

February 18, 2025

City of Ottawa  
Planning, Development, and Building Services Department  
110 Laurier Avenue West, 4<sup>th</sup> Floor  
Ottawa, ON K1P 1J1

**Attention: Mike Giampa**  
**Senior Engineer, Infrastructure Applications**

**Reference: 3610 Innes Road**  
**Transportation Impact Assessment – Revised Addendum Letter**  
**Novatech File No.: 118224**  
**City File No.: PC2024-0252**

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## **1.0 PROPOSED DEVELOPMENT**

This revised letter has been prepared in relation to a Site Plan Control application for a proposed back-to-back townhouse development at 3610 Innes Road. The initial submission of this addendum letter was prepared in October 2024. The subject site includes lands on both sides of the approved roadway Ventus Way, which connects Innes Road to Glenview's The Commons subdivision, which is approved and under construction (City file number D07-16-19-0027). A Transportation Impact Assessment (TIA) for the entire subdivision was prepared by Novatech in October 2019 and revised in April 2020 and is referred to in this letter as the 'parent study.' The parent study accounted for a development with 168 dwellings within the subject lands at the northern end of the subdivision.

A total of 98 townhouse dwellings and a 0.16-hectare park are proposed within the subject lands, which is 70 dwellings less than what was considered in the parent study. For the purposes of this addendum letter, the 58 proposed townhouses on the west side of Ventus Way have been considered 'Site A,' and the 40 proposed townhouses on the east side of Ventus Way have been considered 'Site B.' Site A is proposed to include six full-movement driveways to Ventus Way, and Site B is proposed to include one full-movement driveway to Ventus Way.

Each residence will include one parking space within the garage and one parking space on the driveway. Additionally, three visitor spaces are proposed within Site A, adjacent to the southernmost access to Ventus Way.

It is anticipated that buildout of the proposed townhouses will be completed in 2027. A copy of the proposed site plan is included in **Attachment 1**.

## 2.0 SCREENING

The City's *Revised TIA Guidelines* identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form, which is included in **Attachment 2**. The trigger results are as follows:

- Trip Generation Trigger – The development includes greater than 90 low-rise multifamily units however the site was previously considered as part of the parent study for the subdivision. Further assessment is not **required**.
- Location Triggers – The development does not meet any location triggers; further assessment is **not required**.
- Safety Triggers – The development is within 150m of an adjacent traffic signal; further assessment is **required**.

Per the pre-consultation feedback form received on July 8, 2024, the requirements for a full TIA have been waived, in favour of a TIA addendum letter that review the on-site design modules, potential queues at Innes Road/Ventus Way, and revisions to the approved Geometric Roadway Design Drawing (GRDD) for The Commons subdivision.

## 3.0 DEVELOPMENT DESIGN

### 3.1 Design for Sustainable Modes

Sidewalks on both sides of Ventus Way will provide connections to the townhouses on both Site A and Site B. An east-west walkway is proposed midway along the western property limit of Site A, for future connectivity with the adjacent proposed development at 245-275 Lamarche Avenue. North-south walkways along the western property limit will provide connectivity between the separate loops within Site A. A walkway is proposed along the north side of the private road serving Site B, which will connect Site B to the proposed pedestrian crossover (PXO). A separate east-west walkway is proposed along the southern property limit to provide connectivity between the loops within Site B. Pedestrians may also walk on the private roadways, given the low traffic volumes and speeds that are anticipated on-site.

A concept for the adjacent proposed development at 245-275 Lamarche Avenue is included in **Attachment 3**.

No exterior bicycle parking spaces are provided, as each townhouse dwelling will include a garage.

OC Transpo's service design guidelines for peak period service is to provide service within a five-minute (400m) walk of home, work, or school for 95% of urban residents. Some entrances are within this walking distance of bus stops #1219 and #8129 on Innes Road (west of Ventus Way), and all entrances are within 600m walking distance. These stops currently serve OC Routes 25, 612, and 648.

A review of the *Transportation Demand Management (TDM)-Supportive Design and Infrastructure Checklist* has been conducted and is included in **Attachment 4**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. In addition to the required measures, the proposed development also meets the following 'basic' or 'better' measures as defined in the *TDM-Supportive Development Design and Infrastructure Checklist*:

- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort;
- Provide secure bicycle parking spaces equivalent to at least the number of units at multifamily residential developments.

The parent study in support of The Commons subdivision included a review of the TDM Residential Measures Checklist. The study identified that the following TDM measures will be implemented at the sales centre:

- Display local area maps with walking/cycling routes and key destinations;
- Display relevant transit schedules and route maps;
- Provide multimodal travel option information packages to new residents.

### 3.2 Circulation and Access

Garbage collection is proposed to occur on-site, along the private roads. Garbage truck turning movements have been conducted using the Medium Single Unit (MSU) design vehicle and are included in **Attachment 5**.

All on-site roadways form the fire route for the proposed development. Fire truck turning movements have been conducted using the Pumper Fire Truck design vehicle and are also included in **Attachment 5**.

The MSU and fire truck turning movements that have been completed show these vehicles traversing the southernmost loop within Site A and the westernmost loop within Site B. These movements are representative of each on-site roadway, and therefore garbage trucks and fire trucks will be able to traverse all on-site roadways. The width of each on-site roadway is generally 6.4m to 8.5m, and all curves have a centreline radius of 12m.

## 4.0 PARKING

The subject site is located in Area C of Schedules 1 and 1A of the City's *Zoning By-Law* (ZBL). Minimum vehicle parking and bicycle parking requirements are identified in Sections 101, 102, and 111 of the ZBL. The proposed parking supply and requirements are summarized in **Table 1**.

**Table 1: Parking Review**

Land Use	Rate	Units	Required	Provided
Minimum Vehicle Parking (Section 101/102 of ZBL)				
Planned Unit Development	1.0 spaces per dwelling (townhouse rate)	98 dwellings	98	98
	Visitor parking not required when each dwelling has a driveway accessing a garage or carport		0	3
Minimum Bicycle Parking (Section 111 of ZBL)				
Planned Unit Development	No bicycle parking required when each dwelling has a garage or carport	98 dwellings	0	98

Each townhouse dwelling will include a garage and a driveway accessing it. Therefore, the minimum vehicle and bicycle parking requirements are met.

## 5.0 BOUNDARY STREETS

### 5.1 MMLOS Review

This section provides a review of the boundary street Ventus Way, based on the approved cross-section. The *Multi-Modal Levels of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation on Ventus Way. Using Exhibit 22 of the *MMLOS Guidelines*, the MMLOS targets associated with the 'General Urban Area' have been considered in this review. The targets are summarized as follows:

- **Target pedestrian level of service (PLOS) C**, which is the target for all roadways within the General Urban Area;
- **Target bicycle level of service (BLOS) D**, which is the target for roadways with no cycling route designation;
- **No target transit level of service (TLOS) is identified**, as the roadway is not designated in the City's Rapid Transit and Transit Priority (RTTP) Network;
- **No target truck level of service (TkLOS) is identified**, as Ventus Way has no truck route designation and is not an arterial roadway.

The segment PLOS and BLOS review of Ventus Way is provided in the following tables.

**Table 2: PLOS Segment Analysis**

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed	PLOS
1.8m	0m	≤ 3,000 vpd	N/A	50 km/h	B

**Table 3: BLOS Segment Analysis**

Road Class	Bike Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
Local	No Class	Mixed Traffic	1 per direction	50 km/h	D

As shown in the previous tables, Ventus Way meets the target PLOS and BLOS, based on the approved GRDD.

## 5.2 Geometric Roadway Design Drawing Revisions

A PXO is proposed immediately north of the southernmost access serving Site A and the access serving Site B, which are directly opposite each other. This PXO serves the anticipated desire line between pedestrians on the west side of Ventus Way and the future park on the east side of Ventus Way. A narrowing of Ventus Way from 8.5m to 7.0m is proposed at the PXO, which will act as a traffic calming measure while also reducing the crossing distance for pedestrians.

Per the *Ontario Traffic Manual (OTM) – Book 15*, which includes a Pedestrian Crossover Selection Matrix, the required type of PXO is determined by volume, speed, and crossing distance. For each range of two-way vehicular volumes (four-hour or eight-hour volumes), the selection matrix prescribes the appropriate type of PXO based on the posted speed limit (50 km/h or slower versus 60 km/h), and the number of lanes crossed (using a lane width of 3.0m to 3.75m).

On Ventus Way at Innes Road, the parent study identified projected two-way traffic volumes of approximately 348 vehicles during the PM peak hour. Using the City's expansion factor of 6.22 (converting the PM peak hour volume to eight-hour volume), the converted eight-hour two-way volume is approximately 2,165 vehicles. This falls under the lowest range of volumes considered for a PXO, which includes a lower bound of 750 vehicles and upper bound of 2,250 vehicles.

The anticipated speed limit of Ventus Way is 50 km/h or slower, and the crossing distance is approximately 7.0m (equivalent to two lanes). Based on these parameters and the projected eight-hour volumes, a PXO 'Type D' is the appropriate treatment. This is considered the lowest-order PXO, and includes painted crosswalks and pedestrian crossing signs.

The Pedestrian Crossover Selection Matrix and diagram of a Type D PXO are included in **Attachment 6**.

The previously approved GRDD has been revised to include the proposed PXO location, and incorporates the site plan of the proposed townhouse developments on both sides of Ventus Way. The revised GRDD plan is included in **Attachment 7**.

## 6.0 ACCESS DESIGN

The proposed accesses have been evaluated based on the relevant requirements of the City's ZBL, *Private Approach By-Law (PABL)*, and the Transportation Association of Canada (TAC)'s *Geometric Design Guide for Canadian Roads*.

Section 25(1)(a) of the PABL identifies a maximum number of permissible private approaches to a roadway, based on the amount of frontage on that roadway. There is no minimum frontage to permit a single two-way private approach, which applies to Site B. Site A has approximately 206m of frontage to Ventus Way. Section 25(1)(a) identifies that a maximum of three two-way private approaches are permitted, for sites with 151m to 240m of frontage. Relief of this requirement is requested for Site A, which includes three private roadway loops (and therefore, six two-way private approaches to Ventus Way). Traffic volumes at each private approach are anticipated to be very low, even during the peak hours, as the private roadways will access a maximum of 12 driveways. Based on discussions with City staff it was determined that looped roadways were preferred for Site A rather than a circuitous alignment.

Section 25(1)(c) of the PABL identifies a maximum width requirement of 9m for any two-way private approach. This requirement is met for all accesses when measured at the street line, as each Site A access is approximately 7.0m in width, and the Site B access is approximately 8.2m in width. This requirement is not met when measured at the edge of roadway, as each access includes 5.0m curb radii that are required to accommodate fire truck and garbage truck movements. These curb radii cannot be reduced further.

Section 25(1)(g) of the PABL identifies a minimum separation requirement of 9m between a two-way private approach and any other private approach to the same property, as measured at the street line. Each private approach serving Site A is separated by approximately 25m or more, meeting this requirement.

Section 25(1)(p) of the PABL identifies a minimum separation requirement of 3.0m between the nearest edge of a private approach and the nearest property line. Measuring at the street line, this requirement is met, the northernmost access serving Site A is approximately 3.0m from the nearest property line, the southernmost access serving Site A is approximately 7.0m from the nearest property line, and the access serving Site B is approximately 8.4m from the nearest property line. As previously discussed, the 5.0m curb radii at each access is required to accommodate fire truck and garbage truck movements, and cannot be reduced. The northernmost access serving Site A is approximately 2.0m from the nearest property line when measuring from the back of sidewalk.

In accordance with section 25(1)(t) of the PABL any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2-6% for the first 9m inside the property line. This requirement is generally met by the private approaches, which have grades of up to 4.9% within the first 9m.

TAC's *Geometric Design Guide* identifies minimum stopping sight distance (SSD) and intersection sight distance (ISD) requirements, based on the roadway grade and design speed. Ventus Way will have a generally level grade and a design speed of 50 km/h has been considered. Therefore, the required SSD is 65m and the desired ISDs are 105m for drivers looking right to turn left and 95m for drivers looking left to turn right.

The required SSD will be provided at each private approach, as the curve of Ventus Way is relatively gentle. The desired ISD can also be provided at each private approach, provided any future vegetation is maintained (i.e. the proposed townhouse locations do not obscure sightlines). Sight distance figures at the most critical accesses are included in **Attachment 8**.

The parent study included Synchro analysis of Innes Road/Ventus Way (then referred to as 473m East of Pagé Road). In the total traffic conditions, the Synchro analysis identified 95<sup>th</sup>-percentile (i.e. maximum) queues of 28m to 34m for the northbound left turn/through movement. These queue lengths will not extend back to the proposed development, as the northernmost access serving Site A is approximately 135m south of the stop bar at Innes Road/Ventus Way. Excerpts of the Synchro reports submitted with the parent study are included in **Attachment 9**.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this letter can be summarized as follows:

- Sidewalks on both sides of Ventus Way will provide connections to the townhouses on both Site A and Site B. An east-west walkway is proposed midway along the western property limit of Site A, for future connectivity with the adjacent proposed development at 245-275 Lamarche Avenue. North-south walkways along the western property limit will provide connectivity between the separate loops within Site A. A walkway is proposed along the north side of the private road serving Site B, which will connect Site B to the proposed pedestrian crossover (PXO). A separate east-west walkway is proposed along the southern property limit to provide connectivity between the loops within Site B. Pedestrians may also walk on the private roadways, given the low traffic volumes and speeds that are anticipated on-site.
- No exterior bicycle parking spaces are provided, as each townhouse dwelling will include a garage.
- Garbage trucks and fire trucks will be able to traverse all on-site roadways. The width of each on-site roadway is generally 6.4m to 8.5m, and all curves have a centreline radius of 12m.
- Each townhouse dwelling will include a garage and a driveway accessing it. Therefore, the minimum vehicle and bicycle parking requirements are met.
- Ventus Way meets the target Pedestrian Level of Service (PLOS) and Bicycle Level of Service (BLOS), based on the approved Geometric Road Design Drawing (GRDD).
- A pedestrian crossover (PXO) Type D is proposed immediately north of the southernmost access serving Site A and the access serving Site B, which are directly opposite each other. This PXO serves the anticipated desire line between pedestrians on the west side of Ventus Way and the future park on the east side of Ventus Way. A narrowing of Ventus Way from 8.5m to 7.0m is proposed at the PXO, which will act as a traffic calming measure while also reducing the crossing distance for pedestrians.
- Section 25(1)(a) of the Private Approach By-Law (PABL) identifies that a maximum of three two-way private approaches are permitted, for sites with 151m to 240m of frontage. Relief of this requirement is requested for Site A, which includes six private approaches. Traffic volumes at each private approach are anticipated to be very low, even during the peak hours, as the private roadways will access a maximum of 12 driveways. Based on discussions with City staff it was determined that looped roadways were preferred for Site A rather than a circuitous alignment.
- Section 25(1)(c) of the PABL identifies a maximum width requirement of 9m for any two-way private approach. This requirement is met for all accesses when measured at the street line, as each Site A access is approximately 7.0m in width, and the Site B access is approximately 8.2m in width. This requirement is not met when measured at the edge of roadway, as each access includes 5.0m curb radii that are required to accommodate fire truck and garbage truck movements. These curb radii cannot be reduced further.

- The 95<sup>th</sup>-percentile (i.e. maximum) queues of 28m to 34m for the northbound left turn/through movement at Innes Road/Ventus Way do not extend back to the proposed development, as the northernmost access serving Site A is approximately 135m south of the stop bar.

The proposed development is recommended from a transportation perspective.

## NOVATECH

Prepared by:



Joshua Audia, P.Eng.  
Project Engineer | Transportation

Reviewed by:



Jennifer Luong, P.Eng.  
Senior Project Manager | Transportation

## **Attachment 1**

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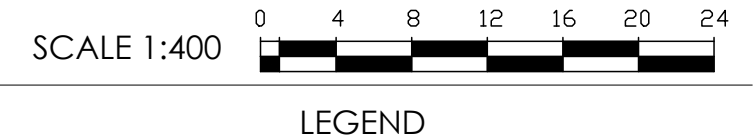
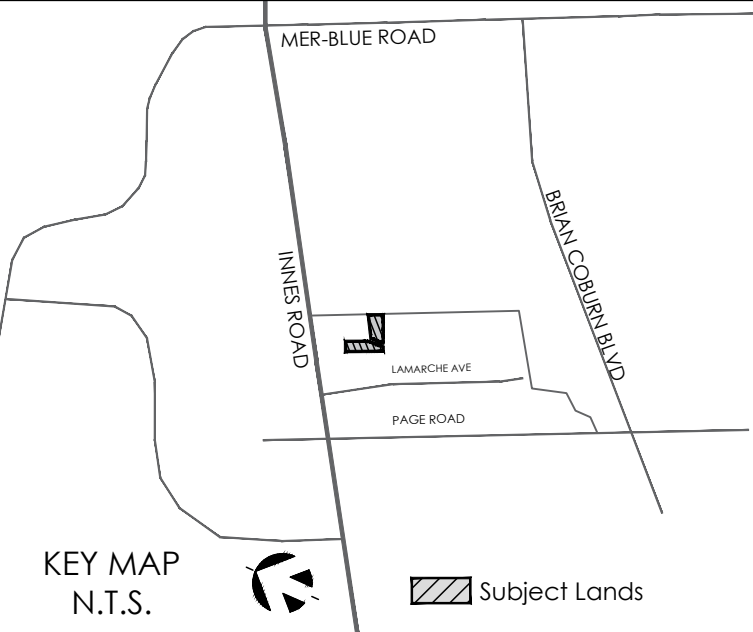
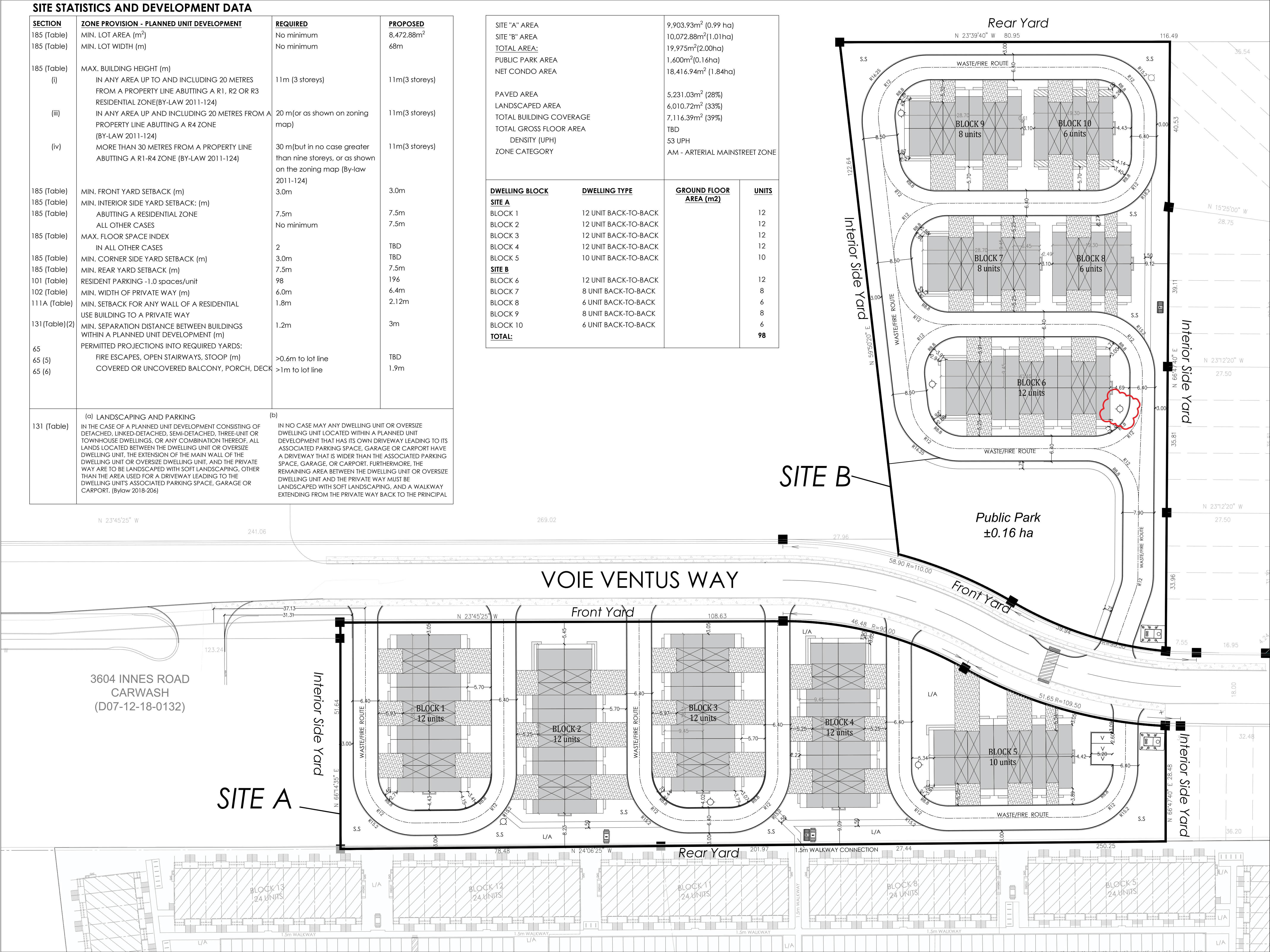
Proposed Site Plan

SITE STATISTICS AND DEVELOPMENT DATA

SECTION	ZONE PROVISION - PLANNED UNIT DEVELOPMENT	REQUIRED	PROPOSED
185 (Table)	MIN. LOT AREA (m²)	No minimum	8,472.88m²
185 (Table)	MIN. LOT WIDTH (m)	No minimum	68m
185 (Table)	MAX. BUILDING HEIGHT (m)		
(i)	IN ANY AREA UP TO AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R1, R2 OR R3 RESIDENTIAL ZONE(BY-LAW 2011-124)	11m (3 storeys)	11m(3 storeys)
(iii)	IN ANY AREA UP AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R4 ZONE (BY-LAW 2011-124)	20 m(or as shown on zoning map)	11m(3 storeys)
(iv)	MORE THAN 30 METRES FROM A PROPERTY LINE ABUTTING A R1-R4 ZONE (BY-LAW 2011-124)	30 m(but in no case greater than nine storeys, or as shown on the zoning map (By-law 2011-124)	11m(3 storeys)
185 (Table)	MIN. FRONT YARD SETBACK (m)	3.0m	3.0m
185 (Table)	MIN. INTERIOR SIDE YARD SETBACK: (m)		
185 (Table)	ABUTTING A RESIDENTIAL ZONE	7.5m	7.5m
	ALL OTHER CASES	No minimum	7.5m
185 (Table)	MAX. FLOOR SPACE INDEX		
	IN ALL OTHER CASES	2	TBD
185 (Table)	MIN. CORNER SIDE YARD SETBACK (m)	3.0m	TBD
185 (Table)	MIN. REAR YARD SETBACK (m)	7.5m	7.5m
101 (Table)	RESIDENT PARKING -1.0 spaces/unit	98	196
102 (Table)	MIN. WIDTH OF PRIVATE WAY (m)	6.0m	6.4m
111A (Table)	MIN. SETBACK FOR ANY WALL OF A RESIDENTIAL USE BUILDING TO A PRIVATE WAY	1.8m	2.12m
131 (Table)(2)	MIN. SEPARATION DISTANCE BETWEEN BUILDINGS WITHIN A PLANNED UNIT DEVELOPMENT (m)	1.2m	3m
65	PERMITTED PROJECTIONS INTO REQUIRED YARDS:		
65 (5)	FIRE ESCAPES, OPEN STAIRWAYS, STOOP (m)	>0.6m to lot line	TBD
65 (6)	COVERED OR UNCOVERED BALCONY, PORCH, DECK	>1m to lot line	1.9m
131 (Table)	(a) LANDSCAPING AND PARKING	(b)	
	IN THE CASE OF A PLANNED UNIT DEVELOPMENT CONSISTING OF DETACHED, LINKED-DETACHED, SEMI-DETACHED, THREE-UNIT OR TOWNHOUSE DWELLINGS, OR ANY COMBINATION THEREOF, ALL LANDS LOCATED BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, THE EXTENSION OF THE MAIN WALL OF THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, AND THE PRIVATE WAY ARE TO BE LANDSCAPED WITH SOFT LANDSCAPING, OTHER THAN THE AREA USED FOR A DRIVEWAY LEADING TO THE DWELLING UNIT'S ASSOCIATED PARKING SPACE, GARAGE OR CARPORT. (Bylaw 2018-206)	IN NO CASE MAY ANY DWELLING UNIT OR OVERSIZE DWELLING UNIT LOCATED WITHIN A PLANNED UNIT DEVELOPMENT THAT HAS ITS OWN DRIVEWAY LEADING TO ITS ASSOCIATED PARKING SPACE, GARAGE OR CARPORT HAVE A DRIVEWAY THAT IS WIDER THAN THE ASSOCIATED PARKING SPACE, GARAGE, OR CARPORT. FURTHERMORE, THE REMAINING AREA BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT AND THE PRIVATE WAY MUST BE LANDSCAPED WITH SOFT LANDSCAPING, AND A WALKWAY EXTENDING FROM THE PRIVATE WAY BACK TO THE PRINCIPAL	

SITE "A" AREA		9,903.93m <sup>2</sup> (0.99 ha)
SITE "B" AREA		10,072.88m <sup>2</sup> (1.01ha)
<u>TOTAL AREA:</u>		19,975m <sup>2</sup> (2.00ha)
PUBLIC PARK AREA		1,600m <sup>2</sup> (0.16ha)
NET CONDO AREA		18,416.94m <sup>2</sup> (1.84ha)
PAVED AREA		5,231.03m <sup>2</sup> (28%)
LANDSCAPED AREA		6,010.72m <sup>2</sup> (33%)
TOTAL BUILDING COVERAGE		7,116.39m <sup>2</sup> (39%)
TOTAL GROSS FLOOR AREA		TBD
DENSITY (UPH)		53 UPH
ZONE CATEGORY		AM - ARTERIAL MAINSTREET ZONE

<u>DWELLING BLOCK</u>	<u>DWELLING TYPE</u>	<u>GROUND FLOOR AREA (m2)</u>	<u>UNITS</u>
<b>SITE A</b>			
BLOCK 1	12 UNIT BACK-TO-BACK		12
BLOCK 2	12 UNIT BACK-TO-BACK		12
BLOCK 3	12 UNIT BACK-TO-BACK		12
BLOCK 4	12 UNIT BACK-TO-BACK		12
BLOCK 5	10 UNIT BACK-TO-BACK		10
<b>SITE B</b>			
BLOCK 6	12 UNIT BACK-TO-BACK		12
BLOCK 7	8 UNIT BACK-TO-BACK		8
BLOCK 8	6 UNIT BACK-TO-BACK		6
BLOCK 9	8 UNIT BACK-TO-BACK		8
BLOCK 10	6 UNIT BACK-TO-BACK		6
<u>TOTAL:</u>			<b>98</b>



LEGEND	
	BACK TO BACK TOWNHOUSE DWELLING
	DRIVEWAY
	PATHWAY
	CROSSWALK
	CURB (0.2m)
	DEPRESSED CURB
	PORCH
	SNOW STORAGE AREA
	LANDSCAPED AREA
	PROPOSED LOT BOUNDARY
	BLOCK BOUNDARY
	VISITOR PARKING
	SWITCHBOARD
	MINI SUB
	SWITCHGEAR
	TWSI (TACTILE WALKING SURFACE INDICATORS)
	HYDRANT
	UTILITY BOX

DATE	REVISION	BY
03/02/25	Second Submission	WS
20/01/25	Revision to radii	WS
01/11/24	First Submission	WS
12/09/24	Revision 1	JH
12/08/24	Draft for review	WS

GENERAL NOTES

- DO NOT SCALE DRAWINGS FOR PRINT.
- THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KORSIAK URBAN PLANNING AND GLENVIEW HOMES. COPYRIGHT RESERVED.
- WALKWAYS AND CURBS TO BE TIED INTO PUBLIC ROW WHERE APPLICABLE.
- REFERENCES CITY OF OTTAWA T.W.S.I. DETAIL SC7.3

PROJECT TEAM	
SITE PLAN DESIGN:	KORSIAK Urban Planning
LANDSCAPE ARCHITECTURE:	NAK design strategies
MECHANICAL/ELECTRICAL:	LRJ
PLANNING:	NOVATECH
TRANSPORTATION:	NOVATECH
ARCHITECTURE:	Glenview Homes
GEOTECHNICAL & STRUCTURAL:	paterson group
CIVIL ENGINEER:	NOVATECH



GLENVIEW  
THE COMMONS SITE PLAN

PART OF LOT 4  
CONCESSION 3 (OTTAWA FRONT)  
GEOGRAPHIC TOWNSHIP OF GLOUCESTER  
REGISTERED PLAN #  
CITY OF OTTAWA

SITE PLAN	
DATE: February 3, 2025	DRAWN BY: JH CHECKED BY: CR
FILE NO.: D07-12-24-041	DRAWING NO. #19221
JOB NO.:	

## **Attachment 2**

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TIA Screening Form

City of Ottawa 2017 TIA Guidelines TIA Screening

1. Description of Proposed Development

Municipal Address	
Description of Location	
Land Use Classification	
Development Size (units)	
Development Size square metre (m <sup>2</sup> )	
Number of Accesses and Locations	
Phase of Development	
Buildout Year	

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Table notes:

1. Table 2, Table 3 & Table 4 TRANS Trip Generation Manual
2. Institute of Transportation Engineers (ITE) Trip Generation Manual 11.1 Ed.

Land Use Type	Minimum Development Size
Single-family homes	60 units
Multi-Use Family (Low-Rise) <sup>1</sup>	90 units
Multi-Use Family (High-Rise) <sup>1</sup>	150 units
Office <sup>2</sup>	1,400 m <sup>2</sup>
Industrial <sup>2</sup>	7,000 m <sup>2</sup>
Fast-food restaurant or coffee shop <sup>2</sup>	110 m <sup>2</sup>
Destination retail <sup>2</sup>	1,800 m <sup>2</sup>
Gas station or convenience market <sup>2</sup>	90 m <sup>2</sup>

**If the proposed development size is equal to or greater than the sizes identified above, the Trip Generation Trigger is satisfied.**

### 3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?		
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)? <sup>2</sup>		

**If any of the above questions were answered with ‘Yes,’ the Location Trigger is satisfied.**

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 kilometers per hour (km/h) or greater?		
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 metre [m] of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		
Is the proposed driveway within auxiliary lanes of an intersection?		
Does the proposed driveway make use of an existing median break that serves an existing site?		

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<sup>2</sup> Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in Schedule C1 of the Official Plan. DPAs are identified in Schedule C7A and C7B of the Official. See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA.

## Transportation Impact Assessment Guidelines

	Yes	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		
Does the development include a drive-thru facility?		

**If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.**

### 5. Summary

Results of Screening	Yes	No
Does the development satisfy the Trip Generation Trigger?		
Does the development satisfy the Location Trigger?		
Does the development satisfy the Safety Trigger?		

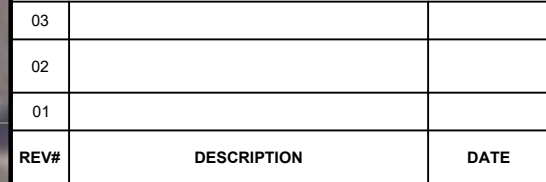
**If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).**

## **Attachment 3**

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245-275 Lamarche Avenue Concept

**LEGEND:**



## OV (Phase 4)

# Community Plan

2024-08-20

SK-1

OT502

## **Attachment 4**

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### Transportation Demand Management

## **TDM-Supportive Development Design and Infrastructure Checklist:** *Residential Developments (multi-family or condominium)*

<b>Legend</b>	
<b>REQUIRED</b>	The Official Plan or Zoning By-law provides related guidance that must be followed
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance

<b>TDM-supportive design &amp; infrastructure measures:</b> <i>Residential developments</i>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>1. WALKING &amp; CYCLING: ROUTES</b>		
<b>1.1 Building location &amp; access points</b>		
<b>BASIC</b>	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input type="checkbox"/>
<b>BASIC</b>	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input type="checkbox"/>
<b>BASIC</b>	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
<b>1.2 Facilities for walking &amp; cycling</b>		
<b>REQUIRED</b>	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations ( <i>see Official Plan policy 4.3.3</i> )	<input type="checkbox"/> - N/A
<b>REQUIRED</b>	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible ( <i>see Official Plan policy 4.3.12</i> )	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks ( <i>see Official Plan policy 4.3.10</i> )	<input checked="" type="checkbox"/>
REQUIRED	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps ( <i>see Official Plan policy 4.3.10</i> )	<input checked="" type="checkbox"/>
REQUIRED	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians ( <i>see Official Plan policy 4.3.11</i> )	<input checked="" type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input type="checkbox"/>
<b>1.3 Amenities for walking &amp; cycling</b>		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input type="checkbox"/>
BASIC	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>		
<b>2.1 Bicycle parking</b>		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	<input type="checkbox"/>
<b>2.2 Secure bicycle parking</b>		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i> )	<input type="checkbox"/> - N/A
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input checked="" type="checkbox"/> - Each unit includes a garage
<b>2.3 Bicycle repair station</b>		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
<b>BASIC</b>	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
<b>BETTER</b>	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
<b>BETTER</b>	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>
<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
<b>REQUIRED</b>	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input checked="" type="checkbox"/>
<b>BASIC</b>	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input type="checkbox"/>
<b>BASIC</b>	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see <i>Zoning By-law Section 104</i> )	<input type="checkbox"/>
<b>BETTER</b>	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see <i>Zoning By-law Section 111</i> )	<input type="checkbox"/>
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
<b>BETTER</b>	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	<input type="checkbox"/>

**TDM Measures Checklist:**  
*Residential Developments (multi-family, condominium or subdivision)*

<b>Legend</b>	
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance
<b>★</b>	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

<b>TDM measures: <i>Residential developments</i></b>		<b>Check if proposed &amp; add descriptions</b>
<b>1. TDM PROGRAM MANAGEMENT</b>		
<b>1.1 Program coordinator</b>		
<b>BASIC</b>	<b>★</b> 1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
<b>1.2 Travel surveys</b>		
<b>BETTER</b>	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
<b>2. WALKING AND CYCLING</b>		
<b>2.1 Information on walking/cycling routes &amp; destinations</b>		
<b>BASIC</b>	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances ( <i>multi-family, condominium</i> )	<input checked="" type="checkbox"/> - at sales centre
<b>2.2 Bicycle skills training</b>		
<b>BETTER</b>	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>3. TRANSIT</b>		
<b>3.1 Transit information</b>		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances ( <i>multi-family, condominium</i> )	<input checked="" type="checkbox"/> - at sales centre
BETTER	3.1.2 Provide real-time arrival information display at entrances ( <i>multi-family, condominium</i> )	<input type="checkbox"/>
<b>3.2 Transit fare incentives</b>		
BASIC ★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	<input type="checkbox"/>
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	<input type="checkbox"/>
<b>3.3 Enhanced public transit service</b>		
BETTER ★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels ( <i>subdivision</i> )	<input type="checkbox"/>
<b>3.4 Private transit service</b>		
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	<input type="checkbox"/>
<b>4. CARSHARING &amp; BIKESHARING</b>		
<b>4.1 Bikeshare stations &amp; memberships</b>		
BETTER	4.1.1 Contract with provider to install on-site bikeshare station ( <i>multi-family</i> )	<input type="checkbox"/>
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized ( <i>multi-family</i> )	<input type="checkbox"/>
<b>4.2 Carshare vehicles &amp; memberships</b>		
BETTER	4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents	<input type="checkbox"/>
BETTER	4.2.2 Provide residents with carshare memberships, either free or subsidized	<input type="checkbox"/>
<b>5. PARKING</b>		
<b>5.1 Priced parking</b>		
BASIC ★	5.1.1 Unbundle parking cost from purchase price ( <i>condominium</i> )	<input type="checkbox"/>
BASIC ★	5.1.2 Unbundle parking cost from monthly rent ( <i>multi-family</i> )	<input type="checkbox"/>

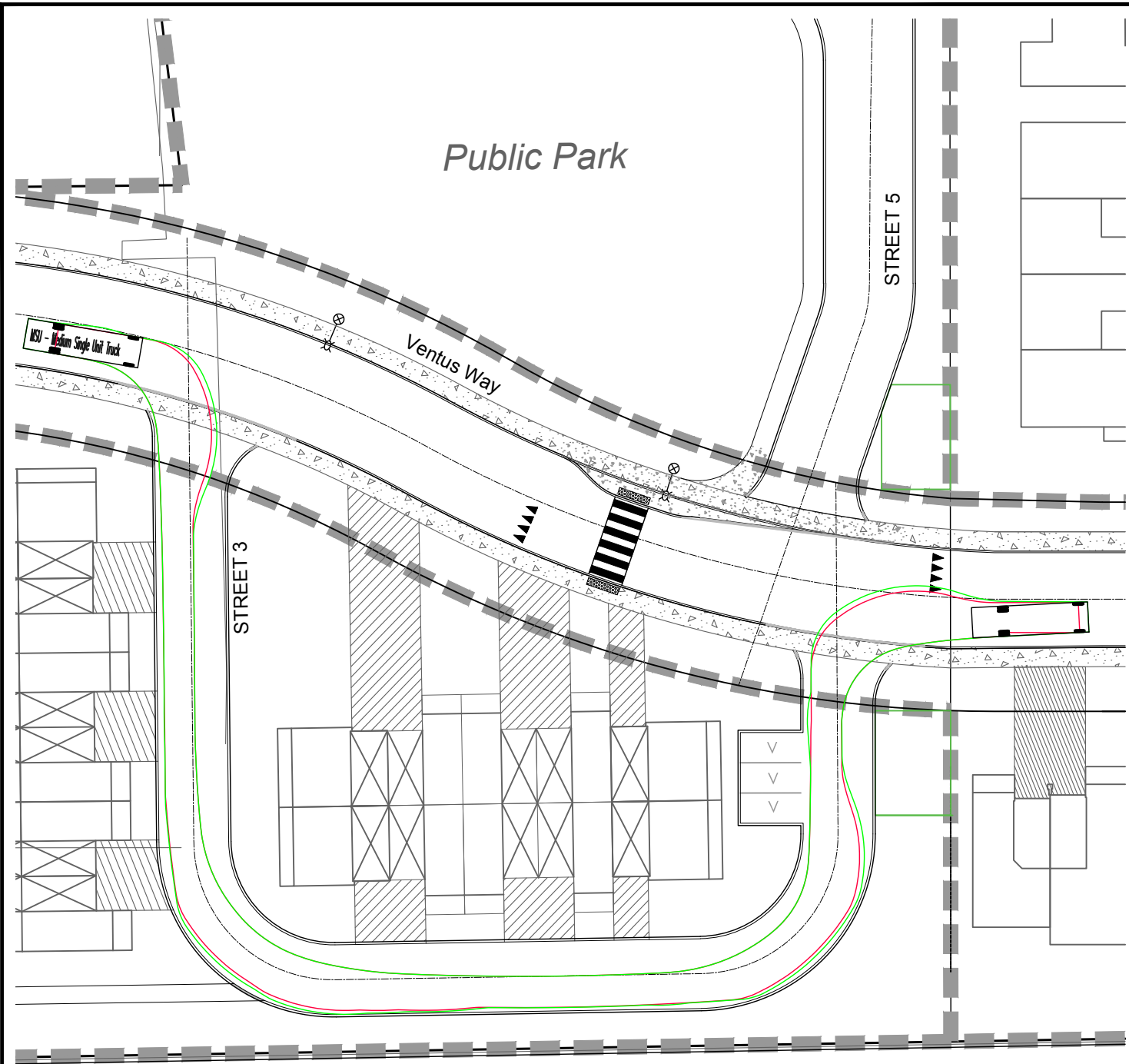
TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>6. TDM MARKETING &amp; COMMUNICATIONS</b>		
<b>6.1 Multimodal travel information</b>		
<b>BASIC</b>	★ 6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/> - at sales centre
<b>6.2 Personalized trip planning</b>		
<b>BETTER</b>	★ 6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

## **Attachment 5**

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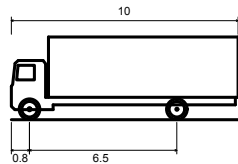
### Turning Movements

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Engineers, Planners & Landscape Architects  
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Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)



MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

GLENVIEW

## TURNING MOVEMENT (MSU)

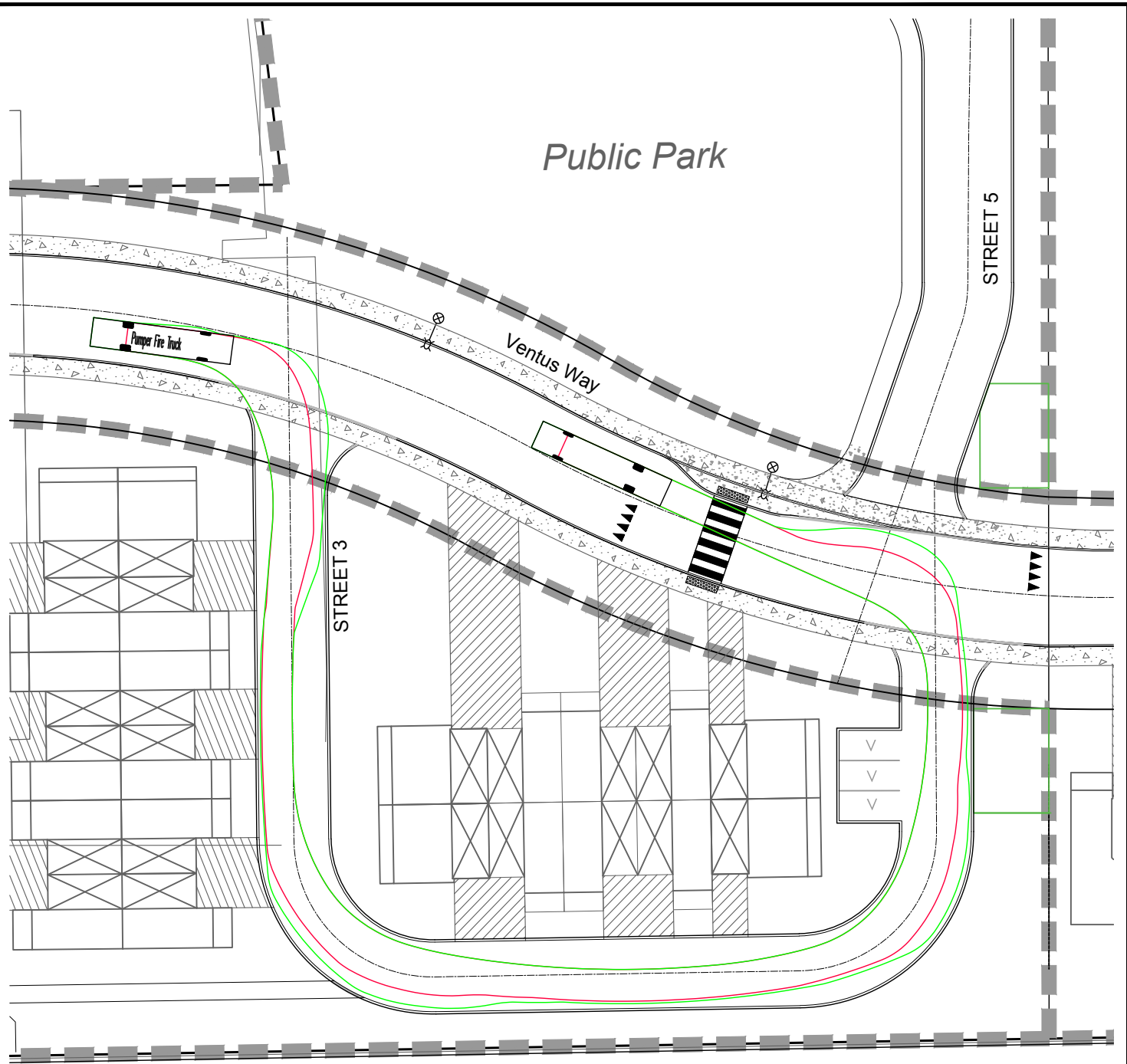
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DATE FEB 2025

JOB 118224

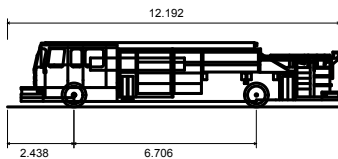
FIGURE FIGURE 1

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Pumper Fire Truck

Overall Length	12.192m
Overall Width	2.438m
Overall Body Height	6.706m
Min Body Ground Clearance	0.200m
Track Width	2.489m
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

GLENVIEW

TURNING MOVEMENT  
(FIRE TRUCK)

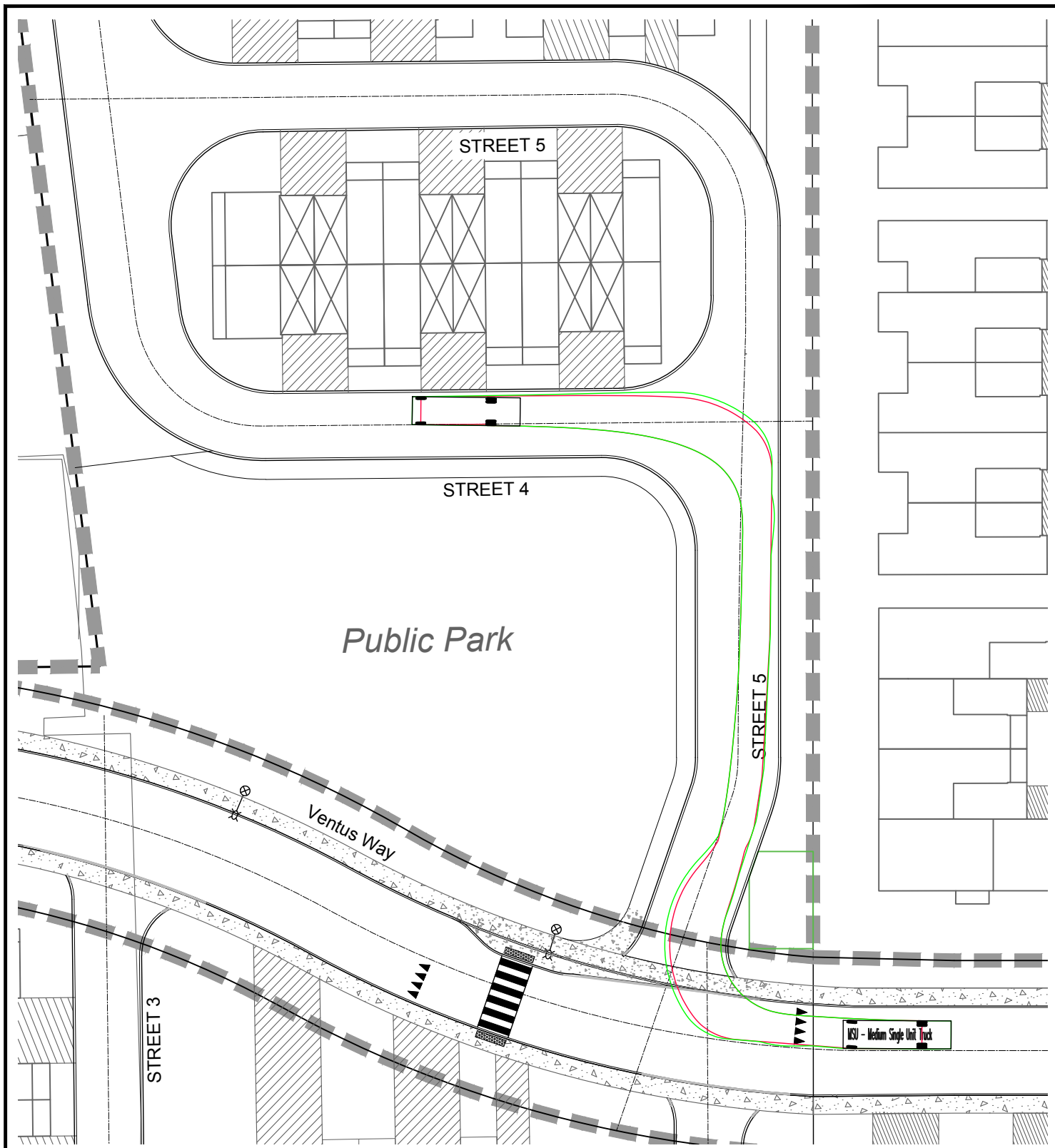
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DATE FEB 2025

JOB 118224

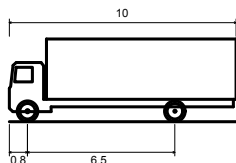
FIGURE FIGURE 2

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MSU - Medium Single Unit Truck

Overall Length 10.000m  
Overall Width 2.600m  
Overall Body Height 3.650m  
Min Body Ground Clearance 0.445m  
Track Width 2.600m  
Lock-to-lock time 4.00s  
Curb to Curb Turning Radius 11.100m

GLENVIEW

## TURNING MOVEMENT (MSU)

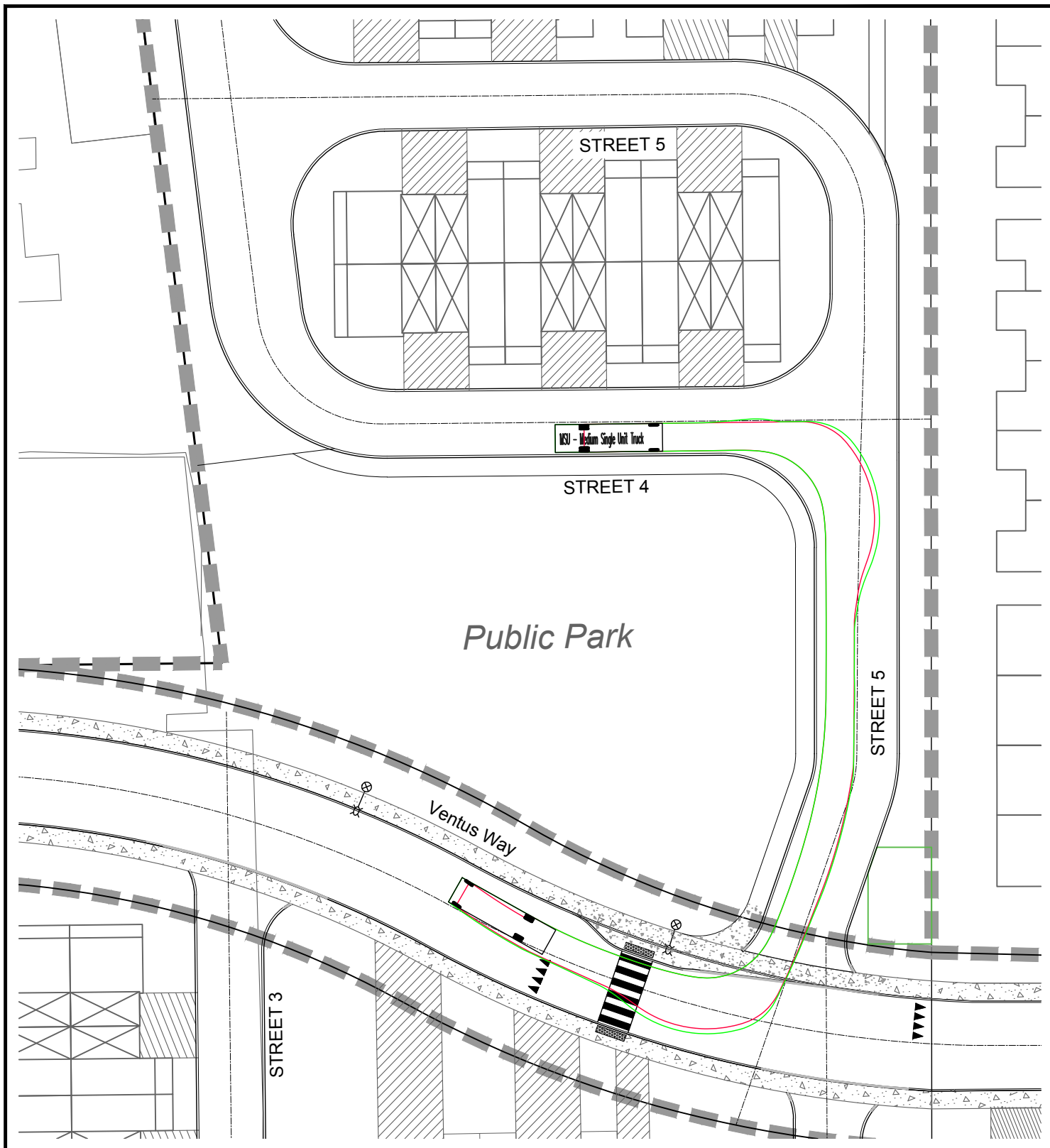
SCALE 1 : 500

DATE FEB 2025

JOB 118224

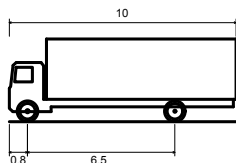
FIGURE FIGURE 3

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MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

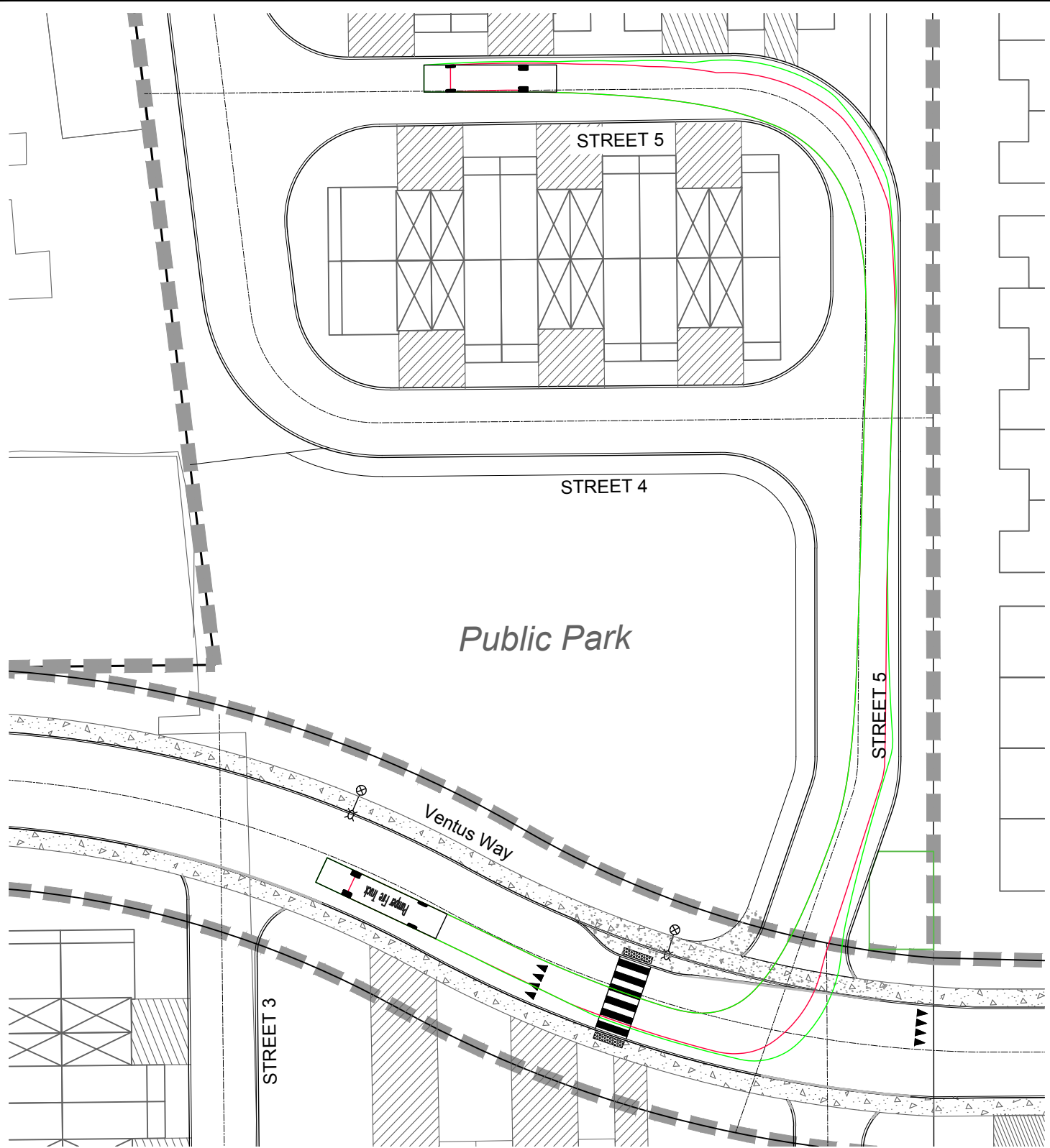
GLENVIEW

## TURNING MOVEMENT (MSU)

SCALE 1 : 500

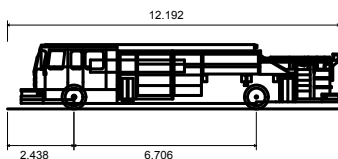
DATE FEB 2025 JOB 118224 FIGURE 4

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Pumper Fire Truck

Overall Length	12.192m
Overall Width	2.438m
Overall Body Height	6.706m
Min Body Ground Clearance	0.200m
Track Width	2.489m
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

GLENVIEW

## TURNING MOVEMENT (FIRE TRUCK)

SCALE 1 : 500

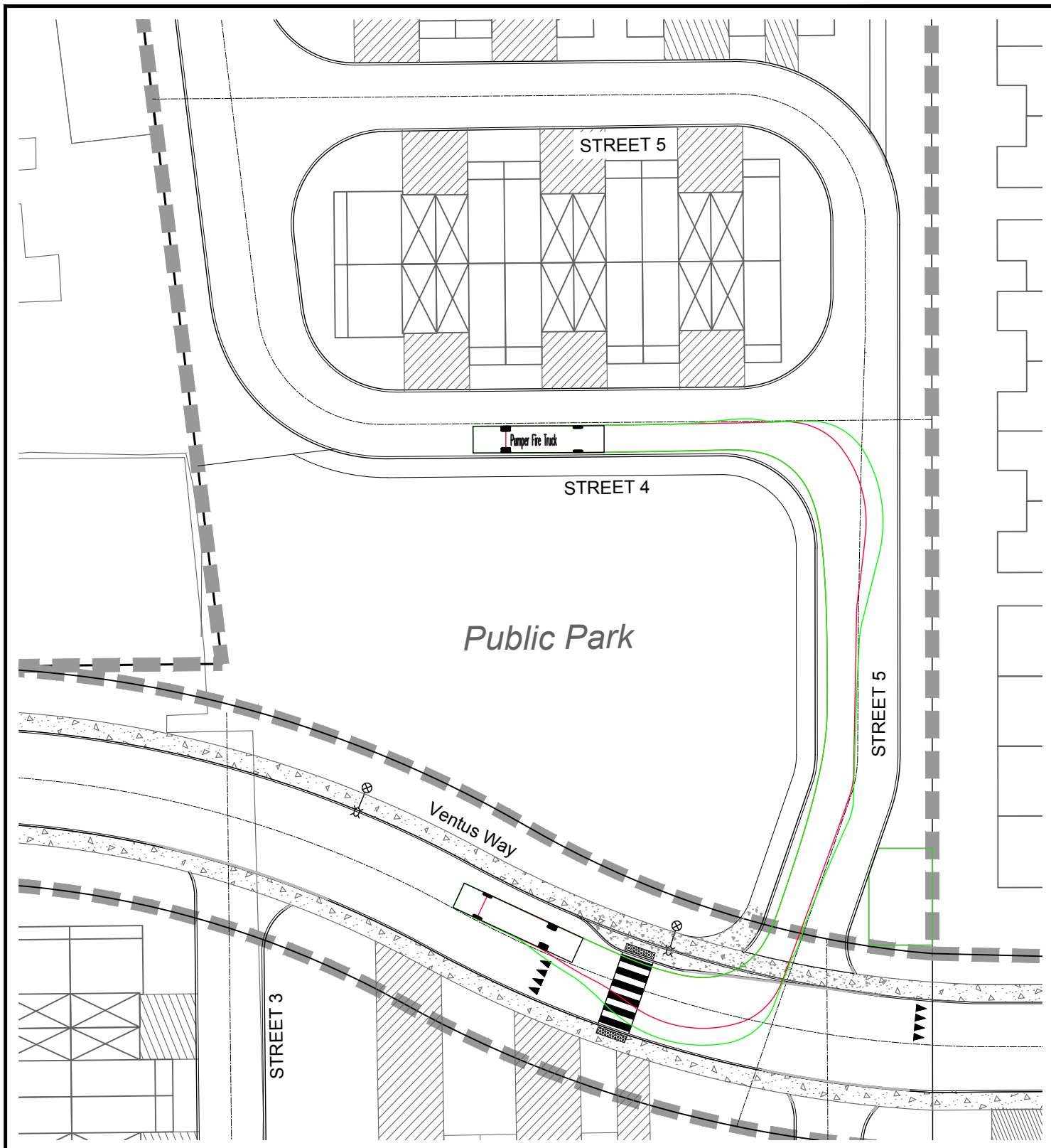


DATE FEB 2025

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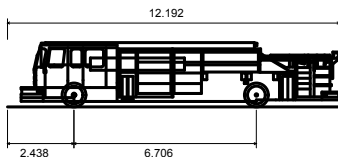
FIGURE FIGURE 5

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Pumper Fire Truck

Overall Length	12.192m
Overall Width	2.438m
Overall Body Height	6.706m
Min Body Ground Clearance	0.200m
Track Width	2.489m
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

GLENVIEW

## TURNING MOVEMENT (FIRE TRUCK)

SCALE 1 : 500

DATE FEB 2025

JOB 118224

FIGURE FIGURE 6

## **Attachment 6**

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### **Pedestrian Crossover Materials**

**Table 7: Pedestrian Crossover Selection Matrix**

Two-way Vehicular Volume			Posted Speed Limit (km/h)	Total Number of Lanes for the Roadway Cross Section <sup>1</sup>			
Time Period	Lower Bound	Upper Bound		1 or 2 Lanes	3 lanes	4 lanes w/raised refuge	4 lanes w/o raised refuge
8 Hour	750	2,250	≤50	Level 2 Type D	Level 2 Type C <sup>3</sup>	Level 2 Type D <sup>2</sup>	Level 2 Type B
4 Hour	395	1,185					
8 Hour	750	2,250	60	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	395	1,185					
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D <sup>2</sup>	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	2,250	4,500	60	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	4,500	6,000	≤50	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 1 Type A
4 Hour	3,155	3,950					
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B		
4 Hour	3,155	3,950					
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B		
4 Hour	3,950	9,215					
8 Hour	7,500	17,500	60	Level 2 Type B			
4 Hour	3,950	9,215					

Type A
  Type B
  Type C
  Type D

Approaches to roundabouts should be considered a separate roadways.

<sup>1</sup>The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) may extend the average crossing distance beyond this range of lane widths.

<sup>2</sup>Use of two sets of side mounted signs for each direction (one on the right side and one on the median)

<sup>3</sup>Use Level 2 Type B PXO up to 3 lanes total, cross section one-way.

The hatched cells in this table show that a PXO is not recommended for sites with these traffic and geometric conditions. Generally a traffic signal is warranted for such conditions.

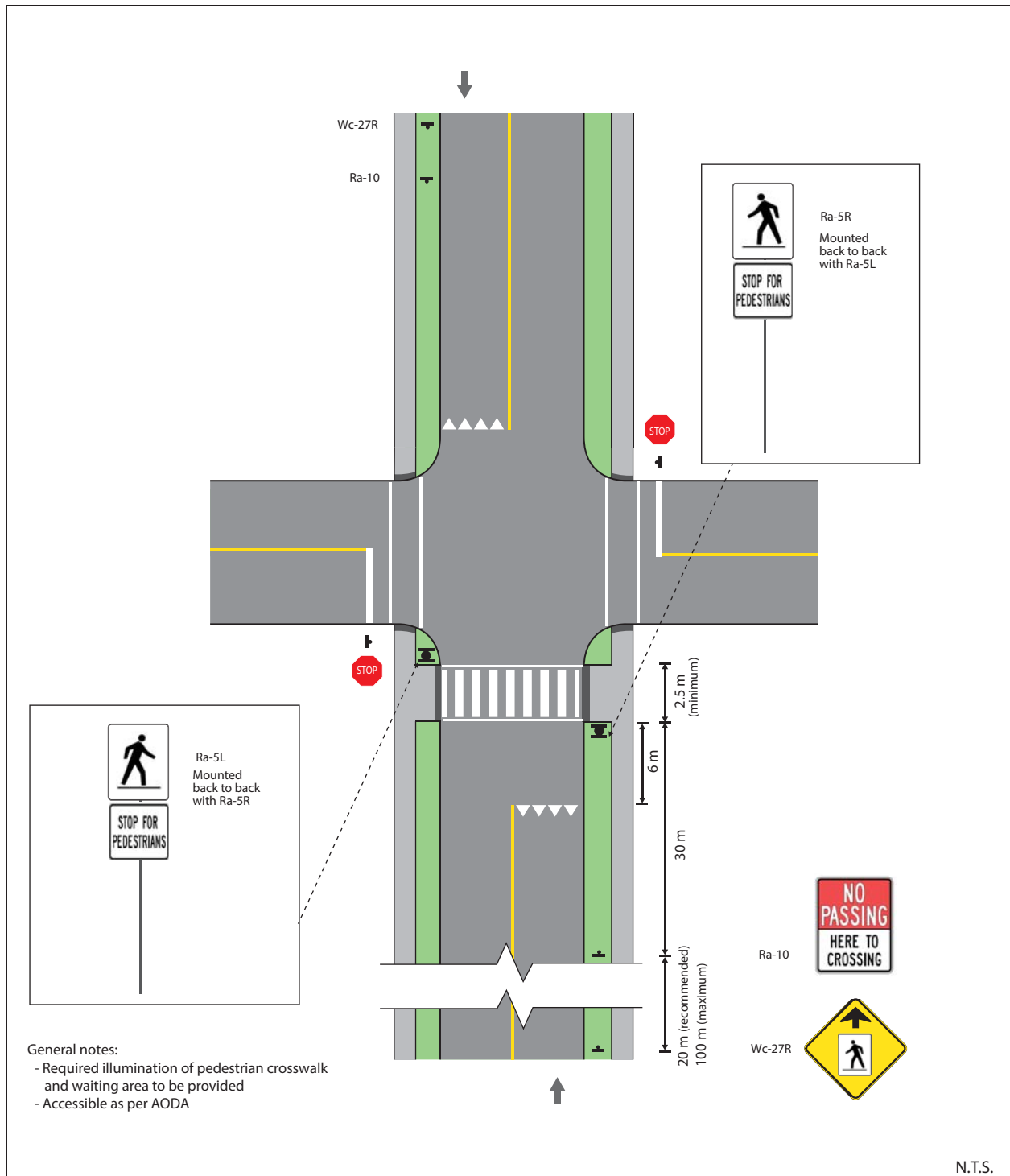


Figure 44: Pedestrian Crossover Level 2 Type D – Intersection (2-way)

## **Attachment 7**

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Revised Geometric Roadway Design Drawing

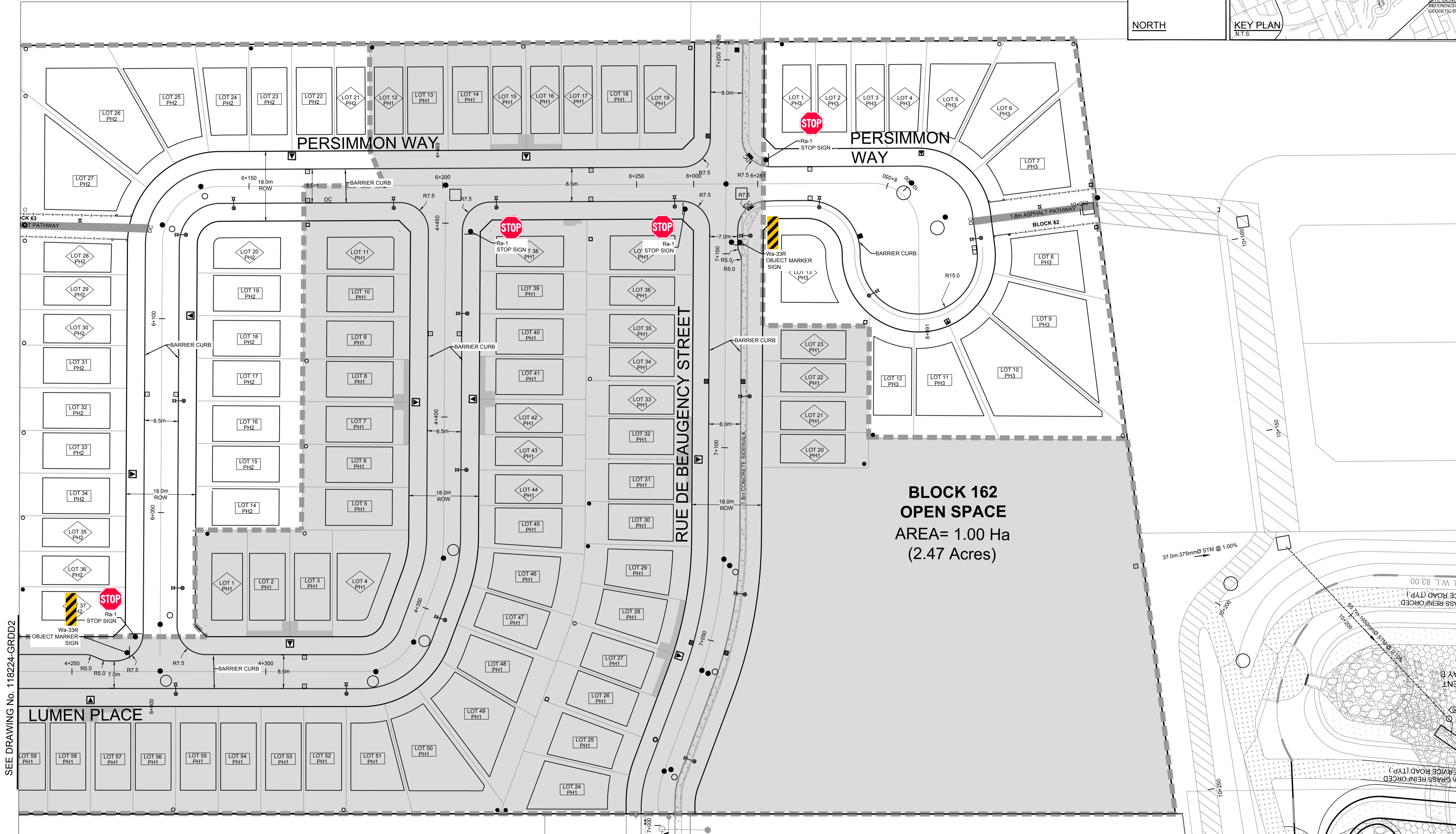
LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- CATCH BASIN
- HYDRANT
- WATERMAIN VALVE
- TACTILE WALKING SURFACE INDICATOR (TWSI)
- DEPRESSED CURB
- STREET LIGHT
- ▼ HYDRO TRANSFORMER

NORTH

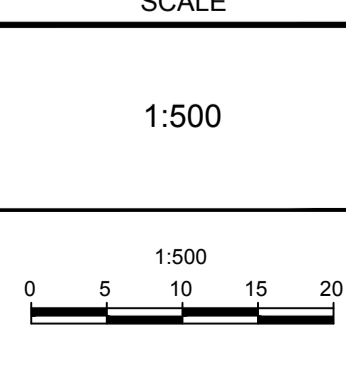
KEY PLAN  
N.T.S.

SITE BENCHMARK  
REFERENCED TO LOCAL  
GEODETIC DATUM



NOTE:  
THE POSITION OF ALL POLE LINES, CONDUITS,  
WATERMANS, SEWERS AND OTHER  
UNDERGROUND AND OVERGROUND UTILITIES AND  
STRUCTURES IS NOT NECESSARILY SHOWN ON  
THE CONTRACT DRAWINGS, AND WHERE SHOWN,  
THE ACCURACY OF THE POSITION OF SUCH  
UTILITIES AND STRUCTURES IS NOT GUARANTEED.  
BEFORE STARTING WORK, DETERMINE THE EXACT  
LOCATION OF ALL SUCH UTILITIES AND  
STRUCTURES AND ASSUME ALL LIABILITY FOR  
DAMAGE TO THEM.

No.	REVISION	DATE	BY
7.	ISSUED FOR CITY REVIEW	FEB 13/25	BHB
6.	ISSUED FOR CITY REVIEW	OCT 29/24	BHB
5.	ISSUED FOR PHASE 2 AND 3	MAY 3/24	BHB
4.	ISSUED EARLY SERVICING AGREEMENT	JULY 5/22	BHB
3.	ISSUED FOR ECA AND TENDER	MAR 18/22	BHB
2.	ISSUED FOR REVIEW	JUNE 15/21	BHB
1.	INTERNAL REVIEW	JUNE 3/21	BHB



DESIGN	BR
CHECKED	BCS
DRAWN	BR / RCH
CHECKED	BCS
APPROVED	BHB

FOR REVIEW ONLY

**NOVATECH**

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LOCATION  
CITY OF OTTAWA  
THE COMMONS

DRAWING NAME

GEOMETRIC ROADWAY DESIGN  
DRAWINGS

PROJECT No.  
118224-00

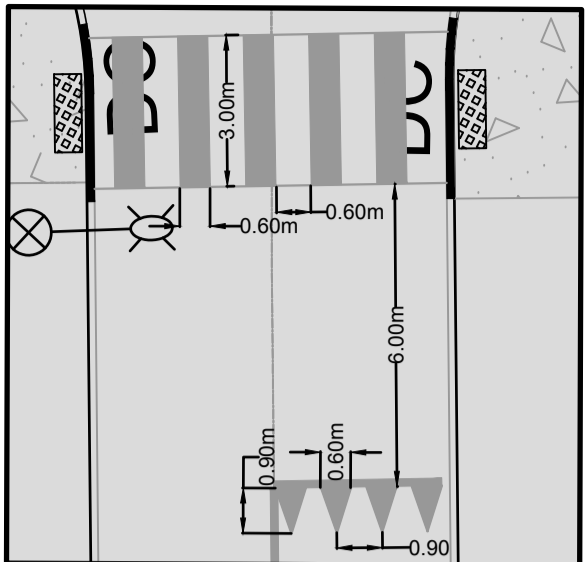
REV  
REV # 7

DRAWING No.

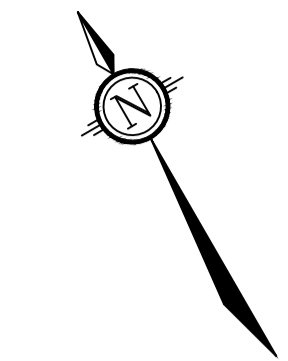
118224-GRDD1

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- CATCH BASIN
- HYDRANT
- WATERMAIN VALVE
- TACTILE WALKING SURFACE INDICATOR (TWSI)
- DC DEPRESSED CURB
- STREET LIGHT
- HYDRO TRANSFORMER

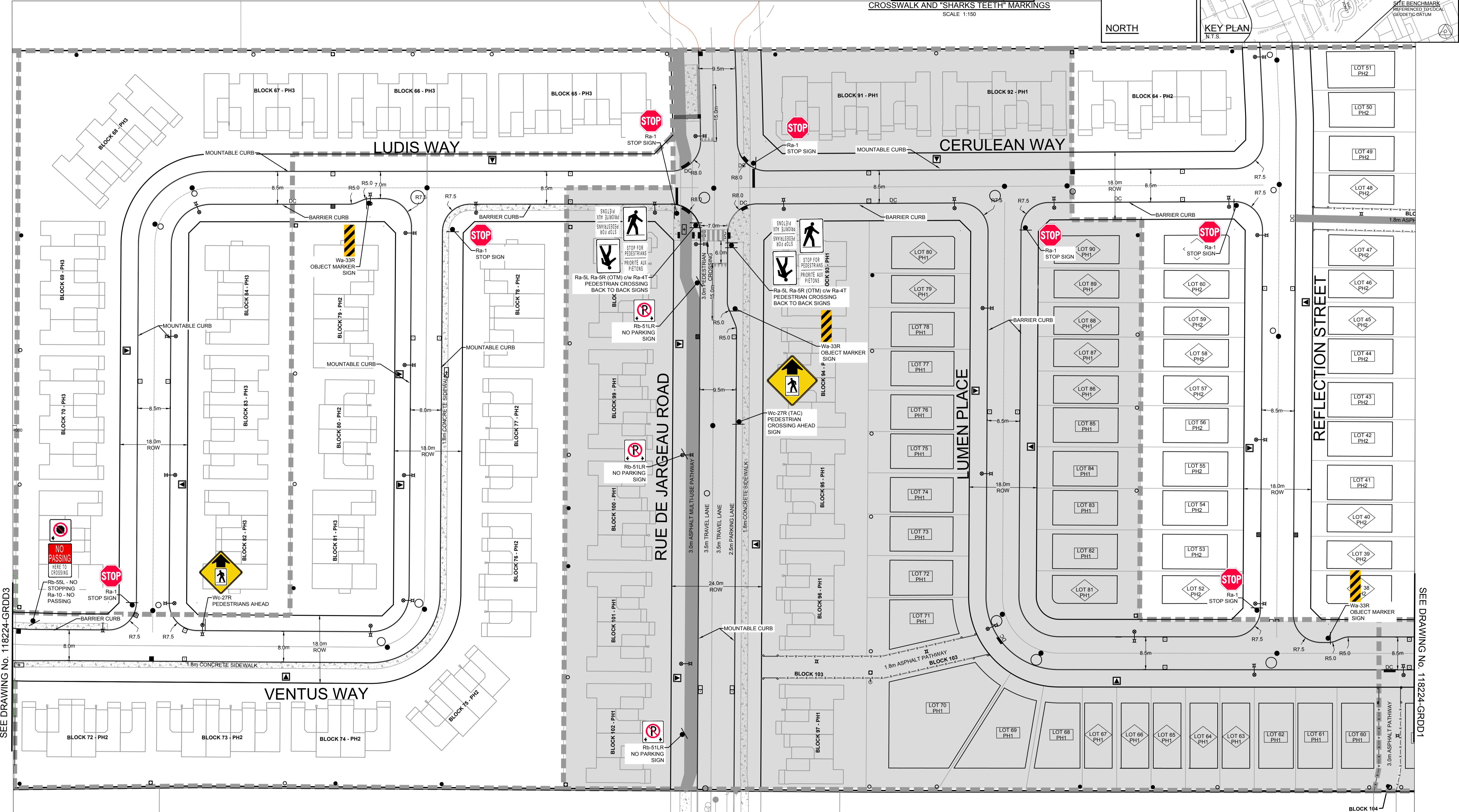


CROSSWALK AND "SHARKS TEETH" MARKINGS  
SCALE 1:150



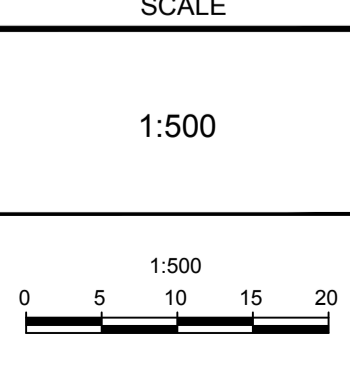
NORTH

KEY PLAN  
N.T.S.



NOTE:  
THE POSITION OF ALL POLE LINES, CONDUITS,  
WATERMAINS, SEWERS AND OTHER  
UNDERGROUND AND OVERGROUND UTILITIES AND  
STRUCTURES IS NOT NECESSARILY SHOWN ON  
THE CONTRACT DRAWINGS, AND WHERE SHOWN,  
THE ACCURACY OF THE POSITION OF SUCH  
UTILITIES AND STRUCTURES IS NOT GUARANTEED.  
BEFORE STARTING WORK, DETERMINE THE EXACT  
LOCATION OF ALL SUCH UTILITIES AND  
STRUCTURES AND ASSUME ALL LIABILITY FOR  
DAMAGE TO THEM.

No.	REVISION	DATE	BY
7.	ISSUED FOR CITY REVIEW	FEB 13/25	BHB
6.	ISSUED FOR CITY REVIEW	OCT 29/24	BHB
5.	ISSUED FOR PHASE 2 AND 3	MAY 3/24	BHB
4.	ISSUED EARLY SERVING AGREEMENT	JULY 5/22	BHB
3.	ISSUED FOR ECA AND TENDER	MAR 18/22	BHB
2.	ISSUED FOR REVIEW	JUNE 15/21	BHB
1.	INTERNAL REVIEW	JUNE 3/21	BHB



DESIGN	BR
CHECKED	BCS
DRAWN	BR / RCH
CHECKED	BCS
APPROVED	BHB

FOR REVIEW ONLY

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Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6  
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website www.novatech-eng.com

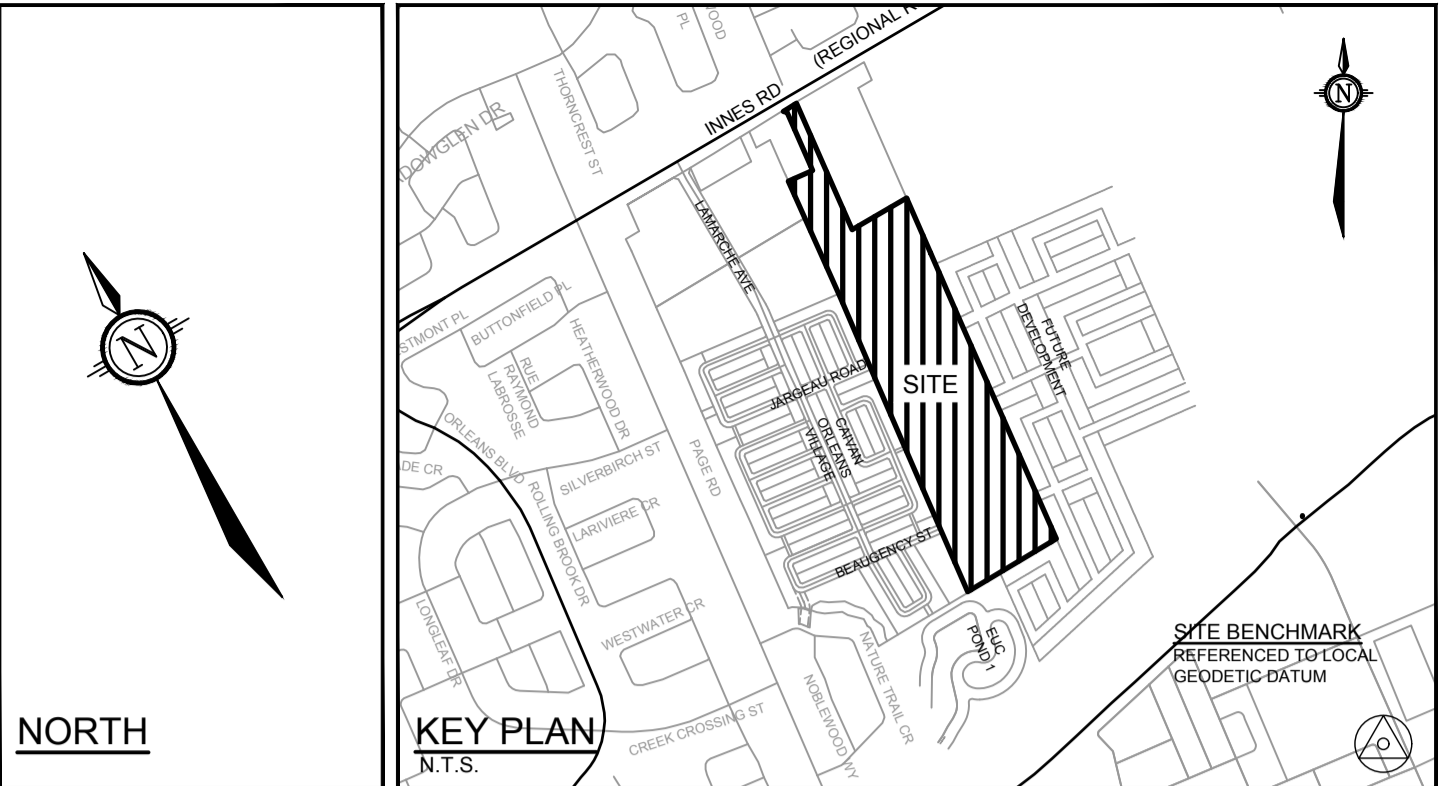
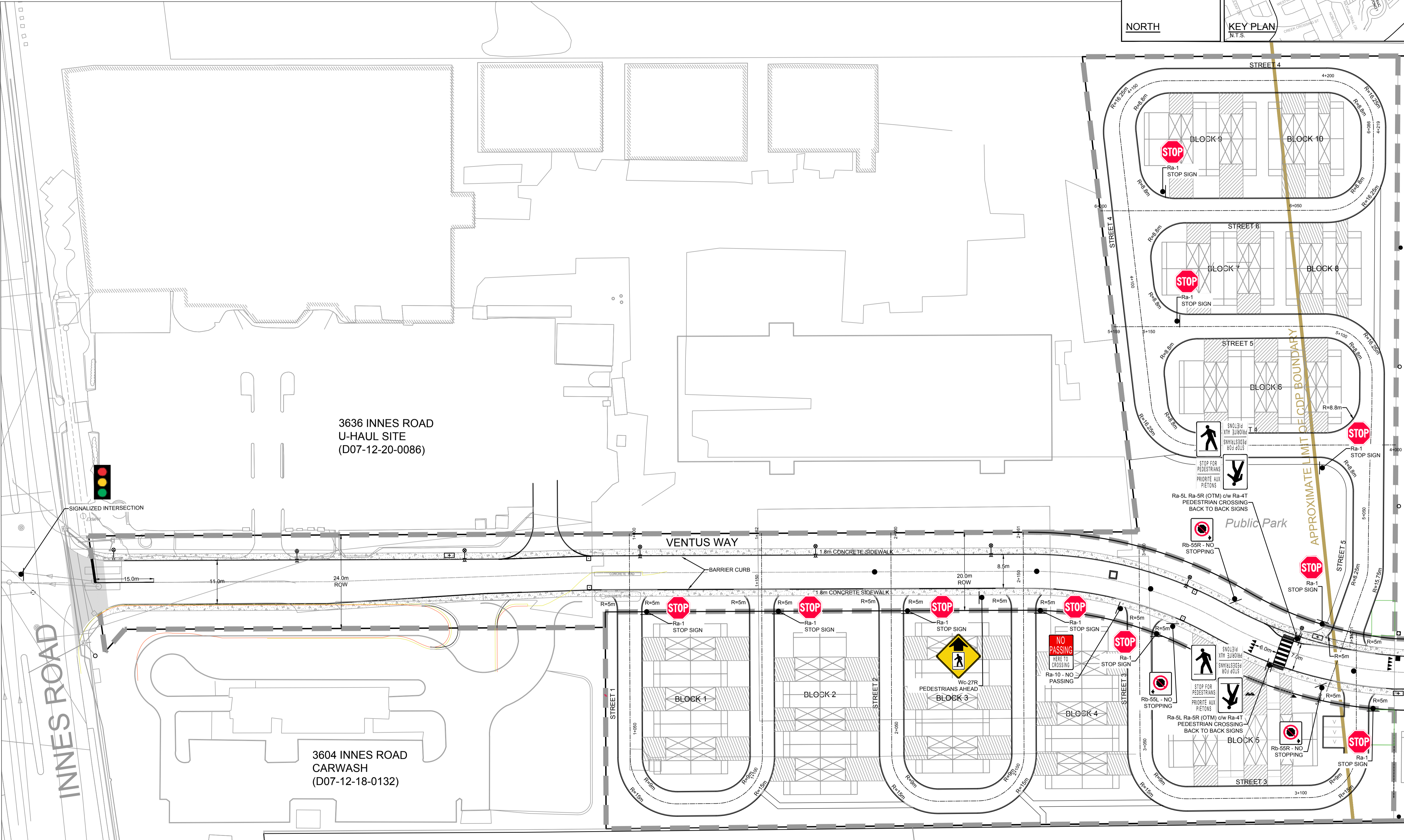
LOCATION  
CITY OF OTTAWA  
THE COMMONS

DRAWING NAME  
**GEOMETRIC ROADWAY DESIGN  
DRAWINGS**

PROJECT No.	118224-00
REV	REV # 7
DRAWING No.	118224-GRDD2

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- CATCH BASIN
- HYDRANT
- WATERMAIN VALVE
- TACTILE WALKING SURFACE INDICATOR (TWSI)
- DEPRESSED CURB
- STREET LIGHT
- ▼ HYDRO TRANSFORMER



NOTE:  
THE POSITION OF ALL POLE LINES, CONDUITS,  
WATERMAINS, SEWERS AND OTHER  
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STRUCTURES IS NOT NECESSARILY SHOWN ON  
THE CONTRACT DRAWINGS, AND WHERE SHOWN,  
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DAMAGE TO THEM.

No.	REVISION	DATE	BY
6.	ISSUED FOR CITY REVIEW	FEB 13/25	BHB
5.	ISSUED FOR CITY REVIEW	OCT 29/24	BHB
4.	ISSUED FOR PHASE 2 AND 3	MAY 3/24	BHB
3.	ISSUED EARLY SERVICING AGREEMENT	JULY 5/22	BHB
2.	ISSUED FOR REVIEW	JUNE 15/21	BHB
1.	INTERNAL REVIEW	JUNE 3/21	BHB

SCALE
1:500
0 5 10 15 20

DESIGN	BR
CHECKED	BCS
DRAWN	BR / RCH
CHECKED	BCS
APPROVED	BHB

FOR REVIEW ONLY	

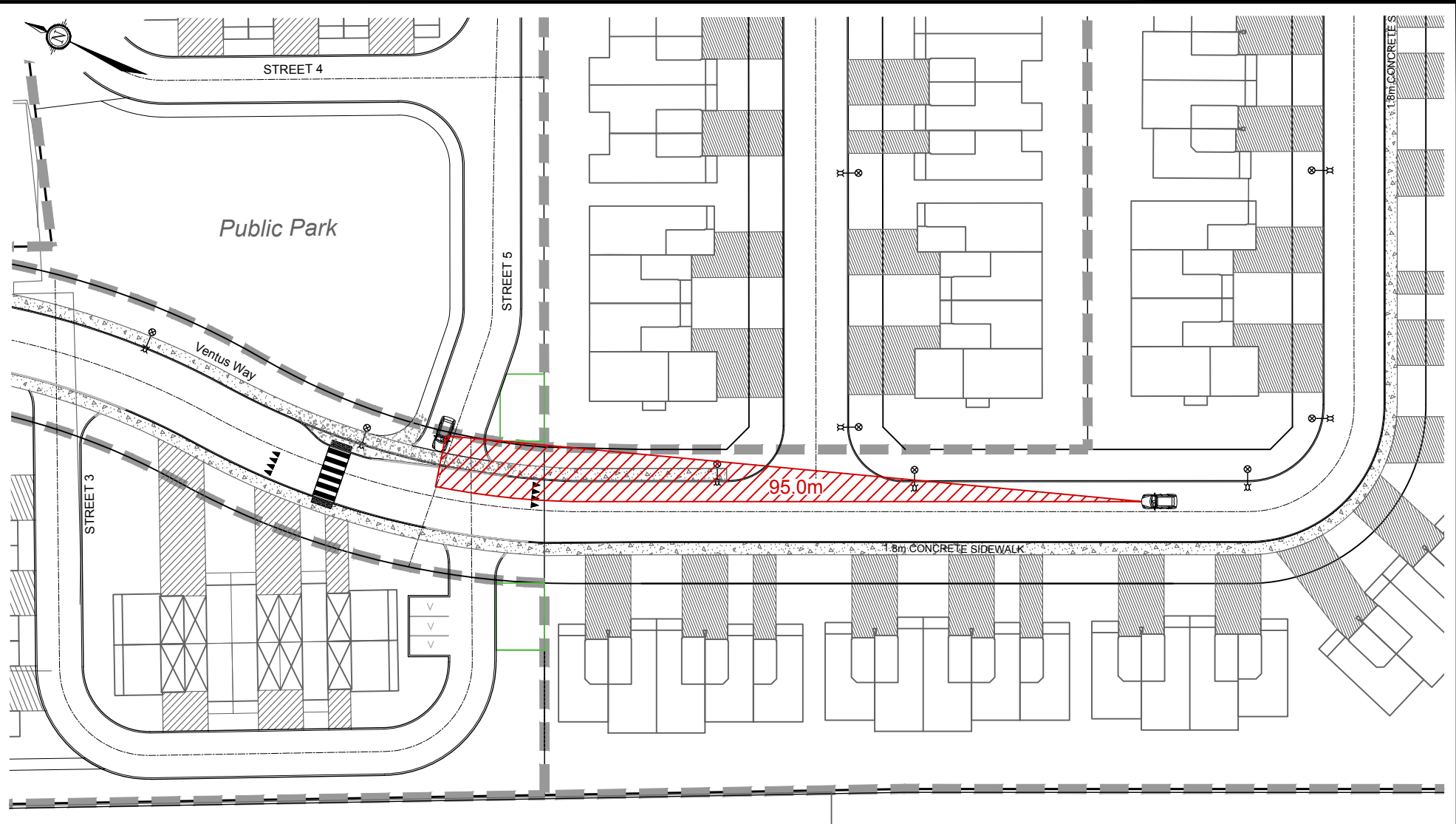
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LOCATION CITY OF OTTAWA THE COMMONS	DRAWING NAME GEOMETRIC ROADWAY DESIGN DRAWINGS	PROJECT No. 118224-00	REV REV # 6
		DRAWING No. 118224-GRDD3	

## **Attachment 8**

---

Sightline Figures



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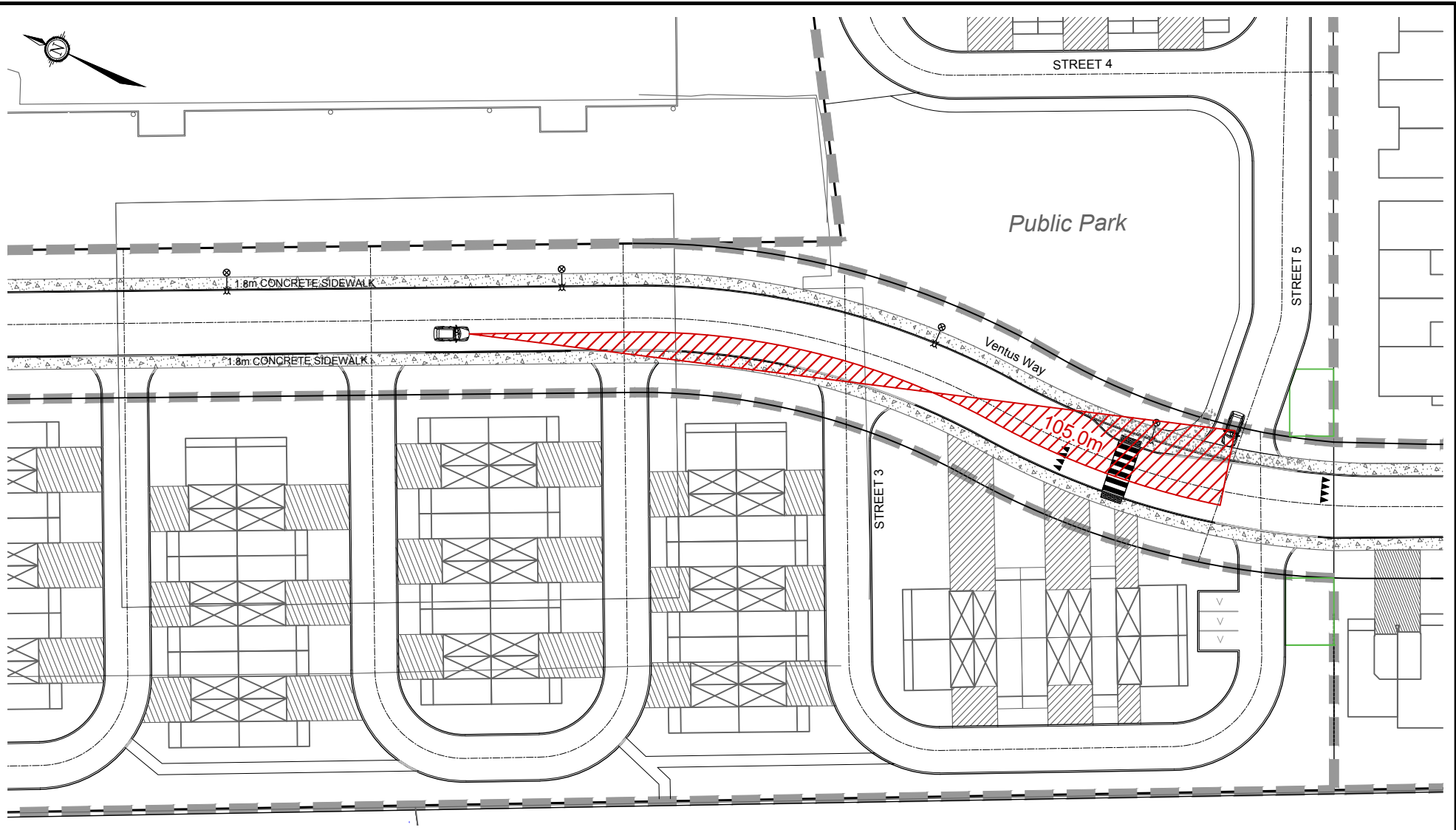
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

INTERSECTION SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025 JOB 118224 FIGURE ISD-1



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Website [www.novatech-eng.com](http://www.novatech-eng.com)

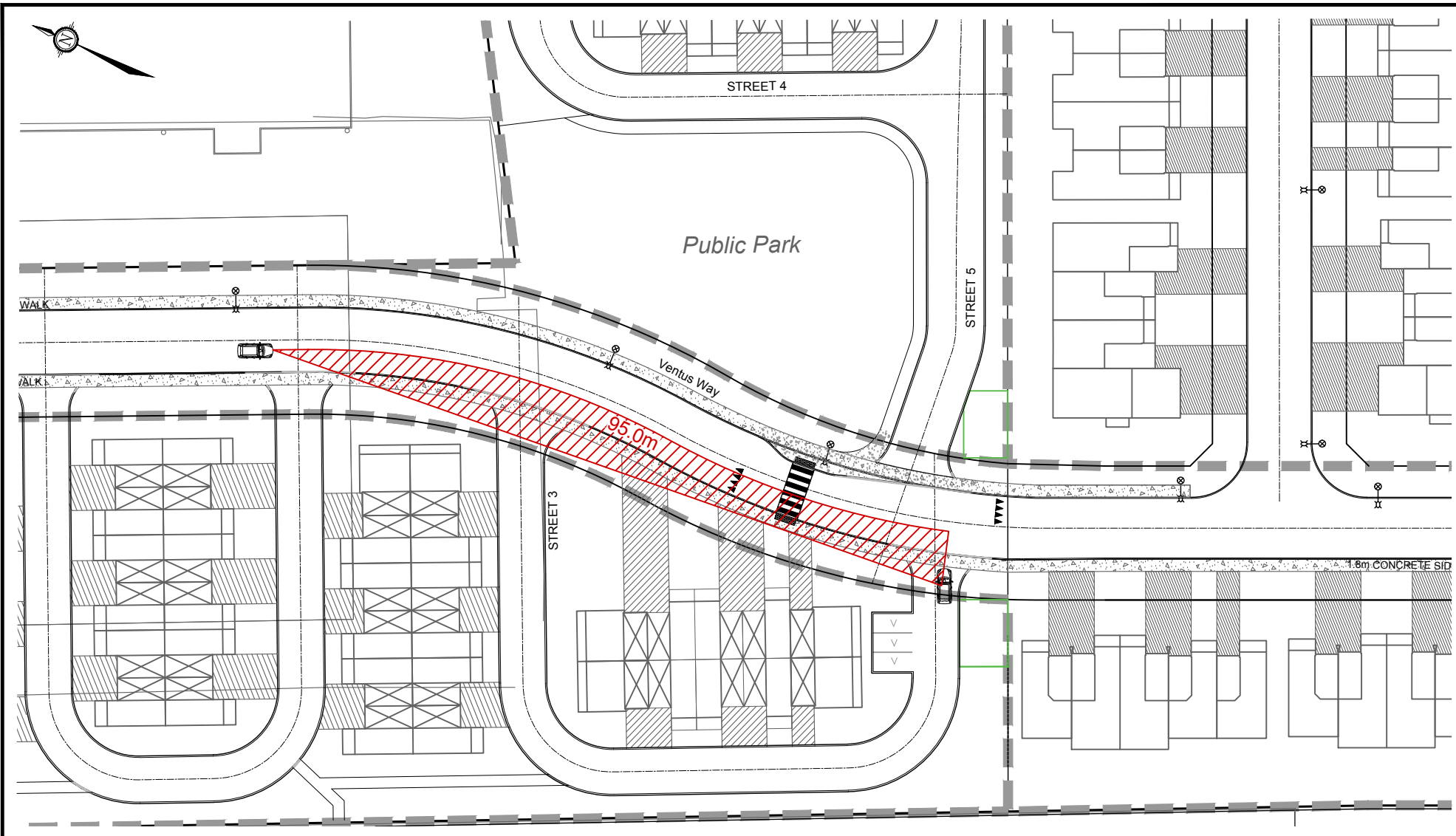
GLENVIEW

INTERSECTION SIGHT  
DISTANCE

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DATE FEB 2025 JOB 118224 FIGURE ISD-2

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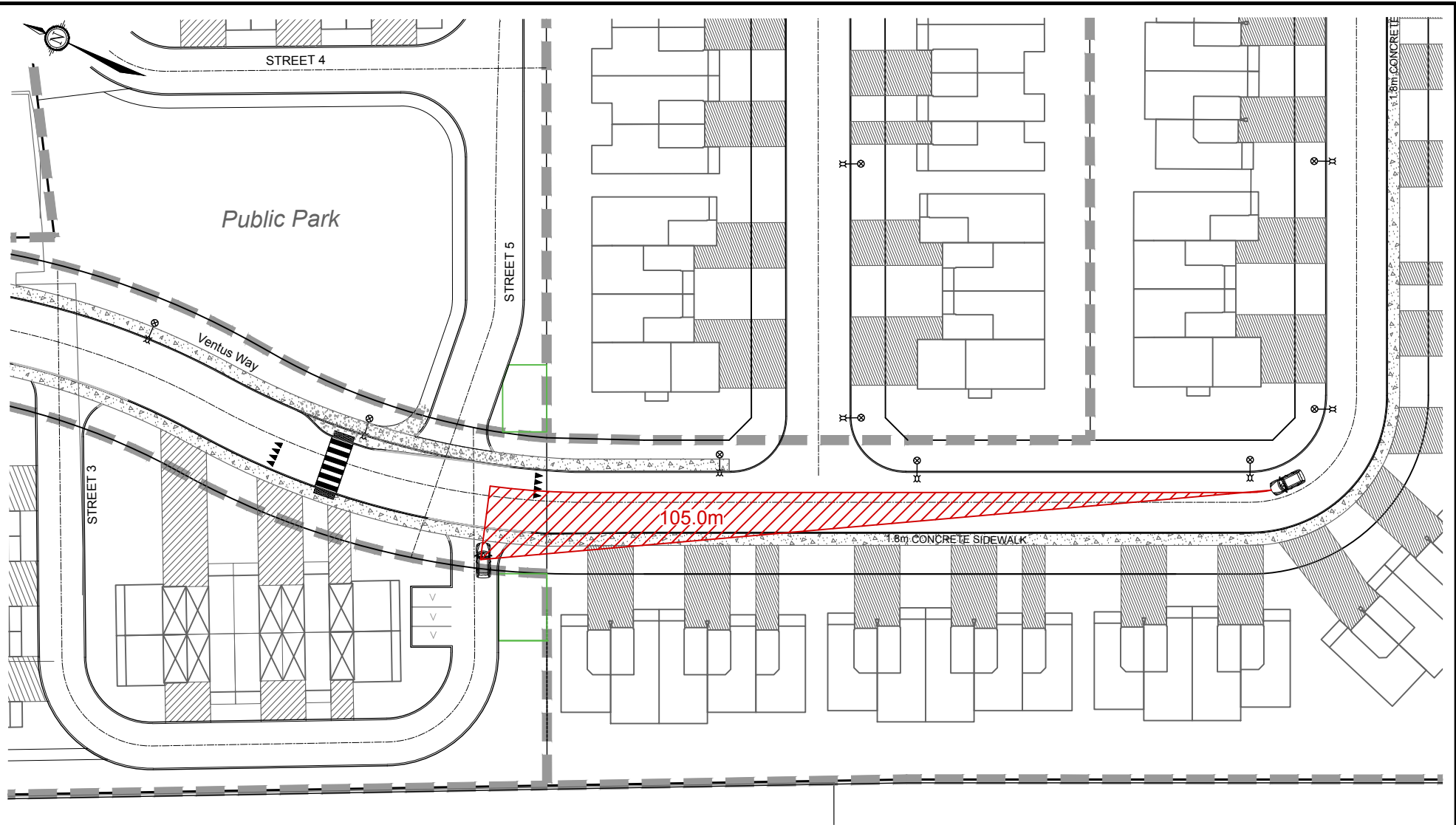
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

## INTERSECTION SIGHT DISTANCE

SCALE 1 : 750

DATE FEB 2025 JOB 118224 FIGURE ISD-3



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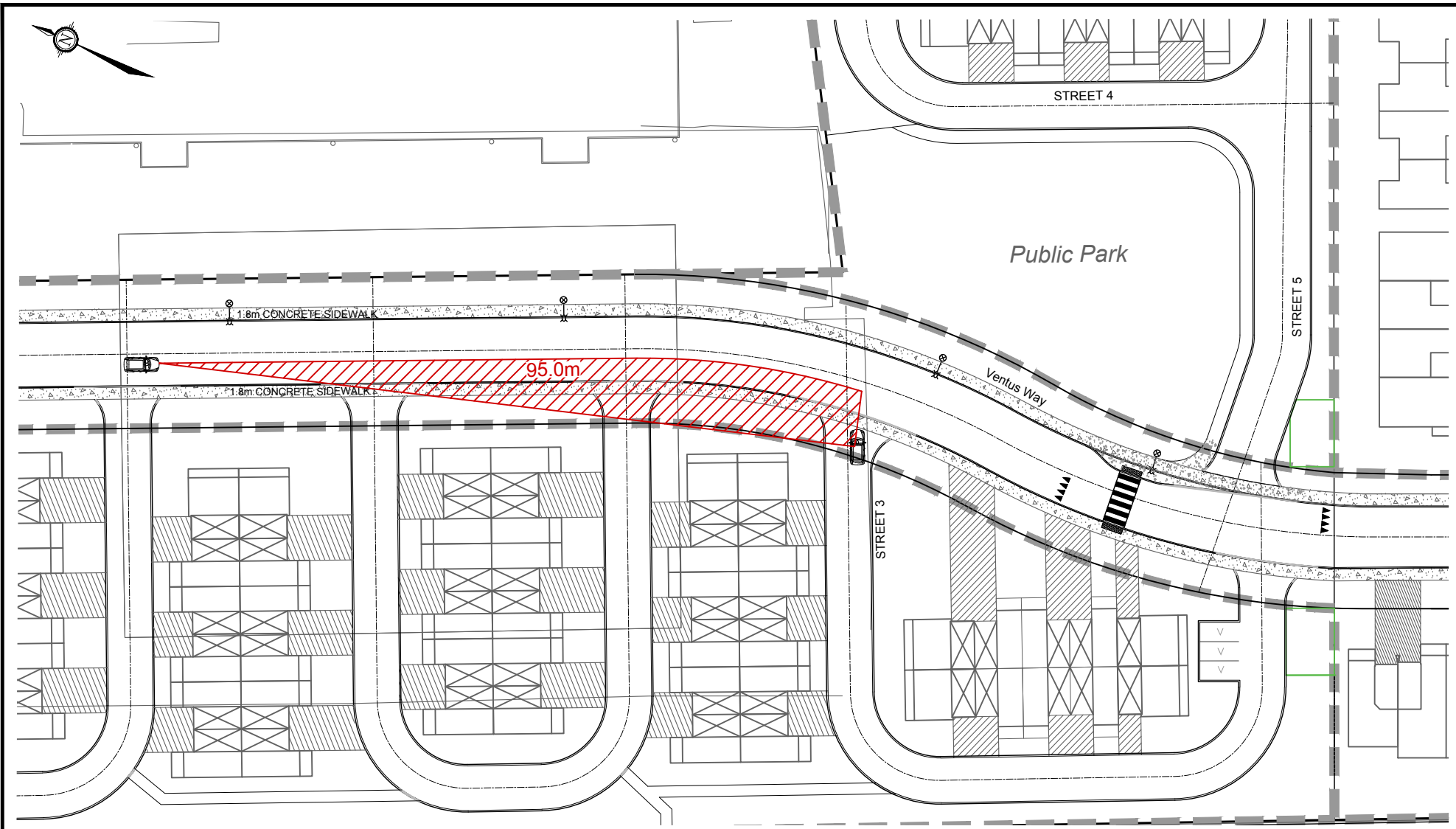
GLENVIEW

INTERSECTION SIGHT  
DISTANCE

SCALE 1 : 750

DATE FEB 2025 JOB 118224 FIGURE ISD-4

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Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

INTERSECTION SIGHT  
DISTANCE

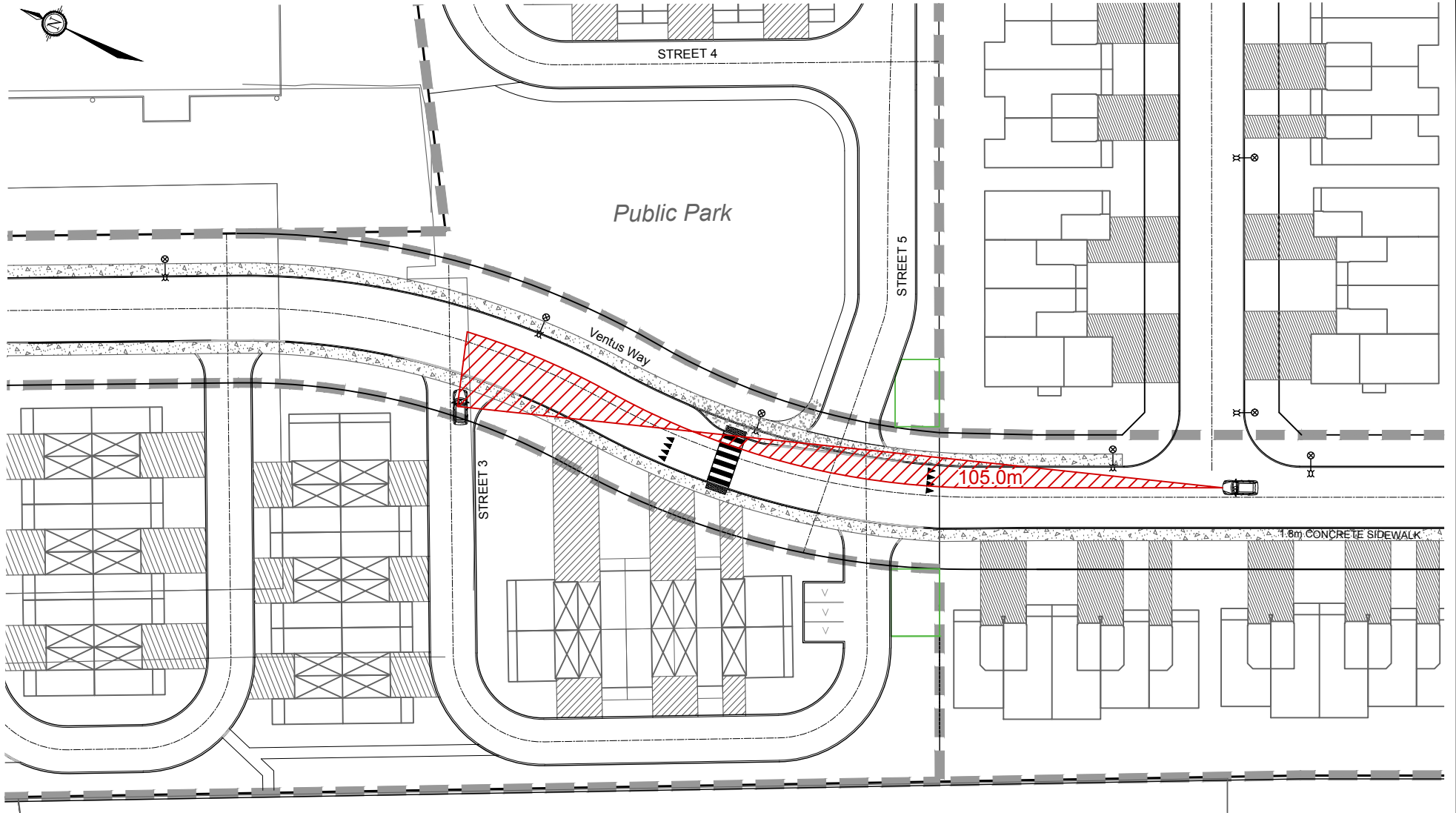
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DATE FEB 2025

JOB 118224

FIGURE ISD-5

SHT8X11.DWG - 216mmx279mm



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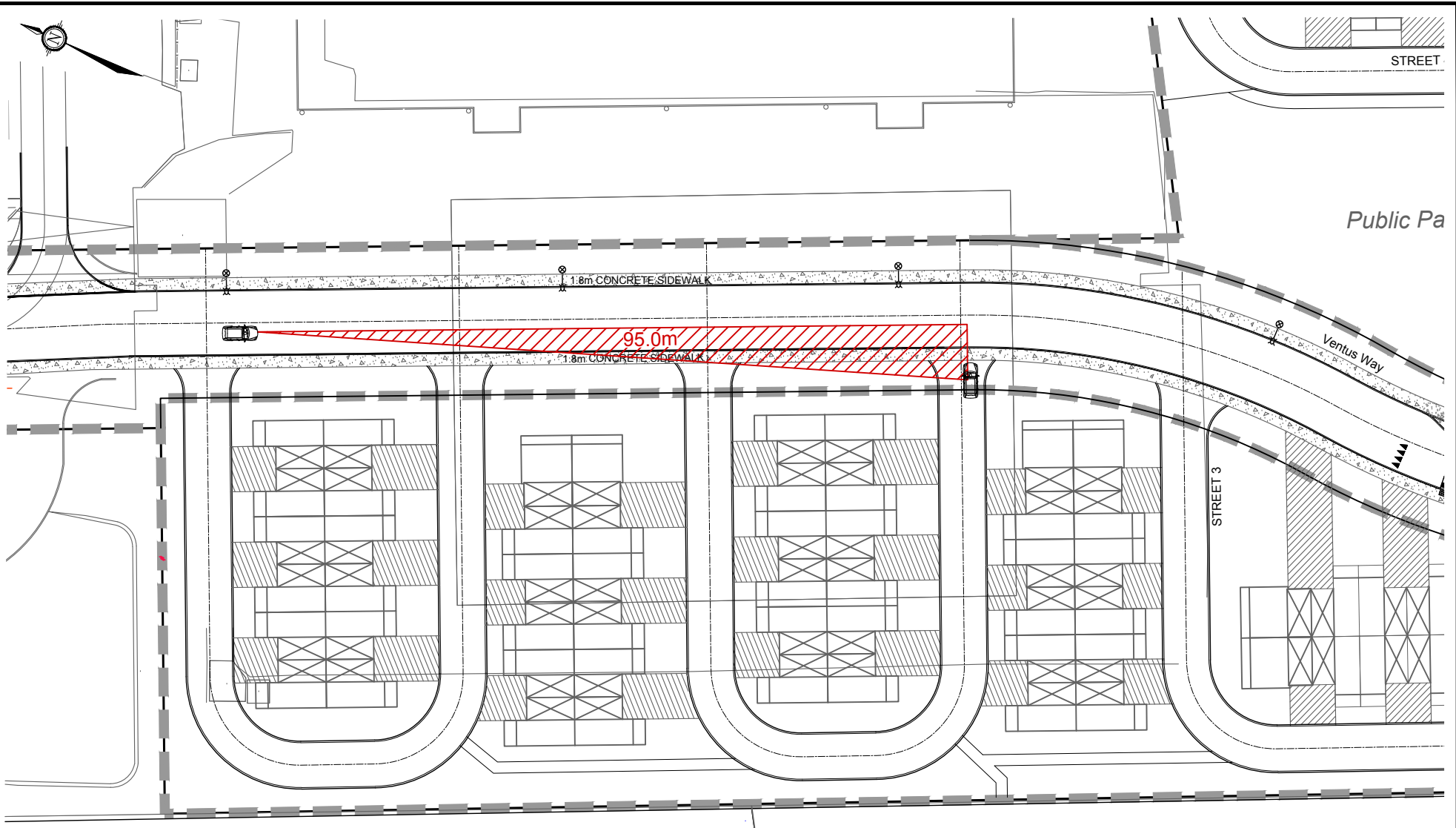
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

INTERSECTION SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025 JOB 118224 FIGURE ISD-6



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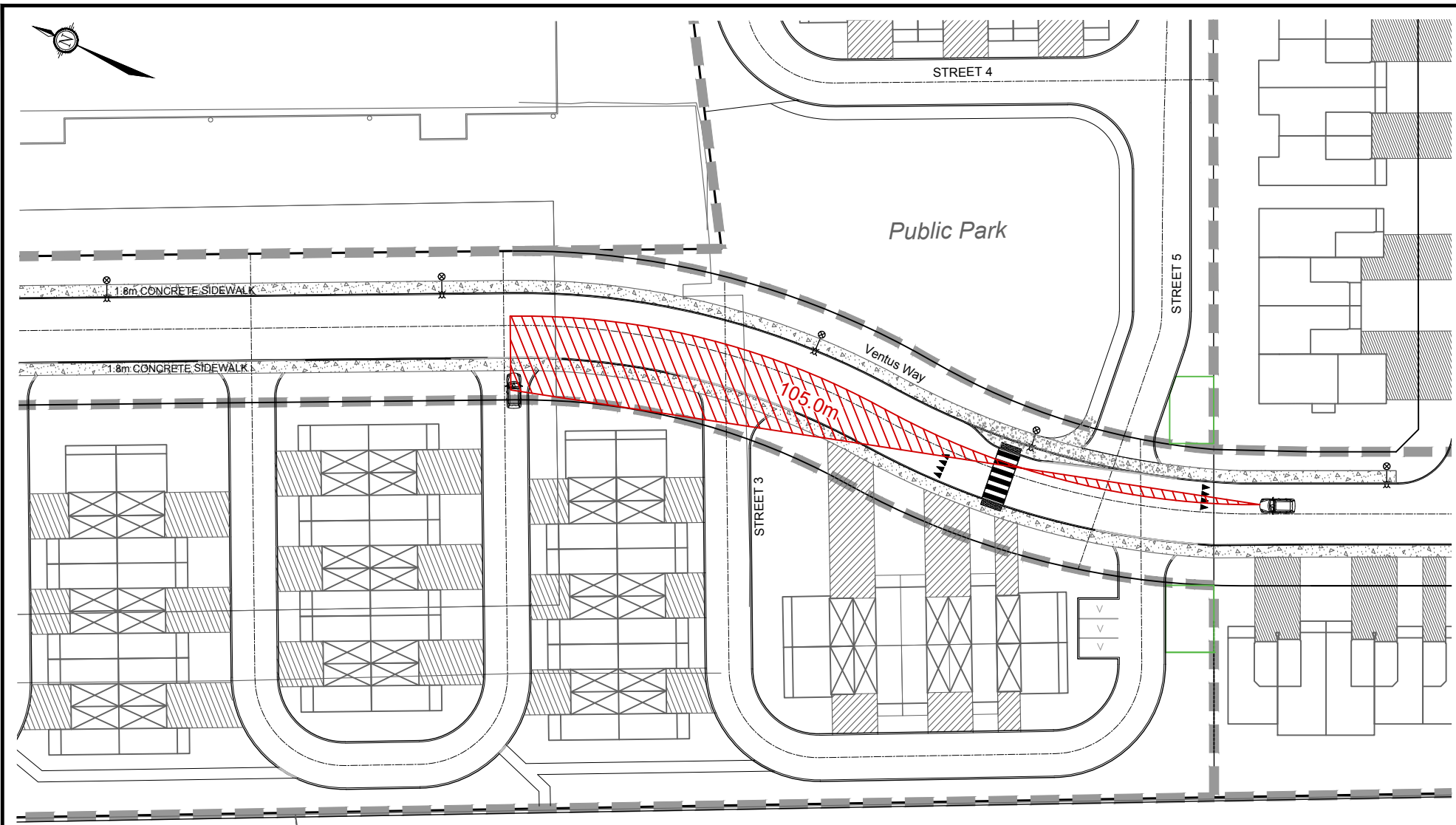
GLENVIEW

INTERSECTION SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025 JOB 118224 FIGURE ISD-7

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GLENVIEW

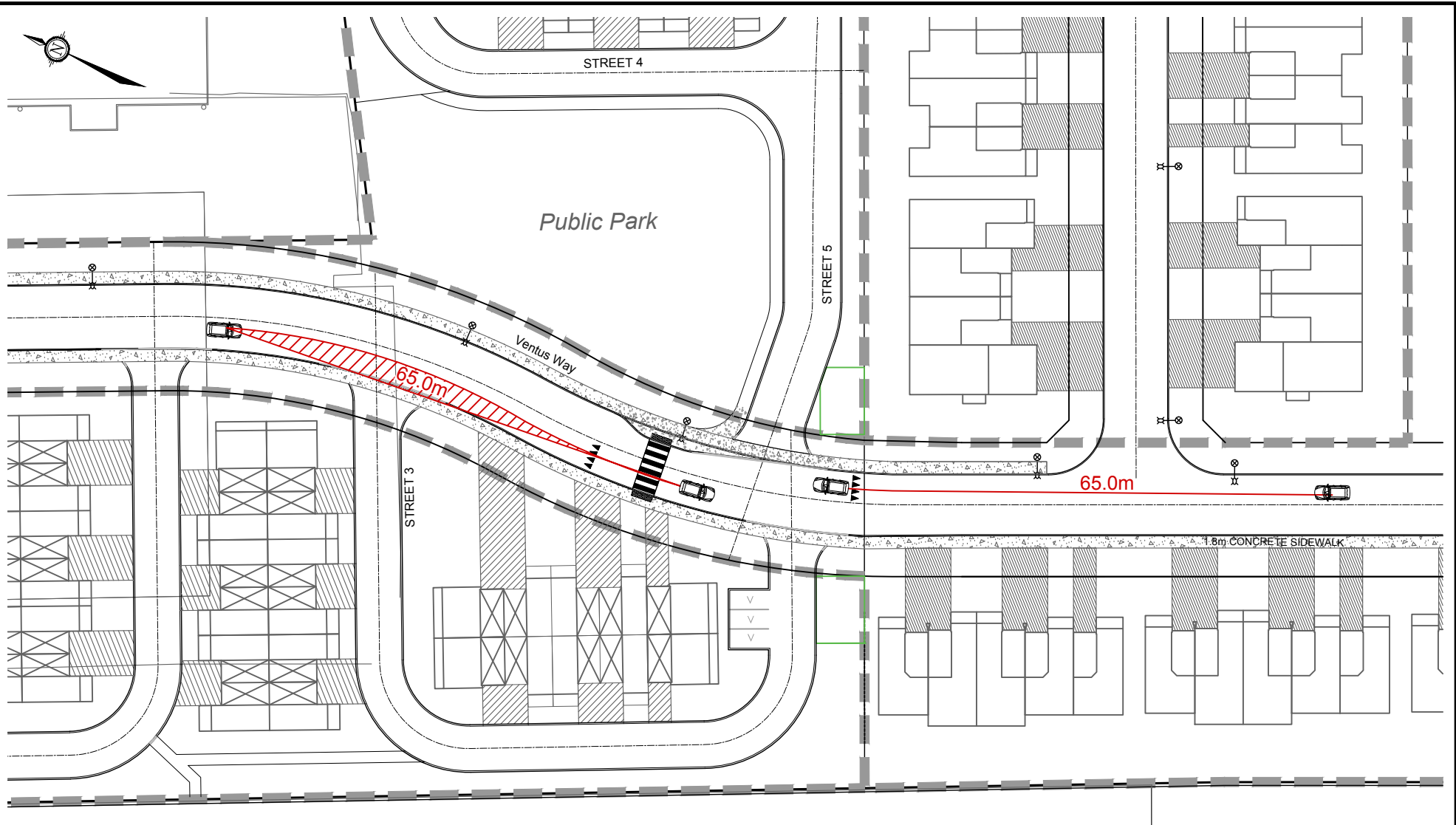
## INTERSECTION SIGHT DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025

JOB 118224

FIGURE ISD-8



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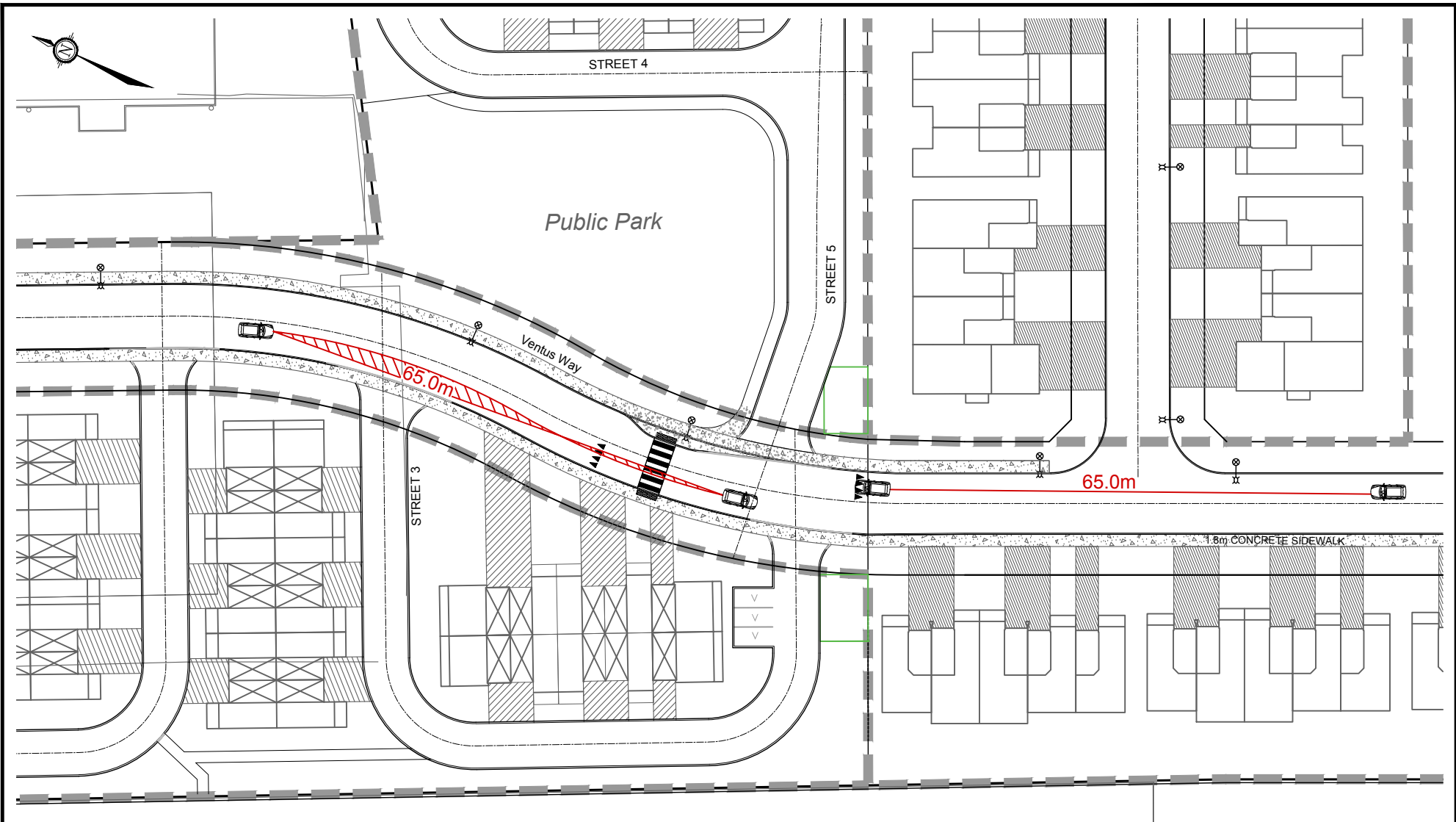
GLENVIEW

STOPPING SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025 JOB 118224 FIGURE SSD-1

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GLENVIEW

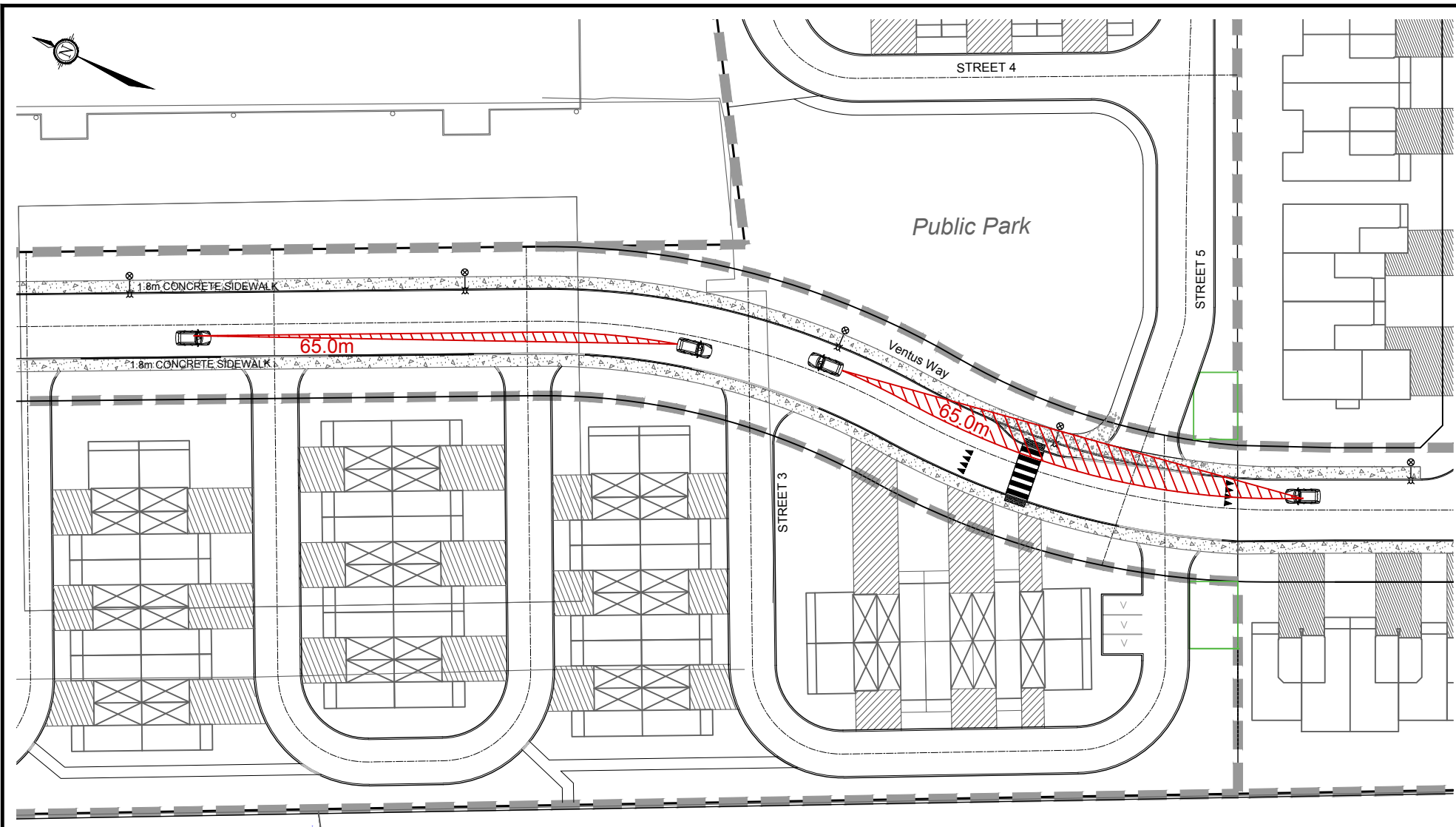
STOPPING SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

DATE FEB 2025 JOB 118224 FIGURE SSD-2

SHT8X11.DWG - 216mmx279mm

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Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

STOPPING SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30

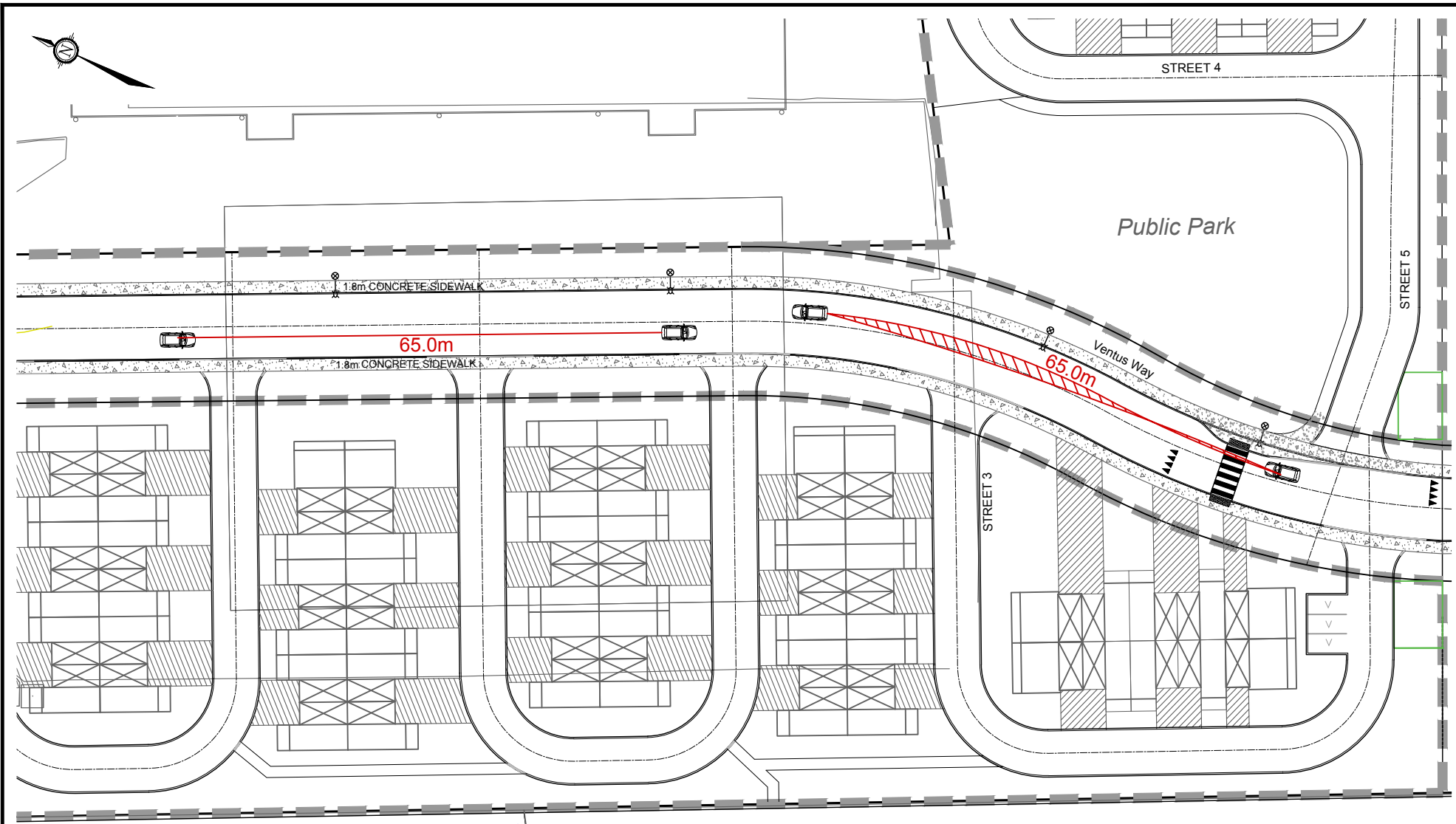
DATE FEB 2025

JOB 118224

FIGURE SSD-3

SHT8X11.DWG - 216mmx279mm

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Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

GLENVIEW

STOPPING SIGHT  
DISTANCE

SCALE 1 : 750 0 10 20 30




















DATE FEB 2025 JOB 118224 FIGURE SSD-4


SHT8X11.DWG - 216mmx279mm

## **Attachment 9**

---

Excerpts of Synchro Reports

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	551	39	12	1439	3	102	0	38	0	0	5
Future Volume (vph)	3	551	39	12	1439	3	102	0	38	0	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (m)	20.0			30.0			20.0			20.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		0.99	1.00			0.99	0.97		0.97	
Frt		0.990							0.850		0.865	
Flt Protected	0.950			0.950				0.950				
Satd. Flow (prot)	1679	3314	0	1679	3357	0	0	1679	1502	0	1489	0
Flt Permitted	0.155			0.429				0.754				
Satd. Flow (perm)	273	3314	0	751	3357	0	0	1314	1464	0	1489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13							38		60	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		236.8			585.5			151.9			62.6	
Travel Time (s)		14.2			35.1			13.7			5.6	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)						14						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	551	39	12	1439	3	102	0	38	0	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	590	0	12	1442	0	0	102	38	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		9.0			9.0			9.0			9.0	
Two way Left Turn Lane		Yes										
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	18.6	93.0		18.6	93.0		18.6	93.0	18.6	18.6	93.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	18.6	5.5		18.6	5.5		18.6	5.5	18.6	18.6	5.5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		87.5			87.5			87.5			87.5	
Detector 2 Size(m)		5.5			5.5			5.5			5.5	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm		NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3	32.3	32.3	32.3	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0	33.0	33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%	27.5%	27.5%	27.5%	
Maximum Green (s)	80.9	80.9		80.9	80.9		26.7	26.7	26.7	26.7	26.7	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3	6.3		6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0	19.0	19.0	19.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10	10	10	10	
Act Effct Green (s)	91.6	91.6		91.6	91.6			16.0	16.0		16.0	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13	0.13		0.13	
v/c Ratio	0.01	0.23		0.02	0.56			0.59	0.17		0.02	
Control Delay	4.3	3.6		7.7	10.1			61.1	14.1		0.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	4.3	3.6		7.7	10.1			61.1	14.1		0.2	
LOS	A	A		A	B			E	B		A	
Approach Delay		3.6			10.1			48.3			0.2	
Approach LOS		A			B			D			A	
Queue Length 50th (m)	0.1	11.5		0.5	51.5			21.4	0.0		0.0	
Queue Length 95th (m)	m0.5	14.2		m2.2	145.0			34.3	8.3		0.0	
Internal Link Dist (m)		212.8			561.5			127.9			38.6	
Turn Bay Length (m)	30.0			40.0								
Base Capacity (vph)	208	2533		573	2563			292	355		377	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.01	0.23		0.02	0.56			0.35	0.11		0.01	

#### Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 10.8

Intersection LOS: B

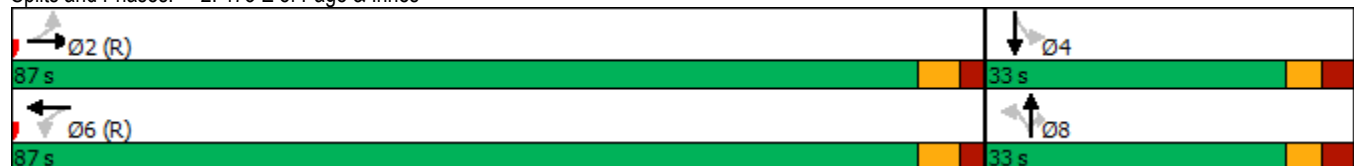
Intersection Capacity Utilization 67.6%




















ICU Level of Service C













Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 473 E of Page & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Future Volume (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (m)	20.0			30.0			20.0			20.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			0.98	0.98		0.98	
Frt		0.990			0.998				0.850		0.950	
Flt Protected	0.950			0.950				0.950			0.969	
Satd. Flow (prot)	1679	3314	0	1679	3349	0	0	1679	1502	0	1605	0
Flt Permitted	0.269			0.050				0.745			0.792	
Satd. Flow (perm)	473	3314	0	88	3349	0	0	1284	1465	0	1302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			2				90		90	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		236.8			585.5			151.9			62.6	
Travel Time (s)		14.2			35.1			13.7			5.6	
Confl. Peds. (#/hr)	10		10	10		10	20		10	10		20
Confl. Bikes (#/hr)						6						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	1968	0	72	1063	0	0	91	51	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		9.0			9.0			9.0			9.0	
Two way Left Turn Lane		Yes										
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	18.6	93.0		18.6	93.0		18.6	93.0	18.6	18.6	93.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	18.6	5.5		18.6	5.5		18.6	5.5	18.6	18.6	5.5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		87.5			87.5			87.5			87.5	
Detector 2 Size(m)		5.5			5.5			5.5			5.5	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		1	6		8	8	8	4	4	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	32.1	32.1		11.0	32.1		32.3	32.3	32.3	32.3	32.3	
Total Split (s)	66.0	66.0		11.0	77.0		33.0	33.0	33.0	33.0	33.0	
Total Split (%)	60.0%	60.0%		10.0%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	
Maximum Green (s)	59.9	59.9		5.0	70.9		26.7	26.7	26.7	26.7	26.7	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.4	2.4		2.3	2.4		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.1	6.1		6.0	6.1			6.3	6.3		6.3	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)	12.0	12.0			12.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	14.0	14.0			14.0		19.0	19.0	19.0	19.0	19.0	
Pedestrian Calls (#/hr)	10	10			10		10	10	10	10	10	
Act Effct Green (s)	77.1	77.1		85.9	87.0			15.1	15.1		15.1	
Actuated g/C Ratio	0.70	0.70		0.78	0.79			0.14	0.14		0.14	
v/c Ratio	0.04	0.85		0.46	0.40			0.52	0.18		0.07	
Control Delay	1.1	10.0		20.8	5.8			53.0	3.1		0.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	1.1	10.0		20.8	5.8			53.0	3.1		0.6	
LOS	A	A		C	A			D	A		A	
Approach Delay		9.9			6.7			35.1			0.6	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.0	2.7		2.9	31.1			17.3	0.0		0.0	
Queue Length 95th (m)	m0.2	#278.4		16.2	64.5			28.3	2.5		0.0	
Internal Link Dist (m)		212.8			561.5			127.9			38.6	
Turn Bay Length (m)	30.0			40.0								
Base Capacity (vph)	331	2325		158	2649			311	423		384	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.85		0.46	0.40			0.29	0.12		0.05	

#### Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 36 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 100.6%

ICU Level of Service G

Analysis Period (min) 15




















# 95th percentile volume exceeds capacity, queue may be longer.













Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 473 E of Page & Innes



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Future Volume (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (m)	20.0			30.0			20.0			20.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.97	0.97		0.98	
Frt		0.990			0.998				0.850		0.950	
Flt Protected	0.950			0.950				0.950			0.969	
Satd. Flow (prot)	1679	3314	0	1679	3349	0	0	1679	1502	0	1602	0
Flt Permitted	0.269			0.047				0.745			0.805	
Satd. Flow (perm)	473	3314	0	83	3349	0	0	1278	1462	0	1320	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			2				76		76	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		236.8			585.5			151.9			62.6	
Travel Time (s)		14.2			35.1			13.7			5.6	
Confl. Peds. (#/hr)	10		10	10		10	20		10	10		20
Confl. Bikes (#/hr)						6						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	1834	134	72	1051	12	91	0	51	12	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	1968	0	72	1063	0	0	91	51	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		9.0			9.0			9.0			9.0	
Two way Left Turn Lane		Yes										
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	18.6	93.0		18.6	93.0		18.6	93.0	18.6	18.6	93.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	18.6	5.5		18.6	5.5		18.6	5.5	18.6	18.6	5.5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		87.5			87.5			87.5			87.5	
Detector 2 Size(m)		5.5			5.5			5.5			5.5	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		1	6		8	8	8	4	4	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	32.1	32.1		11.0	32.1		32.3	32.3	32.3	32.3	32.3	
Total Split (s)	85.0	85.0		12.0	97.0		33.0	33.0	33.0	33.0	33.0	
Total Split (%)	65.4%	65.4%		9.2%	74.6%		25.4%	25.4%	25.4%	25.4%	25.4%	
Maximum Green (s)	78.9	78.9		6.0	90.9		26.7	26.7	26.7	26.7	26.7	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.4	2.4		2.3	2.4		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.1	6.1		6.0	6.1			6.3	6.3		6.3	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)	12.0	12.0			12.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	14.0	14.0			14.0		19.0	19.0	19.0	19.0	19.0	
Pedestrian Calls (#/hr)	10	10			10		10	10	10	10	10	
Act Effct Green (s)	91.3	91.3		101.7	101.6			16.0	16.0		16.0	
Actuated g/C Ratio	0.70	0.70		0.78	0.78			0.12	0.12		0.12	
v/c Ratio	0.04	0.84		0.49	0.41			0.58	0.21		0.08	
Control Delay	1.3	4.7		24.3	5.7			67.3	5.7		0.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	1.3	4.7		24.3	5.7			67.3	5.7		0.7	
LOS	A	A		C	A			E	A		A	
Approach Delay		4.7			6.9			45.2			0.7	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.1	6.6		4.6	27.9			20.8	0.0		0.0	
Queue Length 95th (m)	m0.1	#25.7		17.7	68.6			34.1	5.0		0.0	
Internal Link Dist (m)		212.8			561.5			127.9			38.6	
Turn Bay Length (m)	30.0			40.0								
Base Capacity (vph)	332	2330		147	2618			262	360		331	
Starvation Cap Reductn	0	1		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.84		0.49	0.41			0.35	0.14		0.06	

#### Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 14 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 7.2

Intersection LOS: A

Intersection Capacity Utilization 100.6%

ICU Level of Service G

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 473 E of Page & Innes

