



# 1350-1352 Webster Street

## Servicing Report

**Project Location:**

1350-1352 Webster Street, London, ON

**Prepared for:**

North Development Corp.  
128 Johnston Avenue, Cambridge, ON

**Prepared by:**

MTE Consultants Inc.  
123 St. George Street  
London, ON N6A 3A1

June 4, 2024

**MTE File No.:** 53653-200





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- Appendix B Water Servicing Information
- Appendix C Sanitary Servicing Information
- Appendix D Storm Servicing Information

# 1.0 INTRODUCTION

MTE Consultants Inc. (MTE) was retained by North Development Corp. to complete a Servicing Report for the property at 1350-1352 Webster Street. The proposed development is a small residential development approximately 1.24 Ha in size.

The site is located to the southeast of the intersection of Jensen Road and Webster in the City of London. The property is bounded to the north existing residential development including two stub streets (Croatia Road and Sandra Road), to the south by an existing medium density development, and to the west and east by existing single family residential lots. The site location is illustrated on **Figure 1**.

This report details the municipal servicing (water, sanitary, storm) for the proposed development. A copy of the proposed site plan is included in **Appendix 'A'**.

## 1.1 Background Documents

The following background materials were reviewed and referenced for the subject development:

- Geotechnical Investigation – Proposed Townhouse Development 1350-1352 Webster Street, London (LDS, September 2023).
- Creek View Subdivision Phase 3 – Final Design Drawings (MTE, Approved 2018)

# 2.0 WATER

## 2.1 General

Water servicing is available from the existing 150mm watermain stubs located on Croatia Road and Sandra Road. It is intended to extend a stub into the development to provide service.

Based on information obtained from the city, the site lies within the City's Low-Level System and has an HGL of 301.8masl.

A hydrant flow test was obtained from the City. The test was completed at an existing hydrant at the intersection of Jensen Rd. and Webster Street. The test indicated that the existing watermain network is able to supply 73.2 L/s at a residual pressure of 275 kPa. Refer to **Appendix 'B'** for the hydrant flow test report. A conceptual layout of the internal distribution system is illustrated on **Figure 2**.

## 2.2 Design Flows

### 2.2.1 Domestic Flow

Grades across the property generally range from 271.6 (SW) – 268.8masl (NE). Based on the boundary condition HGL, it is expected that static pressure at the site will generally exceed 296.1 kPa (43.0 psi).

Based on the proposed Site Plan for the development, 56 medium density units are proposed within the building. Based on the City's typical unit population for medium density housing (2.4ppu) and design consumption rate (255 L/cap/day) it is anticipated that the average demand for the site will be approximately:

$$56\text{units} \times 2.4\text{ppu} \times 255\text{L/p/d} / 86400\text{s/d} = 0.40 \text{ L/s.}$$

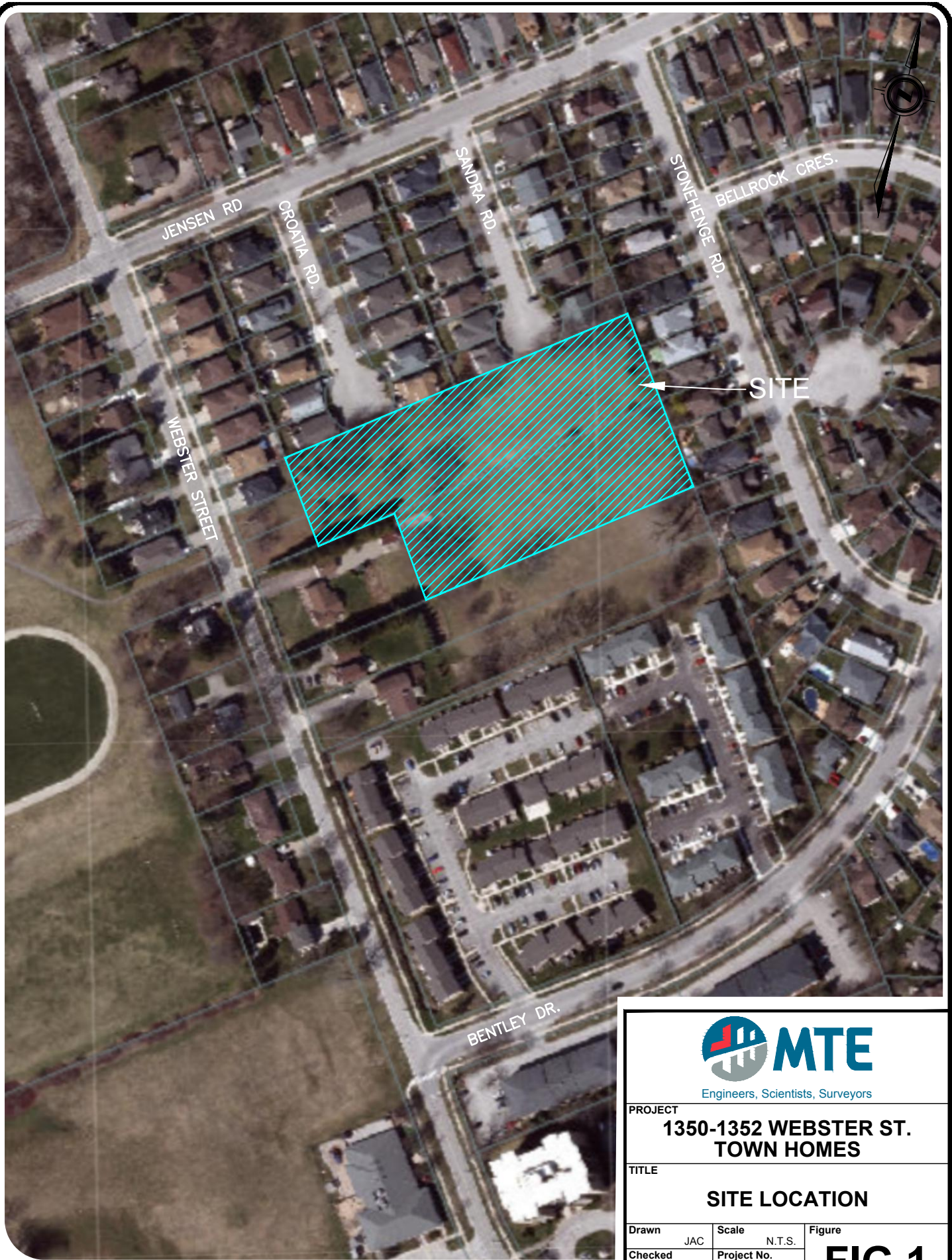


IMAGE SOURCE: MINISTRY OF NATURAL RESOURCES AND FORESTRY



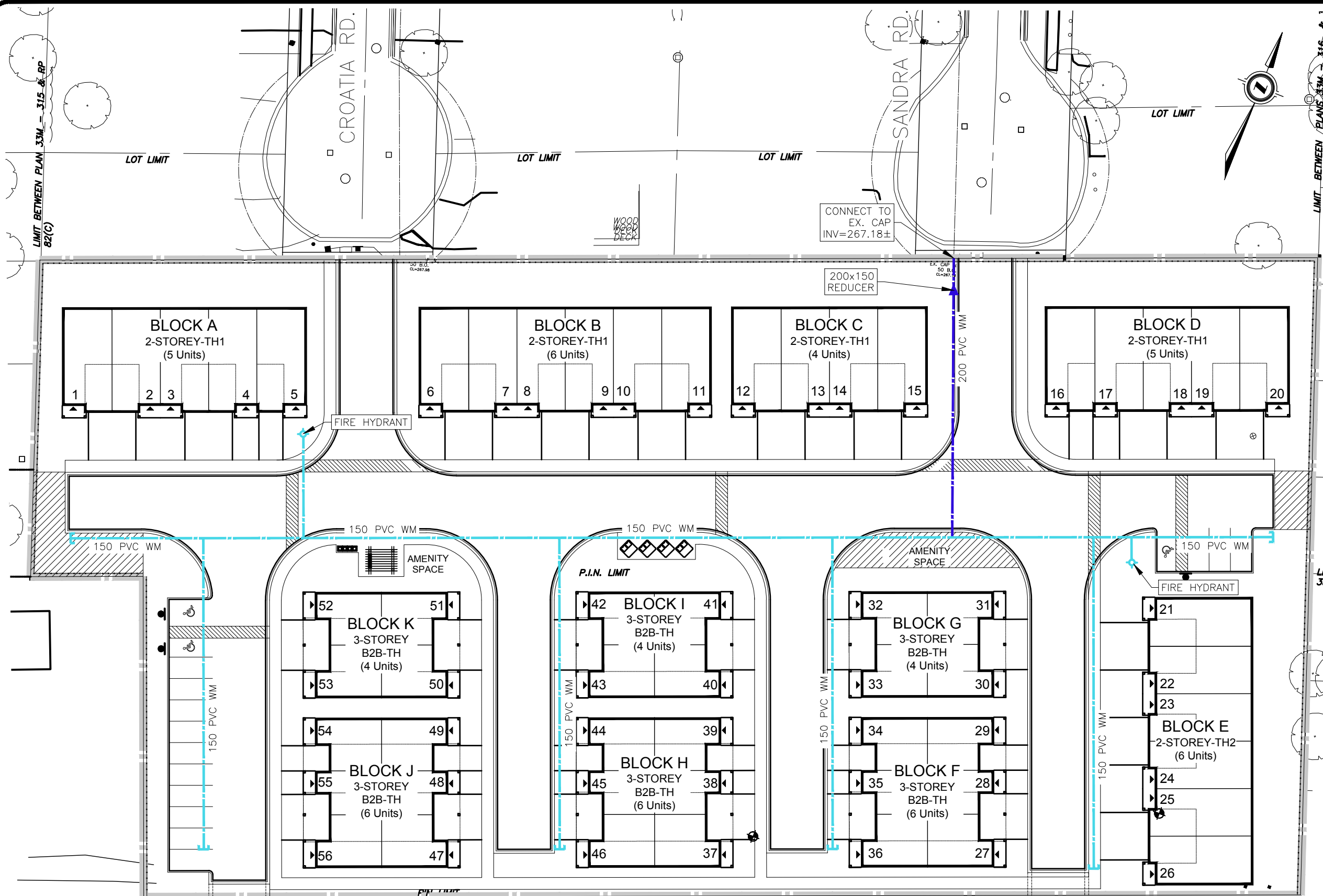
Engineers, Scientists, Surveyors

PROJECT  
**1350-1352 WEBSTER ST.  
 TOWN HOMES**






TITLE  
**SITE LOCATION**


Drawn	JAC	Scale	N.T.S.	Figure
Checked	JJM	Project No.	53653-200	
Date	2024-05-23	Rev No.	0	

**FIG.1**



**LEGEND**

-  CONSTRUCTION LIMITS
-  200 PVC WATERMAIN
-  150 PVC WATERMAIN
-  PROPOSED REDUCER
-  PROPOSED FIRE HYDRANT



**MTE**  
Engineers, Scientists, Surveyors

**PROJECT**  
1350-1352 WEBSTER ST. TOWN HOMES

**TITLE**  
WATER SERVICING

Drawn	JAC	Scale	1:500
Checked	JJM	Project No.	53653-200
Date	2024-05-23	Rev No.	0

Figure  
**FIG.2**

The 150mm watermain will be extended into the site to provide service. For the purposes of this report it is assumed that the first 30m of watermain feeding into the site will be upsized to 200mm with the remainder of the internal network being 150mm. Utilizing the City's peak hour demand factor (7.8), the peak domestic demand for the building is anticipated to be 3.1 L/s (7.8 x 0.40L/s = 3.1L/s)

Based on the size of the available service, the expected peak demand can be supplied through the service at a velocity of:

$$3.1 \text{ L/s} / (\text{Pi} * (150\text{mm}/2000)^2) = 0.2 \text{ m/s} \text{ ( Less than max 1.5m/s allowable)}$$

Given the maximum length through the proposed internal distribution network (140m of 150mm service and 30m of 200mm service), the headloss through the service pipe was calculated using the Hazen Williams equation:

$$h_f = 10.7 \times (Q / C)^{1.852} \times L_p / D^{4.87}$$

Where:  $h_f$  = Headloss (m)

$Q$  = Flow rate in  $\text{m}^3/\text{s}$  (0.0031)

$C$  = Hazen Williams 'C' coefficient (100 / 110)

$L_p$  = Length of Pipe in m (140 / 30)

$D$  = Inside diameter of the pipe in m (0.150 / 200)

$$h_{f(150)} = 10.7 \times (0.0031 / 100)^{1.852} \times 140 / 0.150^{4.87} = 0.0689\text{m} \text{ (0.675 kPa)}$$

$$h_{f(200)} = 10.7 \times (0.0031 / 100)^{1.852} \times 30 / 0.200^{4.87} = 0.0030\text{m} \text{ (0.030 kPa)}$$

Therefore, the headloss across the pipe during the peak hour scenario is 0.70 kPa and the required domestic flow can be provided at the building with a residual pressure of approximately 295.4 kPa which is within the City's preferred operating range for domestic scenarios (275-550 kPa).

As the peak hour scenario is the worst case scenario in terms of velocity and pressure for domestic usage, it is concluded that the proposed service can adequately supply all the building's domestic needs.

## 2.2.2 Quality Turnover

Based on the information provided above, the daily water usage for the site is estimated to be:

$$0.4 \text{ L/s} \times 86400 \text{ s/d} = 34.6 \text{ m}^3$$

Given the anticipated size and total length of the proposed internal piping, the total volume of water contained in the service will be:

$$\text{Pi} \times (150\text{mm}/2000)^2 \times 337\text{m} = 6.0 \text{ m}^3$$

$$\text{Pi} \times (200\text{mm}/2000)^2 \times 30\text{m} = 0.9 \text{ m}^3$$

For a total of  $6.9\text{m}^3$ . As the volume of water contained in the service connection is less than the daily usage volume it is concluded that the entire volume of water in the connection will be replaced daily. Thus, the residency time in the service will not exceed the maximum allowable time of 72 hours and no water quality issues are expected.

### 2.2.3 Fire Demand

The maximum height of the proposed buildings is 3 stories and the maximum footprint is approximately 480m<sup>2</sup>. Since none of the proposed buildings is higher than 3 stories or greater than 600m<sup>2</sup> in area, the buildings are not subject to the OBC fire flow requirements. The minimum OBC requirement for fire flow in structures that meet the OBC criteria for protection is 45 L/s and increases in 15 L/s increments. Considering that the minimum OBC requirement is 45 L/s and the proposed buildings do not meet the threshold for that requirement, a flow of 40 L/s is considered to be adequate for the proposed site. Allowing for the max day demand of 1.4 L/s (0.4 L/s x 3.5), the total flow of 41.4L/s is accounted for.

Based on the size of the proposed service, the fire demand can be conveyed by the service at a velocity of 2.3 m/s which subceeds the maximum allowable velocity of 2.4 m/s.

Given the maximum length of the proposed water service, the headloss through the service pipe was calculated using the Hazen Williams equation:

$$h_f = 10.7 \times (Q / C)^{1.852} \times L_p / D^{4.87}$$

Where:  $h_f$  = Headloss (m)

$Q$  = Flow rate in m<sup>3</sup>/s (0.0414)

$C$  = Hazen Williams 'C' coefficient (100 / 110)

$L_p$  = Length of Pipe in m (140 / 30)

$D$  = Inside diameter of the pipe in m (0.150 / 0.200)

$$h_{f(150)} = 10.7 \times (0.0414 / 100)^{1.852} \times 140 / 0.150^{4.87} = 8.3490\text{m} \text{ (81.853 kPa)}$$

$$h_{f(200)} = 10.7 \times (0.0414 / 100)^{1.852} \times 30 / 0.150^{4.87} = 0.3694\text{m} \text{ (3.622 kPa)}$$

Therefore, the headloss across the pipe during the fire flow scenario is 85.5 kPa and the required fire flow can be provided at the internal hydrant with a residual pressure of approximately 210.6 kPa which is above the minimum operating pressure for fireflow scenarios (140 kPa).

As per the hydrant flow test provided by the City, the local watermains are able to provide the required flow rate with a residual pressure greater than the minimum allowable 140 kPa.

## 3.0 SANITARY

### 3.1 General

Sanitary servicing is proposed to be provided by connection to the existing 200mm sanitary sewers on Croatia Road and Sandra Road. 150mm service connections are proposed to service the site.

As per City record Dwg 11457, the site was included in the design of the Jensen Road sanitary sewer system assuming a population of 112 persons for the site. The design sheets for the Croatia Road and Sandra Road sanitary sewers each allowed for a population of 20 persons from the area of the proposed site. Refer to **Appendix 'C'** for the record drawings.



## 3.2 Design Flow

The design of the Jensen Road sewers was completed in the early 1990's at which time a daily consumption rate of 365 L/p/d was used for design. Therefore, the peak flow from the site used in the design of the local sewers was:

$$112 \text{ persons} \times 365 \text{ L/day} \times 4.23 / 86,400 \text{ s/day} = 2.0 \text{ L/s}$$

Using the City's current standard consumption rate of 255 L/person/day and the Harmon Peaking Factor, a peak sanitary flow of:

$$135 \text{ persons} \times 230 \text{ L/day} \times 4.21 / 86,400 \text{ s/day} = 1.51 \text{ L/s}$$

Is expected from the site.

The sanitary sewers on Croatia Road and Sandra Road currently serve only 14 single family units each which would produce a peak flow of approximately 0.6 L/s using current design standards. Both local sanitary sewers have capacity to convey up to 22 L/s, thus, no capacity issues are expected on the adjacent stub streets.

As the design sanitary flow rate used for the Jensen Street sewers exceeds the actual anticipated sanitary flow rate, no negative downstream impacts are anticipated. Conceptual sanitary servicing is illustrated on **Figure 3**.

## 4.0 STORMWATER

### 4.1 General

As per City record drawing 15791, 0.79 ha of the site was included in the design of the SWM infrastructure on Croatia Road and Sandra Road with a runoff coefficient of 0.5. The design sheets for the area show that flow rates of 49 and 34 L/s were accounted for in the design of the sewers.

The site lies within the Central London subwatershed. Runoff from the site will travel north to Jensen Road, then west to Highbury Ave. before jogging north and discharging to the Meander Creek which is tributary to the Thames River. As per the City's design requirements, the SWM targets for the subwatershed are to control post-development flows to predevelopment levels for all storm events up to the 100 Year storm, to safely convey the major storm event and to not exceed the capacity of the stormwater conveyance system. A Normal Level of quality control is to be provided.

## 4.2 Quantity Control

### 4.2.1 Proposed Area Breakdown

The proposed site is approximately 1.24 ha in size. Based on area take offs completed by MTE the surface area usages for the site are as follows:

Roof Area:	3,809 m <sup>2</sup>
Asphalt / Parking:	3,305 m <sup>2</sup>
Other Impervious:	1,779 m <sup>2</sup>
Grass / Plantings:	3,519 m <sup>2</sup>
Total:	12,412 m <sup>2</sup>

Thus the site is approximately 72% impervious which corresponds to a runoff coefficient of approximately 0.70. As the proposed area and runoff coefficient exceed those used in the design of the storm sewers, runoff from the site must be controlled to the allowable flow rate. As noted previously, the downstream sewers were designed to accommodate flow rates of 34 and 49 L/s.

### 4.2.2 Proposed Quantity Controls

Quantity control for the site is intended to be provided via orifice plates set upstream of the existing stubs. Overland flow will generally be directed toward Sandra Road, given the proposed site plan and existing topographical relief it is assumed that opportunities for surface ponding will be limited and the majority of storage required for the site will need to be provided below grade.

Orifices will be sized to control release rates to the allowable rates as per the storm sewer design resulting in a total allowable release rate of 83 L/s (34 + 49 = 83).

A modified rational method analysis was completed to determine the amount of storage required to attenuate runoff to the desired flow rate. The analysis showed that 282m<sup>3</sup> of storage would be required. Calculations are provided in **Appendix D**.

Storage will be provided within the proposed sewers, subsurface chambers, and by surface ponding within the proposed parking areas and drive aisles. The design of the storage facilities will be provided at the detailed design stage via the SPA process. Surface ponding within the parking / driving areas will be limited to a maximum depth of 0.3m in keeping with the City's guidelines. Conceptual storm servicing is illustrated on **Figure 4**, record drawings are included in **Appendix D**.

It is noted that the site lies within an area identified as a significant groundwater recharge area and highly vulnerable aquifer. The geotechnical report for the site identified that the underlying soils were sandy with factored infiltration rates ranging from 19-69 mm/hr. Groundwater elevations were measured to vary between 2-3m below ground surface. Thus, it may be feasible to implement infiltration measures within the site.

### 4.2.3 Quality Control

Quality control will be provided by an Oil Grit Separator unit (OGS) sized to provide a normal level of control for the site. Based on the site characteristics, an ADS FD-4HC (or approved equivalent) can provide the needed quality control level.

It is anticipated that minor system flow from the entire site can be directed to a single OGS unit which will outlet via the existing storm sewer on Sandra Road. A preliminary Sizing report is provided in **Appendix D**.

## 5.0 EXTERNAL SERVICING

The proposed development will leave two (2) low density residential lots immediately to the south. These two residential lots are identified as municipal addresses 1344 & 1346 Webster Street. It is anticipated that at some point in the future these lots may be developed. These lots are being considered in a general sense to ensure that they will not be cut off from any municipal services (water, sanitary, storm).

### Water

There is an existing 150mm watermain on Webster Street which can service the proposed development. A flow test or other form of water distribution analysis should be performed to ensure the water supply is sufficient at the time of development.

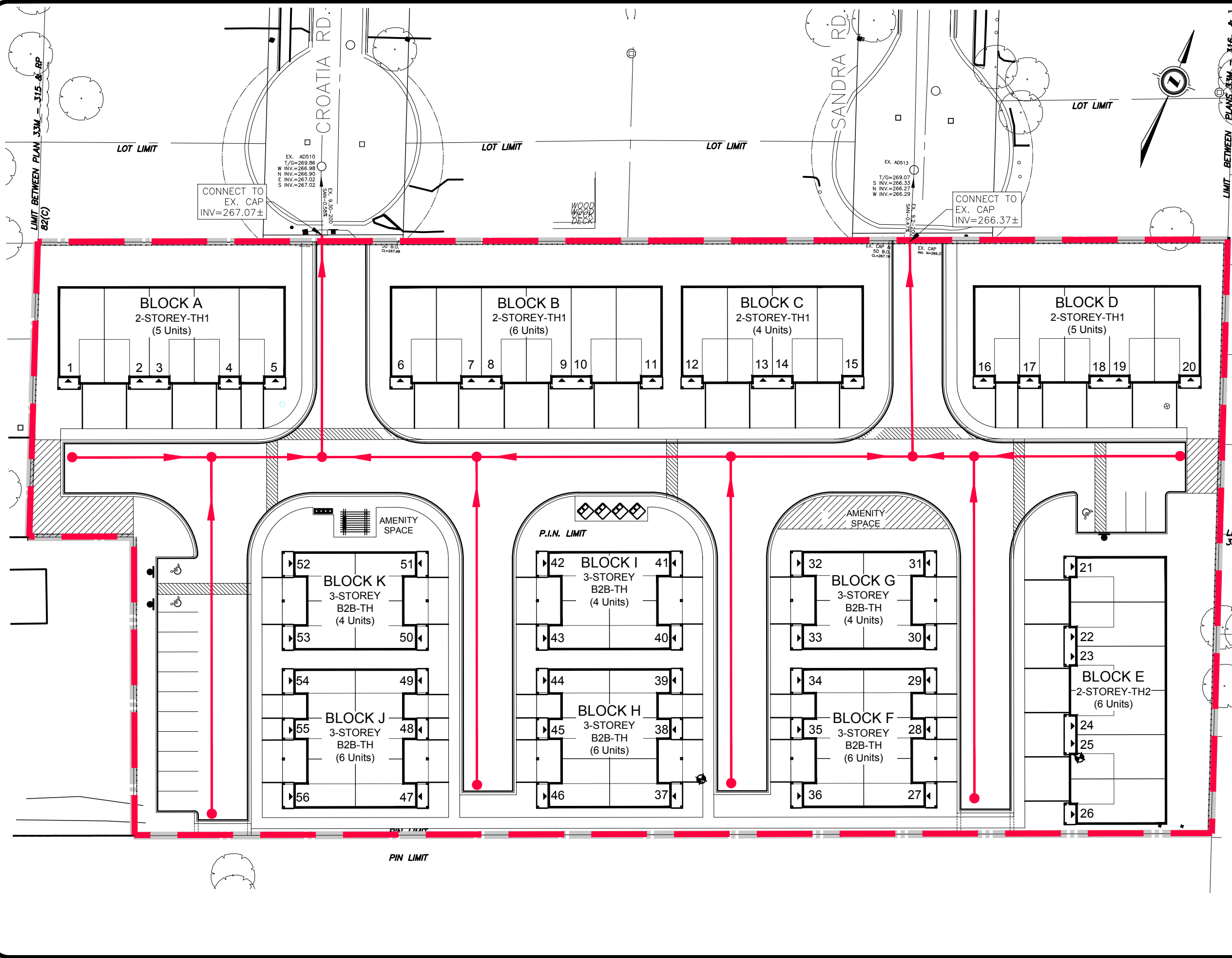
### Sanitary

As per City record drawing 11,457 it appears that area A4, which includes the proposed development as well as 1344-1346 Webster Street, was accounted for in the design of the Jensen Street sanitary sewer and the Webster Street sewer as well. The lots were accounted for in the design of the Webster Street sewer assuming a population density of 200 ppha which is adequate to cover the current zoning of the lots (R1-6).

As adequate provision has been made for the future development of these lots in the Webster Street sewer, these lots are not intended to be serviced through the proposed site. The invert of the existing sanitary sewer on Webster Street (~265.6 masl) is approximately 3.2m lower than the expected minimum elevation of the lots in the south/east corner (~268.8). Thus, it is anticipated that future development of the lots to the south can be serviced via the Webster Street sanitary sewer via gravity.


### Storm

There is no storm sewer available on Webster Street. A new storm sewer could be extended to service the properties from the existing storm MH at the intersection of Webster Street and Bently Drive. Alternatively, given the underlying soils will likely be relatively conducive to infiltration, on-site infiltration measures could be proposed for the minor rainfall events with the majors being directed out to the ROW.



**LEGEND**

- BLOCK A DENOTES BLOCK NUMBERS
- SITE LIMITS
- SANITARY MANHOLE
- SANITARY SEWER



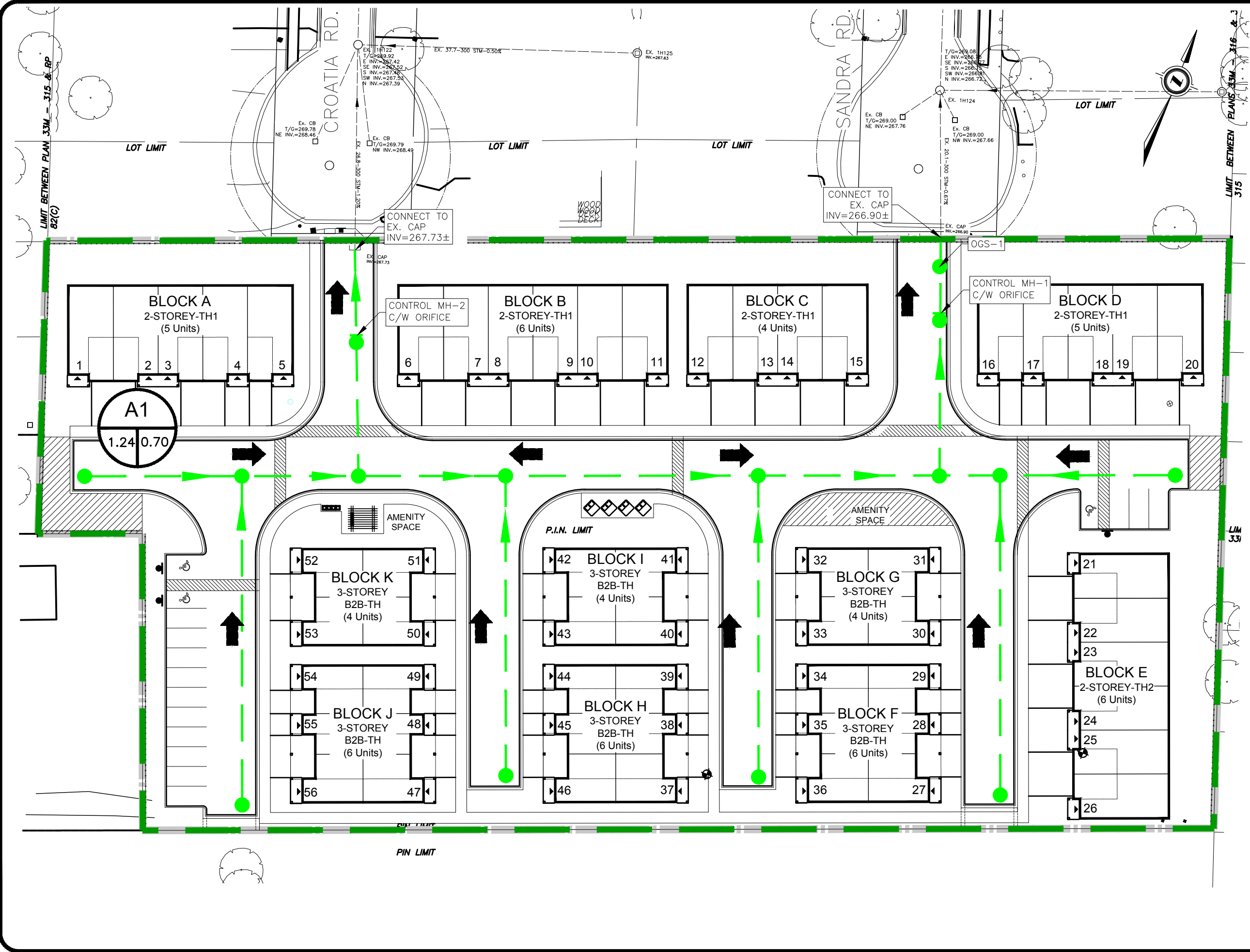
**MTE**  
Engineers, Scientists, Surveyors

**PROJECT**  
1350-1352 WEBSTER ST. TOWN HOMES

**TITLE**  
SANITARY SERVICING

Drawn	JAC	Scale	1:500
Checked	JJM	Project No.	53653-200
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Figure  
**FIG.3**



**KEY**

BLOCK NUMBER  
 AREA (IN ha)  
 C FACTOR

CATCHMENT AREA  
 DRAINAGE DIRECTION

**LEGEND**

PROPOSED STORM SEWER  
 PROPOSED MANHOLE  
 EXISTING STORM  
 LIMIT OF CONSTRUCTION

**MTE**  
Engineers, Scientists, Surveyors

PROJECT  
**1350-1352 WEBSTER ST. TOWN HOMES**

TITLE  
**STORM SERVICING**

Drawn	JAC	Scale	1:500	Figure <b>FIG.4</b>
Checked	JJM	Project No.	53653-200	
Date	2024-05-23	Rev No.	0	

## 6.0 EROSION AND SEDIMENT CONTROLS

### 6.1 Erosion Risk Assessment

Given that the site is 1.24 ha in size and does not discharge runoff to a natural heritage feature, an Erosion Risk Assessment (ERA) is not required.

### 6.2 Erosion and Sediment Controls

Erosion and Sediment Control measures will be prepared for the site giving due consideration to the risk of erosion and the sensitivity of the downstream receiver. The details and locations of the proposed erosion/sediment control devices will be fully detailed at time of SPA. The erosion/sediment control devices may include such measures as:

Erosion Controls:

- Stabilize all disturbed areas after construction or where work will not take place for 30 days. Stabilization will consist of broadcast seeding during the spring, summer or fall.

Sediment Controls:

- Provide light or heavy duty silt fence around the site
- Storm Drain Inlet Protection (Straw Bales, Silt Sacks at inlets)
- Mud Mat
- Perform street sweeping on existing streets as necessary to keep the existing streets cleaned of debris. Dispose of sediment and debris at approved locations.

As much as possible / practical, the measures shall be fully installed prior to any construction activity such as topsoil stripping and earth grading, with the remaining measures implemented in good order.

## 7.0 CONCLUSIONS

The proposed development is a medium density residential development located in London Ontario.

Water is available from the existing 150mm watermain on Sandra Road. The available service is sufficiently sized to provide water for domestic and fire suppression purposes.

Wastewater from the site can be directed to the existing 200mm sanitary sewers on Croatia Road and Sandra Road.

All of the stormwater management controls and minor/major flow patterns have already been established via the storm design(s) previously completed for the neighbourhood and the City's current design standards. Stormwater infrastructure will be implemented on-site via permanent private infrastructure to control flow to the capacity of the existing storm sewers on Croatia Road and Sandra Road.

All of which is respectfully submitted,

**MTE Consultants Inc.**



**Joshua Monster, P.Eng.**

Design Engineer

519-743-6500 ext. 555

[jmonster@mte85.com](mailto:jmonster@mte85.com)

JJM:xxx

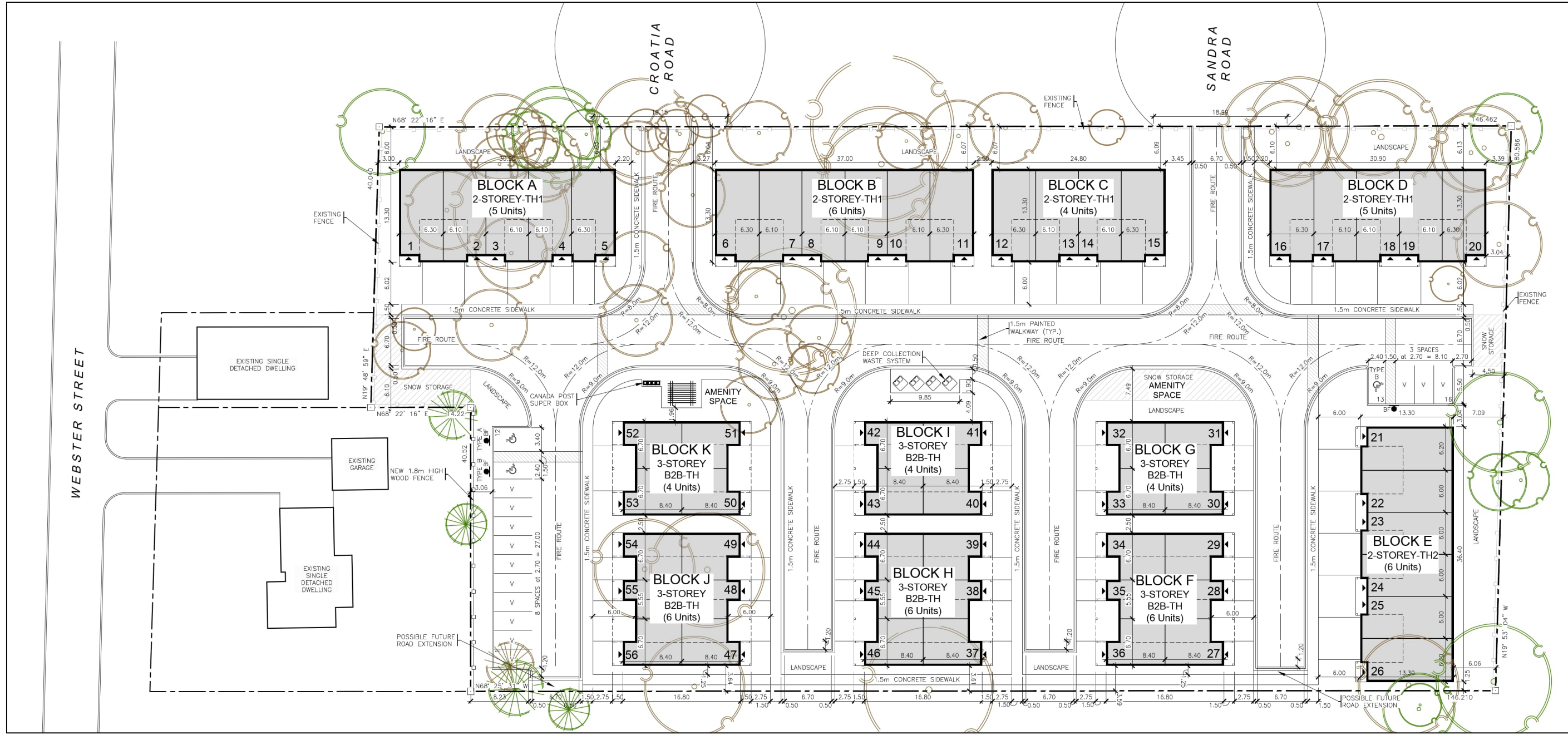
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# Appendix A

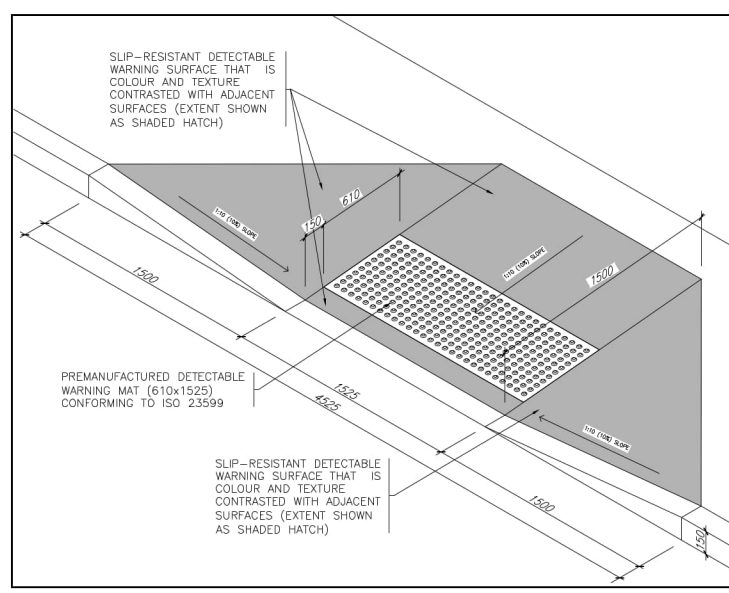
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## Proposed Site Plan

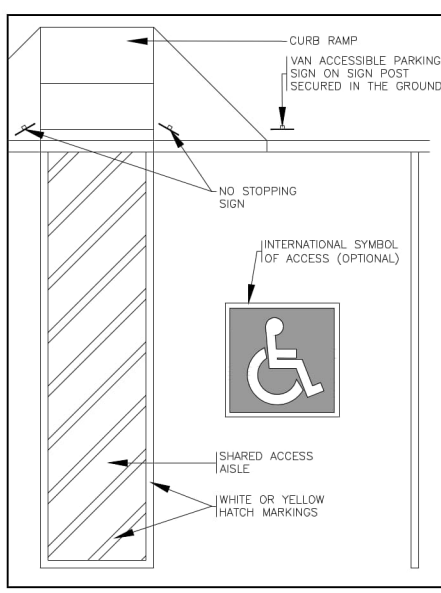




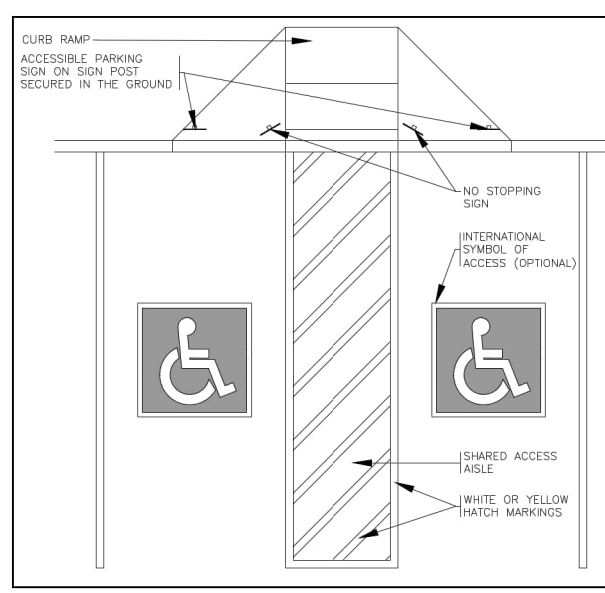
**1 SITE PLAN**  
A1.01 1:300



**2 CURB RAMP DETAIL**  
A1.1 N.T.S.



**3 BARRIER FREE PARKING 'A'**  
A1.1 N.T.S.



**4 BARRIER FREE PARKING 'B'**  
A1.1 N.T.S.

**LEGEND**

- IRON BAR
- PROPERTY LINE
- MAN DOOR ENTRANCE / EXIT.
- 6.0m WIDE FIRE ROUTE
- FIRE HYDRANT
- STOP SIGN
- NO PARKING FIRE ROUTE SIGNAGE
- STREET LIGHT (REFER TO SITE LIGHTING PLAN)
- BARRIER FREE PARKING SIGN
- VISITOR PARKING

**EXISTING ZONING R1-6**  
**PROPOSED ZONING R5-4 (11 BLOCKS, 56 UNITS)**

26 - 2 STOREY UNITS  
30 - BACK-TO-BACK UNITS

REGULATION	REQUIRED	PROPOSED
LOT AREA	8,000 sq.m./0.8 ha	12,412.58 sq.m. (1.24 ha)
LOT FRONTAGE (MINIMUM)	75.0 m	*38.14 m
FRONT YARD (MINIMUM)	6.0 m	6.00 m
EXTERIOR SIDE YARD (MINIMUM)	6.0 m	N/A
SIDE YARD (MINIMUM)	3.0 m	3.00 m
REAR YARD	6.0 m	*3.04 m
LANDSCAPE OPEN SPACE (MIN.)	4,344.40 sq.m. (35%)	4,662.11 sq.m. (37.56%)
LOT COVERAGE (MAXIMUM)	4,965.03 sq.m. (40%)	3,800.13 sq.m. (30.62%)
BUILDING HEIGHT (MAX.)	12.0 m	7.50 m (2 STOREY UNITS) 11.00 m (3 STOREY B2B)
DENSITY (MAXIMUM) PER LOT AREA	24 UNITS/ACRE (24x3.06 = 73 UNITS)	56 UNITS

NOTE: \* REQUIRES SPECIAL REGULATION

**PARKING REQUIREMENTS:**

REQUIRED:  
TOTAL SPACES REQUIRED 1.0 SPACES PER UNIT  
BLOCKS A-K, 56 UNITS x 1.0 = 56 SPACES  
TOTAL SPACES REQUIRED = 56 SPACES

PROVIDED:  
SPACES PROVIDED = 56 WITHIN GARAGE  
SPACES PROVIDED = 56 WITHIN DRIVEWAY  
SPACES PROVIDED = 16 VISITOR  
TOTAL PARKING PROVIDED = 128 SPACES

**BARRIER FREE PARKING REQUIREMENTS:**

REQUIRED:  
4% OF REQUIRED PARKING SPACES = 56 x 4% = 3 SPACES  
REQUIRED TYPE 'A' SPACES = 1 SPACE  
REQUIRED TYPE 'B' SPACES = 2 SPACES

PROVIDED:  
TYPE 'A' SPACES = 1 SPACE  
TYPE 'B' SPACES = 2 SPACES

Project Information

**North**  
DEVELOPMENT CORP.

**NORTH DEVELOPMENT CORP.**  
2 STOREY AND BACK-TO-BACK TOWNHOMES  
1356 Webster Street, London, ON.

**Set Issuance**

No.	Date	Description
1	2023-12-15	ISS FOR REVIEW
2	2023-12-18	ISS TO CONSULTANTS
3	2024-03-18	LANDSCAPE COORDINATION
4	2024-03-27	CLIENT REVISIONS
5	2024-05-06	CITY COMMENTS

Street Information

**SITE PLAN**

Project No. 15462  
Project Start Date: 2023.12.15  
File: Webster Street - Site Plan.dwg  
Drawn by: MGL  
Scale: 1:300

**A1.01**  
Plot Date | Time - 2024-05-07 8:59:18 AM

# Appendix B

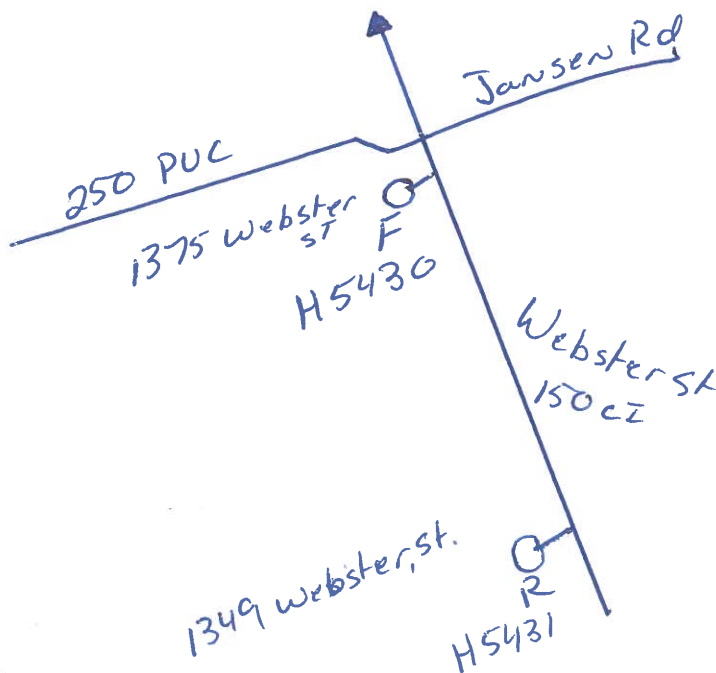
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## Water Servicing Information

**WATER SUPPLY DEPARTMENT  
FLOW TESTS**

DATE:	Aug 24 - 15	FLOW TEST No		15-47
TIME:	11:00	HYDRANT ID		H5430
OPERATOR:	D Prentice	CHLORINE RESIDUAL mg/L		0.60
OPERATOR:	T Allen	WATER QUALITY AFTER TEST	POOR	GOOD
REQUESTED BY:	DMA			EXCELLENT
LOCATION:	1375 Webster St.	TIME USED FOR FLUSHING (IF NECESSARY)		5 min

TEST NUMBER	FLOW HYDRANT					RESIDUAL HYDRANT	
	STATIC PRESSURE PSI	OUTLET SIZE IN	PITOT READING PSI	INDIVIDUAL FLOW US GPM	TOTAL FLOW US GPM	RESIDUAL PRESSURE PSI	STATIC PRESSURE PSI
1	47	2.5	30	920	920	42	45
2		2.5	12	580	1160	40	
		2.5	12	580			
3							

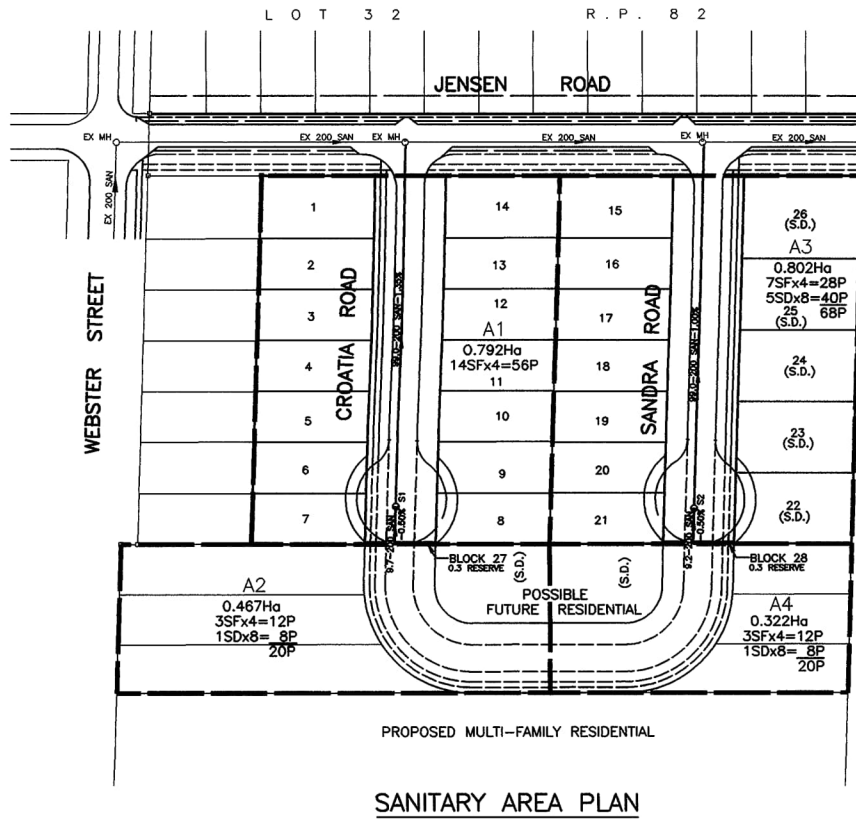


Information contained in this report is representative of flows and pressure losses at the time of the test and depends on reservoir levels, pump operation and customer water demand. Results will vary throughout the day and time of year. Available pressure at other times should be based on a design hydraulic grade line for the pressure zone in which the hydrants are located. By issuing this information report, neither the City nor any of its employees makes any warranty, express or implied, concerning the location, type or extent of services described in this report. Furthermore, neither the City nor any of its employees shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this information or incomplete information.

# Appendix C

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## **Sanitary Servicing Information**



RESIDENTIAL POPULATION DENSITIES

AREA BASIS	LOT & UNIT BASIS	POPULATION
80 PEOPLE PER GROSS HECTARE	SINGLE FAMILY	4 PEOPLE PER LOT
62 PEOPLE PER NET HECTARE	SEMI DETACHED	8 PEOPLE PER LOT
	ROWHOUSING	4 PEOPLE PER UNIT
	APARTMENTS - BACHELOR	1.5 PEOPLE PER UNIT
	APARTMENTS - ONE BEDROOM	2.5 PEOPLE PER UNIT
	APARTMENTS - TWO BEDROOM	3.5 PEOPLE PER UNIT

CITY OF LONDON  
CITY ENGINEERS DEPARTMENT  
SANITARY SEWER DESIGN SHEET

PROJECT: JENSEN ROAD SUBDIVISION  
FILE No. 81094 SHEET OF  
SANITARY AREA  
DESIGNED BY LGWS CHECKED BY  
DATE FEBRUARY 1993

AREA No.	STREET	FROM	TO	Net or Gross	DIMENSIONS	Δ A (ha)	Σ A (ha)	PER ha	No of Lots	PER LOT	Δ POP.	Σ POP.	INFLTR. I/s	SEWERAGE I/s	TOTAL I/s	SIZE mm	S %	n	CAP I/s	Velocity M/s	LOSSES IN MH	FALL IN SEWER	LENGTH M	INVERT U.S.	ELEV. D.S.
A2	CROATIA ROAD	S1	EX MH	G		0.467	1.259	-	14	4	56	76				200	1.35	0.013	36	1.21					
A1	CROATIA ROAD			G		0.792	1.259	-																	
A4	SANDRA ROAD	S2	EX MH	G		0.322		-	20	4	80	88				200	1.00	0.013	33	1.06					
A3	SANDRA ROAD			G		0.792	1.114	-																	

RUNOFF COEFFICIENT 'C'

PARKS & PLAYGROUNDS	0.20
RESIDENTIAL - SINGLE & SEMI	0.50 & 0.55
RESIDENTIAL - ROWHOUSING	0.65
RESIDENTIAL - APARTMENTS	0.65 - 0.70
COMMERCIAL & INDUSTRIAL	0.80 & 0.70
DENSELY BUILT PAVERS	0.90

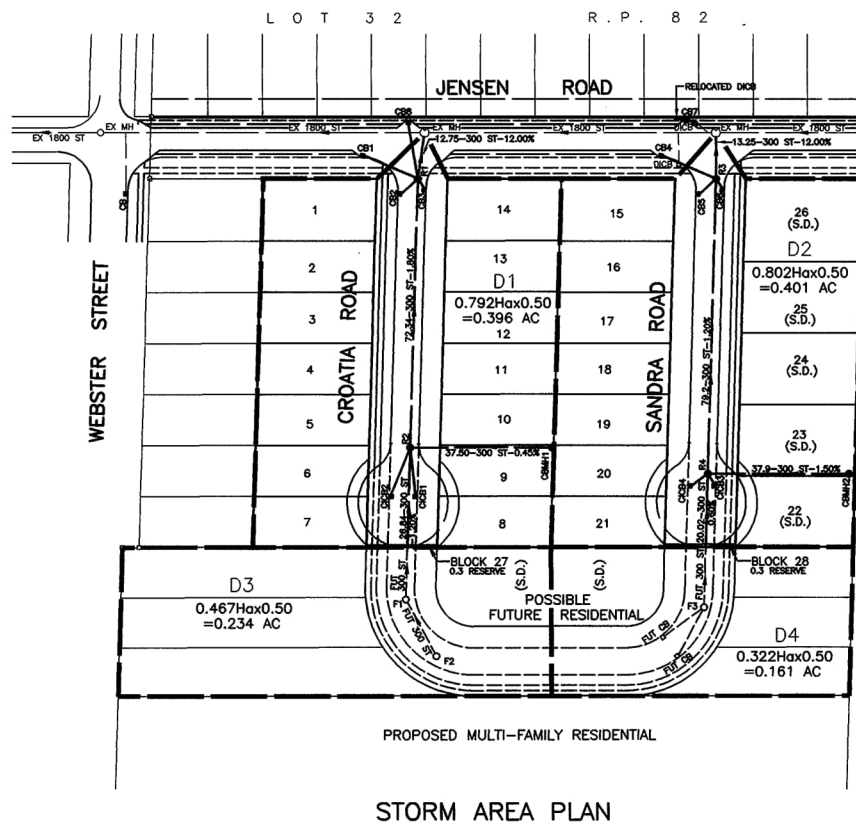
CITY OF LONDON  
CITY ENGINEERS DEPARTMENT  
STORM SEWER DESIGN SHEET

PROJECT: JENSEN ROAD SUBDIVISION  
FILE No. 81094 SHEET OF  
DRAINAGE AREA  
DESIGNED BY LGWS CHECKED BY  
DATE FEBRUARY 1993

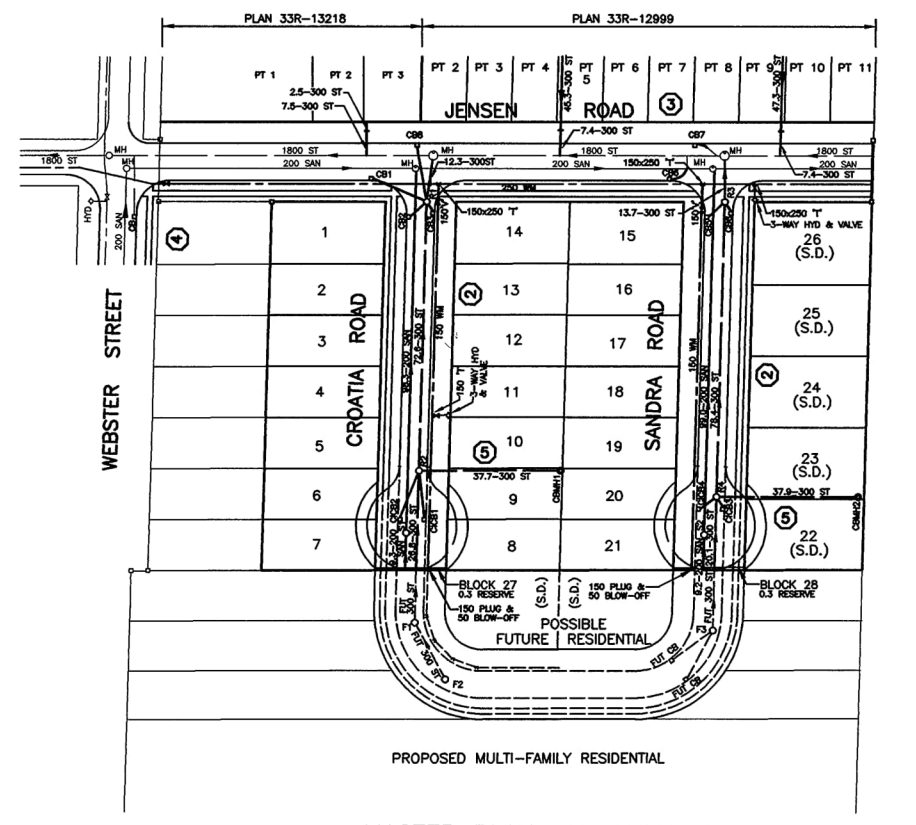
FLOW Q = 2.78 ACI  
WHERE Q = PEAK FLOW IN LITRES PER SECOND (l/s)  
A = AREA IN HECTARES (ha)  
C = RUNOFF COEFFICIENT  
I = RAINFALL INTENSITY IN MILLIMETRES PER HOUR (mm/hr)

RETURN PERIOD 2 YEARS

SEWER LOCATION	AREA	TOTAL AREA (ha)	A x C	RAINFALL INTENSITY	Q (l/s)	SEWER DESIGN														
CROATIA ROAD F2	F1	D3	0.467	0.467	0.50	0.234	0.234	19.00	76	49	300	0.42	0.013	62	0.90	17.0	0.31			
CROATIA ROAD F1	R2		0.467	0.467	0.50	0.234	0.650	0.31	19.31	49	300	1.20	0.013	105	0.90	40.6	0.75			
CROATIA ROAD R2	R1	D1	0.792	1.259	0.50	0.396	0.630	0.630	1.751	0.75	20.06	74	130	300	1.80	0.013	130	1.85	72.34	0.65
CROATIA ROAD R1	EX MH		1.259	1.259	0.50	0.630	0.630	1.751	20.71	0.65	20.71	130	300	12.00	0.013	345	4.8	12.75	0.04	
SANDRA ROAD F3	R4	D4	0.322	0.322	0.50	0.161	0.161	0.161	0.448	19.00	76	34	300	0.80	0.013	75	0.90	36.5	0.68	
SANDRA ROAD R4	R3	D2	0.802	1.124	0.50	0.401	0.562	0.562	1.562	0.68	19.68	75	117	300	1.50	0.013	120	1.70	79.20	0.78
SANDRA ROAD R3	EX MH		1.124	1.124	0.50	0.562	0.562	1.562	20.46	0.68	20.46	117	300	12.00	0.013	345	4.8	13.25	0.05	



NOTE: THE 250 WATERMAIN ON JENSEN ROAD EAST FROM HIGHBURY AVENUE TO THE EASTERLY LIMIT OF THE JENSEN ROAD SUBDIVISION MUST BE INSTALLED PRIOR TO ANY WATERMAIN INSTALLATION IN THE JENSEN ROAD SUBDIVISION.



(S.D.) - DENOTES SEMI-DETACHED LOT  
③ - DENOTES PLAN NUMBER OF PLAN/PROFILE DRAWING

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1 SEE DRAWING NO. FOR FURTHER DETAIL	SANITARY SEWERS, PDC's & MH's	MAY 1994	DESIGN LGWS	1 AS SUBMITTED FOR APPROVAL	MAR 31/93	GS
2 SEWER DESIGN TRANSITION WIDTH OR AS NOTED	STORM SEWERS, PDC's, CB's & MH's	MAY 1994	DRAWN CD	2 FOR CITY APPROVAL	MAY 6/93	GS
3 REFERENCE B.M. NO. 5207 ELEVATION 271.339m	WATERMAIN & WSC's	MAY 1994	CHECKED RWC	3 ROADWORKS	MAR 28/94	GS
4	GRANULAR BASE	MAY 1994	APPROVED	4 AS CONSTRUCTED	FEB /99	EBW
5	CURB & GUTTER	SEPT 1994	DATE MARCH 1993			
	SIDEWALKS	JULY 1998	F BK 551			
	PAVING - BASE	SEPT 1994				
	- SURFACE	JULY 1998	81094A1			

development engineering  
(London) Limited

Consulting Civil Engineers and Planners  
361 Dufferin Avenue  
London, Ontario N6B 1Z5  
Phone (519)672-8310  
Fax (519)672-4182

ENGINEER'S STAMP  
CORPORATION OF THE CITY OF LONDON

SCALE  
1:1000

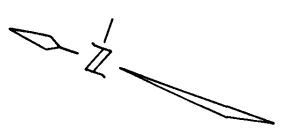
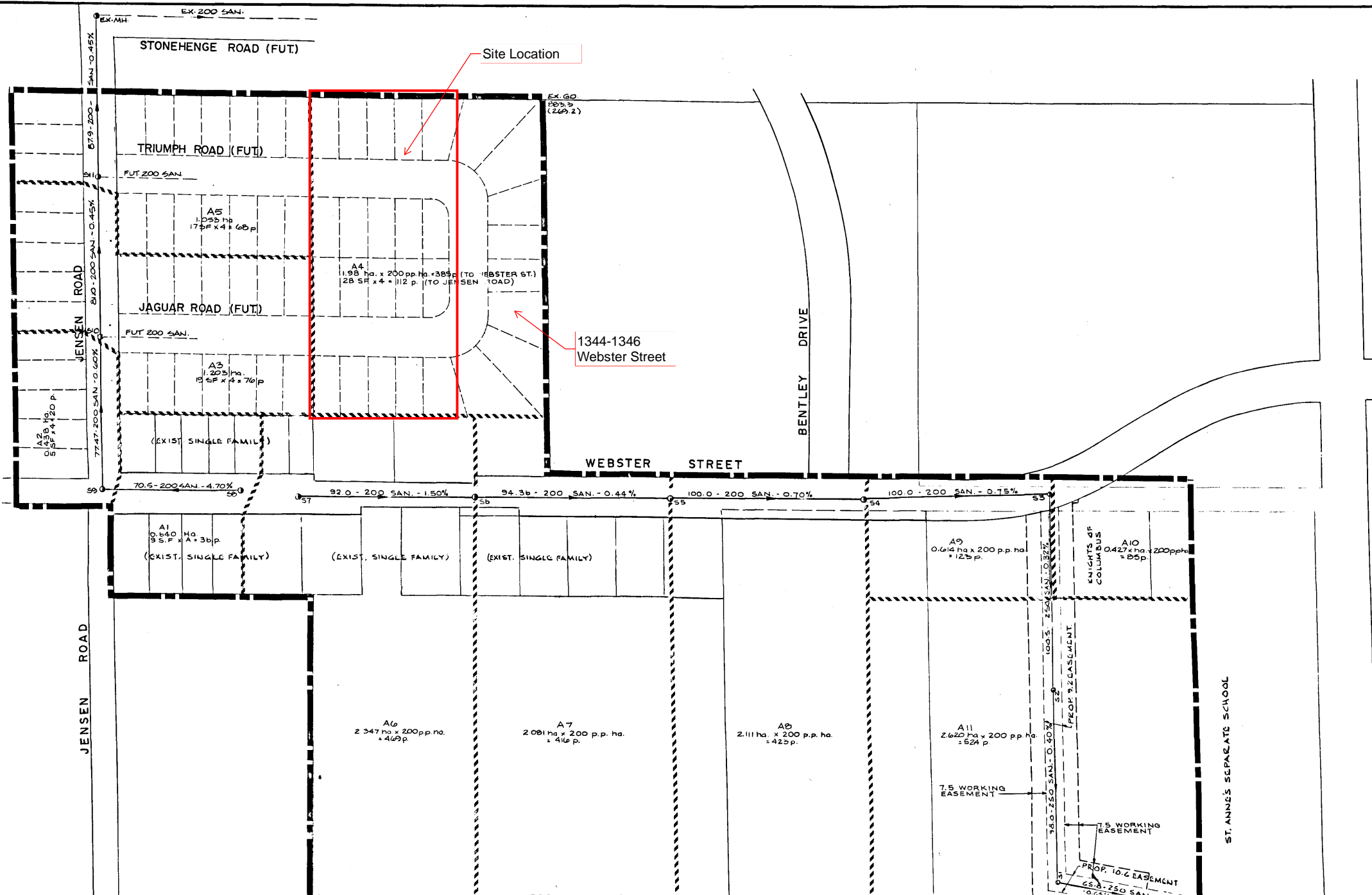
10.0 m 0 20.0 m  
HORIZONTAL  
m p  
VERTICAL

TITLE  
JOE PERAIC LIMITED PLAN 33M-315, 33R-12999  
JENSEN ROAD SUBDIVISION

PROJECT NO. 91094

SHEET NO. 1

PLAN FILE NO. 15,791



11,457

**CITY OF LONDON**  
CITY ENGINEERS DEPARTMENT  
SANITARY SEWER DESIGN SHEET

Project: WEBSTER STREET SANITARY SEWER  
File No. 23-523 Sheet of  
Sanitary Area  
Designed By: J.E.M. Checked By: J.E.M.  
Date: June 8, 1990

AREA	SEWER LOCATION	STREET	FROM	TO	DIMENSIONS	AREA			POPULATION			SEWAGE FLOW			SEWER DESIGN			PROFILE		
						0.4	0.8	1.2	PER ACRE	PER LOT	PER POP	INFILT	SEWAGE	TOTAL	SIZE	S	n	CAP.	VELOCITY	LOSSES/FAL
A1	WEBSTER STREET	S8	S8	S8	0.640	0.640	-	9	4	36	36	MINIMUM	200	4.70	0.015	71	2.70			
A2	JENSEN ROAD	S9	S10	S10	0.638	1.078	-	5	4	20	84	DESIGN	200	0.60	-	28	0.82			
A3	JENSEN ROAD	S10	S11	S11	1.926	2.291	-	19	4	76	192	CRITERIA	200	0.60	-	22	0.72			
A4	JENSEN ROAD	S11	EX. MH 1	EX. MH 2	1.926	2.291	-	28	4	112	-	CRITERIA	200	0.60	-	22	0.72			
A5	JENSEN ROAD	EX. MH 1	EX. MH 2	EX. MH 3	1.926	2.291	-	28	4	112	-	CRITERIA	200	0.60	-	22	0.72			
A6	JENSEN ROAD	S11	S12	S12	0.640	0.640	-	9	4	36	36	MINIMUM	200	4.70	0.015	71	2.70			
A7	JENSEN ROAD	S12	S13	S13	0.638	1.078	-	5	4	20	84	DESIGN	200	0.60	-	28	0.82			
A8	JENSEN ROAD	S13	S14	S14	2.114	8.470	-	423	4	1693	10	270	280	200	0.70	-	28	0.88		
A9	JENSEN ROAD	S14	S15	S15	0.614	8.084	-	123	4	492	10	280	290	200	0.75	-	29	0.92		
A10	EASEMENT	S15	S16	S16	0.427	9.511	-	85	4	340	1.1	280	300	250	0.32	-	32	0.69		
A11	EASEMENT	S16	S17	S17	0.820	12.131	-	524	4	2096	1.5	370	385	250	0.40	-	39	0.78		
A12	EASEMENT	S17	S18	S18	0.820	12.131	-	524	4	2096	1.5	370	385	250	0.65	-	48	1.00		
A13	EASEMENT	EX. MH 1	EX. MH 2	EX. MH 3	2.850	14.781	-	93	4	372	2796	1.8	422	440	300	0.27	-	50		
A14	EASEMENT	EX. MH 2	EX. MH 3	EX. MH 4	2.180	18.941	-	361	4	1444	2.0	450	470	300	0.32	-	54			

AREA A-4 HAS BEEN CONSIDERED TRIBUTARY TO BOTH JENSEN ROAD, AS SINGLE FAMILY, AND TO WEBSTER STREET AS MULTI-FAMILY.

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No	REVISIONS	DATE	BY
1 SEE DRAWING NO. FOR FURTHER DETAIL				DESIGN LGWS	APRIL 1991	CD
2 SEWER DESIGN: TRANSITION WIDTH OR AS NOTED				DRAWN GS		
3 REFERENCE B.M. NO. ELEVATION				CHECKED RWC		
				APPROVED		
				DATE JUNE /90		

development engineering  
Landscape Architects  
361 Dufferin Avenue  
London, Ontario N6B 1Z5  
(519) 672-8310

ENGR'S STAMP  
CORPORATION OF THE CITY OF LONDON  
CITY ENGINEER

SCALE: 1:1250 (APPROX)

TITLE: WEBSTER STREET SANITARY SEWER  
SANITARY SEWER AREA PLAN AND DESIGN SHEET

PROJECT NO: 610/W/64  
SHEET NO: 89053  
PLAN FILE NO: 11,457

# Appendix D

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## Storm Servicing Information





## SWM Calculations

DATE: May 22, 2024  
 JOB NO.: 53653-200

Client: North Development Corp  
 Project: 1350-1352 Webster Street Residential Site  
 Location: London, Ontario

### PRE-DEVELOPMENT CONDITIONS

#### TOTAL PRE-DEVELOPMENT AREA (A1)

	Area (m <sup>2</sup> )	C	A*C
Total Site Area:	7900.000		
Building Area:	0.00	0.9	0
Concrete/Asphalt:	3385.00	0.9	3046.5
Landscaped/Open:	4515.00	0.2	903
Totals:	7900.00		3949.5
$C_{eq} = \text{Sum}(A*C)/\text{Sum}(A) =$	0.50		

#### 5 Year Design Flows

C = 0.50  
 \*\*Time to concentration  $t_c = 19.00$  min  
 Intensity,  $i (@ t_c) = 75.62$  mm/hr  
 Post Development Flow,  $Q_r = 2.78 * C * i * A = 83.03$  l/s

#### 100 Year Design Flows

C = 0.50  
 \*\*Time to concentration  $t_c = 19.00$  min  
 Intensity,  $i (@ t_c) = 131.48$  mm/hr  
 Post Development Flow,  $Q_r = 2.78 * C * i * A = 144.36$  l/s

### POST-DEVELOPMENT CONDITIONS

#### POST-DEVELOPMENT CONTROLLED CATCHMENT A1

	Area (m <sup>2</sup> )	C	A*C
Total Site Area:	12412.000		
Building Area:	3809.00	0.9	3428.1
Concrete/Asphalt:	5084.00	0.9	4575.6
Landscaped/Open:	3519.00	0.2	703.8
Totals:	12412.00		8707.5
$C_{eq} = \text{Sum}(A*C)/\text{Sum}(A) =$	0.70		

#### CITY OF LONDON - 3 HOUR CHICAGO RAINFALL DISTRIBUTION PARAMETERS\*

Return Period (years)	A	B	C
25mm	538.850	6.331	0.809
2	754.360	6.011	0.810
2**	1290.000	8.500	0.860
5	1183.740	7.641	0.838
10	1574.382	9.052	0.860
25	2019.372	9.824	0.875
50	2270.665	9.984	0.876
100	2619.363	10.500	0.884
250	3048.220	10.030	0.888

\*Intensity  $i = A / (t + B)^C$  (mm/hr)

\* Refer to the City of London Design Specification & Requirements Manual (DS&RM), Section 6.

\*\*City's Former Storm Sewer Design Curve (2-Year MacLaren Storm Curve)



FLOW RESTRICTOR CALCULATIONS

Orifice diameter is based on Bernoulli's equation,  $Q=C_d*A*(2gH)^{0.5}$

Rearranging,  $A= Q/[C_d*(2gH)^{0.5}]$ , where:

Required Restriction Flow Rate, Q =	83.03	l/s
Orifice Coefficient, C <sub>d</sub> =	0.63	
Gravitational Acceleration, g =	9.81	m/s <sup>2</sup>
Top of Flooding =	269.10	m
Orifice Invert =	266.90	m
Hydraulic Head on Orifice, H =	2.200	m
Required Cross-Sectional Area, A =	0.02010	m <sup>2</sup>
Required Diameter, d = ((4*A)/pi) <sup>0.5</sup> =	0.159	m
Minimum orifice diameter =	75	mm
Therefore, Use Orifice Restrictor =	159.00	mm
Max Flow Rate, Q =	82.18	

RAINFALL DATA

Rainfall Data - London Rainfall Intensity Duration

**2YR Storm Event**

Duration (min.)	Intensity "i" (mm/hr)
5	108.07
10	79.80
15	64.03
30	41.39
60	25.33
120	15.01
180	10.95

**100 Yr Stm Event**

Duration (min.)	Intensity "i" (mm/hr)
5	232.24
10	181.39
15	149.56
30	99.36
60	60.87
120	35.32
180	25.28

STORAGE CALCULATIONS

Inflow, Q <sub>i</sub> 2.78*C*i*A (l/s)	Volume In Qt*t*60/1000 (m <sup>3</sup> )	Orifice Restrictor Outflow, Q <sub>o</sub> (l/s)	Surface Outflow Q <sub>o</sub> (l/s)	Allowable Release, Q <sub>o</sub> (l/s)	Volume Out Q <sub>o</sub> *t*60/1000 (m <sup>3</sup> )	Difference/ Storage (m <sup>3</sup> )
261.03	78.31	83.03	0.00	83.03	24.91	53.40
192.75	115.65	83.03	0.00	83.03	49.82	65.83
154.66	139.20	83.03	0.00	83.03	74.73	64.47
99.97	179.94	83.03	0.00	83.03	149.45	30.49
61.19	220.28	83.03	0.00	83.03	298.91	-78.63
36.24	260.95	83.03	0.00	83.03	597.81	-336.86
26.44	285.54	83.03	0.00	83.03	896.72	-611.18
Max. Storage Volume (m <sup>3</sup> ) =						65.83

Inflow, Q <sub>i</sub> 2.78*C*i*A (l/s)	Volume In Qt*t*60/1000 (m <sup>3</sup> )	Orifice Restrictor Outflow, Q <sub>o</sub> (l/s)	Surface Outflow Q <sub>o</sub> (l/s)	Allowable Release, Q <sub>o</sub> (l/s)	Volume Out Q <sub>o</sub> *t*60/1000 (m <sup>3</sup> )	Difference/ Storage (m <sup>3</sup> )
560.95	168.29	83.03	0.00	83.03	24.91	143.38
438.12	262.87	83.03	0.00	83.03	49.82	213.05
361.24	325.12	83.03	0.00	83.03	74.73	250.39
239.99	431.98	83.03	0.00	83.03	149.45	282.53
147.02	529.28	83.03	0.00	83.03	298.91	230.37
85.31	614.20	83.03	0.00	83.03	597.81	16.39
61.06	659.44	83.03	0.00	83.03	896.72	-237.28
Max. Storage Volume (m <sup>3</sup> ) =						282.53



# ADS OGS Sizing Summary

<b>Project Name:</b>	1350 Webster St.	
<b>Consulting Engineer:</b>	MTE	
<b>Location:</b>	London, ON	
<b>Sizing Completed By:</b>	C. Neath	<b>Email:</b> <a href="mailto:cody.neath@ads-pipe.com">cody.neath@ads-pipe.com</a>

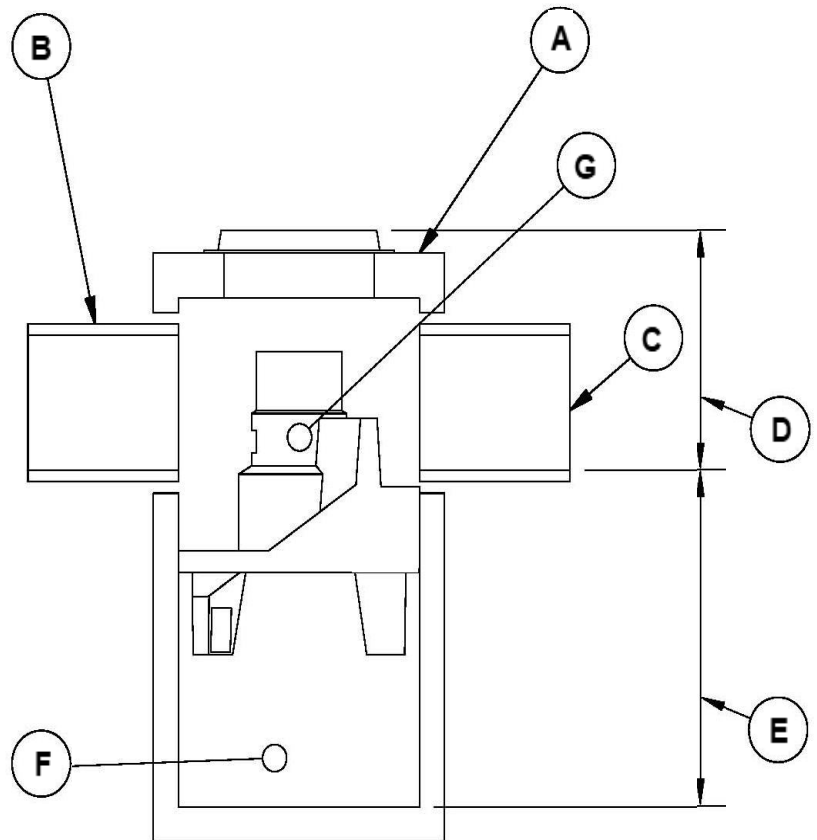
Treatment Requirements		
Treatment Goal:	Enhanced (MOE)	
Selected Parameters:	80% TSS	90% Volume
Selected Unit:	FD-4HC	

Site Area:	1.24 ha
% Impervious:	---
Rational C:	0.71
Rainfall Station:	London Intl Airport, ON
Particle Size Distribution:	Fine
Peak Flowrate:	34 L/s

Summary of Results		
Model	TSS Removal	Volume Treated
FD-4HC	85.0%	>90%
FD-5HC	89.0%	>90%
FD-6HC	92.0%	>90%
FD-8HC	95.0%	>90%
FD-10HC	97.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	300 mm
Outlet Pipe Diameter (C):	300 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 <sup>3</sup>
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,
Outlet Pipe Elevation:	98.00



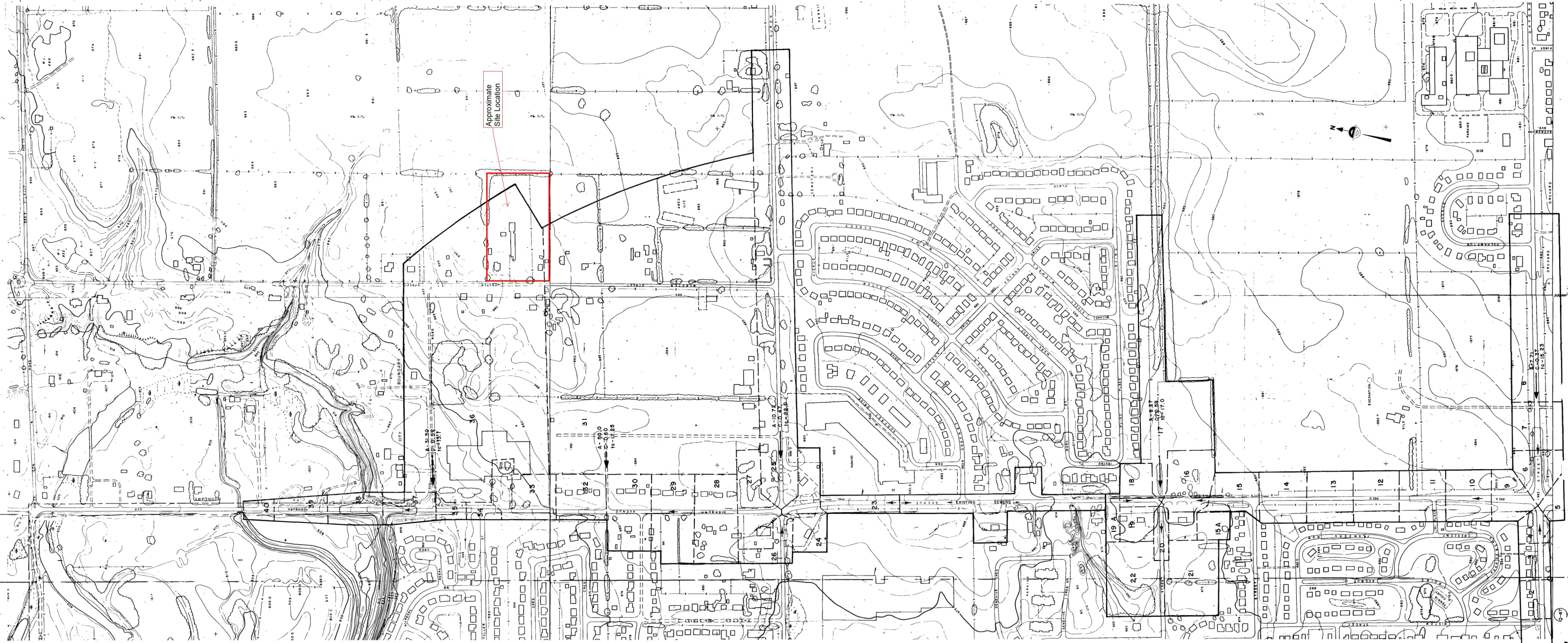
**Notes:**

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.







Approximate Site Location

STORM DRAINAGE AREA PLAN

1" = 200'

2784(4-4)

2784(4-4) A+