335 PLAINS HOLDING INC
355 PLAINS HOLDING INC

FUNCTIONAL SERVICING REPORT

Prepared By:

Metropolitan Consulting Inc.

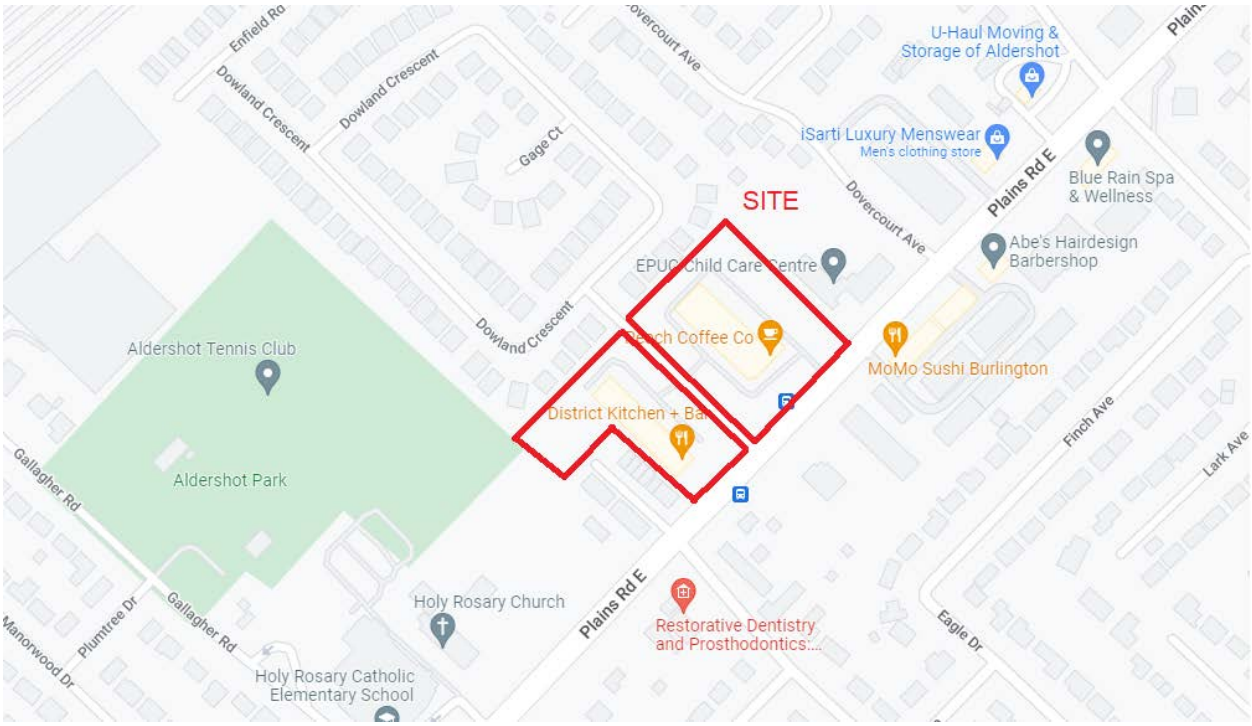
4450 Paletta Court

Burlington, ON L7L 5R2

Date: May 2022

1.0 - INTRODUCTION

The properties under study are 1010 Downsview Drive (0.729 ha) and 355 Plains Rd East (0.750 ha) located at the corner of Plains Road East and Downsview Drive in Burlington, Ontario. The sites are bounded by detached homes on Dowland Crescent to the north, Plains Road to the south, commercial developments to the east, and to the west a church property and a residential development.



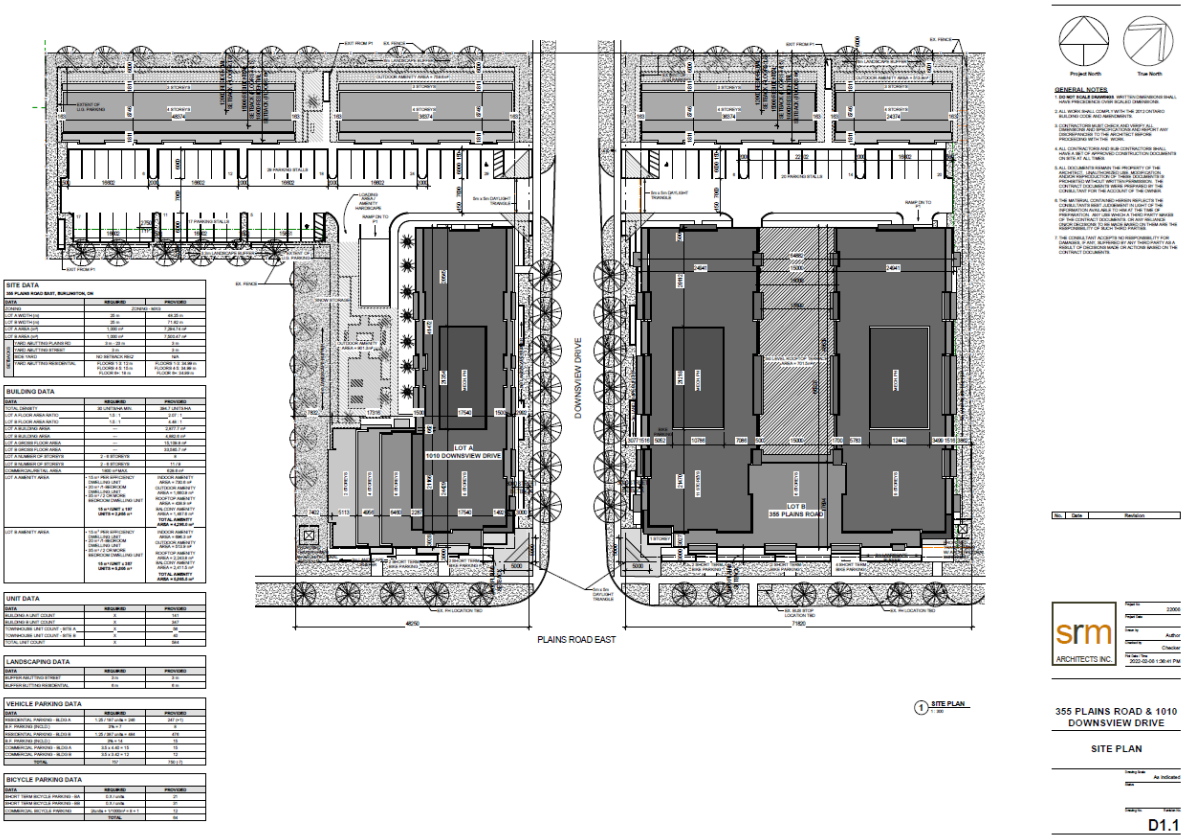
This report will outline the minimum requirements to service the site with respect to sanitary and water services, and the requirements for a stormwater management (SWM) strategy that will be implemented to meet the Halton Region requirements for land development.

For the purposes of analysis, these two neighbouring properties will be treated as a single development.

Coordination with the mechanical consultant will be required. Refer to the *Preliminary Servicing Plan* (Lanhack Consultants Inc., May 2022) and the Storm Water Management Report (Lamarre Consulting Group Inc., May 2022) for more information.

1.1 - PROPOSED DEVELOPMENT

It is proposed to demolish the existing buildings on each property and construct a mixed commercial/residential development. Each property is proposed to have a residential apartment building with commercial space on the first floor and two residential townhome blocks, for a total of two apartment buildings (488 units total) and four residential townhome blocks (96 units total).



For more information see the Site Plan prepared by SRM Architects in the Appendix.

2.0 - SANITARY WASTE WATER DISPOSAL

2.1 - Existing Conditions

Each property has a sanitary service lateral connection to the existing 250mm sanitary sewer on the north side of Plains Road East. There is an existing 250mm sanitary sewer on Downsview Drive, which connects to the existing 250mm sanitary sewer in Plains Road East.

The existing development on each site is a commercial property. The total population of this commercial development is approximately 157 persons across both properties, which results in a sanitary discharge rate of 2.00 L/sec. Refer to the Existing Sanitary Drainage figure in the Appendix for more details.

2.2 - Proposed Development

All existing sanitary service lateral connections on both properties are to be removed or decommissioned to the satisfaction of the Halton Region.

A proposed 150mm (minimum) PVC sanitary sewer is to be installed for the development at 1010 Downsview Drive. This sanitary sewer service lateral is to be connected to the existing 250mm sanitary sewer on Downsview Drive at the existing northern upstream manhole east of the property. A proposed 150mm (minimum) PVC sanitary sewer is to be installed for the development at 355 Plains Road East. This sanitary sewer service lateral is to be connected to the existing 250mm sanitary sewer on Downsview Drive at the existing northern upstream manhole west of the property. Refer to the servicing drawing in the Appendix for details.

The proposed development will add four townhouse blocks (96 units) and two residential apartment buildings (488 units) with commercial space on the first floor (628.6m^2).

The following Region standards for population densities were used to calculate the populations:

- 2.1 persons per unit for apartments
- 2.5 persons per unit for townhomes
- 90 persons per ha for commercial space

Proposed Additional Population		
Townhomes	**Apartments**	**Commercial**
240	1,025	6

The total population of the proposed developments is 1,271 persons. The proposed post-development peak sanitary flow rate for both sites is a total of **15.1 L/sec**. This is an increase of 13.1 L/sec from the existing condition. See Proposed Sanitary Drainage in the Appendix for more details.

As per the Region standard, the downstream sanitary sewer capacity must not exceed 85% as a result of a new development. With the additional flow from the development, the existing downstream sewer on Plains Road was determined to be at **67%** capacity. Since the additional flow in the existing downstream sewer does not raise the capacity above the 85% threshold, the

existing sewer capacity is sufficient and no upgrades are required. Detailed calculations of sanitary discharge rates and downstream sanitary sewer capacity can be found in the Appendix.

As summarized in the Table below, each service lateral will have sufficient pipe flow capacity to convey the peak design flows.

Property	Pipe	Full Flow Capacity	Peak Design Flow
1010 Downsview Dr	150mm PVC @ 2.00%	21.5 L/sec	5.4 L/sec
355 Plains Rd East	150mm PVC @ 2.00%	21.5 L/sec	9.7 L/sec

All laterals shall exceed the minimum self-cleansing velocity of 0.6m/s.

It would be possible to install sanitary lateral connections from each property to the existing sanitary sewer in Plains Road East instead of connecting to the existing sewer in Downsview Drive. This change in lateral location would have no impact on the sanitary capacity analysis since they connect to the same downstream existing sanitary sewer in Plains Road East. Further coordination with the mechanical consultant will be required.

3.0 - WATER DISTRIBUTION

3.1 - Existing Conditions

There is a 150mm ductile iron watermain on Downsview Drive which connects to a 300mm cast iron watermain on the north side of Plains Road East, south of the proposed development.

3.2 - Proposed Development

All existing watermains servicing this site are to be removed or decommissioned to the satisfaction of the Region.

A proposed 150mm PVC Fire Service with a 100mm PVC Domestic Service branch are to be used to supply the proposed buildings at 1010 Downsview Drive. This will be connected to the existing 150mm watermain on Downsview Drive, east of the property.

A proposed 150mm PVC Fire Service with a 100mm PVC Domestic Service branch are to be used to supply the proposed buildings at 355 Plains Road East. This will be connected to the existing 150mm watermain on Downsview Drive, west of the property.

Refer to the servicing drawing in the Appendix for details.

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line were established from the M.E.C.P. criteria.

The Ontario Building Code (OBC) requires a minimum of two sources of water supply from a public system if a building is over 84m in height. Since none of the buildings will be over 84m in height, satisfying these criteria is not a consideration for this development.

The residential water demands for the proposed developments were calculated as follows:

a) Average Day domestic demand *As per Sanitary calculations*	191 L/cap/day (1271 persons)	2.81 L/sec
b) Peak Day Demand	1.3 x daily demand	3.65 L/sec
c) Peak Hour Demand	2.5 daily demand	7.02 L/sec
d) Fire Flow – Worst Case Scenario *As per FUS 1999 manual - see Appendix*		200 L/sec

Total Residential Water Demand = Peak Hour Demand + Fire Flow = 207 L/sec

The commercial water demands for the proposed developments were calculated as follows:

a) Commercial Water Demand *As per Sanitary calculations*	191 L/cap/day (6 persons)	0.013 L/sec
b) Peak Day Demand	1.1 x Daily Demand	0.015 L/sec
c) Peak Hour Demand	1.2 x Peak Day Demand	0.016 L/sec

The Total Commercial Water Demand = 0.02 L/sec

Total Water Demand = Total Residential + Total Commercial = 207.02 + 0.02 = **207.04 L/sec**

As per Region standards, all new developments must demonstrate that the Total Water Demand is less than the flow at 20 psi in the existing watermain. A flow test was performed by Aquacom Contracting in April 2022 in order to determine the available pressures and flows in a typical daily usage scenario. The hydrant flow tests show that the flow rate at 20 psi to be 3,712 USGM, or **234 L/sec**. The detailed results of this test can be found in the Appendix.

The development's Total Water Demand is **207 L/sec**, which is less than the available flow rate of 234 L/sec. Therefore, there is adequate flow available in the existing watermain for the proposed development and no upgrades are required.

It would be possible to install watermain connections from each property to the existing watermain in Plains Road East instead of connecting to the existing watermain in Downsview Drive. This change in lateral location would have no impact on the watermain capacity analysis.

4.0 – STORMWATER MANAGEMENT

4.1 - Existing Conditions

All existing flow on both sites is captured through on-site catch basins and is discharged into the existing 525mm storm sewer on Downsview Drive, which flows into the existing storm sewer in Plains Road East. Emergency overland flow route is south towards Plains Road East. See the Existing Services figure in the Appendix for more details.

All existing stormwater pipes, structures, and lateral connections on both properties are to be removed or decommissioned to the satisfaction of the Halton Region.

4.2 – Proposed Development

Refer to the Storm Water Management Report prepared by Lamarre Consulting Group Inc. (May 2022) for a stormwater management strategy and calculations.

4.3 – Water Quality

During the Site Plan Approval process the consultant is to propose an appropriately sized OGS unit (or equivalent) to the satisfaction of the Halton Region and Conservation Halton requirements for water quality.

5.0 - CONCLUSIONS

The existing sanitary sewer was evaluated and the proposed development can be accommodated, as described in this report. The additional flow generated by the proposed development does not cause the existing downstream sewer to rise over 85% capacity, and therefore no upgrades are required.

The existing watermain was evaluated and the proposed development can be accommodated, as described in this report. The Total Water Demand is lower than the flow at 20 psi residual pressure in the existing watermain, and therefore no upgrades are required.

A stormwater management strategy must be proposed that accommodates the existing sewer, as described in this report.

Coordination between the civil consultant and the mechanical consultant is required to ensure the minimum requirements as described in this report are accommodated.

Summary	
Existing Sanitary Discharge Flow Rate (L/sec)	2.0
Proposed Sanitary Discharge Flow Rate (L/sec)	15.1
Total Water Demand (L/sec)	207
Flow at 20 PSI Residual Pressure (L/sec)	234

Prepared by



Kevin Hollingworth, P.Eng



Paul Jarzecki, B.Eng

5.0 - CONCLUSIONS

The existing sanitary sewer was evaluated and the proposed development can be accommodated, as described in this report. The additional flow generated by the proposed development does not cause the existing downstream sewer to rise over 85% capacity, and therefore no upgrades are required.

The existing watermain was evaluated and the proposed development can be accommodated, as described in this report. The Total Water Demand is lower than the flow at 20 psi residual pressure in the existing watermain, and therefore no upgrades are required.

A stormwater management strategy must be proposed that accommodates the existing sewer, as described in this report.

Coordination between the civil consultant and the mechanical consultant is required to ensure the minimum requirements as described in this report are accommodated.

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Prepared by

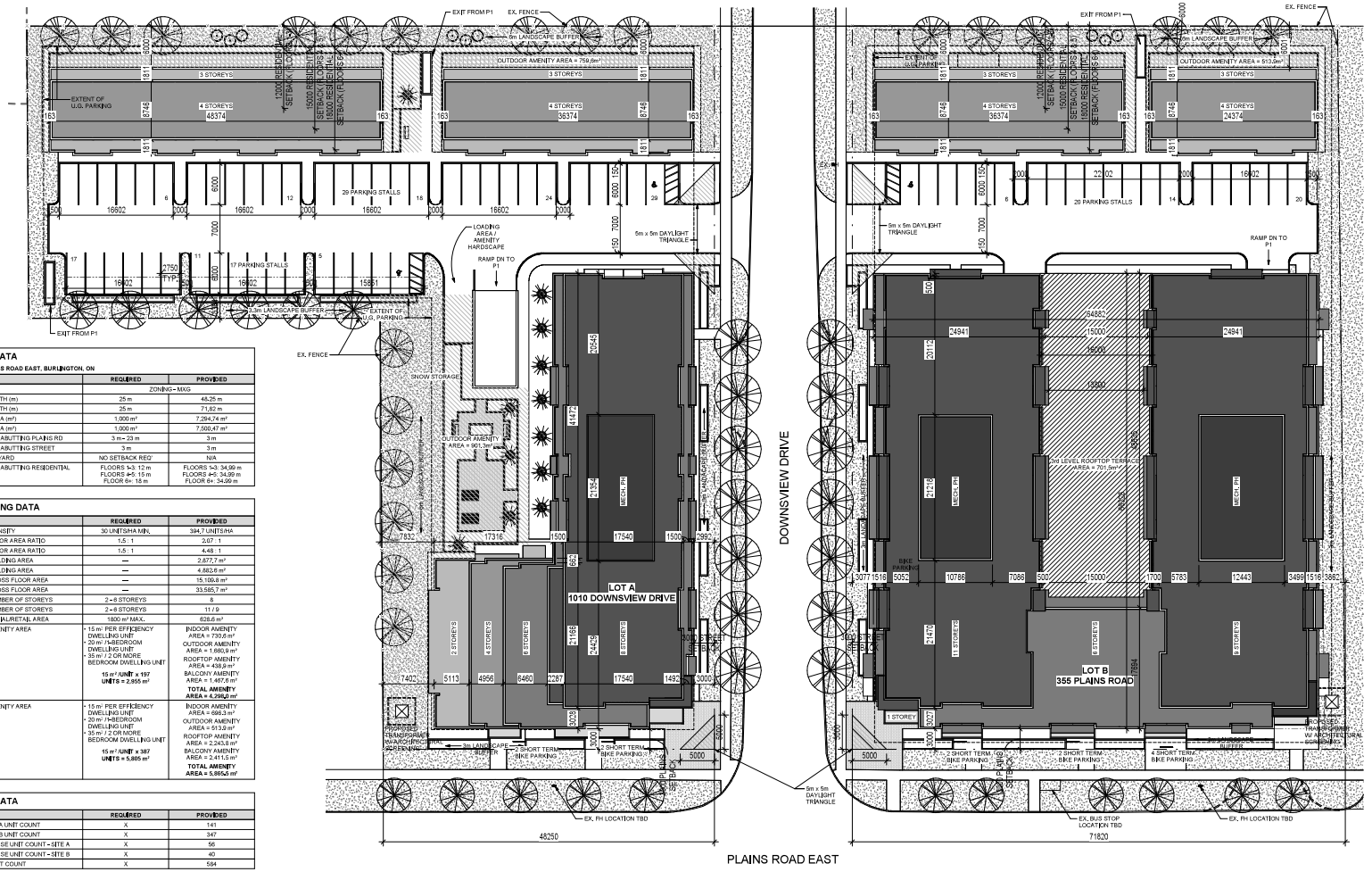
Kevin Hollingworth, P.Eng



Paul Jarzecki, B.Eng

Appendix

Site Plan
Downsview GIS
Downsview P&P
San Design Sheet (Existing)
San Design Sheet (Proposed)
Fire Flow Demand (FUS)



1 SITE PLAN
1 : 300

SITE DATA

355 PLAINS ROAD EAST, BURLINGTON, ON

DATA		REQUIRED	PROVIDED
ZONING		ZONING - MXG	
LOT A WIDTH (m)		25 m	48.25 m
LOT B WIDTH (m)		25 m	71.82 m
LOT A AREA (m²)		1,000 m²	7,294.74 m²
LOT B AREA (m²)		1,000 m²	7,500.47 m²
SETBACKS	YARD ABUTTING PLAINS RD	3 m - 23 m	3 m
	YARD ABUTTING STREET	3 m	3 m
	SIDE YARD	NO SETBACK REQ'	N/A
	YARD ABUTTING RESIDENTIAL	FLOORS 1-3: 12 m FLOORS 4-5: 15 m FLOOR 6+: 18 m	FLOORS 1-3: 34.99 m FLOORS 4-5: 34.99 m FLOOR 6+: 34.99 m

BUILDING DATA

DATA	REQUIRED	PROVIDED
TOTAL DENSITY	30 UNITS/HA MIN.	394.7 UNITS/HA
LOT A FLOOR AREA RATIO	1.5 : 1	3.67 : 1
LOT B FLOOR AREA RATIO	1.5 : 1	4.48 : 1
LOT A BUILDING AREA	—	2,677.7 m²
LOT B BUILDING AREA	—	4,682.6 m²
LOT A GROSS FLOOR AREA	—	15,109.8 m²
LOT B GROSS FLOOR AREA	—	33,585.7 m²
LOT A NUMBER OF STOREYS	2 - 8 STOREYS	8
LOT B NUMBER OF STOREYS	2 - 8 STOREYS	11 / 9
COMMERCIAL/RETAIL AREA	1800 m² MAX.	628.8 m²
LOT A AMENITY AREA	• 15 m² PER EFFICIENCY DWELLING UNIT • 20 m² / 1-BEDROOM DWELLING UNIT • 35 m² / 2 OR MORE BEDROOM DWELLING UNIT 15 m² / UNIT x 197 UNITS = 2,955 m²	INDOOR AMENITY AREA = 730.6 m² OUTDOOR AMENITY AREA = 1,660.9 m² ROOFTOP AMENITY AREA = 438.8 m² BALCONY AMENITY AREA = 1,407.6 m² TOTAL AMENITY AREA = 4,298.0 m²
LOT B AMENITY AREA	• 15 m² PER EFFICIENCY DWELLING UNIT • 20 m² / 1-BEDROOM DWELLING UNIT • 35 m² / 2 OR MORE BEDROOM DWELLING UNIT 15 m² / UNIT x 387 UNITS = 5,805 m²	INDOOR AMENITY AREA = 686.3 m² OUTDOOR AMENITY AREA = 513.0 m² ROOFTOP AMENITY AREA = 2,243.8 m² BALCONY AMENITY AREA = 2,411.5 m² TOTAL AMENITY AREA = 5,855.0 m²

UNIT DATA

DATA	REQUIRED	PROVIDED
BUILDING A UNIT COUNT	X	141
BUILDING B UNIT COUNT	X	347
TOWNHOUSE UNIT COUNT - SITE A	X	56
TOWNHOUSE UNIT COUNT - SITE B	X	40
TOTAL UNIT COUNT	X	584

LANDSCAPING DATA

DATA	REQUIRED	PROVIDED
BUFFER ABUTTING STREET	3 m	3 m
BUFFER BUTTING RESIDENTIAL	6 m	6 m

VEHICLE PARKING DATA

DATA	REQUIRED	PROVIDED
RESIDENTIAL PARKING - BLDG A	1.25 / 197 units = 246	247 (+1)
B.F. PARKING (INCLD.)	3% = 7	8
RESIDENTIAL PARKING - BLDG B	1.25 / 387 units = 484	476
B.F. PARKING (INCLD.)	3% = 14	15
COMMERCIAL PARKING - BLDG A	3.5 x 4.40 = 15	15
COMMERCIAL PARKING - BLDG B	3.5 x 3.42 = 12	12
TOTAL	757	750 (-7)

BICYCLE PARKING DATA

DATA	REQUIRED	PROVIDED
SHORT TERM BICYCLE PARKING - BA	0.X / units	21
SHORT TERM BICYCLE PARKING - BB	0.X / units	31
COMMERCIAL BICYCLE PARKING	2units + 1/1000m² = 8 + 1	12
	TOTAL	64

Project North

True North

GENERAL NOTES

1. **DO NOT SCALE DRAWINGS.** WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.
2. ALL WORK SHALL COMPLY WITH THE 2012 ONTARIO BUILDING CODE AND AMENDMENTS.
3. CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND SPECIFICATIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
4. ALL CONTRACTORS AND SUB-CONTRACTORS SHALL HAVE A SET OF APPROVED CONSTRUCTION DOCUMENTS ON SITE AT ALL TIMES.
5. ALL DOCUMENTS REMAIN THE PROPERTY OF THE ARCHITECT. UNAUTHORIZED USE, MODIFICATION, AND/OR REPRODUCTION OF THESE DOCUMENTS IS PROHIBITED WITHOUT WRITTEN PERMISSION. THE CONTRACT DOCUMENTS WERE PREPARED BY THE CONSULTANT FOR THE ACCOUNT OF THE OWNER.
6. THE MATERIAL CONTAINED HEREIN REFLECTS THE CONSULTANTS BEST JUDGEMENT IN LIGHT OF THE INFORMATION AVAILABLE TO HIM AT THE TIME OF PREPARATION. ANY USE WHICH A THIRD PARTY MAKES OF THE CONTRACT DOCUMENTS, OR ANY RELIANCE ON/OR DECISIONS TO BE MADE BASED ON THEM, ARE THE RESPONSIBILITY OF SUCH THIRD PARTIES.
7. THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR DAMAGES, IF ANY, SUFFERED BY ANY THIRD PARTY AS A RESULT OF DECISIONS MADE OR ACTIONS BASED ON THE CONTRACT DOCUMENTS.

No.	Date	Revision

srm ARCHITECTS INC.

Project No.	22008
Project Date	
Drawn by	Author
Checked by	Checker
Plot Date / Time	2022-02-08 1:36:41 PM

355 PLAINS ROAD & 1010 DOWNSVIEW DRIVE

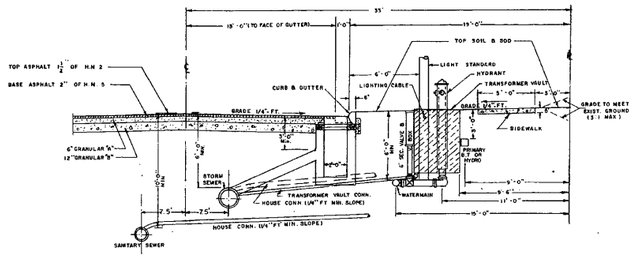
SITE PLAN

Drawing Scale	As indicated
Status	
Drawing No.	Revision No.

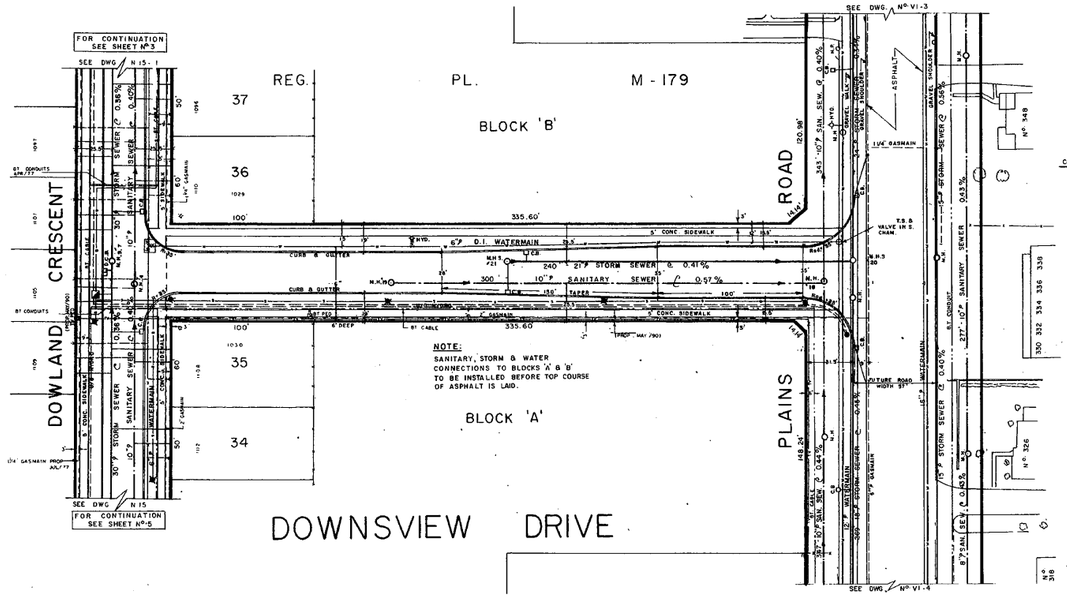
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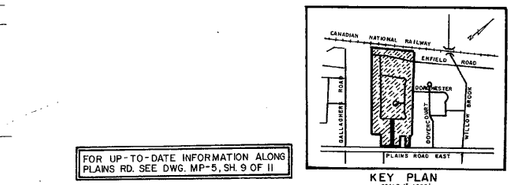
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1128
13413
13420
13428
1042
1080
1124
1120
1116
1112
1030
1029
1096
1092
1088
1084
1036
1032
DOWNSVIEW DRIVE
WAT-150mm Ductile Iron
13432
1016
1014
1012
1010
1008
1006
1004
1002
1000
43275
43274
1015
1013
1011
1009
1007
1005
1003
1001
1010
363
355
375
13435
13457
WAT-300mm Cast Iron
SAN-250mm Vitrified Clay GravitySewer
PLAINS ROAD EAST
WAT-600mm Polyvinyl Chloride
WAT-400mm Ductile Iron
13431
13440
462316
13453
13464
364 366 368 370 372 374 376 378 384
MaintenanceHole
Hydrant
SewerMain
Watermain
ServiceLateral
ServiceLead
PumpingStation
0 10 20 Meters
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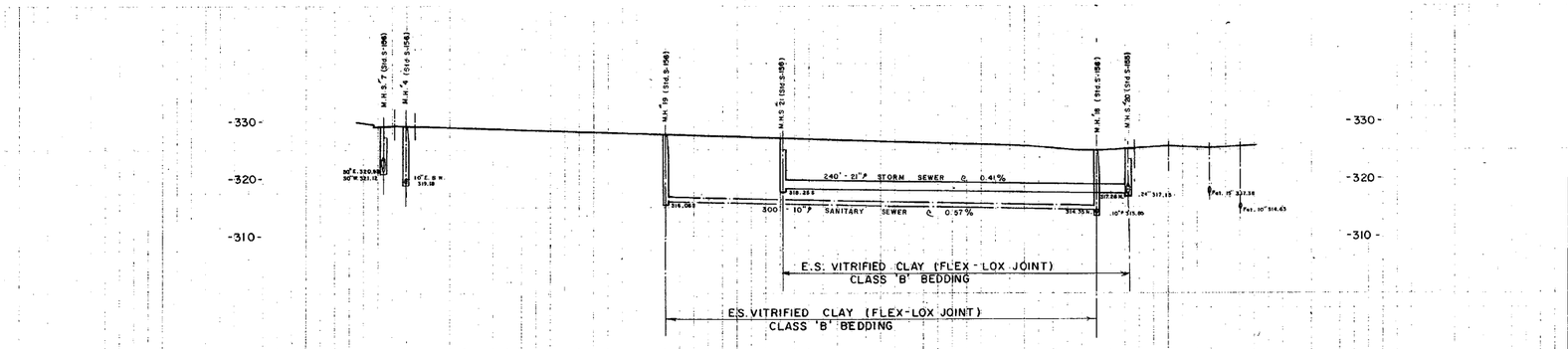
STANDARD ROADWAY SECTION
SCALE 1"= 5'





FOR UP-TO-DATE INFORMATION ALONG PLAINS RD. SEE DWG. MP-5, SH. 9 OF 11

KEY PLAN
SCALE 1"=1000'



BENCH MARKS

1. GEOD. M.M.C.C.C.XLV - BOLT IN S/W FACE OF CONC. BASE OF PILASTER ON S. CORNER OF N° 3 PLAINS RD. - 330.849'
2. S/E CORNER OF CONC. PORCH AT HOUSE N° 419 ENFIELD RD. - 334.18

(AS CONSTRUCTED)

REVISION	DESCRIPTION	DATE	BY
N°. 3	AS CONSTRUCTED	MAY/79	MPS & RCF
N°. 2	UPDATED FOR 2nd. SUBMISSION	NOV. 23/76	G.R.B.
N°. 1	UPDATED FOR 2nd. SUBMISSION	NOV. 10/76	G.R.B.

APPROVED BY REGION OF HALTON	APPROVED BY CITY OF BURLINGTON
DESIGN OF SANITARY & WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY	DIRECTOR OF PUBLIC WORKS
Signed ... Date ... DIRECTOR OF PUBLIC WORKS	DATE: Dec 10/76

CITY OF BURLINGTON
DEPARTMENT OF PUBLIC WORKS

DOVERCOURT ADDITION
DOWNSVIEW DRIVE
PLAINS ROAD EAST TO DOWLAND CRES.

HERBERT R. PEELE LIMITED
CONSULTING ENGINEERS
BURLINGTON, ONTARIO

DATE	SCALE	DRAWING N°
July 1976	Hor. 1" = 40'-0"	D-76-3
FIELD BOOK	Vert. 1" = 10'-0"	SHEET 1 OF 6
DRAWN BY: G.R. Brewer		REGION INDEX N°
CHECKED BY:		DB 0079

N 14

SANITARY SEWER DESIGN SHEET - Existing

Project No.: P22003 Project: Plains Rd
Date: 2022-05-02 Location: 355 Plains Rd West, Burlington ON

LOCATION								FLOW						SEWER DESIGN				
LOCATION (STREET NAME)	AREA LABEL(S)	Upstream Manhole	Downstream Manhole	Total Area	Incremental Population	Accumulated Population	Peaking Factor (M)	Incremental Flow (L/s)	Accumulated Peak Flow (L/s)	Section Area (ha)	Accumulated Area (ha)	Accumulated Infiltration (L/s)	Total Flow (L/s)	Pipe Diameter (mm)	Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	Percent Full (%)
Plains Rd. West	1	13408	13421	2.91	262	262	4.10	3.42	3.42	2.91	2.91	0.83	4.25	250	0.40	38	0.77	11.3%
Plains Rd. West	2	13421	43274	0.11	3	265	4.10	0.04	3.46	0.11	3.02	0.86	4.32	250	0.40	38	0.77	11.5%
Plains Rd. West	3	43274	13435	0.45	40	305	4.08	0.52	3.98	0.45	3.47	0.99	4.97	250	0.40	38	0.77	13.2%
Plains Rd. West	4	13435	13444	0.83	75	380	4.03	0.96	4.94	0.83	4.30	1.23	6.17	250	0.40	38	0.77	16.4%
Plains Rd. West	5	13444	13457	0.91	82	462	3.99	1.04	5.98	0.91	5.21	1.49	7.47	250	0.40	38	0.77	19.9%
Plains Rd. West	6, 7A, 7B	13457	13469	1.14	103	565	3.95	1.29	7.27	1.14	6.35	1.82	9.09	250	0.40	38	0.77	24.2%
Plains Rd. West	8	13469	27907	0.77	134	699	3.89	1.67	8.94	0.77	7.12	2.04	10.98	250	0.40	38	0.77	29.2%
Plains Rd. West	9	27907	13487	0.57	51	750	3.88	0.63	9.57	0.57	7.69	2.20	11.77	250	0.40	38	0.77	31.3%
Plains Rd. West	10	13487	13498	0.50	45	795	3.86	0.55	10.13	0.50	8.19	2.34	12.47	250	0.40	38	0.77	33.2%

Existing Flow Rate	275	L/pp/d
Infiltration	0.29	L/s/ha
n =	0.013	

SANITARY SEWER DESIGN SHEET - Proposed

Project No.: P22003 Project: Plains Rd
Date: 2022-05-02 Location: 355 Plains Rd West, Burlington ON

LOCATION								FLOW						SEWER DESIGN				
LOCATION (STREET NAME)	AREA LABEL(S)	Upstream Manhole	Downstream Manhole	Total Area	Incremental Population	Accumulated Population	Peaking Factor (M)	Incremental Flow (L/s)	Accumulated Peak Flow (L/s)	Section Area (ha)	Accumulated Area (ha)	Accumulated Infiltration (L/s)	Total Flow (L/s)	Pipe Diameter (mm)	Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	Percent Full (%)
Plains Rd. West	1	13408	13421	2.91	262	262	4.10	3.42	3.42	2.91	2.91	0.83	4.25	250	0.40	38	0.77	11.3%
Plains Rd. West	2	13421	43274	0.11	3	265	4.10	0.04	3.46	0.11	3.02	0.86	4.32	250	0.40	38	0.77	11.5%
Plains Rd. West	3	43274	13435	0.45	40	305	4.08	0.52	3.98	0.45	3.47	0.99	4.97	250	0.40	38	0.77	13.2%
Plains Rd. West	4	13435	13444	0.83	439	744	3.88	5.42	9.40	0.83	4.30	1.23	10.63	250	0.40	38	0.77	28.3%
Plains Rd. West	5	13444	13457	0.91	832	1576	3.66	9.70	19.10	0.91	5.21	1.49	20.59	250	0.40	38	0.77	54.7%
Plains Rd. West	6, 7A, 7B	13457	13469	1.14	103	1679	3.64	1.19	20.29	1.14	6.35	1.82	22.11	250	0.40	38	0.77	58.8%
Plains Rd. West	8	13469	27907	0.77	134	1813	3.62	1.55	21.84	0.77	7.12	2.04	23.88	250	0.40	38	0.77	63.5%
Plains Rd. West	9	27907	13487	0.57	51	1864	3.61	0.59	22.43	0.57	7.69	2.20	24.63	250	0.40	38	0.77	65.5%
Plains Rd. West	10	13487	13498	0.50	45	1909	3.60	0.52	22.95	0.50	8.19	2.34	25.29	250	0.40	38	0.77	67.2%

Proposed Flow Rate	275	L/pp/d
Infiltration	0.29	L/s/ha
n =	0.013	

DATE: 2022-05-02
PROJECT NUMBER: P22003

Fire Flow Demand Calculations - Apartments

Based on "Water Supply for Public Fire Protection" (1999) by the Fire Underwriters Survey

$F = 220C\sqrt{A}$

C = coefficient for type of construction
A = total floor area in m² (including all storeys, but excluding basements)
F = fire flow required

Fire Flow Calculation for Apartment

1) ***F= 220*C*√A***

C= 0.8 Assume non-combustible construction

A= 13754 Assumes two (2) largest adjoining floors plus 25 percent of each of any floors immediately above them (one hour rating)

F= 20641 L/min Rounds off to 21000 L/min

2) ***Assume limited combustible contents, therefore fire-flow requirements can be reduced by 15%***

F= 17850 L/min

3) ***Building has have automatic sprinkler protection, therefore 50% reduction to fire-flow requirements***

F= 8925 L/min

4) ***Exposure to adjacent buildings. Assumes 1 @ 10.1m to 20m, 2 @ 20.1 to 30m & 1 @ 30.1m to 45m therefore fire-flow requirements increase 40%***

F= 12495 L/min

FIRE DEMAND (Calculated**) = 12000 L/min** Result from step 4) taken and rounded to nearest thousand Litres

= 200.0 L/s

Therefore use 200 L/s for fire flow for Apartments

DATE: 2022-05-02
PROJECT NUMBER: P22003

Fire Flow Demand Calculations - Townhouse Block

Based on "Water Supply for Public Fire Protection" (1999) by the Fire Underwriters Survey

$F = 220C\sqrt{A}$

C = coefficient for type of construction
A = total floor area in m² (including all storeys, but excluding basements)
F = fire flow required

Fire Flow Calculation for Townhouse Block

1. From Jardin Design - All Blocks over 600m^2 Building footprint, therefore assume Fire Walls required.

1) ***F= 220*C*√A***

C= 1.0 Assume ordinary construction (limited combustible)

A= 1435 m^2 Based on Fire Wall requirement (Building footprint >600m^2) Therefore 4 of 8 units considered with a floor area of 200m^2 (≈2150sq.ft) per townhome unit

F= 8334 L/min Rounds off to 8000 L/min

2) ***Assume limited combustible contents, therefore fire-flow requirements can be reduced by 15%***

F= 6800 L/min

3) ***Homes do not have automatic sprinkler protection, therefore no reduction to fire-flow requirements***

F= 6800 L/min

4) ***Exposure to adjacent buildings. Assumes 2 @ 3.1m to 10m, 1 @ 10.1 to 20m, 1 @ 20.1 to 30m therefore fire-flow requirements increase 55%***

F= 10540 L/min

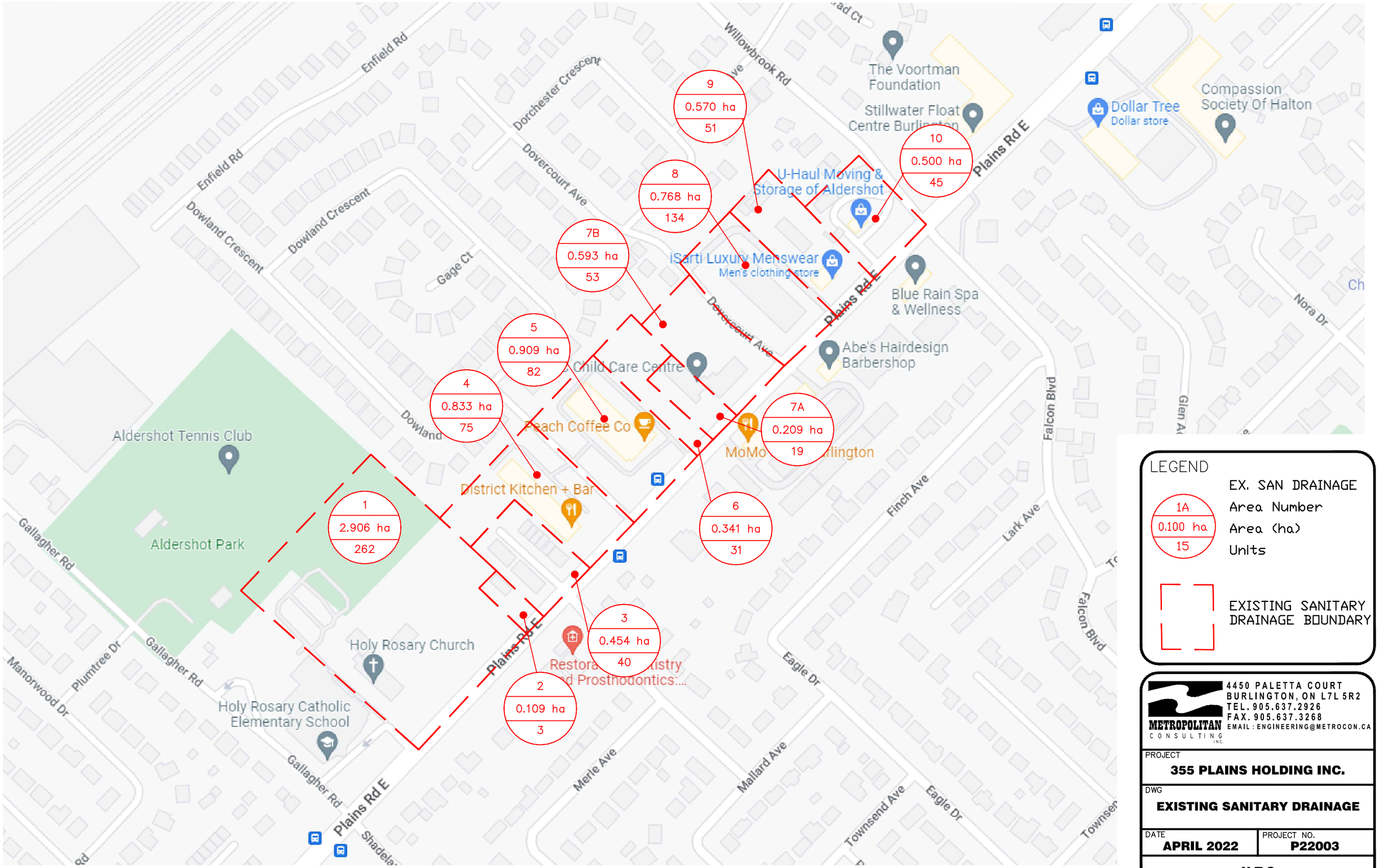
FIRE DEMAND (Calculated**) = 11000 L/min** Result from step 4) taken and rounded to nearest thousand Litres

= 183.3 L/s

Therefore use 183.3 L/s for fire flow for Townhouse Block

Attached Figures

Existing Sanitary Drainage
Proposed Sanitary Drainage
Existing Servicing



LEGEND

EX. SAN DRAINAGE

1A
0.100 ha
15

Area Number
Area (ha)
Units

EXISTING SANITARY DRAINAGE BOUNDARY

METROPOLITAN CONSULTING INC.
4450 PALETTA COURT
BURLINGTON, ON L7L 5R2
TEL. 905.637.2926
FAX. 905.637.3268
EMAIL: ENGINEERING@METROCON.CA

PROJECT
355 PLAINS HOLDING INC.

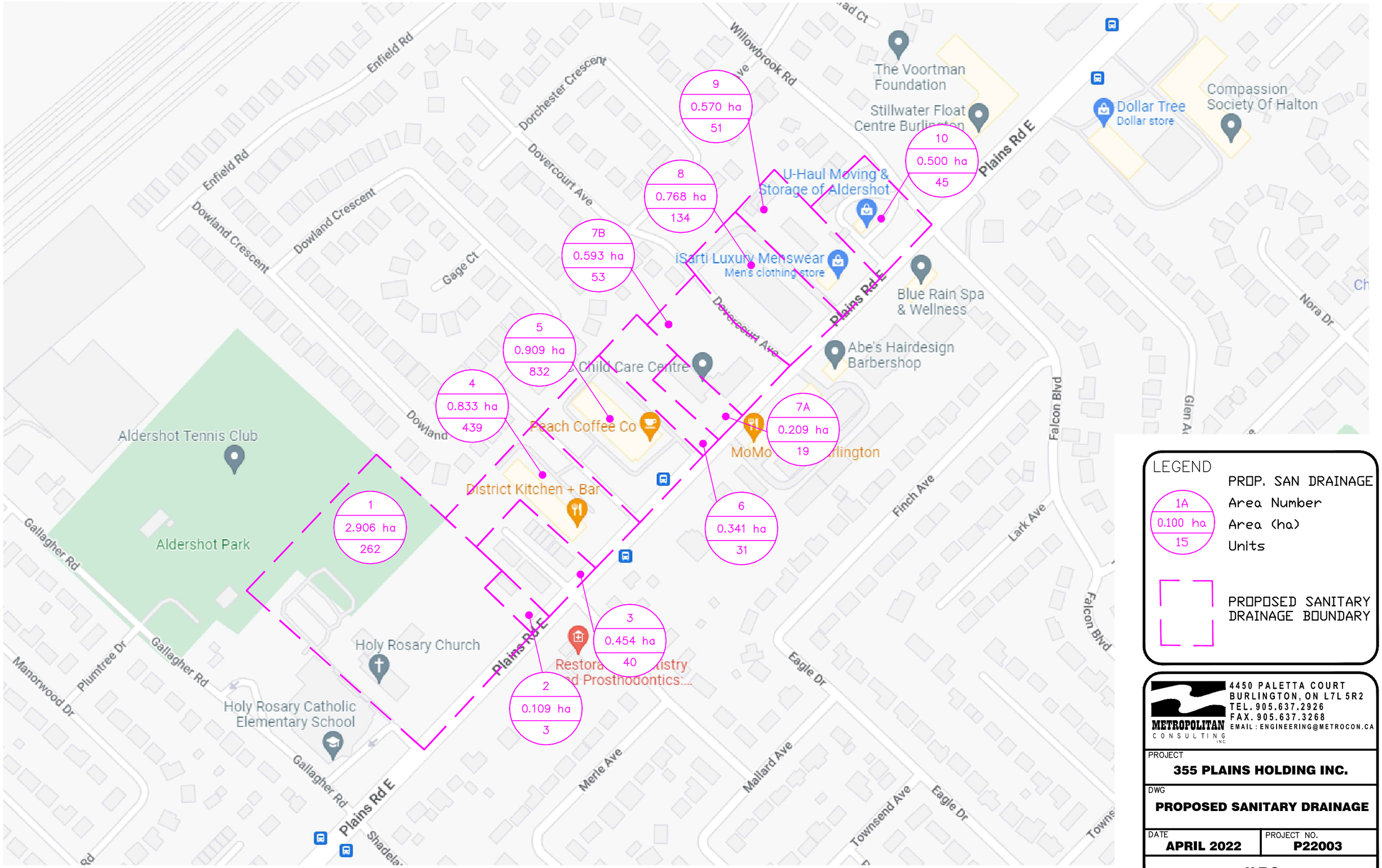
DWG
EXISTING SANITARY DRAINAGE

DATE
APRIL 2022

PROJECT NO.
P22003

N.T.S

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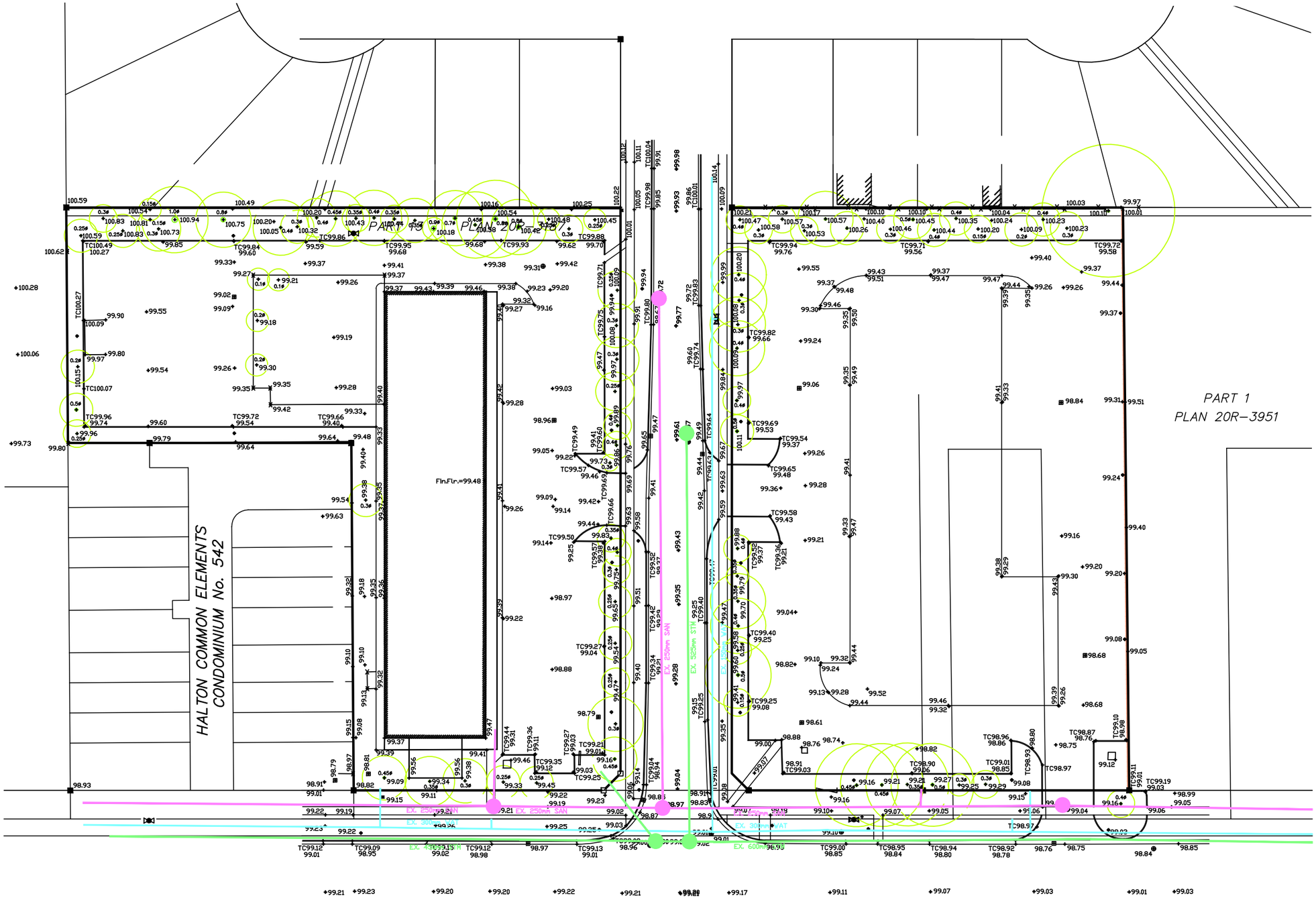
PROJECT
355 PLAINS HOLDING INC.

DWG
PROPOSED SANITARY DRAINAGE

DATE	PROJECT NO.
APRIL 2022	**P22003**

N.T.S

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LEGEND

- EX. SAN MANHOLE
- EX. STM MANHOLE
- EX. SAN SEWER
- EX. STM SEWER
- EX. WATERMAIN

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PROJECT
355 PLAINS HOLDING INC.

DWG
EXISTING SERVICING

DATE
APRIL 2022

PROJECT NO.
P22003

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