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FUNCTIONAL SERVICING REPORT

1360 & 1376 HOWARD AVENUE

CITY OF WINDSOR

(ONTARIO)

PROJECT NO: RB-250002.00

DATED: **MAY 21, 2025**
REVISED: **SEPTEMBER 19, 2025**

700-1350 Provincial Rd
Windsor ON N8W 5W1
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FIGURES

TABLES

APPENDICES

1. INTRODUCTION

Baird AE was retained to prepare a Functional Servicing Report for the proposed development located on 1360 & 1376 Howard Avenue Windsor, Ontario.

This report addresses stormwater management quantity and quality control, along with storm, sanitary and water connection requirements to accommodate the construction of a new development containing 4-storey multiple dwelling building, parking area & landscape open space area.

This report and the associated design are prepared in accordance with the Windsor-Essex Regional Stormwater Management Standards Manual (WERSMSM) published by Essex Regional Conservation Authority and the Development Manual published by the City to ensure compliance with local design standards and development regulations. Moreover, it outlines sediment and erosion control measures.

2. EXISTING CONDITIONS

The subject property, measuring approximately 0.197 hectares, is currently zoned for residential use and is occupied by a used vehicle automotive dealership. The site includes a two-storey building and parking area, fronting both Ottawa Street and Lillian Avenue. Access to the property is provided via a two-way driveway off Lillian Avenue. The site is bounded by Ottawa Street to the north, Howard Avenue to the west, Lillian Avenue and adjacent residential properties to the east, and additional residential lot to the south. Based on the soil mapping tool from the Essex Region Conservation Authority (ERCA), the site's underlying soil type is classified as Brookston Clay Loam, which falls under Hydrologic Soil Group D (Appendix A).

Figure 1 : Predevelopment Conditions

2.1 EXISTING INFRASTRUCTURE

Storm

- An existing 300 mm diameter storm sewer is located on Howard Avenue.
- An existing 675 mm diameter storm sewer is located on Lillian Avenue.
- A 150 mm diameter storm service connection extends from the 300 mm storm sewer on Howard Avenue to 1360 Howard Avenue.

Sanitary

- An existing 250 mm diameter sanitary sewer is located on Lillian Avenue.
- An existing 300 mm diameter sanitary sewer is located along Howard Avenue.
- A 150 mm diameter sanitary service connection extends from the 300 mm sanitary sewer on Howard Avenue to 1376 Howard Avenue.

- Another 150 mm diameter sanitary service connection from the 300 mm sanitary sewer on Howard Avenue also services 1376 Howard Avenue.

Water

- An existing 200 mm diameter watermain is located along Howard Avenue (Appendix A).
- Two existing 25 mm diameter water service connections are tied to the 200 mm watermain; both these connections shall be decommissioned.

3. PROPOSED CONDITION

As shown on the site plan in Figure 2, the development will consist of 4-storey residential apartment building with a total of 25 dwelling units, as described above, parking area, and Landscaped open space.

Conceptual Site Servicing Plan has been attached to the Appendix A for reference.

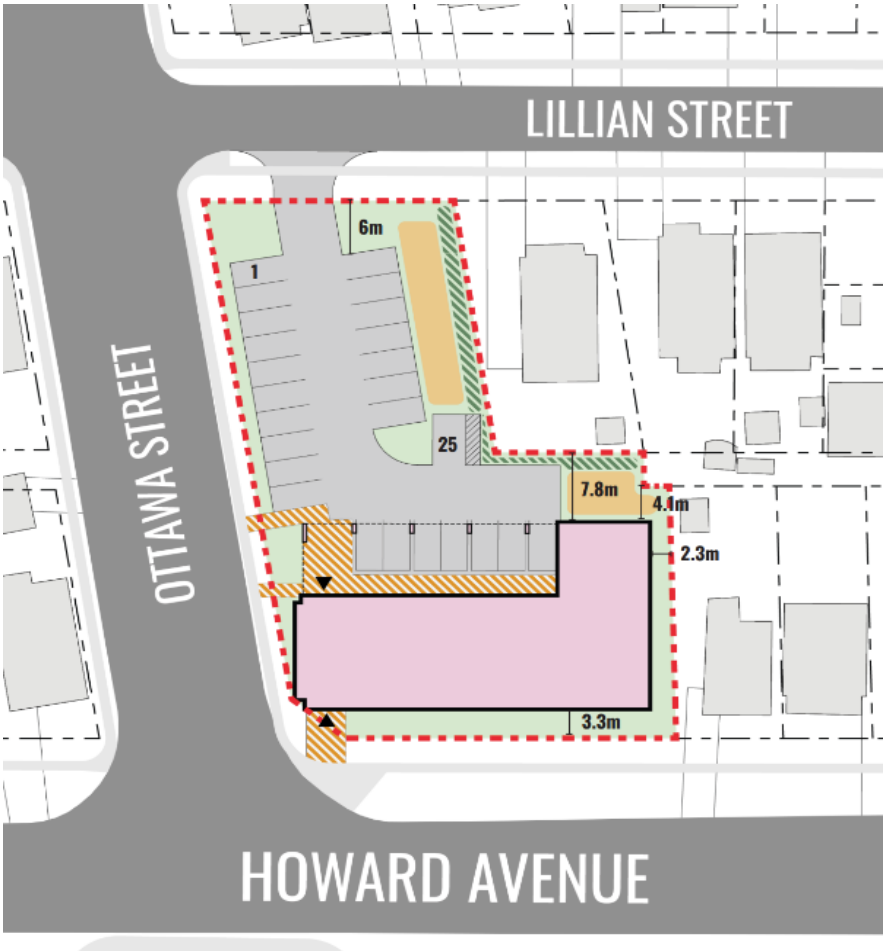

Figure 2: Post-Development Condition

Table 1:Post Development Conditions

CATCHMENT	AREA	RUN-OFF CO-EFFICIENT
HARD SURFACE (PARKING, SIDEWALK & ROOF)	1379 m^2 (0.138 ha)	0.95
GRASS AREA	591m^2 (0.059 ha)	0.20
TOTAL	1970 m^2 (0.197 ha)	0.58

3.1 PROPOSED INFRASTRUCTURE

Storm Sewer and Stormwater Management

- Existing 150mm diameter Storm service connection located in the Howard Avenue from the 300mm diameter storm sewer shall be utilized (Refer to Sewer Information Sheets attached in Appendix B).
- The 2-year pre-development release rate was determined to be 15.78 L/s through rational calculations (See Rational Calculation Sheet attached in Appendix B).
- For storm sewer, the release rate shall be restricted to 15.78 (2-year pre-development release rate) - 1.6 (Sanitary peak flow) = 14.18 L/s. The Inlet control device or an orifice plate shall be designed accordingly.
- During the major storm events, the flow will be restricted within site using orifice plate or an inlet control device. The storage will be provided in the parking lot, Underground Storage and/or swale as required.

Table 2: Infiltration Parameters

Attribute		Brookston Clay Hydro Group (D)
Horton's Infiltration	Max. Infil. Rate (normal) (mm/hr)	25
	Min. Infil. Rate (mm/hr)	0.5
	Decay constant (1/hr)	4
	Drying Time (days)	7

Sanitary Sewer

- The proposed development will outlet into an existing 300mm diameter sanitary sewer located in Howard Avenue with 150mm diameter existing sanitary service connection.
- As outlined in the sanitary study provided in Appendix B, the downstream sewers have sufficient capacity to accommodate the anticipated flows from the proposed development.
- The estimated peak sanitary flow from the proposed development is 1.6 L/s, while the existing sanitary service connection is projected to operate at approximately 3.41% of its available capacity (Refer to Appendix B for Sanitary Design Sheet).
- Existing 150mm diameter sanitary service connection to 1376 Howard Avenue shall be decommissioned.
- As per City of Windsor Development Manual (Section 17.0), a sampling manhole shall be provided at the property line before out letting into the municipal sanitary sewer.

Watermain

- Two existing 25 mm diameter water service connections are to be abandoned as part of the proposed servicing plan.
- A new 150 mm diameter water service is proposed to be extended from the existing 200 mm diameter watermain. This service will be split using a T-connection, with one branch consisting of a 50 mm diameter line designated for domestic use and the other branch, a 150 mm diameter line, dedicated to servicing the proposed fire sprinkler system.

4. WATER QUALITY UNIT

A water quality unit will be installed on the outlet sewer for 70% Total Suspended Solids (TSS) removal efficiency.

Ministry of the Environment, Conservation and Parks (MECP) requirements for normal long-TSS removal is stated as 82 percent TSS removal efficiency for 85 percent of annual flow. The Oil Grit Separator (OGS) manhole shall be designed as per MECP requirements and installed just before the system outlets into the city storm sewer.

The OGS shall be designed in accordance with Hydro First Defense, or an approved equivalent. Detailed OGS design specifications and supporting calculations are provided in Appendix C.

5. EROSION AND SEDIMENT CONTROL

The erosion and sediment control measures for the site will need to be included in the tender documents, and will include the following:

- Silt fence is to be erected before grading begins on the property to protect downstream areas from the migration of sediment in overland flow;
- All disturbed areas will be stabilized by restoration of vegetative ground cover as soon as possible; and
- Filter fabric will be placed over the drainage grates.
- Mud-mat shall be provided at site access to mitigate soil movement.
- Existing catch-basins to be covered to mitigate debris travelling downstream.

6. CONCLUSION:

Stormwater Management: The stormwater management strategy for the proposed development aligns with the City and ERCA requirements. The existing 150mm diameter storm service shall be utilized to outlet the stormwater into the existing 300mm diameter storm sewer located in Howard Avenue. The allowable release rate is calculated to be 14.18 L/s. Additionally, erosion and sediment control measures will be implemented to safeguard the site during construction and beyond.

Sanitary Sewer: The proposed development will connect to the 300mm diameter sanitary sewer, located in the Howard Avenue through an existing 150mm diameter service connection. The peak sanitary flow for the proposed development is calculated to be 1.6 L/s. A sampling manhole shall be provided at the property line prior to out letting into the municipal sanitary sewer. These flows are designed to integrate seamlessly with the existing infrastructure, ensuring efficient wastewater management.

Watermain: The proposed water servicing strategy ensures adequate and efficient supply by upgrading the existing connections to meet both domestic and fire protection demands, while decommissioning undersized infrastructure no longer suitable for the development's needs.

We trust the foregoing is satisfactory and will allow you to review and approve the functional design concept of stormwater and servicing drawings for this development. If you have any questions or require additional information, please do not hesitate to contact Baird AE at your convenience.

All of which is respectfully submitted.

BAIRD AE INC.

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Approved By:

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Senior Project Manager / Civil Engineer

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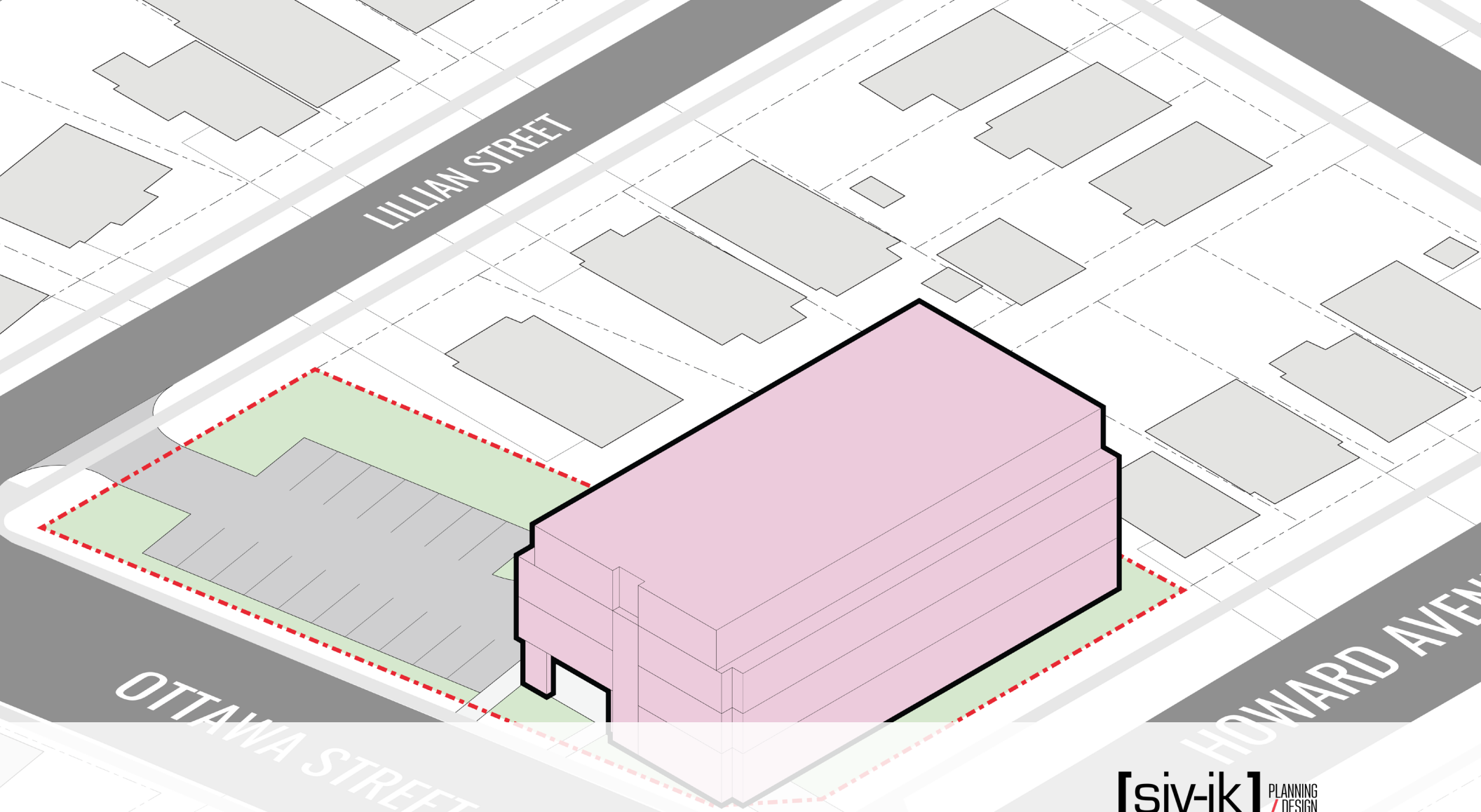
Mohammad Aatif Baki, M.Eng.

Civil E.I.T.

Baird AE

APPENDIX A: BACKGROUND INFORMATION & EXISTING INFRASTRUCTURE



PROJECT **VISION BRIEF**

1360 & 1376 HOWARD AVE

WINDSOR / ON

[siv-ik] PLANNING / DESIGN

Client

Butterfield Limited Partnership

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PREPARED BY
Siv-ik Planning and Design Inc.

PREPARED FOR
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VERSION 1.0

ISSUED
12.19.2024

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CONTENTS

ABOUT THIS REPORT

This report has been prepared by Siv-ik Planning and Design Inc. for Butterfield Limited Partnership The report provides an overview of the physical context, planning framework and technical requirements that are the genesis of the preliminary concept design for 1360 & 1376 Howard Avenue. The graphics and supporting text are intended to highlight links between those factors the specific planning/design response proposed for the site. The report describes the relevant details of the proposed Zoning By-law Amendment to articulate our understanding of, and vision for, the site in a manner that supports preliminary stakeholder consultation for the proposed development.

www.siv-ik.ca

1. INTRODUCTION

1.1 Project Site

The subject site is comprised of two legally titled parcels, municipally identified as 1360 & 1376 Howard Avenue. The site is located on the southeast corner of the intersection of Howard Avenue and Ottawa Street in South-Central Windsor. The site is approximately 1,968m2 (0.197ha) in size and currently accommodates a used vehicle automotive dealership consisting of a 2-storey converted building and a large sales and display area in the rear of the property along Ottawa Street and Lillian Avenue. The site contains direct frontage on three adjacent municipal streets (i.e., Howard Ave, Ottawa Street & Lillian Avenue) and is currently accessed via a 2-way driveway connection to Lillian Avenue. The site is irregular in shape, spanning a depth of approximately 59.3m along Ottawa Street and containing a total frontage of 37.6m on Howard Avenue. City sidewalks are located along all three adjacent municipal streets, with dedicated bicycle lanes along the Ottawa Street frontage.

1.2 Area Context

Within a 400-metre radius (approximately a 5-minute walk) of the site, the land use pattern exhibits a diverse mix of uses. Immediately west of the site is the historic Windsor Grove Cemetery, established in 1866. To the east, the area comprises a mix of low-density residential buildings and additional cemetery lands. Further along Ottawa Street is a traditional main street commercial corridor, featuring a variety of shops, restaurants, and service businesses. The built form along this corridor is typical of a main street, with low-rise buildings that have commercial uses at grade and residential units above.

To the southeast, east of Howard Avenue, the land is characterized by a mix of older light industrial and employment uses. The Howard Avenue corridor itself is primarily residential, containing a range of housing types, including single-detached dwellings, converted dwellings, and low-rise multiplexes. This historic arterial road offers significant potential for redevelopment and residential intensification, given its proximity to a wide range of services and amenities.

Transit access in the area is robust, with Windsor Transit operating multiple routes within 400 metres of the site. Nearby stops include those at Ottawa Street & Parent Avenue to the east and Howard Avenue & Giles Street to the north. This combination of land use diversity, historic context, and transit accessibility underscores the redevelopment potential of the Howard Avenue corridor.

AT-A-GLANCE

Site Area	0.197 Hectares
Frontage	37.6 Metres (Howard)
Depth	59.3 Metres (Ottawa)
Existing Use	Automotive Dealership
Servicing	Full Municipal

N — Low-Rise Residential

S — Low-Rise Residential

W — Windsor Groves Cemetery

E — Low-Rise Residential & Ottawa Street Commercial Corridor

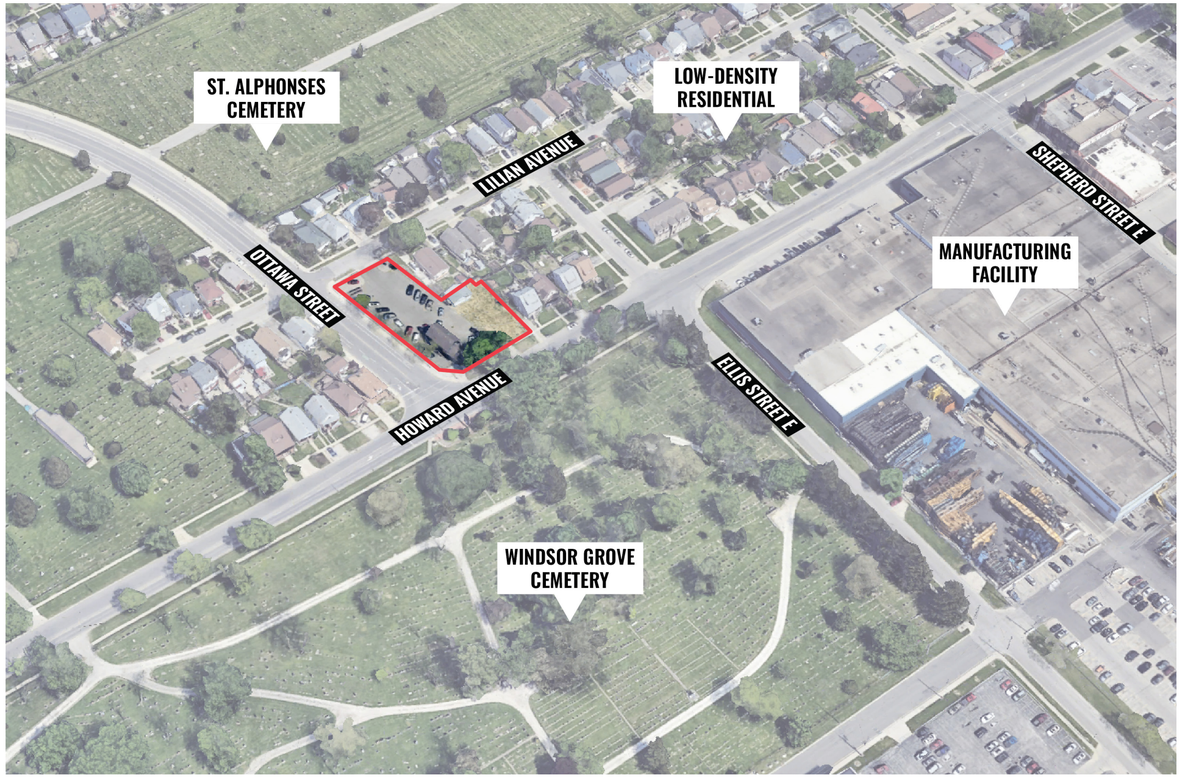


Figure 1: The Project Site

2. PLANNING FRAMEWORK

2.1 City-Structure

Figure 2 provides visual context for the site's positioning relative to Windsor's city-structure, including the City's network of major streets. The project site contains frontage on Howard Avenue which is now identified as a Class II Arterial by the City of Windsor Official Plan and Ottawa Street. This intersection occupies a strategic position within the City of Windsor's overall urban structure, serving as a critical node that bridges residential, commercial, and mixed-use areas. This intersection is characterized by its proximity to established neighborhoods, which contribute to the city's historical and cultural fabric, and its accessibility to major arterial routes, enhancing connectivity to key destinations across Windsor.

The site is located in the Walkerville Planning District, in close proximity to Downtown Windsor. Howard Avenue, a significant north-south corridor, facilitates the movement of people and goods between the core and suburban areas, connecting to the E.C. Row Expressway and Downtown Windsor. Ottawa Street, on the other hand, is a vibrant commercial corridor that supports local businesses, featuring specialty shops, restaurants, and services that attract both residents and visitors. Together, these streets create a dynamic intersection that embodies Windsor's goals of fostering complete and connected communities.

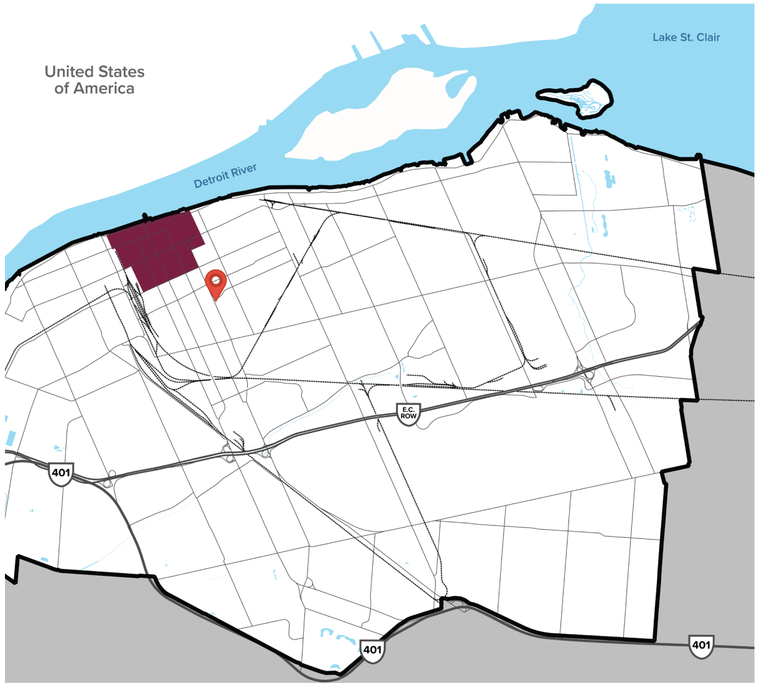
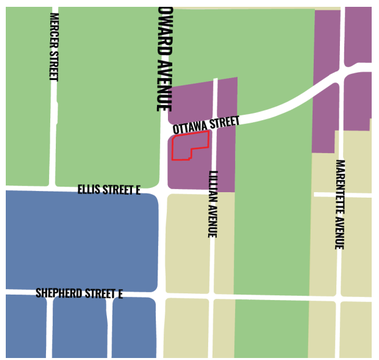


Figure 2: City-Wide Context

2.2 City of Windsor Official Plan

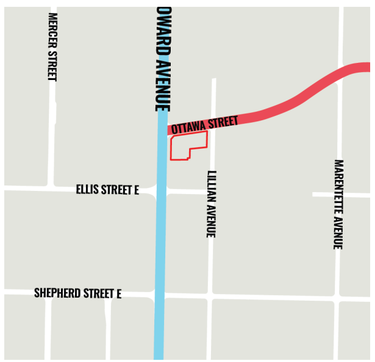
The project site is within the "Mixed Use Corridor" designation as per Schedule D - Land Use Plan - of the City of Windsor Official Plan. Lands designated as "Mixed Use Corridor"are intended become vibrant mixed-use commercial and residential areas. Ideally, the predominant form of new or redeveloped housing should be Medium and High Profile residential buildings with ground floor and possible second floor commercial uses and upper floor residential dwellings. In accordance with the permitted uses policies of 6.5.3.1, Medium and High Profile residential uses either as stand-alone buildings or part of a commercial-residential mixed use buildings shall be throughout the Corridors. The project site is bounded by a Class II Arterial Road (Howard Avenue) to the west and a Class I Collector Road to the North (Ottawa Street), as illustrated on the Schedule F- Roads and Bikeways of the City of Windsor Official Plan. Class II Arterial Roads are intended to carry higher volumes of traffic and direct vehicular accesses to new developments are discouraged. From a built form and intensity perspective, heights are generally limited to 4-storeys or less in the designations except for locations at the intersection of to higher order streets. The subject site, in accordance with policy 6.5.3.3 a), would potentially qualify for said taller building heights given it's corner location at Howard Avenue and Ottawa Street.

Schedule D - Land Use



- Mixed Use Corridor
- Residential
- Industrial
- Open Space

Schedule F - Roads & Bikeways

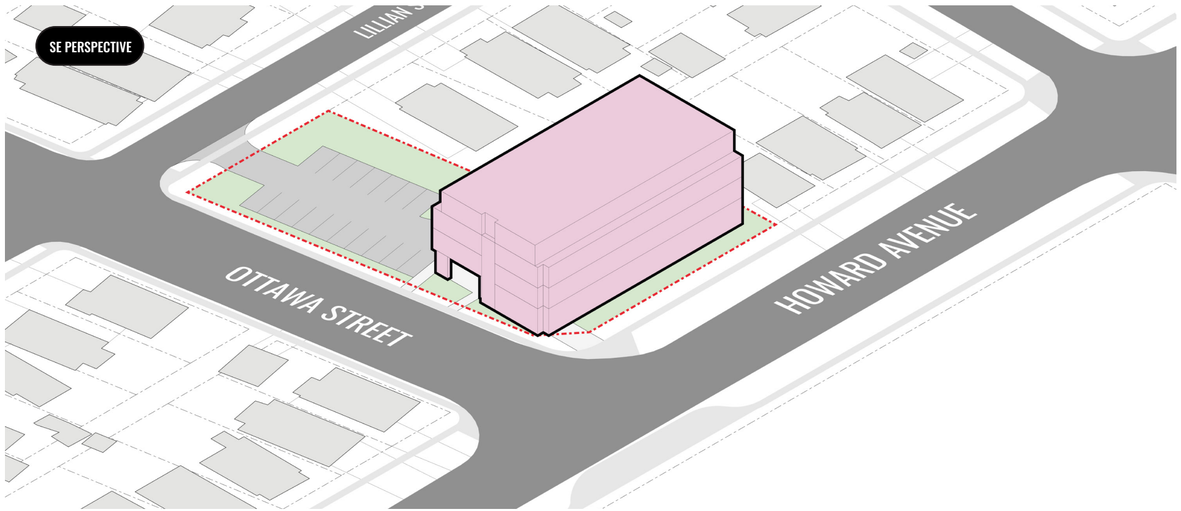


- Class II Arterial Road
- Class I Collector Road

3. PRELIMINARY CONCEPT DESIGN

3.1 4-Storey Multiple Dwelling (Walk-Up Apartment)

The preliminary concept plan illustrated on page 05-06 of this brief envisions the development of a 4-storey residential apartment building with a total of 25 dwelling units. The built form is oriented towards Howard Avenue with surface parking and landscaped amenity areas located in the rear portion of the site. Access is proposed to remain in its current general location, stemming from Lillian Avenue. The site design provides for a total of 25 surface parking stalls (1.0 stalls per unit). Direct pedestrian connections from the building towards the adjacent City sidewalks have been provided to integrate the development with the existing public realm. Main floor units facing Howard Avenue are envisioned to have direct unit entrances and designed as barrier-free. The building has been conceived as a "walk-up" style without an interior elevator system. The upper units as planned as "two-storey" units with access from a common corridor on the 3rd floor. The preliminary concept represents the desirable implementation of the proposed Zoning By-law Amendment outlined in Section 4 of this brief.



Note: Simplified site plan prepared by Siv-ik Planning & Design Inc.

CONCEPT AT-A-GLANCE

Site Area	0.197 ha.
Height	4-Storeys (14.0m)
Residential Units	25
Commercial (GFA)	n/a
Parking	1.0 Per Unit
Amenity Area	10.5m2 per unit
Lot Coverage	36.2%
Landscape OS	31.6%
Density	127uph

LEGEND

- Site Boundary
- Apartment Building
- Principal Entrance
- Pedestrian Connections
- Common Amenity Space
- Enhanced Landscaping

4. ZONING APPROACH

4.1 Proposed Zoning By-law Amendment

The proposed Zoning By-law will provide a framework for a medium density/medium-profile residential development (i.e., 25-unit Multiple Dwelling). To support the development vision for 1360 & 1376 Howard Avenue and to implement the applicable Official Plan policies, we propose to rezone the site from the Residential Districts 2 (RD2.2) and Commercial Districts 2 (CD2.6) to a Residential Districts 3 (RD3.1(_)) Special Provision Zone. The proposed Zoning By-law will provide a framework for residential intensification in an appropriate medium-profile building form. The proposed zone includes special regulations to account for the urban context of the site and implement applicable form-based policy directions of the City of Windsor Official Plan including Section 6.5.3.3.c) which encourages buildings at the street frontage lot line with parking accommodated at the rear of the site. The proposed zone and special regulations are structured to facilitate an appropriate range of desirable site design outcomes but are not directly tied to a specific development design. In this regard, the proposed Zoning By-law Amendment will "lock-in" the key development and built form standards but will also allow for a degree of flexibility to address site and building design details through the future Site Plan Control application process.

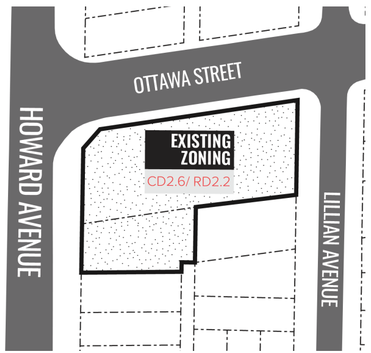


Figure 3: Existing Zoning

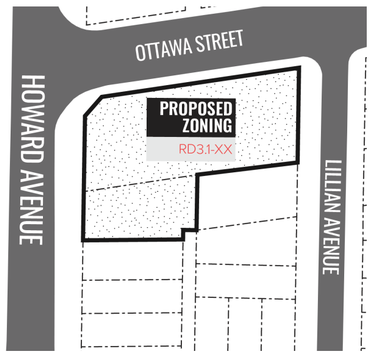


Figure 4: Proposed Zoning

4.2 Proposed Special Regulations Overview

Zone Requirements	Standard RD3.1 Zone Regs	Proposed RD3.1-XX Zone Regs ('-' means no change)
Permitted Uses	See detailed list in Section 12.1.1	-
Lot Frontage (min.)	18.0m	-
Lot Area (min.)	540m2 for the first 5 dwelling units and 67.0m2 per unit for each additional dwelling unit.	-
Lot Coverage (max.)	35%	37%
Main Building Height (max.)	14.0m	-
Front Yard Depth (min.)	6.0m	3.0m
Rear Yard Depth (min.)	7.5m	4.1m
Side Yard Depth (min.)	a) Where a habitable room window of any dwelling unit faces a side yard: 6.0m b) Any other side yard: 3.0m	Interior Side Yard Depth: 3.0m Exterior Side Yard Depth: 0.0m
Landscaped Open Space (min.)	35%	30%
Parking (min.)	**Multiple Dwelling:** 1.25 per unit	**Multiple Dwelling:** 1.0 per unit

Table 1: Special Regulations Overview

5. ADDITIONAL CONSIDERATIONS

5.1 Applications Required

It is anticipated that the following Planning Act applications will be required in order to implement the planned vision for the project site:

1. Zoning By-law Amendment: To rezone the site from the Residential Districts 2 (RD2.2) and Commercial Districts 2 (CD2.6) to a Residential Districts 3 (RD3.1(_)) Special Provision Zone, with special provisions to address the site context and applicable policy framework.
2. Site Plan Control: To implement the specific development design envisioned in the preliminary development concept illustrations.

5.2 Issues for Clarification

From the proponent's perspective, the following attributes are critical to the success of the development vision. As such, the project team would appreciate any specific insights that City Staff are able to offer on the following:

1. Staff perspective on the proposed built form, height, massing and site layout.
2. Known site servicing opportunities and constraints.
3. Reports and studies required for the complete Zoning By-law Amendment application.

REFERENCES

1. Provincial Planning Statement, 2024.
2. City of Windsor Official Plan.
3. City of Windsor Zoning By-law 8600.
4. City of Windsor, MappMyCity (Last updated December 01, 2024).

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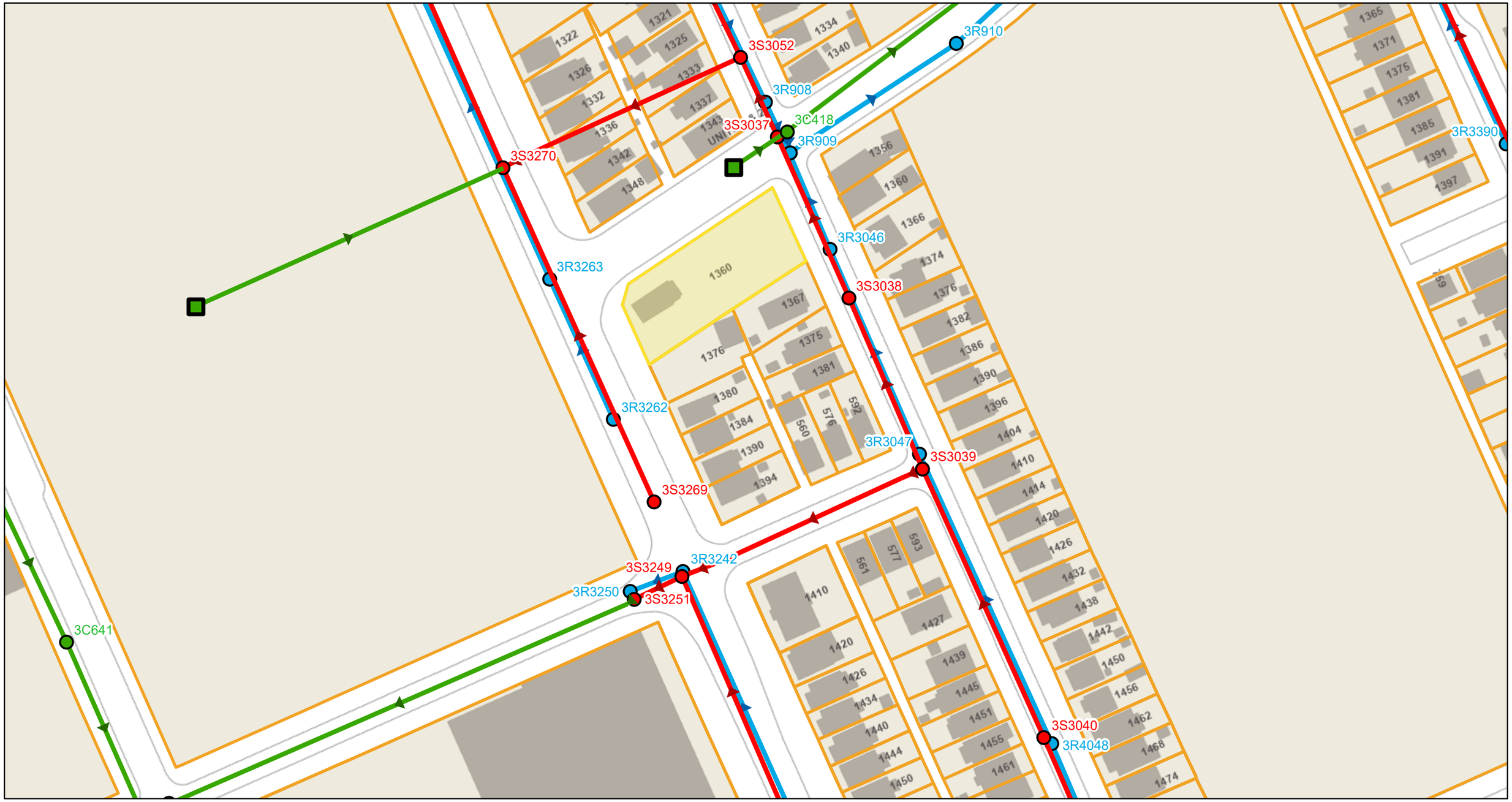
PLAN VIEW
LILLIAN STREET
OTTAWA STREET
HOWARD AVENUE
6m
1
25
7.8m
4.1m
2.3m
3.3m

Existing Storm and Sanitary Sewers



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OTTAWA ST
HOWARD AVE
1360
1367
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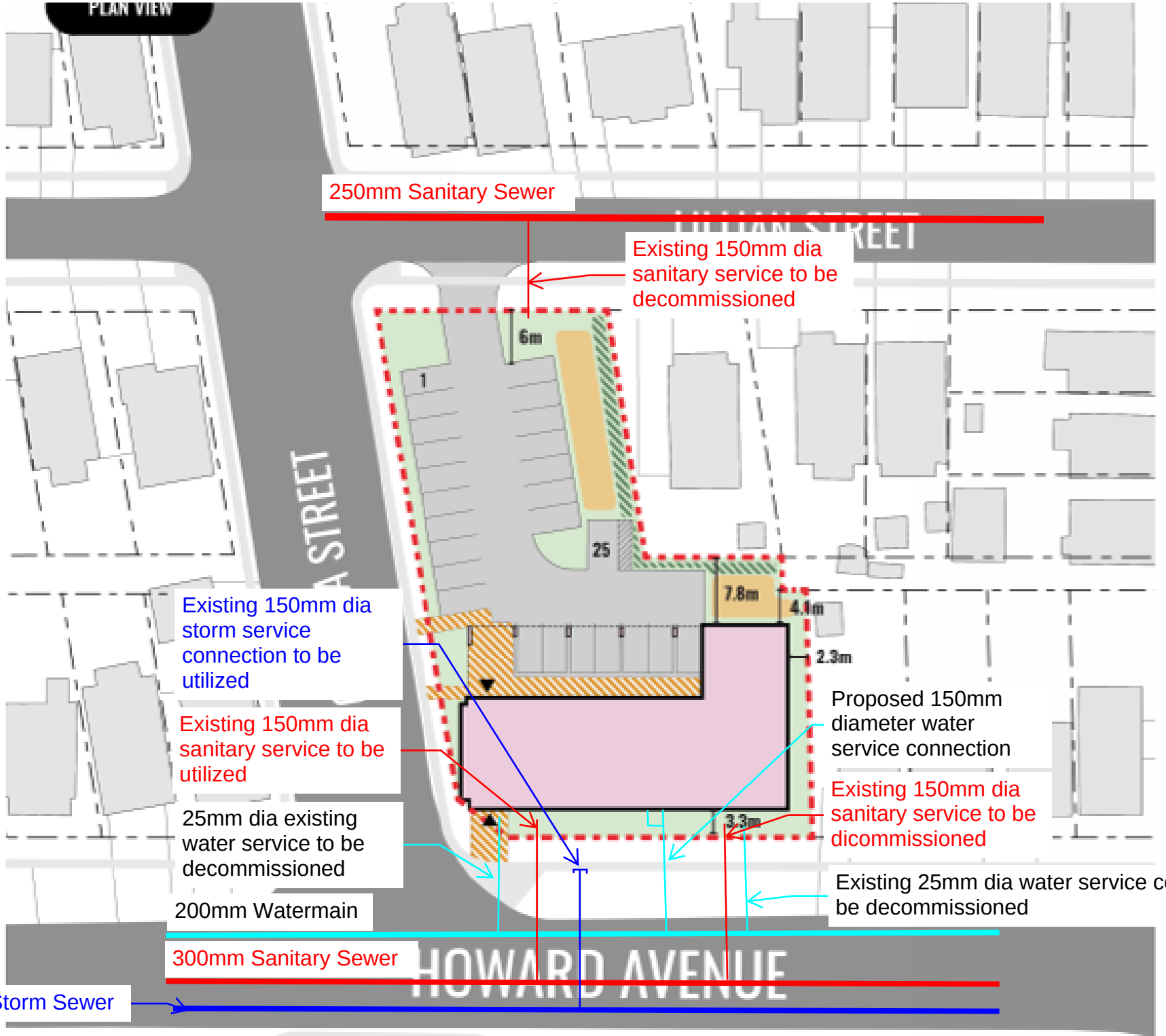
1380
1384
30022008
25 mm
150 mm
200 mm
25 mm
25 mm
25 mm

CONCEPT SITE SERVICING PLAN



APPENDIX B: DESIGN SHEETS & AS-BUILT DRAWINGS

RATIONAL CALCULATION SHEET

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architecture + engineering

Pre-Development Peak Flow Rates Calculation			
Prepared:	A.B.	Page No.	C-01
Checked:	S.T.		
Proj. #	25-002		
Date:	18-Sep-25		

1360 & 1376 Howard Avenue

Rational Formulae: Q = 2.78 CIA (L/s)

Site Area:	0.197	ha
T- Time of Concentration:	20	minutes as per City's Design Criteria
C - Runoff Coefficient :	0.50	Pre-development condition
K - Conversion Factor:	2.78	

Rainfall Intensity: I = A / (TC+B)^C

values of A,B and C are found in Storm Design Requirement in Table 3.2.1.1 of WERSWMM

Return Period:	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	854	1259	1511	1851	2114	2375
B	7.00	8.80	9.50	10.20	10.60	11.00
C	0.818	0.838	0.845	0.852	0.858	0.861
Rainfall Intensity (mm/hr):	57.62	75.35	86.55	101.49	112.29	123.48

Pre Development Peak Flow Rate (L/s):

Return Period:	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Under existing site conditions (L/s):	15.78	20.63	23.70	27.79	30.75	33.81

1360 & 1376 HOWARD AVENUE, WINDSOR, ONTARIO

STORM SEWER DESIGN SHEET

LOCATION			AREA (ha)				FLOW							SEWER DATA							
Drainage Area	From	To	C=	C=	Grass C=	Parking/ Roof/Sidewalk C=	Indiv 2.78 AC	Accum 2 2.78AC	Time of Conc.	Design Storm	Rainfall Intensity	Peak Flow (L/sec)	Qtotal (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)
	Node	Node	0.55	0.75	0.20	0.95															
SWM																					
	Building	EX. STM Sewer			0.059	0.138	0.40	0.40	20.00	5	75.35	29.92	29.92	0.150	150	PVC	0.50	20.10	14.0	0.79	0.42

Q = 2.78 AIR, where
Q= Peak Flow in Litres per Second (l/s)
A= Area in hectares (ha)
I= Rainfall Intensity (mm/hr)
R= Runoff Coefficient

1) Windsor Rainfall-Intensity Curve
2) Min Pipe Velocity = 0.76 m/s
3) Max pipe Velocity = 6.0 m/s
4) Tc =20 min (Business Park)
Intensity = $I=24*(t_c/60)^{-0.71}$

BAIRD | AE
architecture + engineering

Consultant: Baird AE - Architects & Engineers

Date:	September 18, 2025
Design	Mohammad Aatif Baki
Project No:	**Dwg. Reference:**
RB-250002.00	Civil Engineering

1360 & 1376 HOWARD AVENUE, WINDSOR, ONTARIO
SANITARY SEWER DESIGN SHEET

DESIGN CRITERIA

RESIDENTIAL	3.5	People/Lot	362.88	L/cap/day	
COMMERCIAL	74	People/Ha.	0.21	L/ha/s	
INDUSTRIAL	62	People/Ha.	1+14/(4+(P/1000) ^ 0.5)		
INSTITUTIONAL	22	People/Ha.	0.75 m/s to	3 m/s	
			150 mm		

Project : 1360 & 1376 HOWARD AVENUE
CITY OF WINDSOR
Client :

LOCATION				DESIGN AREA SERVED (ha)				DESIGN POPULATION (PERSONS)			PEAK FACTOR	MAXIMUM FLOW			SEWER DATA							
STREET OR EASEMENT	Area Included	From Node	To Node	RESIDENTIAL	TOTAL	CUMULATIVE	LOTS/UNITS	RESIDENTIAL	TOTAL	CUMULATIVE		INFILTRATION (L/s)	SEWAGE (L/S)	TOTAL FLOW (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Manning's "n"	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Ratio (%)
475 CABANA ROAD WEST																							
		BUILDING	EX. CLEAN OUT	0.197	0.197	0.197	25	88	88	88	4.26	0.041	1.57	1.61	0.150	150	PVC	0.01	2.00%	7.34	28.003	1.58	5.74
HOWARD AVENUE		EX. CLEAN OUT	EX. SAN SEWER	0	0.000	0.197	0	0	0	88	4.26	0.041	1.57	1.61	0.150	150	PVC	0.01	5.60%	13.87	46.857	2.65	3.43

Proposed Development and Existing (12) Residential , MD Zone

BAIRD | AE
architecture + engineering

Design By:	Mohammad Aatif Baki		
PROJECT NO:		**Checked and Stamped:**	
RB-250002.00	1360 & 1376 HOWARD AVENUE	Shurjeel Tunio	

SAN STUDY AREA MAPPING

9/18/2025, 3:27:11 PM

1:2,500

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

- Spot Elevations
- Combined Sewer Manholes
- Combined Plugs
- Combined Sewers
- Sanitary Sewer Manholes
- Sanitary Sewers
- Storm Sewer Manholes
- Storm Sewers
- Address Parcels
- CityBoundary
- Parks_sortName_Join_2016
- CityBoundary
- CityBoundary

1360 & 1376 HOWARD AVENUE, WINDSOR, ON
SANITARY STUDY

					DESIGN POPULATION			DESIGN FLOW			SEWER DATA							
Area Included	Area (ha)	Cum. Area (ha)	Upstream MH	Downstream MH	Persons	Cumulative Population	Harmon Peaking Factor	Sewage (L/s)	Infiltration (L/s)	Q Total (L/s)	Dia. (m) Actual	Dia. (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
A1, PROP DEV	0.872	0.872	MH 3S3269	MH 3S3270	87	87	2.05	0.75	0.18	0.93	0.300	300	0.54	116.00	92.3	1.31	1.48	1.0%
A2, A3, A4	9.333	10.205	MH 3S3270	MH 3S3271	95	182	1.80	1.37	2.14	3.52	0.450	450	0.37	115.61	225.3	1.42	1.36	1.6%
A5	0.524	10.729	MH 3S3271	MH 3S3272	7	189	1.79	1.42	2.25	3.67	0.450	450	0.37	110.80	225.3	1.42	1.30	1.6%
A6	0.475	11.204	MH 3S3272	MH 3S3273	22	210	1.76	1.55	2.35	3.90	0.450	450	0.50	87.50	261.9	1.65	0.89	1.5%

Average Flow per Person (l/day) =	363	**Population Densities**				**Date:**	September 18, 2025
Infiltration (l /s/ha) =	0.210	**Residential -**	3.5	ppu	(singles)	**Design By:**	Aatif Baki, E.I.T.
Pipe Friction "n" =	0.013		2.5	ppu	(Multi-unit)	**Reviewed By:**	Shurjeel Tunio, P.Eng
Harmon Peaking Factor =	1 + (14/(4+P^0.5))	Commercial	74	persons/ha		**Project no:**	25-002
		residential	50	persons/ha			

BAIRD | AE
architecture + engineering

Area Name	Area (Ha)	Land Use	No. of Units	
			Singles	Multi-unit
A1	0.675	Residential	7	0
A2	1.265	Residential	27	0
A3	7.080	Cemetry	2	0
A4	0.988	Cemetry	0	0
A5	0.524	Residential	2	0
A6	0.475	RESIDENTIAL	4	3
PROP DEV	0.197	Residential		25
	11.204			

S-1447

44932

CITY OF WINDSOR

DEPARTMENT OF PUBLIC WORKS

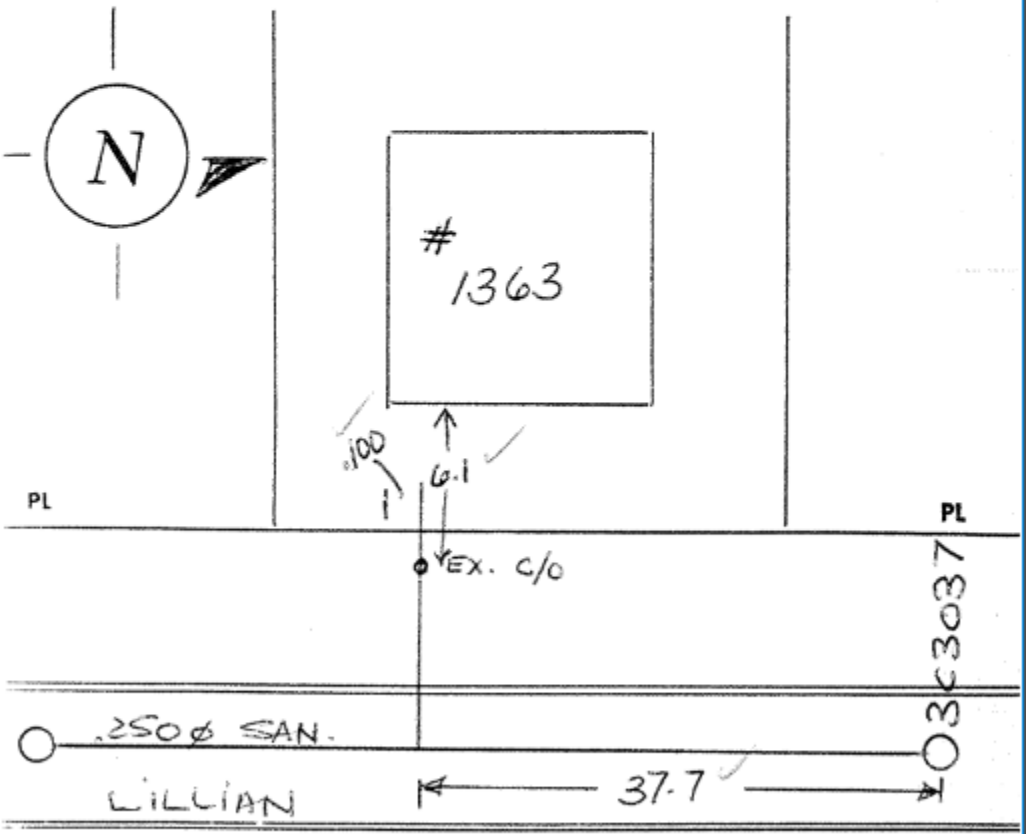
LOCATION OF STORM AND SANITARY CONNECTIONS

DATE OCT 1997

LOCATION #1363 LILLIAN

LOT No.

SAN. SEWER SIZE & TYPE	:	.250ø P.V.C
STORM SEWER SIZE & TYPE	:	
SAN. CONNECTION SIZE & TYPE	:	.150ø P.V.C.
STORM CONNECTION SIZE & TYPE	:	

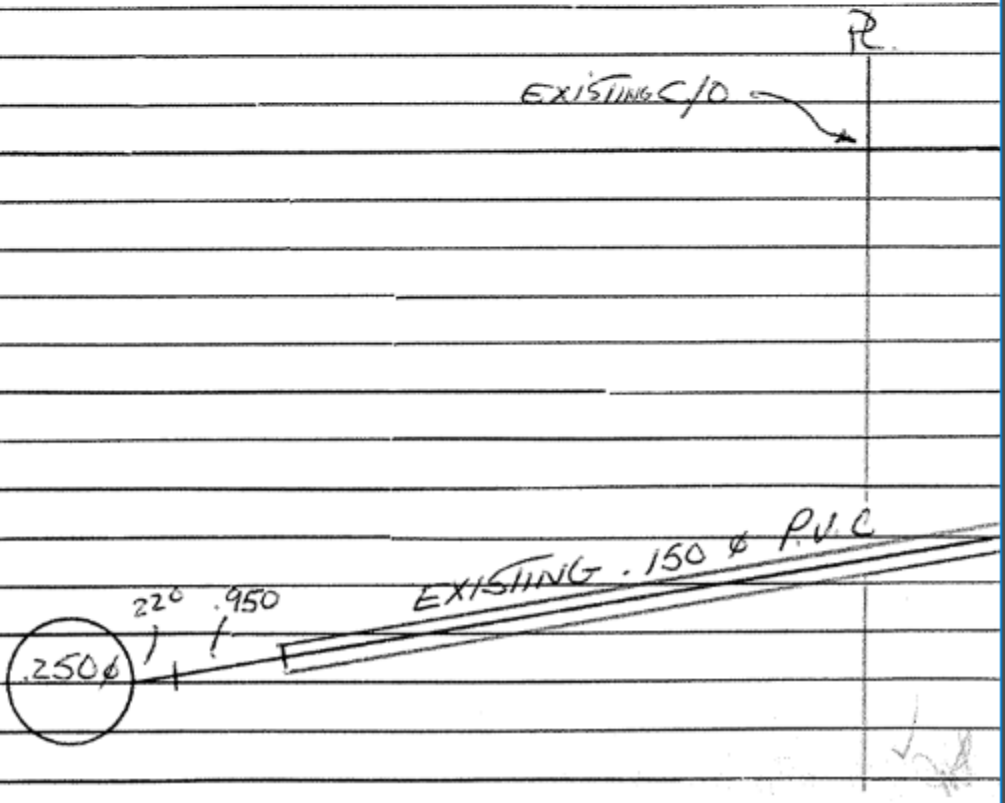


THE DEPARTMENT OF PUBLIC WORKS
DOES NOT GUARANTEE THE ACCURACY OF
THE LOCATIONS AND ELEVATIONS SHOWN

REMARKS: #1363 LILLIAN

1. BASEMENT ELEVATION -
2. INVERT AT PROPERTY LINE -
3. PRIVATE DRAIN CONNECTION OBTAINED BY PLUMBING INSPECTOR -
4. CIRCULAR LETTER SENT TO HOMEOWNER -
5. MAIN SEWER COMPLETED - SEPT. 1997
6. P.D.C. CONNECTION PLACED TO PROPERTY LINE - SEPT. 1997
7. PRIVATE DRAIN CONNECTION INFORMATION AVAILABLE (a) BUILDING DEPARTMENT (b) PUBLIC WORKS DEPT., ENGINEERING

JOB No. - 97-13



P-1905

CITY OF WINDSOR

DEPARTMENT OF PUBLIC WORKS

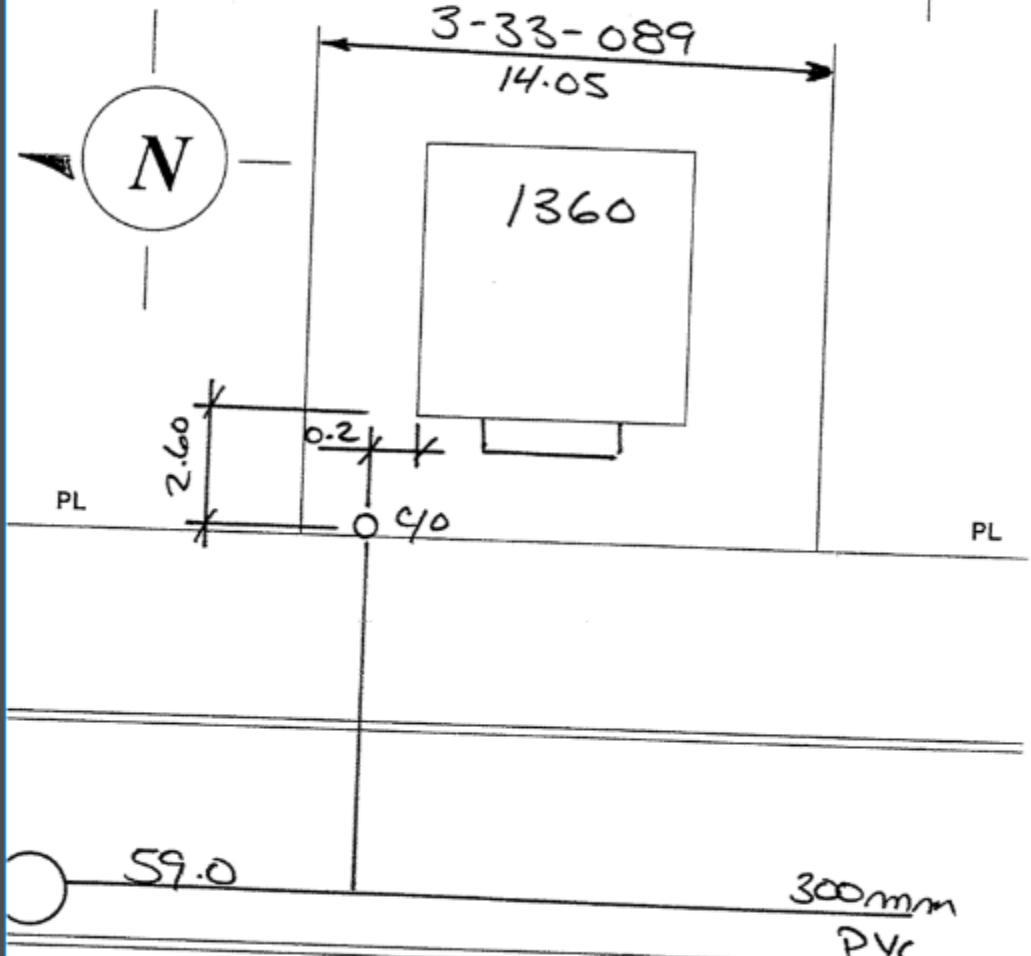
LOCATION OF STORM AND SANITARY CONNECTIONS

DATE SEPT '05

LOCATION 1360 HOWARD - SAN

LOT No.

SAN. SEWER SIZE & TYPE	: 300mm PVC
STORM SEWER SIZE & TYPE	: 300mm PVC
SAN. CONNCTION SIZE & TYPE	: 150 mm PVC
STORM CONNECTION SIZE & TYPE	: 150 mm PVC



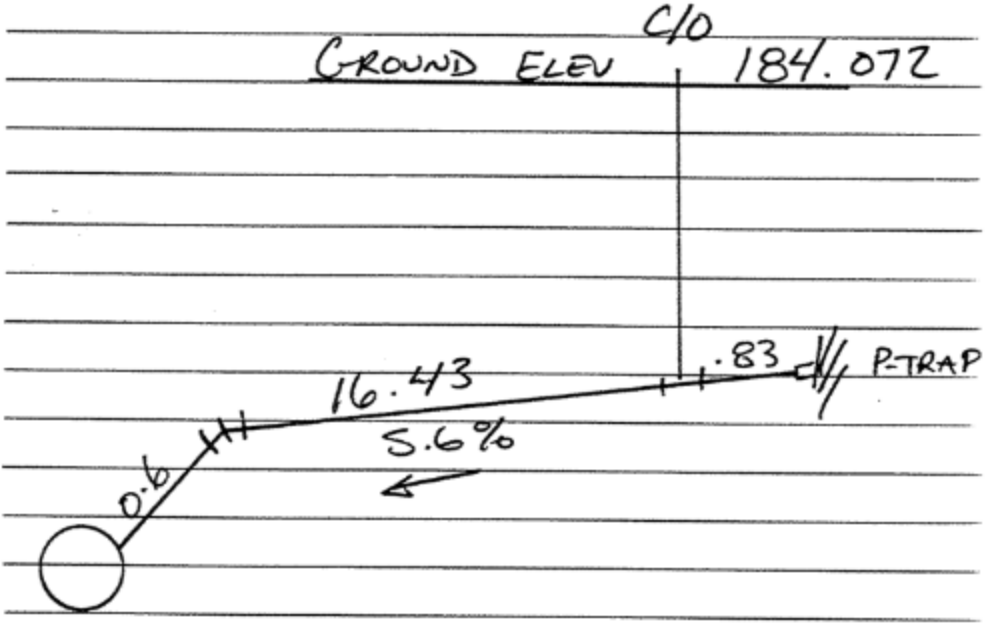
S3270

THE DEPARTMENT OF PUBLIC WORKS
DOES NOT GUARANTEE THE ACCURACY OF
THE LOCATIONS AND ELEVATIONS SHOWN

REMARKS:

1. BASEMENT ELEVATION -
2. INVERT AT PROPERTY LINE - 182.232
3. PRIVATE DRAIN CONNECTION OBTAINED
   BY PLUMBING INSPECTOR -
4. CIRCULAR LETTER SENT TO HOMEOWNER -
5. MAIN SEWER COMPLETED - SEPT '05
6. P.D.C. CONNECTION PLACED TO
   PROPERTY LINE - 27 SEPT '05
7. PRIVATE DRAIN CONNECTION INFORMATION
   AVAILABLE (a) BUILDING DEPARTMENT
   (b) PUBLIC WORKS DEPT., ENGINEERING

JOB No. - 21-05



P-1905

CITY OF WINDSOR

DEPARTMENT OF PUBLIC WORKS

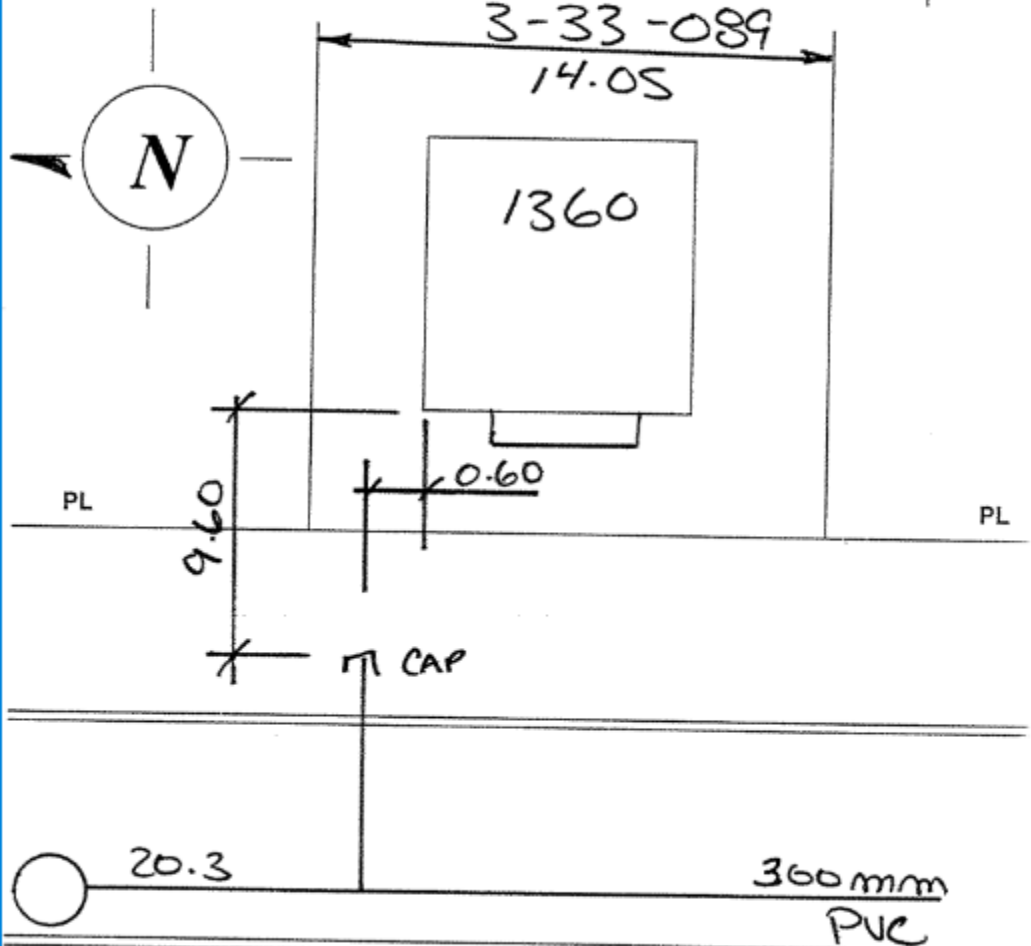
LOCATION OF STORM AND SANITARY CONNECTIONS

DATE SEPT '05

LOCATION 1360 HOWARD - STORM

LOT No.

SAN. SEWER SIZE & TYPE	: 300mm PVC
STORM SEWER SIZE & TYPE	: 300mm PVC
SAN. CONNCTION SIZE & TYPE	: 150mm PVC
STORM CONNECTION SIZE & TYPE	: 150mm PVC



3R3263

THE DEPARTMENT OF PUBLIC WORKS
DOES NOT GUARANTEE THE ACCURACY OF
THE LOCATIONS AND ELEVATIONS SHOWN

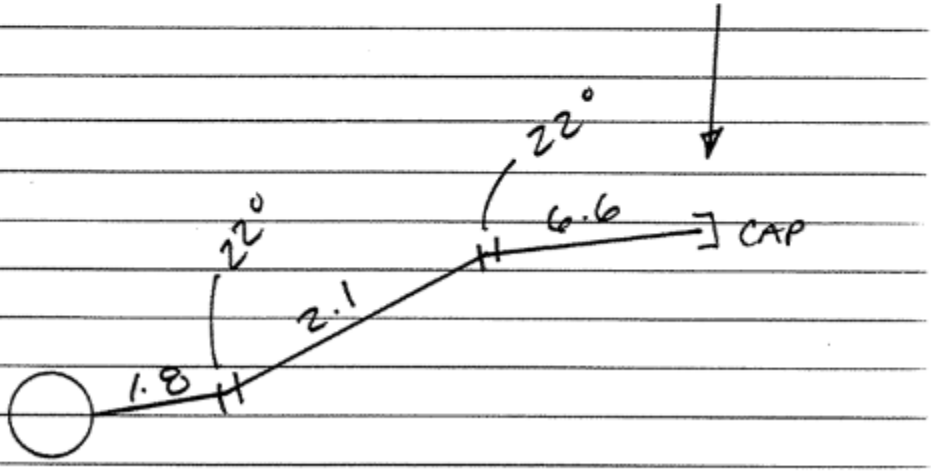
REMARKS:

1. BASEMENT ELEVATION -
2. INVERT AT PROPERTY LINE - 182.372
3. PRIVATE DRAIN CONNECTION OBTAINED
   BY PLUMBING INSPECTOR -
4. CIRCULAR LETTER SENT TO HOMEOWNER -
5. MAIN SEWER COMPLETED - SEPT '05
6. P.D.C. CONNECTION PLACED TO
   PROPERTY LINE - 28 SEPT '05
7. PRIVATE DRAIN CONNECTION INFORMATION
   AVAILABLE (a) BUILDING DEPARTMENT
   (b) PUBLIC WORKS DEPT., ENGINEERING
   JOB No. - 21-05

Amount owing: $ 1,600.00

Paid: _____ per: _____
(date) (init.)

DEPT +/- 1.50m.



P-1905

CITY OF WINDSOR

DEPARTMENT OF PUBLIC WORKS

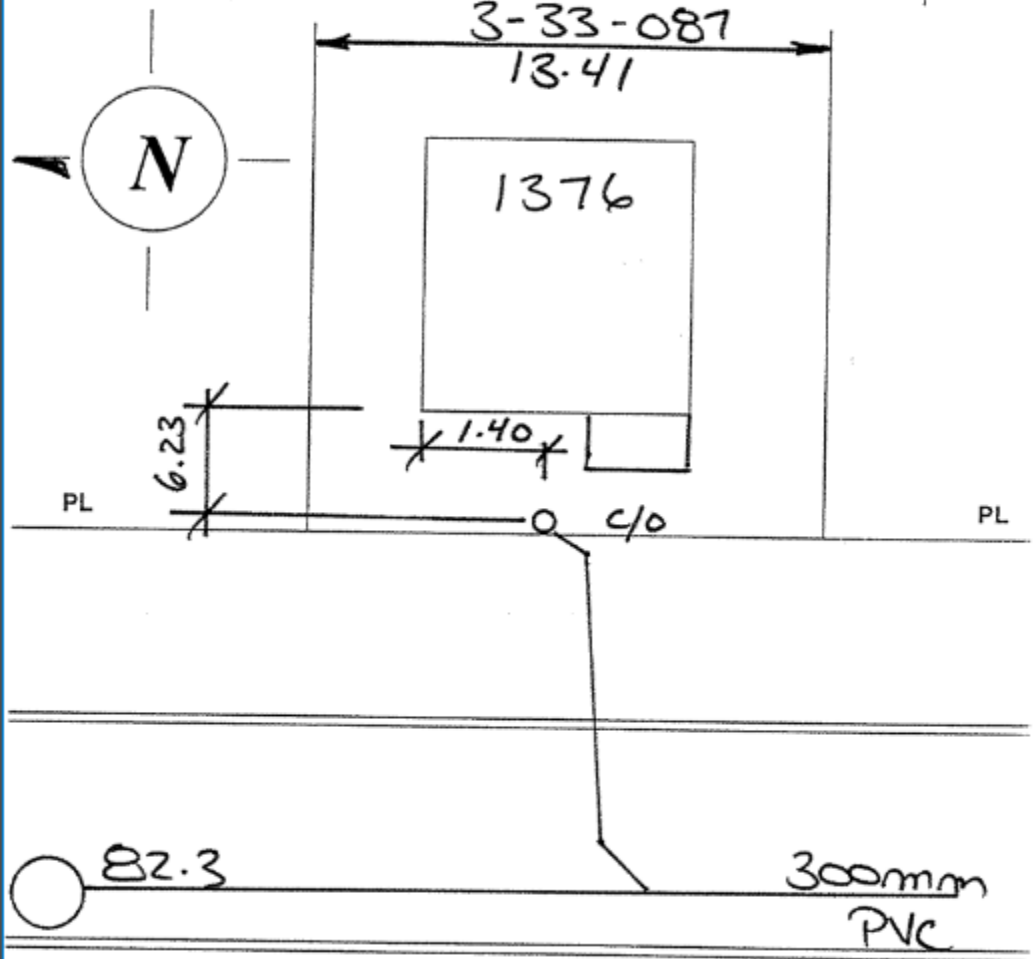
LOCATION OF STORM AND SANITARY CONNECTIONS

DATE SEPT '05

LOCATION 1376 HOWARD - SAN

LOT No.

SAN. SEWER SIZE & TYPE	: 300mm PVC
STORM SEWER SIZE & TYPE	: 300mm PVC
SAN. CONNCTION SIZE & TYPE	: 150mm PVC
STORM CONNECTION SIZE & TYPE	: NONE

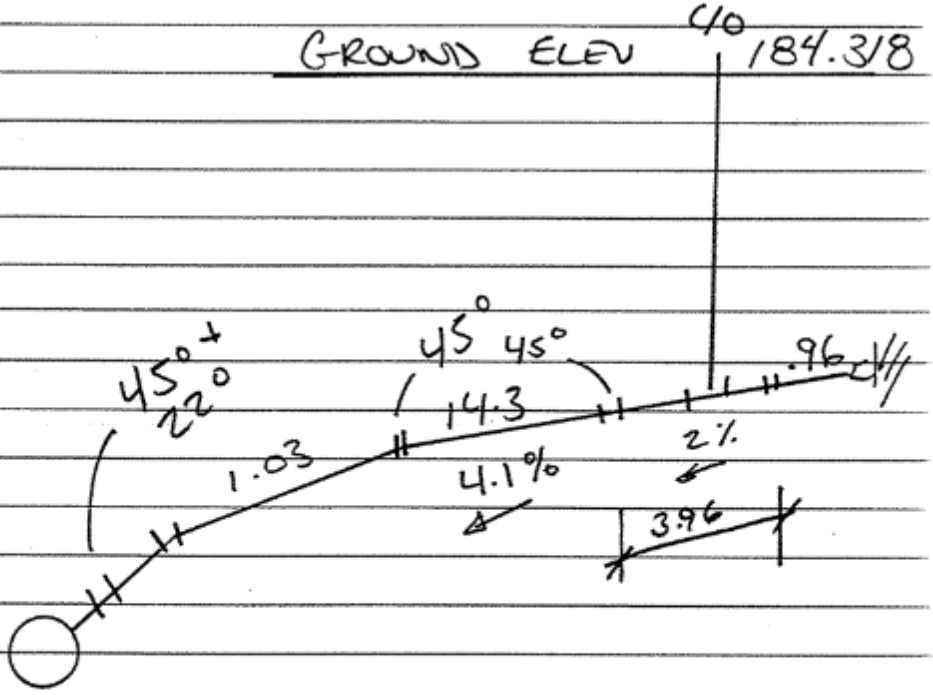


3S 3270

THE DEPARTMENT OF PUBLIC WORKS
DOES NOT GUARANTEE THE ACCURACY OF
THE LOCATIONS AND ELEVATIONS SHOWN

REMARKS:

1. BASEMENT ELEVATION -
2. INVERT AT PROPERTY LINE - 182.447
3. PRIVATE DRAIN CONNECTION OBTAINED
   BY PLUMBING INSPECTOR -
4. CIRCULAR LETTER SENT TO HOMEOWNER -
5. MAIN SEWER COMPLETED - SEPT '05
6. P.D.C. CONNECTION PLACED TO
   PROPERTY LINE - 27 SEPT '05
7. PRIVATE DRAIN CONNECTION INFORMATION
   AVAILABLE (a) BUILDING DEPARTMENT
   (b) PUBLIC WORKS DEPT., ENGINEERING
   JOB No. - 21-05



APPENDIX C: OGS DESIGN SHEET

Hydro First Defense® - HC

Water Quality Flow Rate Worksheet

Rev. 9.5

Project Name:	**RB-250002: 1360 & 1376 Howai**	*Report Date:*	**2025-09-19**
Street:	**1360 & 1376 Howard Avenue**	*City:*	**Windsor**
Province:	**Ontario**	*Country:*	**Canada**
Designer:	**Shurjeel Tunio**	*email:*	**stunio@bairdae.ca**

Paste

Treatment Parameters:

Structure ID:	OGS MH #1	
TSS Goal:	70	% Removal
TSS Particle Size:	Fine	
Water Quality Flow:	14.18	L/s
Peak Storm Flow:	14.18	L/s
Peak Storm Return:	5	yrs

RESULTS SUMMARY

Model	TSS
FD-3HC	**78.3%**
FD-4HC	81.7%
FD-5HC	83.3%
FD-6HC	84.2%
FD-8HC	85.1%

Performance Statement:

The Hydro International stormwater treatment system, model FD-3HC, achieves the water quality objective of 78.3% TSS using Fine particle size distribution, providing continuous treatment positive removal for the water quality flow of 14.18 L/s.

Model Specification:

Selected Model:	**FD-3HC**	
Diameter:	900	mm
Design WQ Flow:	14.18	L/s
No Bypass Flow:	8.00	L/s
Peak Flow Capacity:	425.00	L/s
Sediment Storage:	0.31	m^3
Oil Storeage:	473.00	L

Installation Configuration:

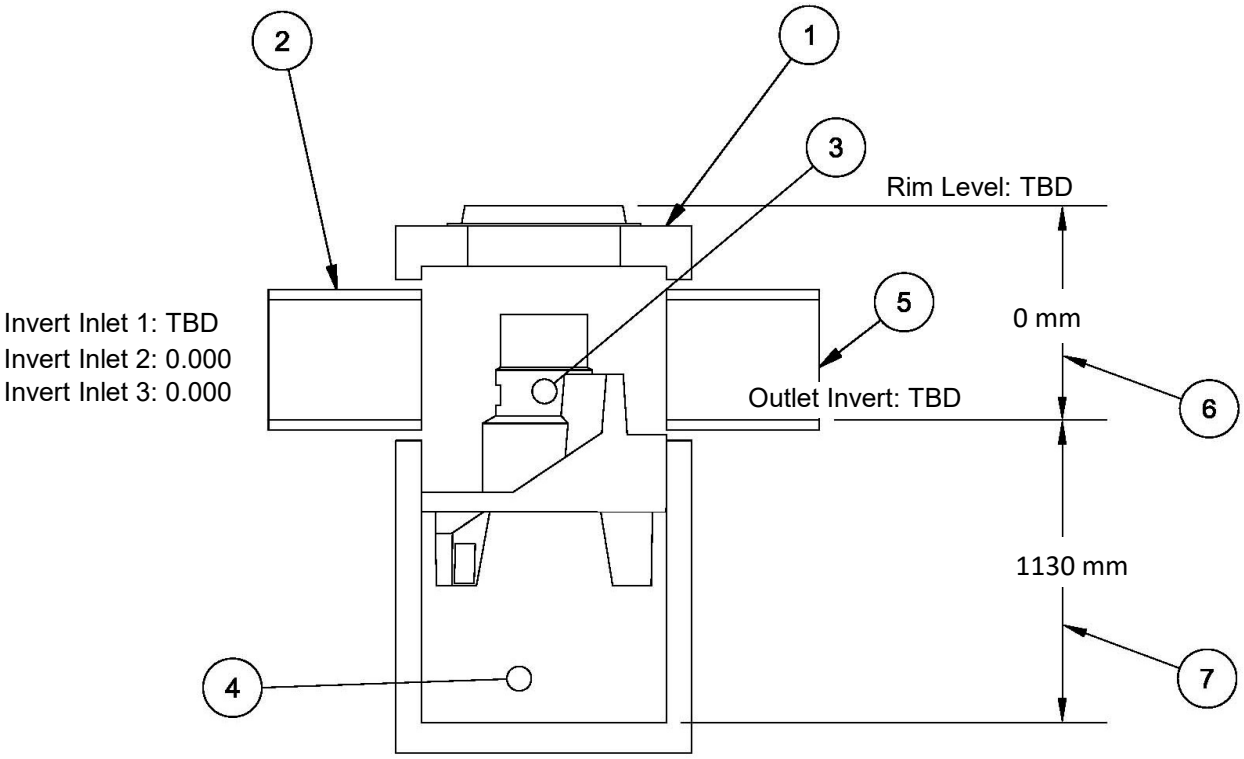
Placement:	Offline		
Outlet Pipe Size:	150	mm	*OK*
Inlet Pipe 1 Size:	150	mm	*OK*
Inlet Pipe 2 Size:		mm	*OK*
Inlet Pipe 3 Size:		mm	*OK*

Rim Level:	TBD	m	Calc Invs.
Outlet Pipe Invert:	TBD	m	*Additional cover may be required.*
Invert Pipe 1:	TBD	m	*Error.*
Invert Pipe 2:		m	*Error.*
Invert Pipe 3:		m	*Error.*

Designer Notes:

Hydro First Defense® - HC

FD-3HC



FD-3HC Specification

1	Vortex Chamber Diameter	900	mm
2	Inlet Pipe Diameter	150	mm
3	Oil Storage Capacity	473	L
4	Min. Provided Sediment Storage Capacity	0.31	m^3
5	Outlet Pipe Diameter	150	mm
6	Rim to Invert	0	mm
7	Invert to Sump	1130	mm
	Total Depth	**1130**	**mm**

All drawing elevations are metres.

Designer Notes: