

19, 29 & 134 Robinson Avenue Transportation Impact Assessment

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report (Draft)

Prepared for:

TC United
800 Industrial Avenue, Unit 9-100
Ottawa, ON K1G 4B8

Prepared by:



13 Markham Avenue
Nepean, ON K2G 3Z1

December 2018

PN: 2018-47

Table of Contents

1	Screening	1
2	Existing and Planned Conditions	1
2.1	Proposed Development.....	1
2.2	Existing Conditions	5
2.2.1	Area Road Network	5
2.2.2	Existing Intersections.....	5
2.2.3	Existing Driveways	5
2.2.4	Cycling and Pedestrian Facilities.....	5
2.2.5	Existing Transit.....	6
2.2.6	Existing Area Traffic Management Measures.....	6
2.2.7	Existing Peak Hour Travel Demand.....	6
2.2.8	Collision Analysis	7
2.3	Planned Conditions.....	7
2.3.1	Changes to the Area Transportation Network	7
2.3.2	Other Study Area Developments.....	8
3	Study Area and Time Periods	8
3.1	Study Area	8
3.2	Time Periods	8
3.3	Horizon Years.....	8
4	Exemption Review	8
5	Development-Generated Travel Demand	9
5.1	Trip Generation and Mode Shares	9
5.1.1	Existing Trip Generation	9
5.1.2	New Development Trip Generation	11
5.2	Trip Distribution.....	12
5.3	Trip Assignment.....	12
6	Background Network Travel Demands.....	13
6.1	Transportation Network Plans	13
6.2	Background Growth.....	13
6.3	Other Developments	13
7	Demand Rationalization	13
8	Development Design	13
8.1	Design for Sustainable Modes	13
8.2	Circulation and Access.....	14
9	Parking	14
9.1	Parking Supply	14
9.2	Parking Spillover	14
10	Boundary Street Design.....	14
11	Summary of Improvements Indicated and Modifications Options	14
12	Next Steps.....	15

List of Figures

Figure 1: Area Context Plan	1
Figure 2: 19 Robinson Site Plan	2
Figure 3: 29 Robinson Site Plan	3
Figure 4: 134 Robinson Site Plan	4
Figure 5: Study Area Existing Pedestrian Network	6
Figure 6: Study Area Existing Cycling Network	6
Figure 7: Representative Study Area Collisions	7
Figure 8: Existing Traffic Volumes (Estimate)	11
Figure 9: Site Traffic Volumes	13

List of Tables

Table 1: Study Area Collision Summary, 2014-2017	7
Table 2: Exemption Review	8
Table 3: Recommended Additional Exemptions	9
Table 4: Trip Generation Person Trip Rates	9
Table 5: Total Person Trip Generation	10
Table 6: OD Survey Existing Mode Share – Ottawa Inner	10
Table 7: Trip Generation by Mode	10
Table 8: TRANS Trip Generation Person Trip Rates	11
Table 9: Total Person Trip Generation	11
Table 10: Trip Generation by Mode	12
Table 11: OD Survey Distribution – Ottawa Inner	12
Table 12: Boundary Street MMLOS Analysis	14

List of Appendices

Appendix A – TIA Screening Form and Certification Form
Appendix B – Collision Data
Appendix C – MMLOS Analysis

1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form for each site, a TIA report was **not required**. The City has subsequently requested a TIA to assess the total impact of new vehicles of all three sites combined on the adjacent road network. The Screening and the Certification Form for TIA Study PM have been provided in Appendix A.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed developments, located at 19, 29 and 134 Robinson Avenue, will convert existing residential units to three storey apartment buildings. The development is located within the Sandy Hill Secondary Plan and Lees Transit-Oriented Design (TOD) Community Design Plan area. The current zoning is for Residential (R5) and permits low and mid-rise apartments. Access for each building will be directly to Robinson Avenue. In total, 149 apartment units will be constructed, with 51 units at 29 and 134 Robinson Avenue, and 47 units at 19 Robinson Avenue. Amenity space is provided at the rear of each building, including four visitor parking spaces (one accessible space) and 26 bike parking spaces. The anticipated full build-out and occupancy horizon is 2020.

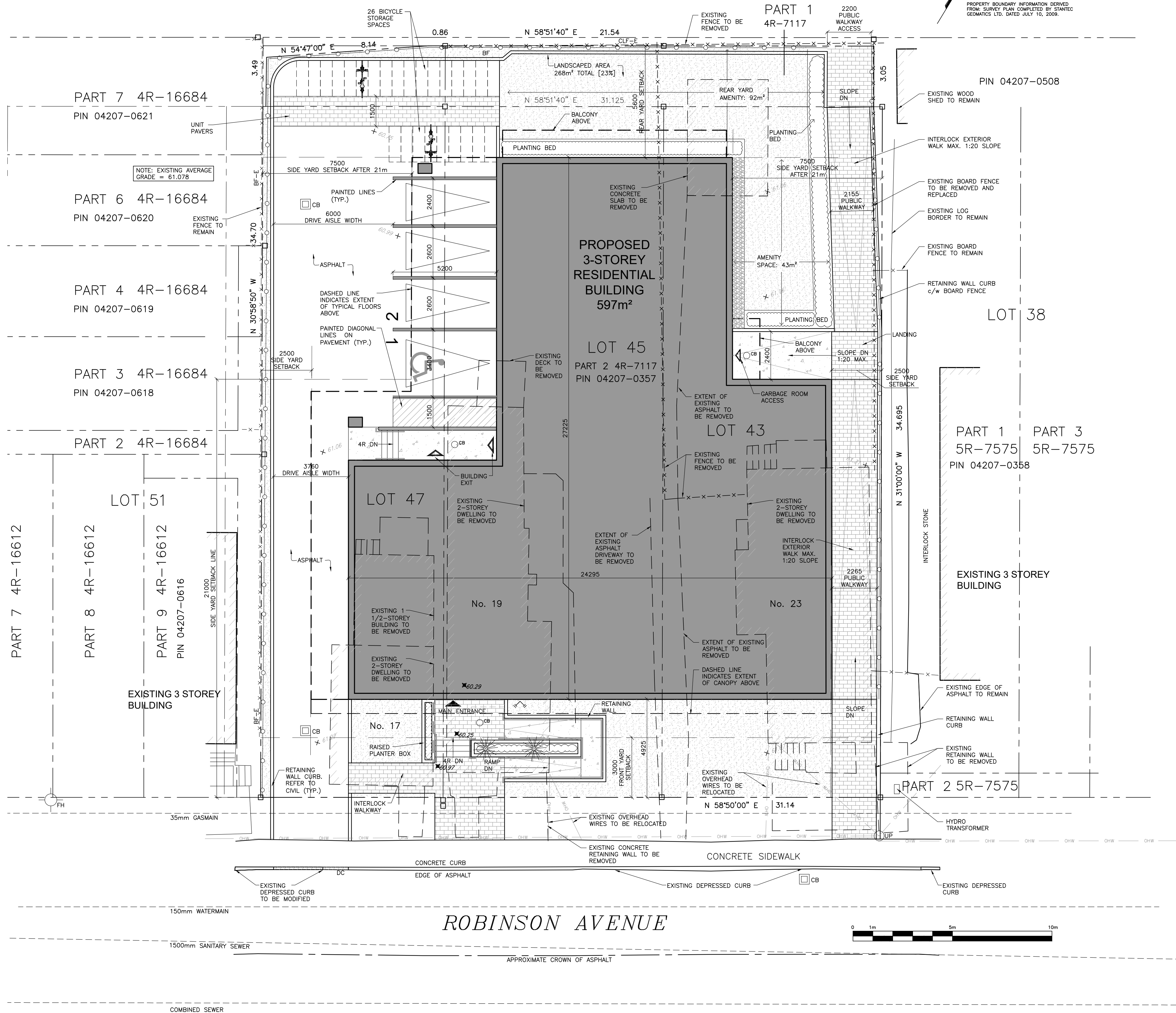
Figure 1 illustrates the Study Area Context. Figure 2, Figure 3, and Figure 4 illustrate the proposed site plans.

Figure 1: Area Context Plan

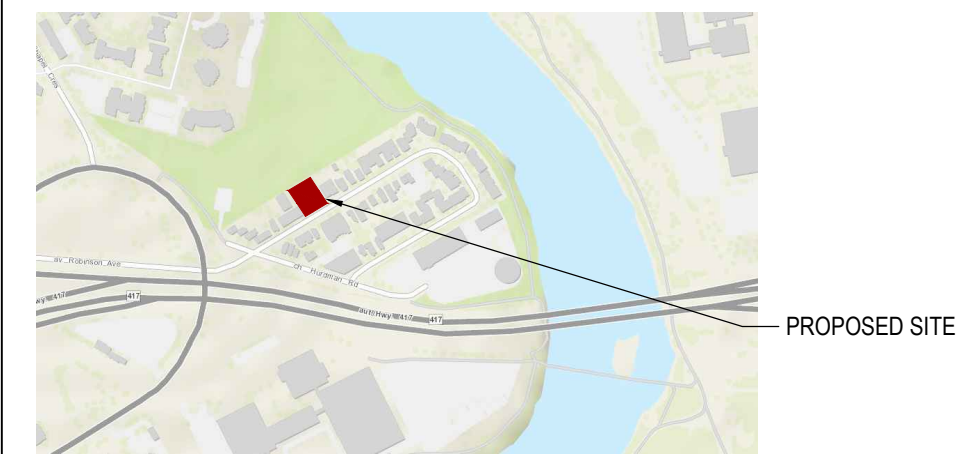


Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 19, 2018

LOT F, CONCESSION D (RIDEAU FRONT)
PART 1 4R-598
PIN 04207-0134



KEY PLAN



PROPERTY DESCRIPTION

TCU - THREE STOREY RESIDENTIAL BUILDING	
CITY OF OTTAWA PIN NUMBER	04207 0357
MUNICIPAL ADDRESS	19 Robinson Avenue

SITE INFORMATION

LOT AREA:	1,170.9m²
LOT FRONTAGE:	31.14m
LOT DEPTH:	37.745m

BUILDING INFORMATION

BUILDING AREA:	597m²
BUILDING FLOOR AREA:	1,791m²
PROPOSED USE:	APARTMENT DWELLING, LOW-RISE
UNIT BREAKDOWN:	
BASEMENT:	8 UNITS 4-STUDIO (B/F), 4-1 BD (B/F)
FIRST FLOOR:	13 UNITS 7-STUDIO, 5-1 BD, 1-2BD
SECOND FLOOR:	13 UNITS 7-STUDIO, 5-1 BD, 1-2BD
THIRD FLOOR:	13 UNITS 7-STUDIO, 5-1 BD, 1-2BD
TOTAL:	47 UNITS 25-STUDIO, 19-1 BD, 3-2BD

ZONING TABLE

CITY OF OTTAWA ZONING BY-LAW No. 2008-250	R5N [2053] S312	REQUIRED	PROPOSED
MINIMUM LOT AREA	450m²		1,170.9m²
MINIMUM LOT WIDTH	15m		31.14m
FRONT YARD SETBACK	3m		4.93m
MINIMUM INTERIOR SIDE YARD SETBACK	2.5m within 21m of front lot line 7.5m in all other circumstances		2.5m for 21m 7.5m for BALANCE
MINIMUM REAR YARD SETBACK	5.6m		5.6m
MAXIMUM BUILDING HEIGHT	12.7m to 18.9m		10.9m
MAXIMUM FLOOR SPACE INDEX	N/A		
LANDSCAPED AREA	30% = 351.27m²		29% = 341.8m² incl. public access walkway
VEHICLE PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	0 parking spaces for first 12 units Table 101 - Dwelling low-rise apartment 0.5 per dwelling unit = 19 spaces		0 SPACES
VISITOR PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	0.1 / DWELLING UNIT AFTER 12 UNITS 4 SPACES REQUIRED		4 SPACES
AMENITY AREA REQUIREMENTS	15m² per unit for the first 8 units = 120m² 6m² per dwelling unit in excess of 8 = 234m² Total = 354m²		92m² REAR YARD AMENITY 43m² REAR SIDE YARD AMENITY 72m² BALCONIES 148m² ROOFTOP AMENITY
BICYCLE PARKING SPACES	0.5 per dwelling unit = 24		26

LEGEND

	SOFT LANDSCAPING		EXISTING TREE TO REMAIN (REFER TO LANDSCAPE DRAWINGS)
	UNIT PAVERS		NEW TREE (REFER TO LANDSCAPE DRAWINGS)
	ASPHALT PAVING		NEW SHRUBS (REFER TO LANDSCAPE DRAWINGS)
	CONCRETE		EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]
	RIVER STONES. REFER TO LANDSCAPE		NEW GROUND ELEVATION REFER TO CIVIL
	EXISTING BUILDING ELEMENT TO BE REMOVED		NOTE: 'X'-E INDICATES EXISTING TO REMAIN
	EXISTING FENCE		
	NEW SCREEN FENCE		
	NEW BOARD FENCE		
	LOT LINE		
	SETBACK LINE		
	DESIGNATED BUILDING ENTRANCE / EXIT		
	FIRE HYDRANT. REFER TO CIVIL		
	CATCH BASIN		
	MANHOLE		
	FLOOR DRAIN		
	UTILITY POLE		
	OVERHEAD UTILITY WIRES		
	LIGHT STANDARD		
	DEPRESSED CURB		

No. Date Émis pour / Object

1 2018-07-09 COORDINATION

2 2018-07-17 COORDINATION

Ingenieur / Engineer (Mécanique & Électrique) / Mechanical & Electrical

Ingenieur / Engineer (Structure) / Structure

Ingenieur / Engineer (Civil / Civil)

Client / Client

Robinson Village I Limited Partnership

Architecte / Architect

Architectes 270 Prince Street 200 Montreal Quebec H3C 2N3 T 514 881 5122 F 514 881 5383 www.rubinrotman.com

Rubin & Rotman architectes

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Scale / Scale

Note: L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et avant immédiatement l'architecte de toutes erreurs ou omissions. Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Project / Project

19 ROBINSON AVE. THREE STOREY APARTMENT BUILDING

19 Robinson Avenue, Ottawa ON

Title / Titre

SITE PLAN

Dessiné par / Drawn by MD No. projet / Project number 1634

Vérifié par / Verified by RC No. dessin / Drawing number

Echelle / Scale As indicated

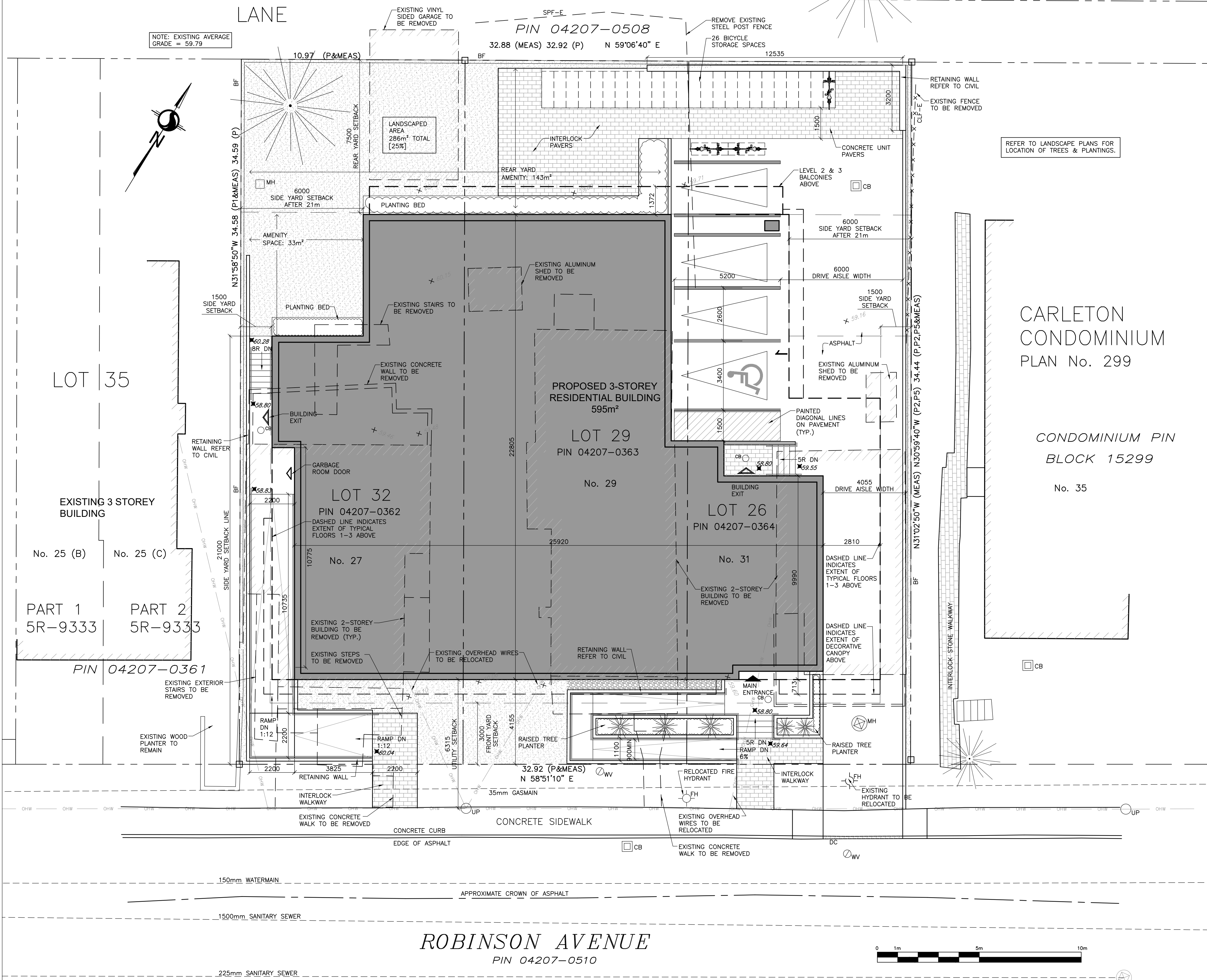
Date de création du dessin / Drawing creation date 2018/05/01

Revision / Revision 1

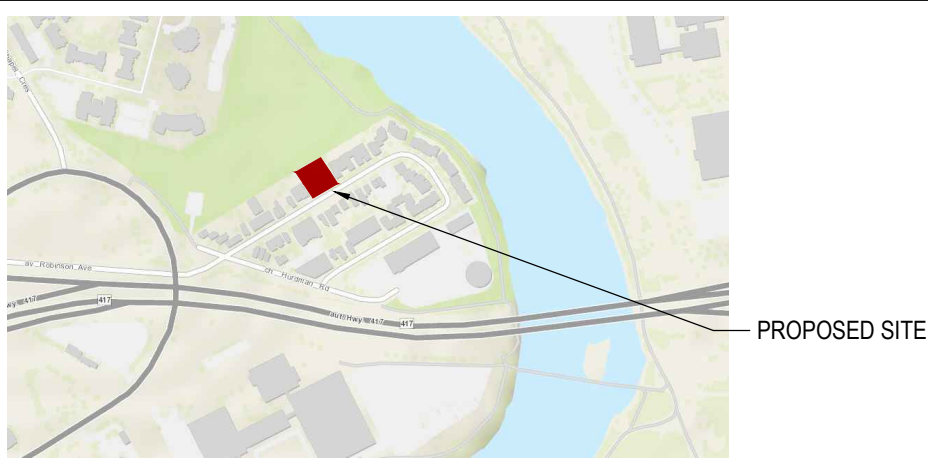
A105

LOT F CONCESSION D (RIDEAU FRONT) (NEPEAN)
PART 1 4R-598

PROPERTY BOUNDARY INFORMATION
DERIVED FROM SURVEY PLAN COMPLETED
BY STANTEC GEOMATICS LTD. DATED APRIL
12, 2018.



KEY PLAN



PROPERTY DESCRIPTION

THREE STOREY RESIDENTIAL BUILDING	
CITY OF OTTAWA PIN NUMBER	04207 0362, 0363, 0364
MUNICIPAL ADDRESS	29 Robinson Avenue

SITE INFORMATION

LOT AREA:	1,139m²
LOT FRONTAGE:	32.92m
LOT DEPTH:	34.59m

BUILDING INFORMATION

BUILDING AREA:	595m²
BUILDING FLOOR AREA:	1,785m²
PROPOSED USE:	APARTMENT DWELLING, LOW-RISE
UNIT BREAKDOWN:	
BASEMENT:	9 UNITS 1-STUDIO, 6-STUDIO (B/F), 1-1 BD (B/F), 1-2 BD (B/F)
FIRST FLOOR:	14 UNITS 10-STUDIO, 4-1 BD
SECOND FLOOR:	14 UNITS 10-STUDIO, 4-1 BD
THIRD FLOOR:	14 UNITS 10-STUDIO, 4-1 BD
TOTAL:	51 UNITS 37-STUDIO, 13-1 BD, 1-2 BD

ZONING TABLE

CITY OF OTTAWA ZONING BY-LAW No. 2008-250	R5K [2133] H(20)	REQUIRED	PROPOSED
MINIMUM LOT AREA	450m²		1,139m²
MINIMUM LOT WIDTH	15m		32.92m
FRONT YARD SETBACK	3m		4.76m
MINIMUM INTERIOR SIDE YARD SETBACK	1.5m within 21m of front lot line 6m in all other circumstances		1.5m
MINIMUM REAR YARD SETBACK	7.5m		7.5m
MAXIMUM BUILDING HEIGHT	14.5m		10.8m
MAXIMUM FLOOR SPACE INDEX	N/A		
LANDSCAPED AREA	30% = 341.7m²		25% = 286m²
VEHICLE PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	0 parking spaces for first 12 units Table 101 - Dwelling low-rise apartment 0.5 per dwelling unit = 20 spaces		0 SPACES
VISITOR PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	0.1 / DWELLING UNIT AFTER 12 UNITS 4 SPACES REQUIRED		4 SPACES
AMENITY AREA REQUIREMENTS	15m² per unit for the first 8 units = 120m² 6m² per dwelling unit in excess of 8 = 258m² Total = 378m²		-143m² REAR YARD AMENITY -33m² REAR SIDE YARD AMENITY [142m² SOFT LANDSCAPING (81%)] -148m² ROOFTOP AMENITY -56m² BALCONIES TOTAL = 380m²
BICYCLE PARKING SPACES	0.5 per dwelling unit = 26		26

LEGEND

	SOFT LANDSCAPING		EXISTING TREE TO REMAIN (REFER TO LANDSCAPE DRAWINGS)
	UNIT PAVERS REFER TO LANDSCAPE		NEW TREE (REFER TO LANDSCAPE DRAWINGS)
	ASPHALT PAVING		NEW SHRUBS (REFER TO LANDSCAPE DRAWINGS)
	CONCRETE		NEW EVERGREEN SHRUB (REFER TO LANDSCAPE DRAWINGS)
	RIVERSTONE REFER TO LANDSCAPE		EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]
	EXISTING BUILDING ELEMENT TO BE REMOVED		NEW GROUND ELEVATION REFER TO CIVIL
	EXISTING FENCE		
	NEW SCREEN FENCE		
	NEW BOARD FENCE		
	LOT LINE		
	SETBACK LINE		
	DESIGNATED BUILDING ENTRANCE / EXIT		
	FIRE HYDRANT. REFER TO CIVIL		
	CATCH BASIN		
	MANHOLE		
	FLOOR DRAIN		
	UTILITY POLE		
	OVERHEAD UTILITY WIRES		
	LIGHT STANDARD		
	DEPRESSED CURB		

No.	Date	Émis pour / Object
1	2018-07-09	COORDINATION
2	2018-07-13	COORDINATION
3	2018-09-17	COORDINATION
4	2018-10-26	SITE PLAN CONTROL

Ingenieur / Engineer
(Structure / Structure)

Ingenieur / Engineer
(Mécanique & Électrique / Mechanical & Electrical)

Ingenieur / Engineer
(Civil / Civil)



Client / Client

Robinson Village II
Limited Partnership

Architecte / Architect

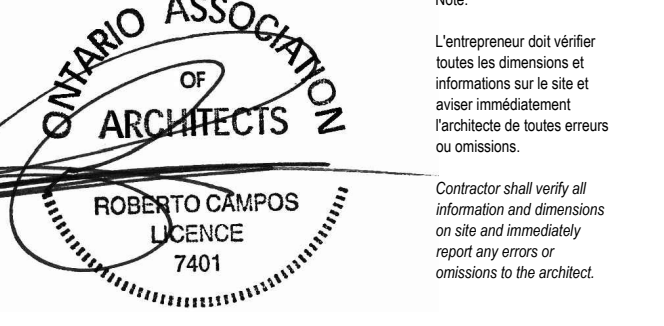


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Scalier / Scale



Projet / Project

THREE STOREY APARTMENT
BUILDING

29 Robinson Avenue, Ottawa ON

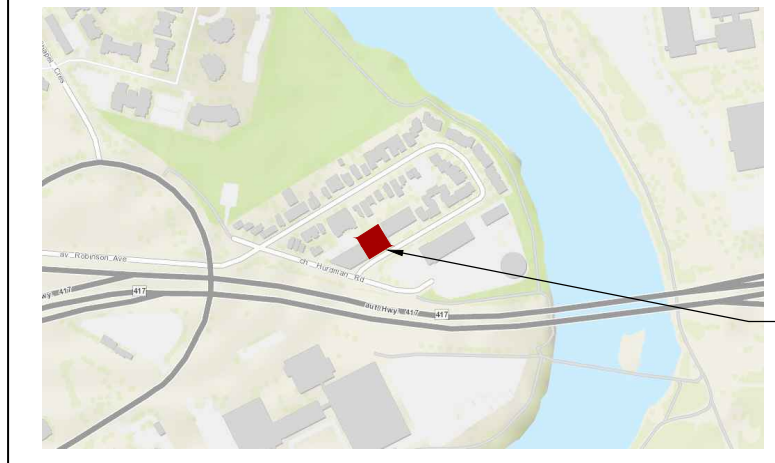
Titre / Title

SITE PLAN

Dessiné par / Drawn by MD	No. projet / Project number 1621
Vérifié par / Verified by RC	No. dessin / Drawing number Revision
Echelle / Scale As indicated	Date de création du dessin / Drawing creation date 2018/05/01

A105

KEY PLAN



PROPOSED SITE

PROPERTY DESCRIPTION

THREE STOREY RESIDENTIAL BUILDING

CITY OF OTTAWA PIN NUMBER04207 0389, 0390, 0391

MUNICIPAL ADDRESS134 Robinson Avenue

SITE INFORMATION

LOT AREA:1,104m²

LOT FRONTAGE:32.92m

LOT DEPTH:33.5m

BUILDING INFORMATION

BUILDING AREA:595m²

BUILDING FLOOR AREA:1,785m²

PROPOSED USE:APARTMENT DWELLING, LOW-RISE

UNIT BREAKDOWN:

BASEMENT:9 UNITS

FIRST FLOOR:14 UNITS

SECOND FLOOR:14 UNITS

THIRD FLOOR:14 UNITS

TOTAL:51 UNITS

1-STUDIO, 6-STUDIO (B/F), 1-1 BD (B/F), 1-2 BD (B/F)

10-STUDIO, 4-1 BD

10-STUDIO, 4-1 BD

10-STUDIO, 4-1 BD

37-STUDIO, 13-1 BD, 1-2 BD

ZONING TABLE

R5K [2133] H(20)

REQUIRED

PROPOSED

CITY OF OTTAWA ZONING BY-LAW No. 2008-250

MINIMUM LOT AREA

450m²

1,104m²

MINIMUM LOT WIDTH

15m

32.92m

FRONT YARD SETBACK

3m

3.81m

MINIMUM INTERIOR SIDE YARD SETBACK

1.5m within 21m of front lot line 6m in all other circumstances

1.5m

MINIMUM REAR YARD SETBACK

7.5m

7.5m

MAXIMUM BUILDING HEIGHT

14.5m

10.8m

MAXIMUM FLOOR SPACE INDEX

N/A

LANDSCAPED AREA

30% = 341.7m²

27.5% = 303.6m²

VEHICLE PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)

0 parking spaces for first 12 units
Table 101 - Dwelling low-rise apartment
0.5 per dwelling unit = 20 spaces

0 SPACES

VISITOR PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)

0.1 / DWELLING UNIT AFTER 12 UNITS
4 SPACES REQUIRED

4 SPACES

AMENITY AREA REQUIREMENTS

15m² per unit for the first 8 units = 120m²
6m² per dwelling unit in excess of 8 = 258m²
Total = 378m²

144m² REAR YARD AMENITY
36m² REAR SIDE YARD AMENITY
(151m² SOFT LANDSCAPING (84%)
148m² ROOFTOP AMENITY
56m² BALCONIES
TOTAL = 384m²

BICYCLE PARKING SPACES

0.5 per dwelling unit = 26

26

LEGEND

SOFT LANDSCAPING

UNIT PAVERS

ASPHALT PAVING

CONCRETE

EXISTING BUILDING ELEMENT TO BE REMOVED

EXISTING FENCE

NEW SCREEN FENCE

NEW BOARD FENCE

LOT LINE

SETBACK LINE

DESIGNATED BUILDING ENTRANCE / EXIT

FIRE HYDRANT. REFER TO CIVIL

CATCH BASIN

MANHOLE

FLOOR DRAIN

UTILITY POLE

OVERHEAD UTILITY WIRES

LIGHT STANDARD

DEPRESSED CURB

EXISTING TREE TO REMAIN (REFER TO LANDSCAPE DRAWINGS)

NEW TREE (REFER TO LANDSCAPE DRAWINGS)

NEW SHRUBS (REFER TO LANDSCAPE DRAWINGS)

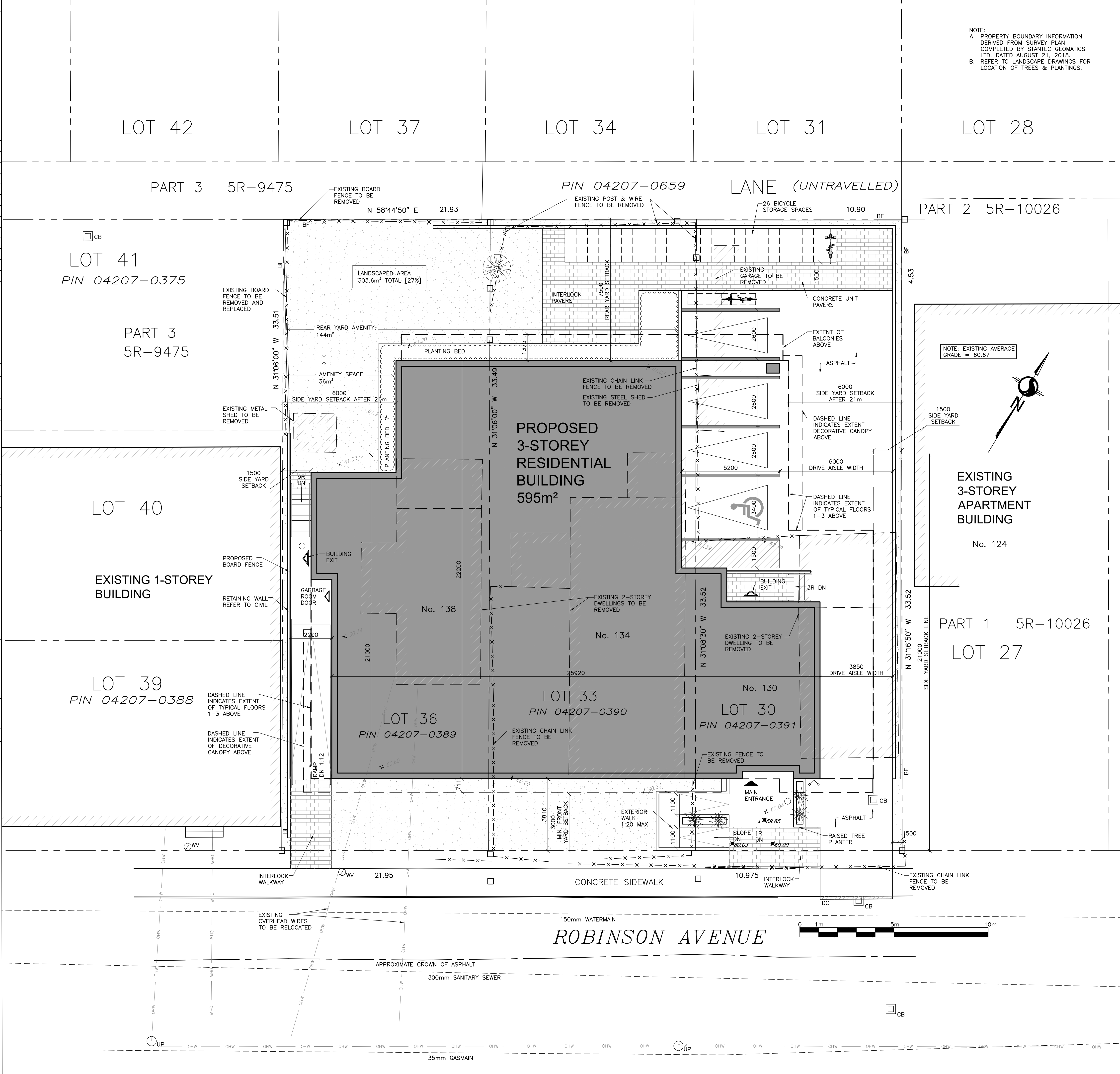
NEW EVERGREEN SHRUB (REFER TO LANDSCAPE DRAWINGS)

FIRE DEPARTMENT CONNECTION

EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]

NEW GROUND ELEVATION REFER TO CIVIL

NOTE: "X"-E INDICATES EXISTING TO REMAIN



No. DateÉmis pour / Object

12018-06-29CLIENT REVIEW

22018-07-13COORDINATION

32018-10-01COORDINATION

42018-10-26COORDINATION

NOTE:

A. PROPERTY BOUNDARY INFORMATION DERIVED FROM SURVEY PLAN COMPLETED BY STANTEC GEOMATICS LTD., DATED AUGUST 21, 2018.

B. REFER TO LANDSCAPE DRAWINGS FOR LOCATION OF TREES & PLANTINGS.

Ingenieur / Engineer
(Structure / Structure)

Ingenieur / Engineer
(Mechanical & Electrical / Mécanique & Électrique)

Ingenieur / Engineer
(Civil / Civil)

Client / Client

Robinson Village III
Limited Partnership

Architecte / Architect

Architectes

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F 514 881 5383
www.rubinrotman.com

Rubin & Rotman
architectes

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Niveau / Seal

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Project / Project

134 ROBINSON AVE.
THREE STOREY APARTMENT
BUILDING

134 Robinson Avenue, Ottawa ON

Titre / Title

SITE PLAN

Dessiné par / Drawn by

MD

No. projet / Project number

1638

Vérifié par / Verified by

RC

No. dessin / Drawing number

Revision / Revision

Echelle / Scale

As indicated

1

Date de création du dessin / Drawing creation date

2018/05/01

A105

2.2 Existing Conditions

2.2.1 Area Road Network

Robinson Avenue

Robinson Avenue is a City of Ottawa local road with a two-lane urban cross-section including a 40 km/h posted speed limit. The reserved right-of-way varies from approximately 12.0m to 16.0m east of Hurdman Road, and 20.0m west of Hurdman Road with a 16.0m width at the Lees Avenue Overpass.

Hurdman Road

Hurdman Road is a City of Ottawa local road with a two-lane urban cross-section including an unposted speed limit assumed to be 40km/h. The current right-of-way is approximately 18.0m.

Lees Avenue

Lees Avenue is a City of Ottawa arterial road with a two-lane urban cross-section including a 50 km/h posted speed limit. The Ottawa Official Plan reserves a 26.0m right of way for Lees Avenue between Robinson Avenue and Mann Avenue, and 23.0m between Robinson Avenue and Main Street.

2.2.2 Existing Intersections

Robinson Avenue / Hurdman Road (North)

The north intersection of Robinson Avenue and Hurdman Road is an all-way stop-controlled intersection with shared all movement lanes on each approach. No turn restrictions were noted.

Robinson Avenue / Hurdman Road (South)

The south intersection of Robinson Avenue and Hurdman Road is a minor stop-controlled T-intersection with shared movement lanes on all approaches. No turn restrictions were noted.

Robinson Avenue / Lees Avenue

The intersection of Robinson Avenue and Lees is a minor stop-controlled intersection with shared movement lanes on the eastbound and northbound approaches, and an auxiliary left-turn lane and through lane on the westbound approach. All approaches. An offset painted median is provided opposite the auxiliary left turn lane on the eastbound approach. No turn restrictions were noted.

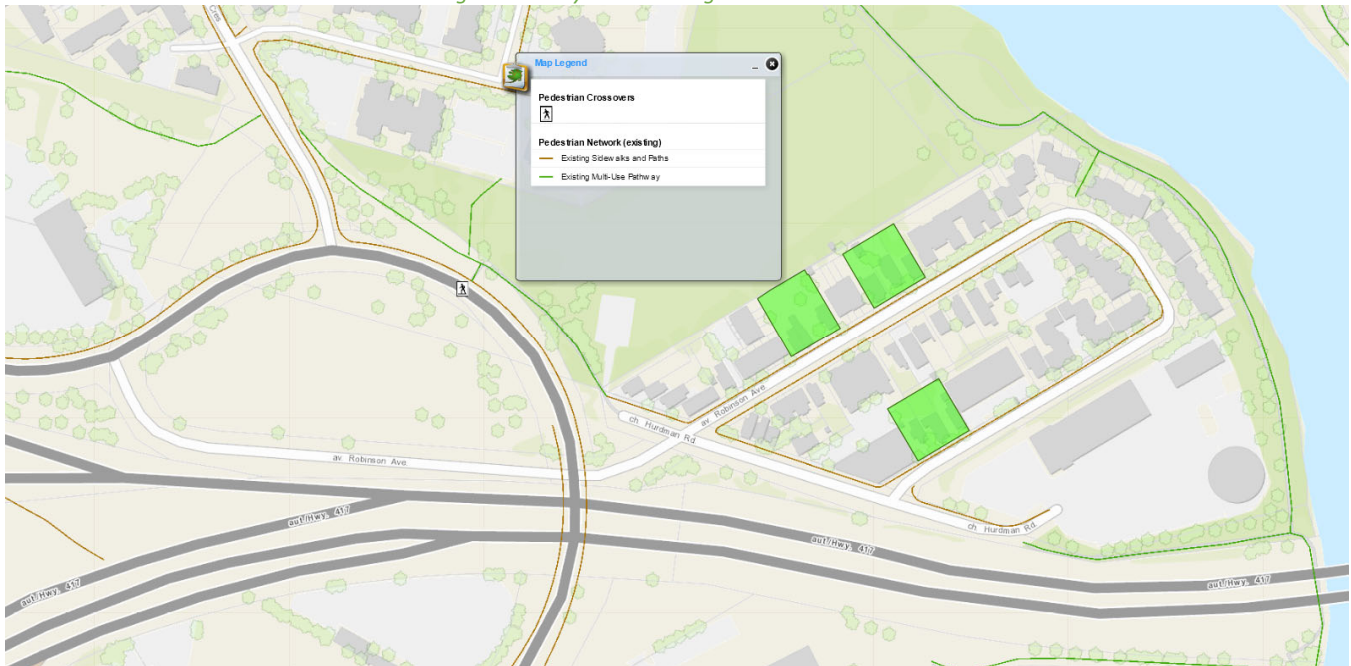
2.2.3 Existing Driveways

Residential driveways exist along Robinson Avenue and Hurdman Road. A commercial access is located at the south intersection of Robinson Avenue and Hurdman Road, and at the southern end of Hurdman Road, the access is provided for the City's Municipal Hurdman Yard.

2.2.4 Cycling and Pedestrian Facilities

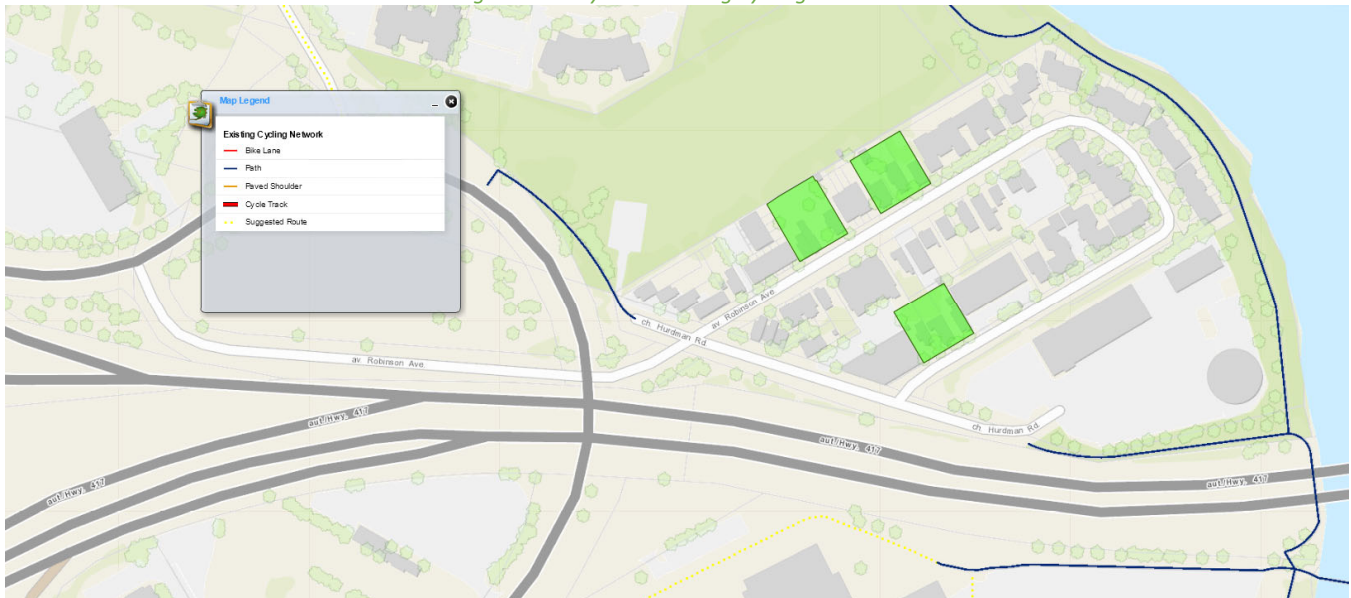
Sidewalks are provided on Robinson Avenue and Hurdman Road, and along Lees Avenue. No sidewalk connection exists on Robinson Avenue west of Hurdman Road. The multi-use pathway network along the Rideau River and through Robinson Park provide the cycling connectivity and allow pedestrians to access Lees Avenue and cross south under Highway 417. Figure 5 illustrates the study area pedestrian network and Figure 6 illustrates the study area cycling network.

Figure 5: Study Area Existing Pedestrian Network



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 19, 2018

Figure 6: Study Area Existing Cycling Network



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 19, 2018

2.2.5 Existing Transit

Transit stops are located at the PXO crossing on Lees Avenue, with routes 16, 56, 85, 97, 98, 101, and 103. Lees LRT Station is over 600m walking distance from the proposed sites.

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

No existing counts have been conducted by the City of Ottawa along Lees Avenue between Mann Avenue and Main Street.

2.2.8 Collision Analysis

Collision data has been acquired from OpenData Ottawa for four years prior to the commencement of this TIA for the study area. Figure 7 illustrates the study area collisions and Table 1 summarizes the collisions.

Figure 7: Representative Study Area Collisions

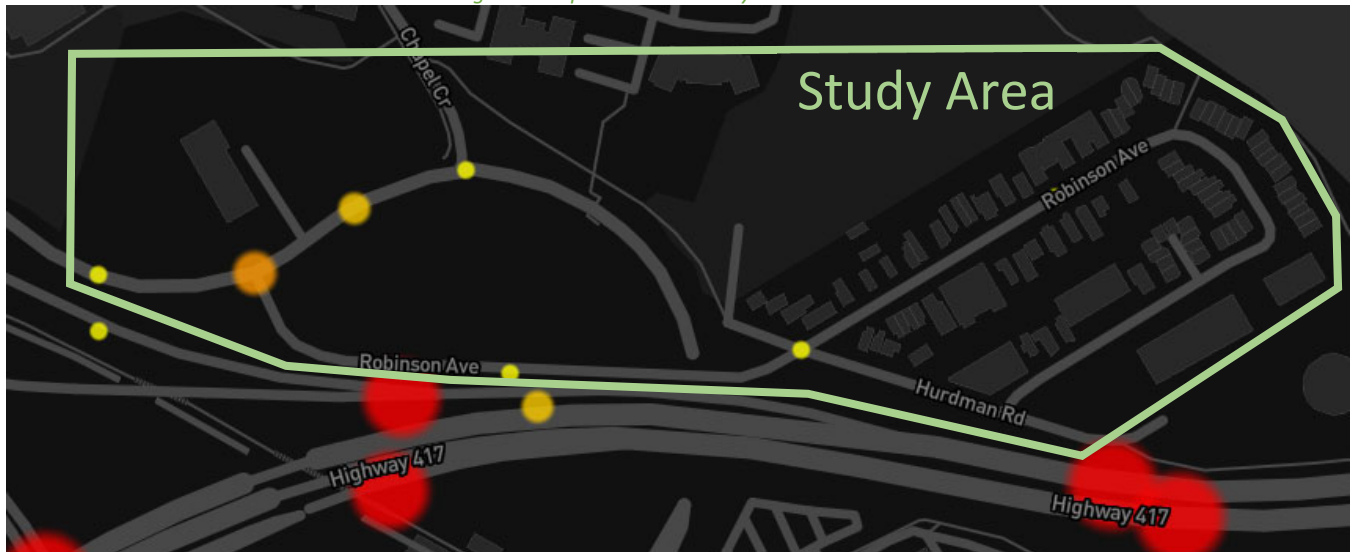


Table 1: Study Area Collision Summary, 2014-2017

		Number	%
Total Collisions		19	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	2	11%
	Property Damage Only	17	89%
Initial Impact Type	Angle	3	16%
	Rear end	3	16%
	Sideswipe	1	5%
	Turning Movement	1	5%
		3	16%
	SMV Other	7	37%
	Other	1	5%
Road Surface Condition	Dry	11	58%
	Wet	2	11%
	Loose Snow	4	21%
	Slush	1	5%
	Packed Snow	1	5%
Pedestrian Involved		0	0%
Cyclist Involved		0	0%

No collision issues are noted within the study area, with three or less collisions identified on the adjacent roadways. Collision data is included in Appendix B.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

No major changes are anticipated for the immediate transportation network. Beyond Robinson Avenue, the extension of the Alta Vista Parkway would connect to the Nicolas Street and Highway 417 interchange, and the Confederation LRT will open in the future at the Lees Station. The Alta Vista Parkway is part of the Concept Network and is not scheduled to occur within the Affordable Network timeframe of 2031.

2.3.2 Other Study Area Developments

At the time of this report, no other development applications are noted in the area.

3 Study Area and Time Periods

3.1 Study Area

The study area will include examining Robinson Avenue a Boundary Road and will focus on the access intersection, parking, and site design aspects of each of the proposed sites.

3.2 Time Periods

As the proposed development is composed entirely of residential units the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2020. As a result, the full build-out plus five years horizon year is 2025.

4 Exemption Review

Table 2 summarizes the exemptions for this TIA and Table 3 summarizes additional recommended exemptions for the TIA.

Table 2: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Required
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

As the Screening Form does not identify the need for a TIA, the following exemptions are also recommended for this TIA.

Table 3: Recommended Additional Exemptions

Module	Element	Explanation
Design Review Component		
3.1 Development Design	All Elements	Trip generation trigger was not met, therefore trip and mode share forecasting is not required for the subject site. Similarly, trip distribution and assignment is not warranted.
3.2 Background Network Travel Demand	All Elements	No background traffic impacts noted for the development sites.
3.3 Demand Rationalization	All Elements	Subject to the trip generation trigger not being met, no demand rationalization is required as part of this TIA.
Network Impact Components		
4.4 Access Intersections	4.4.2 Intersection Control	No roadway intersections serve as access to the development sites.
	4.4.3 Intersection Design	No roadway intersections serve as access to the development sites.
4.7 Transit	All Elements	No network impact components required due to no trip generation trigger.
4.9 Network Intersections	All Elements	No network impact components required due to no trip generation trigger.

5 Development-Generated Travel Demand

5.1 Trip Generation and Mode Shares

5.1.1 Existing Trip Generation

The background traffic for this TIA has been generated through the approximation of the existing residential dwellings on Robinson Avenue and general light industrial land use on Hurdman Road. While it is typically best to conduct a survey to determine the area trips, the subject sites did not trigger the need for a TIA nor any traffic analysis. As such, the approximation of the area trips has been given to provide context to the magnitude of vehicle trips that may be expected for the area.

The vehicle and person trip rates for the residential components were generated using the TRANS Trip Generation Study Report (2009) and the vehicle trip rates for the general industrial component were generated using the ITE Trip Generation Manual (10th Edition). To estimate person trip generation for the general industrial component, a factor of 1.28 has been applied to the ITE rates. Table 4 summarizes the person trip rates for the proposed land uses.

Table 4: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Low-rise Condo	231 (TRANS)	AM	0.50	1.35
		PM	0.49	1.23
Mid-Rise Apartments	223 (TRANS)	AM	0.24	0.65
		PM	0.28	0.70
General Light Industrial	110 (ITE)	AM	0.70	0.76
		PM	0.63	0.84

LUC – Land Use Code

Using the above Person Trip rates, the total existing person trip generation has been estimates. Table 5 below illustrates the total existing person trip generation by land use type.

Table 5: Total Person Trip Generation

Land Use	Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Low-rise Condo	99	38	89	127	65	51	116
Mid-Rise Apartments	128	23	73	96	64	40	104
General Light Industrial	22,500	16	3	19	1	17	18
Total Person Trips		77	165	242	130	108	238

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Ottawa Inner have been summarized in Table 6. As the trip generation is being prepared for the background conditions only, these travel patterns would be established well before the LRT planning and the isolated nature of Robinson Avenue would lend itself to having a higher auto mode share.

Table 6: OD Survey Existing Mode Share – Ottawa Inner

Travel Mode	Existing Mode Share
Auto Driver	40%
Auto Passenger	10%
Transit	25%
Non-Auto	25%
Total	100%

Using the above mode shares and person trip rates, the person trips by mode have been projected. Table 7 summarizes the trip generation by mode.

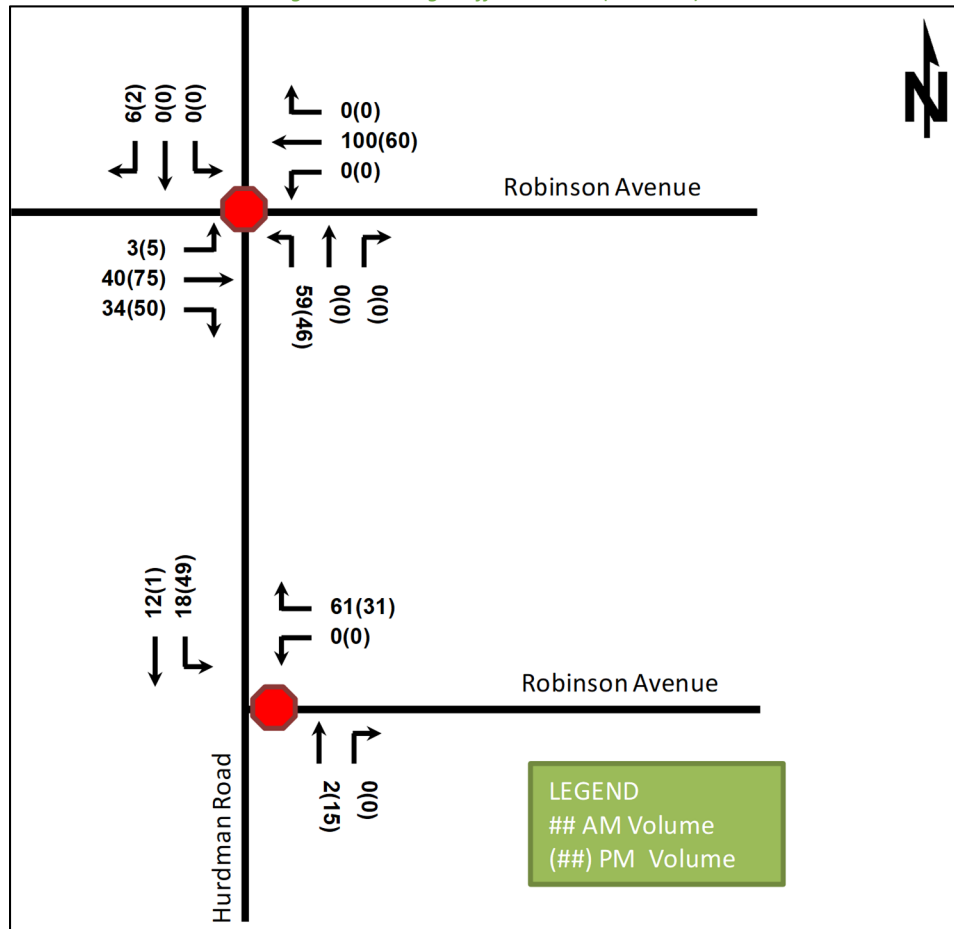
Table 7: Trip Generation by Mode

Travel Mode	Mode Share	In	Out	Total	In	Out	Total
Auto Driver	40%	30	66	96	53	43	96
Auto Passenger	10%	8	16	24	13	11	24
Transit	25%	20	41	61	33	27	60
Non-Auto Modes	25%	20	41	61	33	27	60
Total	100%	78	164	242	132	108	240

As shown above, 96 AM and PM peak hour two-way vehicle trips are projected as the existing conditions for Robinson Avenue and Hurdman Road.

No trip reductions factors (i.e. synergy, pass-by, etc.) have been applied to the existing area.

Figure 8: Existing Traffic Volumes (Estimate)



5.1.2 New Development Trip Generation

The 2009 TRANS Trip Generation Study (TRANS Study) has been reviewed to determine the appropriate residential trip generation rates for the proposed sites. Mid-rise apartment dwellings are proposed within the subject development. Vehicle trip rates have been determined using Table 6.3 of the TRANS Study. The initial mode share associated with these trips has been determined using Table 3.13 of the TRANS Study. Using this information, the person trip rate has been calculated. Table 8 below summarizes the vehicle trip rates, initial mode shares, and person trip rates, for each land use this study will consider.

Table 8: TRANS Trip Generation Person Trip Rates

Dwelling Type	ITE LUC	Peak Hour	Vehicle Trip Rate	Mode Share			Person Trip Rates
				Vehicle	Transit	Non-Motorized	
Mid-Rise Apartment	231	AM	0.24	37%	41%	11%	0.65
		PM	0.28	40%	37%	12%	0.70

LUC – Land Use Code

Using the above Person Trip rates, the total person trip generation has been estimates. Table 9 below illustrates the total person trip generation by dwelling type.

Table 9: Total Person Trip Generation

Land Use	Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Mid-Rise Apartments	149	23	74	97	64	40	104

LUC – Land Use Code

Using the mode shares from Section 5.1.1 and person trip rates the person trips by mode have been projected. Table 10 summarizes the trip generation by mode.

Table 10: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	20%	5	15	19	13	8	21
Auto Passenger	5%	1	4	5	3	2	5
Transit	50%	12	37	49	32	20	52
Non-Auto Modes	25%	6	19	24	16	10	26
Total	100%	23	74	97	64	40	104

As shown above, 19 AM and 21 PM peak hour two-way vehicle trips are projected as a result of the proposed development.

No trip reductions factors (i.e. synergy, pass-by, etc.) have been applied as the subject sites are composed entirely of residential units.

5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the existing travel patterns. Table 11 below summarizes the distribution.

Table 11: OD Survey Distribution – Ottawa Inner

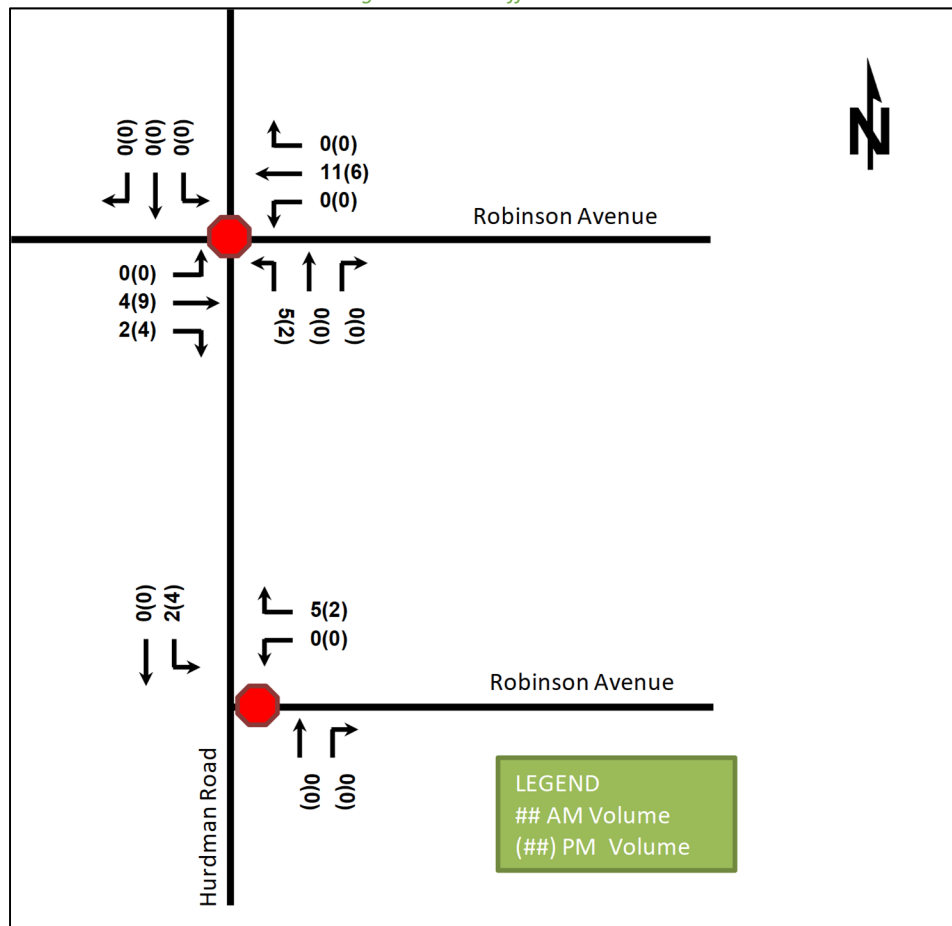
To/From	Percent of Trips
North	20%
South	35%
East	25%
West	20%
Total	100%

While the regional travel would ultimately follow the pattern of the OD Survey, the isolated location of Robinson Avenue and the surrounding road network limit how vehicles enter and exit the area.

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network.

Figure 9: Site Traffic Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

There are no planned changes to the Study Area Transportation Network that would influence the Study Area.

6.2 Background Growth

No additional background growth has been accounted for along Robinson Avenue or Hurdman Road.

6.3 Other Developments

At the time of this report, no other development applications are noted in the area.

7 Demand Rationalization

The new vehicle volumes forecasted to be generated by the new sites is minimal and no demand rationalization is required for the proposed sites or study area.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a residential site plan with perpendicular visitor parking at the side of the buildings and external bicycle parking at the rear of the buildings. Sidewalks are provided along the frontage of each building on Robinson Avenue.

8.2 Circulation and Access

No issues are noted with the internal circulation of the site plan.

9 Parking

9.1 Parking Supply

The on site parking supply for each site is provided for the bylaw requirements for visitor parking, 4 spaces for each building, and does not provide any tenant parking. The TOD area does not require any on-site parking to be provided.

A total of 26 bicycle parking spaces are provided at each of the buildings as well.

9.2 Parking Spillover

The transit-oriented design area has no requirement for tenant parking. If the 3 sites were not in a TOD area, the bylaw requirement would be approximately 59 parking spaces. The area generally supports approximately 60-65 on-street parking spaces, and while not for residential use, there are an additional 18 in the Robinson Park lot.

Aerial mapping illustrates approximately 10-20 on-street parking spaces are occupied on a given day, allowing for potentially 75% of non-TOD bylaw requirements to be facilitated through on-street parking.

10 Boundary Street Design

Table 12 summarizes the MMLOS analysis for the boundary road of Robinson Avenue. The existing and future conditions are the same and have been provided as a single line. The MMLOS worksheet has been provided in Appendix F.

Table 12: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Robinson Avenue (600m to transit))	E	A	A	D	N/A	N/A-	N/A	N/A-

Robinson Avenue does not meet the pedestrian level of service target. While the local road has sidewalks on both sides, the lack of boulevard between the curb and sidewalk does meet the target. To meet the target, the road would need to be reconstructing for a boulevard width between 0.5-2m and widen the sidewalk to 1.8m. This is not a feasible solution to meet the targets within the MMLOS framework and not mitigate measures are recommended to meet the pedestrian level of service.

The remaining targets are met or not applicable for a local road.

The MMLOS analysis is provided in Appendix C.

11 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed sites are located at 19, 29 and 134 Robinson Avenue and will include 51 apartment units, 47 apartment units, and 51 apartment units respectively
- Access will be provided directly to Robinson Avenue as full movement private approaches
- Each site will include 4 visitor parking spaces and 26 exterior bicycle parking spaces
- The developments are proposed to be completed by 2020

- A TIA was not triggered for each of the individual sites, but as they were being proposed in similar time frames, the City requested a TIA be completed for all three sites combined

Existing Conditions

- Robinson Avenue is a local road with a posted speed limit of 40km/h
- Sidewalks are located on both sides of the road along the north loop of Robinson Avenue, and on a single side of the road on the east and south parts of the loop
- No collision issues were noted in the study area

Development Generated Travel Demand

- The development did not trigger the trip generation requirements although the trips were summarized within the context of the area
- A total of 97 AM peak two-way trips and 104 PM peak two-way trips were forecast from all three sites combined
- Given the TOD area, 50% of these trips were assumed to be transit, 25% to be active modes and the remaining 25% to be auto driver and passenger
- The forecasted auto trips total 19 two-way trips during the AM peak, and 21 two-way trips during the PM peak

Background Conditions

- The development did not trigger the trip generation requirements and no background conditions were assessed

Development Design

- Perpendicular parking is provided along the internal drive aisle, and meets City Bylaw requirements
- Bicycle parking is provided at the rear of each building
- Sidewalks are provided along the frontage of each building along Robinson Avenue
- No circulation issues were noted

Parking

- Visitor parking is provided for each building, with 4 spaces per building
- No tenant parking is being provided as the proposed sites are within a TOD zone
- While being marketed as apartments without designated parking spaces, the on-street parking in the area provides up to 60-65 spaces

Boundary Street Design

- Robinson Avenue does not meet the pedestrian MMLOS target due to the lack of boulevard spacing between the curb and sidewalk and the sidewalk being 1.5m in width
- As Robinson Avenue will not be reconstructed and widened, no improvements are recommended to achieve the MMLOS target
- The remaining targets are met or not applicable for a local road

12 Next Steps

Following the circulation and review of this site plan control Strategy Report, any outstanding comments will be documents within the context of the site plan control. Once sign-off has been received from City Transportation Project Manager, a signed and stamped final report will be provided to City staff.

Appendix A

TIA Screening Form and PM Certification Form



TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered² professional in good standing, whose field of expertise [check ☒ appropriate field(s)] is either transportation engineering ☒ or transportation planning ☐.

^{1,2} License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

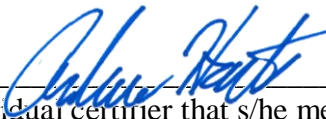
City Of Ottawa
Infrastructure Services and Community
Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d'infrastructure et Viabilité des
collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at Ottawa this 20 day of September, 2018.
(City)

Name: Andrew Harte
(Please Print)

Professional Title: Professional Engineer



Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 13 Markham Avenue
City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com



City of Ottawa 2017 TIA Guidelines
Step 1 - Screening FormDate: Nov. 19, 2018
Project Number: 2018-47
Project Reference: TC United - Robinson Sites

1.1 Description of Proposed Development	
Municipal Address	19 Robinson Avenue
Description of Location	Ward 12 - PIN 042070357
Land Use Classification	Residential
Development Size	47 low-rise apartments
Accesses	Single Access, Robinson Avenue
Phase of Development	Single Phase
Buildout Year	2020
TIA Requirement	No TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	47 Units
Trip Generation Trigger	No

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger	No

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening FormDate: Nov. 19, 2018
Project Number: 2018-47
Project Reference: TC United - Robinson Sites

1.1 Description of Proposed Development	
Municipal Address	29 Robinson Avenue (includes 27 and 31)
Description of Location	Ward 12 - PINs 042070362 to 4
Land Use Classification	Residential
Development Size	51 low-rise apartments
Accesses	Single Access, Robinson Avenue
Phase of Development	Single Phase
Buildout Year	2020
TIA Requirement	No TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	51 Units
Trip Generation Trigger	No

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger	No

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening FormDate: Nov. 19, 2018
Project Number: 2018-47
Project Reference: TC United - Robinson Sites

1.1 Description of Proposed Development	
Municipal Address	134 Robinson Avenue (includes 130 and 138)
Description of Location	Ward 12 - PIN 042070389 to 91
Land Use Classification	Residential
Development Size	51 low-rise apartments
Accesses	Single Access, Robinson Avenue
Phase of Development	Single Phase
Buildout Year	2020
TIA Requirement	No TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	51 Units
Trip Generation Trigger	No

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger	No

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No

Appendix B

Collision Data

Record	Location	X	Y	Date	Time	Environment	Road_Surface	Traffic_Control	Collision_Location	Light	Collision_Classification	Impact_type
1516	LEES AVE btwn TRANSIT & CHAPEL CRES (2)	369677.5711	5030962.331	2014-01-13	4:33	01 - Clear	02 - Wet	10 - No control	01 - Non intersection	07 - Dark	02 - Non-fatal injury	07 - SMV other
4324	LEES AVE @ ROBINSON AVE W	369576.2073	5031231.868	2014-02-11	17:05	01 - Clear	01 - Dry	02 - Stop sign	02 - Intersection related	05 - Dusk	03 - P.D. only	03 - Rear end
5147	CHAPEL CRES @ LEES AVE	369690.9856	5031286.259	2014-03-10	21:35	03 - Snow	03 - Loose snow	02 - Stop sign	03 - At intersection	07 - Dark	03 - P.D. only	02 - Angle
13099	ROBINSON AVE btwn HURDMAN RD & LEES AVE	369952.5339	5031230.044	2014-06-19	18:40	01 - Clear	08 - Loose sand or	09 - Traffic control	01 - Non intersection	01 - Daylight	03 - P.D. only	99 - Other
5374	LEES AVE btwn ROBINSON AVE & CHAPEL CRES	369591.0088	5031239.678	2015-02-04	10:13	03 - Snow	03 - Loose snow	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	07 - SMV other
8053	LEES AVE @ ROBINSON AVE W	369576.5157	5031233.606	2015-06-04	5:01	01 - Clear	01 - Dry	02 - Stop sign	02 - Intersection related	03 - Dawn	03 - P.D. only	07 - SMV other
13525	LEES AVE btwn TRANSIT & CHAPEL CRES (1)	369821.4308	5031206.569	2015-10-21	14:02	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	02 - Angle
8867	LEES AVE btwn TRANSIT & CHAPEL CRES (1)	369826.8772	5031111.254	2016-01-18	1:00	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	07 - SMV other
8865	LEES AVE btwn ROBINSON AVE & CHAPEL CRES	369664.8058	5031284.755	2016-02-24	12:00	03 - Snow	03 - Loose snow	10 - No control	07 - Overpass or bridge	01 - Daylight	03 - P.D. only	07 - SMV other
8869	LEES AVE btwn TRANSIT & CHAPEL CRES (2)	369719.8562	5030989.043	2016-03-20	16:09	01 - Clear	01 - Dry	10 - No control	04 - At/near private drive	01 - Daylight	03 - P.D. only	02 - Angle
8868	LEES AVE btwn TRANSIT & CHAPEL CRES (1)	369815.0954	5031221.581	2016-04-06	21:57	03 - Snow	03 - Loose snow	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	01 - Approaching
8870	LEES AVE btwn TRANSIT & CHAPEL CRES (2)	369716.5452	5030987.834	2016-06-15	20:00	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	05 - Turning movement
12038	ROBINSON AVE btwn LEES AVE & HURDMAN RD	369580.6869	5031222.488	2016-08-27	3:27	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	07 - Dark	03 - P.D. only	01 - Approaching
8858	LEES AVE btwn HWY417 IC118 RAMP25 & ROBINSON AVE	369522.753	5031225.477	2016-09-06	11:17	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	04 - Sideswipe
7433	HURDMAN RD @ ROBINSON AVE	369889.6066	5031192.507	2016-11-16	21:44	01 - Clear	01 - Dry	02 - Stop sign	02 - Intersection related	07 - Dark	03 - P.D. only	07 - SMV other
8855	LEES AVE @ ROBINSON AVE W	369575.8295	5031234.787	2016-12-18	2:41	03 - Snow	04 - Slush	02 - Stop sign	02 - Intersection related	07 - Dark	03 - P.D. only	03 - Rear end
9379	LEES AVE btwn TRANSIT & CHAPEL CRES (1)	369755.934	5031278.391	2017-01-30	16:17	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	01 - Approaching
3522	CHAPEL CRES @ LEES AVE	369691.3773	5031285.233	2017-02-24	23:11	02 - Rain	02 - Wet	02 - Stop sign	02 - Intersection related	07 - Dark	02 - Non-fatal injury	07 - SMV other
9378	LEES AVE btwn TRANSIT & CHAPEL CRES (1)	369795.1819	5031048.435	2017-09-24	16:20	01 - Clear	01 - Dry	10 - No control	01 - Non intersection	01 - Daylight	03 - P.D. only	03 - Rear end

Appendix C

MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Consultant Scenario Comments	CGH Transportation	Project Date	TC United Robinson Sites
	Existing/Future		13-Dec-18

SEGMENTS		Robinson Avenue	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8
Pedestrian	Sidewalk Width Boulevard Width	-	1.5 m < 0.5 m							
	Avg Daily Curb Lane Traffic Volume		≤ 3000							
	Operating Speed On-Street Parking		> 30 to 50 km/h yes							
	Exposure to Traffic PLoS		E	-	-	-	-	-	-	-
	Effective Sidewalk Width									
	Pedestrian Volume									
	Crowding PLoS		-	-	-	-	-	-	-	-
Level of Service		-	-	-	-	-	-	-	-	
Bicycle	Type of Cycling Facility	A	Mixed Traffic							
	Number of Travel Lanes		≤ 2 (no centreline)							
	Operating Speed		≤ 40 km/h							
	# of Lanes & Operating Speed LoS		A	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width									
	Bike Lane Width LoS		-	-	-	-	-	-	-	-
	Bike Lane Blockages									
	Blockage LoS		-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes							
	Sidestreet Operating Speed		≤ 40 km/h							
	Unsignalized Crossing - Lowest LoS		A	-	-	-	-	-	-	-
Level of Service	A	-	-	-	-	-	-	-		
Transit	Facility Type	-								
	Friction or Ratio Transit:Posted Speed									
	Level of Service		-	-	-	-	-	-	-	-
Truck	Truck Lane Width	B	> 3.7 m							
	Travel Lanes per Direction		1							
	Level of Service		B	-	-	-	-	-	-	-
Auto	Level of Service	Not Applicable								