



1027458 ONTARIO INC.

Official Plan Amendment and Zoning By-law Amendment

Functional Servicing Study

North Neighbourhood Phase 7 - North of Wyandotte Street East
Windsor, Ontario

Final Report

February 2023 – 22-4866

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1.0 Introduction

Dillon Consulting Limited (Dillon) has been retained by 1027458 Ontario Inc. to assist in obtaining the necessary planning approvals associated with a proposed residential development located on the north side of Wyandotte Street East and south of Riverside Drive East, between the future extensions of Clover Avenue and Lublin Avenue, herein referred to as the “subject site”, in the City of Windsor, refer Figure 1.0 (in Appendix A).

The proposed development is part of a larger, phased residential development that is being proposed for the North Neighbourhood area; area north of Beverly Glen Street, south of Wyandotte Street East, east of Florence Avenue and west of Icewater Avenue, refer Figure 2.0 (in Appendix A). At present, the other phases are in varying stages of the development process. This functional servicing report is prepared for the Phase 7 of the overall development and is based on the information, provided by the client, that the construction of previous phases (Phases 1 to 6) will be completed before commencing this phase.

This document outlines the servicing strategy including supporting studies and related information for the transportation, sanitary, stormwater management, and watermain servicing for the subject site. This document is to be read in conjunction with the overall Draft Plan of Subdivision (DPS) documents.

The subject site is approximately 1.65 ha (4.08 acres) and is currently a vacant grass land. The subject site is bounded on the north limit generally by the lands of the Riverside Drive East; on the south limit by Wyandotte Street East, on the east limit by the lands of 10965 Riverside Drive East, and on the west limit by the lands of 10835 Riverside Drive East (Riverside Sportsmen Club). The proposed development includes construction of two eleven-storey residential dwelling buildings with a total of 308 units.

1.1 References Documents

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

- North Neighbourhood Phase 1 and 2 Detailed Design North of Beverly Glen Street Stormwater Management Brief (Dillon, September 2022);
- North Neighbourhood Phase 1 and 2 Detailed Design Drawings of North of Beverly Glen Street (visco engineering Inc., June 2022);
- North Neighbourhood Development Storm Water Management Analysis Report (Dillon, 2018);
- City of Windsor – Development Manual (Windsor, 2015);
- City of Windsor - Interactive Mapping (Windsor);
- Design Guidelines for Sewage Works (MOE, 2008); and
- Windsor/Essex Region Stormwater Management Standards Manual (ERCA, 2018).

2.0 Transportation Servicing

2.1 Existing Conditions

The subject site currently has no access.

2.2 Proposed Roadways

In order to provide access to the proposed development, it is proposed to provide an access from Wyandotte Street East on the south side of the property.

A Traffic Impact Study (TIS) is ongoing for this development by Dillon Consulting Limited. Any upgrades such as turn lanes 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 Conditions

Sanitary sewers to service the site are planned to be constructed as a part previous phases of the project. Refer to Figure 3 (in Appendix A).

- A 250mm diameter sanitary sewer will be constructed as part of Phases 1 & 2 along Lublin Avenue. The Lublin Sewer drains southerly into the existing 1500mm sanitary sewer on Beverly Glen Street.

3.2 Proposed Servicing

All sanitary flows from within the proposed development will be conveyed via proposed site sanitary sewers to a 250mm diameter sewer main that crosses Wyandotte Street East, into the 250mm sanitary sewer along Lublin Avenue. The Lublin Main ultimately discharges into the existing City 1500mm diameter trunk sewer along Beverly Glen Street., refer to Figure 2 (in Appendix A) for the location. The 250mm diameter sanitary sewer along Lublin Avenue has adequate capacity to accommodate flows from the proposed Phase 7 development. Refer to Figure 3 (in Appendix A) and the sanitary design sheet provided in Appendix B.

The invert elevations, estimated from The City of Windsor sewer atlas for the existing sewers and from previously submitted reports, sanitary sewer design sheets and design drawings for the planned sewers. The top end of the site sewers has cover of minimum 2.4m. All buildings where the bottom of the footings is below the sanitary sewer and the hydraulic grade line is less than 300mm below the basement floor elevation, shall be equipped with a sewage ejector pump.

The future detailed design of the sanitary sewers and services are to be consistent with the requirements of the Corporation of the City of Windsor and the Ministry of Environment, Conservation and Parks (MECP).

4.0 Stormwater Servicing

4.1 Existing Conditions

A 600mm storm stub is dedicated to the subject property from the existing 1350mm diameter storm sewer that drains westerly along Wyandotte Street East, ultimately discharging into the existing storm water detention pond to the west of Florence Avenue, also known as North Neighborhood Pond, refer Figure 1 (in Appendix A).

4.2 Proposed Servicing

All storm flows from within the proposed development will be conveyed via proposed site storm sewers into the 1350mm storm trunk sewer along Wyandotte Street East. Refer to Figure 1 (in Appendix A) for the proposed storm servicing.

The existing North Neighborhood stormwater detention pond, to the west of Florence Avenue, has adequate capacity to accommodate the runoff from the subject site and to provide the required water quality.

Refer to the report '*East Riverside Development, North Neighbourhood, Phase 7 – North of Wyandotte Street East, Stormwater Management Brief (Dillon, February 2023)*' for additional details, in Appendix C.

5.0 Watermain Servicing

5.1 Existing Conditions

There is an existing 400mm diameter watermain along Wyandotte Street East south of the subject site, refer to Figure 1 (in Appendix A).

5.2 Proposed Servicing

The proposed residential development will be serviced by a new 250mm diameter watermain, refer to Figure 1 (in Appendix A). The proposed watermain will tie into the existing 400mm diameter watermain on the north side of Wyandotte Street East.

No pressure/flow testing has been completed for this development. During detailed design, pressure testing of existing watermains may be required.

The detailed design of the watermain services are to be consistent with the requirements of the Municipality. Placement of hydrants for adequate fire protection will be completed during detailed design.

6.0 Utilities

6.1 Gas

Existing Enbridge service is available along Wyandotte Street East. During detailed design, future conversation on loading will be required for servicing the proposed development.

6.2 Bell

Existing Bell service is available along Wyandotte Street East. During detailed design, future conversation will be required for servicing the proposed development.

6.3 Cogeco

Existing Cogeco service is available along Wyandotte Street East. During detailed design, future conversation will be required for servicing the proposed development.

6.4 MNSi

Existing MNSi service is available along Wyandotte Street East. During detailed design, future conversation will be required for servicing the proposed development.

6.5 Hydro

Existing Enwin service is available along Wyandotte Street East. During detailed design, future conversation will be required for servicing the proposed development.

7.0 Conclusion

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 in consultation with the Municipality.

Yours sincerely,

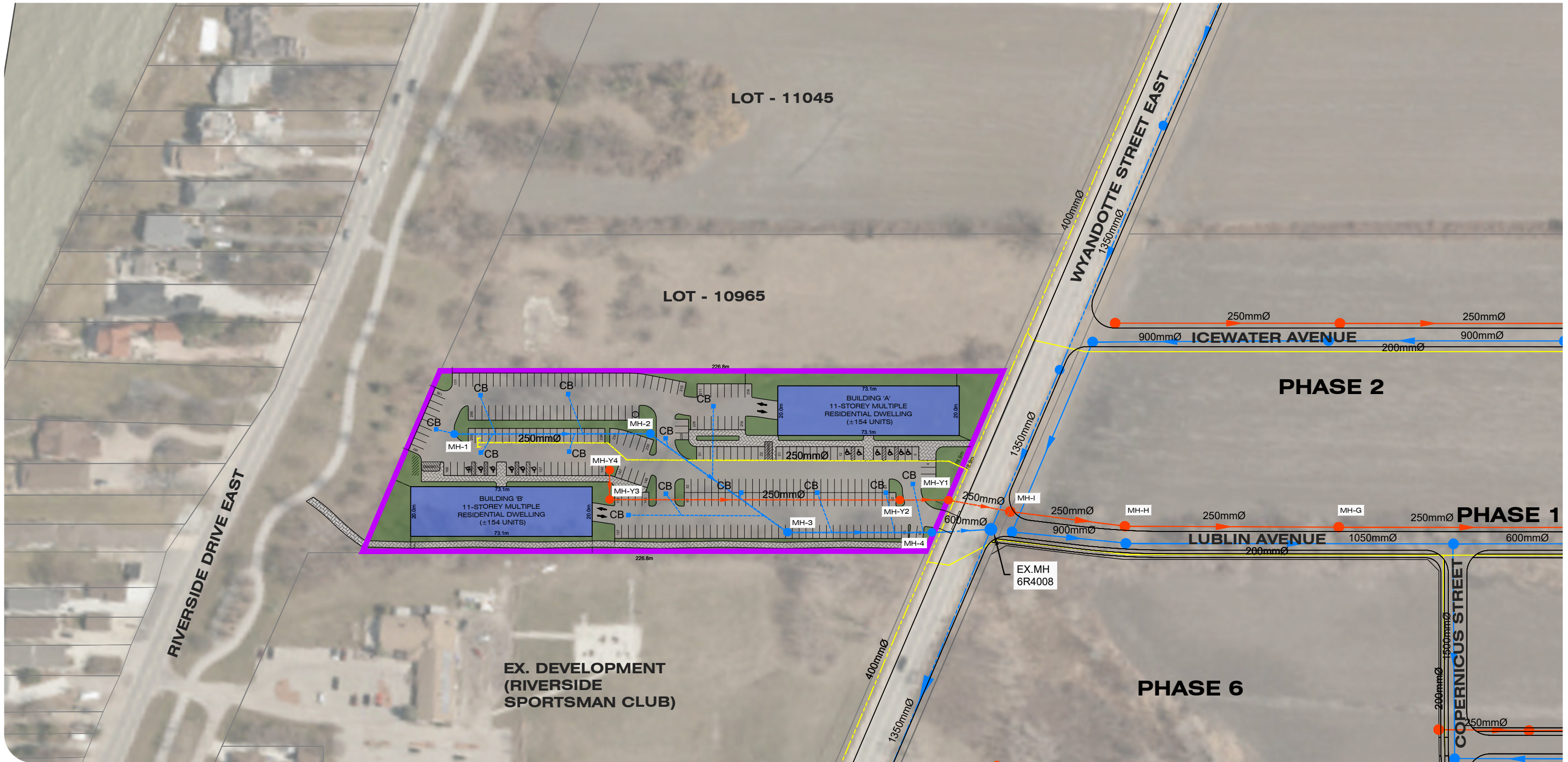
DILLON CONSULTING LIMITED



Viswanath (Vish) Kammula, P.Eng.
Civil Engineer

Appendix A

Functional Servicing Plan



1027458 ONTARIO INC.
 EAST RIVERSIDE DEVELOPMENT
 NORTH NEIGHBOURHOOD - NORTH OF
 WYANDOTTE - CITY OF WINDSOR

**PHASE 7 -
 CONCEPTUAL SERVICING PLAN
 FIGURE 1.0**

	SUBJECT AREA PHASE 7 (± 1.65ha)		PROPOSED LANDSCAPED AREA		PROPOSED PAVEMENT		PLANNED TO BE CONSTRUCTED PHASES 1-5 SANITARY SEWER		PROPOSED PHASE 7 SANITARY SEWER		EXISTING SANITARY SEWER
	PROPOSED MULTIPLE RESIDENTIAL		PROPOSED SIDEWALK		PLANNED TO BE CONSTRUCTED PHASES 1-5 STORM SEWER		PROPOSED PHASE 7 STORM SEWER		EXISTING STORM SEWER		EXISTING STORM SEWER
	PLANNED TO BE CONSTRUCTED PHASES 1-5 WATER LINE		PROPOSED PHASE 7 WATER LINE		EXISTING WATER LINE		EXISTING WATER LINE				

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 neighbourhood - phase 7 - fsr figures.dwg
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SOURCE: COUNTY OF ESSEX AERIAL (2021)

MAP/DRAWING INFORMATION
 THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL
 DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE
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CREATED BY: MRU/DM
 CHECKED BY: KDT
 DESIGNED BY: MRU/DM

SCALE: 1:1500 (11x17)



SITE MATRIX

FRONT YARD DEPTH	- 6.0m
BACK YARD DEPTH	- 7.5m
SIDE YARD DEPTH	- 6.0m
UNIT COUNT	- 308 units
PROPOSED PARKING	- 372 spaces
PROPOSED PARKING RATIO:	1.21
REQUIRED PARKING RATIO:	1.25

PROJECT: 22-4866
 STATUS: DRAFT
 DATE: 02/07/2023

PHASE 6: FIVE (5) MULTIPLE DWELLING BUILDINGS WITH 447 UNITS TOTAL

- BUILDING "A": 6-STOREYS, 63 UNITS
- BUILDING "B": 6-STOREYS, 63 UNITS
- BUILDING "C": 6-STOREYS, 63 UNITS
- BUILDING "D": 12-STOREYS, 129 UNITS
- BUILDING "E": 12-STOREYS, 129 UNITS

PHASE 7: TWO (2) MULTIPLE DWELLING BUILDINGS WITH 308 UNITS TOTAL

- BUILDING "A": 11-STOREYS, 154 UNITS
- BUILDING "B": 11-STOREYS, 154 UNITS

**PHASE 5:
30 TOWNHOME DWELLINGS**

**PHASE 3:
117 TOWNHOME DWELLINGS**

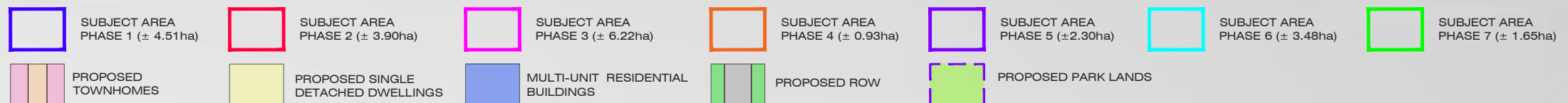
PHASE 2: 71 LOTS

PHASE 4: 11 LOTS

PHASE 1: 81 LOTS

1027458 ONTARIO LIMITED
EAST RIVERSIDE DEVELOPMENT
NORTH NEIGHBOURHOOD - PHASES 1-7
CITY OF WINDSOR

CONCEPTUAL DEVELOPMENT PLAN
MASTER PHASING PLAN
FIGURE 2.0



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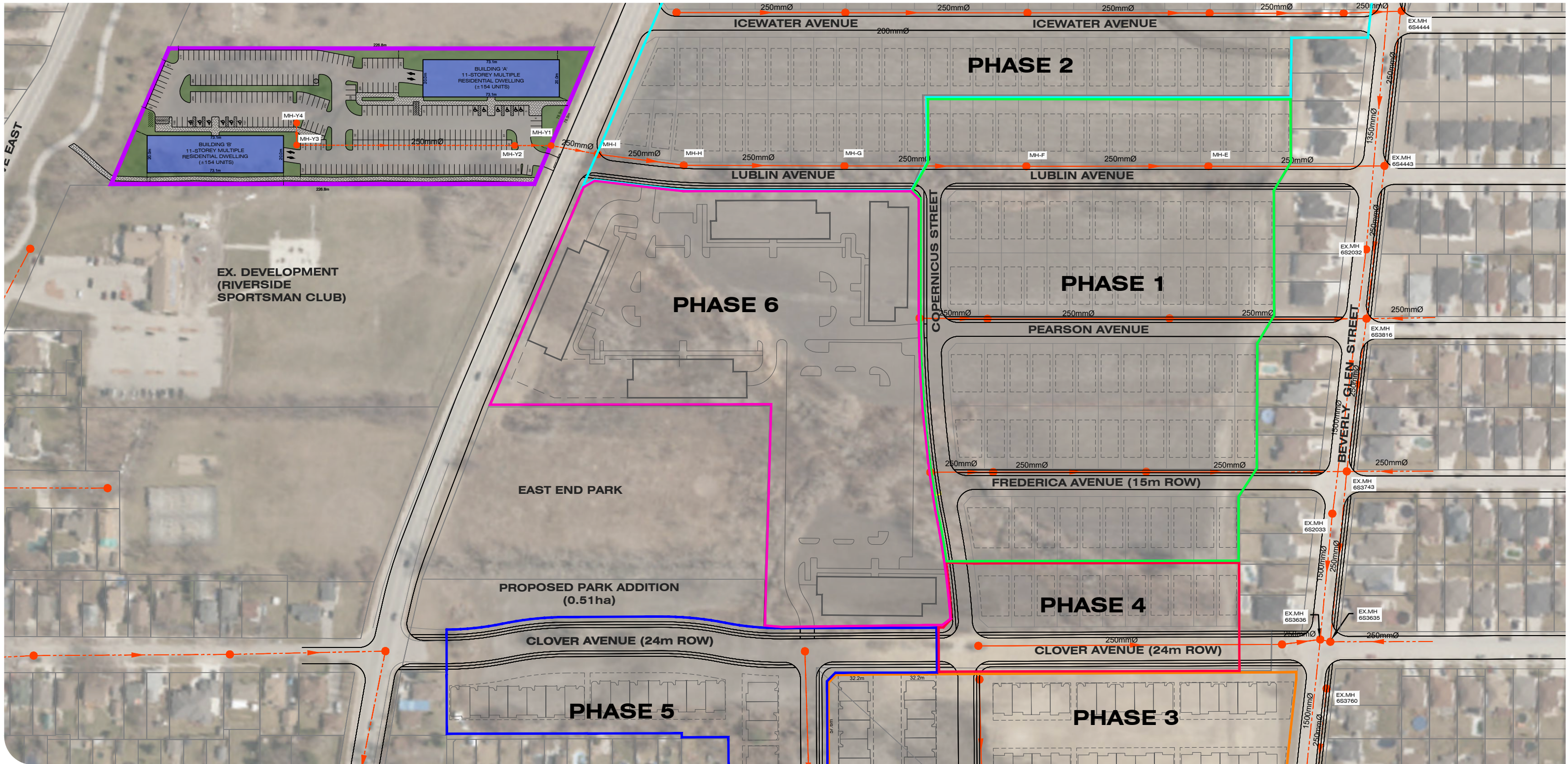
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DESIGNED BY: AMC

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PROJECT: 22-4861
STATUS: FINAL
DATE: 02/27/2023



1027458 ONTARIO INC.
 EAST RIVERSIDE DEVELOPMENT
 NORTH NEIGHBOURHOOD - NORTH OF
 WYANDOTTE - CITY OF WINDSOR

**PHASE 7 -
 SANITARY SERVICING SCHEMATIC
 FIGURE 3.0**

SUBJECT AREA PHASE 7 (± 1.65ha)	PROPOSED LANDSCAPED AREA	PROPOSED PAVEMENT	PHASE 5	PHASE 3	PHASE 1	PLANNED TO BE CONSTRUCTED PHASES 1-5 SANITARY SEWER PROPOSED PHASE 7 SANITARY SEWER EXISTING SANITARY SEWER
PROPOSED MULTIPLE RESIDENTIAL	PROPOSED SIDEWALK	PHASE 6	PHASE 4	PHASE 2	SITE MATRIX FRONT YARD DEPTH - 6.0m BACK YARD DEPTH - 7.5m SIDE YARD DEPTH - 6.0m UNIT COUNT - 308 units PROPOSED PARKING - 372 spaces PROPOSED PARKING RATIO: 1.21 REQUIRED PARKING RATIO: 1.25	

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SOURCE: COUNTY OF ESSEX AERIAL (2021)

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PROJECT: 22-4866
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 DATE: 02/07/2023

Appendix B

Sanitary Sewer Design Sheet

**PROJECT NAME HERE
SANITARY SEWER DESIGN SHEET**

Project Name: North Neighbourhood Phase 7
Project No: 211186

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

Outlet Invert Elevation= **168.666**

Mannings 'n'= **0.013**

Basement Floor Elevation =

Ground Elevation at Outlet = **175.380**

City of Windsor

Total Area= **53.395**

Hydraulic Grade Line Cover = **3.00**

HGL at Outlet = **172.600**

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.)																				
Phase 7	Y4	Y3	0.0	0.00	0	0.00	4.500	0.000	0.000	0.00	32.80	17.2	200	6	1.00	173.236	173.064	0.172	1.04	0.030	176.400	2.958	3.030	173.276	OKAY	OKAY
Phase 7	Y3	Y2	462.0	0.83	462	0.83	3.992	7.748	0.129	7.88	23.65	118.6	200	6	0.52	173.034	172.417	0.617	0.75	0.030	176.300	3.060	3.657	173.276	OKAY	OKAY
Phase 7	Y2	Y1	0.0	0.00	462	0.83	3.992	7.748	0.129	7.88	23.65	20.0	200	6	0.52	172.387	172.283	0.104	0.75	0.030	176.280	3.687	3.711	173.208	OKAY	OKAY
Phase 7	Y1	I	462.0	0.83	924	1.65	3.822	14.837	0.257	15.09	23.65	25.3	200	6	0.52	172.253	172.121	0.132	0.75	0.030	176.200	3.741	3.873	173.196	OKAY	OKAY
Lublin Ave	I	H	10.0	0.19	472	1.02	3.987	7.906	0.158	8.06	59.47	47.0	250	7	1.00	172.091	171.621	0.470	1.21	0.030	176.200	3.852	4.272	173.143	OKAY	OKAY
Lublin Ave	H	G	24.0	0.47	496	1.49	3.976	8.286	0.232	8.52	37.14	81.7	250	7	0.39	171.591	171.273	0.318	0.76	0.030	176.150	4.302	4.670	173.134	OKAY	OKAY
Lublin Ave	G	F	35.0	0.70	531	2.19	3.961	8.836	0.341	9.18	37.14	97.6	250	7	0.39	171.243	170.862	0.381	0.76	0.030	176.200	4.700	5.031	173.117	OKAY	OKAY
Lublin Ave	F	E	40.0	0.80	571	2.99	3.944	9.461	0.466	9.93	37.14	97.6	250	7	0.39	170.832	170.452	0.381	0.76	0.030	176.150	5.061	5.371	173.094	OKAY	OKAY
Lublin Ave	E	6S4443	16.0	0.32	587	3.31	3.937	9.710	0.516	10.23	37.14	68.4	250	7	0.39	170.422	170.155	0.267	0.76	0.060	176.080	5.401	5.688	173.067	OKAY	OKAY
Beverly Glen	6S4443	6S3816	510.0	10.13	1097	13.43	3.774	17.393	2.095	19.49	37.61	82.4	250	7	0.40	170.095	169.765	0.330	0.77	0.060	176.100	5.748	5.978	173.047	OKAY	OKAY
Beverly Glen	6S3816	6S3743	282.0	5.54	1379	18.97	3.706	21.470	2.959	24.43	38.54	82.5	250	7	0.42	169.705	169.359	0.347	0.79	0.060	176.000	6.038	6.284	172.958	OKAY	OKAY
Beverly Glen	6S3743	6S3635	237.0	5.04	1616	24.01	3.656	24.822	3.746	28.57	35.68	91.7	250	7	0.36	169.299	168.969	0.330	0.73	0.060	175.900	6.344	6.574	172.819	OKAY	OKAY
Beverly Glen	6S3635	6S3636	351.0	7.85	1967	31.86	3.591	29.680	4.970	34.65	50.25	5.6	300	9	0.27	168.909	168.894	0.015	0.71	0.060	175.800	6.582	6.697	172.607	OKAY	OKAY
Beverly Glen	6S3636	6S2034	0.0	0.00	1967	31.86	3.591	29.680	4.970	34.65	1580.65	84.9	1500	171	0.05	168.834	168.791	0.042	0.89	0.060	175.900	5.395	5.738	172.600	OKAY	OKAY
Beverly Glen	6S3759	6S2034	1050.0	20.71	1050	20.71	3.786	16.703	3.231	19.93	62.09	6.9	250	7	1.09	168.866	168.791	0.075	1.26	0.060	176.100	6.977	7.152	172.608	OKAY	OKAY
Greenway Trunk	6S2034	6S2035	0.0	0.00	3017	52.57	3.440	43.608	8.201	51.81	1580.65	130.4	1500	171	0.05	168.731	168.666	0.065	0.89	0.060	176.200	5.798	5.043	172.600	OKAY	OKAY

Appendix C

Stormwater Management Report



1027458 Ontario Inc.

Official Plan Amendment and Zoning By-Law Amendment

Stormwater Management Brief

North Neighbourhood Phase 7 – North of Wyandotte Street East

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1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by 1027458 Ontario Inc. to assist in obtaining the necessary planning approvals associated with a proposed residential development located on the north side of Wyandotte Street East and south of Riverside Drive East, between the future extensions of Clover Avenue and Lublin Avenue, herein referred to as the “subject site”, in the City of Windsor. The subject site is Phase 7 of the North Neighbourhood Development, within the Little River Subwatershed.

To support the Official Plan Amendment and Zoning By-law Amendment Application, Dillon has prepared this Stormwater Management (SWM) Brief to document the SWM strategy for the subject site shown on the proposed concept plan presented in Appendix A. This report outlines the proposed SWM strategy, supporting analysis and documentation.

1.1 Background Information

The following background information was reviewed to assist with the development of the proposed SWM strategy.

North Neighbourhood Pond Final Design Report, prepared by Dillon Consulting Limited, 2001.
Design report of the North Neighbourhood Pond.

Stormwater Management Analysis, North Neighbourhood Development, prepared by Dillon Consulting Limited, 2018.

This report presents the stormwater assessment of the North Neighbourhood Development under both existing and future built out conditions.

City of Windsor: East Riverside Flood Risk Assessment, prepared by RWDI, 2019.
This report presents the East Riverside Engineered 1:100 flood elevation.

North Neighbourhood Phase 1 and 2 Detailed Design North of Beverly Glen Street, Stormwater Management Brief, prepared by Dillon Consulting Limited, 2022.

This report presents the stormwater assessment of the proposed Jerome Trunk Sewer, as well as the streets identified on the East Riverside Development Concept Plan dated December 5, 2022, within the Phases 1 and 2 of the North Neighbourhood Subdivision under future built out conditions.

1.2 SWM Design Criteria

The North Neighbourhood Subdivision Phase 7 SWM strategy is based on criteria established in the Windsor/Essex Region Stormwater Management Standards Manual (WESMSM) (December 2018) and previous reports.

The corresponding criteria are described below.

Stormwater Quality Control

The North Neighbourhood SWM facility (North Neighbourhood Pond) is designed to provide for a “Normal” Protection Level of water quality treatment to remove 70% of total suspended solids (TSS) from the proposed site runoff.

Water Quantity Control

The proposed SWM plan is designed at a minimum to provide active storage volume for the 1:100 year 24 hour storm (with a 2 hour time interval and using the SCS Type-II distribution) and the 1:100 year 4 hour storm (with 15 minute time intervals and using the Chicago distribution).

Minor System Conveyance

The minor system will be designed to have a level of service to accommodate the 1:5 year 4 hour storm (with 15 minute time intervals and using the Chicago distribution) with the Hydraulic Grade Lines (HGLs) no closer than 0.30 m from the proposed roadway surface.

Major System Conveyance

The major system will be designed to have a level of service to accommodate the 1:100 year design storm, with the peak water surface elevation (WSEL) along the roadway to not exceed 0.30 m above the minimum road grades during the governing 1:100 year event.

Climate Change Resiliency Assessment

The North Neighbourhood Pond performance has been examined under conditions more intense than the 1:100 year design storm event to assess potential impacts of climate change and the facility’s resiliency using the Urban Stress Test design storm event. The SWM facility is designed to contain the runoff generated from this design storm event without overtopping its banks.

Existing Conditions

The 1.65 ha subject site is currently undeveloped vacant land. Based on the available topographic information, runoff from the existing site generally travels southward towards Wyandotte Street East as shallow surface flow, where it is collected by the existing storm sewer.

Ontario Ministry of Agriculture, Food and Rural Affairs' (OMAFRA) soil survey mapping data shows the soils within the subject site land are composed of Clyde Clay (Cc) which is classified as Hydrologic Soil Groups (HSG) D.

There are currently two trunk storm sewers that convey flow to the North Neighbourhood SWM Pond, the Beverly Glen Trunk Sewer and the Wyandotte Street East Trunk Sewer (south of the subject site). The existing drainage of the North Neighbourhood (north of Beverly Glen) is shown on Figure 1. All runoff from the Phase 7 development area is conveyed as shallow overland flow, towards Wyandotte Street East. Minor system flow is collected in the existing trunk storm sewer and conveyed to the North Neighbourhood SWM Pond. Major system flow is conveyed west on Wyandotte Street East where it enters the existing North Neighbourhood Pond.

3.0

Proposed Conditions

The proposed North Neighbourhood Subdivision Phase 7 development includes two (2) multiple dwelling buildings with 308 units total. The proposed Phase 7 drainage plan is shown in Figure 2. The stormwater designs for the other North Neighborhood phases have been completed as separate assignments. A preliminary SWM strategy was developed to manage the runoff from the subject site:

- On-site storm sewers to convey the minor flows from all storms up to and including 1:5 year design storm event, unrestricted, to the existing Wyandotte Street East storm sewer;
- Major flows from all storms up to and including 1:100 year design storm event are conveyed by the proposed parking lot, unrestricted, to the existing Wyandotte Street East ROW to the existing North Neighbourhood SWM Pond; and
- The existing North Neighbourhood SWM Pond provides all necessary stormwater treatment.

3.1

Hydrologic Analysis Methodology

Evaluation of the North Neighbourhood storm drainage system performance was completed with PCSWMM 2017 Professional. The hydrologic and hydraulic calculations completed using PCSWMM include the existing development, development Phases 1 through 6, which are anticipated to be constructed prior to Phase 7, and the proposed Phase 7 development. Model extents and subcatchment parameters are presented in Appendix B.

All external flows conveyed to the North Neighbourhood Pond are also shown in Figure B-1. Minor flows are collected by the proposed local storm sewers and conveyed to the existing SWM pond which provides both quality and quantity control. Major flows are conveyed via the proposed ROW to the existing SWM facility.

The proposed Phase 7 development area, as shown in Figure B-2, consists of multiple dwelling buildings, as such the area has been simulated with an imperviousness of 90%. Subcatchment parameters used in the simulation model can be found in Table B-1.

3.2

Regional SWM Facility

Based on the information presented in the North Neighbourhood Pond report completed by Dillon Consulting (December 2001), the following water quality design was incorporated within the pond:

- NWL elevation of 172.50;
- Permanent pool comprised of two forebays, three intermediary basins and three shallow transition areas; and
- Design permanent pool volume of 69,000 m³.

1027458 Ontario Inc.

Official Plan Amendment and Zoning By-Law Amendment –
North Neighbourhood Phase 7 – North of Wyandotte Street East
Stormwater Management Brief
February 2023 – 22-4866



The stage-storage curve used in the PCSWMM model, developed based on LiDAR and survey of the existing North Neighbourhood Pond, is tabulated in Appendix B.

3.2.1 Quantity Control

Hydrologic and hydraulic calculations were completed using PCSWMM to estimate the peak WSEL in the North Neighbourhood Pond. Simulations were completed for the 1:5 year, 1:100 year, and the UST as defined in the WERSMSM. It is important to note that in addition to the proposed Phase 7 development the hydrologic/hydraulic calculations also include all development phases of the North Neighbourhood Subdivision. The analysis results are presented in Table 3-1. The calculated design water levels presented in the North Neighbourhood Pond Final Design Report are also documented for comparison purposes.

Table 3-1: North Neighbourhood Pond WSEL Summary

Storm Type	Original SWM Pond Design (WSEL) (m)	Proposed SWM Pond Design (WSEL) (m)
Normal Water Level (NWL)	172.50	172.20 ²
Chicago 1:5 year 4 hour ¹	-	173.28
Chicago 1:100 year 4 hour ¹	-	173.89
SCS Type II 1:100 year 24 hour	174.50	174.05
Urban Stress Test ¹	-	174.51
Top of Bank (m)	175.50	175.50

¹ Design storm not used at time of design.

² Note the NWL was updated in a previous study.

The data shown in Table 3-1 suggest that the minimum calculated freeboard during the SCS Type II 1:100 year 24 hour event is approximately 1.45 m. The WSEL during the UST event is also shown to be held within the banks. Thus, the pond has sufficient capacity to accommodate the runoff from both the proposed Phase 7 development and the future North Neighbourhood phases.

3.2.2 Quality Control

The water quality requirements were analyzed to verify that the pond provides sufficient water quality control based on current provincial standards. Shown in Table 3-2 are the details of the water quality calculations in comparison to what is currently provided as per the original design.

Table 3-2: Water Quality for North Neighbourhood Pond

Description	Value
Total North Neighbourhood Development Area	141 ha
Overall Weighed Percent Impervious	65%

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Description	Value
Total Required Water Quality Unit Volume	123 m ³ /ha
Required Permanent Pool Unit Volume	83 m ³ /ha
Required Permanent Pool Volume	11,750 m ³
Provided Permanent Pool Volume	69,000 m ³

The existing North Neighbourhood SWM Pond permanent pool volume is sufficient to provide quality control to the runoff from the entire North Neighbourhood Subdivision under ultimate buildout conditions, including the proposed Phase 7 development.

Settling and dispersion calculations previously completed to verify that the pond provides sufficient forebay length were completed as part of the 'North Neighbourhood Development Stormwater Management Analysis (Dillon, 2018)' report. The calculations include the flow contributions from the full buildout of the subdivision, including the Phase 7 development. Due to changes in the design criteria with the release of the WESMSM (December 2018), forebay calculations for the Wyandotte Street East outfall have been reassessed for this brief. Based on these calculations, the required settling length is 38 m, while the required dispersion length is 44 m. The actual distance from the proposed inlet to the pond forebay berm is 90 m, therefore the Wyandotte Street East pond forebay meets the provincial design guidance for water quality treatment. The supporting forebay calculations are presented in Appendix C.

3.3 Minor System

As documented in 'North Neighbourhood Phase 1 and 2 Detailed Design North of Beverly Glen Street Stormwater Management Brief (Dillon, November 2022)' runoff from Phase 7 is collected by the existing Wyandotte Street East trunk storm sewer and conveyed to the existing North Neighbourhood SWM pond. Additionally, the Wyandotte Street East storm sewer was evaluated in the North Neighbourhood Development (Dillon, 2018) report to include flow from the proposed Phase 7 development area. Both reports indicate the existing Wyandotte Street East storm sewer has sufficient capacity to accommodate the runoff from the Phase 7 development area.

The proposed site storm sewers convey the site runoff, unrestricted, to the existing Wyandotte Street East trunk storm by gravity. The storm sewers will accommodate the peak discharges from the 1:5 year storm event. The preliminary proposed storm sewer layout for the Phase 7 development is presented in Figure 2. The PCSWMM model was utilized to evaluate upstream and downstream impacts on the Wyandotte Street East Storm Sewer during the 1:5 year design storm event. Pre-development runoff consisted of an imperviousness of 0% directed to the Wyandotte Street East major system as shallow surface flow. The post-development model included major and minor system flow entering the Wyandotte Street East major and minor systems, respectively. Comparing the HGL in the Wyandotte Street East Storm Sewer from the proposed Phase 7 development to the North Neighbourhood Pond, there was a minor (0.07 m) observed increase in HGLs under developed conditions; however, the HGL is maintained greater than 0.3 m below ground, as per the WESMSM. An HGL comparison is presented in Figure B-3.

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3.4

Major System

Major flow routes will be designed to convey runoff as overland flow in the proposed parking lot to the existing Wyandotte Street East ROW, unrestricted, as shown on Figure 2. The performance of the major system will be evaluated for the 1:100 year design storm event to verify ponding depths are less than 0.3 m.

The PCSWMM model was utilized to evaluate upstream and downstream impacts on the Wyandotte Street East major system during the 1:100 year design storm event. Pre-development runoff consisted of an imperviousness of 0% directed to the Wyandotte Street East major system as shallow surface flow. The post-development model included major and minor system flow entering the Wyandotte Street East major and minor systems, respectively. Comparing the HGL in the Wyandotte Street East Major System, there was no observed increase in HGLs under developed conditions. An HGL comparison is presented in Figure B-4.

3.5

Floodproofing

As per the WESMSM, the minimum lowest opening into all buildings shall be at least 0.3 m above the Regulatory Flood Level or on-site calculated 1:100 year water storage elevation, whichever is greater. The East Riverside Engineered 1:100 year flood elevation is 176 m (RWDI, 2019). Therefore; the Lowest Opening Elevation (LOE) for all buildings in the proposed development must be greater than or equal to the higher of the following two criteria:

- East Riverside Engineered 1:100 year flood elevation (176 m) plus 0.3 m freeboard; or
- Calculated on-site 1:100 year High Water Level (HWL) plus 0.3 m freeboard.

The on-site 1:100 year High Water Level will be calculated during detailed design to confirm the required minimum floodproofing elevation.

Future Conditions

Phase 7 is the final stage of the North Neighbourhood Development. The analysis results presented in Section 3.0 show that the SWM Pond has sufficient capacity to accommodate runoff from all future development phases under developed conditions.

Conclusions

Dillon has prepared a preliminary stormwater strategy to support the proposed North Neighbourhood Subdivision Phase 7 development. The preliminary stormwater strategy is designed to meet the corresponding local and provincial SWM policies such that the development of this site will not result in adverse effects on the downstream receiving water systems. The proposed SWM strategy includes:

- A local storm sewer to convey the 1:5 year design storm event without surcharging closer than 0.30m from the proposed roadway surface.
- The proposed ROWs will be designed to convey the 1:100 year design storm event with levels below 0.3 m.
- The North Neighbourhood Pond to provide the required quality and quantity storage.

The existing North Neighbourhood Pond has sufficient capacity to accommodate the runoff from the proposed Phase 7 development and all other development phases, while meeting the WERSMSM guidelines for freeboard during the governing 1:100 year event and without overtopping the pond during the UST event. The existing facility is also designed to provide quality control to the runoff from the proposed Phase 7 development and future conditions development.

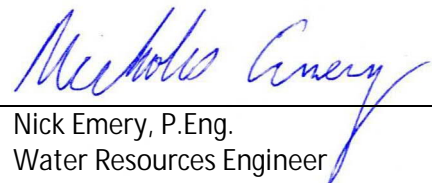
This report is respectfully submitted for review and approval. Please contact the undersigned should you have any questions or require any additional information.

Sincerely,

DILLON CONSULTING LIMITED



Jennifer Bainbridge, P.Eng.
Water Resources Engineer



Nick Emery, P.Eng.
Water Resources Engineer

Figures

File Name: c:\pw working directory\projects 2022\dillon_32aam\dms48937\22-4866 - north neighbourhood - phase 7 - concept plan.dwg



LEGEND

- EXISTING STORM SEWER AND MAINTENANCE HOLE
- SUBJECT SITE LIMITS

OVERLAND FLOW ROUTE DIRECTION

- NAME CATCHMENT ID
- AREA CATCHMENT AREA (Ha)

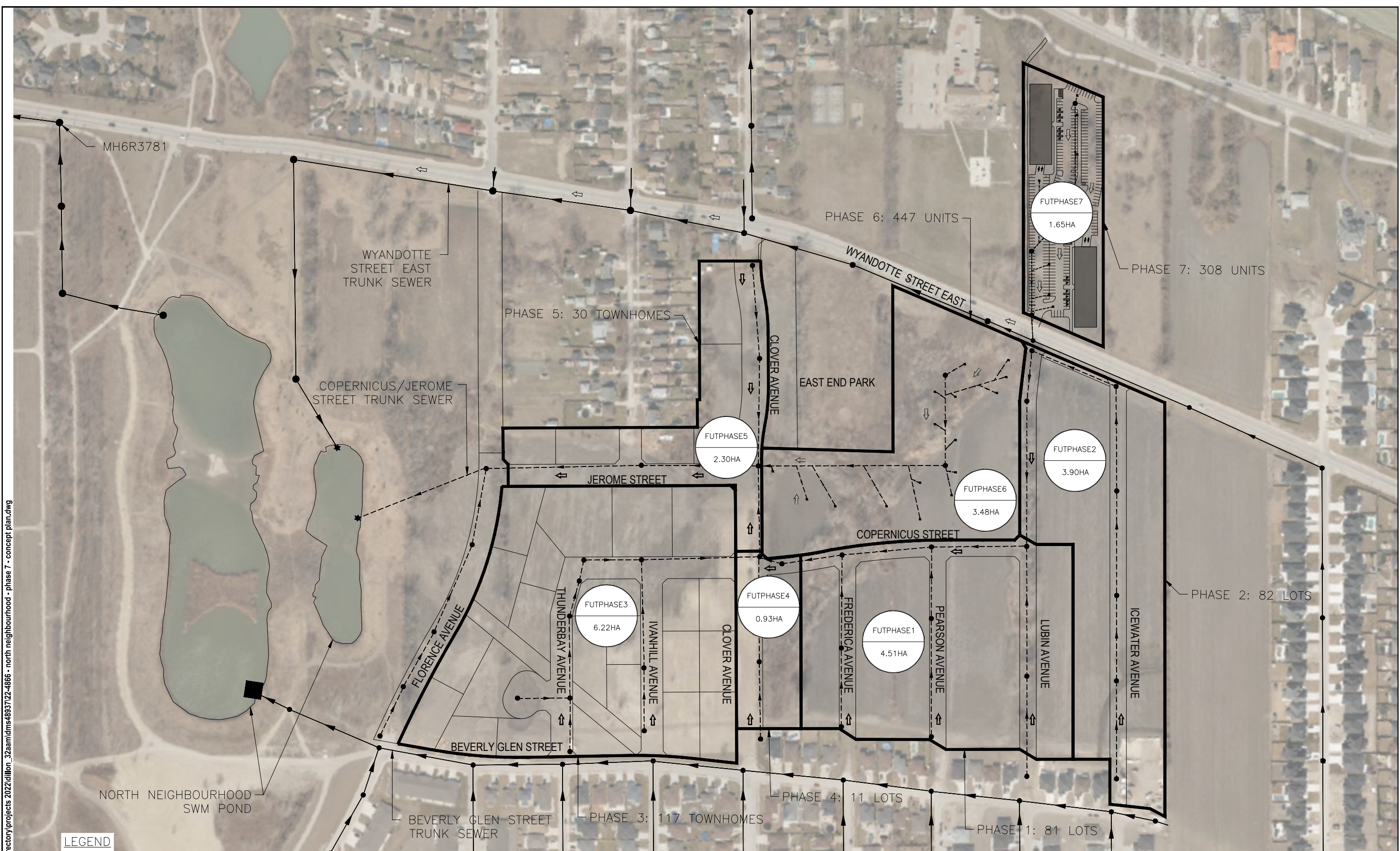


DATE **JANUARY 2023** SCALE **1:1500**

PROJECT	NORTH NEIGHBOURHOOD PHASE 7
TITLE	PRE DEVELOPMENT DRAINAGE AREAS

PROJECT NO.	22-4866
FIGURE NO.	1

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LEGEND

- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- SUBJECT SITE LIMITS
- OVERLAND FLOW ROUTE DIRECTION
- | | |
|------|---------------------|
| NAME | CATCHMENT ID |
| AREA | CATCHMENT AREA (Ha) |

DILLON CONSULTING

DATE **JANUARY 2023** SCALE **1:1500**

PROJECT	NORTH NEIGHBOURHOOD PHASE 7
TITLE	POST DEVELOPMENT DRAINAGE AREAS

PROJECT NO.	22-4866
FIGURE NO.	2

Appendix A

Conceptual Development Plan – Master Phasing Plan

PHASE 6: FIVE (5) MULTIPLE DWELLING BUILDINGS WITH 447 UNITS TOTAL

- BUILDING "A": 6-STOREYS, 63 UNITS
- BUILDING "B": 6-STOREYS, 63 UNITS
- BUILDING "C": 6-STOREYS, 63 UNITS
- BUILDING "D": 12-STOREYS, 129 UNITS
- BUILDING "E": 12-STOREYS, 129 UNITS

PHASE 7: TWO (2) MULTIPLE DWELLING BUILDINGS WITH 308 UNITS TOTAL

- BUILDING "A": 11-STOREYS, 154 UNITS
- BUILDING "B": 11-STOREYS, 154 UNITS

**PHASE 5:
30 TOWNHOME DWELLINGS**

**PHASE 3:
117 TOWNHOME DWELLINGS**

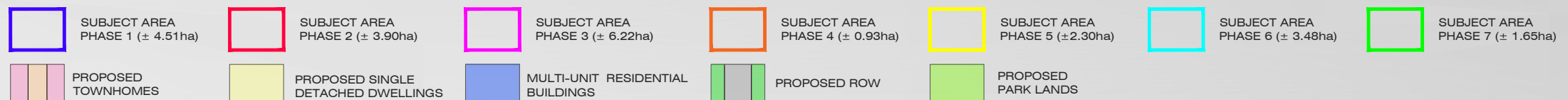
PHASE 2: 71 LOTS

PHASE 4: 11 LOTS

PHASE 1: 81 LOTS

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EAST RIVERSIDE DEVELOPMENT
NORTH NEIGHBOURHOOD

CONCEPTUAL DEVELOPMENT PLAN
MASTER PHASING PLAN
FIGURE A-1



File Location:
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December, 06, 2022 9:17 AM

SOURCE: MAPPMY CITY WINDSOR AERIAL (2021)

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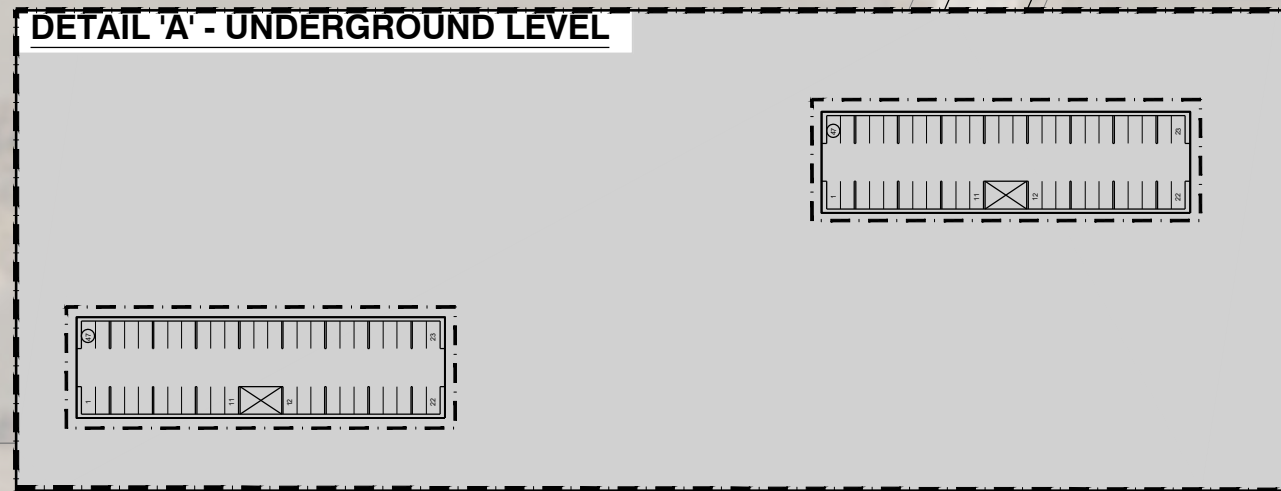
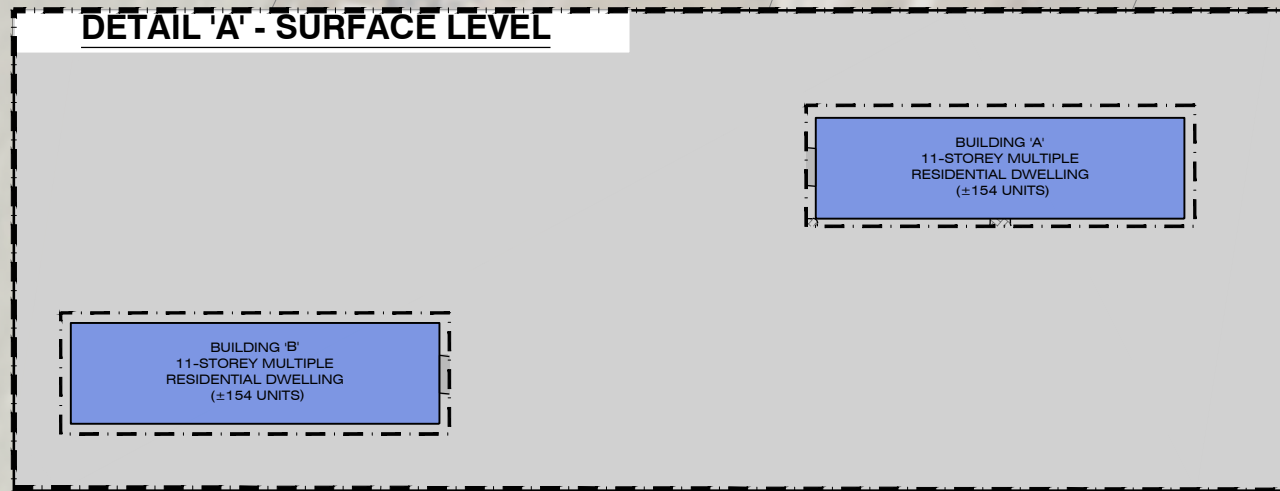
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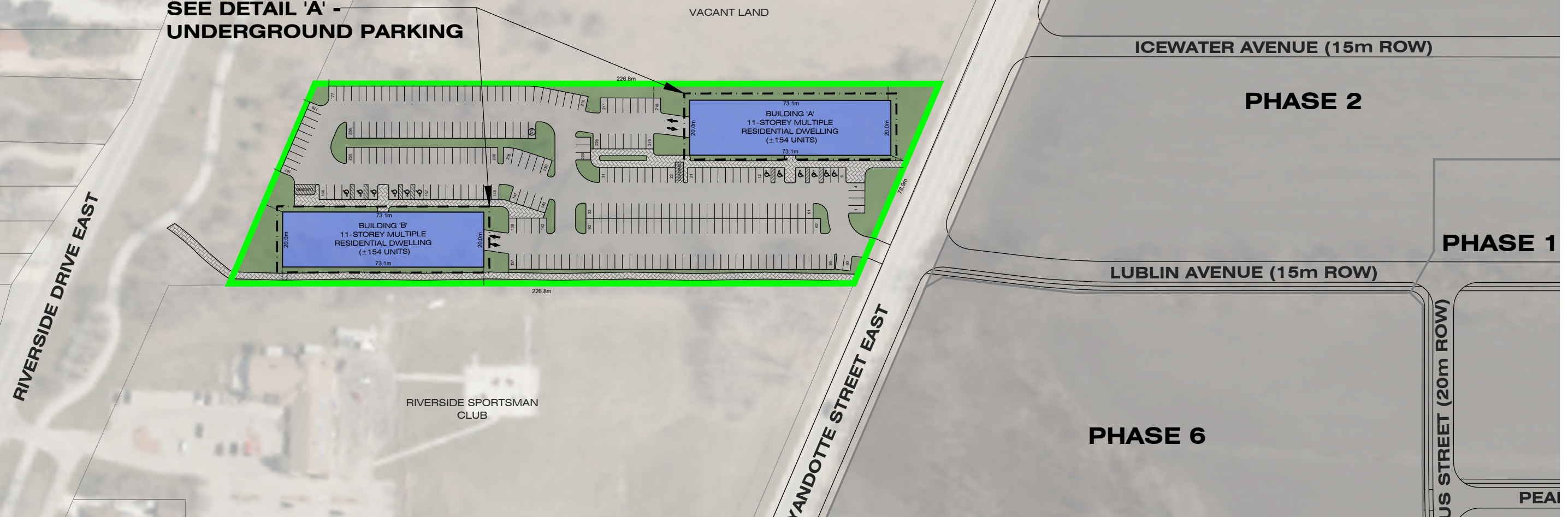
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STATUS: DRAFT
DATE: 12/05/2022

DETAIL 'A' - SURFACE LEVEL

DETAIL 'A' - UNDERGROUND LEVEL



SEE DETAIL 'A' - UNDERGROUND PARKING



1027458 ONTARIO INC.
EAST RIVERSIDE DEVELOPMENT
NORTH NEIGHBOURHOOD

PHASE 7 - CONCEPTUAL DEVELOPMENT PLAN
FIGURE A-2

- SUBJECT AREA PHASE 7 (± 1.65ha)
- PROPOSED MULTIPLE DWELLING RESIDENTIAL
- PROPOSED LANDSCAPED AREA
- PROPOSED SIDEWALK
- PROPOSED PAVEMENT

SITE MATRIX

FRONT YARD DEPTH	- 6.0m
BACK YARD DEPTH	- 7.5m
SIDE YARD DEPTH	- 6.0m
UNIT COUNT	- 308 units
PROPOSED PARKING	- 373 spaces
PROPOSED PARKING RATIO:	1.21
REQUIRED PARKING RATIO:	1.25

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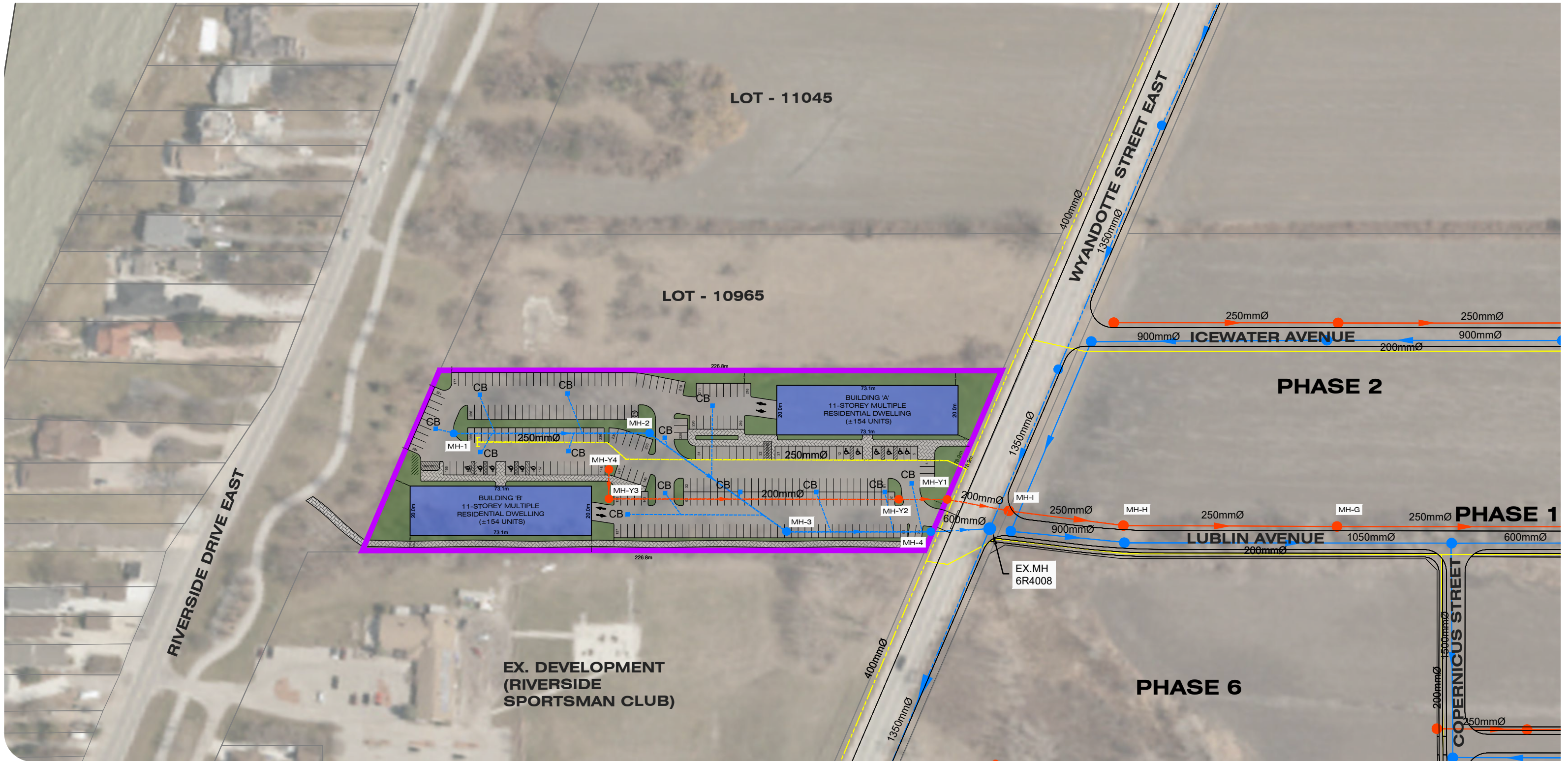
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PROJECT: 22-4866
STATUS: DRAFT
DATE: 01/20/2023



1027458 ONTARIO INC.
 EAST RIVERSIDE DEVELOPMENT
 NORTH NEIGHBOURHOOD - NORTH OF
 WYANDOTTE - CITY OF WINDSOR

**PHASE 7 -
 CONCEPTUAL SERVICING PLAN
 FIGURE A-3**

SUBJECT AREA PHASE 7 (± 1.65ha)	PROPOSED LANDSCAPED AREA	PROPOSED PAVEMENT	PLANNED TO BE CONSTRUCTED PHASES 1-5 SANITARY SEWER	PROPOSED PHASE 7 SANITARY SEWER	EXISTING SANITARY SEWER
PROPOSED MULTIPLE RESIDENTIAL	PROPOSED SIDEWALK		PLANNED TO BE CONSTRUCTED PHASES 1-5 STORM SEWER	PROPOSED PHASE 7 STORM SEWER	EXISTING STORM SEWER
			PLANNED TO BE CONSTRUCTED PHASES 1-5 WATER LINE	PROPOSED PHASE 7 WATER LINE	EXISTING WATER LINE

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 CHECKED BY: KDT
 DESIGNED BY: MRU/DM

SCALE: 1:1500 (11x17)



SITE MATRIX

FRONT YARD DEPTH	- 6.0m
BACK YARD DEPTH	- 7.5m
SIDE YARD DEPTH	- 6.0m
UNIT COUNT	- 308 units
PROPOSED PARKING	- 372 spaces
PROPOSED PARKING RATIO:	1.21
REQUIRED PARKING RATIO:	1.25

PROJECT: 22-4866
 STATUS: DRAFT
 DATE: 08/19/2022

Appendix B

Model Extents and Input Parameters

Figure B-1: Full Model Extents to North Neighbourhood Pond

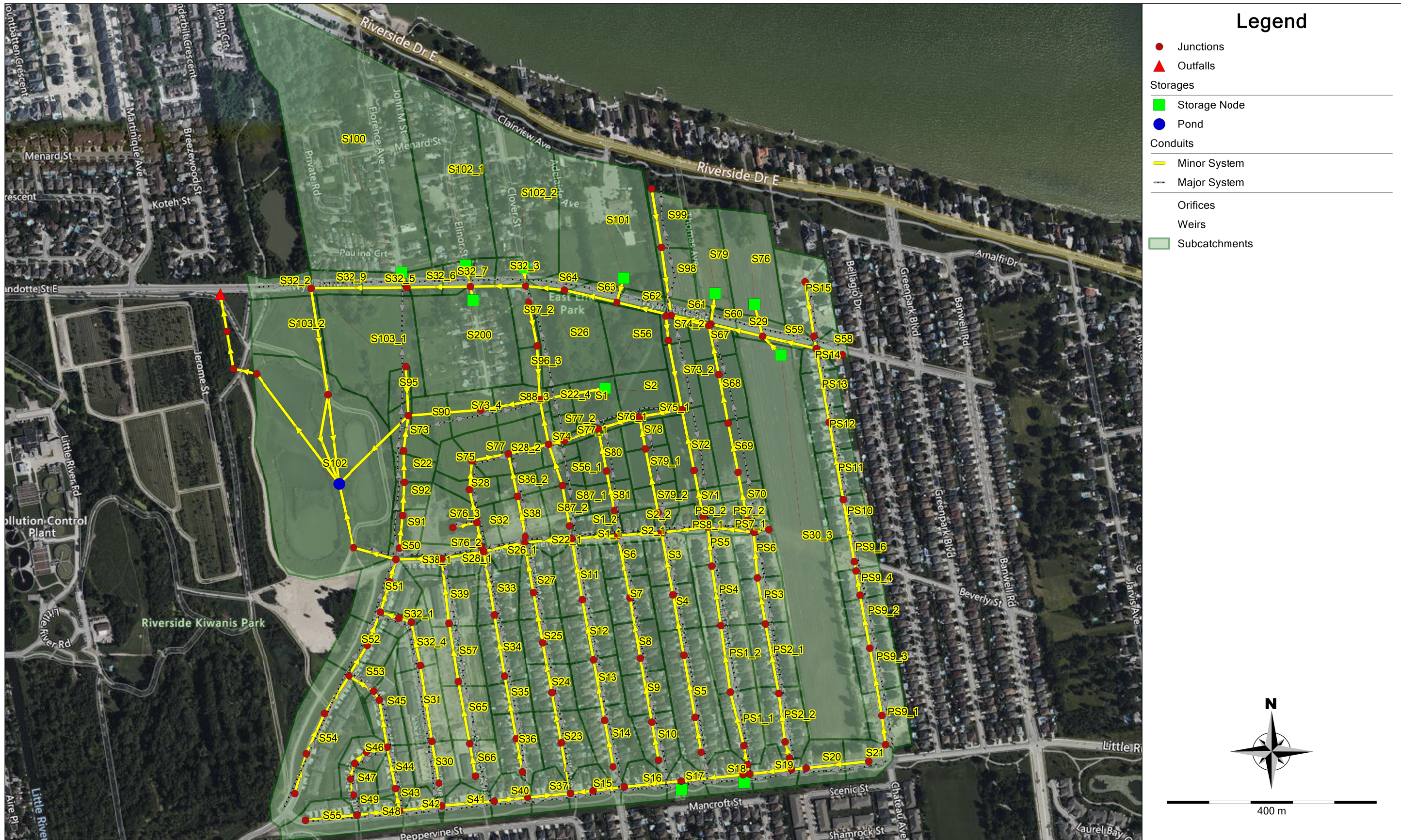


Figure B-2: Phase 7 Development Model Extents



Proposed Phase 7 Development Area Subcatchment Parameters

Name	Area (ha)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Green-Ampt		
							Suction Head (mm)	Conductivity (mm/hr)	Initial Deficit (frac.)
S98	0.6367	90	0.013	0.15	2.5	7.5	180	0.5	0.1
S99	0.6754	90	0.013	0.15	2.5	7.5	180	0.5	0.1

North Neighbourhood Stage Storage Curve

Depth (m)	Elevation (m)	Area (m ²)	Incremental Volume (m ³)	Cumulative Volume (m ³)
0	168.5	16,304	0	0
4	172.5	42,114	112,829	112,829
4.25	172.75	43,861	10,746	123,575
4.5	173	45,621	11,185	134,759
4.75	173.25	47,393	11,626	146,385
5	173.5	49,178	12,071	158,456
5.25	173.75	50,975	12,518	170,975
5.5	174	52,785	12,969	183,944
5.75	174.25	54,607	13,423	197,367
6	174.5	56,442	13,880	211,248
6.25	174.75	58,289	14,341	225,589
6.5	175	60,149	14,804	240,393
6.75	175.25	62,022	15,271	255,663
7	175.5	63,908	15,741	271,404

Figure B-3: Pre- and Post- Development HGL along Wyandotte Street East Storm Sewer

Wyandotte Street East Storm Sewer

1:5 Year Storm

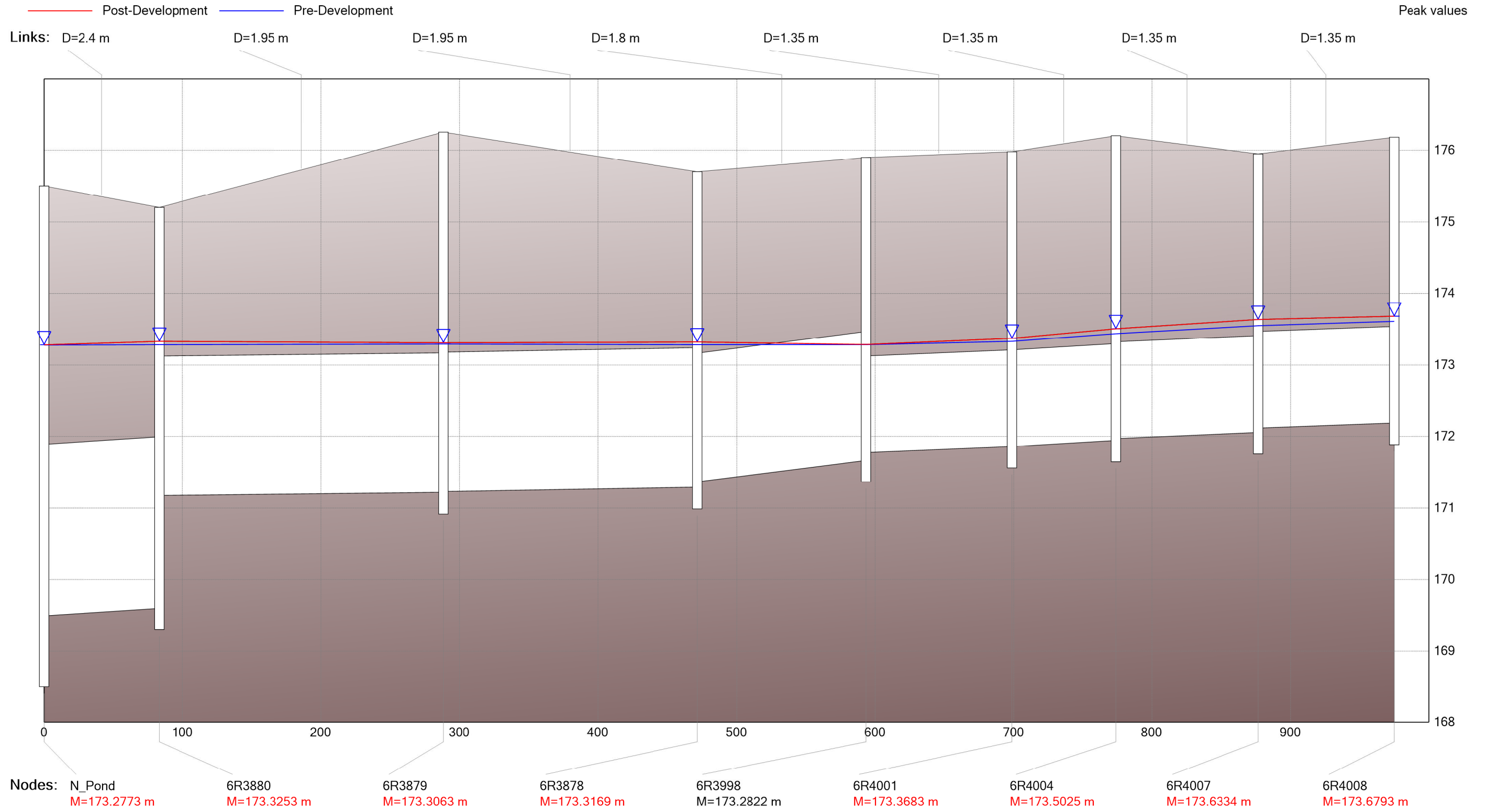
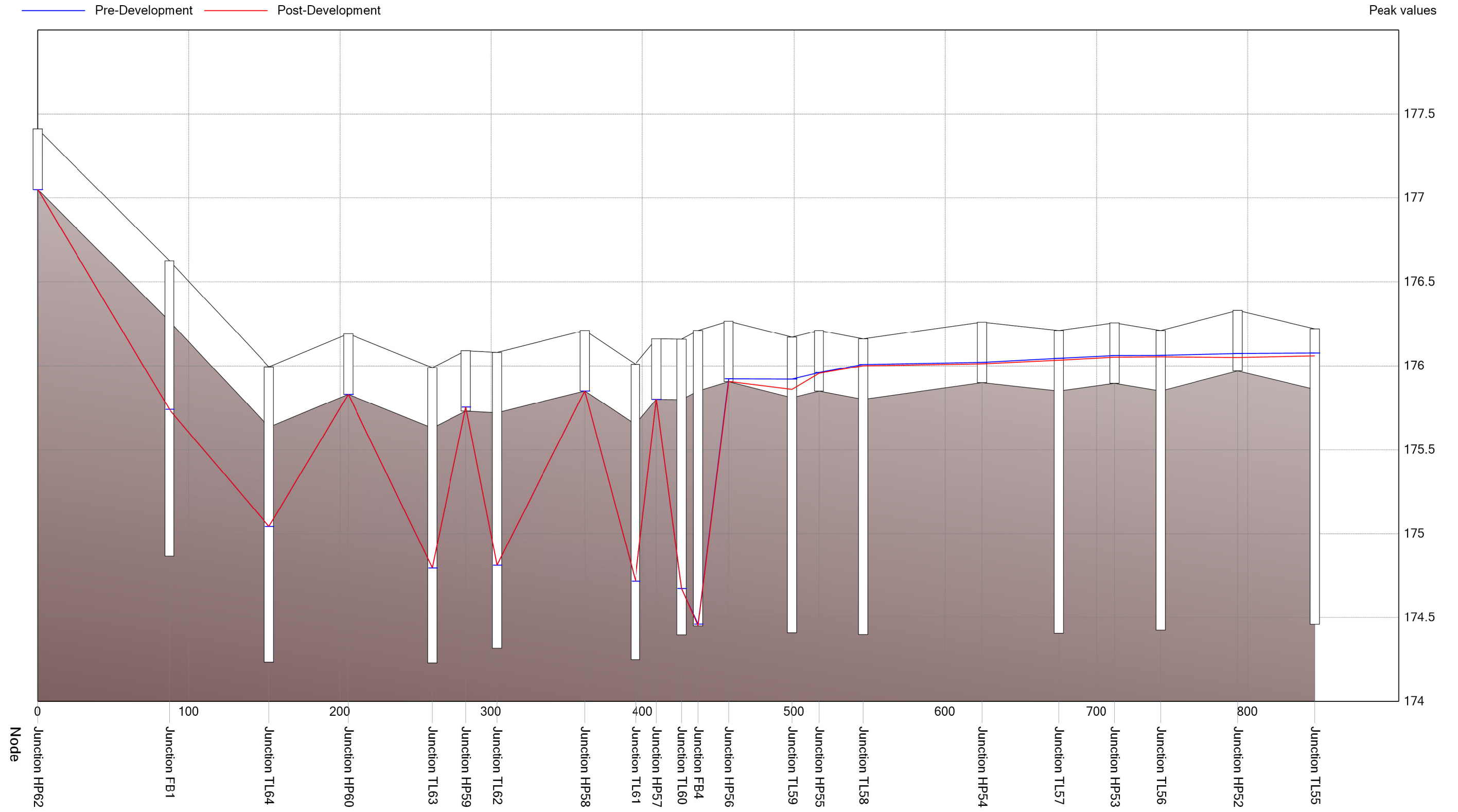


Figure B-4: Pre- and Post- Development HGL along Wyandotte Street East Major System

Wyandotte Street East Major System

1:100 Year Storm



Appendix C

Forebay Calculations

Wyandotte Inlet

Required Forebay Length

Parameters:

Length to width ratio of forebay, r =	2.0:1
Peak outflow (25 mm storm), Q_p =	$0.21 \text{ m}^3/\text{s}$ (24hr ext. det)
Target particle size =	150 mm
Settling velocity, V_s =	0.0003 m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

$$= 38 \text{ m}$$

Check Dispersion Length, Dist₂

Desired velocity in forebay, V_f =	0.2 m/s
Inlet flowrate, Q_5 =	$3.88 \text{ m}^3/\text{s}$
Depth in forebay, d =	3.5 m

$$Dist_2 = \frac{8Q}{dV_f}$$

$$= 44 \text{ m}$$

Therefore, the dispersion length of 44 m governs the design.

Required Length:	= 44 m
Provided Length:	= 90 m