Lot consolidation is required

7. Electric Power and Telecommunication Services

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

8. Design and Construction

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



examination of design drawings, it may be determined that rights-of-way are required for current or future needs

9. Servicing Agreements for Works and Services

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

10. Other Engineering Comments

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

11. Development Permit and Site Related Issues

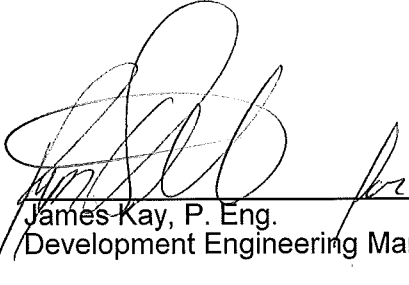
- a. Provide all necessary Statutory Rights-of-Way for any utility corridors as required.
- b. If any road dedication affects lands encumbered by a Utility right-of-way (such as Terasen, etc.) please obtain the approval of the utility prior to application for final subdivision approval. Any works required 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. Access to the development will be from the lane only.

12. Geotechnical Study

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

- v. Recommendations for items that should be included in a Restrictive Covenant.
- vi. Recommendations for roof drains, perimeter drains and septic tank effluent on the site.
- vii. Any items required in other sections of this document.

Additional geotechnical survey may be necessary for building foundations, etc



James Kay, P. Eng.
Development Engineering Manager

JA

ATTACHMENT		A
This forms part of application		
# Z18-0002		
Planner Initials	AC	 City of Kelowna COMMUNITY PLANNING

THE BROOKLYN - 1471 St. PAUL STREET - CONDOMINIUM DEVELOPMENT

MISSION GROUP DEVELOPMENT

Consultants



View From St. Paul Street

Project Statistics

STREET ADDRESS: 1471 St. Paul Street, Kelowna, B.C.
LEGAL DESCRIPTION: LOTS 27 TO 29, PLAN 800; LOT A, PLAN 18789; AND LOTS 2 AND 3, PLAN 2127; ALL OF DISTRICT LOT 139, O.D.Y.D.
ZONING: C7
SITE AREA: 1955.50 sm
SITE COVERAGE:
BUILDING HEIGHT: 74.9m (Top of Storage Level 25)
SETBACKS

	BASE	TOWER
WEST (FRONT)	0.0m	3.07m
SOUTH (LANE)	0.8m	10.05m
EAST (LANE)	0.8m	13.38m
NORTH	0.0m	5.88m

Date
2018 04 05

Issue / Revisions
DP Application

Revisions

FSR CALCULATIONS
 Net Floor Area
 Residential L6-21 (16 floors) 613.9x16 = 9822.4sm
 Residential L22-24 (3floors) 554.6x03 = 1663.8sm
 Commercial L1 257.4 = 257.4sm
Total 11743.6sm

FAR 6.0

Unit Statistics

1 Bedroom	64
1 Bedroom/Den	32
2 Bedroom	73
2 Bedroom/Den	09
Total	178

Parking

	Required	Provided
Commercial	1.3x3=3.9	4 Stalls
Residential	178x1	178 Stalls
Visitor	178/7=25.4	26 Stalls
Total		208 Stalls

Bicycle Parking

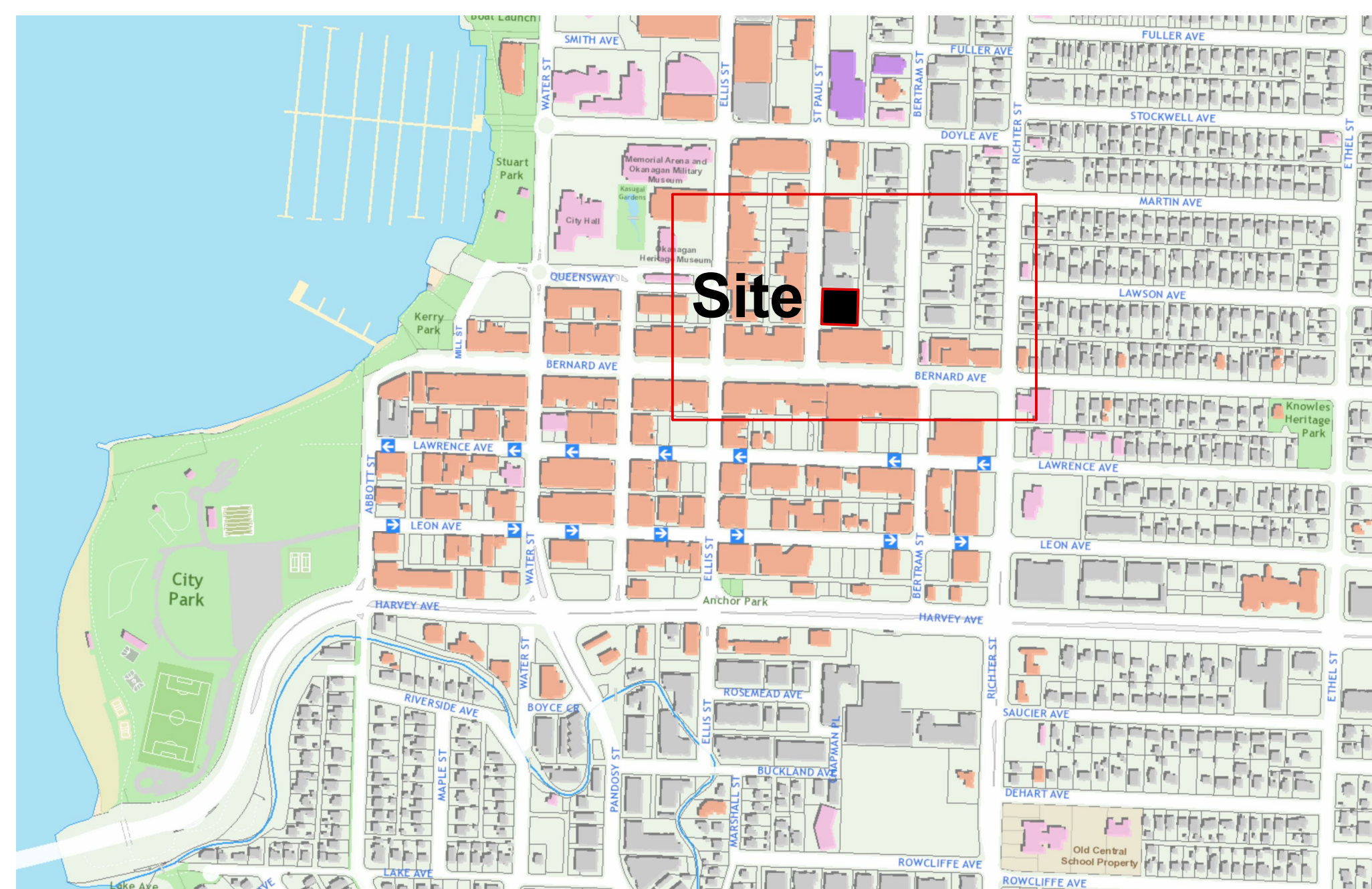
	Required	Provided
Residential	Class 1 178x0.5=89	96
	Class 2 178x.01=18	
Commercial	Class 1 0.2/100ms=0.51	1
	Class 2 0.6/100ms=1.54	3

ATTACHMENT B

This forms part of application
Z18-0002

Planner Initials AC

Seal



Overall Context



Neighbourhood Context

Project Team

Civil
 Aplin Martin
 454 Leon Ave.
 Kelowna BC, V1Y 6J3
 (250) 215-9425

Structural
 Glotman Simpson
 1661 West 5th Ave
 Vancouver BC, V6J 1N5
 (604) 734-8822

Mechanical
 Reinbold Engineering
 201 - 1965 West 4th Ave
 Vancouver BC, V6J 1M8

Electrical
 Gager Electrical
 20689 56th Ave
 Langley, BC, V3A 3Y9
 (778) 277-2225

Geotechnical
 Tetra Tech
 150-1715 Dickson Ave.
 Kelowna, BC, V1Y 9G5
 (250) 862-4832

Landscape
 PLW Partnership Landscape Architects Inc.
 5th Floor, East Asiatic House
 1201 West Pender St. V6E 2V2
 (604) 688-6111

LEED / Energy Modeling
 Reinbold Engineering
 301-1664 Richter Street
 Kelowna BC, V1Y 8N3
 (250) 763-1049

ED / Energy Modeling
 Reinbold Engineering
 301-1664 Richter Street
 Kelowna BC, V1Y 8N3
 (250) 763-1049

Drawing List

A-001	Data & Context
A-002	Survey
A-101	Site, Level 1, Level 2
A-102	Level 3, Level 4
A-103	Level 5, Level 6
A-104	Levels 7- Roof
A-201	Section
A-202	Elevations
A-203	Elevations
A-301	Sketches
L1.00	Cover Sheet
L1.01	Tree Management Plan
L1.02	Notes and Legends
L1.03	All Levels Materials, Layout and Grading Plan
L1.04	All Levels Planting Plan
L1.05	All Levels Irrigation Plan
L1.06	All Levels Water Conservation Plan

NSDA
ARCHITECTS

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 www.nsda.bc.ca

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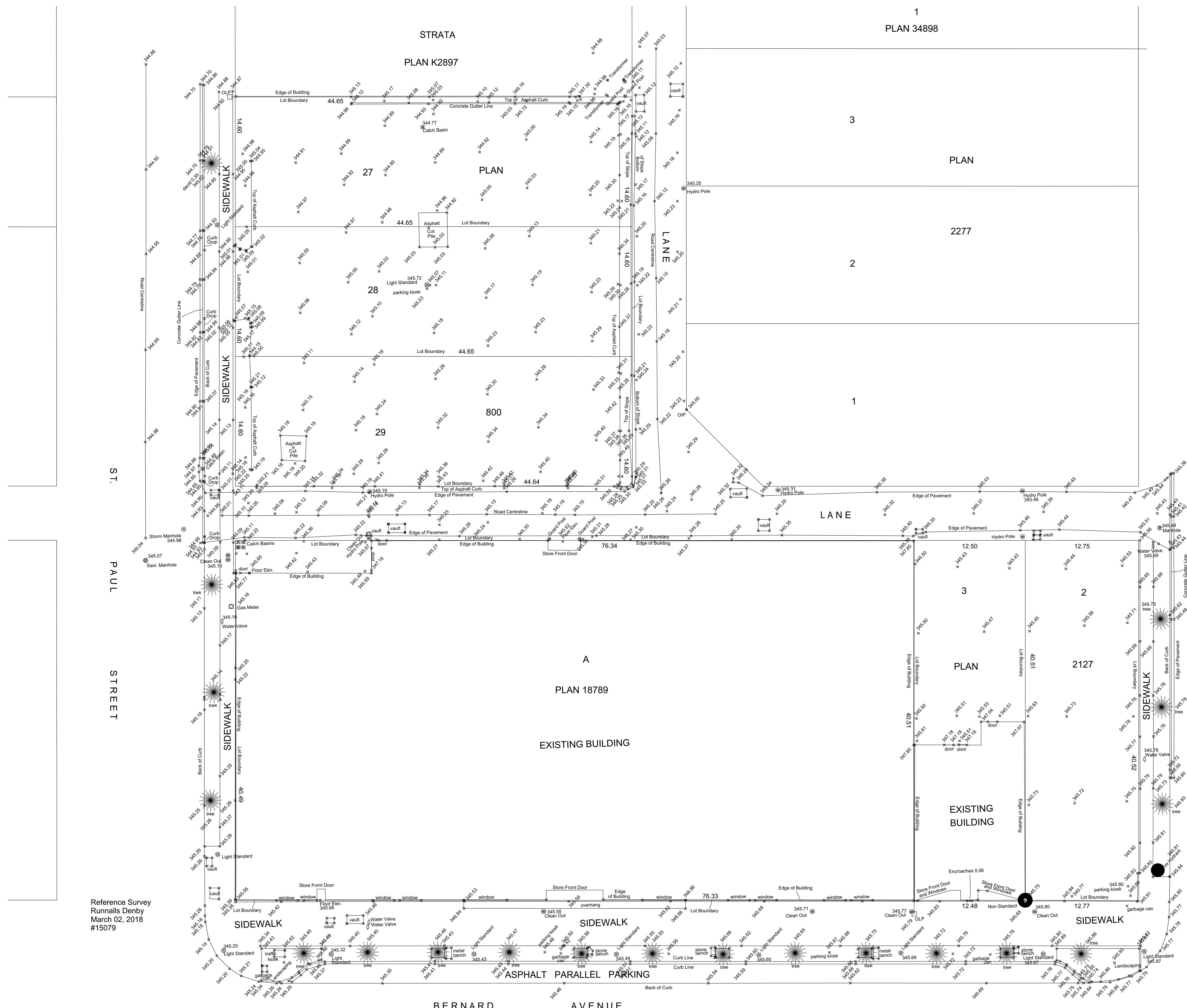
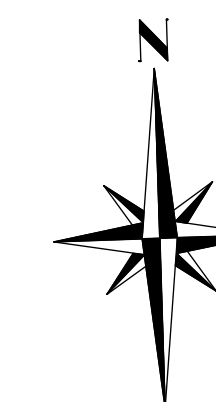
Project
St. Paul St Tower
 1471 St Paul Street
 Kelowna, B.C.

Sheet Title
36x24 Data Cover

Project Number
18004

Scale

Sheet Number
A-001



Reference Survey
Runnalls Denby
March 02, 2018
#15079

Survey
Scale: 1:200

ST. PAUL STREET

BERTRAM STREET

BERNARD AVENUE

1
PLAN 34898

STRATA
PLAN K2897

PLAN
2277

PLAN
800

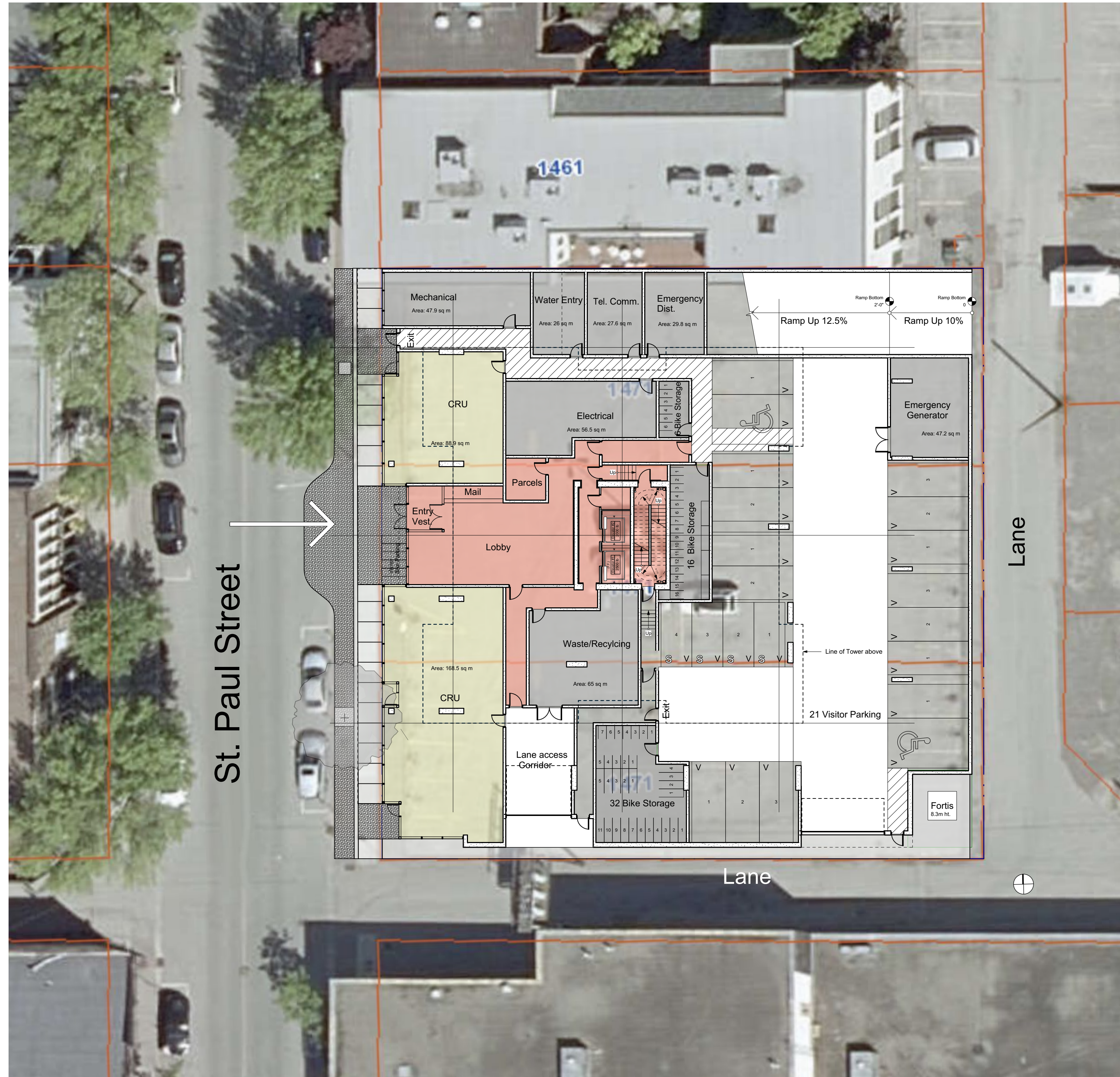
A
PLAN 18789

EXISTING BUILDING

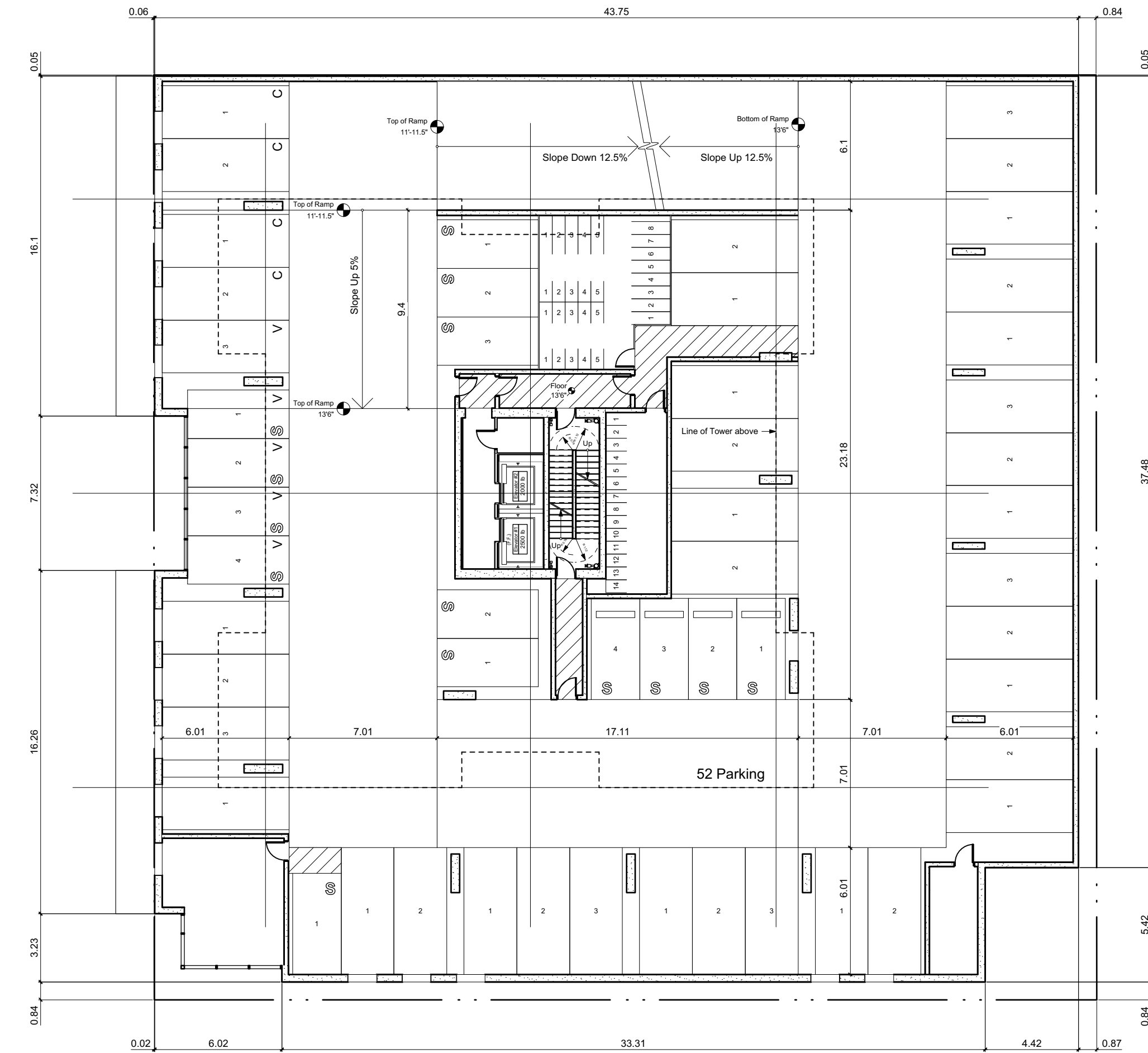
PLAN
2127

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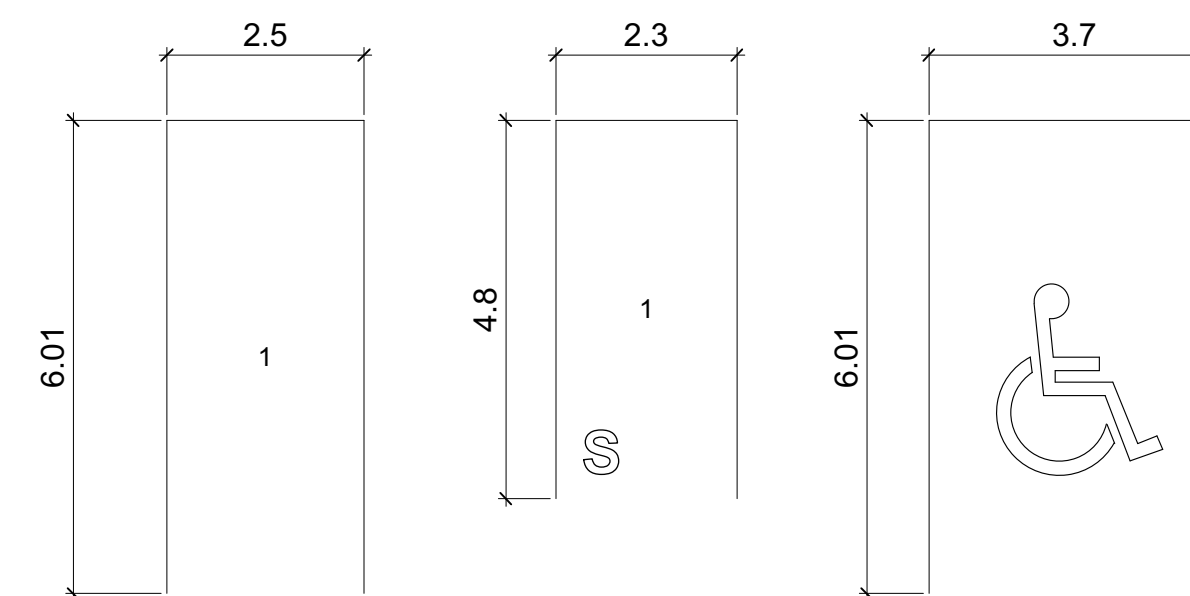
ASPHALT PARALLEL PARKING



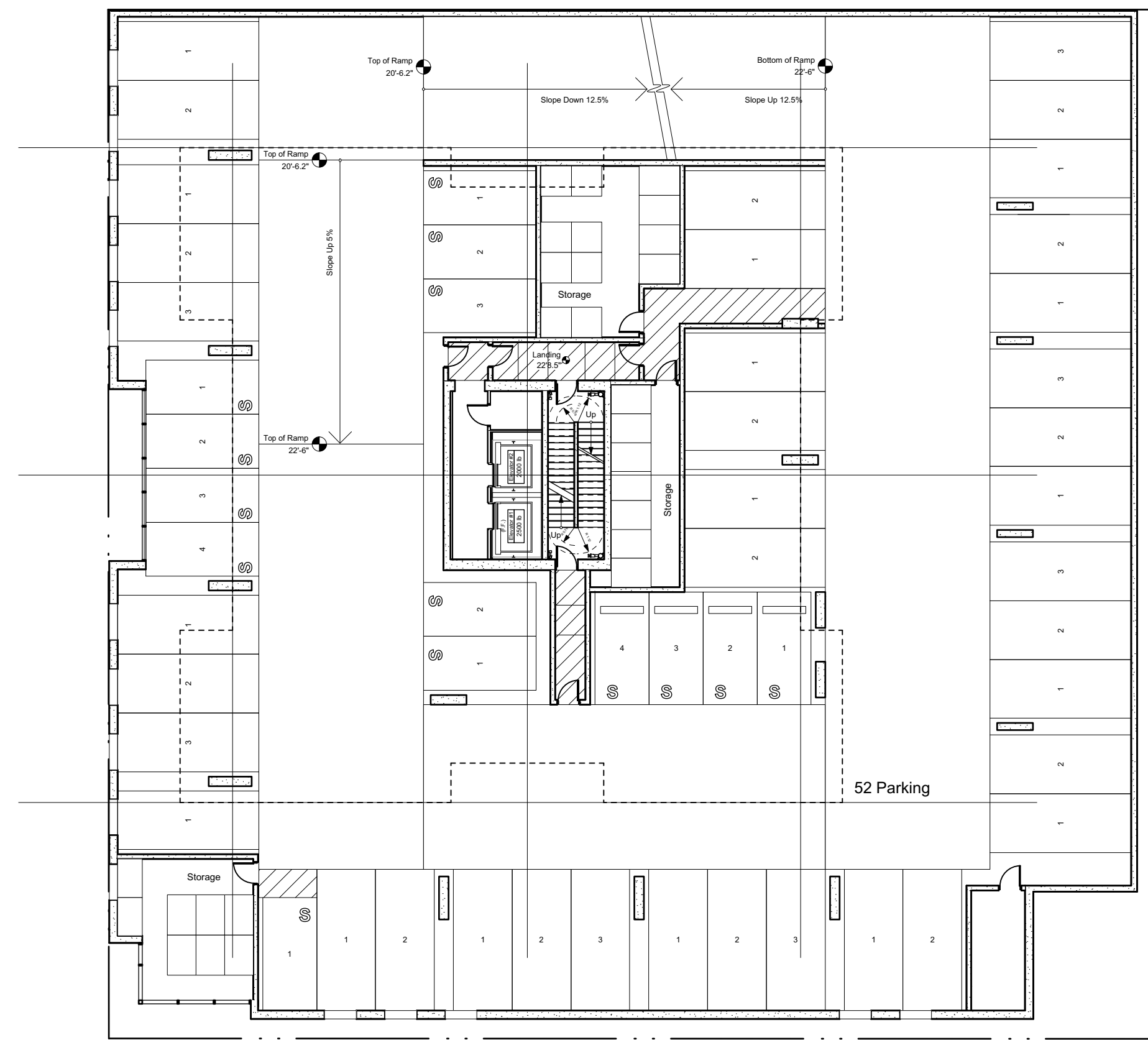
Site & Level 1 Plan
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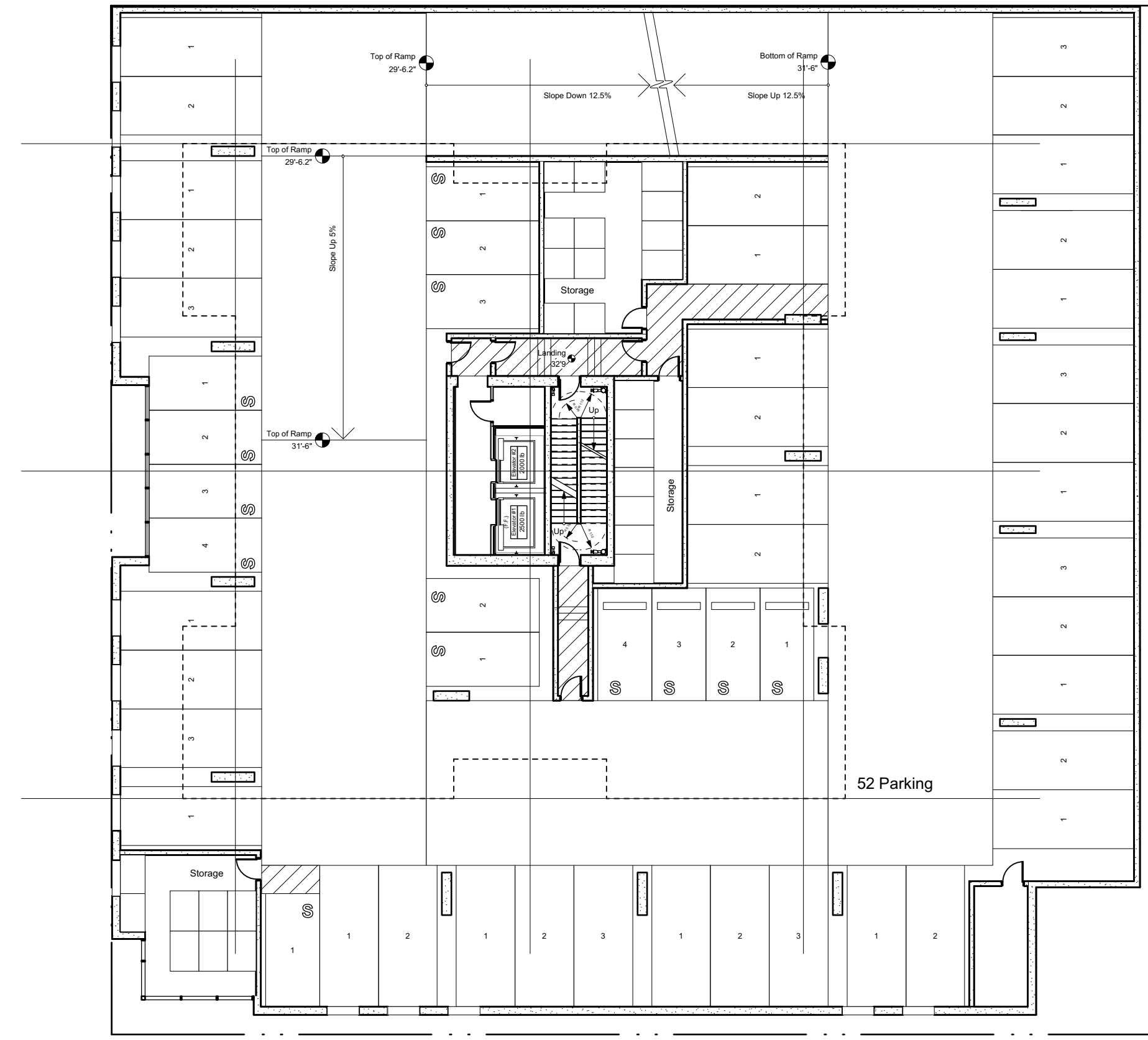
Level 2
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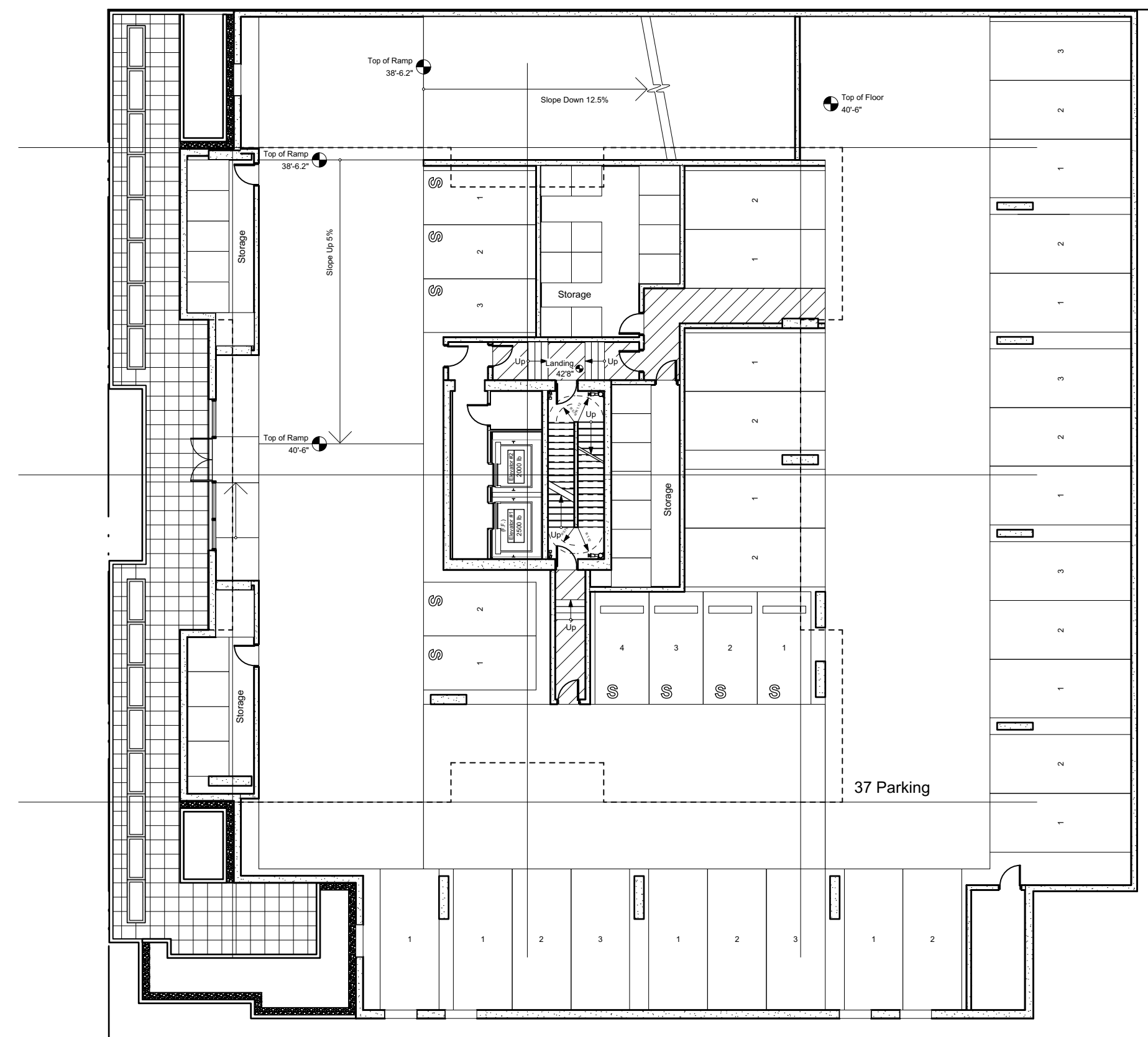
Typical Parking Stalls
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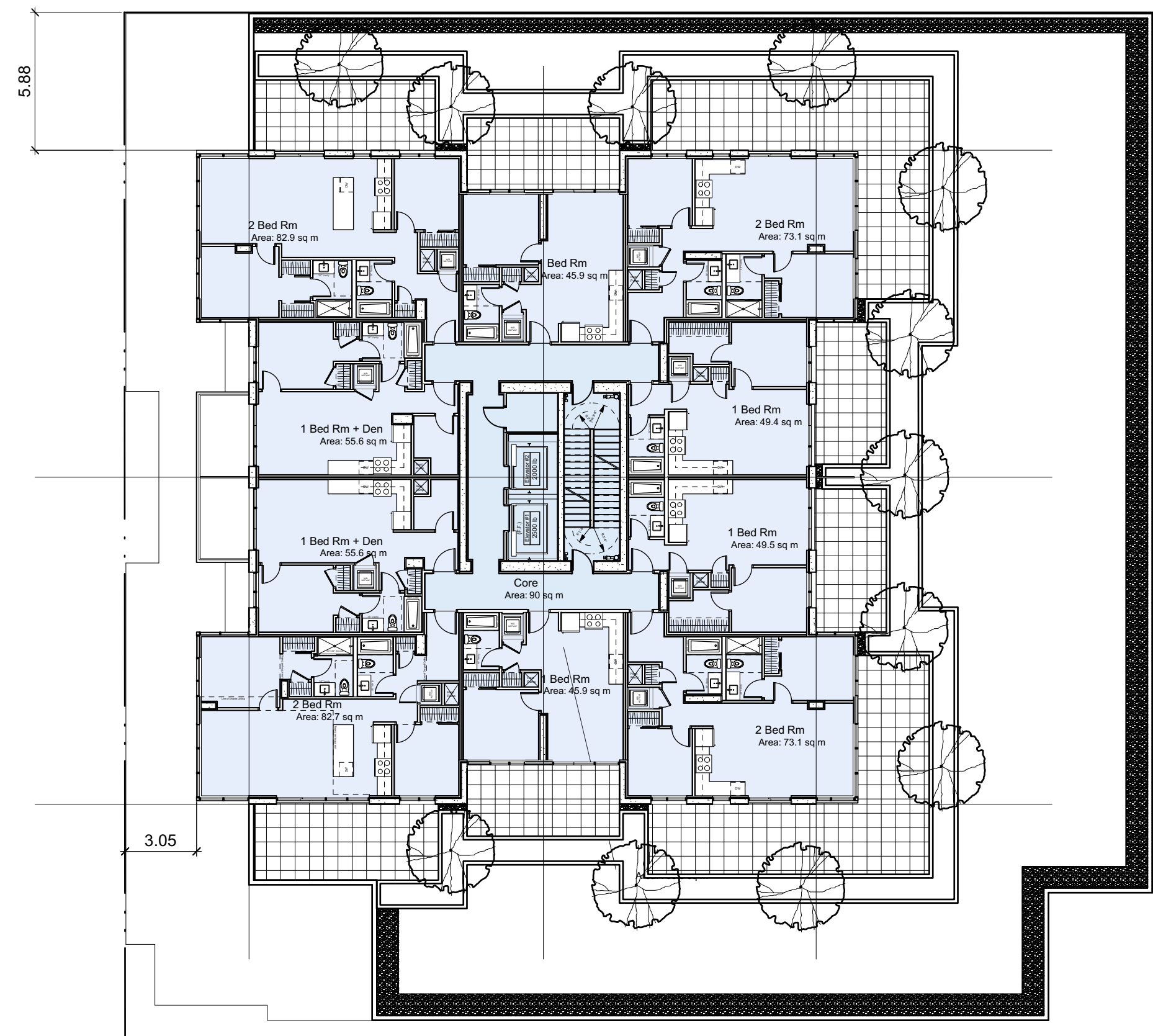
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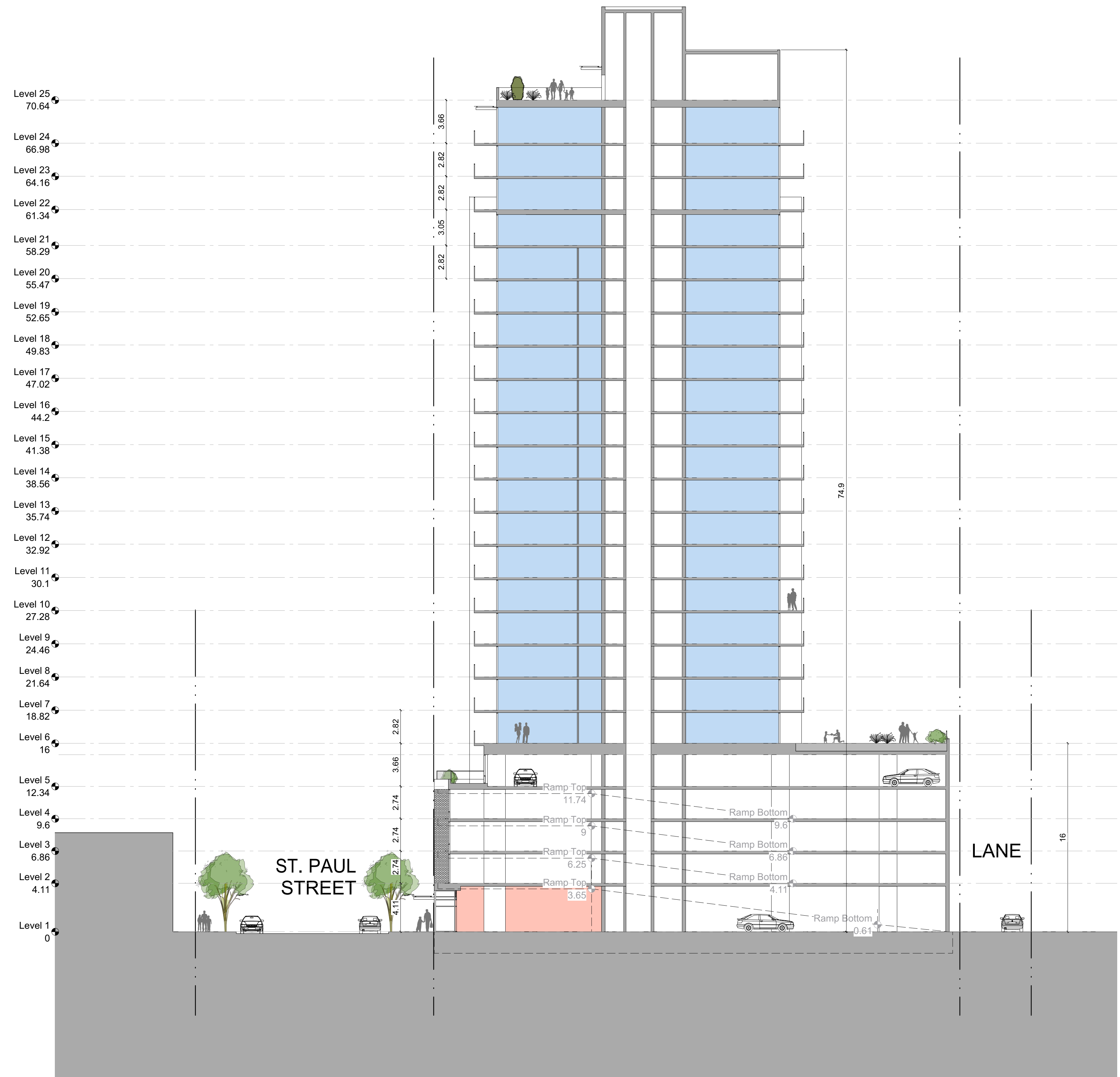
Level 4
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Level 5
Scale: 1:200



Level 6
Scale: 1:200



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Project
St. Paul St Tower
1471 St Paul Street
Kelowna, B.C.

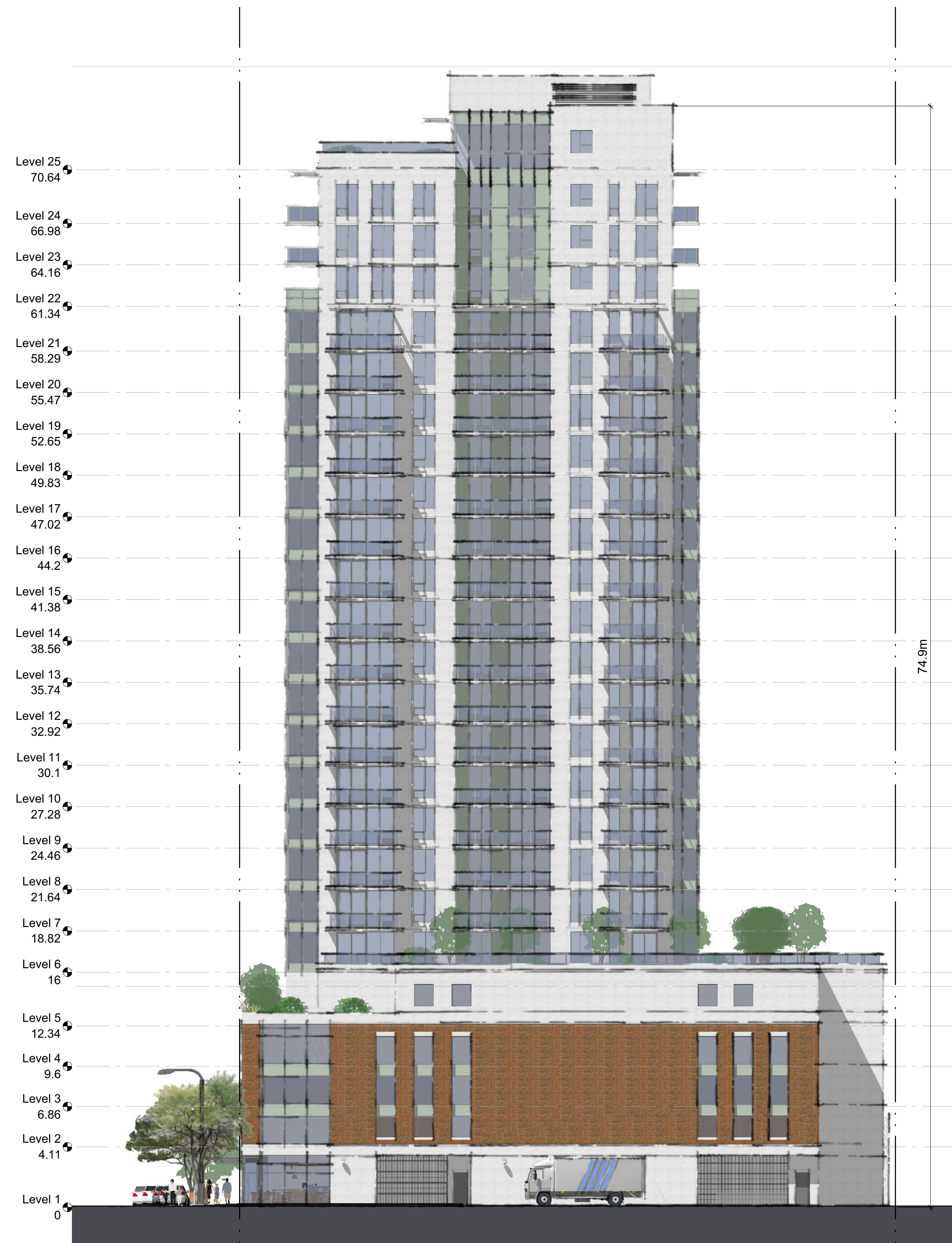
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Project Number
18004

Scale

Sheet Number
A-201

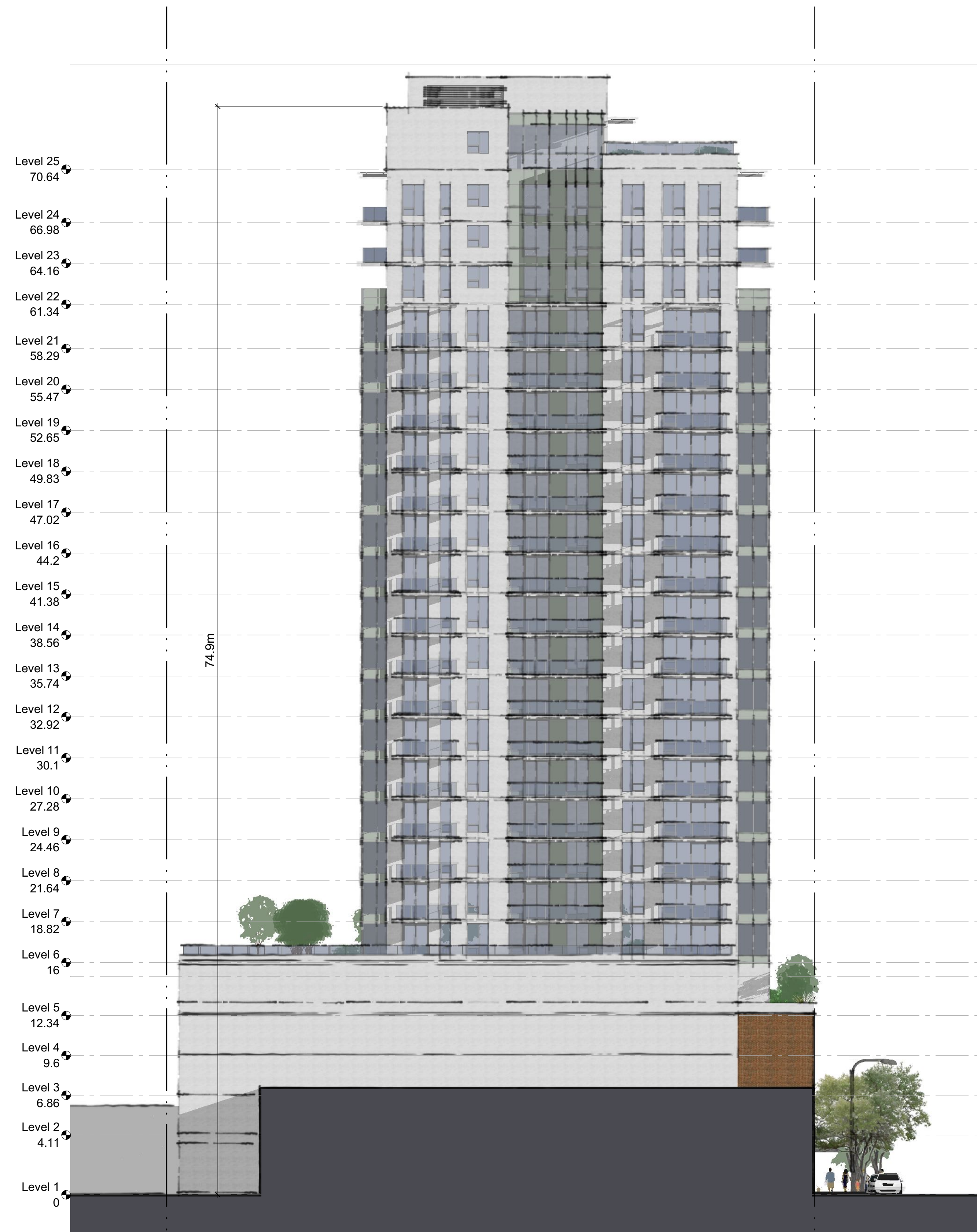
Section
Scale: 1:200



South (Lane) Elevation
Scale: 1:200



West (Street) Elevation
Scale: 1:200



North (Left) Elevation
Scale: 1:200



East (Lane) Elevation
Scale: 1:200



View From St. Paul Street Looking North



View Looking North East



View Looking North East



View Looking North East

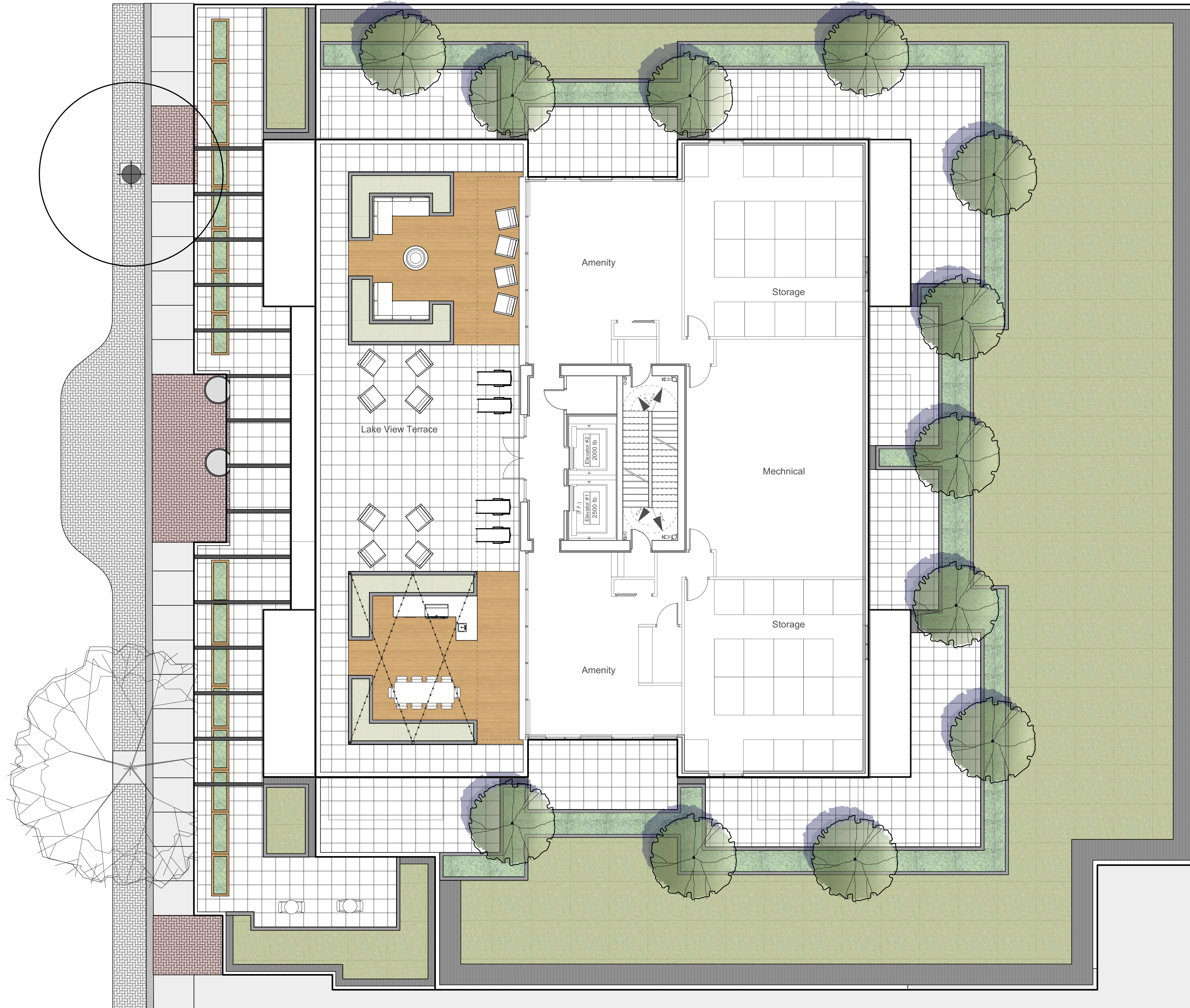
REVISIONS AND ISSUES		
NO.	DATE	DESCRIPTION
1	2018.04.04	Issued for DP

PROJECT NAME
ST PAUL STREET TOWER

CIVIC ADDRESS
1471 St Paul Street

DRAWING CONTENTS

L1.00	COVER SHEET	
L0.01	TREE MANAGEMENT PLAN	
L1.00	NOTES AND LEGENDS	
L1.01	ALL LEVELS	MATERIALS, LAYOUT AND GRADING PLAN
L2.01	ALL LEVELS	PLANTING PLAN
L3.01	ALL LEVELS	IRRIGATION PLAN
L4.01	ALL LEVELS	WATER CONSERVATION PLAN

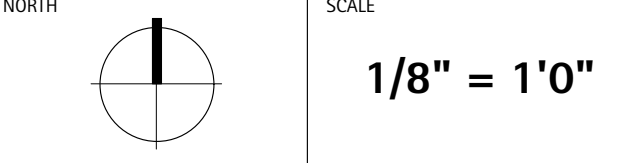


PROJECT
BROOKLYN
ST. PAUL STREET TOWER

ADDRESS
1471 ST. PAUL STREET
KELOWNA, B.C.

DRAWING TITLE
COVER SHEET

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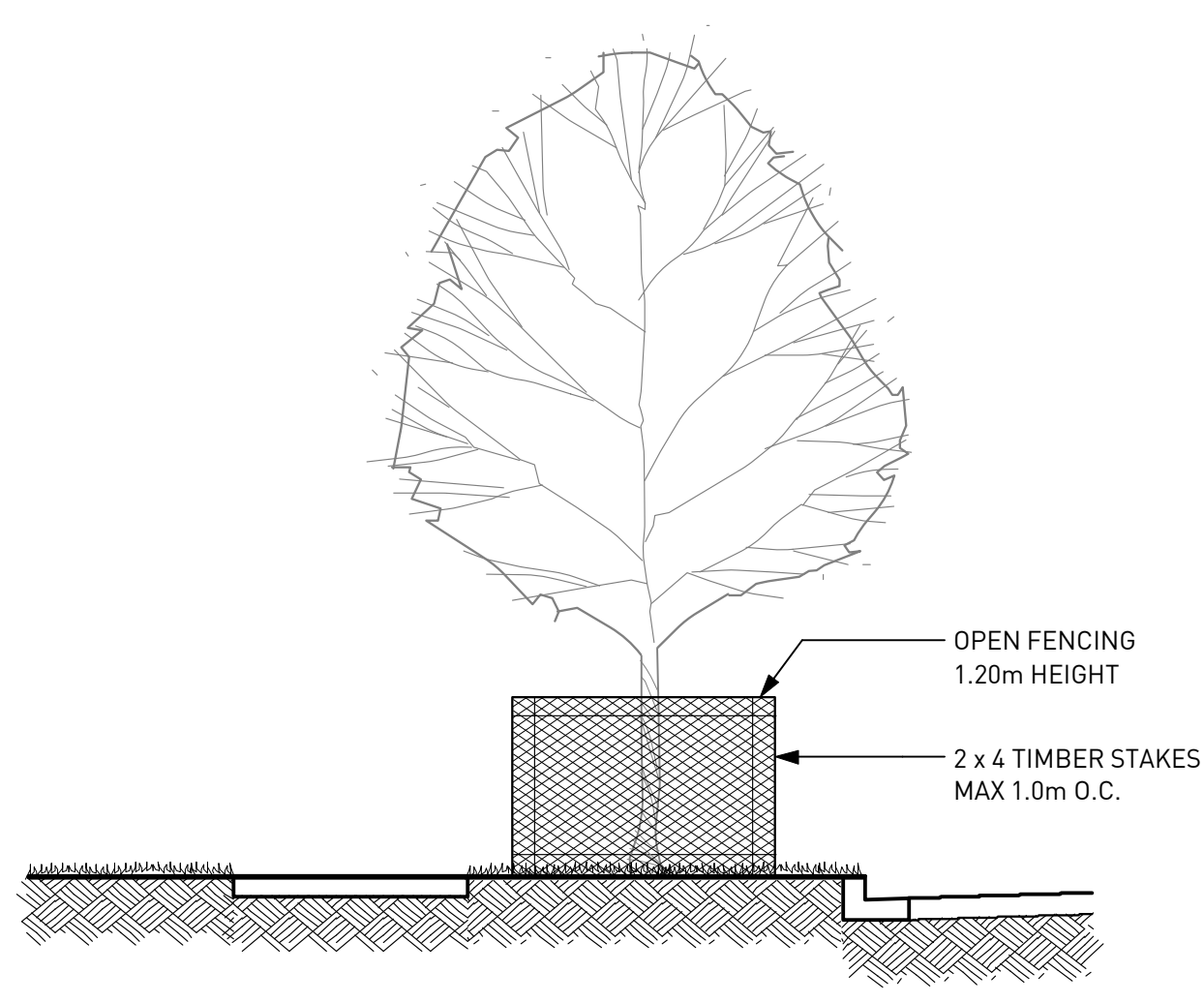
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DATE	22 MARCH 2018
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PLOTTED	18-4-4
DRAWN	TL/PL
REVIEWED	

DRAWING
L1.00

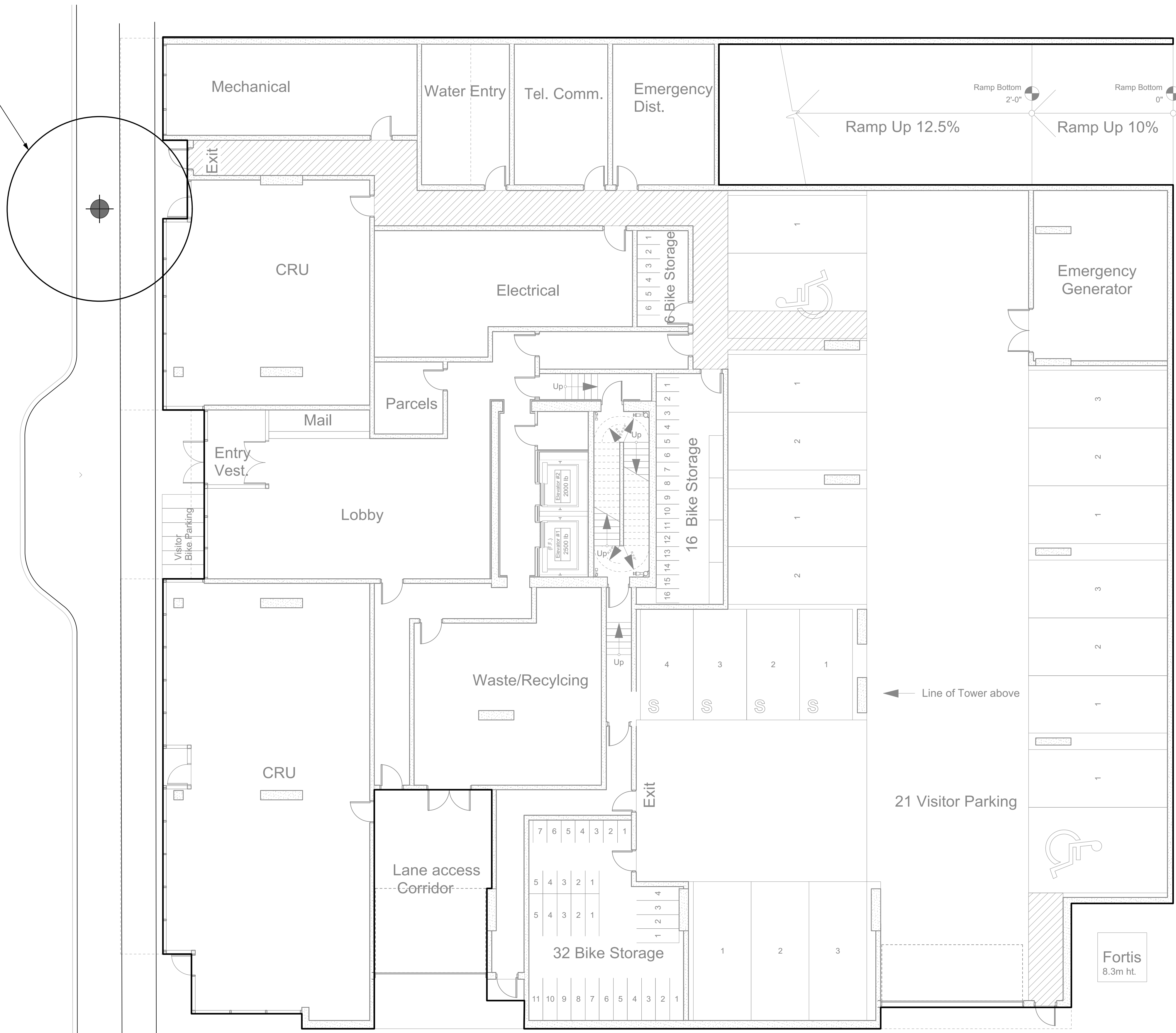
TREE TO BE RETAINED SUBJECT TO ARBORIST AND CONSTRUCTION REVIEW

TREE PROTECTION GENERAL NOTES

- A. EXCAVATION AROUND TREES**
- EXCAVATION WITHIN DRIP LINE OF TREES ONLY WHERE INDICATED ON PLANS AND AS DIRECTED BY THE CONSULTANT.
 - DURING ANY EXCAVATION WITHIN THE DRIP LINE OF A TREE THE CONTRACTOR SHALL EXCAVATE AROUND TREE ROOTS AS DIRECTED BY THE CONSULTANT. DO NOT CUT TREE ROOTS UNLESS DIRECTED BY THE CONSULTANT.
 - TREES AND OTHER DESIRABLE VEGETATION TO BE TOTALLY FENCED BY 1.8M (6'-0") HIGH SEMI-PERMANENT CHAIN-LINK FENCING. FENCING TO BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- B. EXCAVATION FOR NEW CONSTRUCTION WITHIN THE DRIP LINES OF TREES**
- HAND EXCAVATE TO MINIMIZE DAMAGE TO ROOT SYSTEMS.
 - USE NARROW TINE SPADING FORKS TO PROBE AND COMB SOIL TO EXPOSE ROOTS.
 - RELOCATE ROOTS INTO BACKFILL AREAS WHENEVER POSSIBLE. IF LARGE MAIN LATERAL ROOTS ARE ENCOUNTERED, EXPOSE BEYOND EXCAVATION LIMITS AS REQUIRED TO BEND AND RELOCATE WITHOUT BREAKING.
- C. UTILITY TRENCHING WITHIN THE DRIP LINES OF TREES**
- TUNNEL UNDER AND AROUND ROOTS BY HAND DIGGING.
 - DO NOT CUT MAIN LATERAL ROOTS.
 - CUTTING OF SMALLER ROOTS THAT INTERFERE WITH INSTALLATION OF NEW WORK SHALL BE DONE WITH CLEAN SHARP TREE PRUNING TOOLS.
 - ROOTS THAT ARE ENCOUNTERED IMMEDIATELY ADJACENT TO THE LOCATION OF NEW CONSTRUCTION AND ARE TOO DIFFICULT TO RELOCATE SHALL BE CUT 15cm (6") BACK FROM NEW CONSTRUCTION. USE CLEAN SHARP TREE PRUNING TOOLS.
- D. PROTECTION OF EXPOSED ROOTS**
- DO NOT ALLOW EXPOSED ROOTS TO DRY OUT PRIOR TO PLACEMENT OF PERMANENT COVER. PROVIDE ONE OF THE FOLLOWING TEMPORARY REMEDIAL MEASURES:
 - PROVIDE TEMPORARY EARTH COVER. MAINTAIN MOISTURE.
 - PACK WITH WET PEAT MOSS. MAINTAIN MOISTURE.
 - PACK WITH FOUR LAYERS OF WET UNTREATED BURLAP. MAINTAIN MOISTURE.
 - TEMPORARILY SUPPORT AND PROTECT EXPOSED ROOTS FROM DAMAGE UNTIL PERMANENTLY RELOCATED AND COVERED WITH BACKFILL.
 - WATER PUDDLE BACKFILL AROUND ROOTS TO ELIMINATE VOIDS AND AIR POCKETS.



1 TREE PROTECTION BARRIER FENCING DETAIL
NTS



REVISIONS AND ISSUES

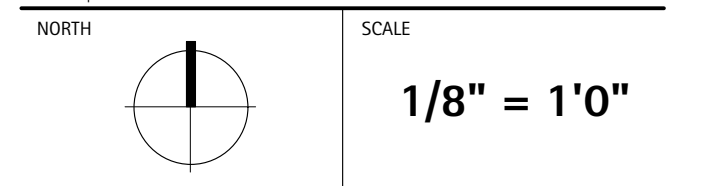
NO.	DATE	DESCRIPTION
1	2018.04.04	Issued for DP

BROOKLYN ST. PAUL STREET TOWER

ADDRESS
1471 ST. PAUL STREET
KELOWNA, B.C.

TREE MANAGEMENT PLAN

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PROJECT NO.	
DATE	22 MARCH 2018
FILE NAME	18033 PLAN.vwx
PLOTTED	18-4-4
DRAWN	TL/PL
REVIEWED	


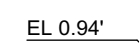
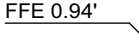
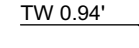
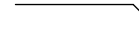
L0.01

LAYOUT AND MATERIALS GENERAL NOTES

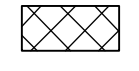


- DO NOT SCALE DRAWING. LAYOUT AS PER DIMENSIONS NOTED ON LANDSCAPE PLANS. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE.
- LANDSCAPE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND ENGINEERING DRAWINGS. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE.
- VERIFY ALL DIMENSIONS WITH FIELD CONDITIONS. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE.
- REFERENCE CIVIL ENGINEER'S DRAWINGS FOR LAYOUT OF ROAD CURBS AND GUTTERS.


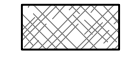

HARDSCAPE LEGEND	
KEY	DESCRIPTION
	CIP Concrete Curb As per Civil.
	Landscape Wall Planter

LIGHTING LEGEND	
KEY	DESCRIPTION
	Wall Light
	Catenary Lighting

GRADING LEGEND	
	Existing Elevation
	Proposed Elevation
	Finished Floor Elevation
	Proposed Top of Wall Elevation
	Proposed Bottom of Wall Elevation

NOTE: CONFIRM DRAIN LOCATIONS WITH MECHANICAL, CIVIL AND ARCH DRAWINGS. REPORT ANY DISCREPANCIES.

IRRIGATION LEGEND	
	Drip Irrigation
	Sleeves
	Water Stub Outs, schematic only.








WATER CONSERVATION LEGEND	
	High Hydrozone
	Medium Hydrozone
	Low Hydrozone








PLANTING GENERAL NOTES

- ALL PLANTS ARE TO CONFORM TO THE STANDARD SPECIFIED IN THE LATEST EDITION OF THE BC LANDSCAPE STANDARD. THE STANDARD IS PUBLISHED BY THE BC SOCIETY OF LANDSCAPE ARCHITECTS AND BC LANDSCAPE AND NURSERY ASSOCIATION.
- SEARCH AREA FOR PLANT MATERIAL IS TO INCLUDE ALL OF WESTERN NORTH AMERICA.
- PLANT MATERIAL SIZES SPECIFIED IN THE PLANT LIST ARE THE MINIMUM ACCEPTABLE SIZES FOR MATERIAL SUPPLIED FOR THIS PROJECT.
- PLANTS WILL BE WELL ESTABLISHED AND UNIFORM IN SHAPE.
- PLANTS WILL BE NUSERY GROWN UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL PROVIDE A GROWING MEDIUM ANALYSIS FOR REVIEW BY THE CONSULTANT AS PER SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. GROWING MEDIUM SUPPLIED TO THE SITE OR PLACED ON SITE PRIOR TO REVIEW BY THE CONSULTANT WILL BE REJECTED.
- CONTRACTOR TO CONFIRM PLANT QUANTITIES ON DRAWING CORRESPOND TO THOSE INDICATED ON THE PLANT LIST. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE.
- PLANT LIST IS TO BE READ IN CONJUNCTION WITH SPECIFICATIONS.
- PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR IS TO CONFIRM THE AVAILABILITY OF PLANT MATERIAL AS PER SPECIFICATIONS. PLANT SUBSTITUTIONS NOT CONFIRMED WITH THE CONSULTANT WILL BE REJECTED.

DESIGN BUILD IRRIGATION SYSTEM GENERAL NOTES

- DESIGN BUILD IRRIGATION DRAWINGS TO BE READ IN CONJUNCTION WITH PLANTING PLANS.
- AUTOMATIC IRRIGATION SYSTEM TO BE PROVIDED AS "DESIGN BUILD". REFER TO SPECIFICATIONS FOR DESIGN AND SUBMISSION REQUIREMENTS.
- PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR TO PROVIDE IRRIGATION DESIGN DRAWINGS FOR CONSULTANT REVIEW AS PER SPECIFICATIONS. IRRIGATION INSTALLED PRIOR TO THE REVIEW OF DESIGN BUILD DRAWINGS BY THE CONSULTANT WILL BE REJECTED.
- LOCATION OF IRRIGATION SLEEVES NOTED ON LANDSCAPE DRAWINGS ARE SCHEMATIC. PRIOR TO THE START OF PROJECT CONSTRUCTION CONTRACTOR TO COORDINATE IRRIGATION SLEEVES UNDER PAVED AREAS AND THROUGH WALLS WITH GENERAL CONTRACTOR. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE. FINAL SLEEVE LOCATIONS ARE TO BE RECORDED ON THE AS-BUILT IRRIGATION DRAWINGS BY THE CONTRACTOR AS PER SPECIFICATIONS.
- PRIOR TO THE START OF PROJECT CONSTRUCTION CONTRACTOR TO COORDINATE CONDUIT RUNS, SLEEVING AND MOUNTING LOCATION FOR RAIN SENSOR AS PER SPECIFICATIONS WITH GENERAL CONTRACTOR. REPORT ANY DISCREPANCIES TO CONSULTANT FOR REVIEW AND RESPONSE. FINAL RAIN SENSOR LOCATION IS TO BE RECORDED ON THE AS-BUILT IRRIGATION DRAWINGS BY THE CONTRACTOR AS PER SPECIFICATIONS.
- IRRIGATION STUB-OUT LOCATIONS NOTED ON LANDSCAPE DRAWINGS ARE SCHEMATIC AND FOR REFERENCE ONLY. CONTRACTOR TO COORDINATE CONNECTION TO WATER SUPPLY WITH THE MECHANICAL CONTRACTOR.
- UNLESS OTHERWISE INDICATED THE IRRIGATION CONTROLLER TO BE LOCATED IN BUILDING MECHANICAL ROOM AS PER SPECIFICATIONS. FOR CONTROLLER LOCATION IN MECHANICAL ROOM, .
- CONTRACTOR TO COORDINATE CONTROLLER CONNECTION TO ELECTRICAL SUPPLY WITH ELECTRICAL CONTRACTOR. .

SITE FURNISHING LEGEND	
KEY	DESCRIPTION
	Metal Planter Boxes
	Outdoor Furniture
	Fire Pit
	BBQ
	Harvest Table
	Moveable Planters
	Steel Arbour

PAVING LEGEND	
KEY	DESCRIPTION
	Concrete Paving
	Special Unit Pavers
	Unit Pavers
	Concrete Aggregate
	Hydrapressed Patio Paver
	Granular Maintenance Strip
	Composite Wood Decking

Plant List						
18033 Brooklyn - St. Paul Street						
ID	Qty	Botanical Name	Common Name	Scheduled Size	Spacing	Remarks
Trees						
Apla	1	Acer platanoides	Norway Maple			
AAL	7	Amelanchier alnifolia	Saskatoon Serviceberry	3.0 m ht. [9'-0" ht.]	As Shown	B&B, Multi-stemmed, dense tree, nursery grown.
FPC	1	Fraxinus pennsylvanica 'Cimmzon'	Cimmzon Green Ash	8 cm cal. [3" cal.]	As Shown	B&B, Specimens
Sivo	5	Syringa reticulata 'Ivory Silk'	Ivory Silk Tree Lilac			
Shrubs						
TXM	56	Taxus x media 'H.M.Eddie'	H.M.Eddie Yew	1.2m	40 cm [16"]	Well established, dense hedging plant / B & B
YFL	4294	Yucca filamentosa	Adam's Needle	#1 pot	75cm [30"]	Well established
Ground Cover						
Perennials						
APP	4294	Artemisia ponicca 'Powis Castle'	Wormwood 'Powis Castle'	#1 pot	30 cm [12"]	Well established, nursery grown
LAA	213	Lavandula angustifolia	True Lavender	#1 pot	45 cm [18"]	Well established
LOF	4294	Lavandula officinalis	Lavender	#1 pot	30cm [12"]	Well established
PAT	4294	Perovskia atriplicifolia	Russian Sage	#1 pot	45 cm [18"]	Well established
SAO	4294	Salvia officinalis	Garden Sage	#1 pot	30cm [12"]	Well established
SSR	220	Sedum spurium	Stonecrop	#1 pot	38 cm [15"]	Well established
Ornamental Grasses						
FOG	4542	Festuca glauca 'Elijah Blue'	Elijah's Blue Fescue	#1 pot	38 cm [15"]	Well established
Vines						
VLC	160	Vitis labrusca 'Concord'	Concord Grape	#2 pot	As Shown	Staked, full development
Aquatic Plants						
Ferns						
Bulbs						



PWL Partnership Landscape Architects Inc
5th Floor, East Alamo House
1201 West Pender Street
Vancouver BC Canada V6E 2V2
www.pwlpartnership.com
T 604.688.8111
F 604.688.8112

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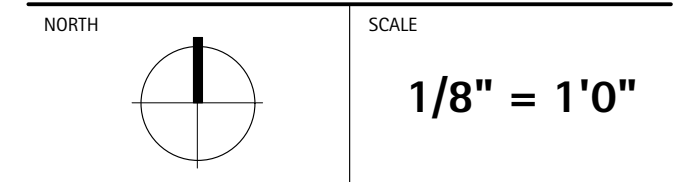
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ADDRESS
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KELOWNA, B.C.

DRAWING TITLE

NOTES AND LEGENDS

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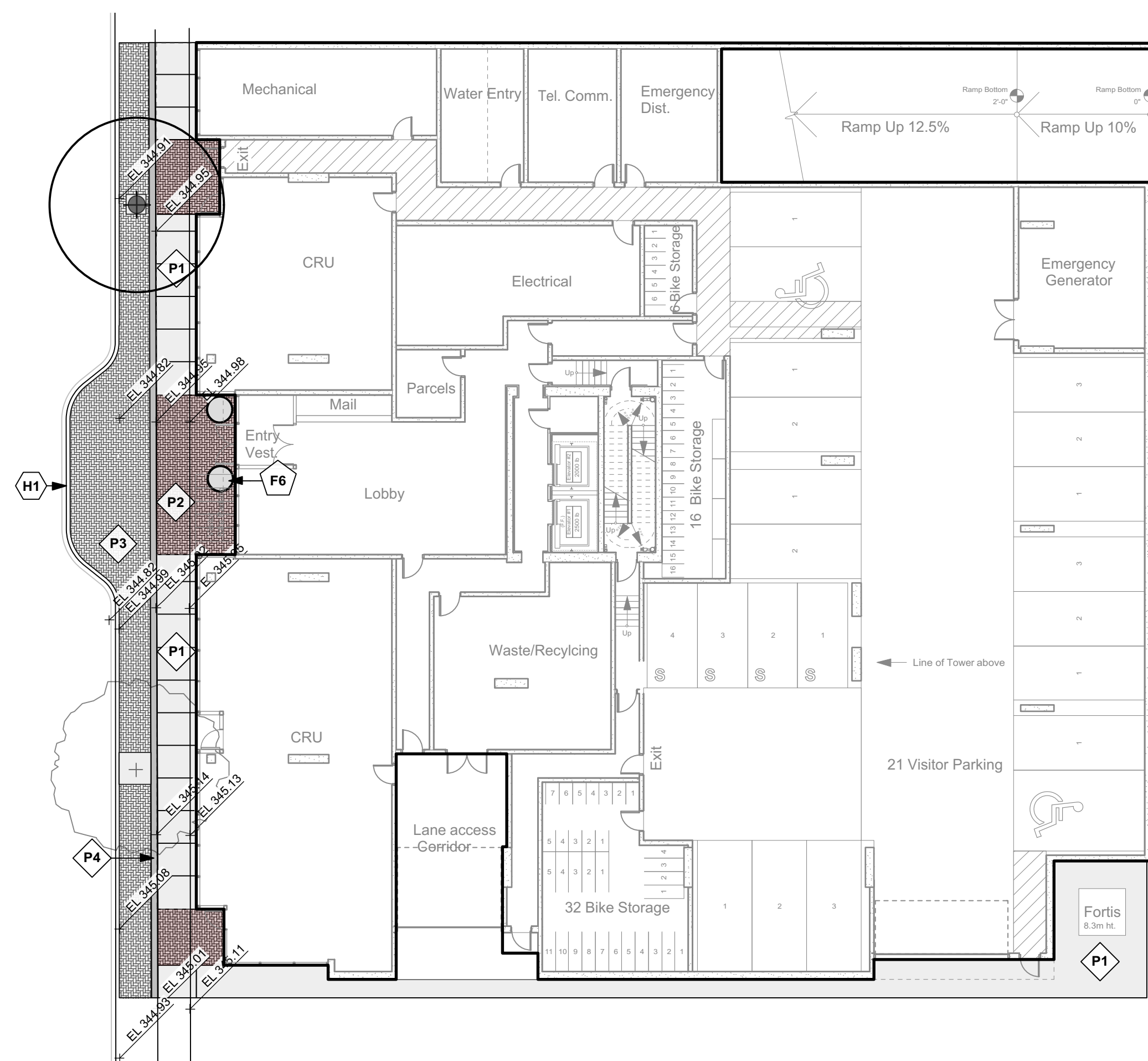


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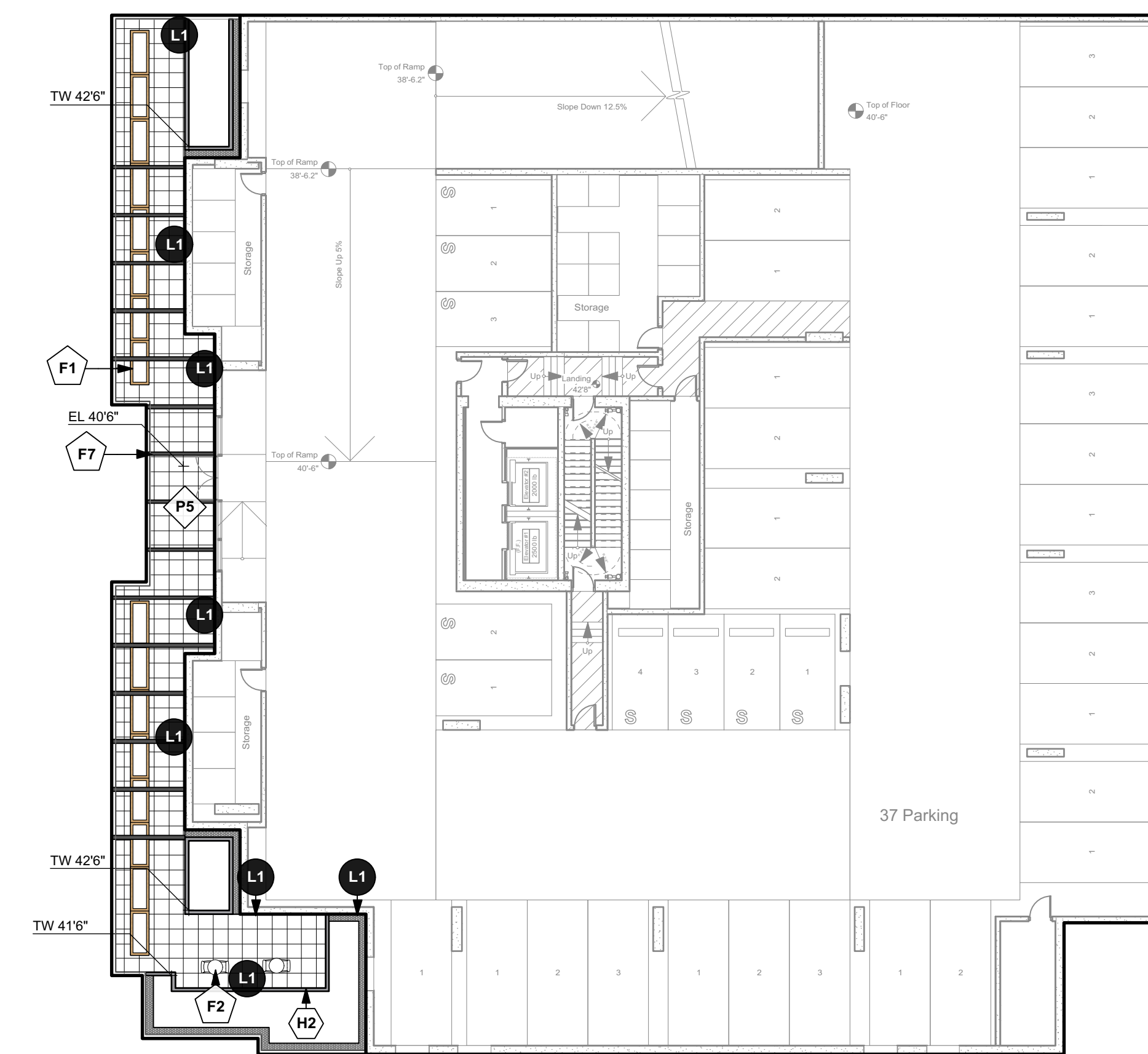
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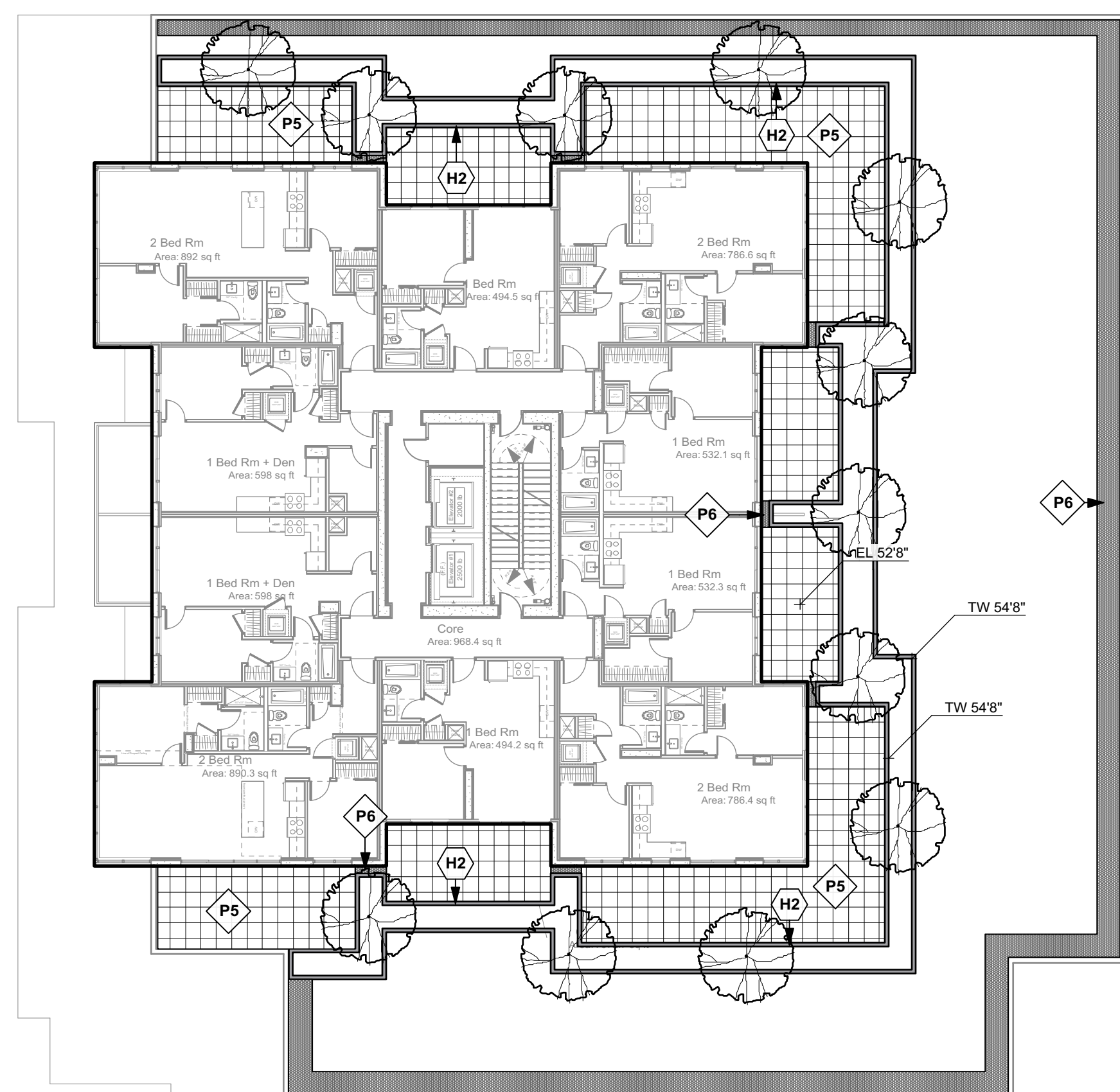
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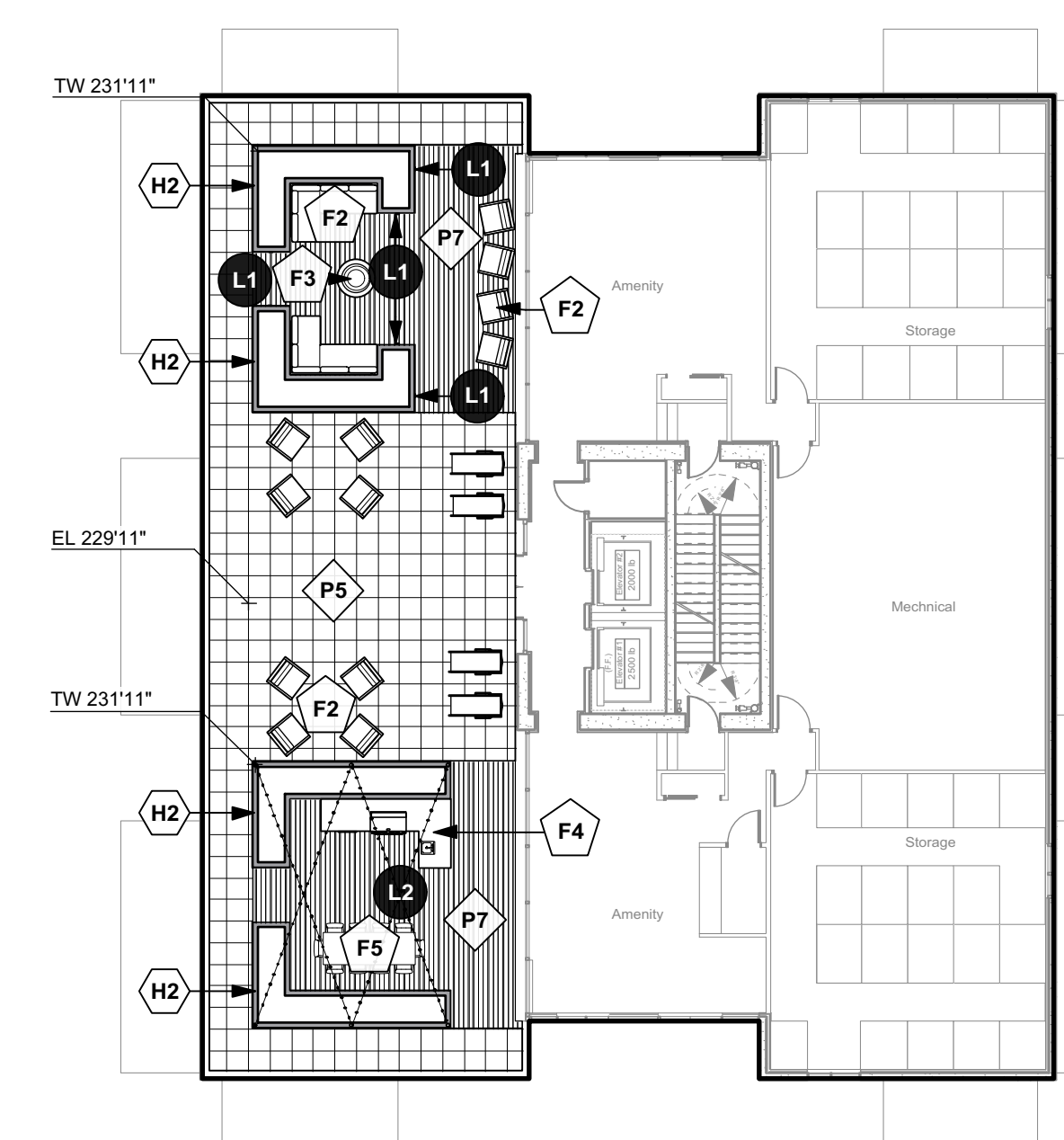
GROUND LEVEL



LEVEL 5



LEVEL 6



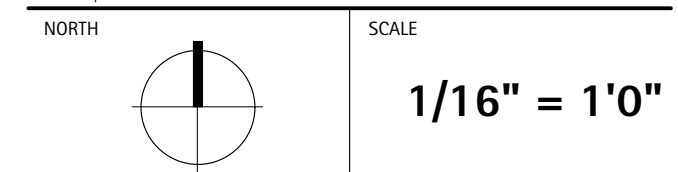
ROOF LEVEL

**BROOKLYN
 ST. PAUL STREET TOWER**

ADDRESS
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 KELOWNA, B.C.

**ALL LEVELS
 MATERIALS, LAYOUT AND
 GRADING PLAN**

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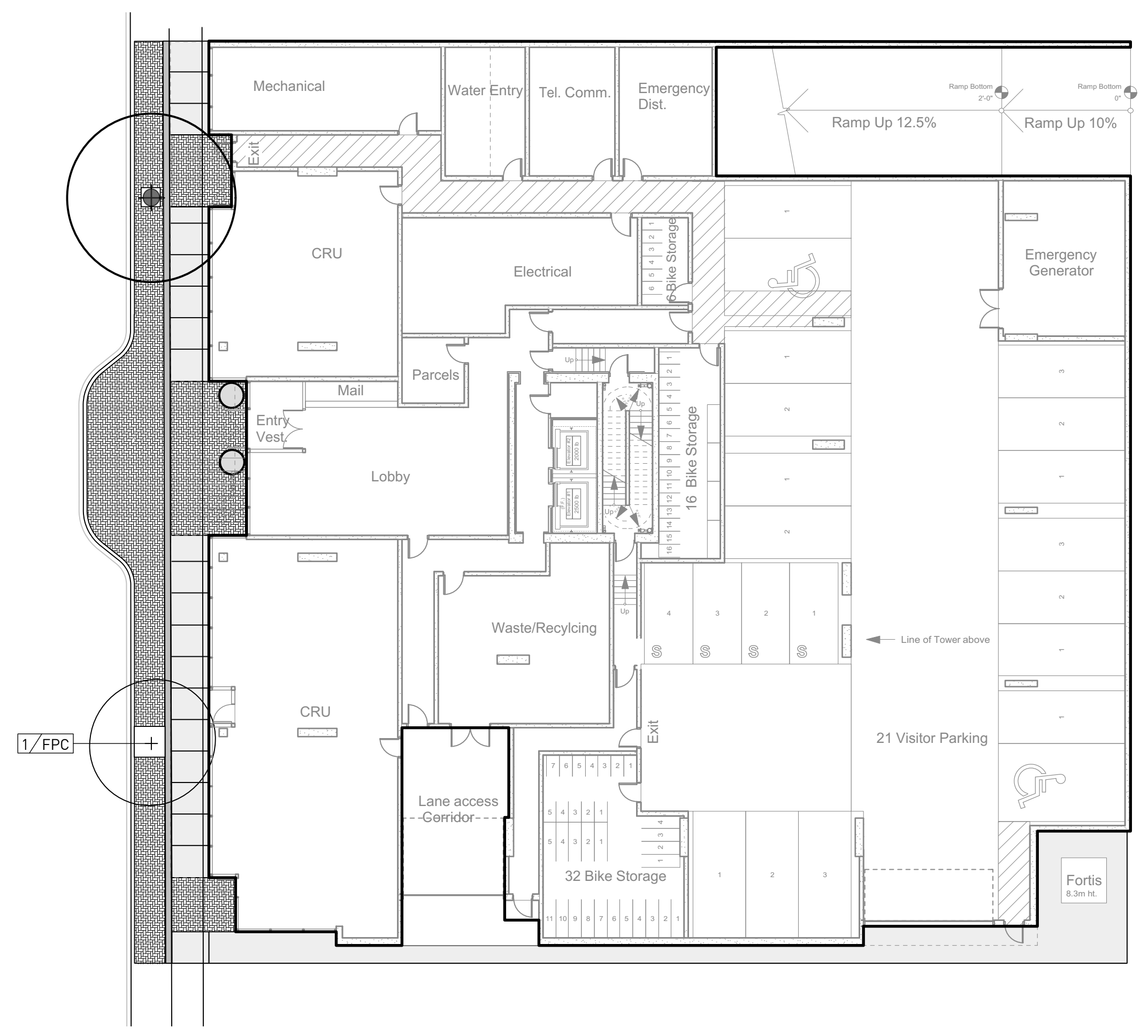
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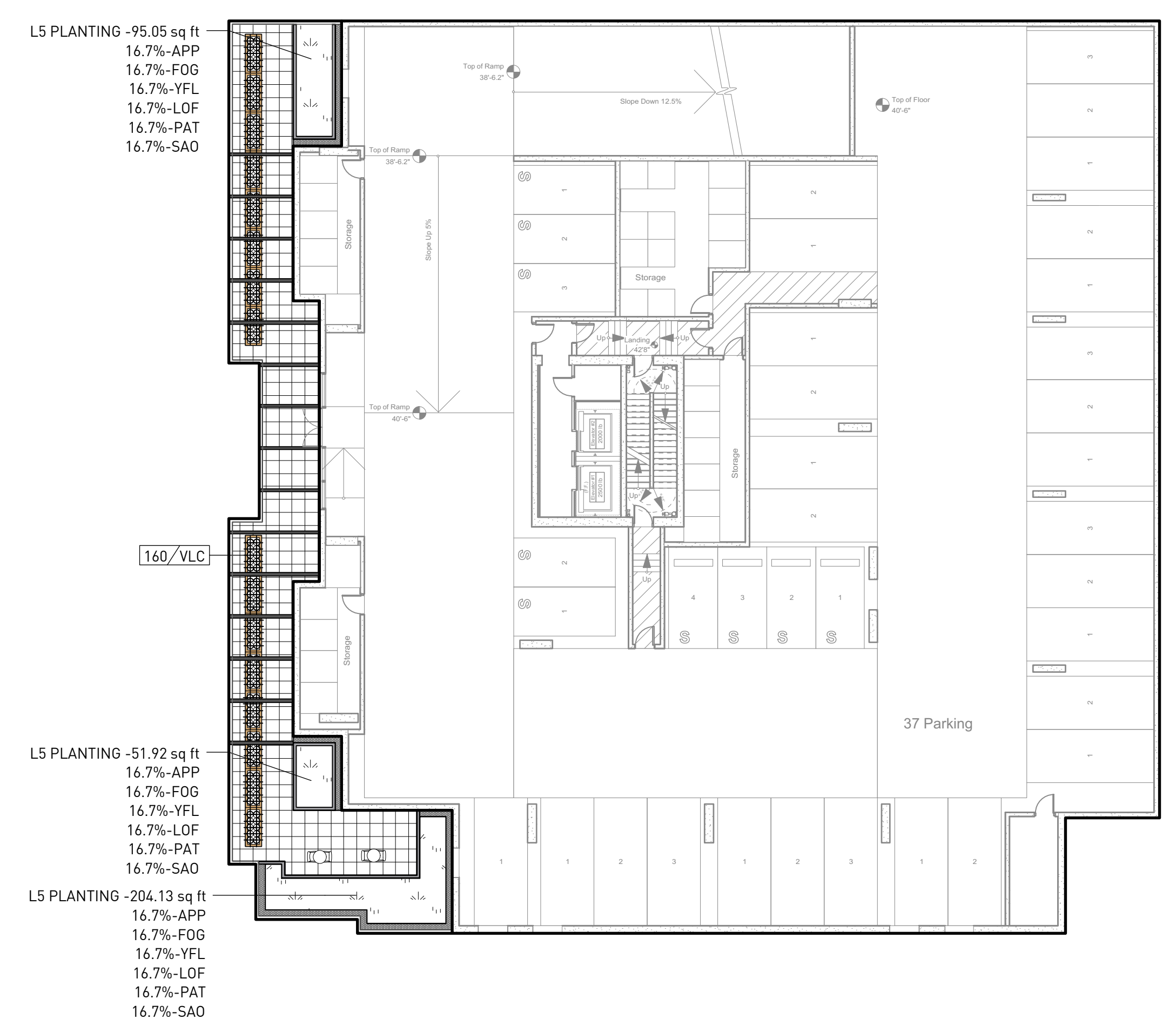
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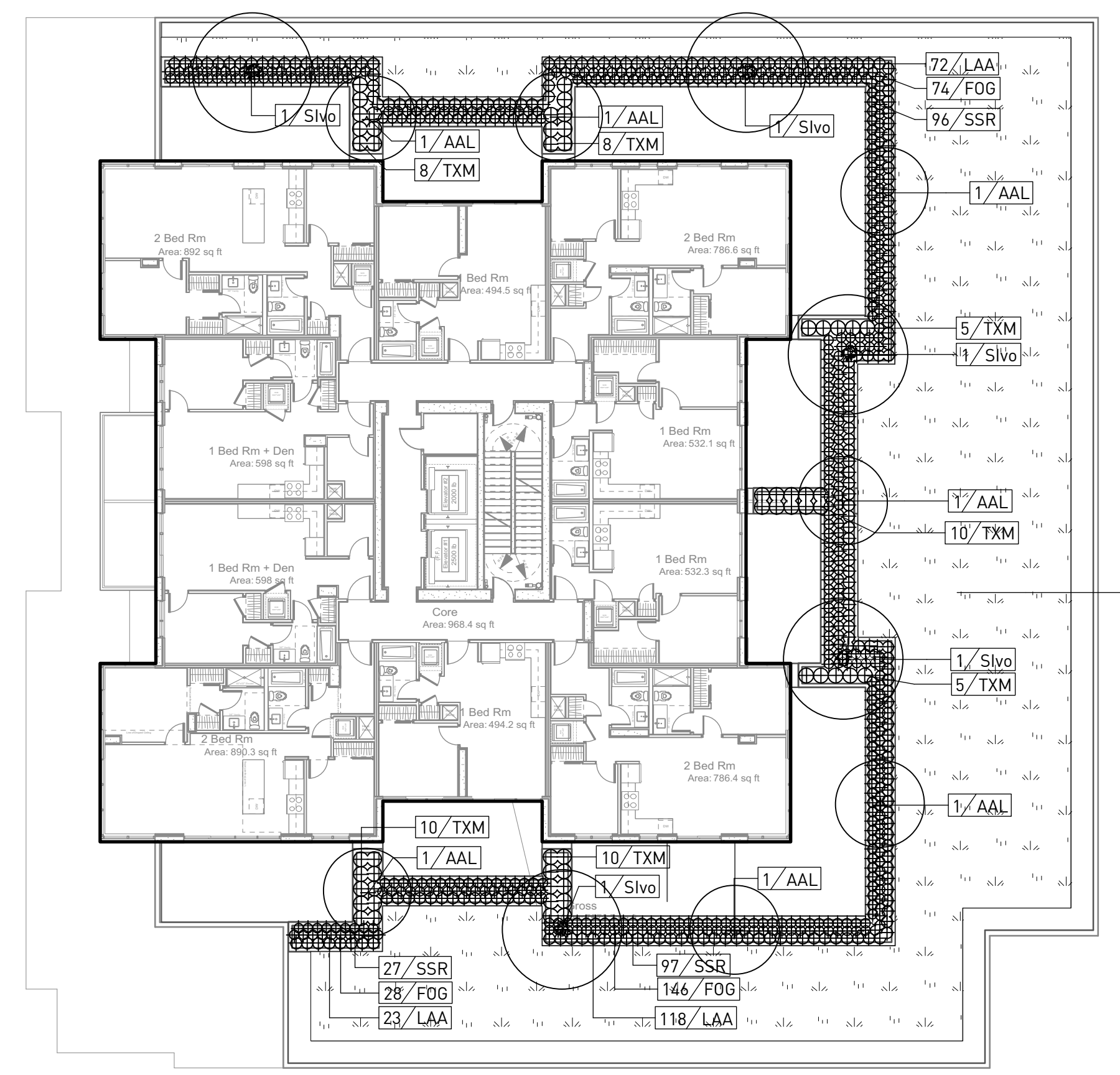
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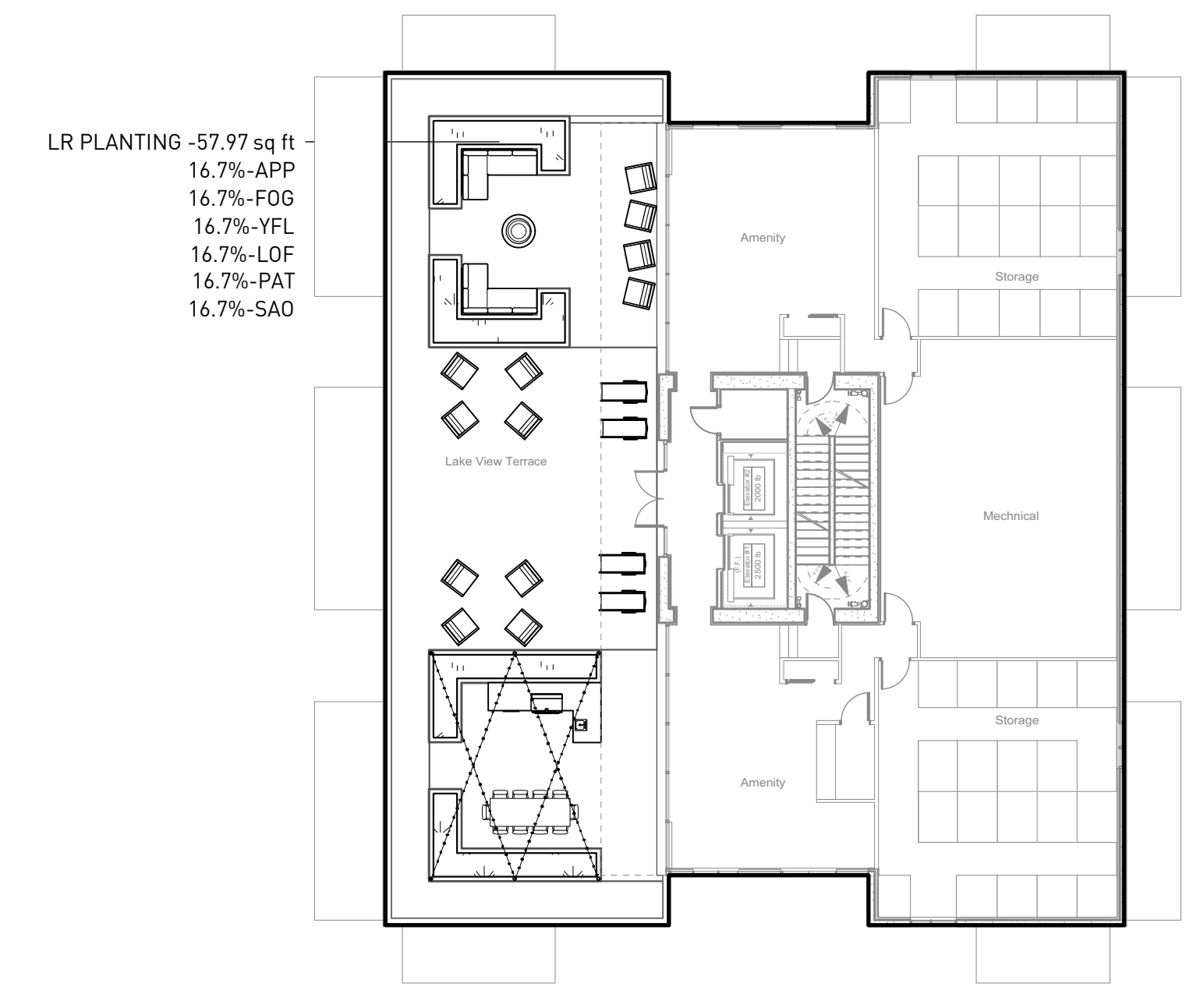
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LEVEL 5



LEVEL 6



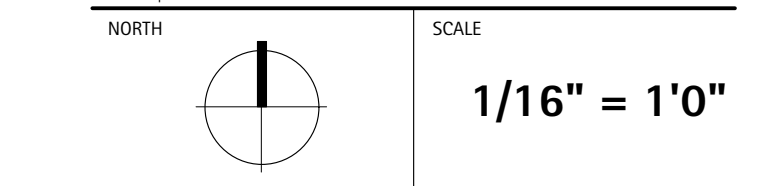
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ALL LEVELS PLANTING PLAN

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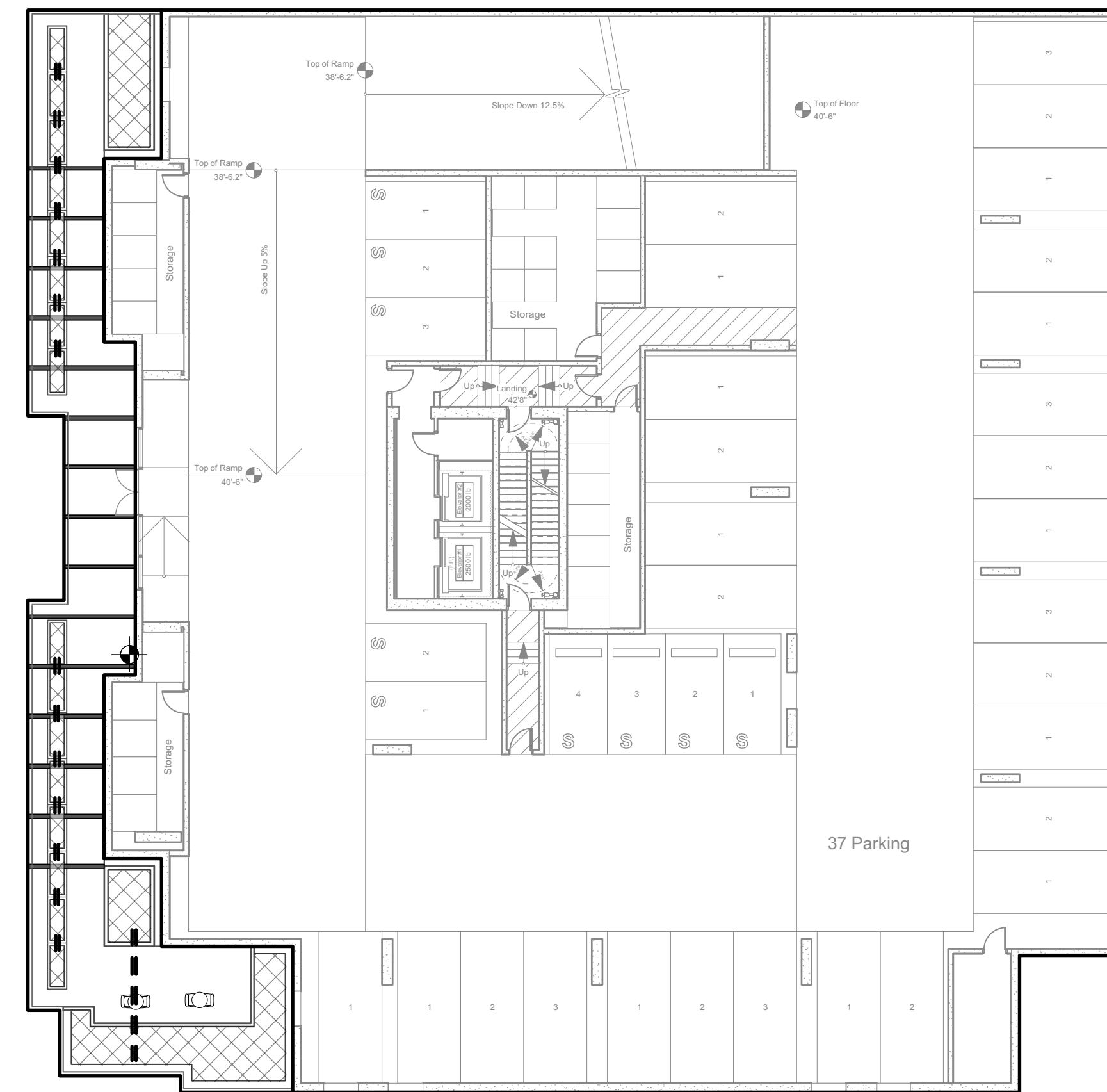


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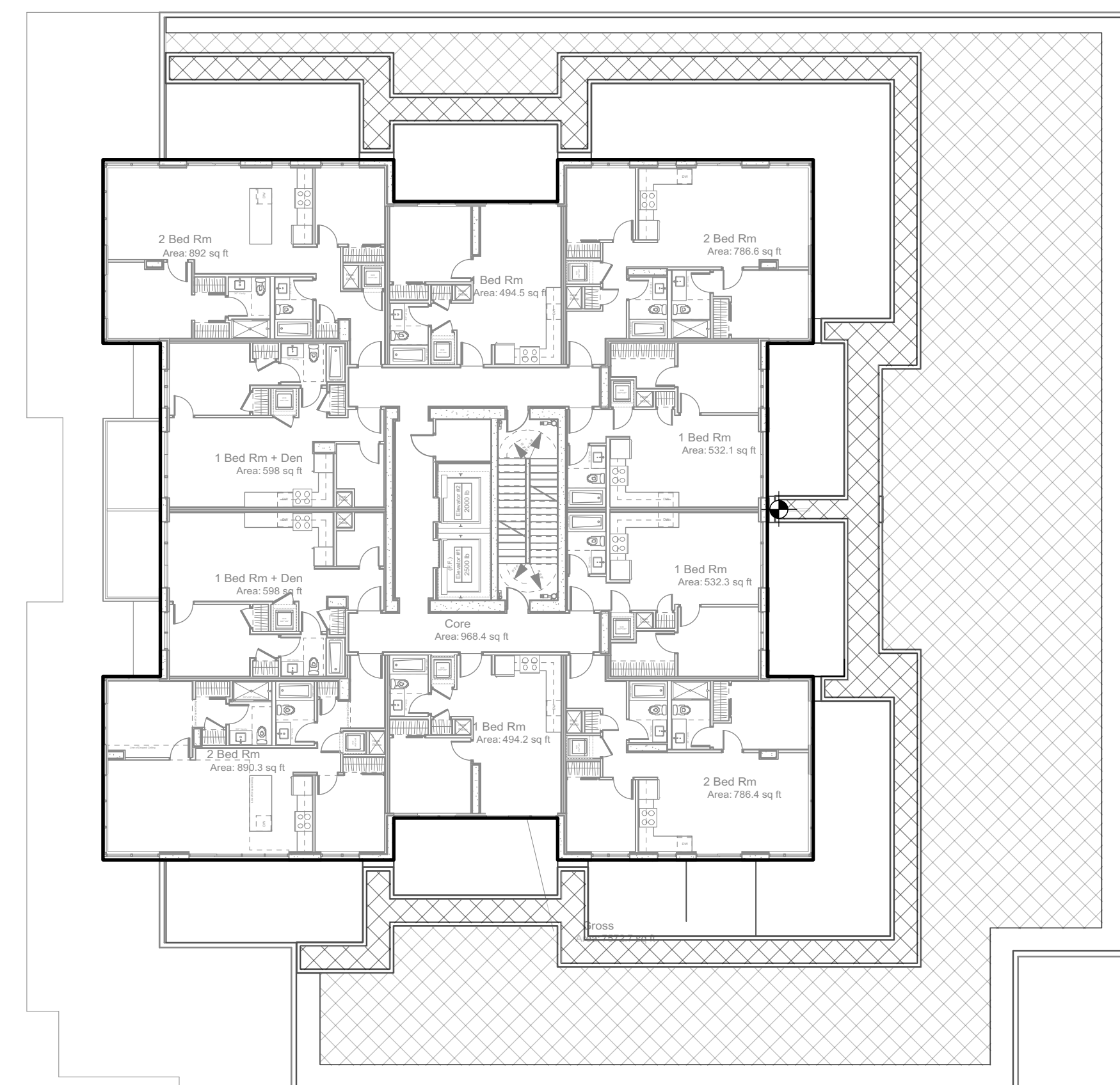
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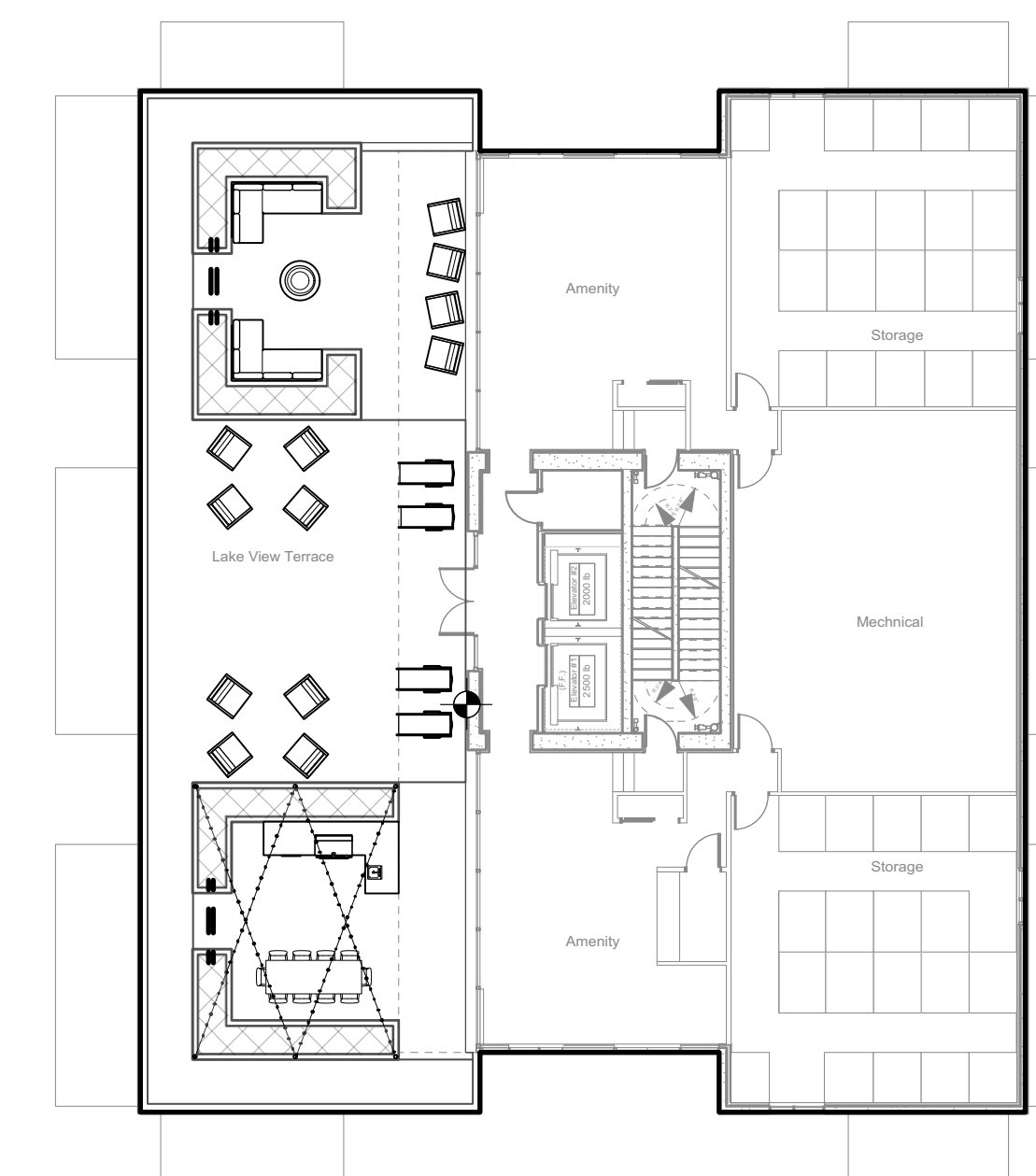
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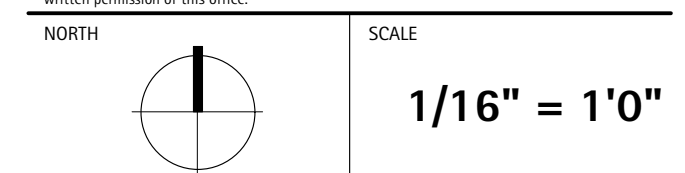
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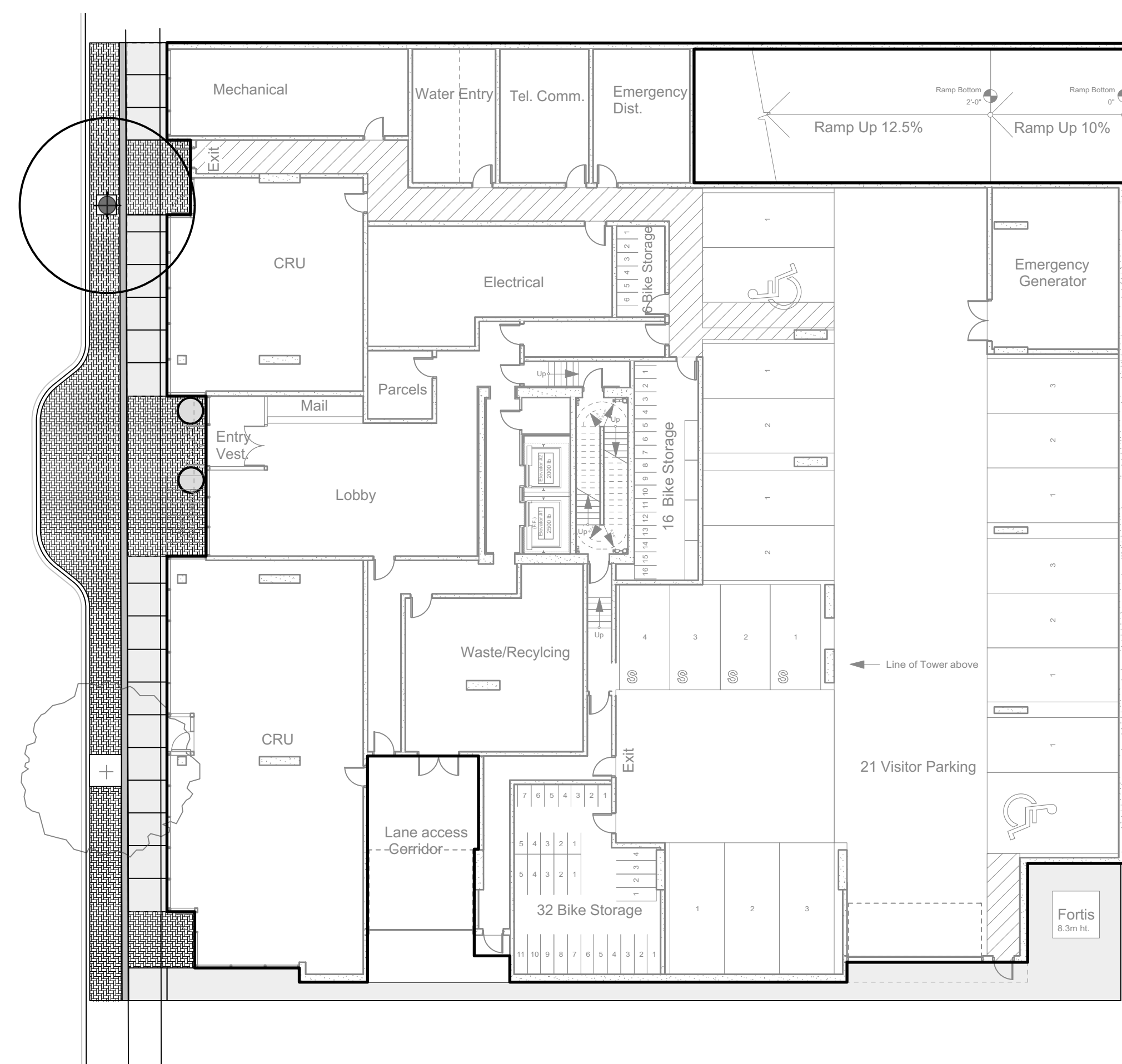


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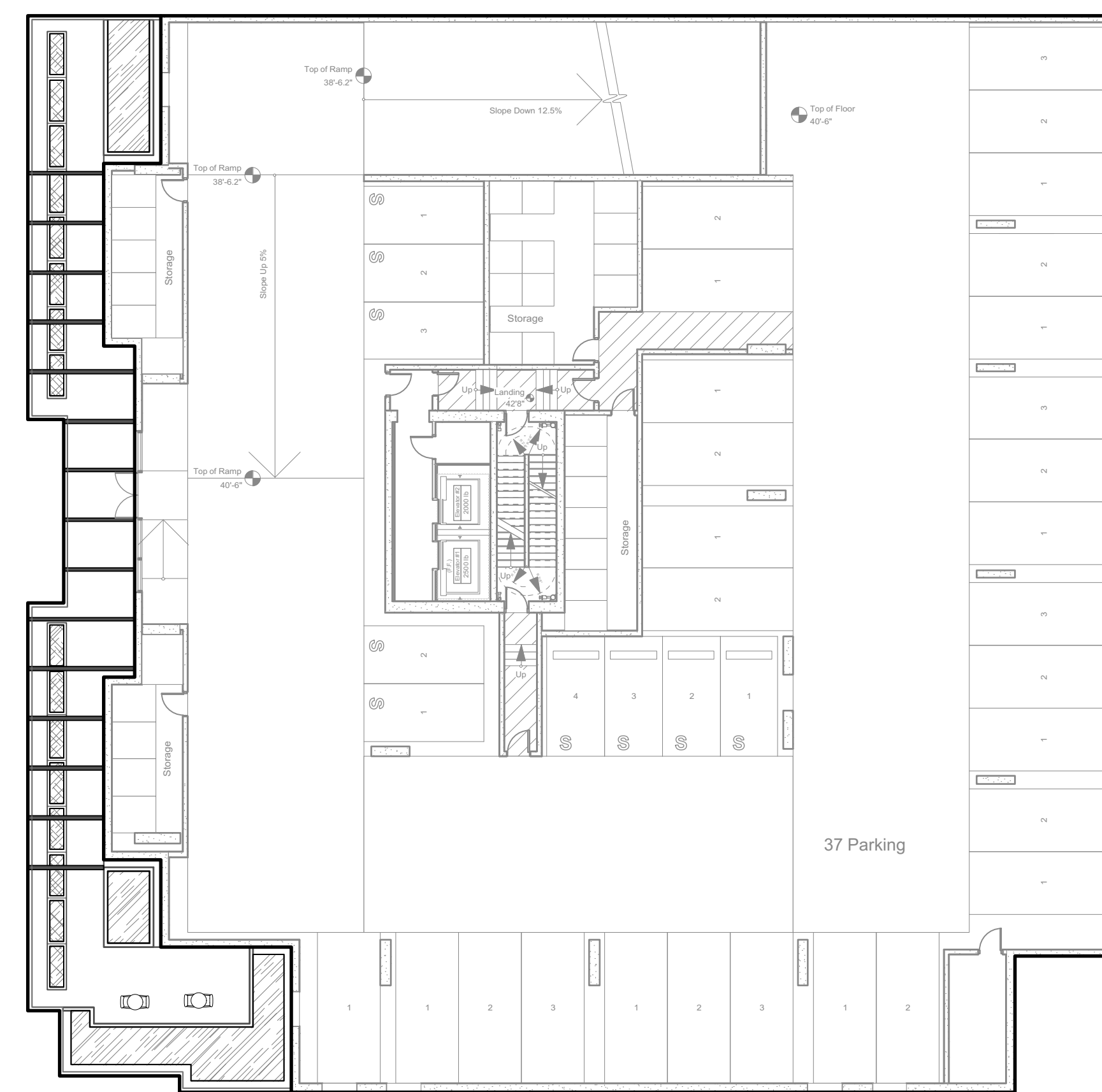
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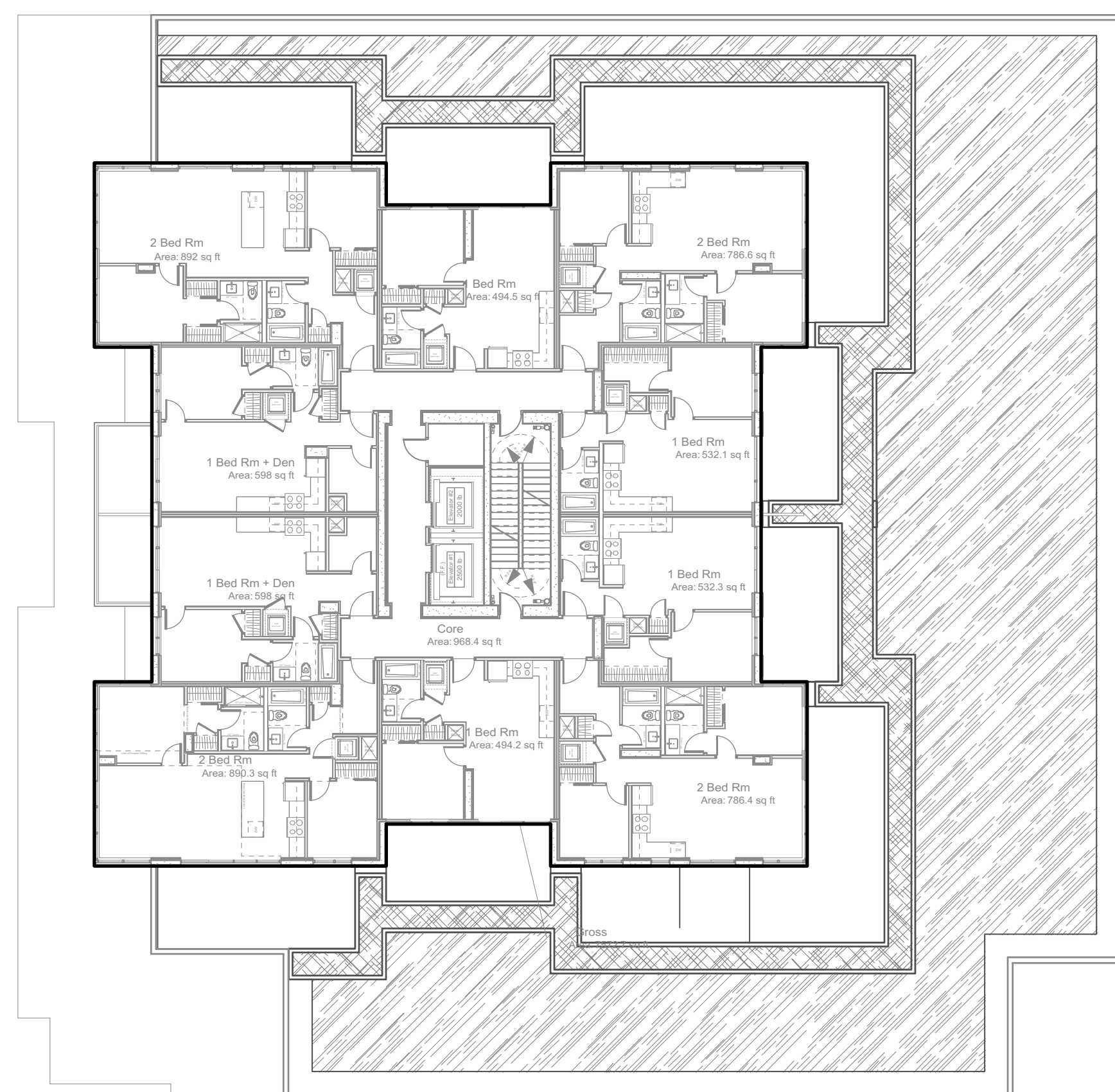
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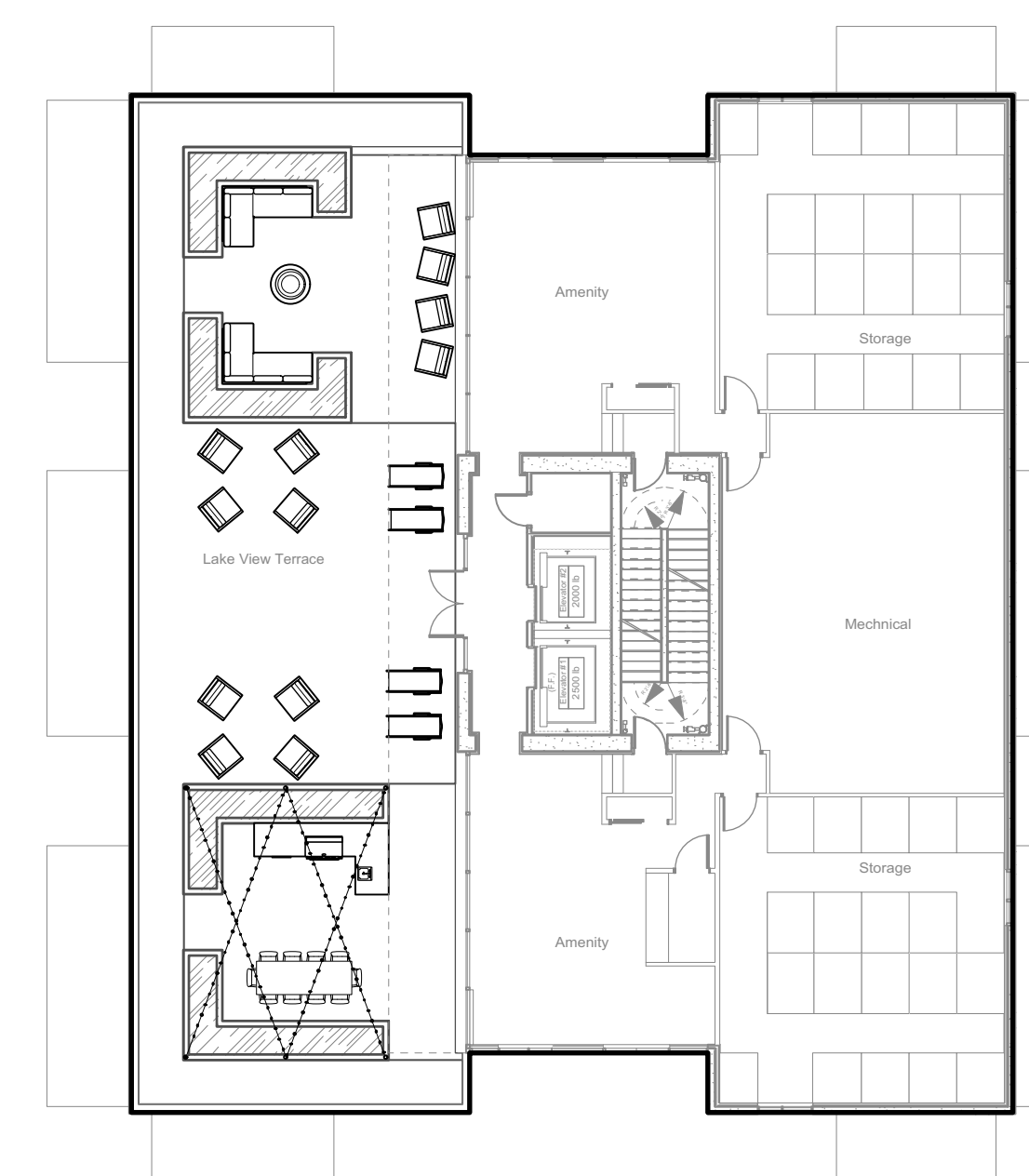
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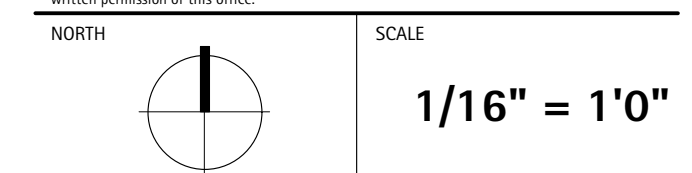
ROOF LEVEL

PROJECT
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ALL LEVELS WATER CONSERVATION PLAN

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ATTACHMENT C

This forms part of application
Z18-0002

Planner Initials



City of
Kelowna
COMMUNITY PLANNING

The attachment label is enclosed in a red border. It contains the text "ATTACHMENT C" in large red letters at the top. Below it, it states "This forms part of application" followed by "# Z18-0002" in red. On the left, it says "Planner Initials" next to a small box containing "AC". On the right, it features the City of Kelowna logo, which consists of a colorful geometric pattern of triangles forming a circle, with the text "City of Kelowna" and "COMMUNITY PLANNING" below it.

1471 St. Paul Street Tower – The Brooklyn Transportation Impact Assessment

Draft Report V04

Prepared for
Mission Group

Date
June 19, 2018

Project No.
04-18-0079

June 19, 2018
04-18-0079

Luke Turri
Vice-President, Development
Mission Group
1000,1631 Dickson Avenue
Kelowna, BC
V1Y 0B5

Dear Luke:

**Re: 1471 St. Paul Street Tower, Transportation Impact Assessment
Draft Report V02**

Bunt & Associates Engineering Ltd. (Bunt) has completed our Transportation Impact Assessment for the proposed residential and commercial development at 1471 St. Paul Street, Kelowna, BC. Our Draft Report is provided herewith, it addresses the potential transportation impacts related to the proposed development.

We trust that our input with this TIA report will be of assistance. Please do not hesitate to contact me should you have any questions.

Yours truly,
Bunt & Associates



Peter Joyce, P.Eng.
Principal

CORPORATE AUTHORIZATION

Prepared By: Jason Potter, PTP
Professional Transportation
Planner

Bunt & Associates Engineering Ltd.
Suite 530, 645 Fort Street
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Canada

Reviewed By: Peter Joyce, P.Eng
Principal

Telephone: +1 250 592 6122

Date: June 19, 2018

Project No. 04-18-0079

Status: Draft

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
1.1 Study Purpose & Objectives	1
1.2 Proposed Development	1
2. EXISTING CONDITIONS	4
2.1 Land Use	4
2.2 Existing Transportation Network	4
2.2.1 Road Network	4
2.2.2 Transit Network	4
2.2.3 Cycling & Pedestrian Networks	4
2.3 Data Collection	5
2.3.1 Traffic Data Collection Program	5
2.3.2 Existing Site Vehicle Trip and Parking Generation	5
2.3.3 Displaced Existing Parking	5
2.4 Existing Traffic Operations	6
2.4.1 Performance Thresholds	6
2.4.2 Existing Operational Analysis Results	7
3. FUTURE TRAFFIC CONDITIONS	13
3.1 Traffic Forecasts	13
3.1.1 Background Traffic Forecasts	13
3.1.2 Site Traffic	13
3.1.3 Total Traffic	15
3.2 Future Traffic Operations	15
3.2.1 Future Background Traffic Operations	15
3.2.2 Future Total Traffic Operations	15
3.2.3 Summary of Traffic Impacts & Recommended Mitigations	15
4. SITE PLAN DESIGN REVIEW	29
4.1 Site Access Design	29
4.2 Parking Supply	29
4.2.1 Vehicle Parking	29
4.2.2 Vehicle Space Size	30
4.2.3 Bicycle Parking	30
4.3 Service Vehicle Operations	30

5. TDM & ACTIVE MODES..... 32

 5.1 Transportation Demand Management 32

 5.2 Recommended TDM Measures for Site 32

 5.2.1 Marketing Materials & Transportation Information 32

 5.2.2 Specialized Parking..... 33

 5.2.3 Bicycle Parking 33

6. CONCLUSIONS & RECOMMENDATIONS..... 34

 6.1 Conclusions 34

 6.2 Recommendations..... 35

APPENDIX A Synchro Reports

APPENDIX B Summary of 95th Percentile Queues

EXHIBITS

Exhibit 1.1: Site Location..... 2

Exhibit 1.2: Site Plan..... 3

Exhibit 2.1: Existing Laning & Traffic Control 8

Exhibit 2.2: Transit Routes & Stops 9

Exhibit 2.3: Existing Peak Hour Vehicle Traffic Volumes 10

Exhibit 2.4: Existing AM Peak Hour Operations 11

Exhibit 2.5: Existing PM Peak Hour Operations 12

Exhibit 3.1: Background Opening Day + 10 Years Traffic Forecasts 17

Exhibit 3.2: Site Traffic Forecasts 18

Exhibit 3.3: Total Opening Day Traffic Forecasts 19

Exhibit 3.4: Total Opening Day + 10 Years Traffic Forecasts..... 20

Exhibit 3.5: Background Opening Day + 10 Years AM Peak Hour Operations 21

Exhibit 3.6: Background Opening Day + 10 Years PM Peak Hour Operations 22

Exhibit 3.7: Total Opening Day AM Peak Hour Operations 23

Exhibit 3.8: Total Opening Day PM Peak Hour Operations 24

Exhibit 3.9: Total Opening Day + 10 Years AM Peak Hour Operations 25

Exhibit 3.10: Total Opening Day + 10 Years PM Peak Hour Operations 26

Exhibit 3.11: Total Opening Day + 10 Years AM Peak Hour Operations – Half Signal at Richter & Doyle
Intersection 27

Exhibit 3.12: Total Opening Day + 10 Years PM Peak Hour Operations – Half Signal at Richter & Doyle
Intersection 28

TABLES

Table 1.1: Proposed Land Uses.....	1
Table 2.1: Intersection Level of Service Thresholds.....	6
Table 3.1: Trip Generation Estimate - High-Rise Residential	13
Table 3.2: Assumed Trip Distribution	14
Table 4.1: Vehicle Parking Supply Requirement & Provision.....	29
Table 4.2: Bicycle Parking Supply Requirement & Provision	30

EXECUTIVE SUMMARY

Mission Group proposes the development of a 25 storey, 178 residential unit building with 257 m² of ground level commercial space at 1471 St. Paul Street, Kelowna.

The site is currently occupied with a 43 space surface parking lot.

Existing conditions traffic analysis using the Synchro traffic model indicates that the surrounding study area intersections currently operate within operational capacity thresholds during weekday AM and PM peak hour periods.

The proposed development is could potentially generate up to approximately 90 vehicle trips (inbound and outbound combined) during the weekday morning peak hour periods, and up to 110 vehicle trips during the weekday afternoon peak hour period but more likely about one-half to two-thirds of this traffic given its downtown location with shops and services within walking and cycling distance and good transit access.

Our analysis indicates that the proposed development will have minimal impact to the adjacent road network. Most vehicle trips generated by the development will travel through signalized intersections that are currently operating well within operational capacity thresholds.

Supplemental analysis regarding the future half signal at the Doyle Avenue and Richter Street intersection and potential Bernard Avenue signal coordination were observed to have little impact on existing and future operations.

The two adjacent lanes will experience increased traffic volume as vehicles access the site from the adjacent north/south and east/west rear laneways. The introduction of a stop sign should be considered on the east/west lane at its approach to Bertram Street.

The proposed supply of 208 parking spaces meets the City of Kelowna Zoning Bylaw requirements and is considered appropriate for this development.

The development proposes 97 Class I bicycle spaces which is greater than required by the Zoning Bylaw. It is currently short on short term (Class II) spaces; however Mission Group has expressed intent to meet Bylaw requirements for Class II spaces. It is Bunt's opinion that the proposed supply of one 6-space Class II bicycle rack located near the building's front entrance and lobby area is appropriate for the proposed use.

To accommodate passenger pick-up/drop-off and loading activity, Bunt recommends that the City consider establishing a curbside loading zone (12 metres for up to two cars or a Medium Single Unit – MSU truck) on St. Paul Street fronting the site.

The proposed higher-density residential tower in the downtown area is a progressive step toward the use of more sustainable transportation modes. Residents living downtown in close proximity to amenities and services typically make more trips by walking, cycling and transit than residents living in suburban or lower density areas.

Mission Group will provide to all new residents of the building a local area Transportation Information package identifying area bike routes, transit routes and stops, car share vehicles and other material designed to encourage residents to consider travel modes other than private vehicle trips.

Mission Group is also encouraged to provide electric charging abilities to a portion of the development's vehicle parking spaces as well as providing electric charging abilities to the proposed bicycle storage rooms.

1. INTRODUCTION

1.1 Study Purpose & Objectives

Mission Group is proposing the development of a residential high-rise building in downtown Kelowna at 1471 St. Paul Street. The 25 storey building project will feature 178 residential condominium units with neighbourhood serving, ground floor commercial space.

Bunt & Associates was retained by Mission Group to assess the traffic and parking implications of the proposed development. This Transportation Impact Assessment (TIA) study will accompany Mission Group's rezoning application. The purpose of this study is to:

- Evaluate the transportation impacts of the proposed development on the adjacent road network;
- Review the development's parking strategy;
- Evaluate the proposed site plan, its proposed access and internal vehicle circulation; and,
- Present Transportation Demand Management (TDM) strategies for lowering the site's traffic and parking demands.

The location of the proposed development is illustrated in **Exhibit 1.1**.

1.2 Proposed Development

The proposed development is summarized in **Table 1.1**.

Table 1.1: Proposed Land Uses

LAND USE	DENSITY/ UNITS
Apartment	178 units
Commercial	257.3 m ²

The site plan (level 1) is shown in **Exhibit 1.2**.

The development will be supported with 208 parking spaces located in a five level above ground parkade, including 187 spaces in the parkade (178 for residents and 9 for residential visitors) and 21 spaces for residential visitors and employee/customer use for the street front commercial units.

As proposed, the project will be accessed from two driveways, one from the north/ south adjacent lane and the other from the east/west lane located to the south of the site.

The site is currently zoned as C4 (Urban Centre Commercial). The proposed rezoning is from C4 to C7 (Central Business District).

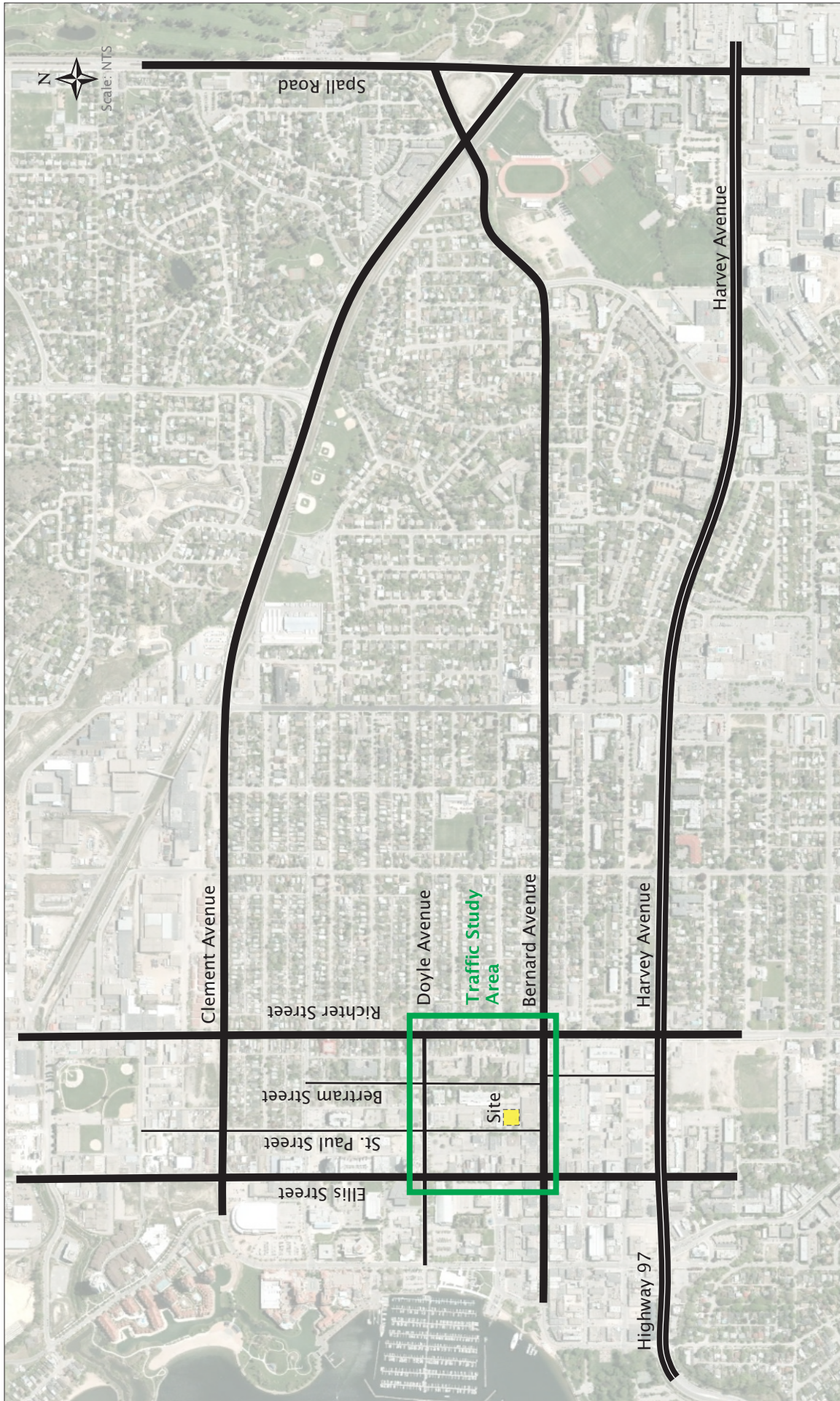


Exhibit 1.1 Site Location

1471 St. Paul Street
April 2018

04-18-0079

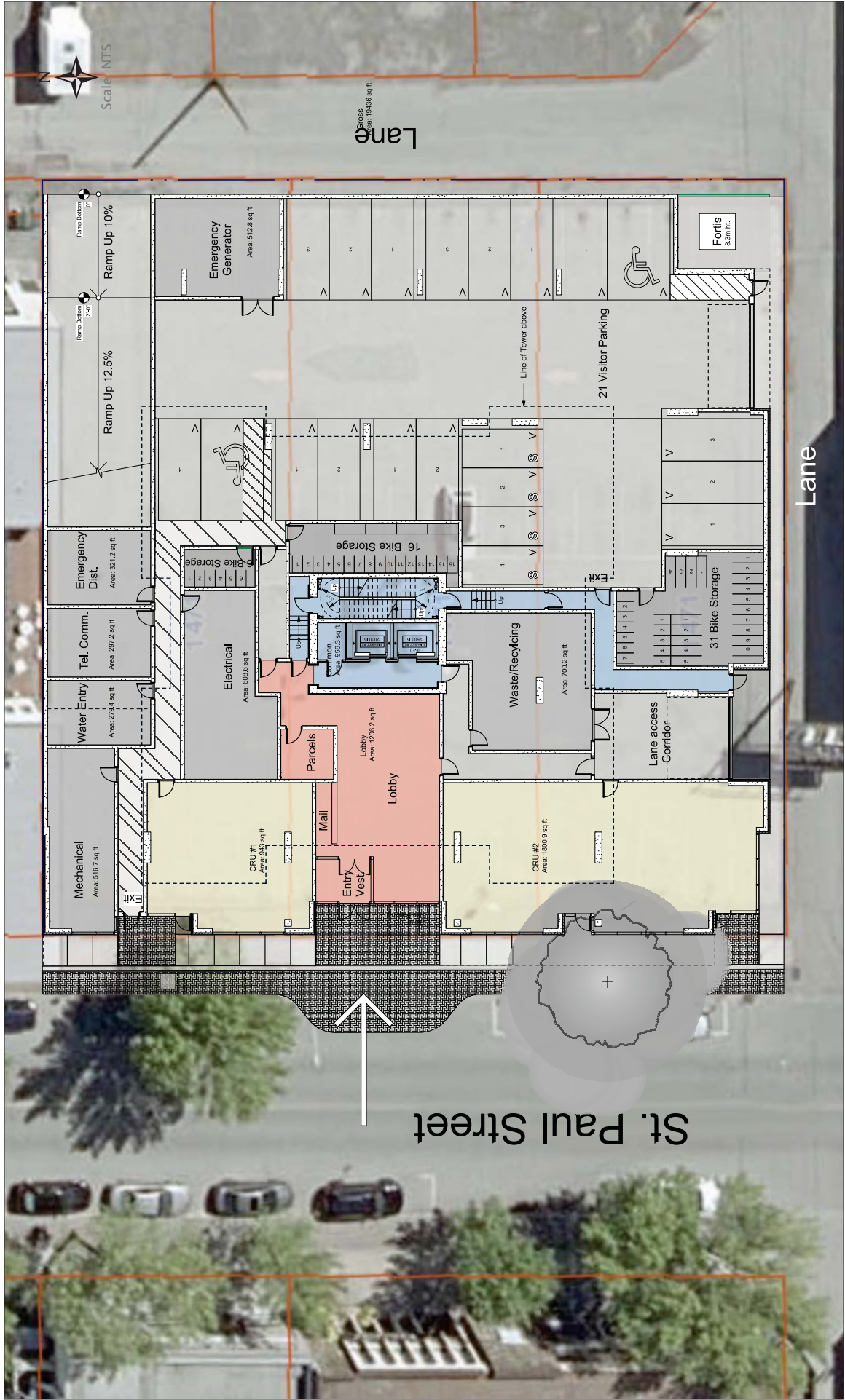


Exhibit 1.2
Site Plan

1471 St. Paul Street
 May 2018

04-18-0079

2. EXISTING CONDITIONS

2.1 Land Use

The 1471 St. Paul Street site is currently occupied with a 43 space parking lot operated by Impark. Thirteen (13) of the spaces are reserved while 30 are available for transient (hourly/daily) use. The parking lot is accessed from one driveway connecting to St. Paul Street and two driveways connecting to the east/west lane that is along the south edge of the site.

2.2 Existing Transportation Network

2.2.1 Road Network

The site is located within Kelowna's downtown area. The study area, the adjacent road network and its laning configuration are illustrated in **Exhibit 2.1** as confirmed in consultation with City of Kelowna Engineering Department (Transportation) Staff.

The east/ west lane that is located south of the site operates as a one-way eastbound lane. It does not have stop or yield signs on its approach to Bertram Street, nor does it have yield or stop signs at its intersection with the north/ south lane.

The intersection of Bertram Street with Bernard Avenue is configured so as to not permit southbound to eastbound left turn movements. This is achieved through regulatory signage and raised median channelization on Bernard Avenue.

2.2.2 Transit Network

The site is well serviced by public transit. The downtown Queensway Transit Exchange is located only two blocks away. The area transit network is presented in **Exhibit 2.2**.

2.2.3 Cycling & Pedestrian Networks

The site is located in Kelowna's downtown core area. It is well connected to both walking and cycling networks. It is connected to Kelowna's regional cycling network through Doyle Street's bicycle lanes, located one block to the north and Bernard Street to the south which is a shared roadway with bicycle sharrow pavement markings. Richter Street to the east of the site has bicycle lanes that provide regional connections to routes both south and north of the site.

All streets surrounding the development site have sidewalks as well as controlled pedestrian crossings at major intersections.

The location is within a walking distance of nearly all typical amenities and services. The location receives a 98 out of 100 Walk Score, placing it in Walk Score's "walker's paradise" category. Walk Score is an on-line tool that assesses the walkability of a location based on distances to a wide variety of amenities and services.

2.3 Data Collection

2.3.1 Traffic Data Collection Program

Traffic spot counts were conducted by Bunt on Tuesday April 10 and Wednesday April 11, 2018. These volumes were used to confirm and augment previous dataset assembled by Bunt for our 2016 Ellis Street parkade TIA report. Intersection traffic count data for the intersections of Doyle Avenue and Richter Street and Bernard Avenue and Richter Street were provided by the City of Kelowna. The Doyle/Richter traffic data was collected in October 2016 and the Bernard/Richter data in November 2017.

The weekday AM and weekday PM peak hour traffic volumes obtained through this assembly of intersection traffic count data are presented in **Exhibit 2.3**.

2.3.2 Existing Site Vehicle Trip and Parking Generation

The existing site is currently occupied with a 43 space parking lot managed by Impark. Thirteen (13) of these spaces are reserved and the remaining 30 are available for transient (hourly/daily) use. Spot counts at the parking lot observed the following occupancies:

- 33/38 at 3:30 PM on Tuesday April 10th 2018;
- 34/38 at 9:20 AM on Wednesday April 11th 2018; and,
- 34/38 at 11:30 AM on Wednesday April 11th 2018.

The parking lot currently does not generate a significant quantity of traffic. Spot counts observed volumes of generally less than five vehicles per peak hour therefore hourly turn movement volumes at the site accesses and adjacent laneways was set at a minimal value of five vehicles per hour in our Synchro traffic model of existing weekday AM and PM peak hour traffic conditions.

2.3.3 Displaced Existing Parking

Existing parking activity that will be displaced by the proposed development can be accommodated by vacancies in nearby public parking lots. The Library Parkade at 1380 Ellis Street was observed to have the following number of vacant spaces:

- 140 vacant spaces at 2:00 PM on Tuesday April 10th 2018;
- 279 vacant spaces at 4:20 PM on Tuesday April 10th 2018;
- 172 vacant spaces at 9:30 AM on Wednesday April 11th 2018; and,
- 135 vacant spaces at 10:45 AM on Wednesday April 11th 2018.

2.4 Existing Traffic Operations

2.4.1 Performance Thresholds

The existing operations of study area intersections and access points were assessed using the methods outlined in the 2010 Highway Capacity Manual (HCM), using the Synchro 9 analysis software. The traffic operations were assessed using the performance measures of Level of Service (LOS) and volume-to-capacity (V/C) ratio.

The LOS rating is based on average vehicle delay and ranges from “A” to “F” based on the quality of operation at the intersection. 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 intersection delay per vehicle.

Table 2.1 below summarizes the LOS thresholds for the five Levels of Service, for both 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

Source: Highway Capacity Manual

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 sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. 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. A V/C ratio over 1.0 indicates a very congested intersection where drivers may have to wait through several signal cycles. In downtown and Town Centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are not uncommon.

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 = LOS D or better;
- Individual movement Level of Service = LOS E or better; and,
- Individual movement V/C ratio = 0.90 or less.

Unsignalized Intersections:

- Individual movement Level of Service = LOS E or better, unless the volume is very low in which case LOS F is acceptable.

In interpreting of the analysis results, note that the HCM methodology reports performance differently for various types of intersection traffic control. In this report, the performance reporting convention is as follows:

- For signalized intersections: HCM 2010 output for overall LOS as well as individual movement LOS and V/C is reported; and,
- For unsignalized two-way stop controlled intersections: HCM 2010 LOS and V/C output is reported just for individual lanes as the HCM methodology does not report overall performance.

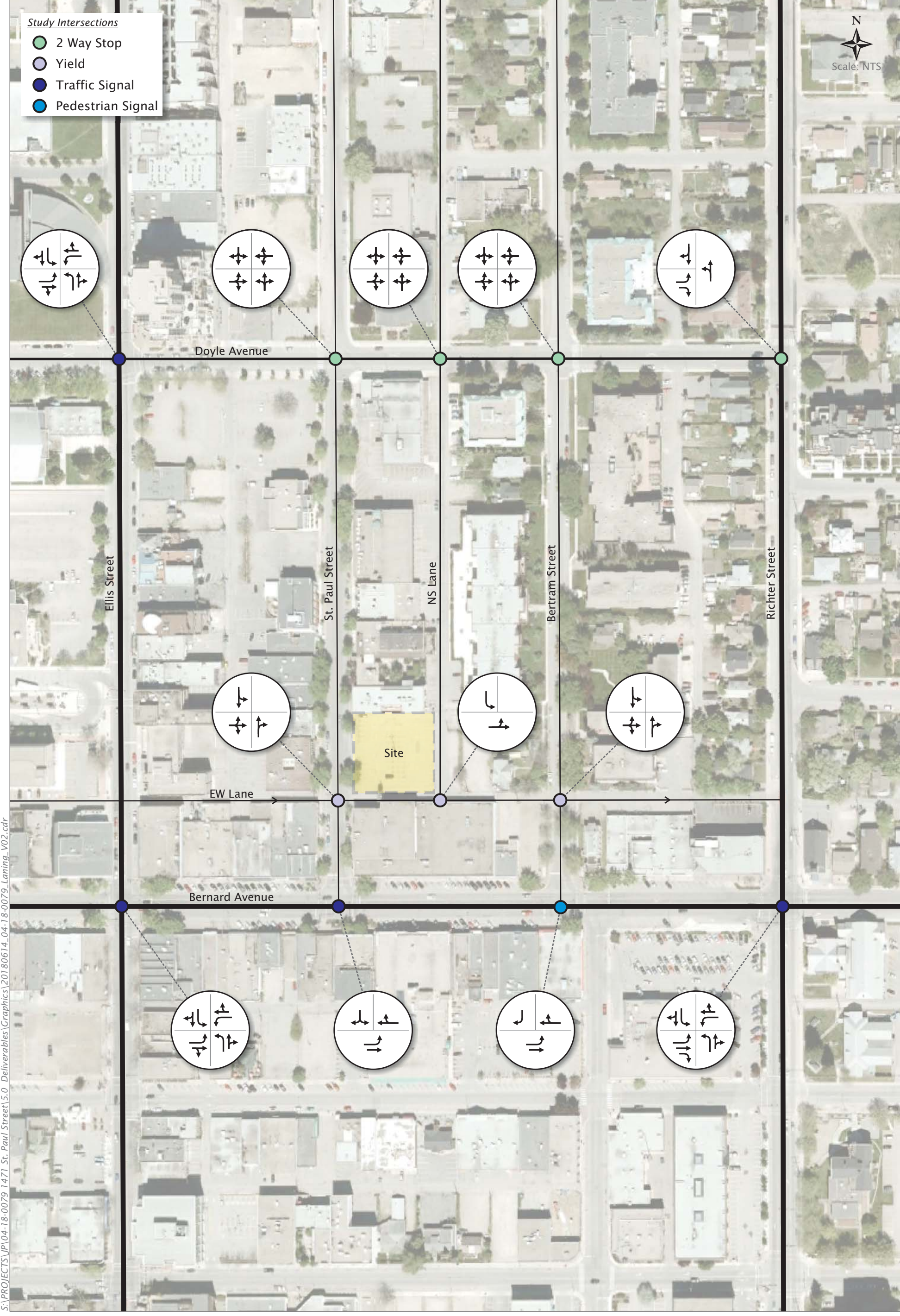
The performance reporting conventions noted above have been consistently applied throughout this document.

All signalized intersections were coded with signal timings provided by the City. Unsignalized intersections where rear lane intersects with St. Paul Street and Bertram Street were coded as minor leg stop controls. This is considered to give an adequate assessment of the intersections due to the higher volume of vehicles on St. Paul Street and Bertram Street. The intersection of the two lanes was coded as a stop control for the north/ south lane. With the low vehicle volumes on both lanes, the intersection will operate similar to the existing unsignalized intersection.

For existing scenarios, the splits have been optimized for all signalized intersections except for the pedestrian controlled intersection.

2.4.2 Existing Operational Analysis Results

As shown in **Exhibits 2.4** and **2.5** all intersections currently operate within described operational thresholds for both the weekday AM and PM peak hour periods. Detailed Synchro reports are provided in **Appendix A** and a summary of 95th percentile queues is provided in **Appendix B**.



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Exhibit 2.1
Existing Laning & Traffic Control

1471 St. Paul Street
 04-18-0079 June 2018



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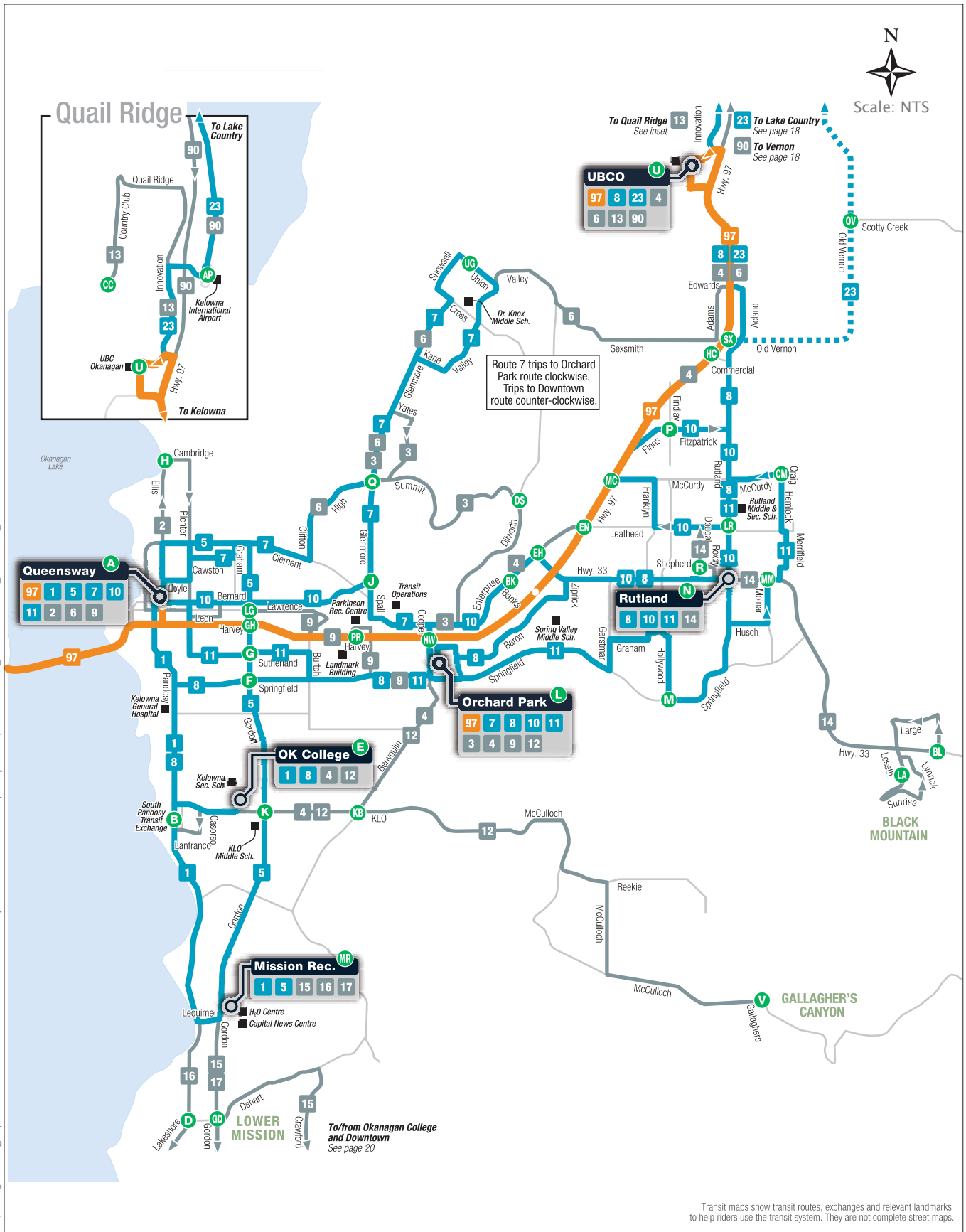
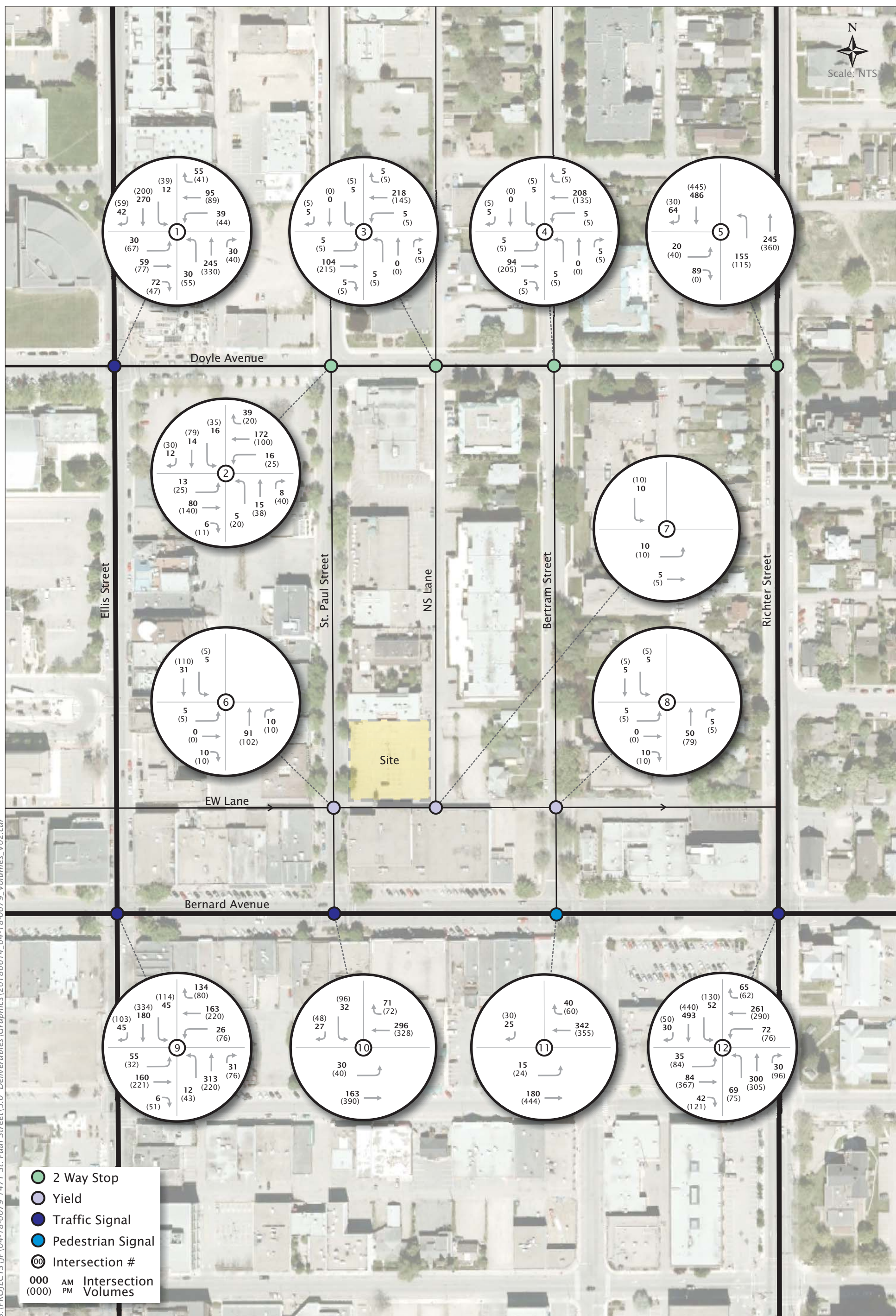


Exhibit 2.2 Transit Routes & Stops

04-18-0079

1471 St. Paul Street
April 2018





- 2 Way Stop
 - Yield
 - Traffic Signal
 - Pedestrian Signal
 - 00 Intersection #
- | 000 | AM | PM | Intersection Volumes |
|-----|----|----|----------------------|
| 000 | AM | PM | Intersection Volumes |

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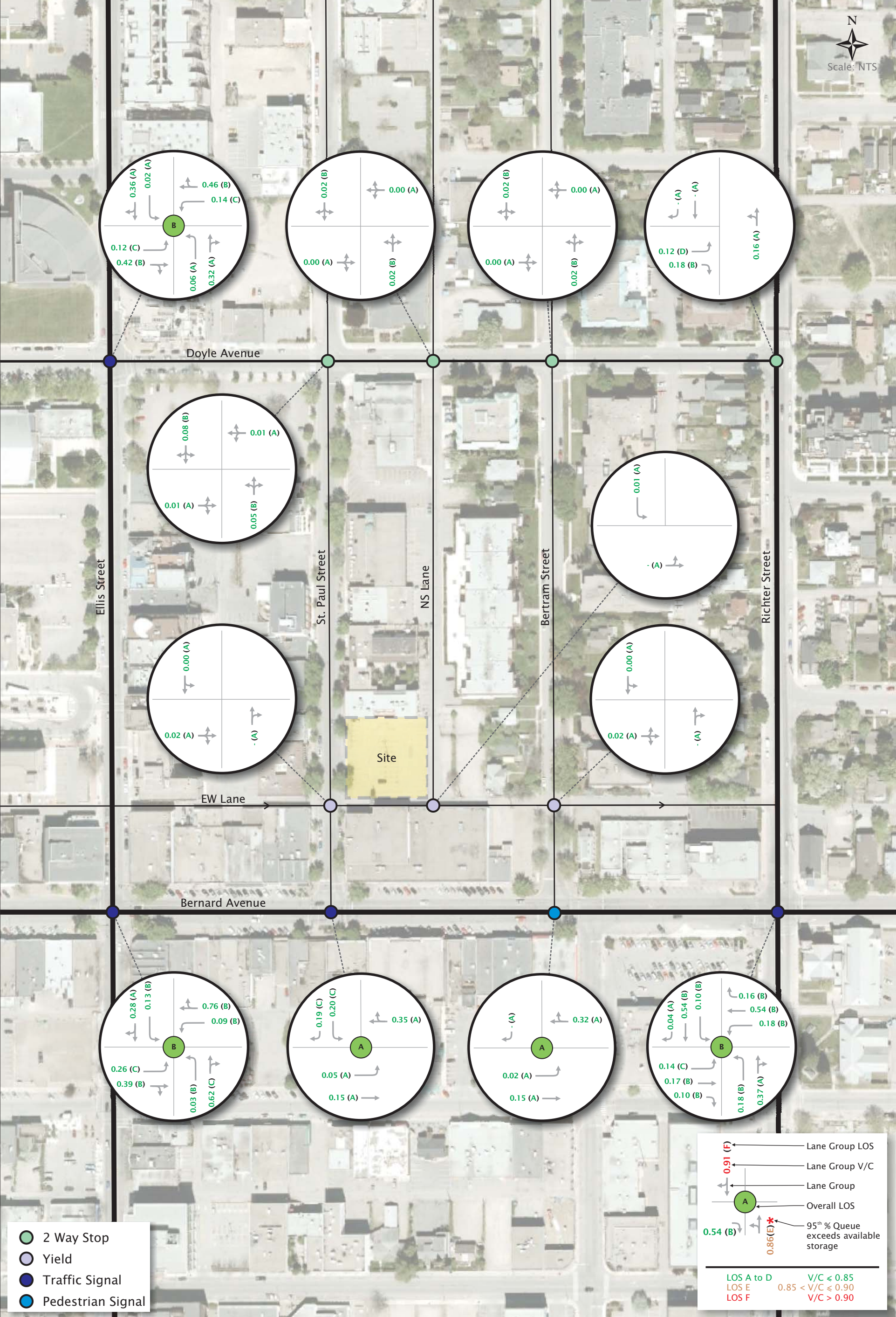
Exhibit 2.3 Existing Peak Hour Vehicle Traffic Volumes

1471 St. Paul Street
June 2018

04-18-0079



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- 2 Way Stop
- Yield
- Traffic Signal
- Pedestrian Signal

<p>0.91 (F)</p> <p>0.54 (B)</p> <p>0.86(E)*</p>	<p>← Lane Group LOS</p> <p>← Lane Group V/C</p> <p>← Lane Group</p> <p>← Overall LOS</p> <p>← 95th % Queue exceeds available storage</p>
<p>LOS A to D V/C ≤ 0.85</p> <p>LOS E 0.85 < V/C ≤ 0.90</p> <p>LOS F V/C > 0.90</p>	

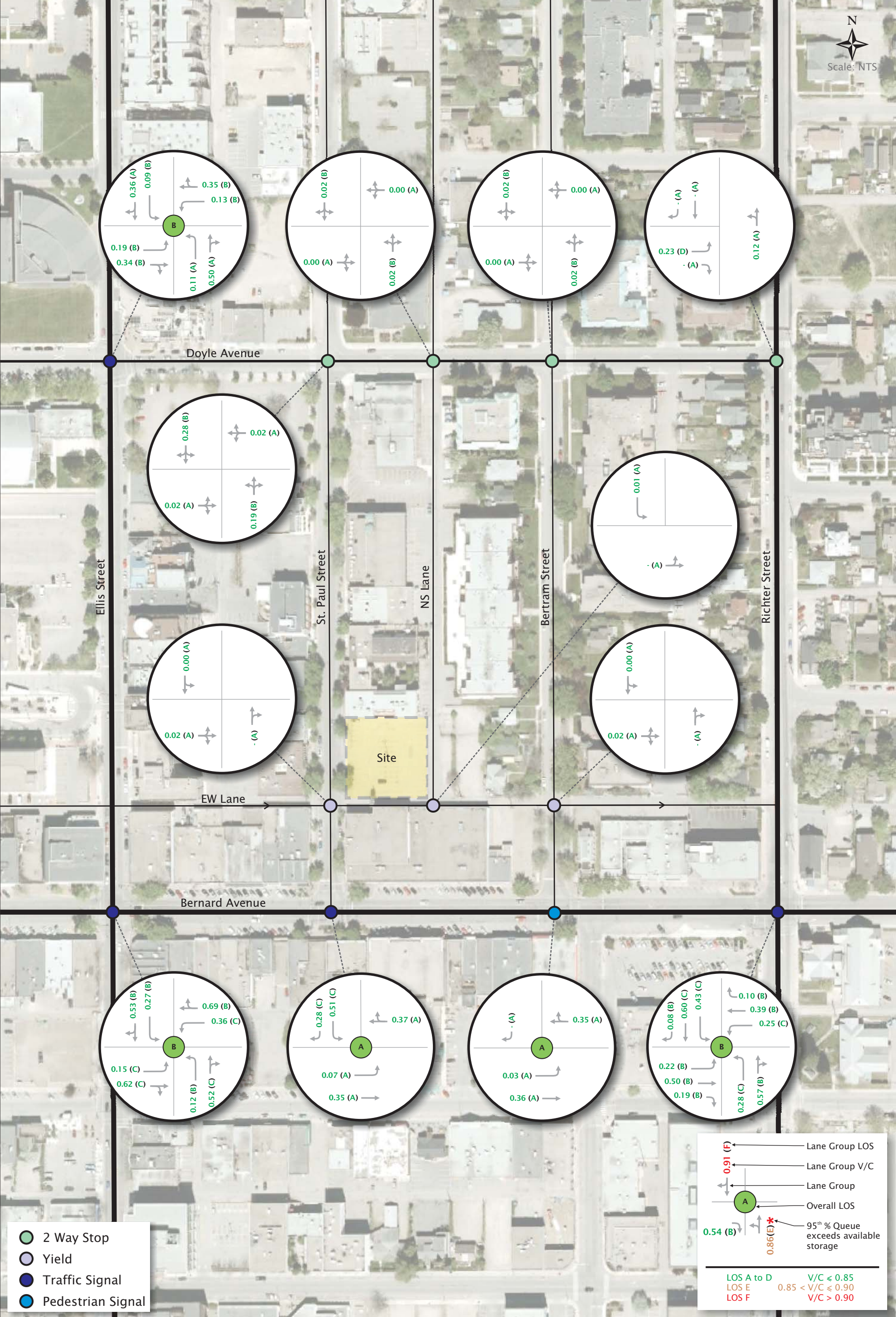
Exhibit 2.4 Existing AM Peak Hour Operations

1471 St. Paul Street
June 2018

04-18-0079



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- 2 Way Stop
- Yield
- Traffic Signal
- Pedestrian Signal

<p>0.91 (F)</p> <p>0.54 (B)</p> <p>0.86(E)*</p>	<p>← Lane Group LOS</p> <p>← Lane Group V/C</p> <p>← Lane Group</p> <p>← Overall LOS</p> <p>← 95th Queue exceeds available storage</p>
<p>LOS A to D V/C ≤ 0.85</p> <p>LOS E 0.85 < V/C ≤ 0.90</p> <p>LOS F V/C > 0.90</p>	

Exhibit 2.5 Existing PM Peak Hour Operations

04-18-0079

1471 St. Paul Street
June 2018



3. FUTURE TRAFFIC CONDITIONS

3.1 Traffic Forecasts

3.1.1 Background Traffic Forecasts

Background traffic represents the traffic that would be present on the road network if the site did not redevelop. Future background scenarios are forecasted by adding a growth factor to existing traffic volumes. Future volumes were calculated by applying a 1.4% per year growth rate to existing volumes. The 1.4% yearly rate is consistent with previous Bunt TIA project work in downtown Kelowna, including notably the Interior Health Office (505 Doyle) and Ellis Street Parkade (1430 Ellis Street) and Library Parkade (1380 Ellis Street) Transportation Impact Assessment in 2014.

A Background Opening Day + 10 years scenario, illustrated in **Exhibit 3.1** was developed to compare with future total (with development) conditions.

3.1.2 Site Traffic

Trip Generation

As confirmed with City of Kelowna Staff, the vehicle trip generation calculation for the proposed development has been based on trip rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, for Land Use Code 220 “Apartment”. The ground floor commercial space is anticipated to be primarily neighbourhood serving with a high proportion of walk in customer traffic.

As the observed traffic associated with the existing surface parking lot has not been subtracted out of Bunt’s future traffic forecasts, the future traffic generation associated with the small commercial component of the 1471 St. Paul Street development has been assumed to be approximately accounted for by the traffic kept in the analysis with the surface parking lot even though this parking lot will be eliminated to make way for the proposed development.

For the 178 unit residential component of the project, the vehicle trip generation analysis is summarized in **Table 3.1** below:

Table 3.1: Trip Generation Estimate – High-Rise Residential

TIME PERIOD	SIZE (SF OR UNITS)	RATE (PER 1K SF OR UNIT)	SOURCE	% IN	% OUT	TRIPS IN	TRIPS OUT	TOTAL TRIPS
Weekday AM	178	0.51	ITE 220	20%	80%	18	73	91 vehicles/hr
Weekday PM	178	0.62	ITE 220	65%	35%	72	38	110 vehicles/hr

It is noted that the ITE Trip Generation Manual (9th Edition) for Land Use Code 220 (Apartments) represents traffic volume data observed for a broad grouping of apartment land use, from ground oriented, to low rise, to high rise from urban and suburban locations in the United States and Canada over the past 40 years.

For more urban context locations with residential and commercial uses within convenient walking and cycling distance and good public transit access, our experience at Bunt has been that the proportion of vehicle trips is reduced in favour of increase walking/cycling and transit trips. As mentioned previously, the 1471 St. Paul Street site in Downtown Kelowna achieves a Walk Score of 98 “Walker’s Paradise” rating. As such, it is our opinion that ITE Land Use Code 220 trip rates quite likely overstate the volume of vehicle traffic likely to be generated by the proposed development; the actual vehicle trip generation could well be only one-half to two-thirds the trip rates reported.

However, as a conservative measure for the traffic impact assessment of the project, no downward adjustment has been applied to the vehicle trip estimates set out in Table 3.1; these figures have been applied directly to the traffic impact analysis.

Opening day of the proposed development is assumed to occur in 2020.

Trip Distribution & Assignment

Trips generated by the proposed development were assigned to the study area based largely on existing travel patterns observed for the area. Access to the site will come from the north/south lane located to the east of the building and the east/west lane located south of the site. The distribution of site traffic is influenced by the east/west lane to the south of the site being a one-way (eastbound) lane. The assumed site traffic distribution on the area lane and street system is presented in **Table 3.2** and illustrated in **Exhibit 3.2**.

Table 3.2: Assumed Trip Distribution

ROUTE	% OF TRIPS
Ellis Street to/from North	5%
Richter Street to/from North	10%
Bernard Avenue to/from East	25%
Richter Street to/from South	35%
Ellis Street to/from South	10%
Bernard Avenue to/from West	10%
Doyle Avenue to/from West	5%
Total	100%

3.1.3 Total Traffic

Total future traffic consists of the proposed development's net new site-generated traffic volumes added to the forecasted background traffic volumes.

Exhibit 3.3 presents the forecasted future traffic volumes for the Total Opening Day 2020 weekday AM and PM peak hour time periods. The Total Opening Day + 10 years 2030 weekday AM and PM scenarios are shown in **Exhibit 3.4**.

3.2 Future Traffic Operations

3.2.1 Future Background Traffic Operations

Future background AM and PM traffic operations during the opening day and opening day + 10 years scenarios (2030) are shown in **Exhibits 3.5** and **3.6**. The background 2020 scenario represents relatively little change from existing 2018 volumes and therefore no operational analysis is reported here.

As shown in Exhibits 3.5 and 3.6 all intersections for the longer term Background 2030 scenario model operate within the acceptable operational thresholds outlined in Section 2.4.1, for both the weekday AM and PM peak hour periods.

3.2.2 Future Total Traffic Operations

Future total traffic operations examine the background future volumes with the addition of the proposed development's site trips. **Exhibits 3.7 – 3.10** illustrate the forecasted Total Weekday AM and Weekday PM peak hour operations for the 2020 and 2030 horizon years respectively. The Total 2030 scenario can be compared with the Background 2030 operations (i.e. without the proposed development) to assess the predicted net impact of the proposed development.

As illustrated in Exhibits 3.7 to 3.10 all intersections in the Total 2020 and 2030 scenarios operate within the operational thresholds described in Section 2.4.1 for both the weekday AM and PM peak hour periods. The Ellis Street northbound through movement 95th percentile queue at Bernard Avenue occasionally extends slightly beyond Lawrence Avenue. This could be improved by updating signal timing plans and/ or coordinating the signal timing plan with the intersection to the south, however due to the rarity of this event occurring it is not seen as a significant issue.

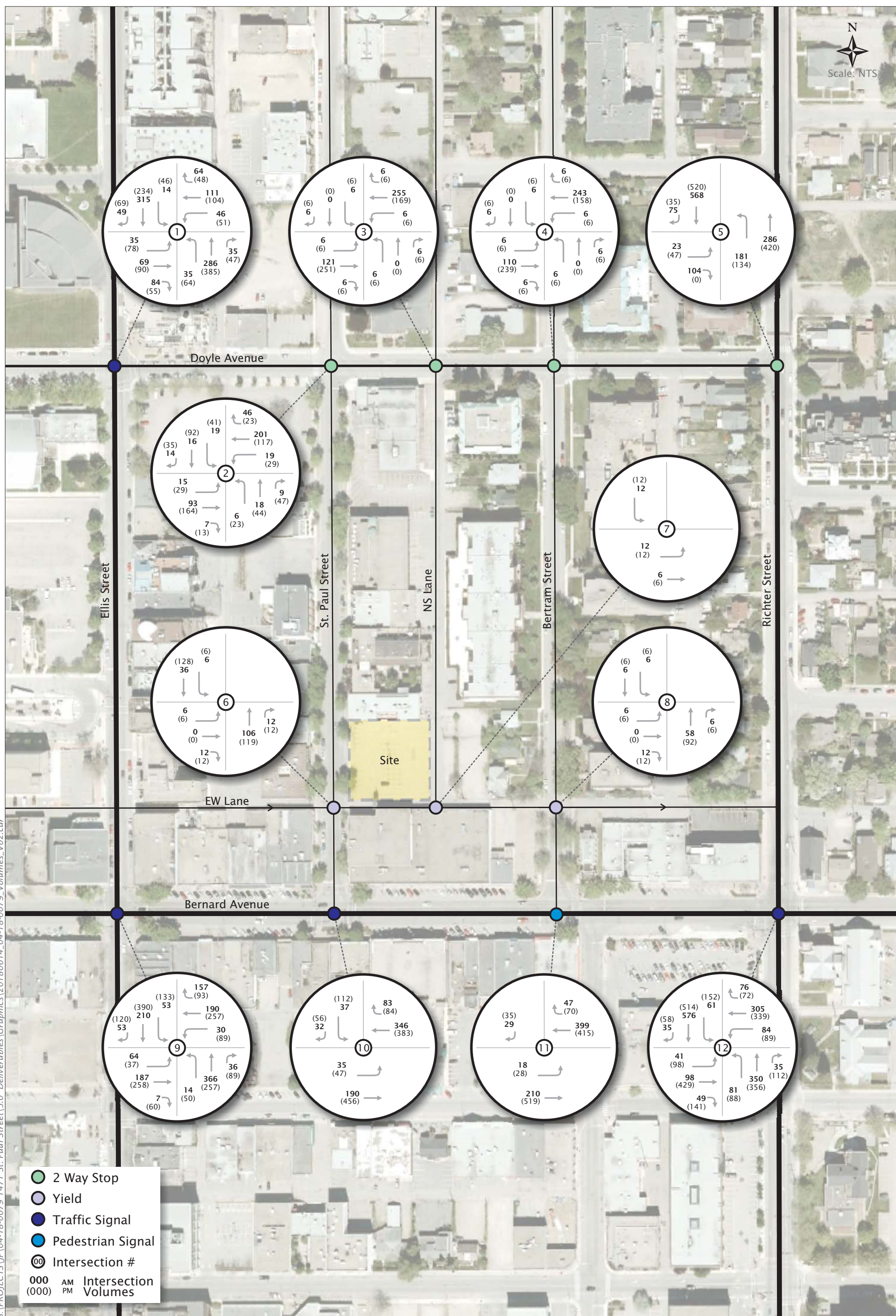
3.2.3 Summary of Traffic Impacts & Recommended Mitigations

Our analysis indicates that the proposed development of 178 residential units and ground level commercial at 1471 St. Paul Street will have near negligible impact to the adjacent road network. The proposed development is a relatively low volume vehicle traffic generator in part due to its downtown location. Most vehicle trips generated by the development will travel through signalized intersections that are currently operating well within operational capacity thresholds.

The two adjacent lanes will experience more traffic as vehicles access the site from the adjacent north/south and east/west rear laneways. It is recommended that a stop sign be introduced at the east/west lane and Bertram Street intersection for east/ west lane vehicles as they approach Bertram Street.

The City plans to introduce a half signal to the Richter Street and Doyle Avenue intersection in 2018. The Total 2030 scenario was reanalysed with this consideration, and the operations are illustrated in **Exhibits 3.11** and **3.12**. The half signal improves the overall operations of the intersection by reducing the delays for eastbound vehicles and slightly increasing delays for northbound and southbound vehicles.

Bunt also analysed the fully signalized intersections on Bernard Avenue (Ellis Street, St. Paul Street and Richter Street) to identify an optimum traffic signal timing strategy for the Total 2030 traffic scenarios. For this analysis, the existing cycle lengths were retained, but the intersection offsets and splits were optimized. The existing cycle lengths were retained as these intersections may be coordinated within a larger coordinated system and the City would like to keep the cycle lengths as low as possible to increase the number of pedestrian crossing opportunities. These optimizations had minimal effect on the traffic operations as the split lengths are primarily based on the pedestrian phases and the short cycle lengths.



- 2 Way Stop
- Yield
- Traffic Signal
- Pedestrian Signal
- Intersection #

000	AM	PM	Intersection
(000)			Volumes

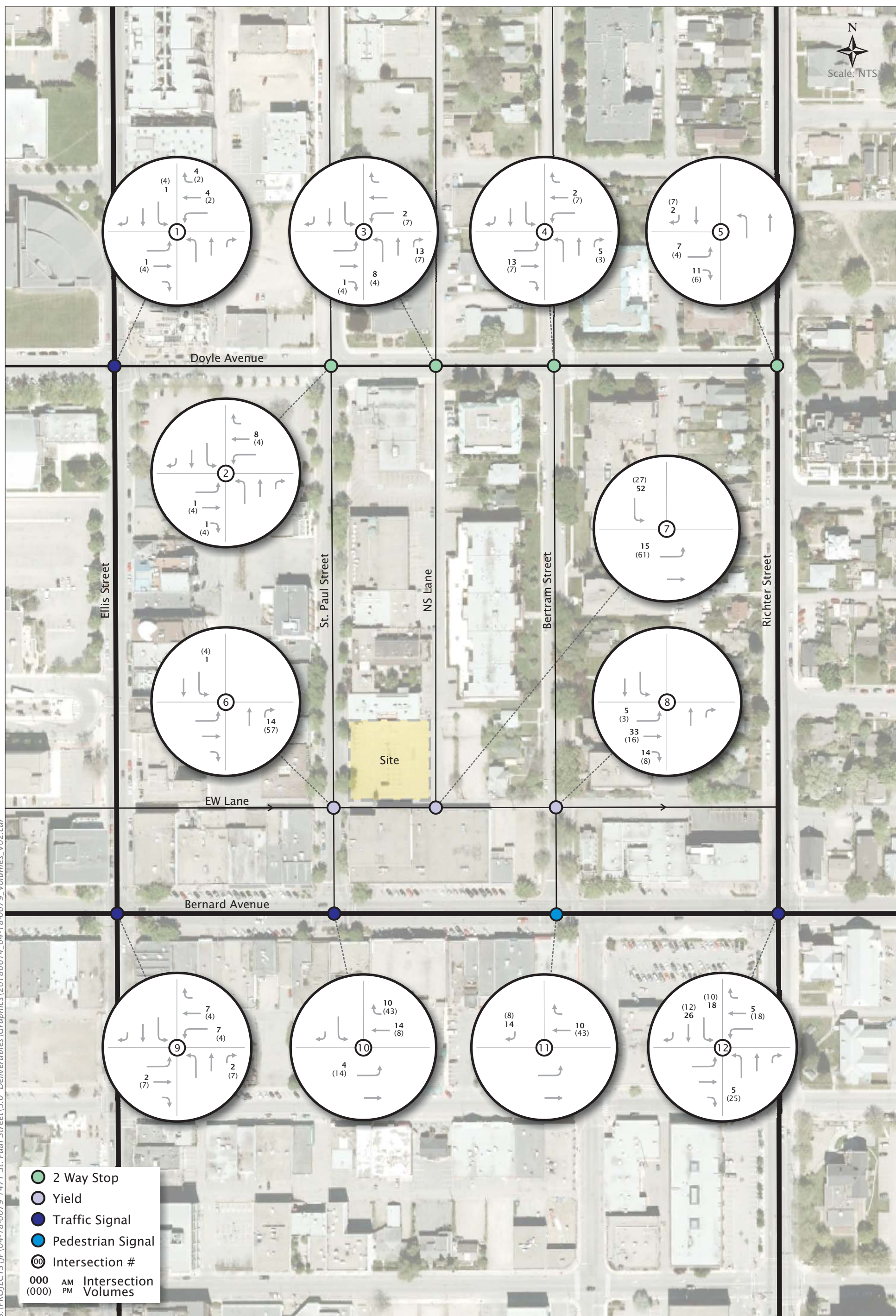
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Exhibit 3.1 Background Opening Day + 10 Years Traffic Forecasts

1471 St. Paul Street
June 2018

04-18-0079



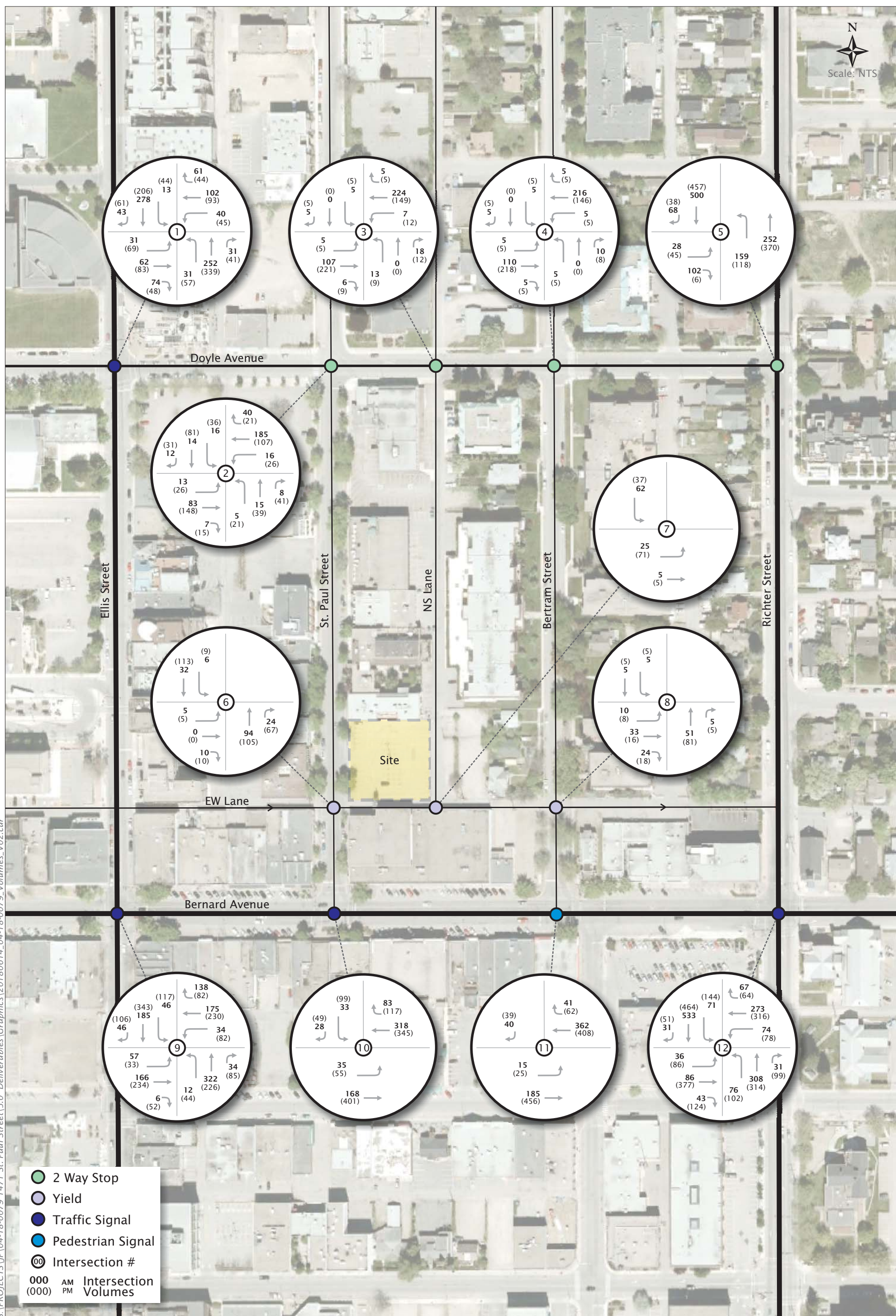


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Exhibit 3.2 Site Traffic Forecasts

1471 St. Paul Street
June 2018
04-18-0079



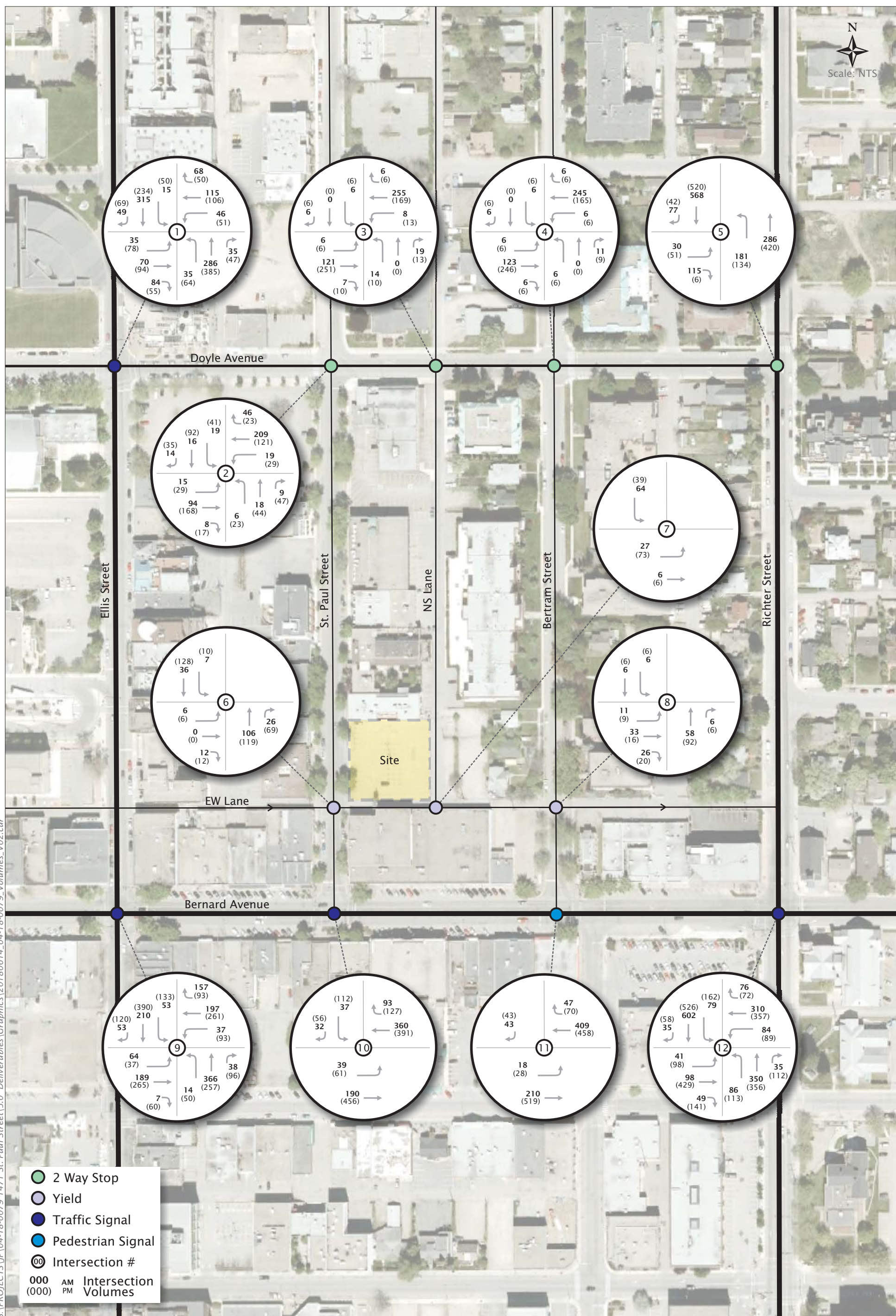


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Exhibit 3.3 Total Opening Day Traffic Forecasts

1471 St. Paul Street
June 2018
04-18-0079





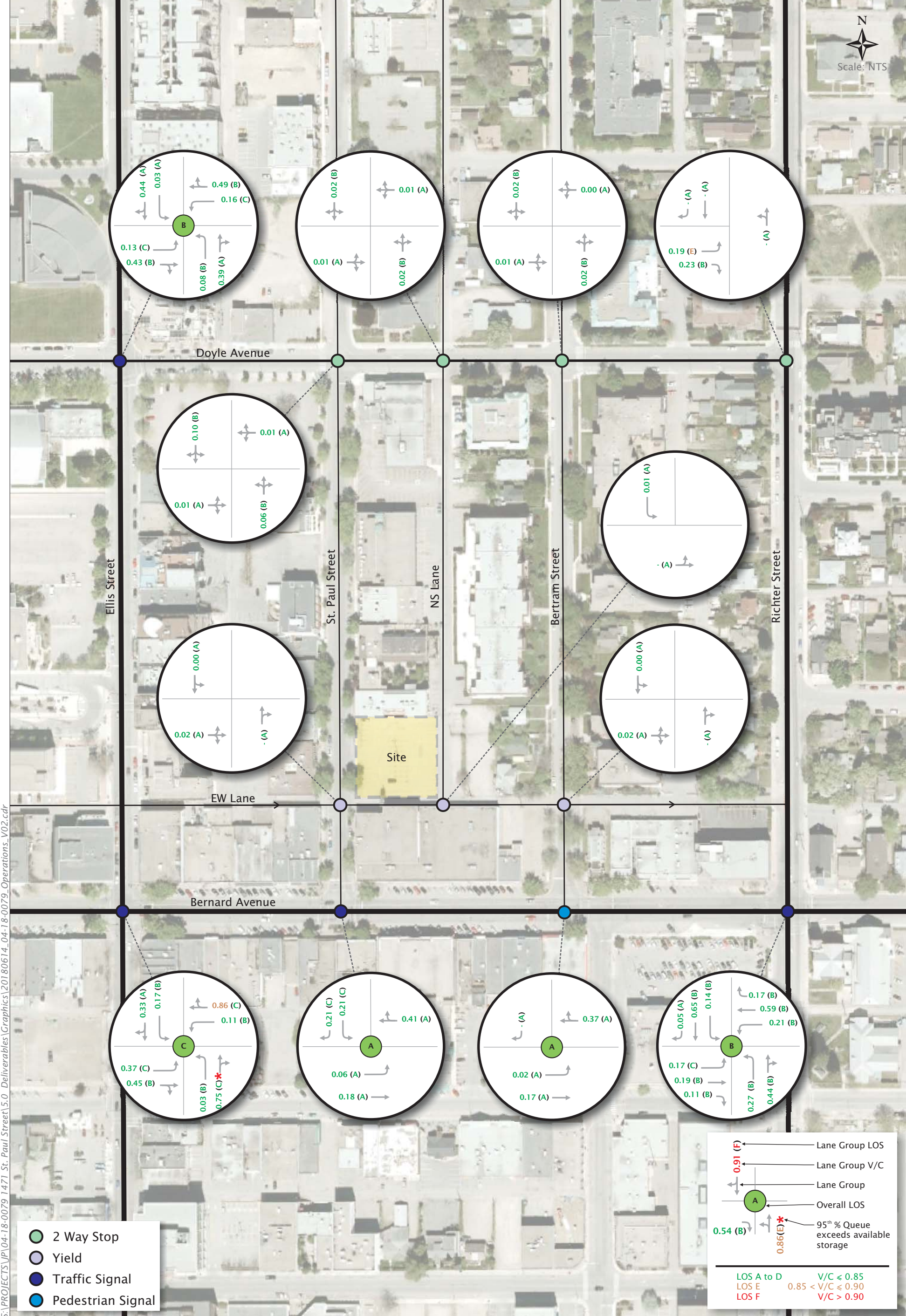
- 2 Way Stop
 - Yield
 - Traffic Signal
 - Pedestrian Signal
 - 00 Intersection #
- | 000 | AM | PM | Intersection Volumes |
|-----|----|----|----------------------|
| 000 | AM | PM | Intersection Volumes |

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Exhibit 3.4 Total Opening Day + 10 Years Traffic Forecasts

04-18-0079 1471 St. Paul Street June 2018





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Exhibit 3.5 Background Opening Day + 10 Years AM Peak Hour Operations

04-18-0079 1471 St. Paul Street
June 2018



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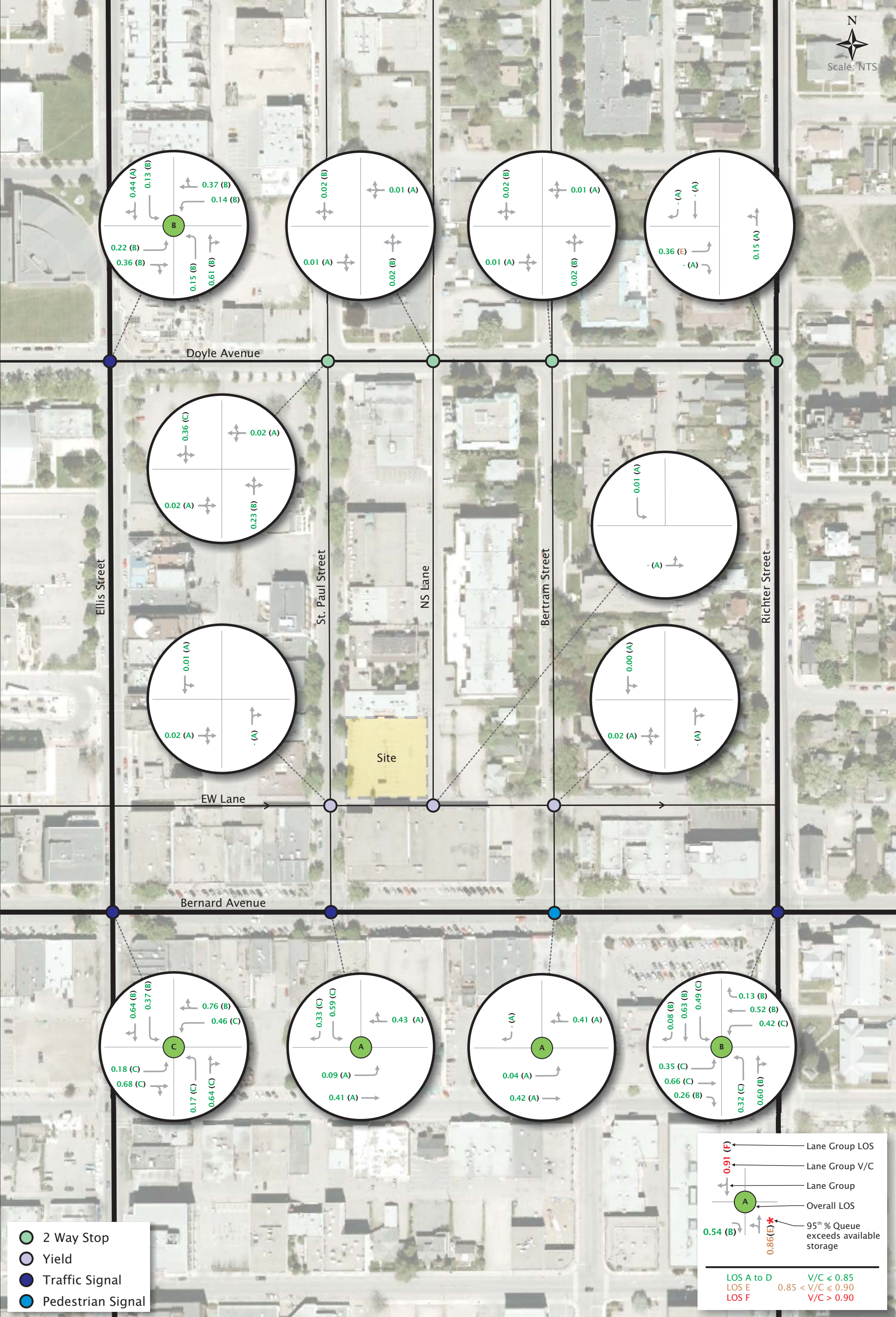
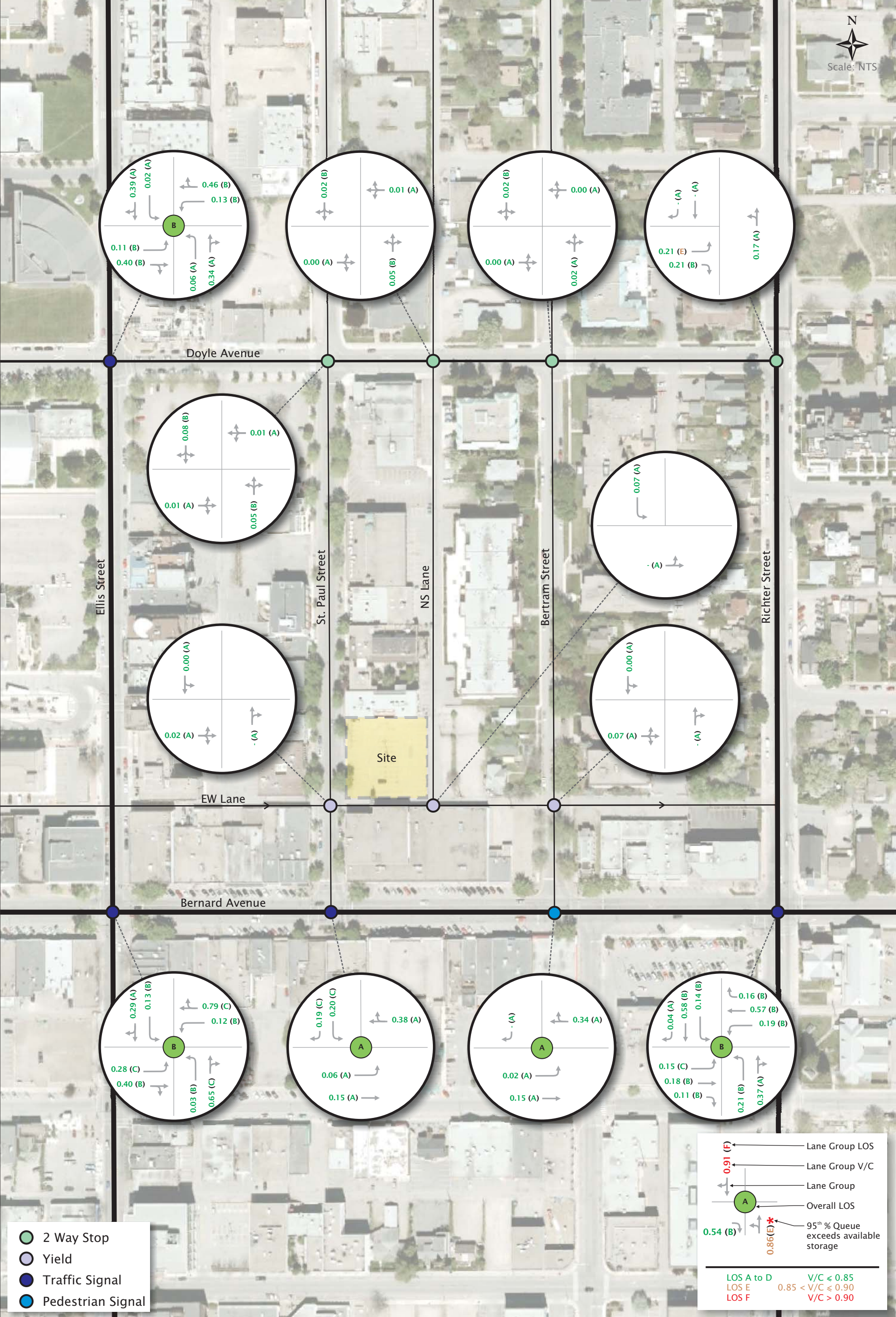


Exhibit 3.6 Background Opening Day + 10 Years PM Peak Hour Operations



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- 2 Way Stop
- Yield
- Traffic Signal
- Pedestrian Signal

0.91 (F) ← Lane Group LOS
0.86 (E)* ← Lane Group V/C
0.54 (B) ← Lane Group
A ← Overall LOS
0.86 (E)* ← 95th Queue exceeds available storage

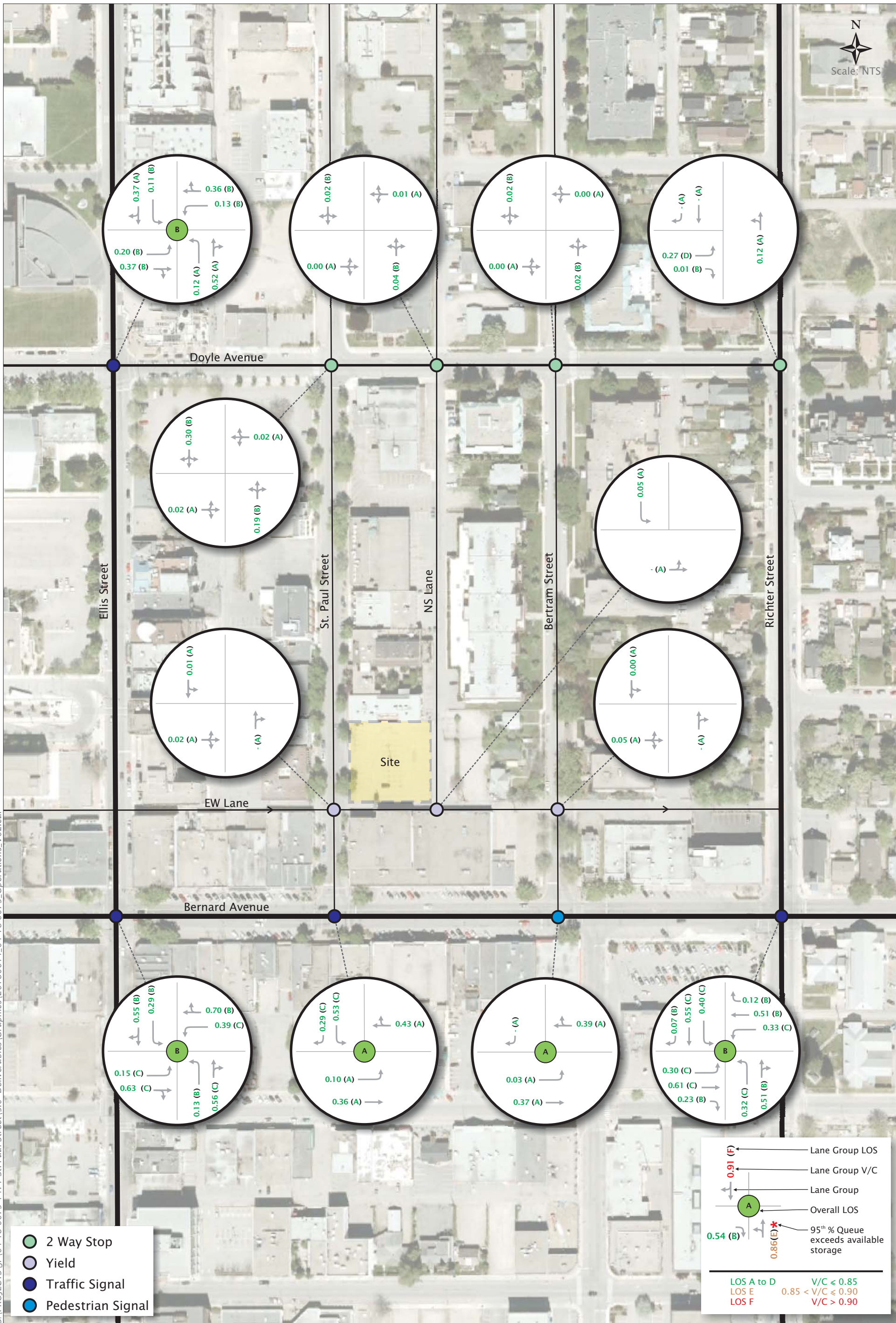
LOS A to D V/C ≤ 0.85
LOS E 0.85 < V/C ≤ 0.90
LOS F V/C > 0.90

Exhibit 3.7 Total Opening Day AM Peak Hour Operations

1471 St. Paul Street
June 2018



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0.91 (F)	← Lane Group LOS
←	← Lane Group V/C
←	← Lane Group
←	← Overall LOS
←	← 95 th Queue exceeds available storage

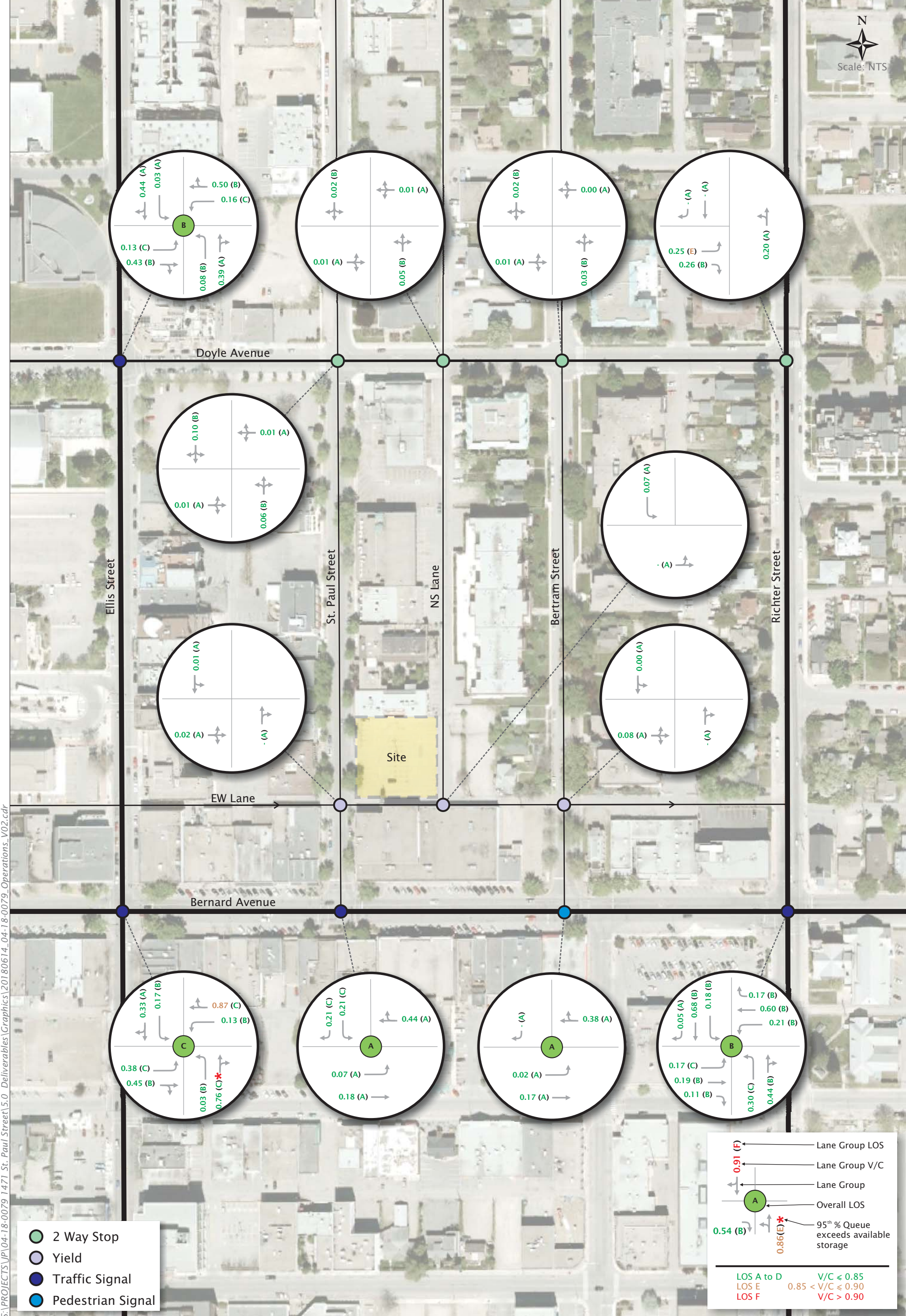
LOS A to D	V/C ≤ 0.85
LOS E	0.85 < V/C ≤ 0.90
LOS F	V/C > 0.90

Exhibit 3.8 Total Opening Day PM Peak Hour Operations

04-18-0079

1471 St. Paul Street
June 2018





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Total Opening Day + 10 Years AM Peak Hour Operations

Exhibit 3.9

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1471 St. Paul Street
June 2018



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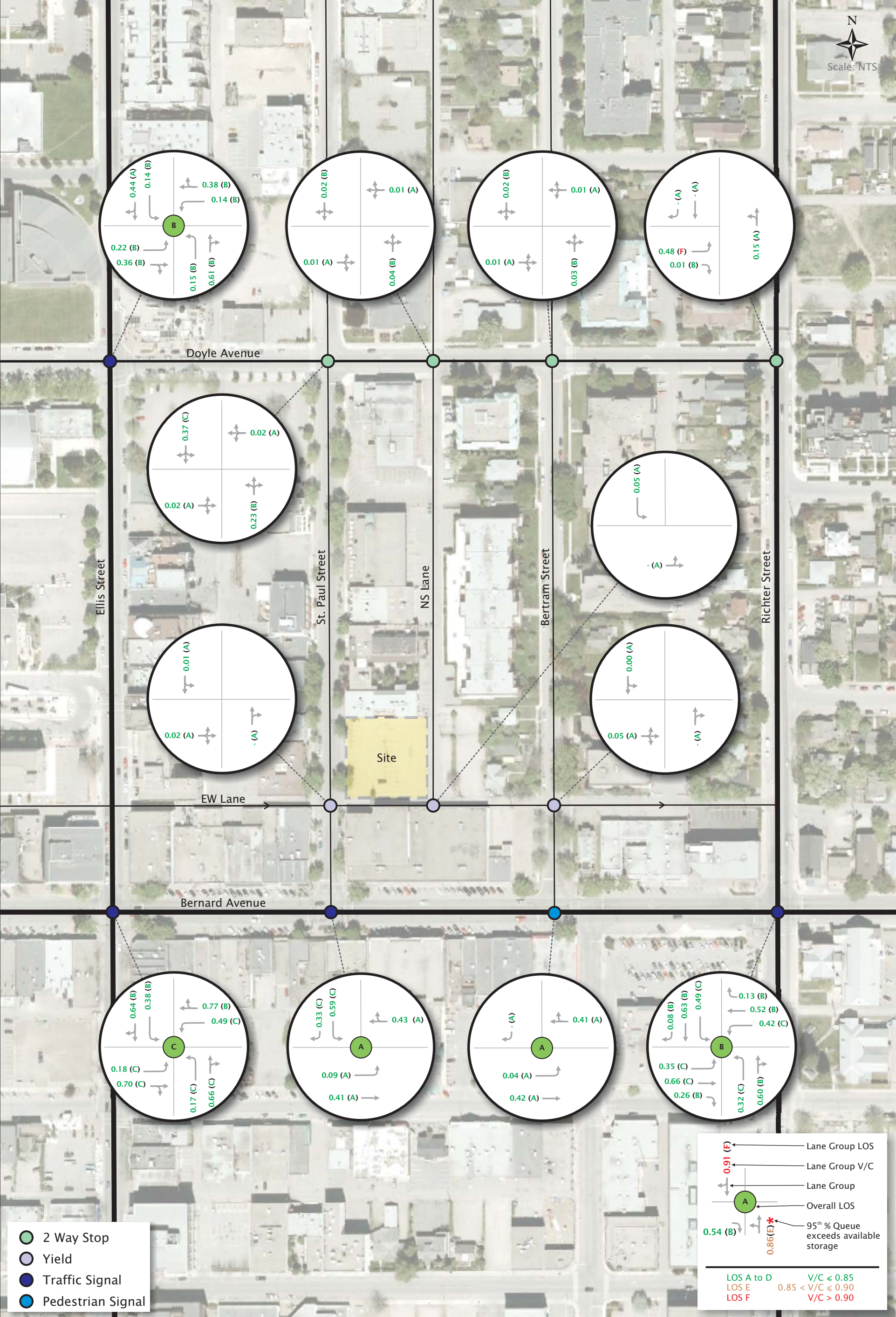
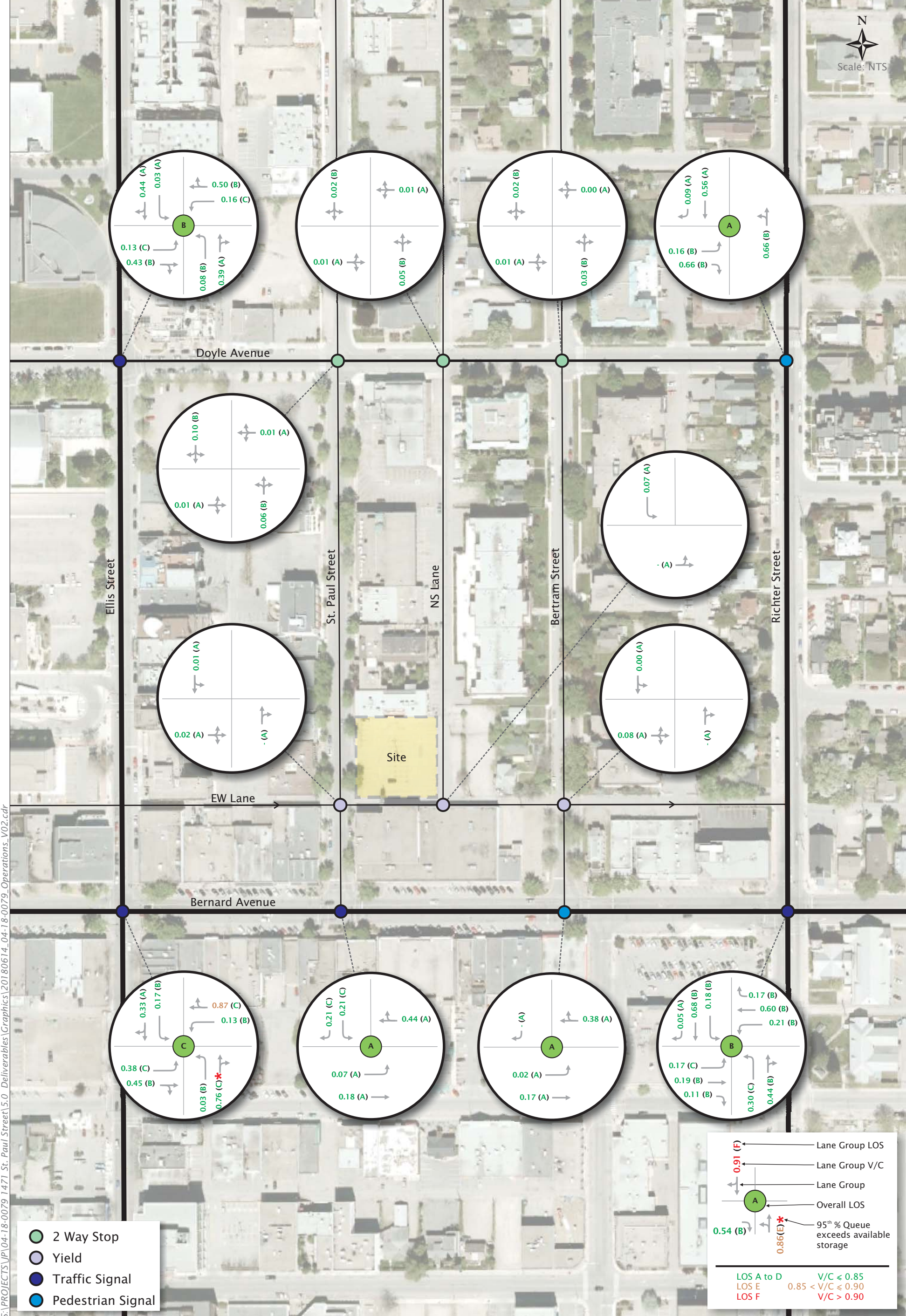


Exhibit 3.10 Total Opening Day + 10 Years PM Peak Hour Operations

1471 St. Paul Street
June 2018
04-18-0079





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- 2 Way Stop
- Yield
- Traffic Signal
- Pedestrian Signal

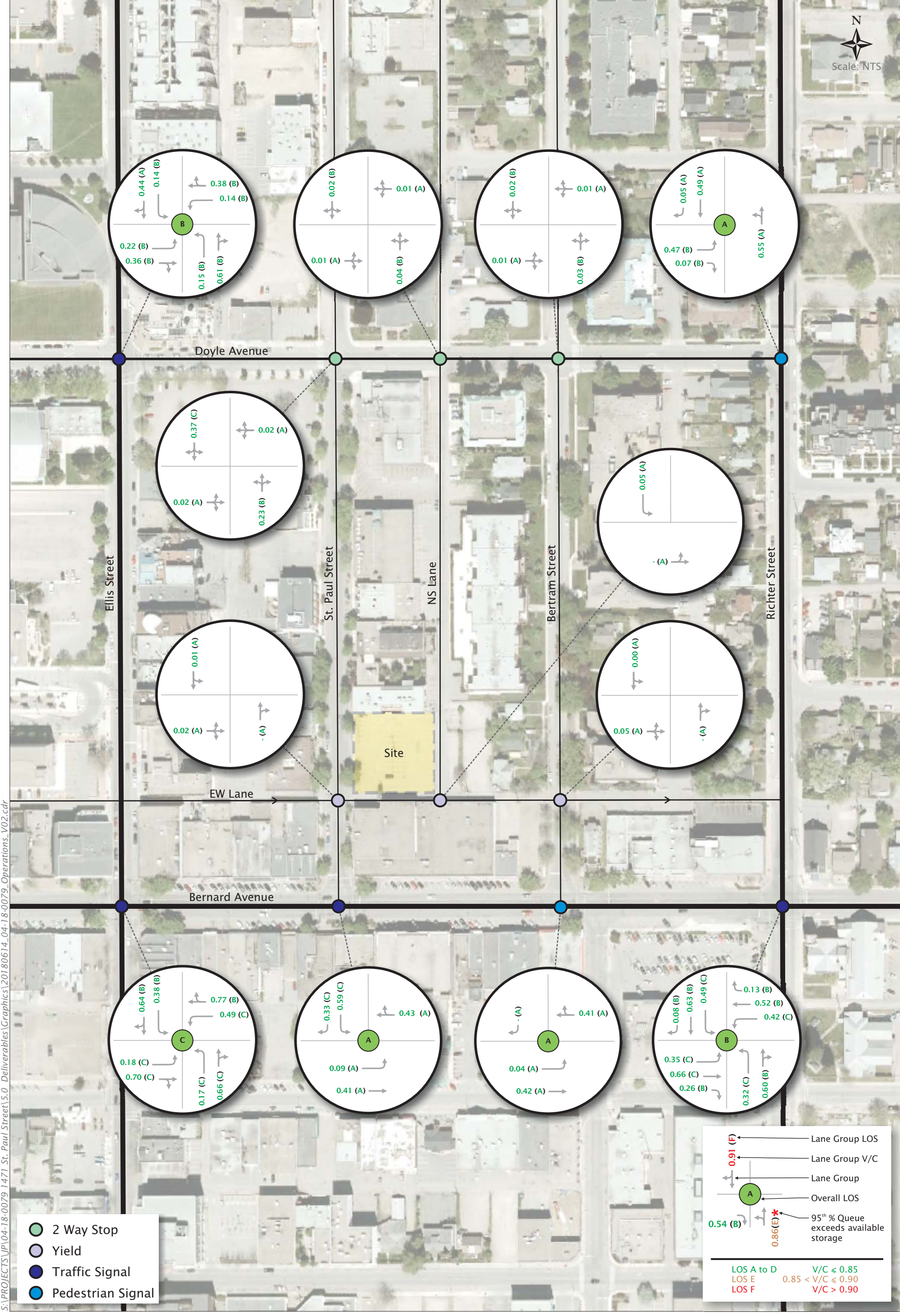
0.91 (F) ← Lane Group LOS
0.86 (E)* ← Lane Group V/C
0.54 (B) ← Lane Group
A ← Overall LOS
0.86 (E)* ← 95th Queue exceeds storage

LOS A to D V/C ≤ 0.85
 LOS E 0.85 < V/C ≤ 0.90
 LOS F V/C > 0.90

Exhibit 3.11 Total Opening Day + 10 Years AM Peak Hour Operations Half Signal at Richter & Doyle Intersection

1471 St. Paul Street
June 2018





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Exhibit 3.12
Total Opening Day + 10 Years PM Peak Hour Operations
Half Signal at Richter & Doyle Intersection

1471 St. Paul Street
 04-18-0079 June 2018



4. SITE PLAN DESIGN REVIEW

4.1 Site Access Design

The proposed development will have two vehicle access points, one from the east/west (leading into the 21 stall visitor parking area) and the other from the north/south lane leading to the resident parking above.

4.2 Parking Supply

4.2.1 Vehicle Parking

The site is being rezoned from C4 to C7 zoning. As per C7 (Urban Centre Commercial) zoning requirements (Zoning Bylaw No. 8000, Section 8 – Parking and Loading) the residential component of the development must provide a minimum of one resident parking space per residential unit. In addition, the development must provide 1 residential visitor parking space per 7 units. The Bylaw rate for commercial land use in the C7 zone is 1.3 spaces per 100m² GFA.

Bylaw requirements are summarized in **Table 4.1**.

Table 4.1: Vehicle Parking Supply Requirement & Provision

LAND USE	DENSITY	BYLAW RATE	BYLAW SUPPLY REQUIREMENT	PROVIDED	DIFFERENCE
Apartment	178 units	1 per unit + 1 visitor per 7 units	178 resident and 26 visitor = 204 total	204	-
Commercial	257.3 m ²	1.3 per 100m ² GLA	4	4	-
			208	208	-

As shown in Table 4.1, the proposed total parking supply of 208 spaces is compliant with Bylaw requirements.

It is recommended to take advantage of the resident visitor and commercial land uses having different peak demand times by sharing parking spaces.

All resident parking spaces will be provided within a 187 space above ground parkade. In addition to the parkade spaces there are 21 spaces located at ground level outside of parkade gates. The 21 ground level spaces plus nine spaces within the parkade will be reserved for visitors.

4.2.2 Vehicle Space Size

According to Bylaw a minimum of 50% of the apartment and commercial spaces must be full sized stalls (6m length, 2.5m width and 2m height). Up to 40% can be medium sized stalls (4.8m length, 2.3m width and 2m height) and up to 10% can be compact car/ motorcycle stalls (3.4m length, 2m width and 2m height). The proposed development provides 60 medium sized spaces which is compliant with Bylaw.

4.2.3 Bicycle Parking

Well managed, secure, accessible and covered bicycle parking will be provided as part of the development plan. The site plan indicates a total of 97 Class I bicycle spaces spread between five bicycle storage rooms. The development will also supply electric outlets for a portion of the bicycle parking spaces. In addition, one 6 space Class II bicycle rack will be provided near the building's main St. Paul Street entry in a well lit and highly visible area.

Current City of Kelowna Bylaw requirements are provided in **Table 4.2**.

Table 4.2: Bicycle Parking Supply Requirement & Provision

LAND USE	DENSITY	BYLAW RATE	BYLAW SUPPLY REQUIREMENT	PROVIDED	DIFFERENCE
Apartment	178	Class I: 0.5 per unit Class II: 0.1 per unit	89 Class I 18 Class II	-	-
Commercial	257.3 m ²	Class I: 0.2 per 100m ² Class II: 0.6 per 100m ²	1 Class I 2 Class II	-	-
TOTAL			90 CLASS I 20 CLASS II	97 CLASS I 6 CLASS II	+7 CLASS I -14 CLASS II

The proposed development provides 97 Class I bicycle spaces which is greater than that required by the Zoning Bylaw by 9 spaces.

The proposed 6 Class II bike parking spaces is short from Bylaw by 14 spaces. While this supply of 6 Class II spaces is considered by Bunt to be suitable for the scale and mix of uses planned for the development, Mission Group has expressed intent on adding Class II spaces in order to meet Bylaw requirements.

4.3 Service Vehicle Operations

The City of Kelowna Zoning Bylaw does not stipulate a requirement for off-street loading for residential land use. Loading activity for the proposed 178 unit residential units would likely involve trucks no larger than a 5-10 tonne single unit vehicle, e.g., (Transportation Association of Canada MSU design vehicle). At 10m in length, a MSU design vehicle could be accommodated in a passenger/loading zone located on the St. Paul Street curbside fronting the new development.

The ground floor commercial space at 257 square metres is relatively small and is not anticipated to require loading by vehicles larger than a Medium Single Unit (Transportation Association of Canada MSU design vehicle). The Zoning Bylaw requires that an off street loading space be provided at the rate of one space per 1,900 square metres of commercial area; the proposed commercial space is less than 15% of this area. A two vehicle (12 metre) passenger/loading zone on St. Paul Street would function quite effectively for this dual function purpose, along with the residential loading activity described in the previous paragraph.

An area labeled "Lane access corridor" that connects to the east/west lane to the south of the site will be used for garbage and recycling collection.

5. TDM & ACTIVE MODES

5.1 Transportation Demand Management

Transportation Demand Management (TDM) is defined as the “application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute this demand in space or in time”¹. A successful TDM program can influence travel behaviour away from Single Occupant Vehicle (SOV) travel during peak periods towards more sustainable modes such as High Occupancy Vehicle (HOV) travel, transit, cycling or walking. The responsibility for implementation of TDM measures can range across many groups, including regional and municipal governments, transit agencies, private developers, residents/resident associations or employers.

5.2 Recommended TDM Measures for Site

5.2.1 Marketing Materials & Transportation Information

Travel patterns are most pliable when residents move from one location to another. New developments can assist in influencing travel behaviours, through distribution of marketing materials to potential buyers/renters and through provision of information packages to new residents that emphasize the attractiveness and ease of alternative travel modes. In marketing materials to prospective new residents, clear and simple messages such as cost savings and health benefits (within the context of life style choice and urban living), along with practical information about local transit services, walking and cycle routes to key locations would help attract residents who want to live a car-free lifestyle.

For residents who are moving in, a Transportation Information Package should be provided on move-in day. The package should include:

- Map showing local cycling routes (can be obtained from City of Kelowna website);
- Map showing local transit routes (can be obtained from City of Kelowna website or BC Transit website);
- Map showing amenities within a typical walking catchment of 800m (can be obtained from Walk Score website: www.walkscore.com); and
- Information pertaining to on-site vehicle and bicycle parking space supply and management.

The developer will provide a commitment to develop such a Transportation Information package and provide to all new residential of the building.

¹ <http://ops.fhwa.dot.gov/tdm/index.htm> FHWA Travel Demand Management home page

5.2.2 Specialized Parking

The developer is encouraged to provide electric charging abilities to a portion of the development's parking spaces.

5.2.3 Bicycle Parking

The City of Kelowna's Zoning Bylaw requires the development to provide 0.5 Class I and 0.1 Class II bicycle parking spaces per unit.

The development will be providing 97 Class I bicycle parking spaces. This exceeds bylaw requirements by 7 spaces. The development will provide one Class II bicycle spaces to meet Bylaw requirements, including a bicycle rack near the building's main entry on St. Paul Street.

6. CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

1. The proposed development at 1471 St. Paul Street consists of 178 residential apartments and approximately 257 square metres of ground level commercial space.
2. The 1471 St. Paul Street site is currently occupied with a 43 space parking lot. The parking lot was observed to be well used. The parking needs of these vehicles are anticipated to be adequately accommodated by nearby parking lots (such as the Library Parkade on Ellis Street) which were observed by Bunt to have considerable reserve capacity (particularly the Library Parkade) during the weekday mid-day peak parking period.
3. All intersections currently operate within capacity and acceptable level of service thresholds during both the weekday AM and PM peak hour periods.
4. The proposed development could potentially generate up approximately 90 vehicle trips in the weekday AM peak hour and approximately 110 vehicle trips in the weekday PM peak hour. Because the development is located in the Downtown Kelowna area within convenient walking and cycling distance of employment, shops and services and good transit access, the vehicle trip generation for the project may well be substantially lower at between one-half to two-thirds of the volumes noted above.
5. Our analysis indicates that the proposed development of 178 residential units and ground level commercial at 1471 St. Paul Street will have minimal impact to the adjacent road network. Most vehicle trips generated by the development will travel through signalized intersections that are currently operating well within operational capacity thresholds.
6. The future half signal at the Doyle Avenue and Richter Street intersection and potential Bernard Avenue signal coordination were observed to have little impact on existing and future traffic operations.
7. The proposed development will be accessed from two driveways, one from the north/ south adjacent lane located to the east of the site and the other from the east/west lane that is located south of the site.
8. The development will be supported with 208 parking spaces located in a five level above ground parkade. This vehicle parking supply meets Bylaw requirements.
9. The proposed development provides 97 Class I bicycle spaces which is greater than required through Kelowna Bylaw. The proposed 6 Class II bike parking spaces are short from Bylaw by 14 spaces. While this supply of 6 Class II spaces is considered by Bunt to be suitable for the scale and mix of uses

planned for the development, Mission Group has expressed intent on adding Class II spaces in order to meet Bylaw requirements.

10. The site location and high-rise design is in itself a progressive step toward more sustainable transport modes. Residents living downtown in close proximity to amenities and services are anticipated to take more trips by walking, cycling and transit than residents living in suburban or lower density areas.

6.2 Recommendations

1. It is recommended that the City establish a two space parking length (12 m) on St. Paul Street in front of the proposed building for short term (5 minutes) parking and loading activity.
2. It is recommended that the City consider introducing a stop sign for the east/west lane at its approach to Bertram Street.
3. It is recommended that Mission Group provide a commitment to design a local area Transportation Information package and provide to all residential units.
4. It is recommended that Mission Group provide electric charging abilities to a portion of the development's vehicle parking spaces as well as providing electric charging abilities to the Class I bicycle storage rooms.

