

Farhi Holdings Corporation

Functional Servicing and Stormwater Management Report

5855 Cabana Road East, Windsor, ON

Zoning By-law Amendment

Version: 2nd Submission

July 2026 – 23-6242

Submitted by

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1.0 Introduction

Dillon Consulting Limited (Dillon) has been retained by Farhi Holding Corporation to develop a functional servicing strategy to facilitate a proposed mixed-use development located at 5855 Cabana Road East, in the City of Windsor. This document outlines the servicing strategy, including supporting studies and related information for the transportation, sanitary, stormwater management, and watermain servicing for the site.

This phase of the overall proposed development has a total site area of approximately 2.09 ha (5.17 acres). The subject area is currently vacant agricultural land located adjacent to the future Windsor-Essex Acute Care Hospital at the southwest corner of the Cabana Road East and 9th Concession Road intersection. When fully developed, the subject site will consist of a hotel building (Hotel 'B-1' adjoined with Hotel 'B-2') with a total of 200 rooms and a 410.26 m² (4,416.00 ft²) commercial building for a Drive -through Restaurant. Vehicular access is proposed from 9th Concession Road and Cabana Road East. There are 300 parking spaces proposed for the hotel and commercial building. Refer to **Figure 1** in **Appendix A**.

1.1 Reference Documents

The following documents and drawings were referenced when completing this study:

- City of Windsor – Mapp My City system: Interactive Mapping;
- Windsor/Essex Region Stormwater Manual (WERSM, 2024); and
- City of Windsor Development Manual (May 2015).
- City of Windsor, Sandwich South Master Servicing Plan (May 2023).

2.0 Transportation Servicing

2.1 Existing Conditions

The subject site is bordered to the north by Cabana Road East, to the east by 9th Concession Road, to the west and to the south by future development lands.

The surrounding land uses include the Windsor Airport Lands to the north and the future site of the Windsor-Essex Acute Care Hospital to the east.

Currently, there are multiple access points to the property. Two entrances are located along the northeast section of the site from Cabana Road East, a third access is located at the southeast corner of the site from 9th Concession Road, and a fourth entrance is situated along the east side of the property, providing access to two existing residential dwellings on 9th Concession Road.

2.2 Proposed Conditions

The proposed development will consist of two new access points. The first proposed entrance will be located at the northwest limit of the property, from Cabana Road East. The second entrance will be located along the east limit of the property, from 9th Concession Road. The road layout of the proposed development is shown in **Figure 1** in **Appendix A**.

The pavement structure of the proposed driveway and parking area will be consistent with the Geotechnical report and will be finalized during detailed design.

A Traffic Impact Study (TIS) for this development is concurrently being completed and will be submitted under separate cover. Any upgrades that may be required to the existing road network that are identified in the report will be incorporated in the detailed design of this development.

3.0 Sanitary Servicing

3.1 Existing Servicing and Estimated Flows

Currently, there is an existing 1200mm diameter sanitary trunk sewer located on the north side of the Cabana Road East right-of-way.

3.2 Design Criteria

The design criteria used to estimate sanitary flows for the proposed development are summarized in **Table 1**.

Table 1: Sanitary Sewer Design Criteria

Criteria	Value
Hydraulic Sewer Sizing	Manning's Equation
Minimum Service Connection Size (mm)	150 diameter
Connection Depth at Property Line	
Minimum (m)	1.2
Maximum (m)	3.0
Manning's Roughness Coefficient 'n'	0.013
Velocity:	
Minimum (m/s)	0.75
Maximum (m/s)	3.00
Infiltration Allowance/Peak Extraneous Flow	0.156 L/s/ha
Population Densities For: Commercial Use	74 persons/Ha
Average Daily Sewage Flow For: Commercial/ Mixed-Use	363 L/capita/day
Hydraulic Sewer Sizing	Manning's Equation

3.3 Proposed Servicing and Estimated Flows

It is proposed that the private sanitary main on-site will be designed to have minimum cover at the upstream end with the proposed outlet to the deep sanitary trunk sewer on the north side of the Cabana Road East right-of-way. The proposed connection to the deep sanitary trunk sewer on the north side of Cabana Road East will be made via a drop structure located at the north limit of the subject site at the downstream end of the private sanitary main. The outlet pipe across Cabana Road East will be directionally bored across the road and the connection will be made to the existing 1200mm diameter sanitary trunk sewer using a doghouse manhole at the connection point.

Refer to **Figure 3** in **Appendix A** which illustrates the proposed sanitary servicing layout. The sanitary servicing for the proposed development is as follows:

- All sanitary flows from within the proposed development will be conveyed via local 200mm diameter private sanitary sewers within the proposed development;
- The proposed private sanitary sewer will outlet to the existing 1200mm diameter sanitary trunk sewer on the north side of the Cabana Road East right-of-way; and
- Effluent from the site will be conveyed through a proposed sampling manhole located at the downstream end of the proposed private sanitary main along the north property line (SMH 'C').

The average daily sanitary sewage flow rate for the site has been calculated using established design guidelines. The estimated peak design flow rate is 260,928 liters per day, or 3.06 liters per second. This calculation considers the anticipated commercial development, accounting for variations in water usage patterns and peak demand times.

For additional details on the flow rate calculations, refer to **Appendix B**.

4.0 Stormwater Servicing

4.1 Existing Conditions

The proposed development lands are currently undeveloped agricultural land. Elevation points of the area show that these lands naturally drain to the northeast limit of the site into an existing ditch. Stormwater drains into the North Townline Drain.

4.2 Design Criteria

The storm sewer design criteria for this property are outlined in **Table 2**. The design criteria were established by the WERSM (2024).

Table 2: Storm Sewer Design Criteria

Criteria	Windsor/Essex Region Stormwater Management Standards Manual
Stormwater Runoff	Hydrodynamic Model
Hydraulic Sewer Sizing	Manning's Equation
Sewer Sizing Rainfall Event	1:5-year event
Minimum Cover Depth (m)	1.07
Manning's Roughness Coefficient 'n'	0.013
Velocity:	
Minimum (m/s)	0.80
Maximum (m/s)	3.00
Roof Downspouts	Connected
Inlet Times:	15 minutes
Runoff Coefficients:	
Asphalt, Concrete, Roof Areas	0.95
Grassed Areas, Parkland	0.20
Commercial Land Use	0.90
Sewer Surcharging	Maximum hydraulic grade line is below road grade

4.3 Proposed Storm Servicing

It is proposed that the site's stormwater outlets to the existing municipal North Townline Drain on Cabana Road East via a pumped outlet. Refer to **Figure 3** in **Appendix A** for the proposed servicing. The stormwater servicing for the proposed development is as follows:

- The proposed site will be serviced through a new private storm sewer network constructed within the proposed development;
- The proposed storm sewers have been sized to convey the 1:5 Year storm event. Refer to the functional storm sewer design sheet provided in **Appendix B**;
- The parking lots and drive aisles, will be graded to allow for overland flow to be captured on-site and directed to the proposed storm sewer network. The ponding depth will not exceed 300mm for design events up to and including the 1:100 year storm event within the parking lot and drive aisle areas;
- Stormwater quantity control will be provided via surface ponding within the parking lots and drive aisles and a proposed grass depression basin adjacent to the west limit of the development area. Details are provided in the Stormwater Management Report in **Appendix C**;
- Stormwater quality control will be provided via an Oil and Grit Separator (OGS). Details are provided in the Stormwater Management Report in **Appendix C**; and,
- The minimum building opening elevation is 184.42 m, which is 0.3 m above the 1:100 year high water level on site of 184.72 m.

Details related to the stormwater quantity and quality control can be found in the Stormwater Management Report. This report has been included in **Appendix C**.

5.0 Watermain Servicing

5.1 Existing Conditions

There is an existing 25mm water service line provided to the subject site, located at the east limit of the property. The existing water service line connects to an existing 150mm diameter watermain along the 9th Concession Road right-of-way.

5.2 Proposed Servicing

Please refer to **Figure 3** in **Appendix A** which illustrates the proposed watermain servicing. The watermain servicing for the proposed development is as follows:

- It is proposed that the existing 25mm water service east of the subject site will be capped and abandoned, and a new connection southeast of the development will be provided to service the hotel buildings and Building 'A'.
- The internal development will be serviced by a new private 150mm diameter watermain constructed within the proposed development; and,
- The new private 150mm diameter watermain will connect to the existing 150mm diameter watermain within the 9th Concession Road right-of-way.

The detailed design of the watermain services will be consistent with the requirements of the City of Windsor and the Windsor Utilities Commission. Placement of fire hydrants for adequate fire protection will be completed during detailed design. No pressure/flow testing has yet been completed for this development.

6.0 Utilities

6.1 Gas

Existing natural gas service is available along Cabana Road East. During detailed design, future conversation on alignment and loading will be coordinated with Enbridge.

6.2 Bell

During detailed design, future conversations will be required with Bell.

6.3 Cogeco

During detailed design, future conversations will be required with Cogeco.

6.4 MNSi

During detailed design, future conversations will be required with MNSi Telecom.

6.5 Hydro One Networks

Existing service is available along Cabana Road East. During detailed design, future conversations will be required with Hydro One.

7.0 Conclusions

The review of the adjacent services has been found to be sufficient for the proposed development. The design of the proposed internal services will be finalized during detailed design.

Yours sincerely,

Dillon Consulting Limited



Kyle Edmunds, P.Eng.

Project Engineer



Dhruv Moradiya, EIT

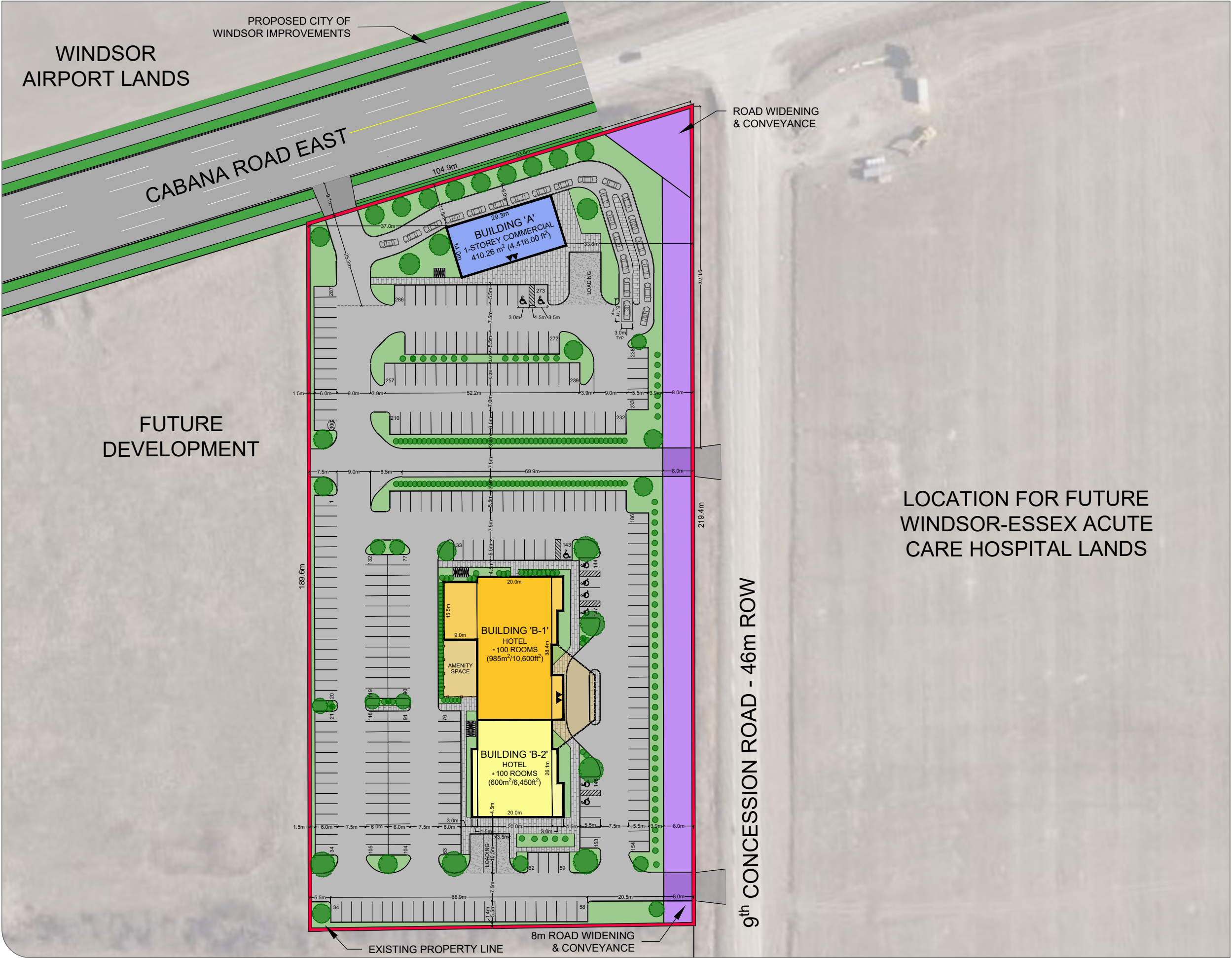
Civil Designer

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Appendix A

Concept Plan, Site Servicing and
Grading Plan



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

CONCEPTUAL DEVELOPMENT
PHASE 1

- SUBJECT AREA**
(±2.09 ha/5.17 ac)
- PROPOSED HOTEL - PHASE 1**
(±985m²/10,600ft²)
(100 ROOMS)
- PROPOSED HOTEL - PHASE 2**
(±600m²/6,450ft²)
(100 ROOMS)
- PROPOSED COMMERCIAL**
(±410m²/416ft²)
- PROPOSED LANDSCAPE**
- 8.00m ROAD WIDENING & LAND CONVEYANCE**
- PROPOSED SIDEWALK**
- PROPOSED BICYCLE PARKING (18 spaces)**

SITE DATA MATRIX

COMMERCIAL DISTRICT 4.1 (CD 4.1) ZONE

	ZONING BY-LAW	PROVIDED
SITE AREA	N/A	20,939.9m²
BUILDING AREA	N/A	1,700.3m²
LOT COVERAGE	N/A	8.1%
LOT FRONTAGE	N/A	104.9m
SETBACKS	N/A	FRONT: 11.5m INT. SIDE: 36.5m EXT. SIDE: 33.8m REAR: 29.2m
BUILDING HEIGHT (MAX)	20.0m	34.0m*
LANDSCAPED OPEN SPACE	N/A	30.0%
PARKING SPACES	COMMERCIAL: 55 HOTEL: 245** TOTAL: 300	COMMERCIAL: 55 HOTEL: 245 TOTAL: 300
ACCESSIBLE PARKING SPACES	TYPE A: 4 TYPE B: 5	TYPE A: 4 TYPE B: 5
STACKING SPACES	12	23
LOADING SPACES	COMMERCIAL: 1 HOTEL: 3	COMMERCIAL: 2 HOTEL: 3

*NOT IN CONFORMITY WITH PROPOSED ZONING BYLAW
**1,000m² CONSIDERED FOR RESTAURANT, CONVENTION HALL, MEETING ROOMS AND OTHER PLACES OF ASSEMBLY

SCALE: 1:1000 (11x17)



MAP/DRAWING INFORMATION:
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.

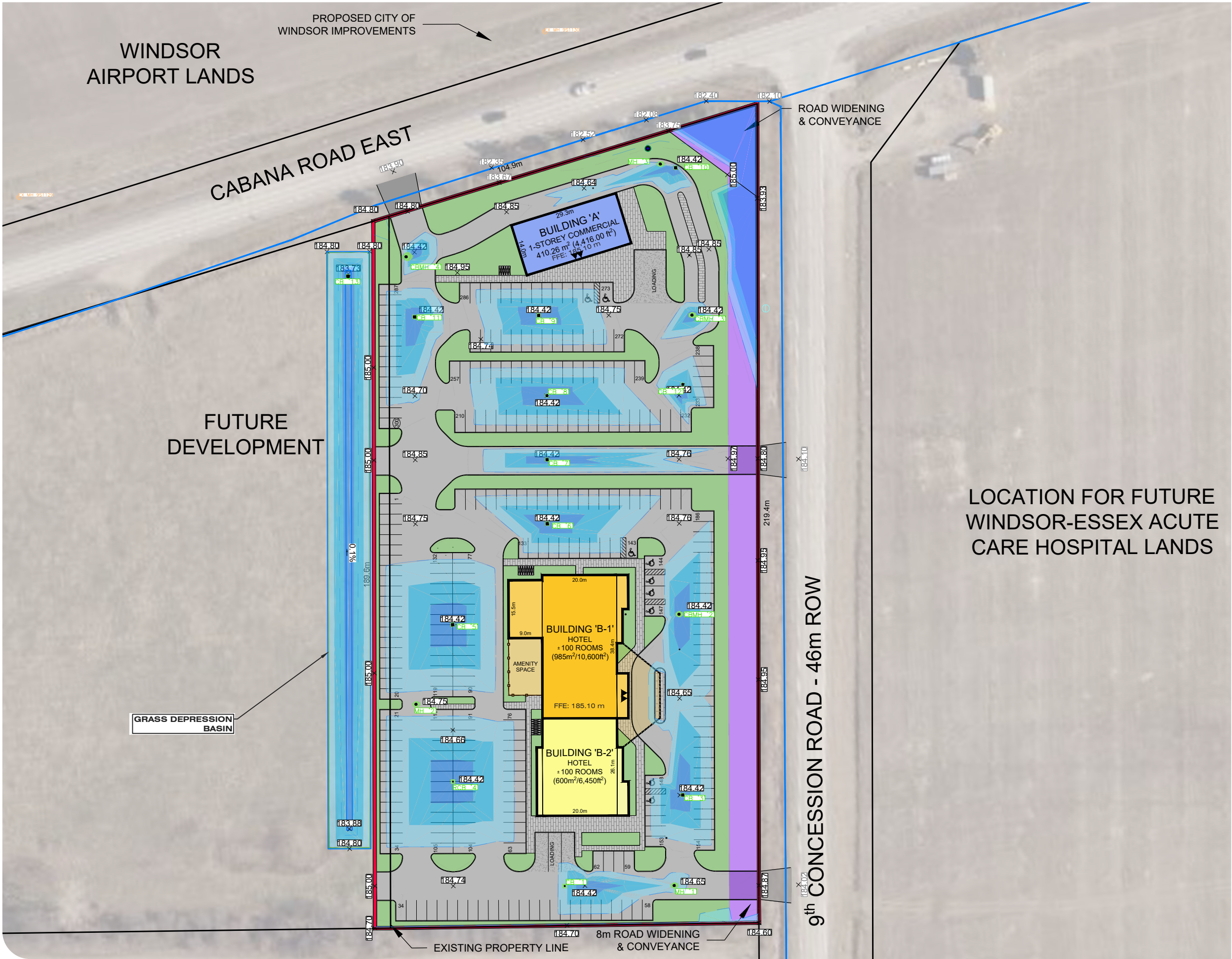
CREATED BY: JSC
CHECKED BY: KDT
DESIGNED BY: JSC

SOURCES:
COUNTY OF ESSEX AERIAL PHOTOGRAPHY (2025)

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conceptual plan.dwg
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PROJECT: 23-6242
STATUS: DRAFT
DATE: 01/29/2025



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

GRADING PLAN (PHASE 1)
FIGURE 2.0

-  SUBJECT AREA
(±2.09 ha/5.17 ac)
-  PROPOSED HOTEL - PHASE1
(±985m²/10,600ft²)
(100 ROOMS)
-  PROPOSED HOTEL - PHASE 2
(±600m²/6,450ft²)
(100 ROOMS)
-  PROPOSED COMMERCIAL
(±410m²/416ft²)
-  100-YR STORM EVENT
SITE PONDING AREAS (184.72m)

SCALE: 1:1000 (11x17)

MAP/DRAWING INFORMATION:
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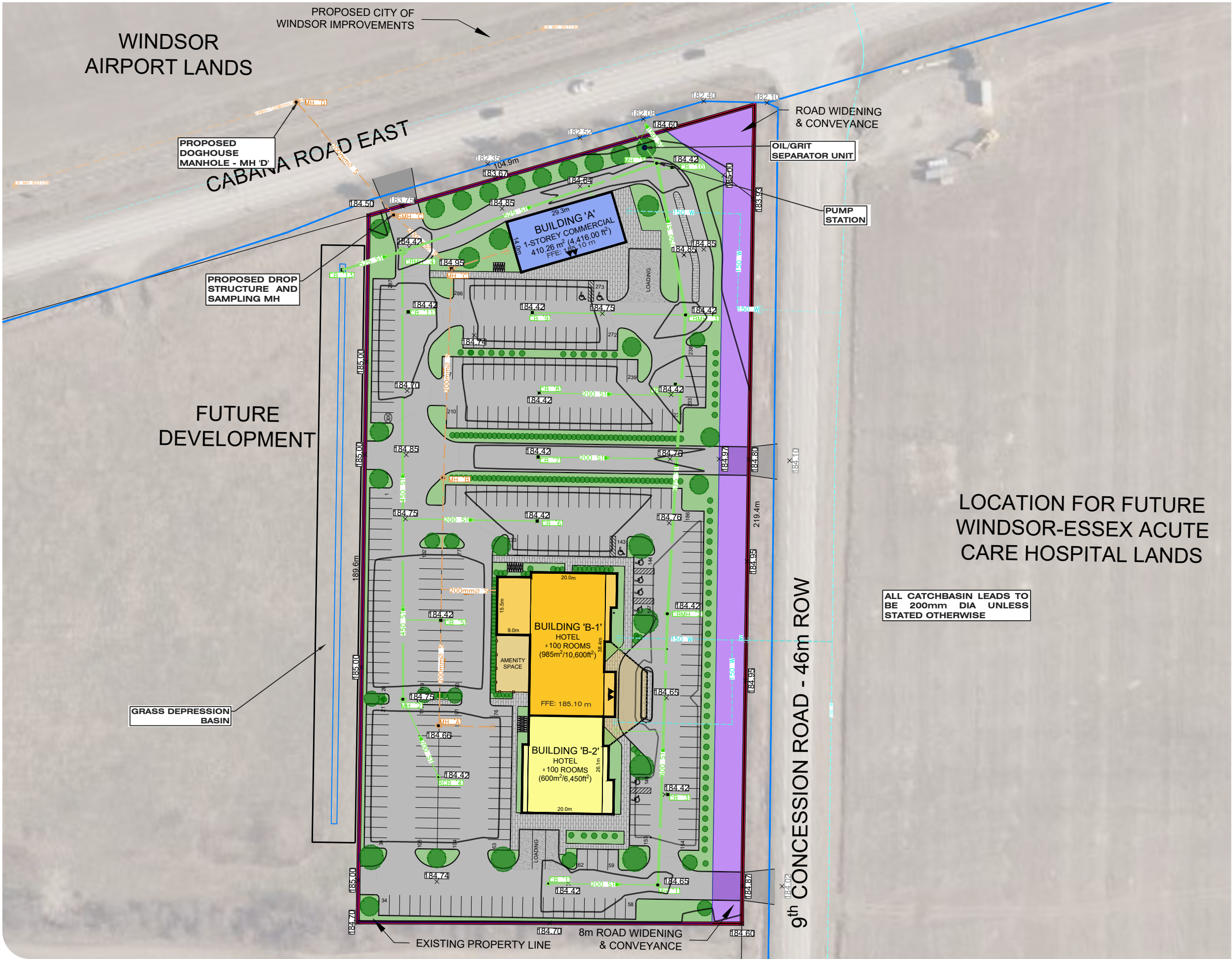
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COUNTY OF ESSEX AERIAL PHOTOGRAPHY

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PROJECT: 23-6242
STATUS: FINAL
DATE: 08/07/2026



SERVICING PLAN (PHASE 1)
FIGURE 3.0

- SUBJECT AREA
(±214,527 sq. ft./4.92 ac)
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING SANITARY
- EXISTING STORM
- EXISTING WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM
- PROPOSED WATERMAIN
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- CATCH BASINS

SCALE: 1:1000 (11x17)

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CREATED BY: JULIO SARTI CALDEIRA
CHECKED BY: KARL TANNER
DESIGNED BY: 360 SMART DESING

SOURCES:
- COUNTY OF ESSEX
AERIAL PHOTOGRAPHY

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Appendix B

Sanitary Sewer and Storm Sewer
Design Sheets

5855 COUNTY ROAD 42, TECUMSEH
SANITARY SEWER DESIGN SHEET

Project Name: 5855 County Rd 42, Tecumseh										Outlet Invert Elevation= 177.227																													
Project No: 236242										The Peaking Factor was derived: Using Harmon Formula= Y (Y or N) From a Table= N Value from table=										Residential Average Daily Flow= 363 L/Cap.D Peak Extraneous Flow= 0.156 L/Ha.S										Mannings 'n'= 0.013 Basement Floor Elevation = or Ground Elevation at Outlet = 183.690									
Municipality/Town										Total Area= 2.103										Hydraulic Grade Line Cover = HGL at Outlet =																			
Location			Flow Characteristics								Sewer Design/Profile										Cover			Hydraulic Grade Line															
ROAD/STN	LOCATION		INDIVIDUAL		CUMULATIVE		PEAKING FACTOR M	POP FLOW Q(p) (L/s)	PEAK EXTR. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE DIA. (mm)	Wall Thickness (mm)	SLOPE (%)	UPPER INVERT (m)	LOWER INVERT (m)	FALL (m)	VELOCITY (m/s)	DROP IN LOWER MANHOLE (m)	Ground Elevation Upper MH	Cover @ Up MH (m)	Cover @ Low MH (m)	HGL Elev at Upstream MH	HGL Elev vs. Grnd Elev @ Up MH	HGL Elev vs. Obvert @ Up MH													
	FROM MH	TO MH	POP	AREA (ha.)	POP	AREA (ha.)																																	
5855 Co Rd 42	MH A	MH B	43	0.576	43	0.576	4.33	0.775	0.090	0.86	32.80	66.5	200	30	1.00	181.402	180.737	0.665	1.04	0.050	184.060	2.428	3.333	0.008		INTERSECTS OBV													
5855 Co Rd 42	MH B	MH C	48	0.651	91	1.227	4.25	1.623	0.191	1.81	19.40	56.1	200	30	0.35	180.687	180.491	0.196	0.62	0.050	184.300	3.383	3.519	0.007		INTERSECTS OBV													
5855 Co Rd 42	MH C	SMH A	65	0.876	156	2.103	4.19	2.737	0.328	3.06	19.40	21.1	200	30	0.35	180.441	180.367	0.074	0.62	3.000	184.240	3.569	3.513	0.005		INTERSECTS OBV													
Co Rd 42	SMH A	MH D	0	0.00	156	2.103	4.19	2.737	0.328	3.06	19.40	40.0	200	135	0.35	177.367	177.227	0.140	0.62	0.000	184.110	6.408	6.128	0.003		INTERSECTS OBV													

5855 COUNTY ROAD 42, TECUMSEH
STORM SEWER DESIGN SHEET

Project Name: 5855 County Rd 42, Tecumseh
Project Number: 236242

Intensity Option # 1

1) Intensity (i) = a/(t+b)^c

2) Intensity (i) = a*t^b

3) Insert Intensity

Manning's n = 0.013

Based on 1:5 Year Storm Event
Lakeshore, Ontario

a= 1259.000
b= 8.800
c= 0.838

a=
b=

i=

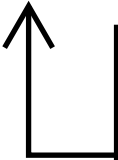
Total Area (ha)= 2.102

Outlet Invert Elevation= 182.440

Ground Elevation @ Outlet = 183.740

High Water Level at Outlet=

Location												Sewer Design / Profile										Cover				Hydraulic Grade Line	
Road /Stations	From MH	To MH	Area (ha)	Run. Coef.	2.78AC	Accum. 2.78AC	T of In (min)	T of F (min)	T of Conc. (min)	Intensity (mm/hr)	Exp. Flow (L/s)	Capacity (L/s)	Velocity (m/s)	Wall Thickness (mm)	Length (m)	Pipe Dia. (mm)	Slope (%)	Invert Up MH	Invert Low MH	Fall (m)	Drop Across Low MH (m)	Ground Elev Up MH	Cover @ Up MH (m)	Cover @ Low MH (m)	HGL Elevation at Upstream MH	HGL Elev vs. Grnd Elev @ Up MH	
5855 Co Rd 42	MH 1	CBMH 2	0.712	0.90	1.783	1.783	15.0	1.49	15.00	88.40	157.59	229.74	0.81	95.00	72.70	600	0.14	181.800	181.698	0.102	0.005	184.060	1.565	1.427	182.88	Okay	
5855 Co Rd 42	CBMH 2	CBMH 3	0.530	0.90	1.326	3.109	15.0	1.64	16.49	84.01	261.15	291.19	0.81	102.00	80.20	675	0.12	181.693	181.597	0.096	0.005	183.820	1.350	1.446	182.83	Okay	
5855 Co Rd 42	CBMH 3	MH 3	0.225	0.90	0.562	3.671	15.0	0.87	18.13	79.70	292.57	352.05	0.80	108.00	41.41	750	0.10	181.592	181.550	0.041	-1.025	183.820	1.370	1.342	182.75	Okay	
5855 Co Rd 42	MH 2	CBMH 4	0.523	0.90	1.308	1.308	15.0	2.49	15.00	88.40	115.67	127.50	0.80	64.00	119.96	450	0.20	181.918	181.678	0.240	0.005	184.150	1.718	1.628	182.99	Okay	
5855 Co Rd 42	CBMH 4	MH 3	0.112	0.90	0.279	1.588	15.0	1.47	17.49	81.32	129.12	177.32	0.82	89.00	72.22	525	0.17	181.673	181.550	0.123	-1.025	183.820	1.533	1.586	182.79	Okay	
5855 Co Rd 42	MH 3	OUTLET	0.000	0.90	0.000	5.259	15.0	0.25	19.00	77.61	408.16	15.23	0.86	27.00	13.02	150	1.00	182.575	182.445	0.130	0.005	183.750	0.998	1.118	182.73	Okay	



OUTLET IS RESTRICTED TO MEET THE ALLOWABLE RELEASE RATE OF 12.5 L/s.

SEE STORMATER MANAGEMENT REPORT IN APPEDIX C FOR ADDITONAL DETAILS.

Appendix C

Stormwater Management Report

Farhi Holdings Corporation

Stormwater Management Technical Design Brief

5855 County Road 42, Windsor, ON

Zoning By-law Amendment

July 2026 – 23-6242

Submitted by
Dillon Consulting Limited

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- B Post Development Modelling Analysis and SWM Design**

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by Farhi Holdings Corporation to develop a stormwater management (SWM) strategy for the proposed Phase 1 (2.10 ha) development located at 5855 Cabana Road (formerly referred to as County Road 42), Windsor, Ontario (the Site). The Site is proposed to be developed with a hotel, commercial area, parking lot and landscape/grass area and sits within the County Road 42 Secondary Planning Area (CR42 SPA). The Site is currently undeveloped and drains to the North Townline Municipal Drain and sits within the Little River Drain Watershed.

This technical design brief has been developed to support the Zoning By-Law Amendment application for the Site.

1.1 Background Review

The following background reports were reviewed for the site:

1. 1960 North Townline Drain Report, (Township of Sandwich South, January 1960)

- Reports the hydrological analysis of the municipal drainage watershed and original design of the municipal drain.

2. Sandwich South Master Servicing Plan (Dillon Consulting Ltd, May 2023) [SSMSP]

- The SSMSP outlines the necessary SWM improvements within the SSMSP. Specifically relating to the CR42 SPA and the Site, a regional wet pond (P8) with a pumping station, and storm sewers along both Cabana Road (i.e., County Road 42) and 9th Concession Road are proposed.

3. Upper Little River Watershed Drainage and Stormwater Management Master Plan, Class Environmental Assessment, (Stantec Consulting Ltd, January 2023) [ULRMP]

- Provide information about the existing condition of the Upper Little River watershed and gave direction to the regional SWM strategy which was considered in the SSMSP.

1.2 Stormwater Management Design Criteria

The SWM Design criteria for the Site are based on the following reference documents:

- Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003)
- City of Windsor Sandwich South Master Servicing Plan (Dillon Consulting Ltd. May,2023)
- Windsor/Essex Region Stormwater Management Manual (ERCA, June 2024) [WERSM]
- The site is located within the Upper Little River Watershed and Sandwich South Master Planning Area. The following design criteria will apply to the proposed development.

1.2.1 Design Storms

The following design storm events, as recommended in the WERSM, are to be used to assess the on-site storage requirements under post-development conditions:

- 2-Year, 4-hour design storm using Chicago distribution with a 15-minute time interval and a total rainfall depth of 32 mm.
- 2-Year, 24-hour design storm using SCS Type-II distribution with a 2-hour time interval and a total rainfall depth of 37.7 mm.
- 5-Year, 4-hour design storm using the Chicago distribution with a 15-minute time interval and a total rainfall depth of 49.5 mm.
- 100-Year, 4-hour design storm using the Chicago distribution with a 15-minute time interval with a total rainfall depth of 81.6 mm.
- 100-Year, 24-hour design storm using the SCS Type-II distribution with a 2-hour time interval and a total rainfall depth of 108 mm.
- Urban Stress Test (UST) storm using the Chicago distribution with a 15-minute time interval with a uniform distribution of an additional 42 mm for a total rainfall depth of 150 mm.

1.2.2 Quantity Control

Based on the recommendations in the ULRMP and SSMSP, flows off the site are to be restricted to a release rate of 6 L/s/ha under a developed conditions for all storms, up to and including, the governing 100-Year and UST events.

Surface ponding within parking lots and roadways are to be maintained below 0.30 m during all storms, up to and including the governing 100-Year event. During the UST event, ponding depths within the parking lot must be maintained below proposed building entrances.

1.2.3 Quality Control

Runoff produced by the Site is required to be treated to a "Normal" protection level, which is defined as the removal of 70% of total suspended solids (TSS) on an average annual basis. Water quality control design is to meet requirements set out within the WERSM for particle size distribution and rainfall intensity/rainfall volume relationships shown in Table 3.4.1.4 and Table 3.4.1.5 respectively.

1.2.4 Minor System Conveyance

Storm sewers on the Site are to be designed to a 5-Year level of service where the 5-Year Hydraulic Grade Line (HGL) in the sewer system is to be 0.30 m below the lowest road elevation.

1.2.5 Major System Conveyance

Major system overland flow depths along parking lots and roadways are to be maintained below 0.30 m in depth during all storms, up to and including, the governing 100-Year event.

2.0 Existing Conditions

The Site, encompassing a total of approximately 2.10 hectares, falls within the Essex Region Conservation Authority (ERCA) regulated area. The site is bound by Cabana Road to the north and 9th Concession Road to the east. Based on a review of the North Townline Drain Report and SSMSP, the Site sits within the North Townline drain watershed and currently conveys runoff to this drain. The existing conditions drainage area plan is shown in **Figure 1.0**.

2.1 Existing Condition Hydrogolic Analysis

A total catchment area of 2.10 ha was used for the pre-development condition analysis, as shown in the pre-development drainage area plan provided in **Figure 1.0**. Based on a review of the ERCA public interactive mapping, existing soil conditions on the site consist of Brookston Clay which has a hydrologic soil group (HSG) D classification. The Green-Ampt infiltration method was used in the model to calculate infiltration losses.

The existing conditions (pre-development) modelling parameters and design inputs, soils map and model schematic are presented in **Appendix A**.

The hydrological model parameters have been developed using the WERSM, considering the SSMSP allowable release rate for the development area of 6 L/s/ha.

As per the WERSM, the following storm events were simulated:

- 2-Year, 4-hour design storm using Chicago distribution with a 15-minute time interval and a total rainfall depth of 32 mm.
- 2-Year, 24-hour design storm using SCS type II distribution with a 2-hour time interval and a total rainfall depth of 37.7 mm.

Provided below in **Table 1** are the pre-development modelling parameters used for the site.

Table 1: Pre-Development Model Parameters

Site	Drainage Area (ha)	Impervious Value (%)	Sub-Catchment Parameters
5855 Cabana Road	2.10	2.14%	Flow Length = 209m Slope = 0.5% Impervious Depression Storage = 2.5 mm Pervious Depression Storage = 7.5 mm Manning's N Impervious = 0.013 Manning's N Pervious = 0.12 <u>Green-Ampt Infiltration Parameters (Type D Soil):</u> Suction Head = 180 mm Conductivity = 0.50 mm/hr Initial Deficit (normal) = 0.10

The peak flow results for the existing site are shown below in **Table 2**.

Table 2: Pre-Development Peak Flows

Site	Chicago 1:2 Year 4 Hour Uncontrolled (L/S)	SCS Type II 1:2 Year 24 Hour Uncontrolled (L/S)
5855 Cabana Road	49	36

2.2 Allowable Release Rate

As mentioned in Section 1.2.2, the SSMSPP identified that developments within the study area are to control flows to the allowable release rate of 6 L/s/ha. A comparison of the SSMSPP allowable release rate for developments in comparison to the existing condition hydrologic analysis are provided below:

- Site Area: 2.10 ha
- Governing 2-Year Site Flow = 36 L/s
- **SSMSPP Allowable Release Rate for the Site= 12.6 L/s**

Based on the above noted findings, an allowable release rate of 12.6 L/s will govern the site SWM quantity control design for the Site.

3.0 Post Development Conditions

For the proposed condition modelling analysis, the site was assessed using the PCSWMM modelling software as a lumped catchment. Modelling parameters to represent a developed condition are shown below in **Table 3**.

Table 3: Post Development Model Parameters

Site	Drainage Area (ha)	Impervious Value (%)	Sub-Catchment Parameters
5855 Cabana Road	2.10	90%	Flow Length = 197 m Slope = 1 % Impervious Depression Storage = 2.5 mm Pervious Depression Storage = 7.5 mm Manning's N Impervious = 0.013 Manning's N Pervious = 0.12 <u>Green-Ampt Infiltration Parameters (Type D Soils):</u> Suction Head = 180 mm Conductivity = 0.50 mm/hr Initial Deficit (normal) = 0.10

The proposed condition PCSWMM model schematic is provided in **Appendix B**. The post development drainage area plan is provided in **Figure 2.0**.

3.1 Stormwater Management Design and Analysis

The SWM design for Phase 1 of the Site is to include both water quantity and water quality control.

3.1.1 Water Quantity Control

Based on the proposed condition modelling for the Site, the water quantity control volume requirements for the development during the 5-Year, 100-Year and UST storm events are presented below in **Table 4**.

Table 4: Water Quantity Control Volume Requirements

Return Period Event	Allowable Release Rate (L/s)	Storage Requirement (m ³)
Chicago 5-Year, 4-hour	12.6 L/s	847
Chicago 100-Year, 4-hour	12.6 L/s	1,519
SCS Type II 100-Year, 24-hour	12.6 L/s	1,643
UST	12.6 L/s	2,352

On-site quantity control is proposed through a combination of parking lot storage areas, pipe storage and a temporary grass depression basin as shown in **Figure 3.0**. The lands west of the proposed development site for the grass depression basin is currently owned by Farhi Holdings Corporation for future development phasing. At the onset of future planning and design for the next phase of development, consideration will be had for the abandonment of the depression basin and any necessary storage compensation will be accounted for. The design for the temporary grass depression basin is as follows:

- Basin Bottom Dimensions: 150 m x 1.5 m
- Bottom of Basin Elevation = 183.73 m
- Basin Top Dimensions: 160 m x 11.5 m
- Total Basin Depth = 1.07 m
- Top of Basin Elevation= 184.80 m
- Side Slopes = 5:1

The proposed design is required to meet the SWM quantity control requirements based on the current allowable release rate for the Site at this time. Flows are to be controlled into the North Townline Drain using a pump station outlet with a maximum flow rate of 12.6 L/s.

A summary of the required and provided storage for Phase 1 of the Site is presented in **Table 5**. Additional modelling results for the post-development conditions are provided in **Appendix B**.

Table 5: Quantity Control Storage Summary

Return Period Event	Storage Requirement (m ³)	Storage Provided (m ³)	On-Site Water Surface Elevation (WSEL) (m)
Governing 100-Year Storm	1,643	1,657	184.72
UST	2,352	2,539	184.79

The results shown in **Table 5** account for storage within storm sewers, parking lot areas, and the temporary grass depression basin for the Site. Further breakdown of the provided site storage is provided in **Appendix B**. Based on the proposed grading for the site, runoff during the UST storm event is contained within the site and grass depression basin. Parking lot ponding depths during the 100-Year event are maintained below 0.30 m.

During detail design, the SWM quantity control design will be further refined to reflect the final grading and servicing for the development.

3.1.2 Water Quality Control

As discussed in **Section 1.2.3**, to meet the water quality requirements of the site at a 'Normal' protection level water quality treatment (70% TSS removal) and requirements set out within the WERSM, an oil and grit separator (OGS) unit is proposed. The FD-4HC model supplied by ADS, or approved equivalent is recommended for this site which provides a TSS removal efficiency of 72.0%.

The details of this OGS sizing are provided in **Appendix B**.

3.1.3 Conveyance

Storm sewers for the site have been designed for a 5-Year level of service and further detailed in the Functional Servicing Report for the Site.

4.0 Development Floodproofing

All buildings on the Site are to be built with a minimum building opening elevation at least 0.30 m higher than the governing floodproofing level between the 100-Year water surface elevation (WSEL) on the Site of 184.72 m and the 100-Year flood elevation of the North Townline Drain. Based on correspondence with ERCA, the North Townline Drain has a 100-Year flood level of 184.12 m.

A minimum building opening elevation of 185.02 m (governed by the Phase 1 Site's 100-Year WSEL) will be considered during detailed design. Correspondence with ERCA is provided in **Appendix B**.

5.0 Erosion and Sediment Control

Erosion and sediment control measures are to be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987) and "Construction Specification for Temporary Erosion and Sediment Control Measures" (OPSS 805).

6.0 Conclusions

The SWM design proposed for Phase 1 (2.10 ha) of the 5855 Cabana Road property meets all regional and provincial requirements to satisfy the Zoning Bylaw application requirements at this time.

Based on the analysis performed, the Site under a developed condition is to have the following SWM strategy:

- Maximum allowable release rate of 12.6 L/s, based on the SSMSPP (Dillon, 2023). The peak discharge from the site will be restricted to this value for all events up to and including the 100-Year and UST storm event.
- Runoff from the site will be restricted into the existing North Townline Municipal Drain through a pump station outlet.
- Estimated on-site storage volume of 1,657 m³ is provided on-site to restrict flows to the allowable release rate during the governing 100-Year event.
- Estimated on-site storage of 2,539 m³ is provided to restrict flows to the allowable release rate during the UST event.
- On-site storage is being achieved through the accommodation of surface ponding around CB locations in parking lot areas, pipe storage, and within a temporary grass depression basin. The temporary grass depression basin will be abandoned during future phases of the development, and compensation considered at that time.
- Water quality control will be achieved using a FD-6HC sized OGS unit to achieve 70% TSS removal over an average annual basis.
- A minimum building opening elevation of 185.02 m (governed by the Phase 1 Site's 100-Year WSEL) will be considered during detailed design.

This report is respectfully submitted for review and approval. Should you have any questions, we would be pleased to discuss the results of our evaluation in further detail.



Ryan Langlois, P.Eng.
Water Resources Engineer



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

**PRE-DEVELOPMENT DRAINAGE AREA
PLAN**
FIGURE 1.0

 SUBJECT AREA
(±2.09 ha/5.17 ac)

SCALE: 1:1000 (11x17)



MAP/DRAWING INFORMATION:
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL DIMENSIONS AND
BOUNDARY INFORMATION SHOULD BE VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.

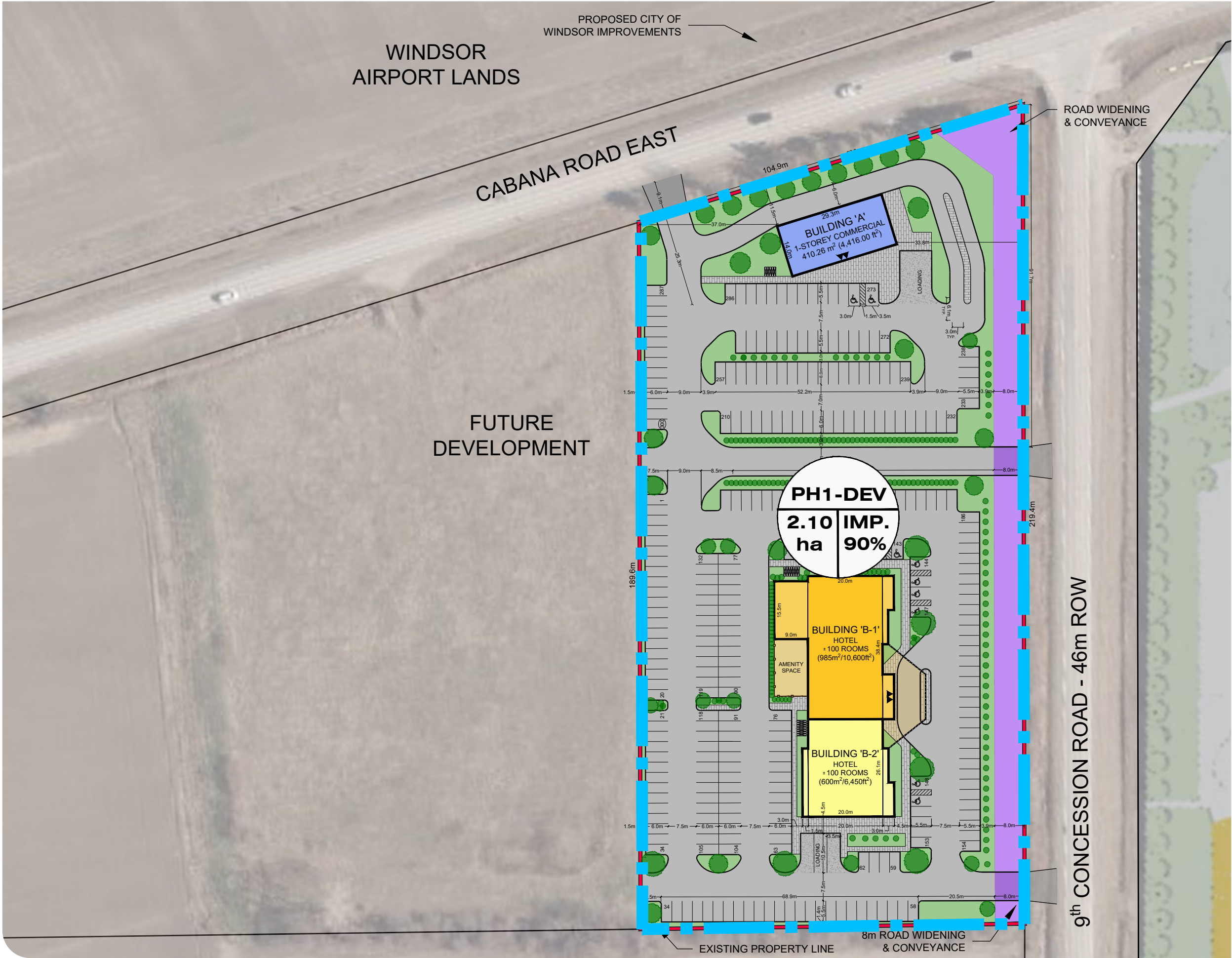
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PROJECT: 23-6242
STATUS: FINAL
DATE: 08/07/2026



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

POST-DEVELOPMENT SITE PLAN
FIGURE 2.0

- SUBJECT AREA**
(±2.09 ha/5.17 ac)
- PROPOSED HOTEL - PHASE1**
(±985m²/10,600ft²)
(100 ROOMS)
- PROPOSED HOTEL - PHASE 2**
(±600m²/6,450ft²)
(100 ROOMS)
- PROPOSED COMMERCIAL**
(±410m²/416ft²)
- PROPOSED LANDSCAPE**
- PROPOSED SIDEWALK**
- 8.00m ROAD WIDENING & LAND CONVEYANCE**

ID

xx.x
ha

%
IMP.

CATCHMENT ID
AREA / IMPERVIOUSNESS

CATCHMENT BOUNDARY

NOTES:
1- PROPOSED CITY OF WINDSOR ROAD IMPROVEMENTS (AS PER CLASS EA STUDY)

SCALE: 1:1000 (11x17)



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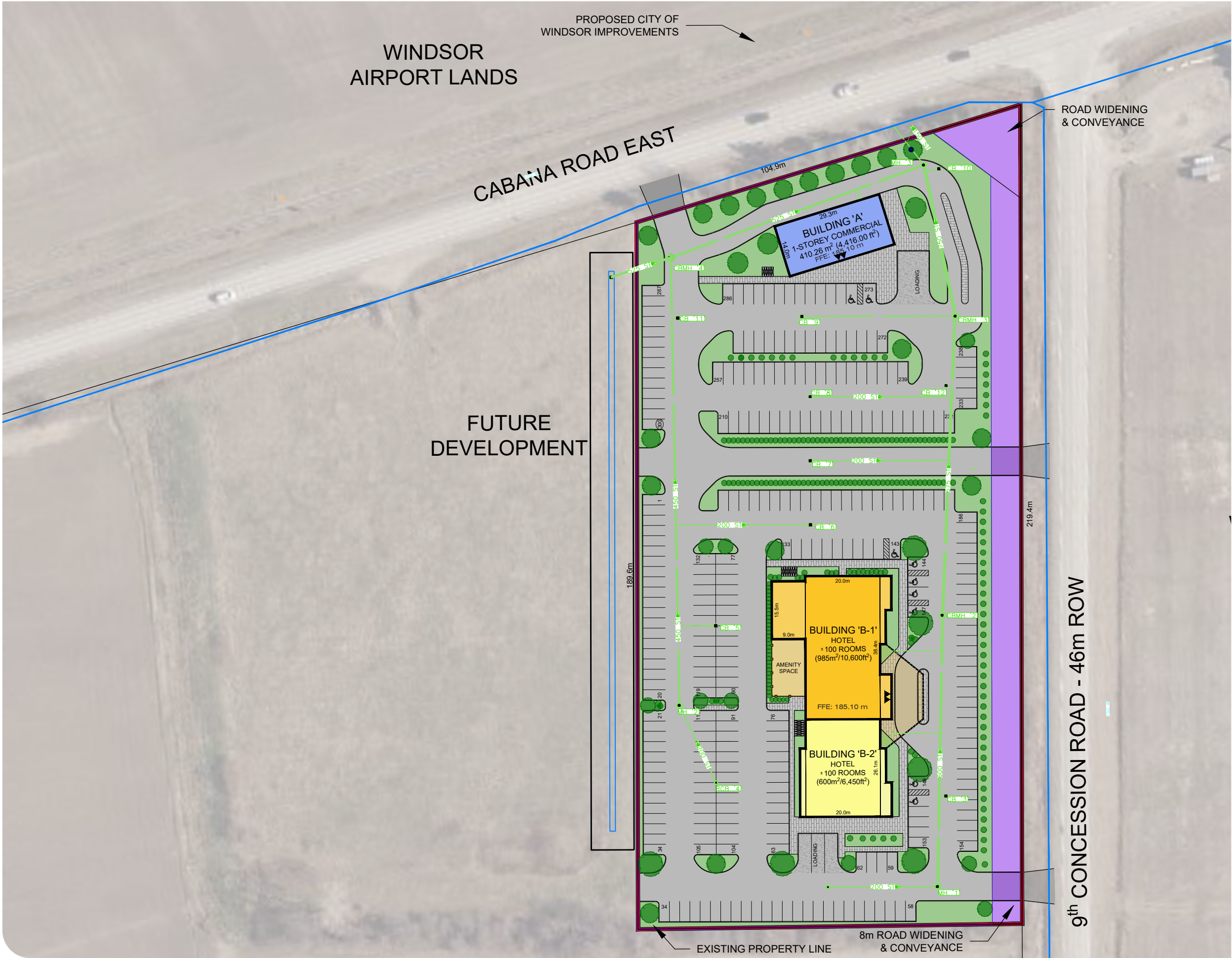
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PROJECT: 23-6242
STATUS: FINAL
DATE: 08/07/2026



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

STORMWATER MANAGEMENT AND DRAINAGE PLAN
FIGURE 3.0

- SUBJECT AREA
(±2.09 ha/5.17 ac)
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED OGS UNIT
- PUMP STATION
- EXISTING STORM
- PROPOSED STORM
- CATCH BASINS

SCALE: 1:1000 (11x17)



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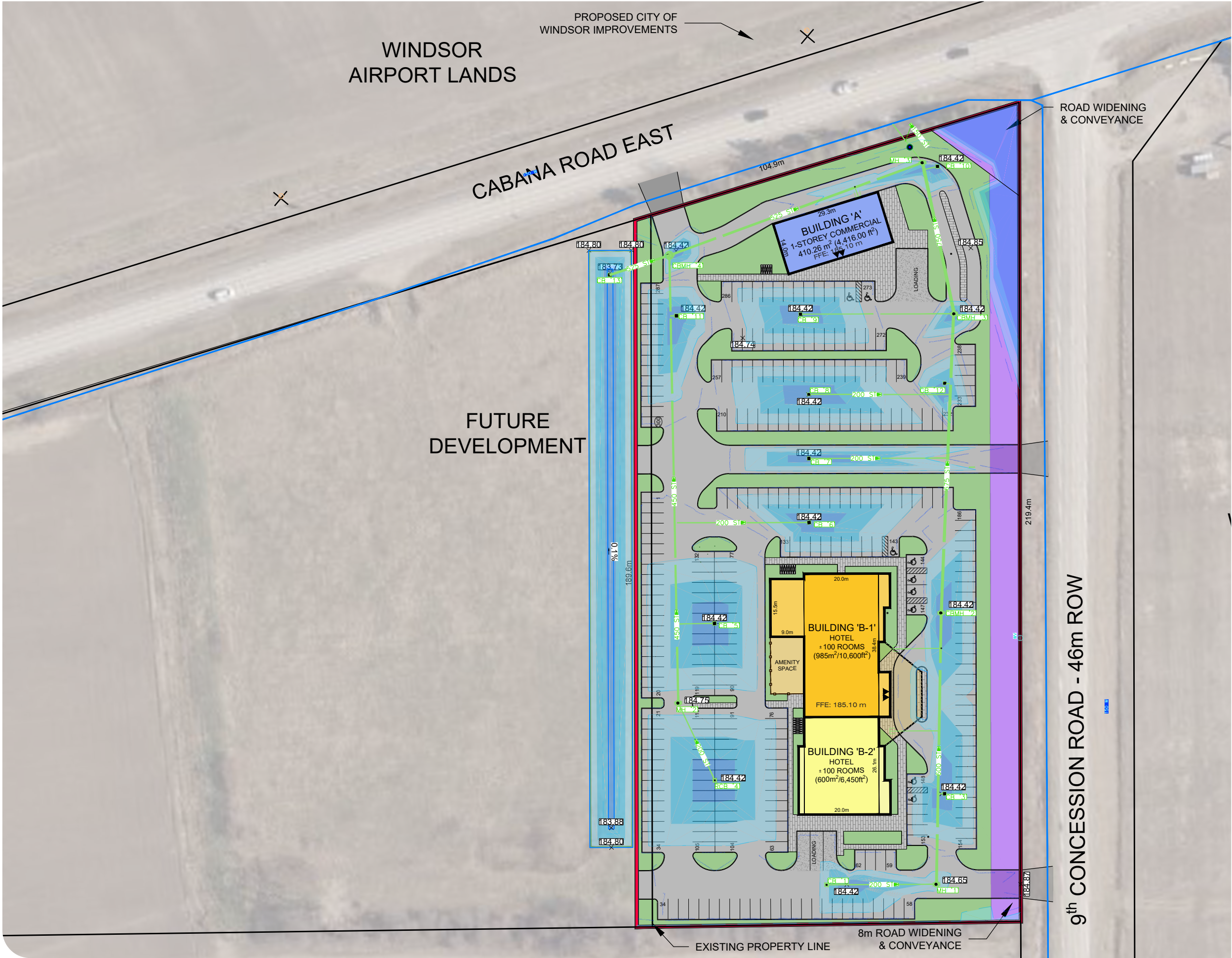
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PROJECT: 23-6242
STATUS: FINAL
DATE: 08/07/2026



FARHI HOLDINGS CORPORATION
CABANA ROAD EAST AT 9TH CONCESSION

SURFACE PONDING AREA PLAN
FIGURE 4.0

- SUBJECT AREA
(±2.09 ha/5.17 ac)
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED OGS UNIT
- PUMP STATION
- EXISTING STORM
- PROPOSED STORM
- CATCH BASINS
- 100-YR STORM EVENT
SITE PONDING AREAS (184.72m)
- URBAN STRESS TEST EVENT
SITE PONDING AREA (184.79m)

SCALE: 1:1000 (11x17)



MAP/DRAWING INFORMATION:
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CREATED BY: NTH
CHECKED BY: RTL
DESIGNED BY: NTH

SOURCES:
- COUNTY OF ESSEX
AERIAL PHOTOGRAPHY

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PROJECT: 23-6242
STATUS: FINAL
DATE: 08/07/2026

Appendix A

Background Information and
Pre-Development Modelling
Analysis



Langlois, Ryan <rlanglois@dillon.ca>

5855 County Road 42 Development: Request for Floodproofing Requirements

Tian Martin <TMartin@erca.org>

Mon, Oct 21, 2024 at 11:52 AM

To: "Langlois, Ryan" <rlanglois@dillon.ca>

Cc: Lina Florian <LFlorian@erca.org>, Stefano Forest <sforest@dillon.ca>

Hi Ryan,

I have attached the floodplain map at this location. Please note that the layout out of the future site plan may allow for some slight adjustments to the values below. The values below are based on the governing modelled water level for the extent of this property.

The 1:100 year Natural Hazard Water Level at this property is 184.12m CGVD28:78. The lowest building opening elevation for this property can be no lower than the greater of the following:

- Natural Hazard 1:100 year Water Level + Freeboard = 184.42m CGVD28:78
- Calculated on-site 1:100 year High Water Level (HWL) + 0.30 metres
- Calculated on-site Stress Test Water Level

Applicable setbacks from the municipal drains will apply to the future development of this site. Additionally, based on the mapping, the floodway may extend onto a portion of the property. In the floodway area, development is prohibited without providing an assessment to ensure no negative impact which may include requiring floodplain compensation.

The minimum road elevation to comply with ERCA policies is 183.82m CGVD28:78.

Please note that this information does not constitute any type of approval for this development and that the information provided to you is of a preliminary nature only and based on our limited understanding of the proposed development.

Thanks,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6

P. 519-776-5209 x 304 • F. 519-776-8688

tmartin@erca.org www.essexregionconservation.ca

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tmartin@erca.org www.essexregionconservation.ca

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FloodHazard_LittleRiver_GridIndex_L_1067mm_x_762mm_102.pdf
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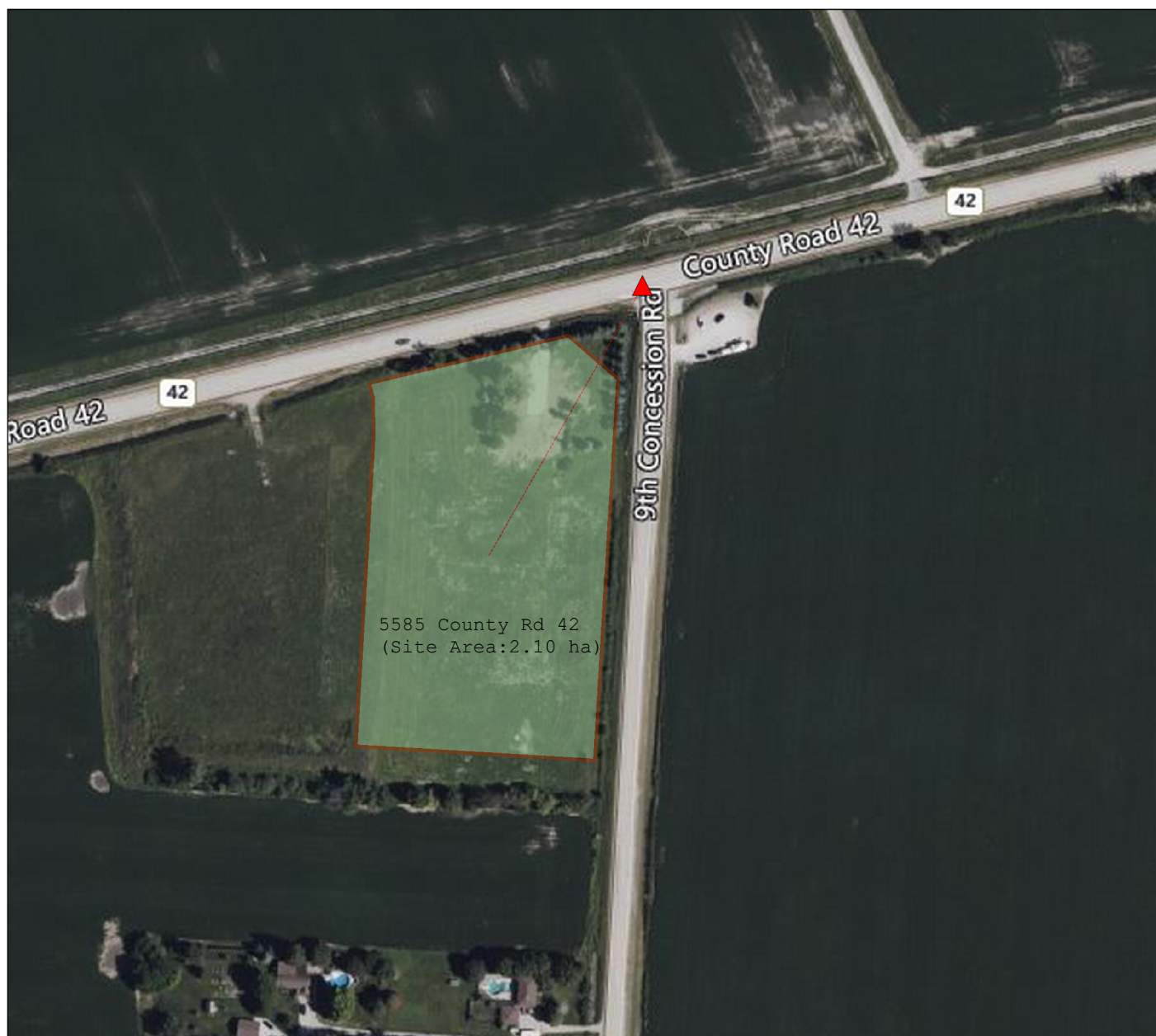
County Rd 42

Soil Type: BC (Brookston Clay)

Bc

9Th Con Rd

Soil Information from:
ERCA Public Interactive Mapping

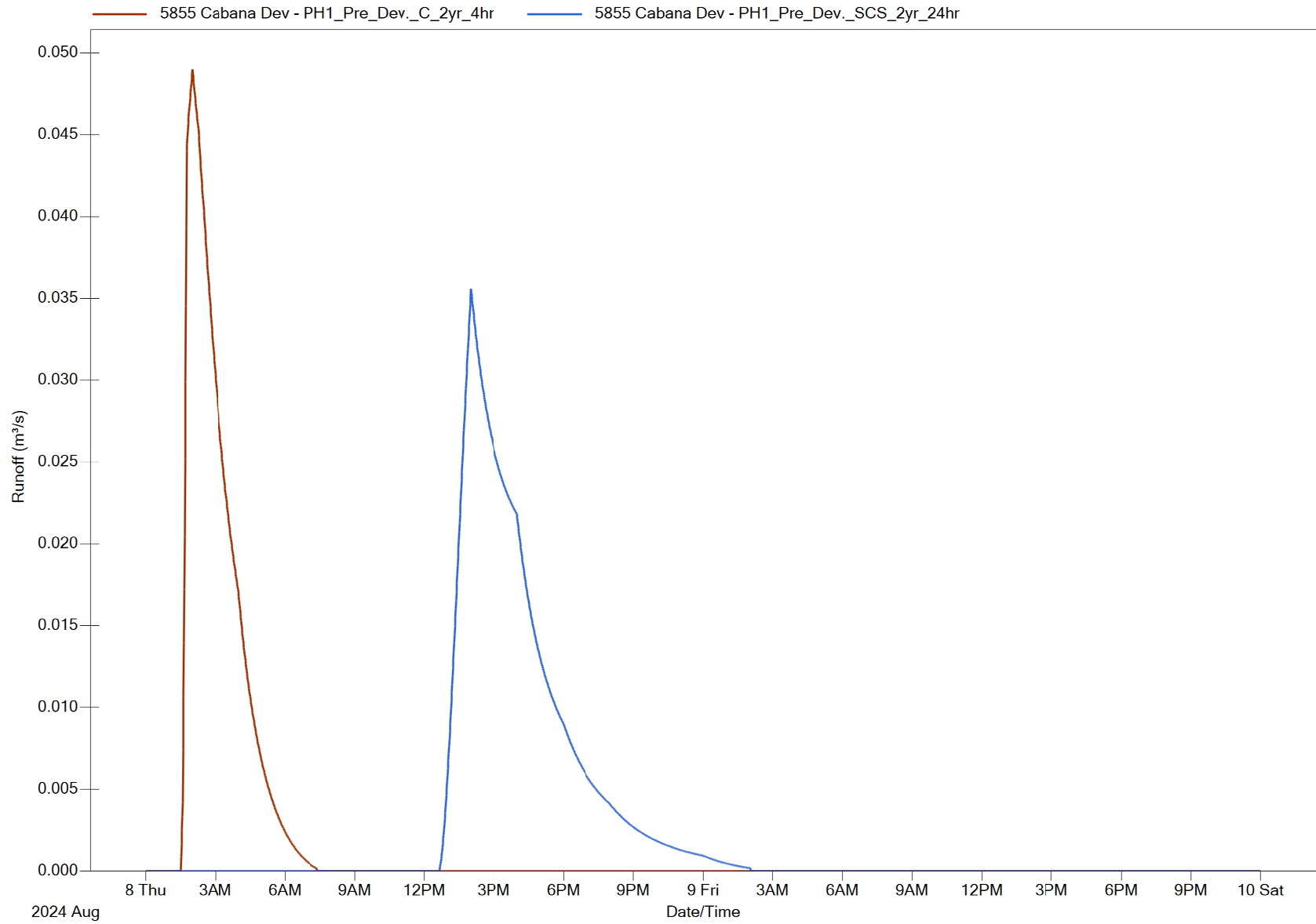


Pre-development Model Schematic

- ▲ Outfalls
- ▭ Subcatchments



5855 Cabana Road - Farhi Development Site



Appendix B

Post Development Modelling
Analysis and SWM Design

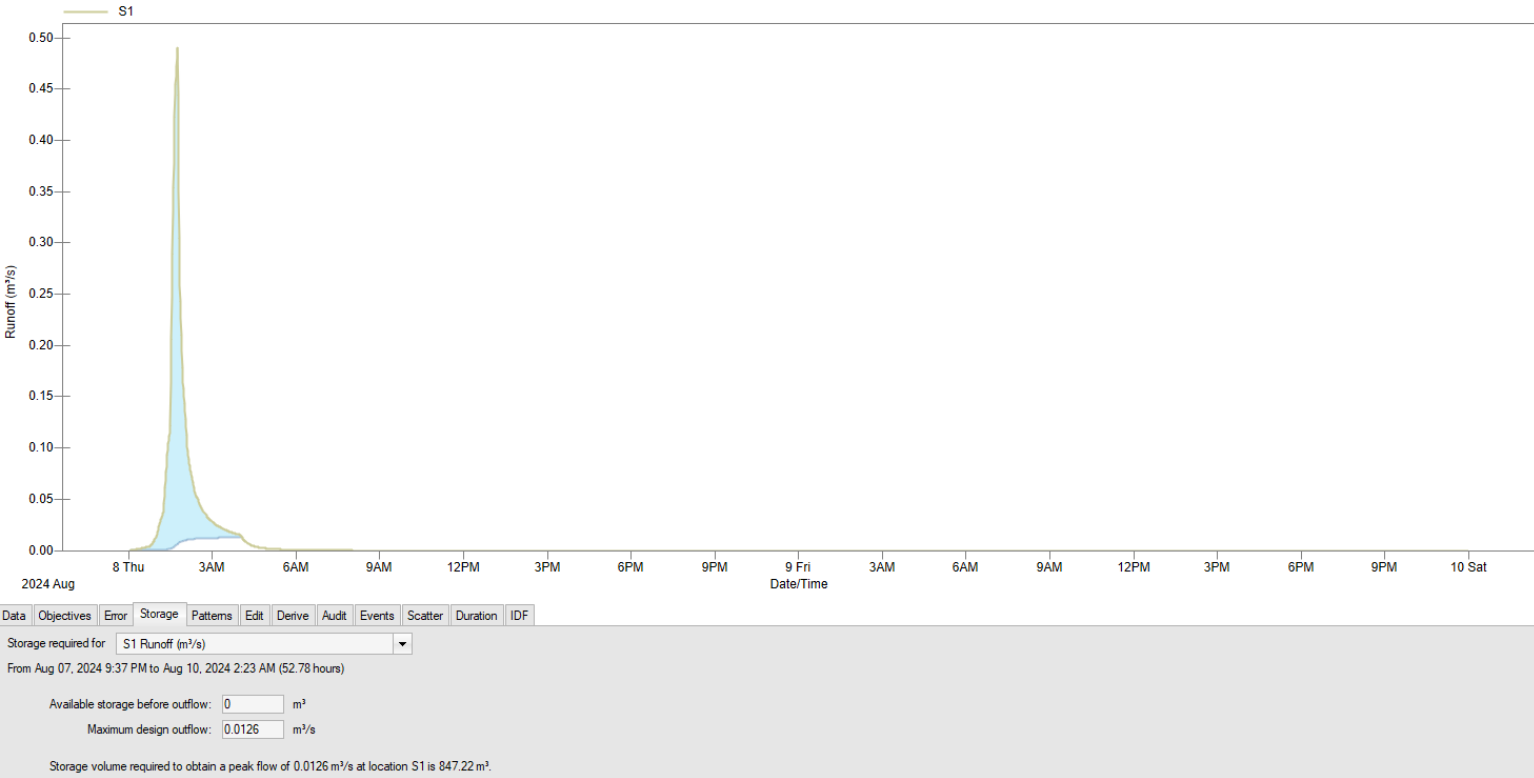


Post-development Model Schematic

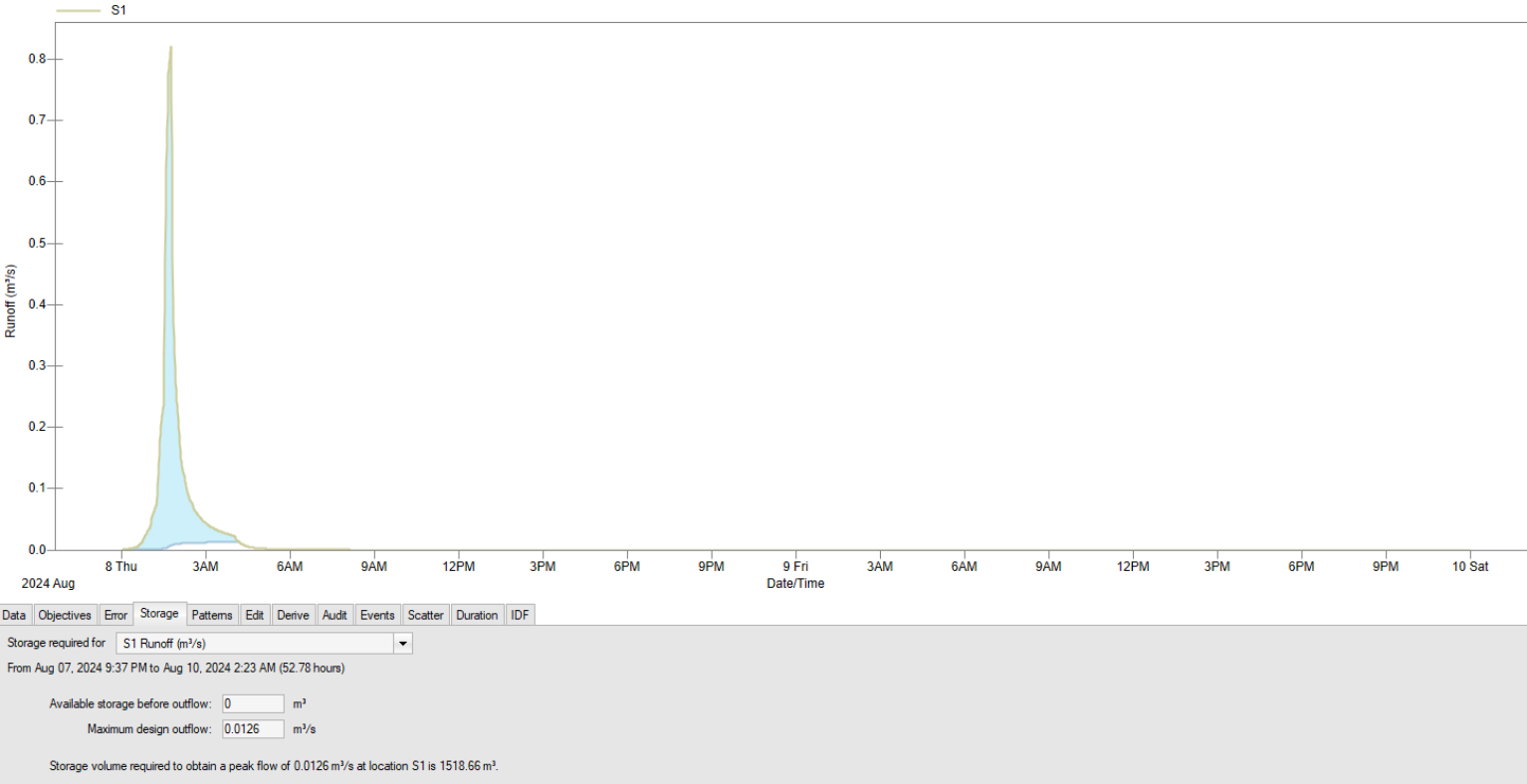
- ▲ Outfalls
- Subcatchments



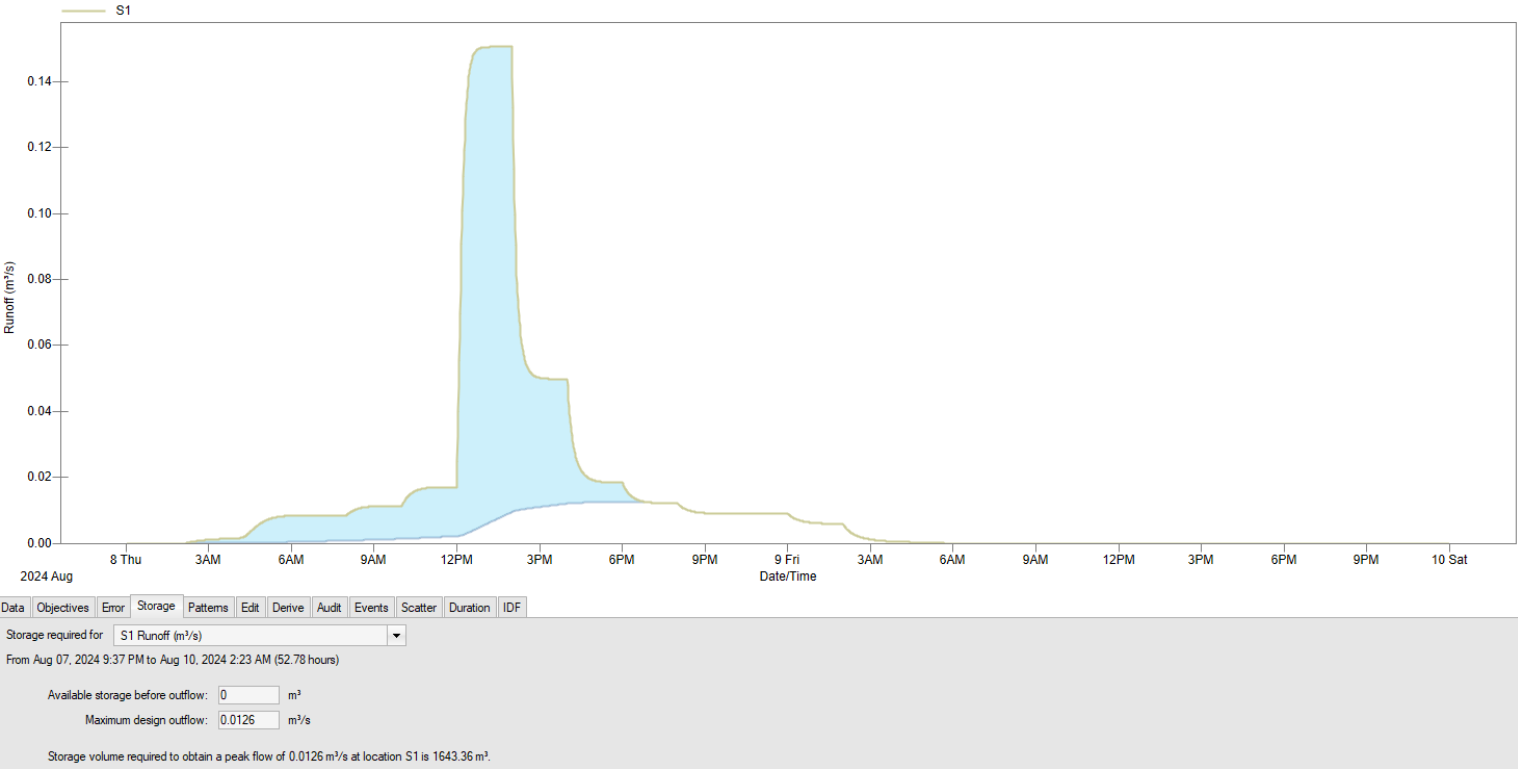
Required Volume under Chicago 5-Year, 4-hour



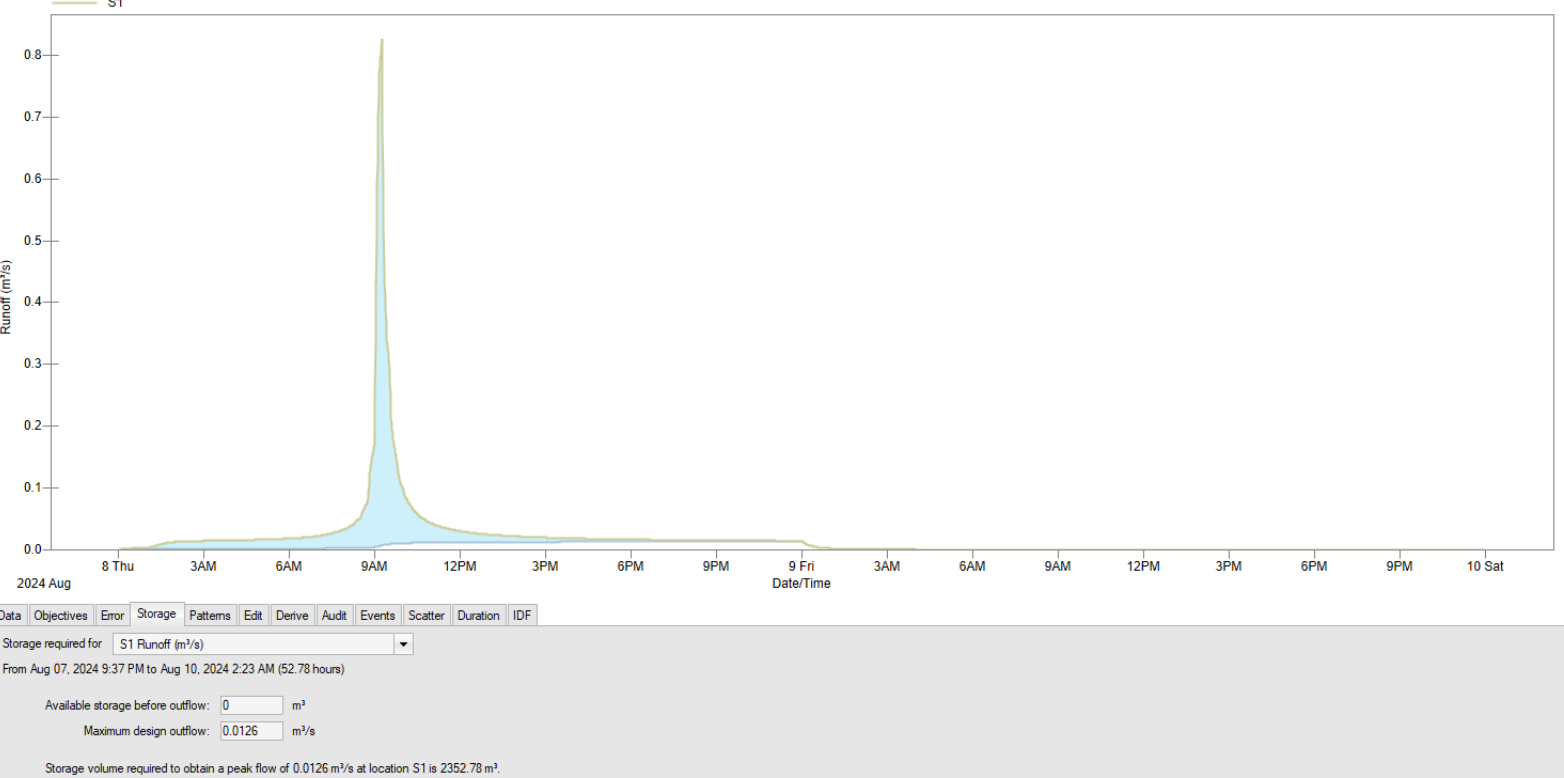
Required Volume under Chicago 100-Year, 4-hour



Required Volume under SCS Type II 100-Year, 24 hour



Required Volume under UST



100-Year and UST On-site Surface Storage Provided

Storage Volume on Site - SCS 100 Yr Event (184.72m)			
	Design	Required	
Grass Depression Basin	875.00m3	1,643.00	m3
Storm Pipes	93.60m3		
Storm Structures	8.48m3		
Parking Area	680.00m3		
Total	1,657.08m3	1,643.00	m3

Storage Volume on Site - UST (184.79m)			
	Design	Required	
Grass Depression Basin	997.00m3	2,352.00	m3
Storm Pipes	93.60m3		
Storm Structures	8.48m3		
Parking Areas	1,440.00m3		
Total	2,539.08m3	2,352.00	m3

Storm Structure Volume					
Structure	Length (m)	Width/DIA (m)	Depth (m)	Area (m2)	Volume (m3)
CB (x11)	0.6	0.6	1	0.36	3.96
MH (x4)	1.2		1	1.13	4.52
Total					8.48

Storm Pipe Volume					
	Dia (mm)	Dia (m)	Length (m)	Area (m2)	Volume (m3)
Services/C	200	0.2	24.07	0.03	0.76
	200	0.2	22.91	0.03	0.72
	200	0.2	9.81	0.03	0.31
	200	0.2	35.33	0.03	1.11
	200	0.2	40.65	0.03	1.28
	200	0.2	37.80	0.03	1.19
	200	0.2	19.99	0.03	0.63
	200	0.2	41.25	0.03	1.30
Sewers	600	0.6	72.70	0.28	20.56
	675	0.45	80.20	0.16	12.76
	750	0.75	41.41	0.44	18.29
	450	0.45	119.96	0.16	19.08
	525	0.525	72.22	0.22	15.63
Total	* Including Services				93.60



ADS OGS Sizing Summary

Project Name:	5585 Cabana Road Farhi Development
Consulting Engineer:	Dillon Consulting Limited
Location:	Windsor, Ontario
Sizing Completed By:	Haider Nasrullah
Email:	haider.nasrullah@adspipe.com

Treatment Requirements

Treatment Goal:	Normal (MOE)
Selected Parameters:	70% TSS 90% Volume
Selected Unit:	FD-4HC

Summary of Results

Model	TSS Removal	Volume Treated
FD-4HC	72.0%	88.7%
FD-5HC	76.0%	>90%
FD-6HC	78.0%	>90%
FD-8HC	82.0%	>90%
FD-10HC	86.0%	>90%

FD-4HC Specification

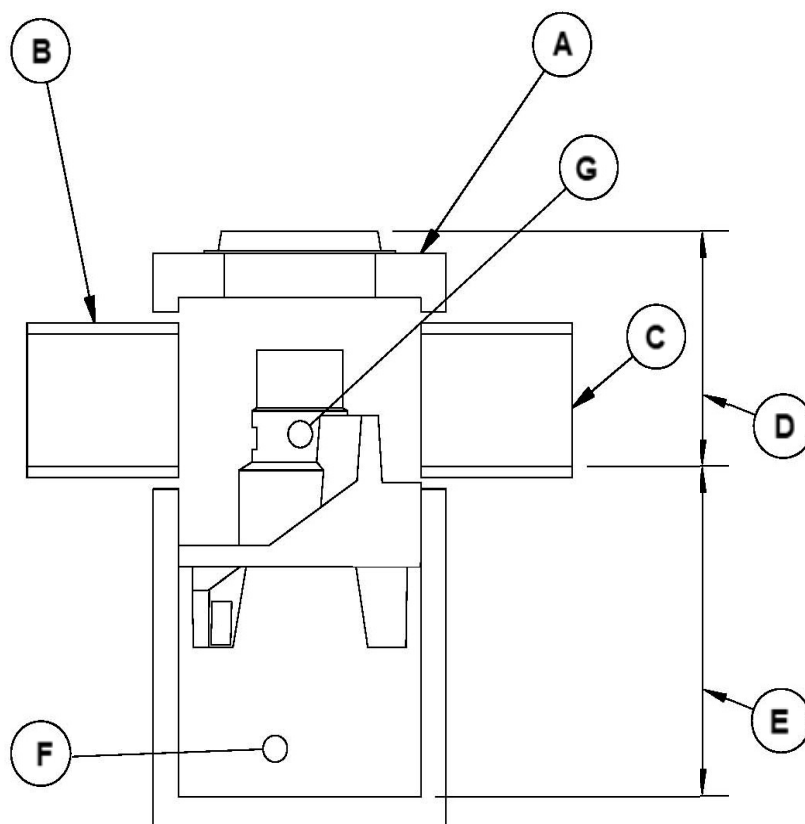
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	600 mm
Outlet Pipe Diameter (C):	600 mm
Height, T/G to Outlet Invert (D):	2000 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m ³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s

Site Elevations:

Rim Elevation:	100.00
Inlet Pipe Elevation:	98.00
Outlet Pipe Elevation:	98.00

Site Details

Site Area:	2.10 ha
% Impervious:	90%
Rational C:	0.84
Rainfall Station:	Windsor, ONT
Particle Size Distribution:	Fine
Peak Flowrate:	466 L/s



Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.



Project Name: 5585 Cabana Road Farhi Development

Consulting Engineer: Dillon Consulting Limited

Location: Windsor, Ontario

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity ⁽¹⁾	Fraction of Rainfall ⁽¹⁾	FD-4HC Removal Efficiency ⁽²⁾	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
3.00	13.2%	81.5%	10.8%
4.00	9.6%	79.3%	7.6%
5.00	7.5%	77.7%	5.8%
6.00	6.0%	76.4%	4.6%
7.00	4.8%	75.3%	3.6%
8.00	4.1%	74.4%	3.0%
9.00	3.6%	73.6%	2.6%
10.00	3.2%	72.9%	2.3%
11.00	2.8%	72.2%	2.0%
12.00	2.5%	71.6%	1.8%
15.00	6.6%	70.2%	4.6%
20.00	8.3%	68.3%	5.7%
25.00	5.8%	66.9%	3.9%
30.00	4.6%	65.8%	3.0%
35.00	3.8%	64.8%	2.5%
40.00	2.9%	64.0%	1.9%
45.00	2.4%	63.3%	1.5%
50.00	1.8%	62.7%	1.1%
65.00	6.6%	61.2%	4.0%
Total Net Annual Removal Efficiency:			70%
Total Runoff Volume Treated:			>90%

Notes:

- (1) Based on Windsor/Essex Region Stormwater Manual 2018, Table 3.4.1.5
- (2) Based on third party verified data and approximating the removal of a PSD similar to the STC Fine distribution
- (3) Rainfall adjusted to 5 min peak intensity based on hourly average.

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