

June 10<sup>th</sup>, 2025

**Mr. Jaafar Oleiche**  
Project Manager – Land Development  
**Richcraft Homes Ltd.**  
2280 St. Laurent Boulevard, Suite 201  
Ottawa, Ontario  
K1G 4K1

### **Re: 6259 Renaud Road, Ottawa, Ontario - Block 121 – Trailsedge Phase 3**

Richcraft Homes Ltd. is proposing to build 76 townhomes at 5259 Renaud Road which is located in the northwest corner of Renaud Road / Compass Street intersection in Ottawa. The site is approximately 13,300 m<sup>2</sup> in size, with 2,800 m<sup>2</sup> of building area. The proposed residential development has been estimated to be built out and occupied by the end of 2025. The site plan is illustrated in Attachment “A”.

Of the 76 proposed units:

- 48 units would have access internal to the site via two planned accesses onto Renaud Road.
- 16 units would have driveways with direct access to Renaud Road,
- 6 units would have access to Melodie Street, and
- 6 units would have access to Compass Street.

#### *A. Traffic Information Collected*

Manual traffic counts were undertaken on Tuesday, April 1<sup>st</sup>, 2025 over two 3-hour “**peak periods**” (between 6:00-to-9:00 am and 3:30-to-6:30pm) along the Renaud Road corridor within the vicinity of the proposed site. The analyzed intersections include:

- Renaud Road / Glenlivet Avenue;
- Renaud Road / Melodie Street;
- Renaud Road / both the access and egress to the Notre-Dame-des-Champs Catholic Elementary School; and
- Renaud Road / Compass Street.

The traffic count information was then converted to digital format and the “**peak hour**” traffic volumes were then determined. The peak hour information was then balanced to assure that all traffic entering the adjacent accesses/intersections would balance with the traffic leaving. An additional 75 vehicles were added to the westbound through traffic to account for a discrepancy in traffic volumes between the Renaud Road / Compass Street intersection and the Renaud Road / Fern Casey Street intersection that was counted for a related study on Thursday, August 15<sup>th</sup>, 2024. The existing traffic volume diagram is illustrated in Attachment “B”.

#### *B. Traffic Generation and Mode Shares*

The TRANS Trip Generation Manual Summary Report (WSP, December 2020) was referenced to summarize applicable traffic generation rates and mode shares.

Tables 3, 4, 7 and 9 within the document were used to determine the appropriate traffic generation rates and mode shares for the proposed 76 residential townhomes.

A person-trip rate for a “Multi-Unit (Low-Rise)” development was used to estimate the trips generated by the proposed development. Those person-trips were split into mode shares based on the percentages documented within the Orleans District. The peak period trips were converted into peak hour trips and the recommended vehicle directional splits were then used to determine the final vehicle traffic generated by the site. Table B-1 summarizes the findings and shows that the development is estimated to generate:

- 33 vehicle trips (10 in and 23 out) during the morning peak hour of travel demand, and
- 48 vehicle trips (27 in and 21 out) during the afternoon peak hour of travel demand.

**Table B-1: Traffic Generation Summary**

<b>Person-trip Rates</b>									
<b>Residential Dwelling Type</b>	<b>ITE Code</b>	<b>Number of units</b>	<b>Morning Peak Hour</b>		<b>Afternoon Peak Hour</b>				
			<b>Trip Rate</b>	<b>Outbound Trips</b>	<b>Trip Rate</b>	<b>Inbound Trips</b>			
Multi-Unit (Low-Rise)	220	76	1.35	103	1.58	120			
<b>Peak Period Residential Mode Shares for Orleans</b>									
<b>Mode Share</b>		<b>%</b>	<b>Outbound Trips</b>		<b>%</b>	<b>Inbound Trips</b>			
Auto Driver		47%	48		51%	61			
Auto Pass		15%	15		19%	23			
Transit		29%	30		24%	29			
Cycling		1%	1		1%	1			
Walking		9%	9		6%	7			
<b>Peak Hour Residential Trip Rates</b>									
<b>Mode Share</b>		<b>Person-Trip Rates per Peak Period</b>		<b>Outbound Trips</b>	<b>Person-Trip Rates per Peak Period</b>		<b>Inbound Trips</b>		
Auto Driver		48%		23	44%		27		
Auto Pass		48%		7	44%		10		
Transit		55%		14	47%		13		
Cycling		58%		0	48%		1		
Walking		58%		4	52%		3		
<b>Directional Splits</b>									
<b>Mode Share</b>		<b>%</b>	<b>Inbound</b>	<b>%</b>	<b>Outbound</b>	<b>%</b>	<b>Inbound</b>	<b>%</b>	<b>Outbound</b>
<b>Auto Driver</b>		30%	<b>10</b>	70%	<b>23</b>	56%	<b>27</b>	44%	<b>21</b>
Auto Pass			3		7		10		8
Transit			6		14		13		10
Cycling			0		0		1		0
Walking			2		4		3		2

Table B-2 summarizes the traffic distribution patterns assumed for the proposed development. Both accesses would be used equally, with half the traffic going east and half the traffic going west along Renaud Road. Attachment “B” illustrates the forecast (2025 with the development in place) traffic volumes. For the purposes of examining a “worst-case” scenario, the analyses assumed that all site generated traffic would use the 2 Renaud Road access points. The 6 units that abut Melodie Street and the 6 units that abut Compass Street would produce/attract negligible traffic on the two corridors.

**Table B-2: Traffic Distribution Trends**

<b>Traffic Destination/Origin</b>	<b>Western Access</b>		<b>Eastern Access</b>	
West: (Renaud Road)	25%	25%	25%	25%
East: (Renaud Road)	25%	25%	25%	25%

### C. Traffic Circulation

It's worthwhile to note that:

- the corner lots on both Melodie and Compass Street satisfy Private Approach By-law No. 2003-447 Section 26(1)(c) as their driveways exceed the 6m required minimum separation from the intersecting street line of Renaud Road.
- The 16 units along Renaud Road are accessed through 8 driveways. The traffic generated by these driveways is infrequent and temporary. It is not anticipated to result in a lasting disruption to the flow of traffic along the Renaud Road corridor
- The location of the existing pedestrian crossover of Renaud Road and the sidewalk along the north side of Renaud Road in concert with proposed driveways along Renaud Road was evaluated in terms of raising the risk of a vehicle-pedestrian conflict. The existing pedestrian crossover was established in 2016, 5-years prior to the southerly extension of Compass Avenue forming a 4-leg intersection that was established in 2021. Recognizing Richcraft's plans to develop an amenity area in the north-west quadrant of the Compass/Renaud intersection, it is worthwhile to consider relocating or removing the PXO from its existing location and establish an alternative pedestrian crossing at the Compass/Renaud intersection.

### D. Left-Turn warrants for Private Approaches

City of Ottawa staff had requested that left turn warrant analyses be undertaken to address both private accesses proposed for the residential townhouse development. The warrants analyses followed the Ministry of Transportation of Ontario (MTO) geometric design standards<sup>1</sup>.

Warrants for left turn lanes are based on the left turn traffic volume, the volume of opposing vehicle traffic and the volume of advancing vehicle traffic. The purpose of left turn auxiliary lanes is two-fold:

- to minimize that conflict between the northbound advancing vehicles and southbound left turn vehicle traffic during the left turn maneuver; and
- to mitigate the delay for southbound vehicle traffic that must queue behind left turning vehicles.

Attachment "D" illustrates the left turn warrant analyses for eastbound Renaud Road left turns into the proposed residential development for the morning and afternoon peak hours. The attachment illustrates two graphs, the upper graph for the west access, and the lower graph for the east access, representative of the existing 50kph design speed (posted at 40 kph as it is a school zone).

The graphs within Attachment "D"...

- indicate that the forecast eastbound left turns into the site represent less than 5% of the advancing traffic volume,
- indicate a grey-shaded area with the inset text that notes "No Left Turn Lane Required",
- illustrate red and blue lines that indicating the advancing and opposing vehicle traffic volumes (based on 2025 values). The horizontal and vertical red and blue lines represent the 2025 morning and afternoon peak hour approaching and advancing hourly volumes on Renaud Road 34 respectively. In each case the intersection of the red lines (AM) and blue lines (PM) is located well within the grey zone indicating that ...

**Conclusion: Eastbound left turn auxiliary lanes from Renaud Road into the proposed site are not warranted at either intersection.**

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<sup>1</sup> "MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads", Appendix 9: Intersections, June 2017

*E. Traffic Operations*

Table C-1 indicates the intersection capacity analysis results for the Renaud Road corridor assuming a 2025-time horizon both with and without the development in place. Attachment “C” presents the forecast Synchro 10 traffic operational results.

**Table C-1: Traffic Operational Analysis:  
Forecast (2025) With and Without the Development in Place**

	Intersection	Control Type	Weekday Morning Peak Hour (Afternoon Peak Hour)				
			Critical Movement Operations				
			Approach / Movement	Delay (seconds)	LOS	95th Percentile Queue (m)	v/c
<b>2025 WITHOUT the Development in Place</b>							
1.	Renaud Road / Glenlivet Avenue	Minor Leg -STOP control	NB	14.6 (14.7)	B (B)	3.0 (3.0)	0.12 (0.11)
2.	Renaud Road / Melodie Street	Minor Leg -STOP control	SB	16.4 (14.6)	C (B)	1.5 (0.8)	0.07 (0.04)
3.	Renaud Road / West School Access (Entrance)	Minor Leg -STOP control	WB-LT	0.8 (0.2)	A (A)	1.7 (0.4)	0.07 (0.02)
4.	Renaud Road / East School Access (Exit)	Minor Leg -STOP control	NB	14.9 (15.1)	B (C)	6.0 (5.3)	0.22 (0.19)
5.	Renaud Road / Compass Street	Minor Leg-STOP control	SB	13.1 (13.6)	B (B)	5.3 (2.3)	0.19 (0.10)
<b>2025 WITH the Development in Place</b>							
1.	Renaud Road / Glenlivet Avenue	Minor Leg -STOP control	NB	14.8 (15.0)	B (C)	3.0 (3.0)	0.13 (0.11)
2.	Renaud Road / Melodie Street	Minor Leg -STOP control	SB	16.7 (14.9)	C (B)	1.5 (0.8)	0.07 (0.05)
3.	Renaud Road / West School Access (Entrance)	Minor Leg -STOP control	WB-LT	0.8 (0.2)	A (A)	1.7 (0.4)	0.07 (0.02)
4.	Renaud Road / East School Access (Exit)	Minor Leg -STOP control	NB	15.2 (15.4)	C (C)	6.8 (5.3)	0.23 (0.19)
5.	Renaud Road / Compass Street	Minor Leg-STOP control	SB	13.2 (13.9)	B (B)	5.3 (3.0)	0.19 (0.11)
6.	Renaud Road / Development Access (West)	Minor Leg-STOP control	SB	14.2 (13.3)	B (B)	0.8 (0.8)	0.03 (0.02)
7.	Renaud Road / Development Access (East)	Minor Leg-STOP control	SB	14.7 (13.3)	B (B)	0.8 (0.8)	0.03 (0.03)

LOS – Level of Service / v/c – Volume-to-Capacity Ratio  
 Values outside of brackets represent morning peak hour.  
 Values in brackets represent PM Peak Hour

The findings of Table C-1 indicate that all intersections were found to offer satisfactory operational characteristics assuming existing (2025) conditions, with LOS “C” or better. The advent of the proposed townhouse development was determined to have negligible impact upon intersection traffic operations. Should construction be delayed into 2026, background traffic calculated from one additional year would also have negligible impact on the finding of the table above.

## F. Turning Movement Diagrams

Attachment “E” illustrates ...

- the turning movements associated with a garbage truck and a fire truck (emergency vehicle) that would be required to circulate in, and out, of the site from either of the two new proposed accesses, approaching on Renaud Road from either the east or west.
- Attachment “E” illustrates that a garbage truck can maneuver safely throughout the site and enter/exit from either access.

However, a review of the site plan provided indicated that the accesses as designed were unable to accommodate the turning maneuvers of fire trucks without mounting the curbs. The diagrams illustrate a section of the curb (marked as a red line) that if made mountable could accommodate these large vehicles. However, this solution would be temporary, as the City of Ottawa has designated Renaud Road to be ultimately widened. This would require the sidewalk and entrance curbs to be relocated. At that time, new accesses would be required to be designed to allow for the full movement for fire trucks.

## G. Conclusion

The document concludes the following about the proposed Richcraft Block 121 development:

- The residential development is estimated to generate:
  - 33 vehicle trips (10 in and 23 out) during the morning peak hour, and
  - 48 vehicle trips (27 in and 21 out) during the afternoon peak hour;
- Intersection Capacity Analysis indicated that all intersections under existing conditions were found to operate at an acceptable LOS “C” or greater. Assuming the proposed development to be in place, the same intersections exhibited essentially no noticeable decrease in operational performance. All intersections were found to continue to operate at acceptable / satisfactory operational levels.
- The vehicle turning movements of both garbage trucks and fire trucks were evaluated.
  - Garbage trucks were found to easily maneuver through the site,
  - Fire trucks were found to require additional space at both private accesses into the property. It was decided to recommend that the curbs be mountable as a short-term solution, until such time that Renaud Road would be widened, and the accesses designed in their proper location.
- Left-Turn Warrants Analysis indicated that eastbound left turn auxiliary lanes were found not to be required at either access into the proposed development.

It is recommended that the City of Ottawa allow the proposed residential development to proceed.

Respectfully,



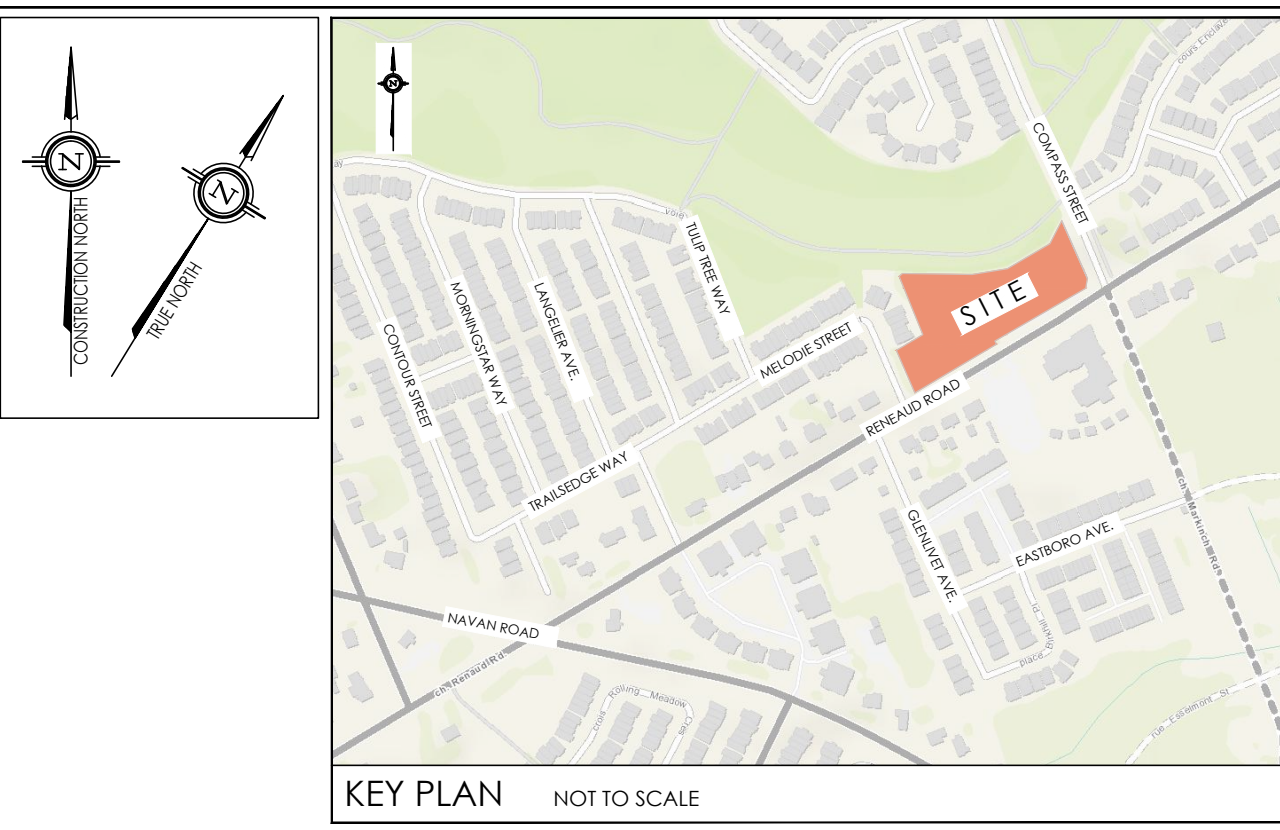
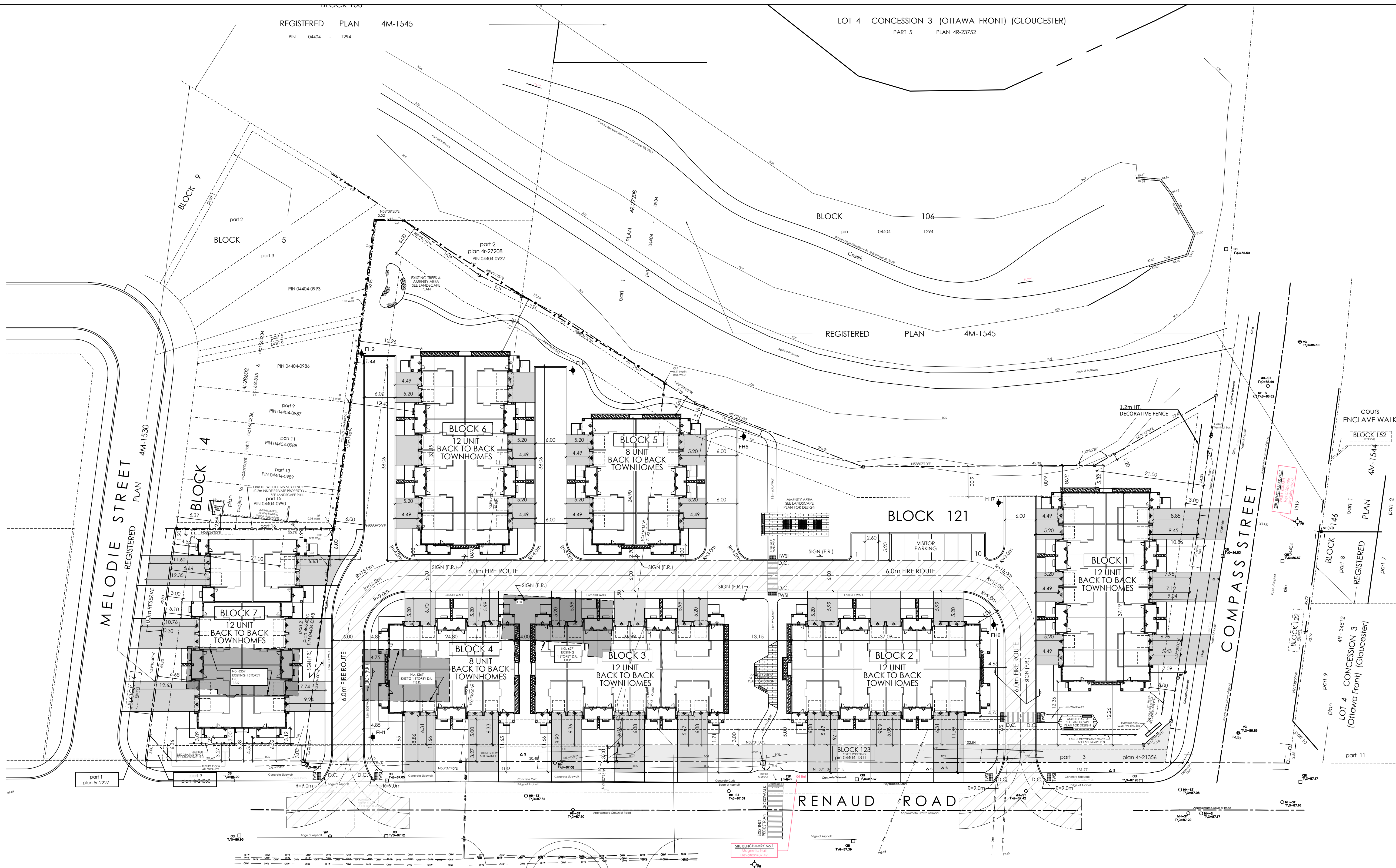
Mr. Arthur Gordon B.A. P.Eng  
Principal Engineer  
**Castleglenn Consultants Inc.**



Mr. Konstantin Joulanov BAsc  
Transportation Planner  
**Castleglenn Consultants Inc.**

Attachment "A"

Site Plan (June 9<sup>th</sup>, 2025)



**SITE INFORMATION :**

PROPOSED ZONING : R3Z - PERMITTED USES : - PLANNED UNIT DEVELOPMENT  
- TOWNHOUSE DWELLING

SITE AREA : 13,295.58 m<sup>2</sup> [ SITE AREA DOES NOT INCLUDE BLOCK 123 RENAUD ROAD STREET WIDENING ]  
 TOTAL BUILDING AREA : 2,808.00 m<sup>2</sup> [ SITE AREA INCLUDES RENAUD ROAD FUTURE R.O.W. ALLOWANCE ]  
 AREA OF PRIVATE R.O.W. : AREA : 2,077.99 m<sup>2</sup>  
 LANDSCAPED AREA : 8,409.59 m<sup>2</sup> = 8,409.59/13,295.58 = 63% SITE AREA

PROPOSED ZONING:	R3Z	PROVIDED:
LOT AREA (MIN.):	1,400.0 m <sup>2</sup>	13,295.58 m <sup>2</sup> (13.29 ha)
LOT WIDTH (MIN.):	18.0 m	45.83 m (Melodie Street)
FRONT YARD (MIN.): (Melodie Street)	3.0 m FROM BUILDING	5.1 m BLOCK 7
	6.0 m FROM GARAGE TO SIDEWALK	10.76 m BLOCKS 2&3
CORNER SIDE YARD (MIN.): (Renaud Road)	3.0 m FROM BUILDING	5.06 m BLOCK 4
	6.0 m FROM GARAGE TO SIDEWALK	11.65 m BLOCK 4
INTERIOR SIDE YARD (MIN.):		
Within 21m of Front Lot Line	1.2 m	1.99 m BLOCK 7
All Other Cases	6.0 m	4.09 m BLOCK 5
REAR YARD (MIN.): (Compass Street)	3.0 m SECTION 135(11)	5.00 m BLOCK 1
	6.0 m FROM GARAGE TO SIDEWALK	7.09 m BLOCK 1
BUILDING HEIGHT (MAX.):	11.0 m	10.82 m
PUD PROVISIONS (TABLE 131):		
WIDTH OF PRIVATE WAY	6.0 m	6.0 m
SETBACK FROM BUILDING TO PRIVATE WAY	1.8 m	2.90 m BLOCKS 5 & 6
SETBACK FROM GARAGE TO PRIVATE WAY	5.2 m	5.2 m
BETWEEN BUILDINGS	1.2 m	4.00 m
BUILDING HEIGHT (MAX.):	11.0 m	10.82 m
PORCH STAIR TO LOT LINE (SECTION 65)	0.60 m	4.55 m BLOCK 7

BACK/BACK TOWNHOME PARKING:

PARKING REQUIRED: 1.0 Spaces / d.u. = 76 Spaces

PARKING PROVIDED: 2.0 Spaces / d.u. = 152 Spaces (1-GARAGE & 1-DRVWAY)

VISITOR PARKING REQUIREMENTS: Section 102(4)

NO VISITOR PARKING REQUIRED

Townhomes with driveways accessing a garage

VISITOR PARKING PROVIDED: 10 Spaces

TOTAL PARKING PROVIDED ON SITE = 162 Spaces

STREET BACK TO BACK TOWNHOMES

BLOCK No.:	BUILDING AREA:	GROSS FLOOR AREA:	No. UNITS:
BLOCK 1 = BACK TO BACK TOWNHOMES	648.0 m <sup>2</sup>	1,675.7 m <sup>2</sup>	12 UNITS
BLOCK 2 = BACK TO BACK TOWNHOMES	648.0 m <sup>2</sup>	1,675.7 m <sup>2</sup>	12 UNITS
BLOCK 3 = BACK TO BACK TOWNHOMES	648.5 m <sup>2</sup>	1,674.2 m <sup>2</sup>	12 UNITS
BLOCK 4 = BACK TO BACK TOWNHOMES	433.5 m <sup>2</sup>	1,115.6 m <sup>2</sup>	8 UNITS
BLOCK 5 = BACK TO BACK TOWNHOMES	433.5 m <sup>2</sup>	1,115.6 m <sup>2</sup>	8 UNITS
BLOCK 6 = BACK TO BACK TOWNHOMES	648.0 m <sup>2</sup>	1,675.7 m <sup>2</sup>	12 UNITS
BLOCK 7 = BACK TO BACK TOWNHOMES	648.0 m <sup>2</sup>	1,675.7 m <sup>2</sup>	12 UNITS
TOTAL =	4,105.5 m <sup>2</sup>	10,608.2 m <sup>2</sup>	76 UNITS

NOTE:

SITE PLAN TO BE READ IN CONJUNCTION WITH :

- SITE SERVICING PLAN PREPARED BY STANTEC - 400 - 1331 CLYDE AVENUE OTTAWA ON. K2C 3G4
- LANDSCAPING PLAN PREPARED BY NAK DESIGN STRATEGIES - 1285 WELLINGTON ST. OTTAWA, ON. K1Y 3A8
- BOUNDARIES DERIVED FROM: TOPOGRAPHIC PLAN OF SURVEY OF BLOCK 121 REGISTERED PLAN 4M-1545 PART OF LOT 4 CONCESSION 3 (OTTAWA FRONT) GEOGRAPHIC TOWNSHIP OF GLOUCESTER CITY OF OTTAWA SURVEYED BY ANNIS, O'SULLIVAN, VOLLEBEK LTD. DATED APRIL 16, 2024

LEGEND:

- D.C. - DEPRESSED CURB
- [Symbol] - WALL MOUNT LIGHT FIXTURE
- [Symbol] - TACTILE WALKING SURFACE INDICATORS (TWSI)
- SIGN (F.R.) - FIRE ROUTE SIGN (NO PARKING)
- T.B.R. - EXISTING STRUCTURE TO BE REMOVED
- [Symbol] - EXISTING FIRE HYDRANT
- [Symbol] - PROPOSED FIRE HYDRANT LOCATION

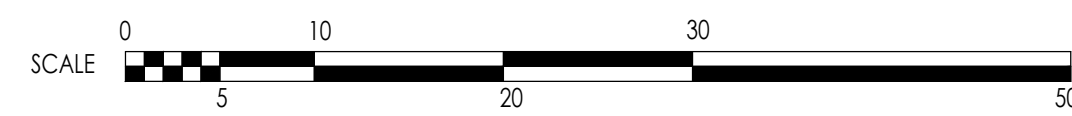
NOTE:

REFER TO LANDSCAPE PLANS PREPARED BY NAK DESIGN STRATEGIES FOR:

- EXISTING & PROPOSED TREE LOCATIONS & PLANTING DETAILS
- PROPOSED TREE CANOPY COVER PERCENTAGE
- DETAILED DESIGN OF AMENITY AREAS
- PROPOSED FENCING DETAILS

**SITE PLAN**  
SCALE= 1:400

NOTE:  
CLEARED SNOW TO BE REMOVED FROM SITE



**GENERAL NOTES:**

1. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
2. ALL WORK AND MATERIALS TO BE IN COMPLIANCE WITH ALL CODES, REGULATIONS, AND BY-LAWS.
3. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANINGS AND INTENT AS IF THEY WERE INCLUDED WITH THE PLANS IN CONTRACT DOCUMENTS.
4. DO NOT SCALE DRAWINGS.
5. THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE.
6. THIS REPRODUCTION SHALL NOT BE ALTERED.

**M. David Blakely**  
Architect Inc.  
2200 Prince of Wales Dr. - Suite 101  
Ottawa, Ontario K2E 6Z9  
Phone (613) 226-8811 Fax (613) 226-7742

SEAL

No.	DATE	DESCRIPTION	INIT.
10.			
9.			
8.			
7.			
6.			
5.	09/06/25	REVISED PER RICHCRAFT COMMENTS	JB
4.	07/05/25	L1 COORD. & BLOCK 7 HYDRO CLOSET	JB
3.	13/01/25	REVISED SITE/ FOR REVIEW	JB
2.	02/02/23	ADDED WEST PARCEL TO PLAN	SM
1.	25/04/22	FOR REVIEW	SM

PROJECT **BLOCK 121, RENAUD ROAD**  
PLANNED UNIT DEVELOPMENT  
OTTAWA, ONT.

CLIENT **RICHCRAFT**  
2280 ST. LAURENT BLVD. - SUITE 201  
OTTAWA, ONTARIO, K1G 4K1

DRAWING TITLE **SITE PLAN**  
RENAUD ROAD

DATE **APR., 2022.** SCALE **1:400** SHEET No. **SP-1**

DRAWN BY: **SBM** CHECKED: **MDB**



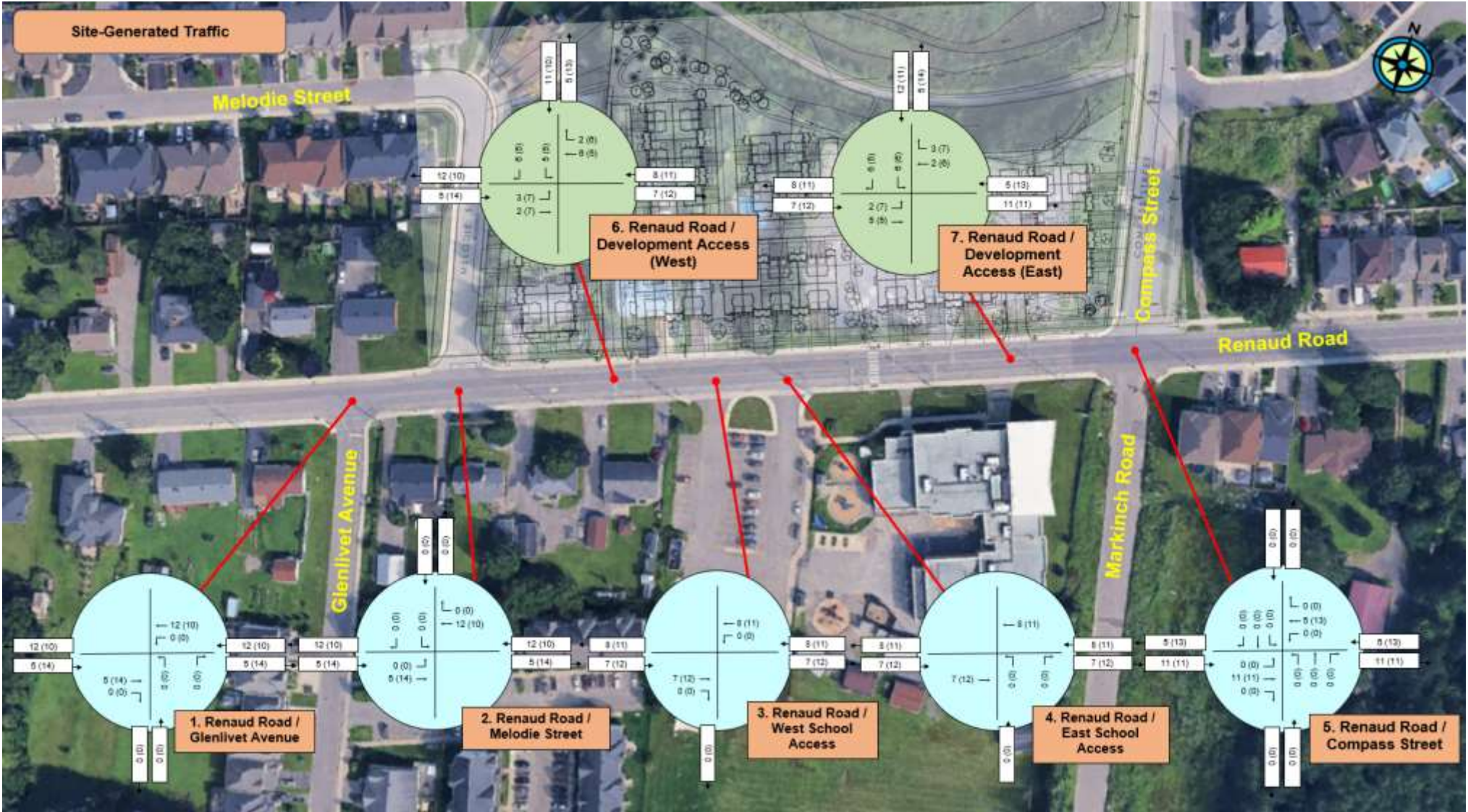
**Castleglenn  
Consultants**

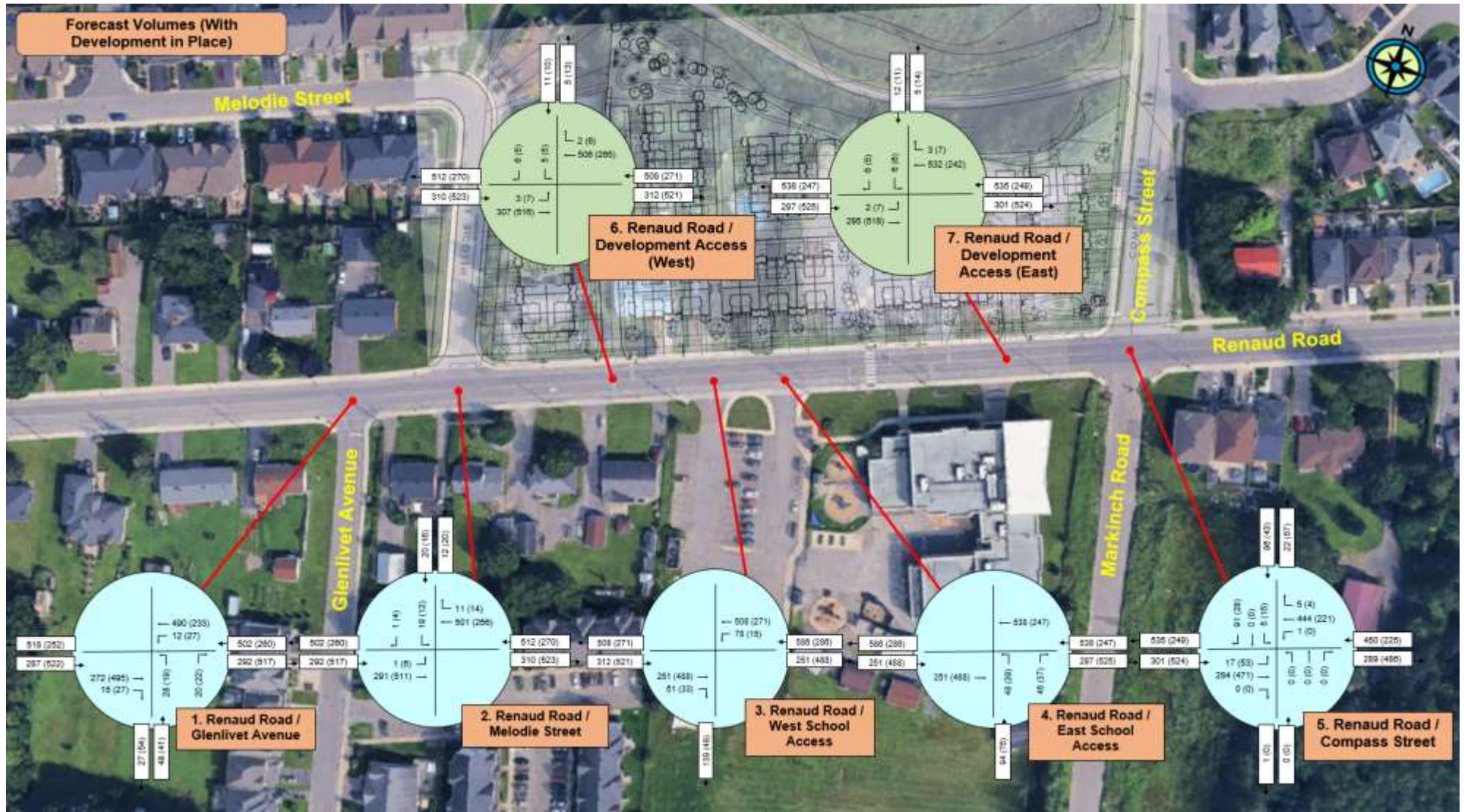
Engineers, Project Managers & Planners

## Attachment "B"

### Traffic Volumes Diagrams









**Castleglenn  
Consultants**

Engineers, Project Managers & Planners

## Attachment "C"

Intersection Capacity Analyses Results (Synchro 10)

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	267	15	12	478	28	20
Future Vol, veh/h	267	15	12	478	28	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	290	16	13	520	30	22

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	306	0	844 298
Stage 1	-	-	-	-	298 -
Stage 2	-	-	-	-	546 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1255	-	334 741
Stage 1	-	-	-	-	753 -
Stage 2	-	-	-	-	580 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1255	-	329 741
Mov Cap-2 Maneuver	-	-	-	-	329 -
Stage 1	-	-	-	-	753 -
Stage 2	-	-	-	-	571 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	428	-	-	1255	-
HCM Lane V/C Ratio	0.122	-	-	0.01	-
HCM Control Delay (s)	14.6	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	286	489	11	19	1
Future Vol, veh/h	1	286	489	11	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	311	532	12	21	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	544	0	-	0	851 538
Stage 1	-	-	-	-	538 -
Stage 2	-	-	-	-	313 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1025	-	-	-	330 543
Stage 1	-	-	-	-	585 -
Stage 2	-	-	-	-	741 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1025	-	-	-	330 543
Mov Cap-2 Maneuver	-	-	-	-	330 -
Stage 1	-	-	-	-	584 -
Stage 2	-	-	-	-	741 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1025	-	-	-	337
HCM Lane V/C Ratio	0.001	-	-	-	0.065
HCM Control Delay (s)	8.5	0	-	-	16.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	↑
Traffic Vol, veh/h	244	0	0	530	48	46
Future Vol, veh/h	244	0	0	530	48	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	265	0	0	576	52	50

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	841 265
Stage 1	-	-	-	-	265 -
Stage 2	-	-	-	-	576 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0	0	-	335 774
Stage 1	-	0	0	-	779 -
Stage 2	-	0	0	-	562 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	335 774
Mov Cap-2 Maneuver	-	-	-	-	335 -
Stage 1	-	-	-	-	779 -
Stage 2	-	-	-	-	562 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	464	-	-
HCM Lane V/C Ratio	0.22	-	-
HCM Control Delay (s)	14.9	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.8	-	-

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	273	1	1	439	5	1	1	1	5	1	91
Future Vol, veh/h	17	273	1	1	439	5	1	1	1	5	1	91
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	297	1	1	477	5	1	1	1	5	1	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	482	0	0	298	0	0	866	818	298	817	816	480
Stage 1	-	-	-	-	-	-	334	334	-	482	482	-
Stage 2	-	-	-	-	-	-	532	484	-	335	334	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1081	-	-	1263	-	-	274	311	741	295	311	586
Stage 1	-	-	-	-	-	-	680	643	-	565	553	-
Stage 2	-	-	-	-	-	-	531	552	-	679	643	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1081	-	-	1263	-	-	224	304	741	289	304	586
Mov Cap-2 Maneuver	-	-	-	-	-	-	224	304	-	289	304	-
Stage 1	-	-	-	-	-	-	666	630	-	554	552	-
Stage 2	-	-	-	-	-	-	440	551	-	663	630	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			16			13.1		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	330	1081	-	-	1263	-	-	552
HCM Lane V/C Ratio	0.01	0.017	-	-	0.001	-	-	0.191
HCM Control Delay (s)	16	8.4	0	-	7.9	0	-	13.1
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	481	27	27	223	19	22
Future Vol, veh/h	481	27	27	223	19	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	523	29	29	242	21	24

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	552	0	838
Stage 1	-	-	-	-	538
Stage 2	-	-	-	-	300
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1018	-	336
Stage 1	-	-	-	-	585
Stage 2	-	-	-	-	752
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1018	-	325
Mov Cap-2 Maneuver	-	-	-	-	325
Stage 1	-	-	-	-	585
Stage 2	-	-	-	-	727

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	414	-	-	1018	-
HCM Lane V/C Ratio	0.108	-	-	0.029	-
HCM Control Delay (s)	14.7	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	6	497	246	14	12	4
Future Vol, veh/h	6	497	246	14	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	540	267	15	13	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	282	0	-	0	829 275
Stage 1	-	-	-	-	275 -
Stage 2	-	-	-	-	554 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1280	-	-	-	340 764
Stage 1	-	-	-	-	771 -
Stage 2	-	-	-	-	575 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1280	-	-	-	337 764
Mov Cap-2 Maneuver	-	-	-	-	337 -
Stage 1	-	-	-	-	765 -
Stage 2	-	-	-	-	575 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1280	-	-	-	392
HCM Lane V/C Ratio	0.005	-	-	-	0.044
HCM Control Delay (s)	7.8	0	-	-	14.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	↑
Traffic Vol, veh/h	476	0	0	236	39	37
Future Vol, veh/h	476	0	0	236	39	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	517	0	0	257	42	40

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	774 517
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	257 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0	0	-	367 558
Stage 1	-	0	0	-	598 -
Stage 2	-	0	0	-	786 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	367 558
Mov Cap-2 Maneuver	-	-	-	-	367 -
Stage 1	-	-	-	-	598 -
Stage 2	-	-	-	-	786 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	440	-	-
HCM Lane V/C Ratio	0.188	-	-
HCM Control Delay (s)	15.1	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.7	-	-

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	53	460	1	1	208	4	1	1	1	15	1	28
Future Vol, veh/h	53	460	1	1	208	4	1	1	1	15	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	500	1	1	226	4	1	1	1	16	1	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	230	0	0	501	0	0	863	849	501	848	847	228
Stage 1	-	-	-	-	-	-	617	617	-	230	230	-
Stage 2	-	-	-	-	-	-	246	232	-	618	617	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1338	-	-	1063	-	-	275	298	570	281	299	811
Stage 1	-	-	-	-	-	-	477	481	-	773	714	-
Stage 2	-	-	-	-	-	-	758	713	-	477	481	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1338	-	-	1063	-	-	252	280	570	267	281	811
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	280	-	267	281	-
Stage 1	-	-	-	-	-	-	448	452	-	727	713	-
Stage 2	-	-	-	-	-	-	728	712	-	446	452	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0			16.3			13.6		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	323	1338	-	-	1063	-	-	467
HCM Lane V/C Ratio	0.01	0.043	-	-	0.001	-	-	0.102
HCM Control Delay (s)	16.3	7.8	0	-	8.4	0	-	13.6
HCM Lane LOS		C	A	A	-	A	-	B
HCM 95th %tile Q(veh)		0	0.1	-	-	0	-	0.3

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	272	15	12	490	28	20
Future Vol, veh/h	272	15	12	490	28	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	296	16	13	533	30	22

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	312	0	863 304
Stage 1	-	-	-	-	304 -
Stage 2	-	-	-	-	559 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1248	-	325 736
Stage 1	-	-	-	-	748 -
Stage 2	-	-	-	-	572 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1248	-	320 736
Mov Cap-2 Maneuver	-	-	-	-	320 -
Stage 1	-	-	-	-	748 -
Stage 2	-	-	-	-	563 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	419	-	-	1248	-
HCM Lane V/C Ratio	0.125	-	-	0.01	-
HCM Control Delay (s)	14.8	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	1	291	501	11	19	1
Future Vol, veh/h	1	291	501	11	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	316	545	12	21	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	557	0	-	0	869 551
Stage 1	-	-	-	-	551 -
Stage 2	-	-	-	-	318 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1014	-	-	-	322 534
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	738 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1014	-	-	-	322 534
Mov Cap-2 Maneuver	-	-	-	-	322 -
Stage 1	-	-	-	-	576 -
Stage 2	-	-	-	-	738 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1014	-	-	-	329
HCM Lane V/C Ratio	0.001	-	-	-	0.066
HCM Control Delay (s)	8.6	0	-	-	16.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	↑
Traffic Vol, veh/h	251	0	0	538	48	46
Future Vol, veh/h	251	0	0	538	48	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	273	0	0	585	52	50

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	858 273
Stage 1	-	-	-	-	273 -
Stage 2	-	-	-	-	585 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0	0	-	327 766
Stage 1	-	0	0	-	773 -
Stage 2	-	0	0	-	557 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	327 766
Mov Cap-2 Maneuver	-	-	-	-	327 -
Stage 1	-	-	-	-	773 -
Stage 2	-	-	-	-	557 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	454	-	-
HCM Lane V/C Ratio	0.225	-	-
HCM Control Delay (s)	15.2	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	284	1	1	444	5	1	1	1	5	1	91
Future Vol, veh/h	17	284	1	1	444	5	1	1	1	5	1	91
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	309	1	1	483	5	1	1	1	5	1	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	488	0	0	310	0	0	884	836	310	835	834	486
Stage 1	-	-	-	-	-	-	346	346	-	488	488	-
Stage 2	-	-	-	-	-	-	538	490	-	347	346	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1075	-	-	1250	-	-	266	303	730	287	304	581
Stage 1	-	-	-	-	-	-	670	635	-	561	550	-
Stage 2	-	-	-	-	-	-	527	549	-	669	635	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1075	-	-	1250	-	-	217	297	730	281	298	581
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	297	-	281	298	-
Stage 1	-	-	-	-	-	-	657	622	-	550	549	-
Stage 2	-	-	-	-	-	-	436	548	-	653	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	16.3	13.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	321	1075	-	-	1250	-	-	546
HCM Lane V/C Ratio	0.01	0.017	-	-	0.001	-	-	0.193
HCM Control Delay (s)	16.3	8.4	0	-	7.9	0	-	13.2
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

HCM 6th TWSC  
 14: Renaud Road & Development Access (West)

Richcraft Block 121  
 Forecast 2025 AM (With Development)

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	3	307	506	2	5	6
Future Vol, veh/h	3	307	506	2	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	334	550	2	5	7

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	552	0	-	0	891 551
Stage 1	-	-	-	-	551 -
Stage 2	-	-	-	-	340 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1018	-	-	-	313 534
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	721 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1018	-	-	-	312 534
Mov Cap-2 Maneuver	-	-	-	-	312 -
Stage 1	-	-	-	-	575 -
Stage 2	-	-	-	-	721 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1018	-	-	-	403
HCM Lane V/C Ratio	0.003	-	-	-	0.03
HCM Control Delay (s)	8.5	0	-	-	14.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	2	295	532	3	6	6
Future Vol, veh/h	2	295	532	3	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	321	578	3	7	7

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	581	0	-	0	905 580
Stage 1	-	-	-	-	580 -
Stage 2	-	-	-	-	325 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	993	-	-	-	307 514
Stage 1	-	-	-	-	560 -
Stage 2	-	-	-	-	732 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	993	-	-	-	306 514
Mov Cap-2 Maneuver	-	-	-	-	306 -
Stage 1	-	-	-	-	559 -
Stage 2	-	-	-	-	732 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	993	-	-	-	384
HCM Lane V/C Ratio	0.002	-	-	-	0.034
HCM Control Delay (s)	8.6	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	495	27	27	233	19	22
Future Vol, veh/h	495	27	27	233	19	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	538	29	29	253	21	24

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	567	0	864 553
Stage 1	-	-	-	-	553 -
Stage 2	-	-	-	-	311 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1005	-	325 533
Stage 1	-	-	-	-	576 -
Stage 2	-	-	-	-	743 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1005	-	314 533
Mov Cap-2 Maneuver	-	-	-	-	314 -
Stage 1	-	-	-	-	576 -
Stage 2	-	-	-	-	718 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	403	-	-	1005	-
HCM Lane V/C Ratio	0.111	-	-	0.029	-
HCM Control Delay (s)	15	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	6	511	256	14	12	4
Future Vol, veh/h	6	511	256	14	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	555	278	15	13	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	293	0	-	0	855	286
Stage 1	-	-	-	-	286	-
Stage 2	-	-	-	-	569	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1269	-	-	-	329	753
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1269	-	-	-	326	753
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	566	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.1	0	14.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1269	-	-	-	380	
HCM Lane V/C Ratio	0.005	-	-	-	0.046	
HCM Control Delay (s)	7.9	0	-	-	14.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	↑
Traffic Vol, veh/h	488	0	0	247	39	37
Future Vol, veh/h	488	0	0	247	39	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	530	0	0	268	42	40

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	798 530
Stage 1	-	-	-	-	530 -
Stage 2	-	-	-	-	268 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0	0	-	355 549
Stage 1	-	0	0	-	590 -
Stage 2	-	0	0	-	777 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	355 549
Mov Cap-2 Maneuver	-	-	-	-	355 -
Stage 1	-	-	-	-	590 -
Stage 2	-	-	-	-	777 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	429	-	-
HCM Lane V/C Ratio	0.193	-	-
HCM Control Delay (s)	15.4	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.7	-	-

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	53	471	1	1	221	4	1	1	1	15	1	28
Future Vol, veh/h	53	471	1	1	221	4	1	1	1	15	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	512	1	1	240	4	1	1	1	16	1	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	244	0	0	513	0	0	889	875	513	874	873	242
Stage 1	-	-	-	-	-	-	629	629	-	244	244	-
Stage 2	-	-	-	-	-	-	260	246	-	630	629	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1322	-	-	1052	-	-	264	288	561	270	289	797
Stage 1	-	-	-	-	-	-	470	475	-	760	704	-
Stage 2	-	-	-	-	-	-	745	703	-	470	475	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1322	-	-	1052	-	-	241	270	561	256	271	797
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	270	-	256	271	-
Stage 1	-	-	-	-	-	-	441	446	-	714	703	-
Stage 2	-	-	-	-	-	-	715	702	-	439	446	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0			16.7			13.9		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1322	-	-	1052	-	-	452
HCM Lane V/C Ratio	0.01	0.044	-	-	0.001	-	-	0.106
HCM Control Delay (s)	16.7	7.8	0	-	8.4	0	-	13.9
HCM Lane LOS		C	A	A	-	A	A	B
HCM 95th %tile Q(veh)		0	0.1	-	-	0	-	0.4

HCM 6th TWSC  
 14: Renaud Road & Development Access (West)

Richcraft Block 121  
 Forecast 2025 PM (With Development)

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	516	265	6	5	5
Future Vol, veh/h	7	516	265	6	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	561	288	7	5	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	295	0	-	0	869 292
Stage 1	-	-	-	-	292 -
Stage 2	-	-	-	-	577 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1266	-	-	-	322 747
Stage 1	-	-	-	-	758 -
Stage 2	-	-	-	-	562 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1266	-	-	-	319 747
Mov Cap-2 Maneuver	-	-	-	-	319 -
Stage 1	-	-	-	-	751 -
Stage 2	-	-	-	-	562 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1266	-	-	-	447
HCM Lane V/C Ratio	0.006	-	-	-	0.024
HCM Control Delay (s)	7.9	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	518	242	7	6	5
Future Vol, veh/h	7	518	242	7	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	563	263	8	7	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	271	0	-	0	846 267
Stage 1	-	-	-	-	267 -
Stage 2	-	-	-	-	579 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1292	-	-	-	333 772
Stage 1	-	-	-	-	778 -
Stage 2	-	-	-	-	560 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1292	-	-	-	330 772
Mov Cap-2 Maneuver	-	-	-	-	330 -
Stage 1	-	-	-	-	771 -
Stage 2	-	-	-	-	560 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1292	-	-	-	446
HCM Lane V/C Ratio	0.006	-	-	-	0.027
HCM Control Delay (s)	7.8	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



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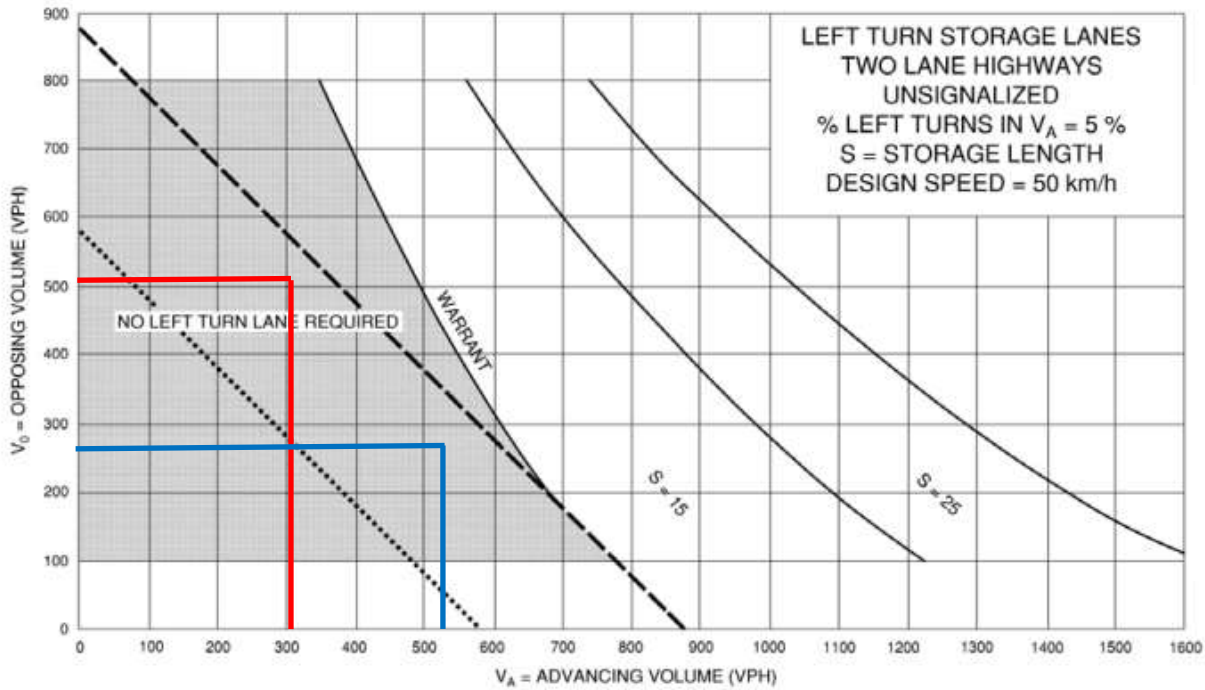
Engineers, Project Managers & Planners

Attachment “D”

Left Turn Warrant Analysis



### Eastbound Left Turn into WEST Development Access



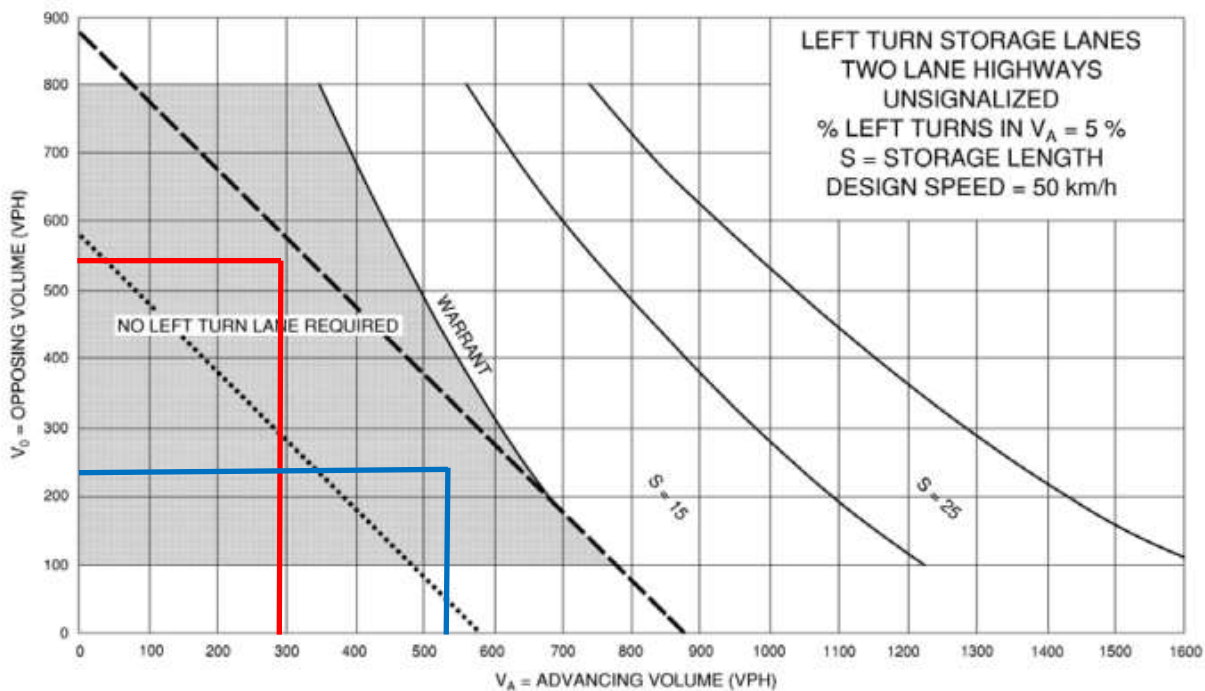
**AM:**

Advancing Traffic Volume,  
 $V_A = 307$ vph  
Opposing Traffic Volume,  
 $V_0 = 506$ vph  
Percentage of Left Turning  
Traffic:  $3/306 = 1.0\%$

**PM:**

Advancing Traffic Volume,  
 $V_A = 516$ vph  
Opposing Traffic Volume,  
 $V_0 = 265$ vph  
Percentage of Left Turning  
Traffic:  $7/516 = 1.4\%$

### Eastbound Left Turn into EAST Development Access



**AM:**

Advancing Traffic Volume,  
 $V_A = 295$ vph  
Opposing Traffic Volume,  
 $V_0 = 532$ vph  
Percentage of Left Turning  
Traffic:  $2/295 = 0.7\%$

**PM:**

Advancing Traffic Volume,  
 $V_A = 518$ vph  
Opposing Traffic Volume,  
 $V_0 = 242$ vph  
Percentage of Left Turning  
Traffic:  $7/518 = 1.4\%$

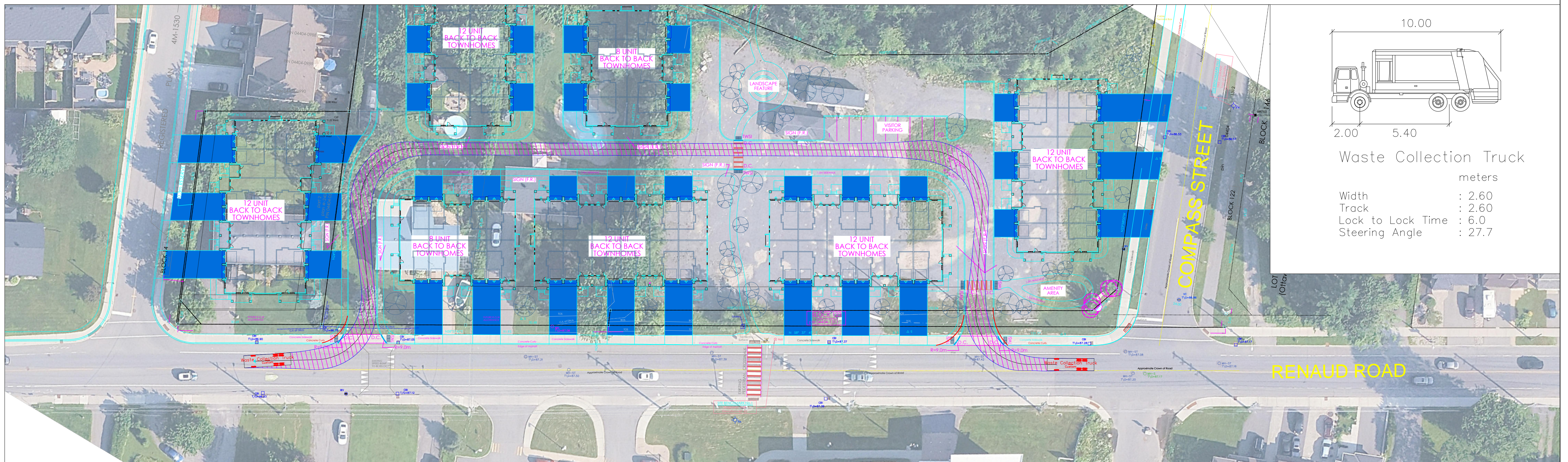
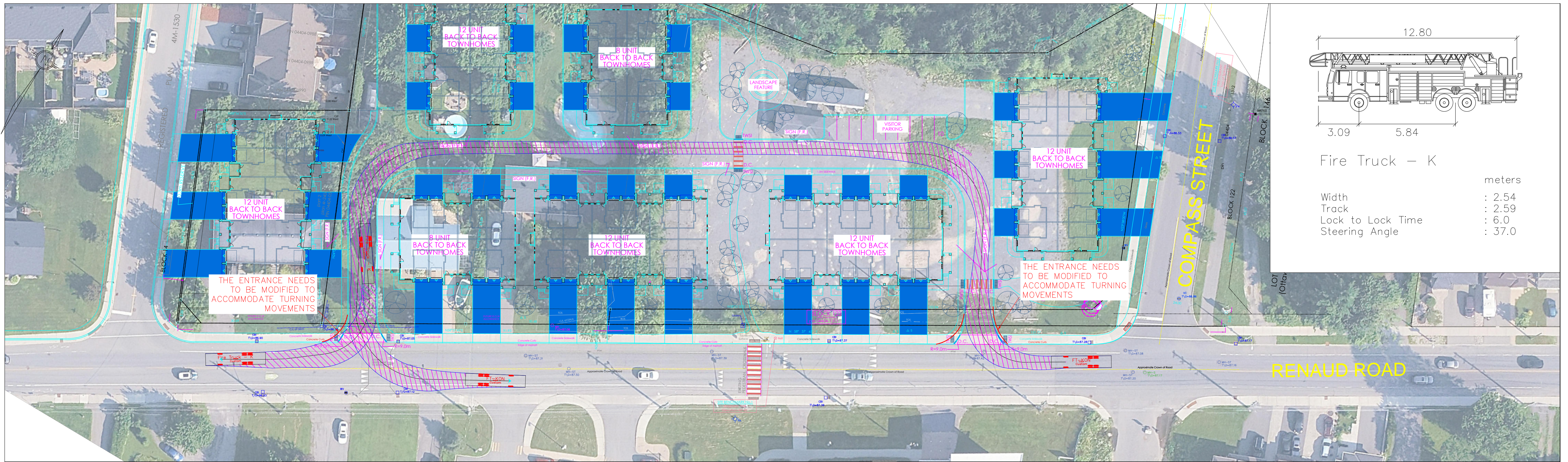


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Attachment "E"

Turning Movement Diagrams



CONSULTANT



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DESIGNED BY A.P.      CHECKED BY  
CONSULTANTS JOB NO.

CONCEPT PLAN  
FOR DISCUSSION ONLY

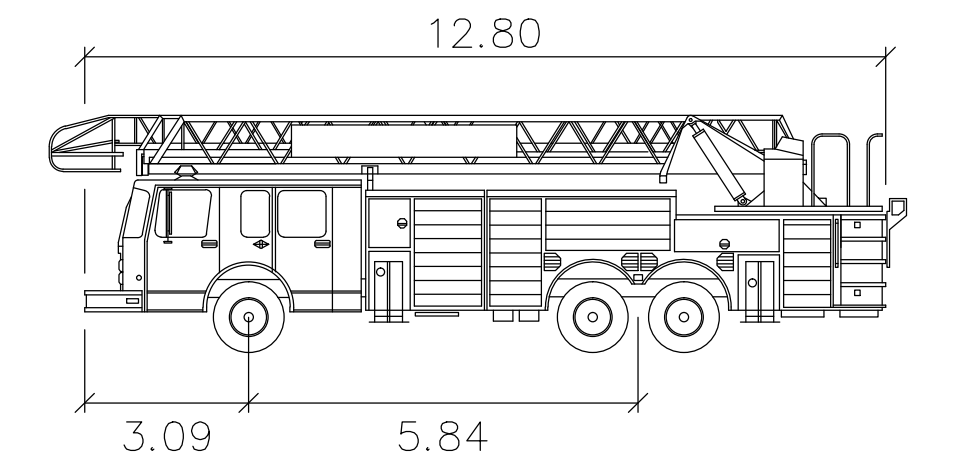
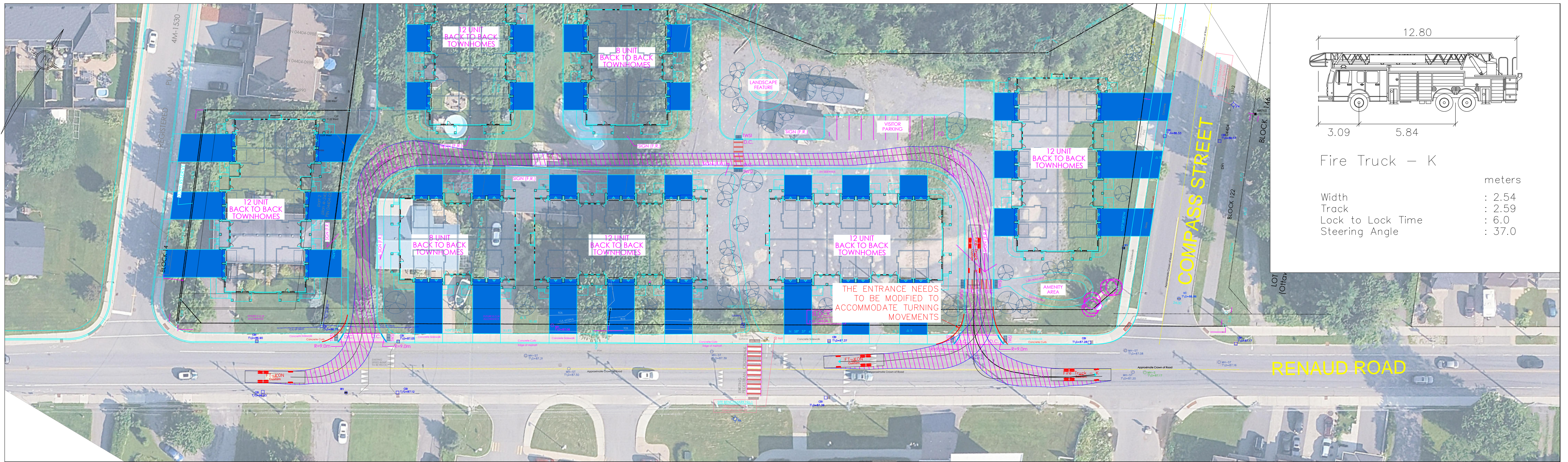
**FIRE TRUCK/WASTE COLLECTION TRUCK COMING FROM EAST**

8.0m 0 8.0m  
HORIZ 1: 400

SCALE

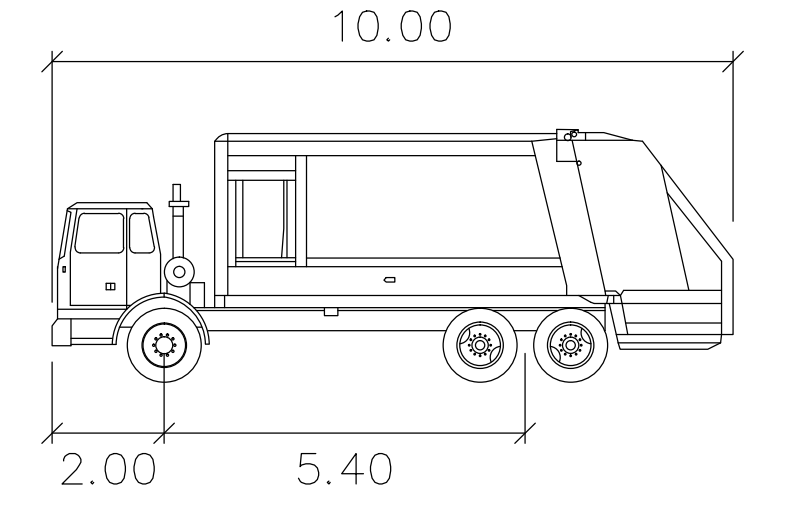
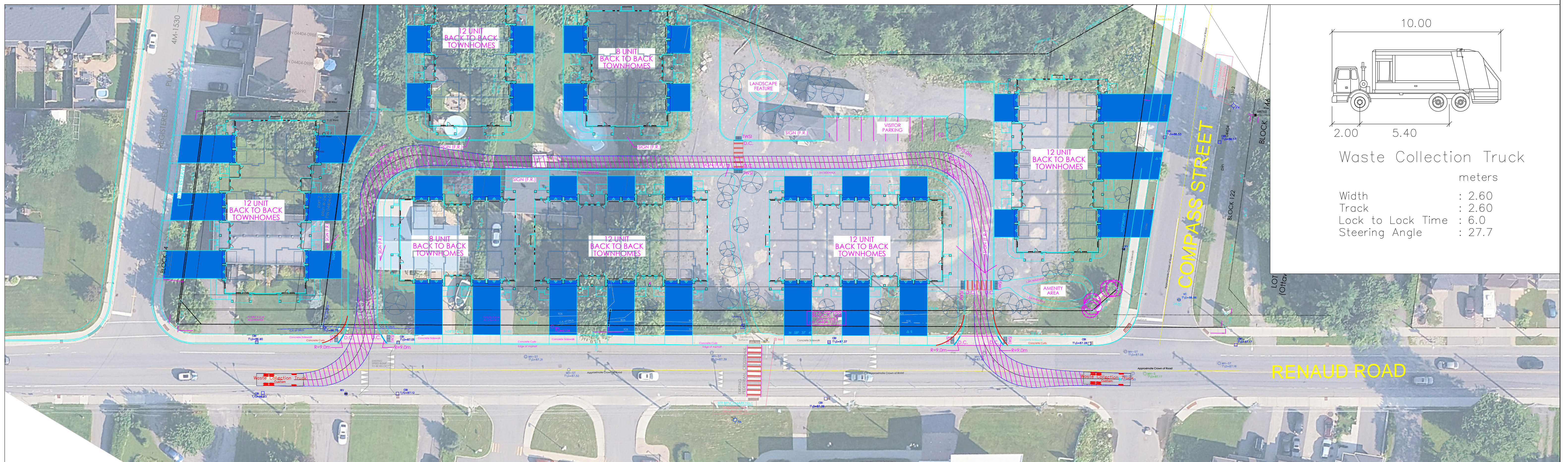
PLAN NUMBER

<b>BLOCK 121</b>		
<b>TRAILSEDGE PHASE3</b>		
STATUS DRAFT	DATE 02-04-2025	SHEET 01 OF 02



Fire Truck – K

	meters
Width	: 2.54
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.0



Waste Collection Truck

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 27.7

CONSULTANT

**Castleglenn Consultants**  
Engineers, Project Managers & Planners

DESIGNED BY A.P.      CHECKED BY  
CONSULTANTS JOB NO.

CONCEPT PLAN  
FOR DISCUSSION ONLY

**FIRE TRUCK/WASTE COLLECTION TRUCK COMING FROM WEST**

8.0m 0 8.0m  
HORIZ 1: 400

SCALE

PLAN NUMBER

<b>BLOCK 121</b>		
<b>TRAILSEDGE PHASE3</b>		
STATUS DRAFT	DATE 02-04-2025	SHEET 02 OF 02