AME-TECH Developments Limited
Urban Engineering & Project Management Services

STORMWATER MANAGEMENT DESIGN BRIEF
Lot 30 and Part of Lot 31, Registered Plan 230
6460 Main Street, Residential Development
TOWN OF WHITCHURCH STOUFFVILLE
Revised NOVEMBER 2023

1.0 INTRODUCTION

The subject property is located on the north side of Main Street west of Baker Street, descrobed as Lot 30 and Part of Lot 31, Registered Plan 230 in the Town Whitchurch. Stouffville, Municipal address 6460 Main Street as depicted in Figure 1.

The existing topography of the land is gently sloping in a southerly direction towards Main Street as identified in Figure 2. Storm drainage from the site is presently conveyed to Main Street via sheet flow drainage. An existing 600mm diameter storm sewer on Main Street and 300mm diameter service connection are available to service the subject lands.

The minor storm system shall be sized in order to accomodate the 5 year storm per Town specifications. The 100 year post-development flows shall be captured on-site and controlled to their pre-development levels where possible in order to maintain the present water balance site characteristics. Best management practices shall be implimented including sedimentation control, infiltration, evapotranspiration, enhanced landscaping, and other low impact developmet (LIDs) storm drainage practices for water management.

2.0 POST-DEVELOPMENT STORM DRAINAGE AREAS

Total Site Area =	2468.1 sq.m.	
Hard Surface Area =	1556.8 sq.m.	C=0.90
Landscaped Area =	911.3 sq.m.	C=0.30

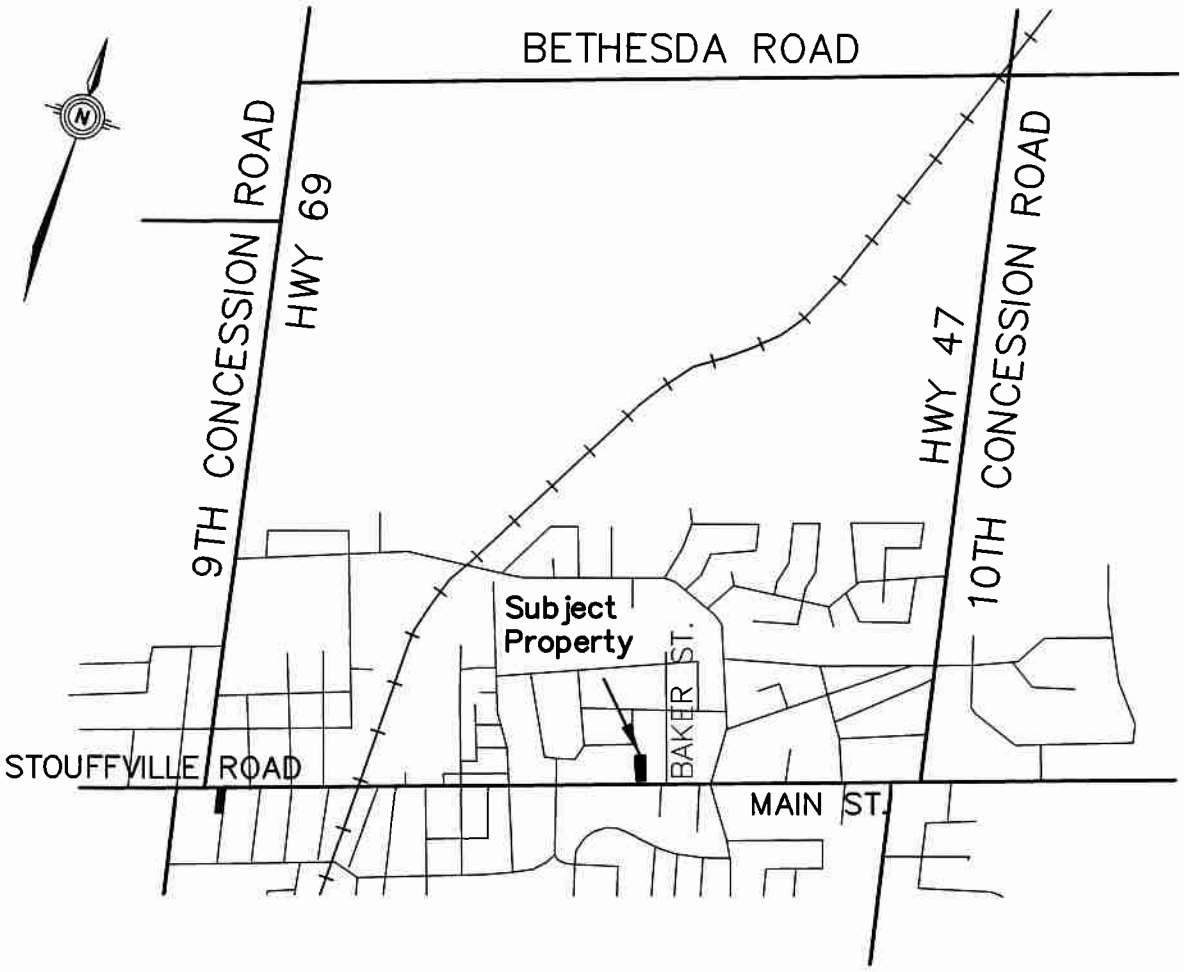
Composite Run-off Coefficient 0.68
(refer to Figure 3. for further details)

346 Newkirk Road, Unit 9, Richmond Hill, Ontario L4C 0A9 Tel: (905) 884-4336 Email: ame-tech@on.aibn.com

2426009 ONTARIO LTD.

PROPOSED RESIDENTIAL DEVELOPMENT

6460 MAIN STREET, TOWN OF WHITCHURCH–STOUFFVILLE



KEY PLAN
N.T.S.

FIGURE 1 – LOCATION PLAN

2426009 ONTARIO LTD.

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6460 MAIN STREET, TOWN OF WHITCHURCH–STOUFFVILLE

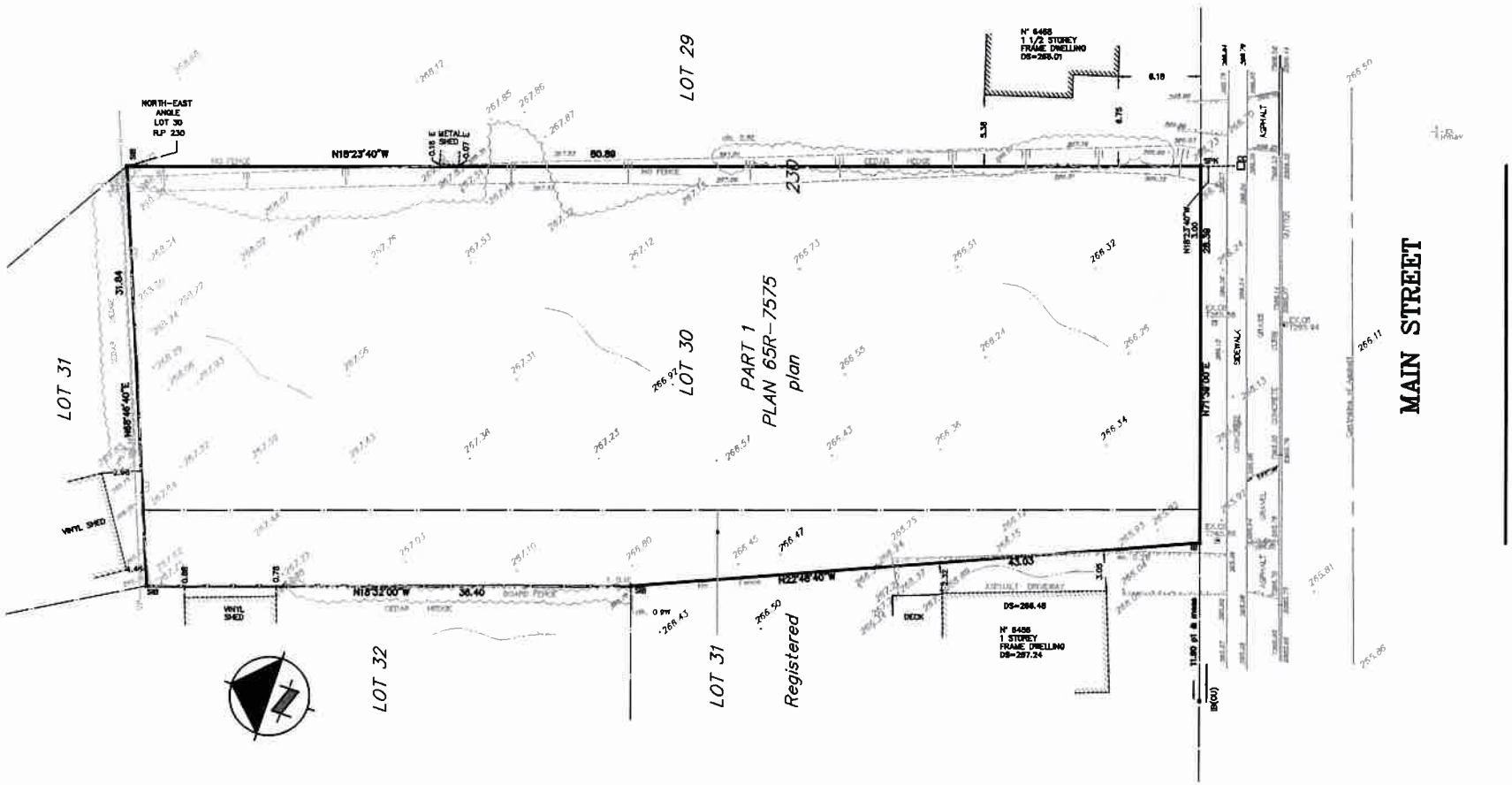
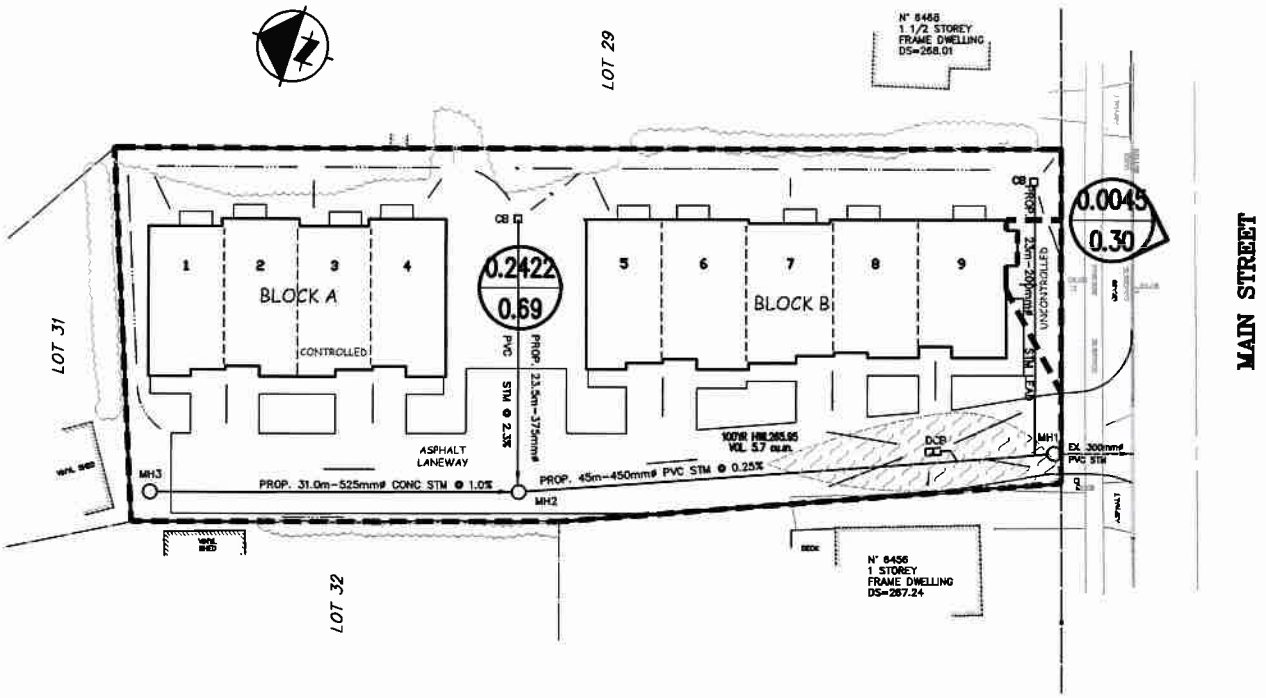


FIGURE 2 – EXISTING TOPOGRAPHY

2426009 ONTARIO LTD.

PROPOSED RESIDENTIAL DEVELOPMENT

6460 MAIN STREET, TOWN OF WHITCHURCH–STOUFFVILLE



POST–DEVELOPMENT STORM DRAINAGE	
TOTAL SITE AREA	2468.1 SQ.M.
LANDSCAPED AREAS	911.3 SQ.M.
HARD SURFACE AREA	1556.8 SQ.M.
COMPOSITE RUN–OFF COEFFICIENT	Rc=0.68
CONTROLLED AREAS	
LANDSCAPED	866 SQ.M.
HARD	1556.8 SQ.M.
COMPOSITE RUN–OFF COEFFICIENT	Rc=0.69
UNCONTROLLED	
LANDSCAPED	45.3 SQ.M.
RUN–OFF COEFFICIENT	R=0.30

FIGURE 3 – POST–DEVELOPMENT DRAINAGE

3.0 DESIGN CRITERIA

Proposed 5-year Minor System

The proposed internal minor storm sewer system shall be designed to accomodate the 5-year storm in accordance with the Town's standards using the following formula:

Q5= 2.78xRIA l/s
R - Runoff coeficient
I - Intensity mm/hr, Tc (10min.)
A - Drainage Area (ha)

I5 = 1015.93 x (T+5.255)^-0.82
R = 0.75 (Towns)
I = 107.00 mm/hr
A = 0.2468 ha
Q5post = 55.06 l/s
Q5pre = 22.02 l/s R=0.30

Note: The existing 300mm dia. service lateral @ 0.5% has a capacity of 71 L/s which is satisfactory.
Flow capacity of the internal 450mm dia storm @ 0.25% = 149 l/s

Proposed Major System

On-site detention shall be provided in order to control the 100 year post-development flows to the pre-development level (R=0.30).

The 100-year pre-development flow is calculated as follows:

Q100pre = 2.78xRIA l/s
R - Runoff coeficient
I - Intensity mm/hr, Tc (10min.)
A - Drainage Area (ha)
= 2.78 x 0.30 x 186.74 x .2468
38.4 l/s

I100 = 2051.707 x (T+6.23)^-0.86
R = 0.30
I = 186.74
A = 0.2468 ha

4.0 UNCONTROLLED RUNOFF

A small landscaped portion of the site on the south side of Block B shall discharge to the Main Street existing BCB without stormwater controls as follows:

Landscaped Area = 0.00453 ha

R= 0.300
Tc(min.) = 10.0
I100 = 186.74

Q100u = 2.78 x 0.30 x 186.74 x 0.00453
= 0.71 l/s

(refer to previous Figure 3)

5.0 DETENTION VOLUME CALCULATIONS

RUNOFF / STORAGE COMPUTATIONS (100 Year Storm Event)

The allowable flow adjusted for uncontrolled areas is :

Qall = 38.4 - 0.71 l/s
= 37.7 l/s

Total Controlled areas: 0.24228
Landscaped = 0.0866
Hard Surface 0.15568
Post Rc = 0.69
All- Dist(cms) 0.03773

100 Year Storm Storage Requirements
I for Tc 10 min. 186.74

Max. Stor. (m3)= 29.11

TIME (min.)	INTENSITY (mm/hr)	Q PEAK (m3/s)	RUN-VOL (m3)	DIS-VOL (m3)	STO-VOL (m3)
1	374.33	0.173	10.36	2.264	8.10
2	334.87	0.154	18.54	4.528	14.01
3	303.42	0.140	25.20	6.792	18.41
4	277.73	0.128	30.75	9.056	21.70
9	197.24	0.091	49.14	20.376	28.76
10	186.74	0.086	51.69	22.640	29.05
11	177.38	0.082	54.01	24.904	**29.11**
12	168.98	0.078	56.13	27.168	28.96
20	123.58	0.057	68.42	45.281	23.14
25	106.36	0.049	73.61	56.601	17.01
30	93.61	0.043	77.74	67.921	9.82

AVAILABLE DETENTION VOLUME CALCULATIONS

Required Storage Volume : **29.1** cu.m.

Available Storage Volume :
Pipe : 23 m - 200mm dia. STM 0.7 cu.m.
Pipe : 45 m - 450mm dia. STM 7.2 cu.m.
Pipe : 23.5 m - 450mm dia. STM 3.7 cu.m.
Pipe : 31 m - 525mm dia. STM 6.7 cu.m.

Ponding Areas 5.7 cu.m.
Catchbasins & Manholes 5.0 cu.m.

Provided Storage Volume : **Total** **29.1** cu.m.

6.0 INLET CAPACITY / OUTLET CONTROLS

The inlet capacity at the sag can be verified using the attached MTO Design Chart 4.19. Based on a ponding depth of 150mm the capacity of the double catchbasin is 0.17 cu.m/s.

Post Dev. flow to the DCB: Q100 = 2.78 x 0.69 x 186.74 x 0.1965
= 86.2 l/s

Assuming 50% blockage at DCB or reduced capacity of 85 l/s, sufficient capacity within acceptable tolerances (<2%) has been provided to accomodate the anticipated 100 year flow.

Limit discharge to Qa = 37.7 l/s

Q = CA(2gh)^.5 C = 0.82
A = Q/(C(2gh)^.5) Q = 0.0377 cms
D = (4A/PI)^.5 g = 9.8 m/s^2
h(max) = 1.035 m

A = 0.0102 m^2
D = 0.114 m
Use a 115 mm orifice pipe

7.0 WATER BALANCE MANAGEMENT

The primary objective of Water Balance Management is to capture and manage rainfall on the development site itself where possible to preserve the pre-development hydrology or "Water Balance". The pre-development hydrology / water balance typically consists of three components: runoff, infiltration and evapotranspiration.

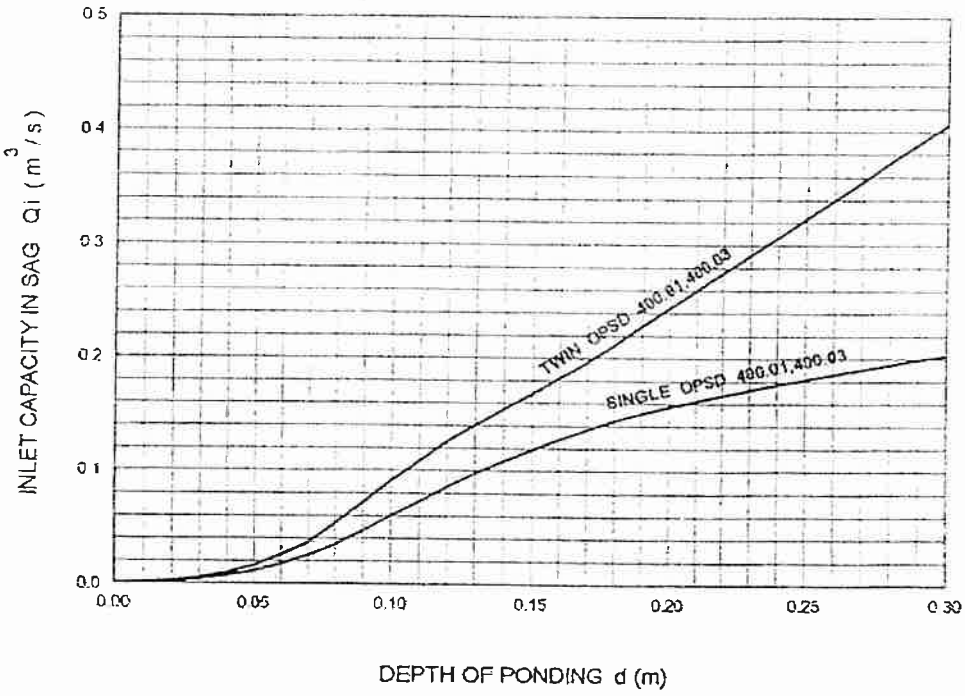
Water balance targets / criteria on a development site can be achieved through the implimentation of a combination of the following:
1. Infiltration
2. Evapotransportation
3. Landscaping
4. Rainwater re-use and/or other Low Impact Development (LID) practices.

Targets and Design criteria:

Within the Toronto area, storms with 24-hour volumes of 5mm or less contribute 50% of the total average annual rainfall volume. Therefore, the first flush or 5mm shall be retained on-site through infiltration, evapotranspiration and/or rainwater re-use.
The techniques used in order to facilitate a water balance for the subject development are identified and summarized below:

1. Use of absorbent landscaping materials.
2. Extended swale lengths, reduced swale gradients with french drains (where possible).
3. Porous / Eco Pavers on driveways.
4. Roof-top drainage or portion thereof connected to infiltration galleries / french-drains.

Design Chart 4.19: Inlet Capacity at Road Sag



Water Balance Measures Summary:

Target - Retain runoff from a 5mm, 24hr rainfall event

Site Area	% of Total Area	Abstraction for Area	Abstraction for Total Area
Absorbent Landscaping	36.9%	5 mm	1.85 mm
Porous / Eco Pavers	6.2%	5 mm	0.31 mm
Roof-top to Infiltr. Galleries	6.5%	5 mm	0.33 mm
Total Roof-top & Hard Surfaces	63.1%	0.6 mm	3.15 mm
			5.63 mm Total

* Although the roof-top and asphalt surfaces are impermeable some minor evaporation / infiltration will occur during and after a rainfall event (0.6mm).

Smaller developments present a challenge with respect to achieving Water Balance targets however, we believe the proposed LID measures and assumptions have achieved / exceeded the required target level and are in general conformity with Water Balance Management best management practices.

8.0 STORMWATER QUALITY CONTROL

Water quality controls can be enhanced by installing an oil and grit separator. The proposed STC 300i by Stormceptor specifies Level 1 (Enhanced) water quality control for the subject area by removing 85% annual TSS. The Stormceptor sizing table and detailes have been provided herewith in Appendix A.

The TRCA rate the Stormceptor OGS products as being only 50% effective in TSS removal and as such a pro-rated water quality assesment (worst case) for the subject site can be summarized as follows:

Target: Level 1 (Enhanced) - 80% TSS Removal for the site.

Total Site Area: 2468 sq.m.
Treated areas: Pavement / Driveways / Walkways 846 sq.m.
Based on the treated drainage areas of 850 sq.m. the STC 300i specifies a TSS removal of 85%.

Water Quality Summary:	**(sq.m.)**	**% TSS Removal**	
Roof plus Landscape Areas -	1622	100	
Treated Pavement Areas -	846	42.5	(50% of 85% TSS)
Un-treated Pavement Areas -	0	0	
Pro-rated TSS removal:		**80.3**	
Plus: Catchbasin with sumps:		10	
Total TSS Removal		**90.3**	

Notes:
1. Suspended solid transfer from roof-tops and absorbant landscaped areas are negligible
2. Properly maintained catchbasins equipped with sumps and / or goss traps will enhance the overall water quality and TSS removal within the site.

The Water Quality Level 1 Enhanced target has been achieved for the subject property by utilizing the STC300i Stormcetor.

9.0 EROSION AND SEDIMENTATION COTROL

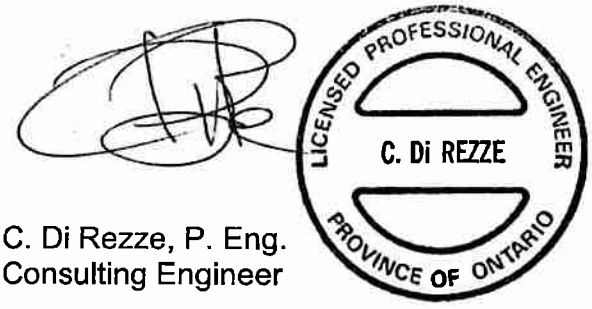
Prior to and during the construction phase of the project the erosion and sedimentation control strategy as outlined on Dwg. ESC1 shall be implimented.

In order to prevent erosion and the transport of sediments off-site and / or from migrating into the storm sewer system, the following temporary measures should be considered and implimented as required:

- install 'heavy duty' sediment fencing around the perimeter of the construction area
- install sediment controls at catchbasins and catchbasin maintenance chambers
- install rock-check dams and provide mud-mat tracking area at entrance / exit to the site
- immediate seeding and mulching of any disturbed and permanent landscaped areas

Sincerely,

AME-TECH Developments Limited



C. Di Rezze, P. Eng.
Consulting Engineer

APPENDIX A
Stormcetor Sizing Table and Detail

Ontario Stormceptor Sizing Table

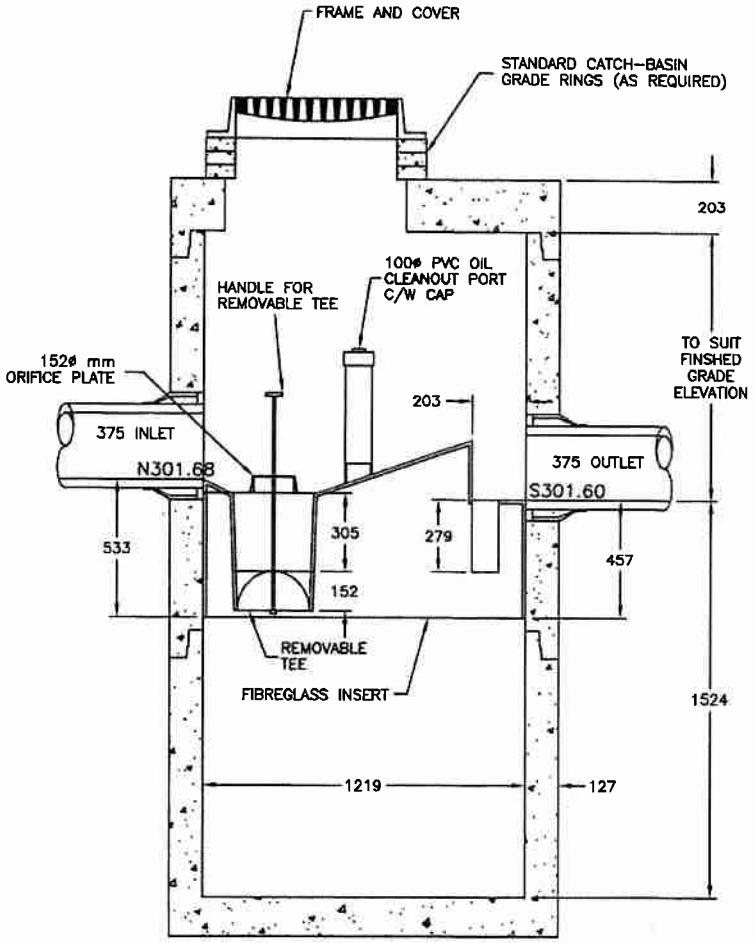
Estimates obtained from simulations using the Expert System Version sizing program
Toronto Central Rain Gauge, 1986 to 1996
All drainage areas are 100% impervious
No flow control has been assumed

Legend

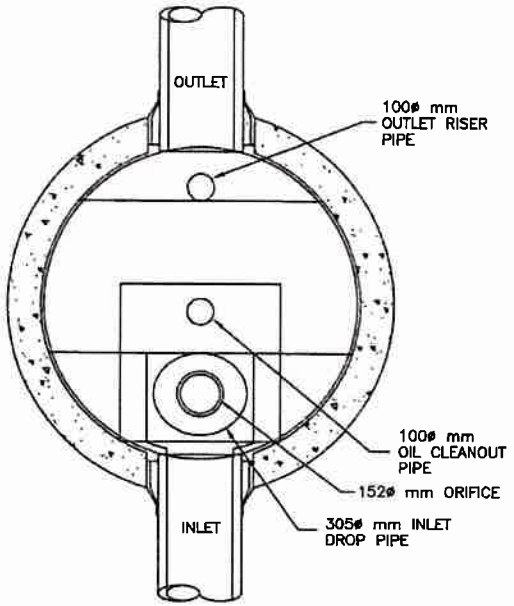
80% or greater
70% to 79%
60% to 69%
Less than 60%

Hanson Stormceptor®
Hanson Pipe & Products Canada, Inc.
p. 1.888.888.3222 f. 519.621.8233

Drainage Area (ha)	ESTIMATED ANNUAL % RUNOFF TREATED — Stormceptor Model												ESTIMATED ANNUAL % TSS REMOVED — Stormceptor Model												Drainage Area (ha)
	300	750	1000	1500	2000	3000	4000	5000	6000	9000	10000	14000	300	750	1000	1500	2000	3000	4000	5000	6000	9000	10000	14000	
0.1	95	99	99	99	100	100	100	100	100	100	100	100	85	91	91	92	94	95	96	96	97	98	98	98	0.1
0.2	88	96	98	98	99	99	100	100	100	100	100	100	78	86	87	88	90	91	93	94	95	95	95	97	0.2
0.3	83	97	97	97	98	99	99	99	100	100	100	100	73	83	84	84	87	88	91	91	93	94	95	96	0.3
0.4	78	95	95	95	98	98	99	99	99	100	100	100	70	80	81	82	85	86	89	90	91	93	94	95	0.4
0.5	74	93	93	93	97	97	99	99	99	99	99	100	67	78	79	80	83	84	87	88	90	92	93	94	0.5
0.6	70	91	91	91	96	96	98	98	99	99	99	100	64	76	77	78	81	83	86	87	89	91	91	93	0.6
0.7	66	89	89	89	94	94	98	98	99	99	99	99	62	74	75	76	80	81	85	86	88	90	91	92	0.7
0.8	63	88	88	88	93	93	97	97	98	99	99	99	60	73	74	74	78	80	84	84	87	89	90	91	0.8
0.9	60	87	87	87	92	92	96	96	98	99	99	99	58	71	73	73	77	79	83	83	86	88	89	91	0.9
1.0	57	85	85	85	91	91	96	96	98	99	99	99	56	70	71	72	76	78	82	82	85	87	88	90	1.0
1.1	55	84	84	84	91	91	95	95	97	98	98	99	55	68	70	71	75	77	81	82	84	97	98	89	1.1
1.2	53	83	83	83	90	90	95	95	97	98	98	99	53	68	69	70	74	76	80	81	83	86	87	89	1.2
1.3	51	81	81	81	89	89	94	94	96	98	98	99	52	67	68	69	73	75	79	80	82	85	96	88	1.3
1.4	49	80	80	80	88	88	93	93	96	98	98	99	51	66	67	68	72	74	78	79	82	85	86	88	1.4
1.5	47	79	79	79	87	87	93	93	95	97	97	99	50	65	67	67	72	73	78	78	81	84	85	87	1.5
1.6	45	78	78	78	86	86	92	92	95	97	97	98	49	65	66	66	71	72	77	78	81	84	84	87	1.6
1.7	44	76	76	76	85	85	92	92	95	97	97	98	48	64	65	65	70	72	76	77	80	83	84	86	1.7
1.8	42	75	75	75	85	85	91	91	94	96	96	98	47	63	64	65	69	71	75	77	79	83	83	86	1.8
1.9	41	74	74	74	84	84	91	91	94	96	96	98	46	62	63	64	69	70	75	76	79	82	83	85	1.9
2.0	40	73	73	73	83	83	90	90	93	96	96	98	45	62	63	63	68	70	75	75	78	82	82	85	2.0
2.1	39	72	72	72	82	82	90	90	93	95	95	97	44	61	62	62	68	69	74	75	78	81	82	84	2.1
2.2	38	71	71	71	82	82	89	89	93	95	95	97	43	60	61	62	67	68	74	74	77	81	82	84	2.2
2.3	37	70	70	70	81	81	89	89	92	95	95	97	43	60	61	61	66	68	73	74	77	80	81	84	2.3
2.4	36	69	69	69	80	80	88	88	92	95	95	97	42	59	60	61	66	67	73	73	76	80	81	83	2.4
2.5	35	68	68	68	79	79	88	88	91	94	94	97	41	59	60	60	65	67	72	73	76	79	80	83	2.5
2.6	34	67	67	67	79	79	87	87	91	94	94	96	41	59	59	59	65	66	72	72	75	79	80	82	2.6
2.7	33	66	66	66	78	78	87	87	91	94	94	96	40	57	59	59	64	66	71	72	75	79	79	82	2.7
2.8	32	66	66	66	77	77	86	86	90	93	93	96	40	57	58	58	64	65	71	72	75	78	79	82	2.8
2.9	32	65	65	65	77	77	86	86	90	93	93	96	39	56	58	58	64	65	70	71	74	78	79	82	2.9
3.0	31	64	64	64	76	76	85	85	90	93	93	95	39	56	57	57	63	65	70	71	74	78	78	81	3.0
3.1	30	63	63	63	75	75	85	85	89	92	92	95	38	55	57	57	63	64	70	70	74	77	78	81	3.1
3.2	30	62	62	62	75	75	84	84	89	92	92	95	38	55	56	56	62	64	69	70	73	77	78	81	3.2
3.3	29	62	62	62	74	74	84	84	89	92	92	95	37	55	56	56	62	63	69	70	73	77	77	80	3.3
3.4	28	61	61	61	74	74	83	83	88	92	92	95	37	54	55	55	61	63	68	69	73	76	77	80	3.4
3.5	28	60	60	60	73	73	83	83	88	91	91	94	36	54	55	55	61	62	68	69	72	76	77	80	3.5
3.6	27	59	59	59	72	72	83	83	88	91	91	94	36	53	54	55	61	62	68	69	72	76	77	79	3.6
3.7	27	59	59	59	72	72	82	82	87	91	91	94	36	53	54	54	60	62	67	68	72	75	76	79	3.7
3.8	26	58	58	58	71	71	82	82	87	91	91	94	35	52	53	54	60	61	67	68	71	75	76	79	3.8
3.9	26	57	57	57	71	71	81	81	87	90	90	94	35	52	53	53	60	61	67	68	71	75	76	79	3.9
4.0	25	57	57	57	70	70	81	81	86	90	90	93	35	52	53	53	59	61	66	67	71	75	75	78	4.0
4.1	25	56	56	56	69	69	80	80	86	90	90	93	34	51	52	53	59	60	66	67	71	74	75	78	4.1
4.2	25	56	56	56	69	69	80	80	86	90	90	93	34	51	52	52	59	60	66	67	70	74	75	78	4.2
4.3	24	55	55	55	68	68	80	80	85	89	89	93	34	51	52	52	58	60	66	66	70	74	75	78	4.3
4.4	24	54	54	54	68	68	79	79	85	89	89	93	33	50	51	52	58	59	65	66	70	74	74	77	4.4
4.5	24	54	54	54	67	67	79	79	85	89	89	92	33	50	51	51	58	59	65	66	69	73	74	77	4.5
4.6	23	53	53	53	67	67	78	78	84	89	89	92	33	50	51	51	57	49	65	66	68	73	74	77	4.6
4.7	23	53	53	53	66	66	78	78	84	88	88	92	32	49	50	50	57	58	65	65	69	73	74	77	4.7
4.8	23	52	52	52	66	66	78	78	84	88	88	92	32	49	50	50	57	58	64	65	69	73	73	76	4.8
4.9	22	52	52	52	65	65	77	77	83	88	88	92	32	49	50	50	56	58	64	65	68	72	73	76	4.9
5.0	22	51	51	51	65	65	77	77	83	88	88	91	32	48	49	50	56	57	64	64	68	72	73	76	5.0
Drainage Area (ha)	300	750	1000	1500	2000	3000	4000	5000	6000	9000	10000	14000	300	750	1000	1500	2000	3000	4000	5000	6000	9000	10000	14000	Drainage Area (ha)
	Stormceptor Model — ESTIMATED ANNUAL % RUNOFF TREATED												Stormceptor Model — ESTIMATED ANNUAL % TSS REMOVED												



SECTION VIEW



PLAN VIEW

STORMCEPTOR MODEL STC 300i CAPACITIES				
MAXIMUM TREATMENT FLOWRATE (L/s)	DOWN PIPE DIAMETER/ ORIFICE (mm)	SEDIMENT CAPACITY (L)	OIL CAPACITY (L)	TOTAL HOLDING CAPACITY (L)
5	100	950	350	1425

NOTES:
1. ACCESS OPENING SHOULD BE LOCATED OVER THE OIL CLEANOUT PORT TO ALLOW FOR INSPECTION AND MAINTENANCE FROM THE SURFACE.
2. PIPE INSTALLATION BY NON-SHRINK GROUT OR FLEXIBLE BOOTS.

DESIGN SPECIFICATIONS:
1. MANUFACTURED TO CSA A257.4
2. CONCRETE STRENGTH: 30 MPa
3. REINFORCING STEEL: 448 MPa
4. WELDED WIRE FABRIC TO CSA G30.5
5. CONCRETE COVER TO STEEL: 25 mm MIN.
6. DESIGNED TO OHBDC '91 3rd EDITION LOADING

THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING PATENTS:

CANADIAN PATENT NO. 2,009,208
CANADIAN PATENT NO. 2,137,942
CANADIAN PATENT NO. 2,175,277
CANADIAN PATENT NO. 2,180,305

Centennial
Concrete Pipe & Products Inc.

Stormceptor®

STC-300i
INLET STORMCEPTOR
300 GALLON CAPACITY

DATE:		
10 MAY 00		
D.B. B.L.	UNITS: METRIC	SCALE: 1:25

NAME OF PROJECT / SUBDIVISION

6460 MAIN STREET RESIDENTIAL
Lot 30 and Part of Lot 31, R.P. 230 Town of Whitchurch-Stouffville

SANITARY SEWER DESIGN SHEET

LOCATION OF WORK
N. SIDE OF MAIN ST., W. OF BAKER ST., BTWN 9th & 10th CONC.

PREPARED BY AME-Tech Dev. Limited
CHECKED BY
DATE MARCH 2024
FILE NO.

SHEETS NO. OF SHEETS
1 of 1

Ref.Dwg.: FIGURE A

MH	to MH	AREA (IN HECTARES) AREA (ha)	CUM AREA (ha)	POPULATION	CUM. POP.	PEAK (M)	DOMESTIC FLOW (cu.m/sec)	INFILTRATION (EXTRANEOUS) =0.23 l/sec/ha	MAXIMUM CUMULATIVE FLOW (cu.m/sec)	TYPE OF PIPE n = 0.013	PIPE DIA-METER (mm)	MINIMUM GRADE (m / 100 m)	CAPACITY AT MIN. GRADE (cu.m/sec)	LENGTH OF SEWER (m)	VELOCITY (m/sec)	REMARKS
MH 3A	MH 2A	0.112	0.112	12	12	4.0	0.00020	0.00003	0.00023	P.V.C.	200	1.85	0.045	27.0	1.42	
MH 2A	EX. MH	0.135	0.247	15	27	4.0	0.00025	0.00003	0.00051	P.V.C.	200	2.10	0.048	44.5	1.51	

$$Q(cu.m/s) = \frac{P \times 360 \times M}{60 \times 60 \times 24}$$

SINGLE FAMILY	3.2 p/unit
TOWNHOUSE	2.9 p/unit
APARTMENT	2.2 p/unit

Notes:

FIGURE A

TOWN OF WHITCHURCH-STOUFFVILLE
ENGINEERING DEPARTMENT

SANITARY SEWER DESIGN SHEET

SCALE :
DRAWN :
DATE MAR 2024
DWG. NO :

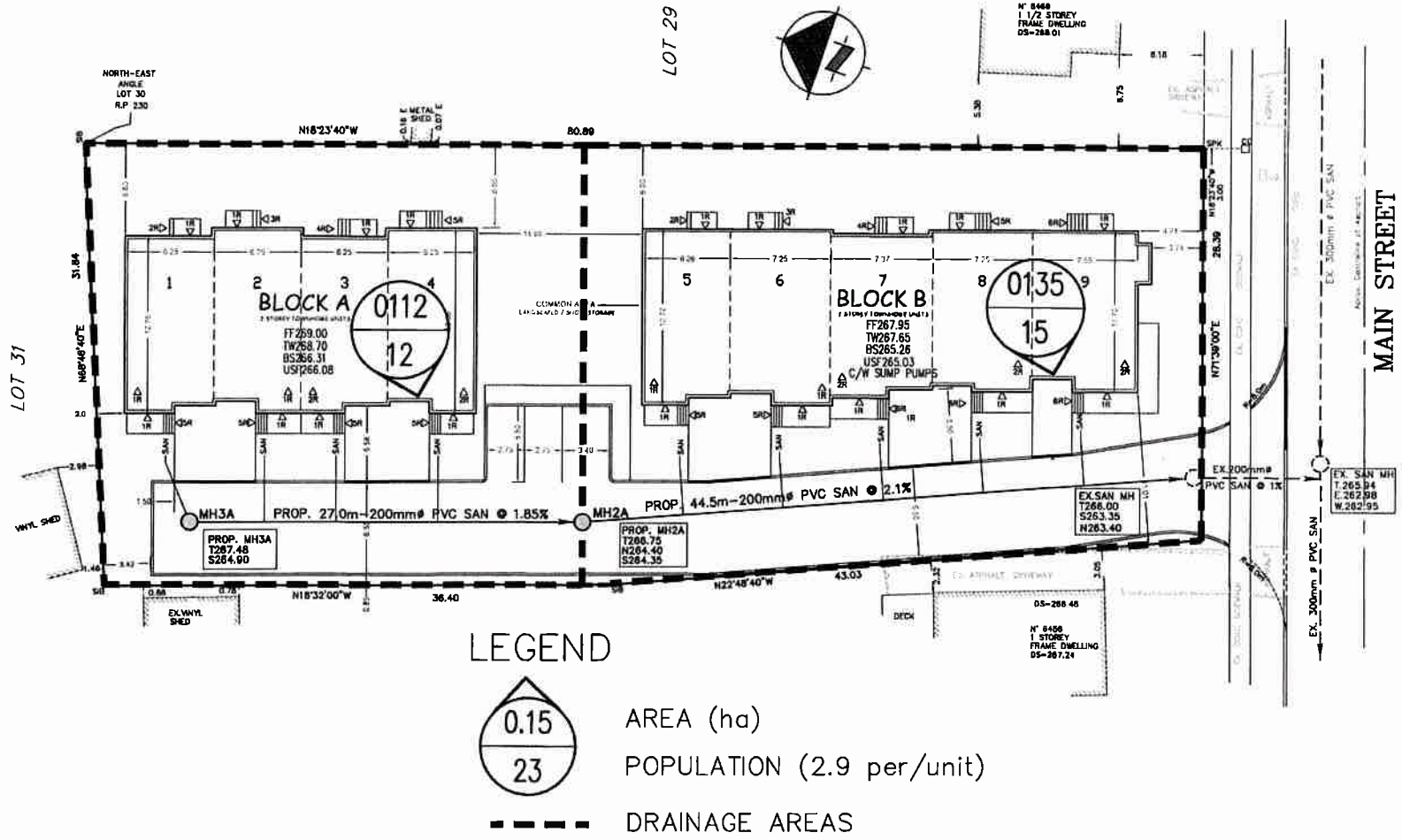
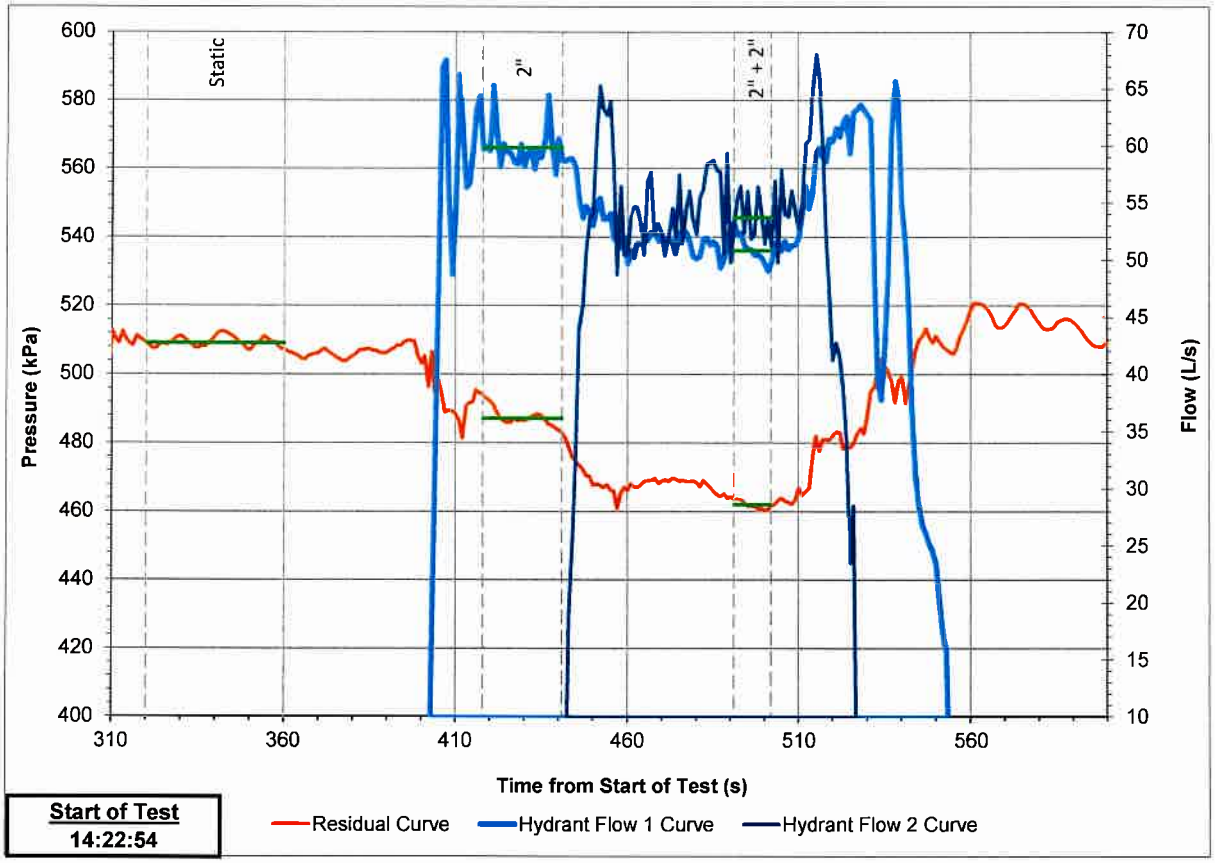


FIGURE A – SANITARY DRAINAGE AREAS

6460 Main St (HYD1284)



Subject Watermain Details			
Diameter:	300 mm	Material:	
Area:	0.071 m2		

Subject Hydrant & Valve Details	
Residual Hydrant:	HYD1284
Flow Hydrant:	HYD1285

TABLE A: TESTED PRESSURES AND FLOWS

Point	Time		Residual Hydrant (HYD1284)		Flow Hydrant (HYD1285)				Total Flow		Velocity
			Residual (S1)		Port 1 (S1)		Port 2 (S2)				
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	320	360	509	73.8	0.0	0	0.0	0	0.0	0	0.0
2"	418	441	487	70.6	59.8	948	0.0	0	59.8	948	0.8
2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0
2" + 2"	491	502	462	67.0	50.8	805	53.7	851	104.5	1656	1.5

6460 Main St (HYD1284)

HYDRANT FLOW TEST RESULTS

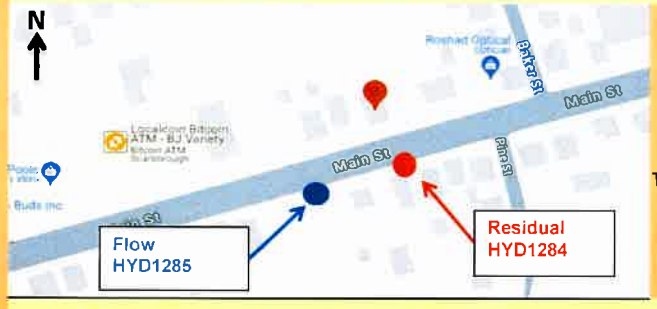
Date: 20-Nov-23 Time: 14:22 (hh/mm)

Municipality: Town of Stouffville

Operator:

Tested By: Sen

Test No: 1



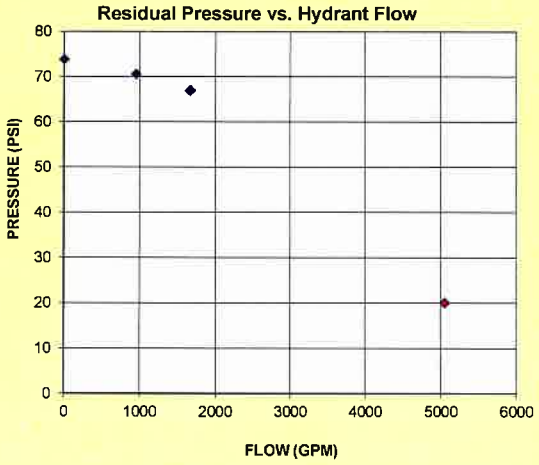
Conditions before Test (STATIC)

Residual Hydrant:	73.8 psi	509 kPa
Hydrant that will Flow:	73.8 psi	509 kPa
Δ pressure:	0.0 psi	0 kPa
Elevation Difference: (Flow El. - Residual El.)	0.0 ft	0.0 m

Test Notes:

TEST		TEST FLOW		RESIDUAL PRESSURE (psi)		Minimum Residual P, (psi)	Fire Flow at Minimum Residual, Q, (USGPM)	Fire Flow at Minimum Residual, Q, (L/s)	10% Pressure Drop Achieved?
Port Size (in)	Nozzle Pressure (psi)	(USGPM)	(L/s)	Monitoring Hydrant	Flow Hydrant (Corrected) *				
STATIC	n/a	0	0	73.8	73.8				
Single Port Tests									
2"	32.1	948.0	59.8	70.6	70.6	20	4335	273	NO
2"						20			
Two Port Test									
1"						20			
2"									
Two Port Test									
2"	23.2	805.0	50.8	67	67.0	20	5051	319	NO
2"	25.9	851.0	53.7						

* Pressure correction is equal to the elevation difference. Column 2 (and Table A) show the nozzle pressure while flowing.



Results			
Static Pressure		Flow at 20 psi (140kPa)*	
(psi)	(kPa)	(gpm)	(L/s)
73.8	509	5100	322

* Results carried to nearest 50 gpm or 100 gpm if over 1000 gpm

Hydrant Classification as per NFPA 291			
Class	AA	Color	BLUE

Water Discharged During Test:	12400 L

Rounded up to closest 100L

DISCLAIMER FOR FIRE FLOW TESTS

While WSP makes every effort to ensure that the information contained herein is accurate and up to date, WSP is not responsible for unintended or incorrect use of the data and information described and/or contained herein. The user must make his/her own determination as to its accuracy and suitability. The information is representative for a dynamic water system that may change over time.

GENERAL NOTES

1. THE NOTES ON THIS SHEET APPLY TO ALL WORKS UNDER THIS CONTRACT UNLESS OTHERWISE NOTED ON THE PLAN AND PROFILE DRAWINGS AND/OR SPECIFIC DETAIL DRAWINGS.
2. ALL MATERIALS ARE TO COMPLY WITH THE MANUFACTURER'S SPECIFICATIONS PER APPROVED PRODUCTS AS LISTED IN SCHEDULE 'B' OF THE TOWN'S GUIDELINES.
3. THE STANDARD DRAWINGS OF THE TOWN OF WHITCHURCH-STOUFFVILLE, ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS) AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) CONSTITUTE PART OF THE PLANS OF THIS CONTRACT. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY TOWN OF WHITCHURCH-STOUFFVILLE STANDARD DRAWINGS, AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL RELEVANT STANDARD DRAWINGS AND SPECIFICATIONS AS REQUIRED FOR THIS CONTRACT.
5. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHOWN ON THE ENGINEERING DRAWINGS ARE IN METRES OR MILLIMETERS.
6. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
7. EXISTING SERVICES AND UTILITIES SHOWN ON THESE CONTRACT DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE AND THEIR LOCATIONS ARE NOT GUARANTEED. THE CONTRACTOR SHALL INTERPRET THIS INFORMATION AS HE WISHES WITH THE UNDERSTANDING THAT THE OWNER DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY AND/OR SUFFICIENCY.
8. ALL PRIMARY HYDRO, TELECOMMUNICATION CABLE, GAS LINES AND CABLE T.V. SHALL BE PLACED UNDERGROUND IN LOCATIONS SHOWN ON THE ROAD SECTIONS LISTED IN THE STANDARD DRAWINGS.
9. ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND THE GROUND COVER HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE TOWN.
10. NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
11. GRANULAR MATERIAL USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY.
12. ALL DISTURBED AREAS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 300mm OF APPROVED TOPSOIL AND NURSERY SOD.
13. ALL FENCING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN STANDARD DRAWINGS.
14. THE STREET LIGHTING SYSTEM SHALL BE DESIGNED BY A QUALIFIED CONSULTING ENGINEER IN ACCORDANCE WITH THE ILLUMINATION ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) LATEST EDITION STANDARDS AND APPROVED BY THE TOWN. STREET LIGHTING SYSTEMS FOR ROADWAYS IN THE TOWN OF WHITCHURCH-STOUFFVILLE SHALL MEET THE REQUIREMENTS OF HYDRO ONE.

PAVEMENT & MUNICIPAL ACCESS

1. THE ROAD PAVEMENT MINIMUM STRUCTURE SHALL CONSIST OF THE FOLLOWING AND WILL BE CONFIRMED BY A SOILS CONSULTANT AND APPROVED BY THE TOWN:
   - 40mm OF HL3 SURFACE COURSE ASPHALT
   - 50mm OF HL8 BINDER COURSE ASPHALT
   - 150mm OF 19mm CRUSHER RUN LIMESTONE or EQUIVALENT
   - 350mm OF 50mm CRUSHER RUN LIMESTONE or EQUIVALENT *

   * RECYCLED CONCRETE MAY BE SUBSTITUTED UPON WRITTEN APPROVAL OF TOWN

   BOULEVARDS: - 450mm TOPSOIL & SOD
   DITCHES: - 300mm TOPSOIL & SOD
2. NATIVE SUBGRADE TO BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PROOF ROLLED. NATIVE SUBGRADE SHALL HAVE A CROSS-FALL OF 3% AND THE MATERIAL SHALL BE APPROVED BY A SOILS CONSULTANT AND IS SUBJECT TO APPROVAL BY THE TOWN ENGINEER.
3. CONCRETE BARRIER CURBS CONFORMING TO OPSD 600.11 SHALL BE USED. CONCRETE STRENGTH IS TO BE A MINIMUM OF 30MPa AT 28 DAYS WITH 7% ± 1.5% AIR ENTRAINMENT.
4. DRIVEWAY DEPRESSIONS SHALL BE FORMED IN THE CURB AS PER OPSD 351.010.
5. SIDEWALK CONSTRUCTION SHALL COMPLY WITH OPSD M310.010 (MODIFIED) AND SHALL BE CONSTRUCTED ON 100mm OF GRANULAR 'A' ON POLYETHYLENE BARRIER AND A COMPACTED FOUNDATION. CONCRETE STRENGTH IS TO BE A MINIMUM OF 30MPa AT 28 DAYS WITH 7% ± 1.5% AIR ENTRAINMENT. SIDEWALK AT DRIVEWAYS TO BE 150mm THICK.
6. RESIDENTIAL DRIVEWAYS TO BE CONSTRUCTED WITH A MINIMUM OF 150mm GRANULAR 'A', AND BE PAVED WITH A MINIMUM OF 50mm OF HL8 BASE AND 25mm HL3A TOP ASPHALT FROM STREET TO GARAGE/DWELLING, OR AS APPROVED BY THE TOWN.
7. ALL ACCESS DRIVEWAYS SHALL BE LOCATED A MINIMUM OF 1.0M FROM LIGHT POLES, HYDRO TRANSFORMERS, CATCHBASINS, HYDRANTS, WATERMAIN VALVES, BELL MANHOLES, BELL AND CABLE TV JUNCTION BOXES, WATER SERVICE VALVE BOXES, SIDE LOT LINES AND OTHER DRIVEWAYS. WHERE FRONTAGE LIMITATIONS INTERFERE WITH STANDARD LOCATIONS, SITE SPECIFIC SOLUTIONS SHALL BE DETAILED IN THE PLAN AND PROFILE AND LOT GRADING PLANS.
8. MINIMUM SLOPES ON DRIVEWAYS SHALL BE 1.0% AND MAXIMUM SLOPES SHALL BE 8.0%.
9. ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE TOWN WORKS DEPARTMENT PRIOR TO THE COMMENCEMENT OF ANY WORK ON ANY ROAD THAT IS EXTERNAL TO THE PLAN. A MINIMUM 48 HOUR NOTICE IS REQUIRED.

STORM SEWERS

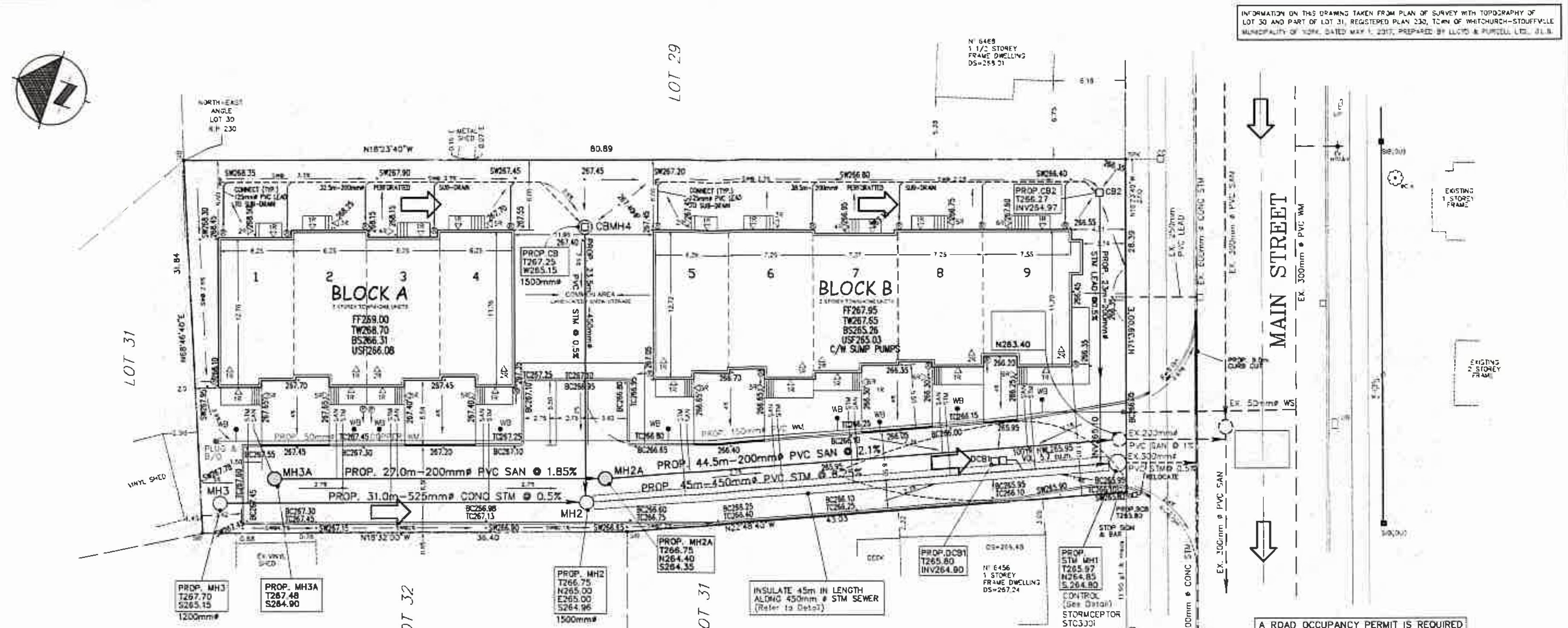
1. STORM SEWER TO BE LOCATED TYPICALLY 1.5m TO THE WEST OR SOUTH OF CENTRELINE OF THE ROAD.
2. PIPE SHALL CONFORM TO THE REQUIREMENTS SHOWN BELOW:
   a) NON-REINFORCED CONCRETE PIPE, CSA STANDARD A257.1 CLASS 1,2,3
   b) REINFORCED CONCRETE PIPE, CSA STANDARD A257.2 STRENGTH CLASS 50-D, 65-D, 100-D AND 140-D
   c) PVC PIPE, CSA STANDARD B182.1 AND B182.4 (SDR35)
3. ALL STORM SEWERS OVER 450mm DIAMETER SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE PIPE.
4. SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD 802.010, AND 802.030, UNLESS OTHERWISE SPECIFIED BY A GEOTECHNICAL CONSULTANT AND APPROVED BY THE TOWN.
5. TRENCH BACKFILL SHOULD BE PLACED IN 200mm LIFTS AND COMPACTED TO 95% SPMOD.
6. ALL STORM SEWER MANHOLES TO BE ACCORDING TO TOWN STANDARDS AND BE BENCHED TO OBVERT IN ACCORDANCE WITH OPSD 701.021.
7. DROP STRUCTURES SHALL CONFORM WITH OPSD 1003.010 AND 1003.020.
8. MANHOLE TOPS ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE. FRAME AND COVER TO BE PER OPSD M401.010, TYPE 'B'. GRADE AND CROSSFALL ADJUSTMENT SHALL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE. MODULAR ADJUSTMENT RINGS ARE TO BE USED TO ADJUST THE MANHOLE TO FINAL GRADE.
9. CATCHBASINS MUST BE OF THE PRECAST TYPE AS SHOWN ON THE OPSD DRAWINGS 705.010 OR 705.020. DOUBLE CATCHBASINS ARE REQUIRED IN VALLEYS.
10. SINGLE CATCHBASIN LEADS SHALL BE PVC SDR35 PIPE WITH MINIMUM SLOPE OF 1% AND MINIMUM SIZES AS FOLLOWS:
    - SINGLE CATCHBASIN 250mm DIAMETER
    - DOUBLE CATCHBASIN 300mm DIAMETER
    - REAR LOT CATCHBASIN 250mm DIAMETER
11. THE FRAME AND GRATE FOR CATCHBASINS SHALL BE OPSD 400.010. CATCHBASIN GRATES ARE TO BE RAMPED USING HOT-MIX ASPHALT. CATCHBASINS AT LOW POINTS SHALL BE SET TO BASE ASPHALT AND ADJUSTED TO SURFACE COURSE.
12. REAR LOT CATCHBASIN LEADS TO BE CONCRETE ENCASED FROM THE STREET LINE TO THE CATCHBASIN, PER STANDARD DETAIL WS-401. FRAME AND GRATE TO BE OPSD 400.010.
13. WHERE CATCHBASINS ARE CONNECTED DIRECTLY TO SEWERS, PRE-MANUFACTURED TEES SHALL BE USED.
14. PARTIAL BULK HEADS ARE REQUIRED AT MANHOLE CONNECTIONS TO EXISTING SEWERS.
15. MANHOLE STEPS ARE TO BE SOLID, RECTANGULAR ALUMINUM PER OPSD 405.020.
16. ROOF LEADERS SHALL DISCHARGE TO CONCRETE SPLASH PADS, UNLESS NOTED OTHERWISE.

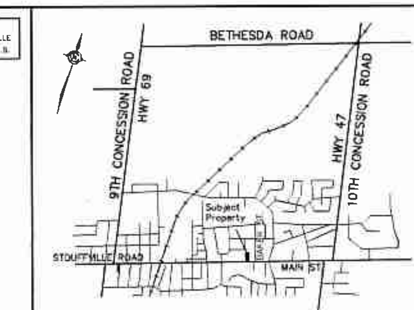
WATERMAINS

1. WATERMAIN SHALL BE LOCATED AS SHOWN ON THE STANDARD TOWN ROADWAY CROSS SECTIONS. THIS LOCATION SHALL NORMALLY BE ON THE NORTH AND EAST SIDE OF THE STREET. WATERMAIN SHALL BE OFFSET FROM STREET LINE AS PER STANDARD ROAD CROSS SECTION.
2. ALL WATERMAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSS 441. PIPE MATERIAL SHALL BE CLASS 150 PVC (DR18) IN ACCORDANCE WITH APPLICABLE AWWA STANDARDS, LATEST REVISION.
3. WATERMAIN BEDDING SHALL BE AS PER OPSD 802.010.
4. A MINIMUM CLEARANCE BETWEEN THE WATERMAIN AND ALL UTILITIES MUST BE KEPT, WHILE STILL MAINTAINING A MINIMUM DEPTH OF COVER AT ALL TIMES.
5. WATERMAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF 1.8m.
6. CAST IRON MECHANICAL JOINT FITTINGS MEETING AWWA SPECIFICATIONS C-907 AND C.S.A. B138.2 SHALL BE USED ON PVC WATERMAIN 150 TO 300mm IN DIAMETER.
7. ALL VALVES SHALL BE RESILIENT WEDGE GATE VALVES WITH VALVE BOX UNLESS OTHERWISE APPROVED BY THE TOWN. VALVES SHALL HAVE A NON-RISING STEM AND A 50mm SQUARE OPERATING NUT, OPENING COUNTER-CLOCKWISE.
8. VALVES IN EXCESS OF 1.8m IN DEPTH SHALL REQUIRE A VALVE STEM EXTENSION.
9. A MINIMUM HORIZONTAL SEPARATION OF 2.5m SHALL BE MAINTAINED BETWEEN THE WATERMAIN AND ANY SEWER.
10. PIPE DEFLECTION SHOULD BE USED WHEREVER POSSIBLE TO MINIMIZE THE USE OF BENDS WHEREVER IT IS NECESSARY TO DEFLECT FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE. THE AMOUNT OF DEFLECTION SHALL NOT EXCEED THE RECOMMENDATIONS OF THE MANUFACTURER.
11. THE TOWN ENGINEER MUST BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF ANY PRESSURE AND LEAKAGE TESTING, CHLORINATION OR FLUSHING WHICH MUST BE CARRIED OUT IN ACCORDANCE WITH TOWN SPECIFICATIONS AND OPSS 441.

WATER SERVICES

1. EACH RESIDENTIAL UNIT SHALL HAVE A SEPARATE 25mm MINIMUM DIAMETER, TYPE K COPPER WATER SERVICE. WHEN SERVICE LINE EXCEEDS 30m IN LENGTH, THE SIZE OF THE LINE SHALL BE INCREASED TO AN APPROPRIATE DIAMETER, OR AS DIRECTED BY THE TOWN.
2. SERVICES SHALL BE INSTALLED ACCORDING TO OPSD 1104.010 AND 1104.020.
3. WATER SERVICES TO BE LOCATED 2.5m FROM THE LOT LINE OPPOSITE THE DRIVEWAY WITH A CURB STOP AT THE STREET LINE AND A MINIMUM 1.0m CLEAR FROM THE EDGE OF DRIVEWAY. LOCATIONS TO BE MARKED WITH 2 X 4 PAINTED BLUE.
4. THE MINIMUM DEPTH OF COVER IS 1.8m.
5. WATER SERVICES SHALL BE INSTALLED TO AVOID DRIVEWAYS. WHERE NOT POSSIBLE, FROST RINGS TO BE USED.
6. NO COUPLINGS WILL BE ALLOWED BETWEEN THE CURB STOP AND MAIN STOP.
7. STAINLESS STEEL SERVICE SADDLES SHALL BE USED WHEN TAPPING INTO THE PVC WATERMAIN.
8. A REMOTE READOUT WATER METER WILL BE REQUIRED ON EACH RESIDENCE. MAKE AND MODEL IS TO BE PER TOWN REQUIREMENTS COMPLETE WITH A REMOTE READER LOCATED ON AN OUTSIDE WALL, ADJACENT TO THE HYDRO METER.





KEY PLAN
N.T.S.

NOTE:
Distances Shown On This Plan Are In Metres And Can Be Converted To Feet By Dividing By 0.3048
The Position of Pole Lines, Conduits, Watermains, Sewers and Other Underground and Overground Utilities and Structures is Not Necessarily Shown On The Contract Drawing, And Where Shown, The Accuracy Of The Position of Such Utilities and Structures is Not Guaranteed. Before Starting Work, The Contractor Shall Inform Himself Of The Exact Location of All Such Utilities and Structures, and Shall Assume All Liability For Damage To Them.

LEGEND

266.35	PROPOSED ELEVATION
	EX. ELEVATION
	EX. STORM MAINTENANCE HOLE
	EX. SANITARY MAINTENANCE HOLE
	PROP. ROOF LEADER C/W SPLASH PAD
Ex CB	EXISTING CATCHBASIN
CB	PROPOSED CATCHBASIN
MC	PROP. WATER METER CHAMBER
WB	PROPOSED WATER BOX
PROP HYD&V	PROP. HYDRANT & VALVE
	PROP. FLOW DIRECTION
	PROP. 3:1 (MAX) SLOPE
FF	FINISHED FIRST FLOOR ELEVATION
TW	TOP OF FOUNDATION WALL ELEVATION
USF	UNDERSIDE OF FOOTING ELEVATION
	DENOTES EXISTING TREES
	STOP SIGN C/W STOP BAR
	OVERLAND FLOW ROUTE

No.	Revision	Date	By	App'd
1	REV. PER TOWN & BURNSIDE COMMENTS - MAR. 2021	MAR. 2024	CDR	CDR

Benchmarks

No.	Elevation	Description
130210005	265.196m	ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY CONTROL SURVEY INFORMATION EXCHANGE (COSINE). BENCHMARK N° 130210005 HAVING A PUBLISHED ELEVATION OF 265.196 METRES.

SANITARY SEWERS

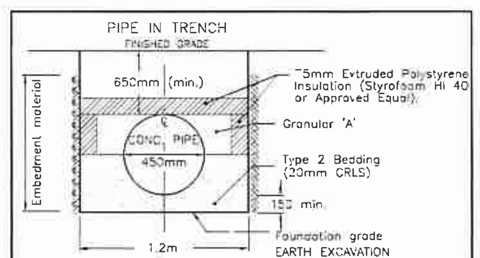
1. SANITARY SEWERS SHALL GENERALLY BE LOCATED 1.5m NORTH OR EAST OF THE ROAD CENTER.
2. ALL POLYVINYL CHLORIDE (PVC) SANITARY SEWER PIPE SHALL BE CSA STANDARD B182.2, SDR35. ALL SANITARY SEWERS SHALL HAVE WATERTIGHT JOINTS AND GASKETTED FITTINGS.
3. SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD 802.010, AND 802.030, UNLESS OTHERWISE SPECIFIED BY A GEOTECHNICAL CONSULTANT AND APPROVED BY THE TOWN. IN WATER BEARING SAND, IF EXTENSIVE DEWATERING IS REQUIRED, A CLASS "A" BEDDING CONSISTING OF CONCRETE MAY BE REQUIRED.
4. FRAMES AND COVERS SHALL BE IN ACCORDANCE WITH O.P.S.D. 401.010, TYPE 'A'.
5. ALL DOMESTIC CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TOWN STANDARD DRAWINGS AND ALL APPLICABLE O.P.S.D. DETAILS TO A MAXIMUM DEPTH OF 4.5m. CONTROLLED SETTLEMENT JOINTS ARE REQUIRED ON ALL RISERS GREATER THAN 4.5m DEPTH.
6. INSTALL SEWER DROP CONNECTIONS TO MANHOLES AS PER OPSD 1003.010 AND 1003.020.
7. ALL MANHOLE ADJUSTMENT RINGS SHALL BE MORTARED FROM THE OUTSIDE AND INSIDE OF THE STRUCTURE PRIOR BACKFILLING.
8. MANHOLES ARE TO BE WATER-PROOFED PER OPSS 1351. MANHOLES ARE TO BE WATERTIGHT AND PARGED ALONG OUTSIDE OF JOINTS WITH MORTAR PRIOR TO BACKFILLING.
9. "CLAY PLUGS" SHALL BE USED IN THE TRENCH AND BE PLACED 2 TO 3 METERS UPSTREAM FROM ANY MANHOLE WHICH IS SUSPECTED OF BEING SUSCEPTIBLE TO HIGH WATER LEVELS OF INFLOW/INFILTRATION, SUBJECT TO VERIFICATION BY GEOTECHNICAL ENGINEER.
10. MAINTENANCE HOLE TOPS (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE, AND THEN ADJUSTED TO FINAL GRADE WHEN TOP LIFT OF ASPHALT IS PLACED. GRADE AND CROSSFALL ADJUSTMENT SHALL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE. MODULAR ADJUSTMENT RINGS ARE TO BE USED TO ADJUST THE MANHOLE TO FINAL GRADE.
11. PRECAST CONCRETE MANHOLES SHALL CONFORM TO OPSD M701.010 (MODIFIED) FOR 1200mm DIAMETER.
    a) REINFORCED, POURED IN PLACE CONCRETE MANHOLES, ARE SUBJECT TO APPROVAL OF THE TOWN ENGINEER
    b) SAFETY PLATFORMS ARE TO BE PROVIDED FOR MANHOLES IN ACCORDANCE WITH PROVINCIAL REGULATIONS
    c) ALL SANITARY MANHOLES TO HAVE BENCHING TO OBVERT PER OPSD 701.021
12. MINIMUM CLEARANCES BETWEEN SERVICES SHALL BE PROVIDED IN ACCORDANCE WITH M.O.E. GUIDELINES. MINIMUM CLEARANCE FOR SEWERS IN THE COMMON TRENCH SHALL BE 450MM BETWEEN THE OUTSIDE OF THE BELLS.
13. A MINIMUM COVER OF 2.8m BELOW THE CENTERLINE ROAD ELEVATION OR SUFFICIENT DEPTH FOR BASEMENT FLOOR DRAINS AND FROST COVER SHALL BE PROVIDED. WHERE SEWERS AREA LOCATED WITHIN AN EASEMENT A MINIMUM FROST COVER OF 1.5m MAY BE USED, PROVIDED SUCH SEWERS CROSS BELOW WATERMAINS.
14. BULKHEADS OR PLUGS ARE REQUIRED IN DOWNSTREAM MANHOLE AT OUTLET FROM DEVELOPMENT, UNTIL FIRST OCCUPANCY.
15. ALL TESTING OF THE SANITARY SYSTEM IS TO BE COMPLETED IN ACCORDANCE WITH THE "SANITARY SEWER SYSTEM INSPECTION, TESTING AND ACCEPTANCE GUIDELINE"(OCT.2011) AS PREPARED BY THE REGION OF YORK, OR LATEST AMENDMENT THERETO.
16. MANHOLE STEPS ARE TO BE SOLID, RECTANGULAR ALUMINUM PER OPSD 405.020.

SEWER SERVICE LATERALS

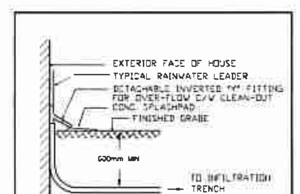
1. ALL SANITARY LATERAL PIPES SHALL BE PVC-DR28, GREEN IN COLOR. SINGLES ARE 100mm, DOUBLES ARE 125mm.
2. STORM SERVICES SHALL BE 150mm DIAMETER PVC DR 28, WHITE IN COLOR.
3. ELEVATION OF SERVICE CONNECTIONS AT THE STREETLINE IS TO BE 2.5m MINIMUM BELOW FINISHED GRADE AND TERMINATED WITH A WATER-PROOF PLUG.
4. LOCATION STAKED WITH A 2 X 4 MARKER PAINTED RED FOR SANITARY AND GREEN FOR STORM.
5. ALL LATERALS ARE TO BE INSPECTED BY CCTV FROM THE MAINLINE TO THE DWELLING AND A REPORT SUBMITTED TO THE TOWN PRIOR TO OCCUPANCY OF THE DWELLING.
6. TEST FITTINGS AT STREET-LINE TO BE WATER-TIGHT PVC FITTING.
7. BEDDING FOR LATERALS TO BE PER OPSD 1006.010 AND OPSD 1006.020 (MODIFIED).

GRADING NOTES:

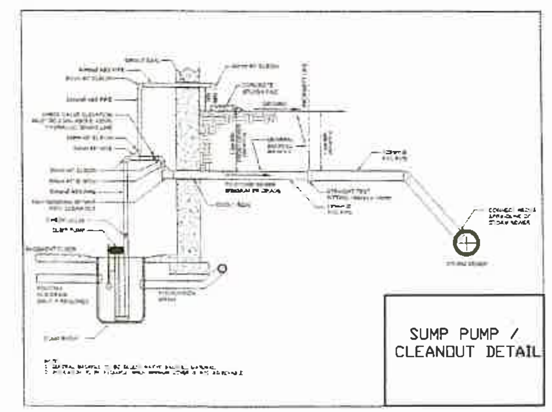
1. All external site areas disturbed by the activities of the contractor shall be restored to existing condition or better and to the satisfaction of the Town. Grassed areas shall be restored by placing 150mm topsoil and actively growing 1 nursery sod. All boulevards to be sodded.
2. Topsoil in fill areas to be stripped. All fill materials approved for suitability by the geotechnical engineer prior to any filling or reuse of excavated material. Approval fill material shall be compacted to the satisfaction of the geotechnical engineer.
3. Pavement grades (min. 0.5% max. 5.0%)
4. Drainage swales with grades (min. 2%, max. 5.0%)
5. Slopes in landscaped areas and on berms shall not exceed 3 horizontal to 1 vertical with a maximum vertical elevation not in excess of the applicable Town standard.
6. Silt fence to be installed and maintained to prevent silt flowing onto adjacent lands prior to stripping topsoil and to be maintained until all construction is complete.
7. Construction access shall be constructed with a minimum depth of 450mm crushed stone base from the municipal curb or edge of pavement to the property line, to the satisfaction of the Town.
8. Boulevard grades are to be 2.0% to 4.0% max.
9. Siltation control measures shall be in place prior to start of any construction.
10. All grading to conform to Town of Richmond Hill standards and specification and OPSD.
11. All construction to be carried out in accordance with the most recent design criteria, standards, and specifications of the Town of Richmond Hill and OPSD.
12. The geotechnical consultant shall verify the suitability of the engineered fill at source prior to hauling any material on site.
13. All fill shall be placed and compacted to 95% standard proctor density in maximum 0.20m lifts to sub-grade.
14. Unless otherwise shown on the grading and/or erosion sediment control plan, proposed stockpiling of topsoil during construction will require the owner's engineer to provide the location and height of stockpiled topsoil. Topsoil pile must be stable and seeded to establish a temporary vegetative cover and to prevent erosion.



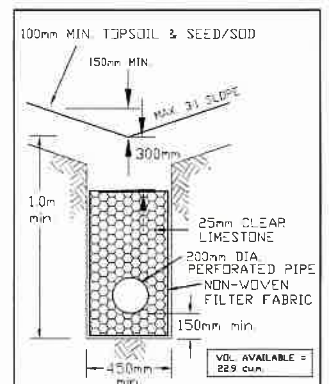
INSULATION & BEDDING DETAIL FOR 200 & 450mm STORM SEWERS
N.T.S.



RAIN WATER LEADER DETAIL
N.T.S.

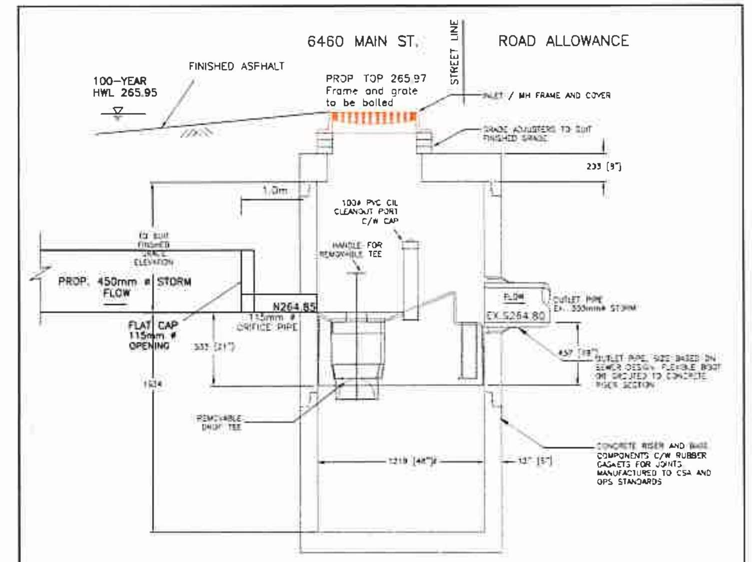


SUMP PUMP / CLEANOUT DETAIL



REAR-YARD GRASSED SWALE DETAIL C/W INFILTRATION TRENCH
N.T.S.

REQ'D VOLUME(V) = REAR ROOF AREAS (sq.m) x 0.025m / 0.4 (Void Ratio)
V = 352 (sq.m) x 0.025 / 0.4
V = 22.0 cu.m



CONTROL MANHOLE MH1
STORMCEPTOR STC 300i
NTS

2426009 ONTARIO LTD.
PROPOSED RESIDENTIAL DEVELOPMENT
6460 MAIN STREET, TOWN OF WHITCHURCH-STOUFFVILLE

CONSULTANT
LICENSED PROFESSIONAL ENGINEER
C. DI REZZE
MAR.29/2024
PROVINCE OF ONTARIO

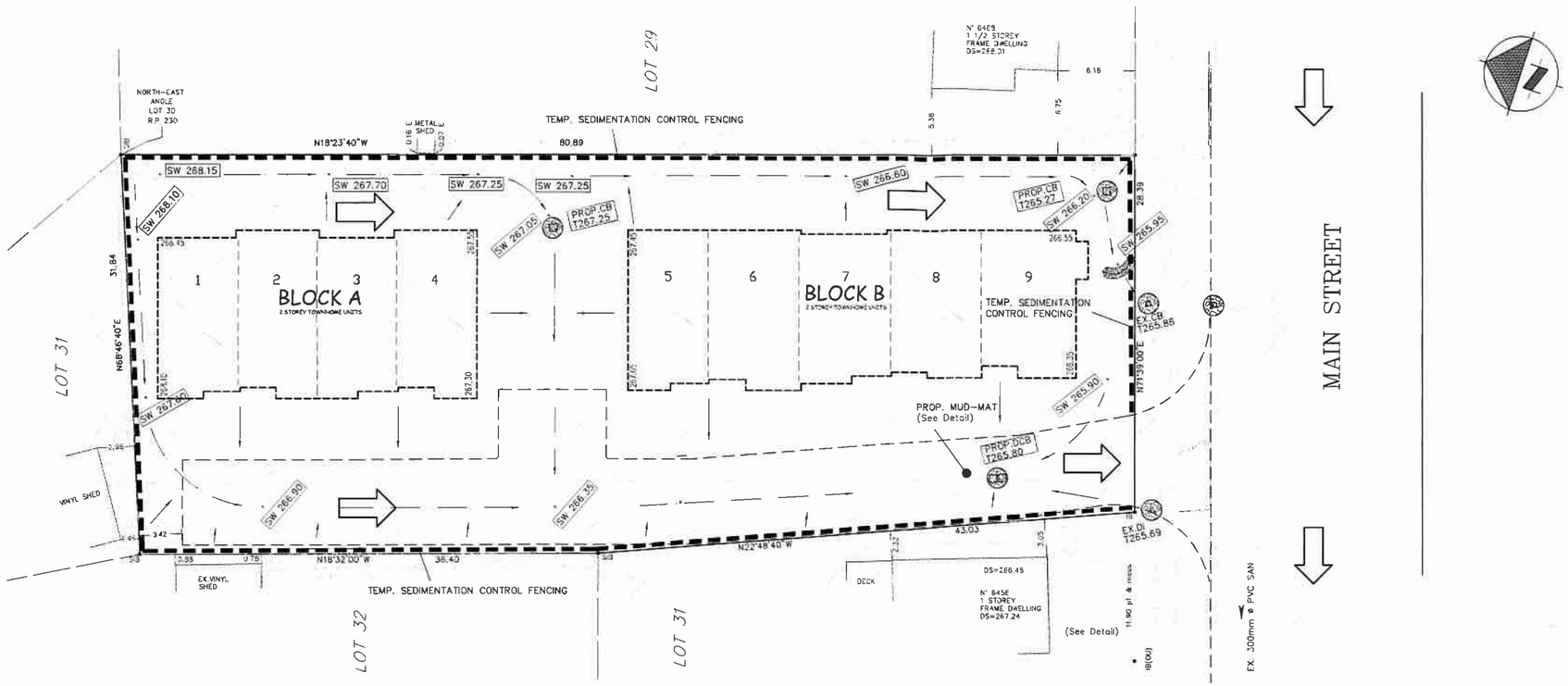
ACCEPTED
TOWN OF WHITCHURCH STOUFFVILLE
SIGNATURE DATE

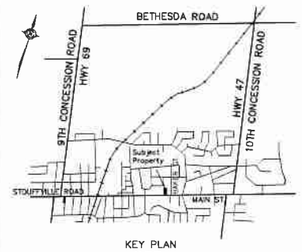
TOWN OF WHITCHURCH-STOUFFVILLE

AME-TECH Developments Limited
Urban Engineering & Project Management Services
346 Newkirk Road, Unit 9, Richmond Hill, Ontario L4C 0A9, 905.884.4336

SERVICING & GRADING
LOT 30 AND PART OF LOT 31, REGISTERED PLAN 230
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

Surveyed by: BIRNWELL O.L.S.	Checked by: CDR	Town File No.: SPA20.019
Drawn by: CADD	Approved by: CDR	
Designed by: CDR	Date: MARCH 2024	Drawing No.: SG1
Scale: Horz. 1:250 (0m 5m 10m)		Sheet No.: 1 OF 2





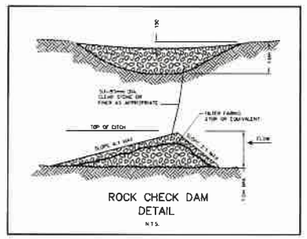
KEY PLAN
N.T.S.

NOTE:
Distances Shown On This Plan Are In Metres And Can Be Converted To Feet By Dividing By 0.3048

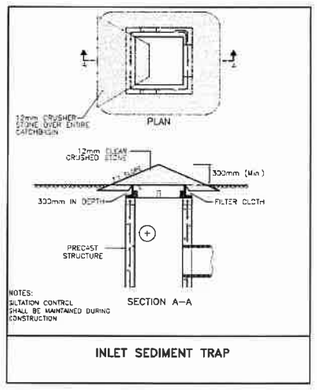
The Position of Pole Lines, Conduits, Watermains, Sewers and Other Underground and Overground Utilities and Structures is Not Necessarily Shown On The Contract Drawing, And Where Shown, The Accuracy Of The Position of Such Utilities and Structures is Not Guaranteed. Before Starting Work, The Contractor Shall Inform Himself Of The Exact Location of All Such Utilities and Structures, and Shall Assume All Liability For Damage To Them.

LEGEND

- PROPOSED SILT FENCE
- ROCK CHECK DAM
- SW 266.00 — CUT-OFF SWALE ELEVATION
- EX. FLOW DIRECTION
- PROPOSED FLOW DIRECTION
- EXISTING TREES
- SILT CONTROL AT CB
- OVERLAND FLOW ROUTE



ROCK CHECK DAM DETAIL
N.T.S.

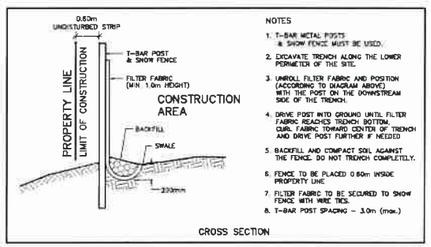


NOTES:
SILTATION CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION

INLET SEDIMENT TRAP

ESC PHASING CHART

ESC MEASURES	TIMING FOR INSTALLATION	INSPECTION/MAINTENANCE REQUIREMENTS	TIMING FOR REMOVAL
PHASE 1 - TOPSOIL STRIPPING AND AREA GRADING			
- SILT FENCE - MUD MAT - DRAINAGE SWALES - CHECK DAMS - SEDIMENT TRAPS	PRIOR TO TOPSOIL STRIPPING	CONSULTANT TO ARRANGE INSPECTION WITH TOWN STAFF ONCE INSTALLATION IS COMPLETE. CONSULTANT TO UNDERTAKE EACH RAINFALL EVENT, INCLUDING WEEKLY REPORTING REGULAR MAINTENANCE TO REMOVE ACCUMULATED SEDIMENT AND REPAIR ESC MEASURES.	JUST PRIOR TO FINAL GRADING REPLACEMENT WITH PHASE 2 MEASURES, OR CONSTRUCTION OF MUNICIPAL SERVICES
PHASE 2 - MUNICIPAL SERVICING CONSTRUCTION			
- RESTORATION HYDROSEEDING - SEDIMENT TRAPS - DRAINAGE SWALES - TEMPORARY CONNECTIONS TO STORM SEWERS	AFTER AREA GRADING AND INSTALLATION OF STORM DRAINAGE SYSTEM IS COMPLETE	CONSULTANT TO UNDERTAKE WEEKLY INSPECTION AND AFTER EACH RAINFALL EVENTS, INCLUDING WEEKLY REPORTING REGULAR MAINTENANCE TO REMOVE ACCUMULATED SEDIMENT AND REPAIR ESC MEASURES.	JUST PRIOR TO FINAL GRADING OR BUILDING CONSTRUCTION
PHASE 3 - BUILDING CONSTRUCTION			
- MAINTENANCE AND REPAIR TO ALL REMAING ESC MEASURES AS PER DETAIL INSPECTION WITH TOWN INSPECTOR - REMOVAL OF PHASE 1 OR 2 MEASURES	PRIOR TO BUILDING CONSTRUCTION, ESC MEASURES TO BE REPAIRED AS PER TOWN DEFICIENCY LIST.	DETAILED INSPECTION OF ALL REMAINING ESC MEASURES WITH TOWN INSPECTOR CONSULTANT TO UNDERTAKE WEEKLY INSPECTIONS AND AFTER EACH RAINFALL EVENT, INCLUDING WEEKLY REPORTING REGULAR MAINTENANCE TO REMOVE ACCUMULATED SEDIMENT AND REPAIR ESC MEASURES	JUST PRIOR TO FINAL GRADING OR BUILDING CONSTRUCTION



NOTES
1. T-BAR METAL POSTS & SNOW FENCE MUST BE USED.
2. EXCAVATE TRENCH ALONG THE LOWER PERIMETER OF THE SITE.
3. UNROLL FILTER FABRIC AND POSITION (ACCORDING TO DIAGRAM ABOVE) WITH THE POST ON THE DOWNSTREAM SIDE OF THE TRENCH.
4. DRIVE POST INTO GROUND UNTIL FILTER FABRIC REACHES TRENCH BOTTOM. CURL FABRIC TOWARD CENTER OF TRENCH AND DRIVE POST FURTHER IF NEEDED.
5. BACKFILL AND COMPACT SOIL AGAINST THE FENCE. DO NOT TRENCH COMPLETELY.
6. FENCE TO BE PLACED 0.60m INSIDE PROPERTY LINE.
7. FILTER FABRIC TO BE SECURED TO SNOW FENCE WITH WIRE TIES.
8. T-BAR POST SPACING - 3.0m (max.)

CROSS SECTION

SILT/SEDIMENT CONTROL FENCE SPECIFICATION NOTES

1. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SILT TRAPS WITH ROCK CHECK-DAM OUTLETS MUST BE INSTALLED AT LOW / CONCENTRATION POINTS, WITH 120 CUBIC METERS OF CAPACITY PER 1 HECTARE OF DRAINAGE AREA.
3. TOP OF FILTER FABRIC TO BE A MINIMUM OF 1.0M ABOVE GROUND LEVEL AND ATTACHED TO FENCE WITH A CONTINUOUS STEEL WIRE OR FOLD FILTER FABRIC OVER TOP OF FENCE AND ATTACH TO FENCE WITH WIRE LOOPED THROUGH FABRIC ON BOTH SIDES OF FENCE.

SILTATION CONTROL SCHEDULE

PREGRADING

1) ERECT EROSION AND SEDIMENTATION CONTROL FENCE AROUND THE PERIMETER OF THE SITE AS DETAILED ON PLAN.
2) STRIP TOPSOIL AND DISPOSE OFF SITE.
3) CONSTRUCT CUT-OFF SWALES COMPLETE WITH ROCK-CHECK DAMS AT THEIR APPROPRIATE LOCATION.

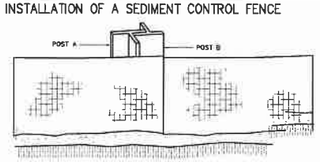
UNDERGROUND SERVICING AND ROADS

4) AFTER SUBSTANTIAL RAINFALL ANY RUN-OFF PUMPED FROM OPEN TRENCHES SHALL BE DIRECTED TOWARDS APPROVED OUTLETS.
5) ANY WATER TRAPPED WITHIN PREGRADED AREAS SHALL BE DIRECTED TOWARDS THE ROCK CHECK DAM VIA CUT-OF SWALES OR BY PUMPING.

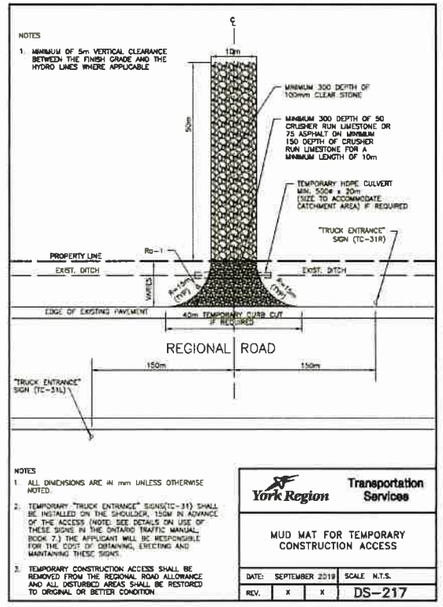
BUILDING CONSTRUCTION

6) SEDIMENT CONTROL FEATURES SHALL REMAIN INPLACE UNTIL THE PERMANENT DRAINAGE FACILITY HAVE BEEN CONSTRUCTED.
7) THE BUILDER IS NOW RESPONSIBLE FOR SILTATION CONTROL MEASURES TO THE SATISFACTION OF THE TOWN INCLUDING THE CLEANING OF STREETS AND THE OUTLET OF STORM WATER AT THE APPROVED OUTLET

INSTALLATION OF A SEDIMENT CONTROL FENCE



SILTATION CONTROL SCHEDULE



NOTES
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. TEMPORARY "TRUCK ENTRANCE" SIGN(TC-31) SHALL BE INSTALLED ON THE SHOULDER, 150M IN ADVANCE OF THE ACCESS (NOTE: SEE DETAILS ON USE OF THESE SIGNS IN THE ONTARIO TRAFFIC MANUAL, BOOK 7.) THE APPLICANT WILL BE RESPONSIBLE FOR THE COST OF OBTAINING, ERECTING AND MAINTAINING THESE SIGNS.
3. TEMPORARY CONSTRUCTION ACCESS SHALL BE REMOVED FROM THE REGIONAL ROAD ALLOWANCE AND ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION

York Region Transportation Services

MUD MAT FOR TEMPORARY CONSTRUCTION ACCESS

DATE: SEPTEMBER 2019 | SCALE N.T.S.
REV. X X
DS-217

INFORMATION ON THIS DRAWING TAKEN FROM PLAN OF SURVEY WITH TOPOGRAPHY OF LOT 30 AND PART OF LOT 31, REGISTERED PLAN 230, TOWN OF WHITCHURCH-STOUFFVILLE, MUNICIPALITY OF YORK, DATED MAY 1, 2017, PREPARED BY LOJO & PARCELL LTD., O.L.S.

No.	Revision	Date	By	Appd.
1	REV. PER TOWN & SURVISOR COMMENTS - MAR. 2021	MAR. 2024	CDR	CDR

Benchmarks

No.	Elevation	Description
130210005	265.196m	ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY CONTROL SURVEY INFORMATION EXCHANGE (COSINE). BENCHMARK N° 130210005 HAVING A PUBLISHED ELEVATION OF 265.196 METRES.

2426009 ONTARIO LTD.

PROPOSED RESIDENTIAL DEVELOPMENT
6460 MAIN STREET, TOWN OF WHITCHURCH-STOUFFVILLE

CONSULTANT

LICENSED PROFESSIONAL ENGINEER C. DI REZZE MAR 29/2024 PROVINCE OF ONTARIO

ACCEPTED
TOWN OF WHITCHURCH STOUFFVILLE

SIGNATURE DATE

TOWN OF WHITCHURCH-STOUFFVILLE

AME-TECH Developments Limited
Urban Engineering & Project Management Services
346 Newkirk Road, Unit 9, Richmond Hill, Ontario L4C 0A9, 905.884.4336

EROSION & SEDIMENT CONTROL

LOT 30 AND PART OF LOT 31, REGISTERED PLAN 230
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

Surveyed by: BARNICOTT O.L.S.	Checked by: CDR	Town File Nos.	
Drawn by: DAD	Approved by: CDR		
Designed by: CDR	Date: MARCH 2024	Drawing No.	ESC1
Scale: Horz. 1:200 (2m 4m 6m)		Sheet No.	2 OF 2