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1. 本報告係根據「證券交易法」第 36 條之規定，彙集本公司董事、監察人、經理人及其他負有報告義務之人（以下簡稱「報告義務人」）之報告，並經本公司董事會決議通過，爰將報告義務人報告之內容，分別彙編於本報告之「董事會報告」、「監察人報告」、「經理人報告」及「其他報告」等項下，以供股東參考。

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1. 本報告係根據「證券交易法」及「證券發行人財務報告編製準則」之規定，由本公司董事會及監察人共同編製，並經會計師查核簽證，其內容如有虛偽、不實或隱匿重要事實，致影響投資者之投資判斷，本公司董事會及監察人將依法負法律上之責任。

















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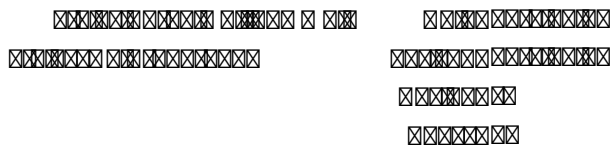
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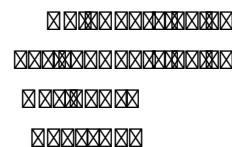
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Project Information			
Project Name			
Project Location			
Project Description			
Project Status			
Project Budget			
Project Timeline			
Project Risks			
Project Deliverables			
Project Stakeholders			
Project Summary			

Financial Data		
Revenue	Costs	Profit
1000	500	500
2000	1000	1000
3000	1500	1500
4000	2000	2000
5000	2500	2500
6000	3000	3000
7000	3500	3500
8000	4000	4000
9000	4500	4500
10000	5000	5000



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The diagram illustrates the decomposition of a 10x10 grid into a 9x9 grid and a 1x1 grid. The 10x10 grid is shown as a large rectangle divided into a 9x9 grid and a 1x1 grid. The 1x1 grid is shown separately below the 9x9 grid.

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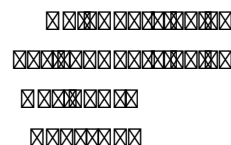
The diagram illustrates the decomposition of a 3x3 grid into a 2x2 grid of 2x2 subgrids and a 1x1 subgrid. The 3x3 grid is shown on the left, with its center cell shaded. This is decomposed into a 2x2 grid of 2x2 subgrids on the right, with the top-right subgrid shaded, and a 1x1 subgrid (the center cell) shown separately above the 2x2 grid.

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姓名: _____ 性别: _____ 年龄: _____ 身份证号: _____				
本人声明: 本人自愿参加本次体检, 并承诺所提供的个人信息真实有效。 如有隐瞒或虚假信息, 后果自负。 体检项目: _____ 体检时间: _____ 体检地点: _____				
体检结果: _____ 医生建议: _____ 体检费用: _____ 体检单位: _____				
体检人签字: _____ 日期: _____ 体检单位盖章: _____ 日期: _____				



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Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

Building Area = 2630 sq.m
Total Floor Area (+ 50% of floor above) = 3945 sq.m

C = 1.0 Assume ordinary construction

Therefore F = 13,818 L/min

Fire flow determined above shall not exceed:

30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Combustible 0% reduction

0 L/min reduction
13,818 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

As part of this analysis, building is assumed to have sprinkler protection (50% reduction),

6,909 L/min reduction

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Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed buildings

Name	Distance (m)	Charge (%)	Surcharge (L/s)
North Adjacent Dwelling	22	10%	1381.8
South Adjacent Dwelling	6	20%	2763.6
East Adjacent Dwelling	28	10%	1381.8
West Adjacent Dwelling	20.2	10%	1381.8
6,909 L/min Surcharge			

Determine Required Fire Flow

No.1	13,818	
No. 2	0 reduction	
No. 3	-6,909 reduction	
No. 4	<u>6,909</u> surcharge	
Required Flow:	13,818 L/min	
Rounded to nearest 1000 L/min:	14,000 L/min	or 233.3 L/s 3,698 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5



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Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

Building Area = 2926 sq.m
Total Floor Area (+ 50% of floor above) = 4389 sq.m

C = 1.0 Assume ordinary construction

Therefore F = 14,575 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Combustible	0% reduction
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0 L/min reduction
14,575 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

As part of this analysis, building is assumed to have sprinkler protection (50% reduction),

7,287 L/min reduction

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Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed buildings

Name	Distance (m)	Charge (%)	Surcharge (L/s)
North Adjacent Dwelling	25	10%	1457.5
South Adjacent Dwelling	22	10%	1457.5
East Adjacent Dwelling	20.2	10%	1457.5
West Adjacent Dwelling	15	15%	2186.2
6,559 L/min Surcharge			

Determine Required Fire Flow

No.1	14,575	
No. 2	0 reduction	
No. 3	-7,287 reduction	
No. 4	<u>6,559</u> surcharge	
Required Flow:	13,846 L/min	
Rounded to nearest 1000 L/min:	14,000 L/min	or 233.3 L/s 3,698 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5



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Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

Building Area = 3790 sq.m
Total Floor Area (+ 50% of floor above) = 5685 sq.m

C = 1.0 Assume ordinary construction

Therefore F = 16,588 L/min

Fire flow determined above shall not exceed:

30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Combustible 0% reduction

0 L/min reduction
16,588 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

As part of this analysis, building is assumed to have sprinkler protection (50% reduction),

8,294 L/min reduction

Water Supply for Public Fire Protection - 1999
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed buildings

Name		Distance (m)	Charge (%)	Surcharge (L/s)
North	Adjacent Dwelling	33	5%	829.4
South	Adjacent Dwelling	>45	0%	0.0
East	Adjacent Dwelling	>45	0%	0.0
West	Adjacent Dwelling	15	15%	2488.2
3,318 L/min Surcharge				

Determine Required Fire Flow

No.1	16,588		
No. 2	0 reduction		
No. 3	-8,294 reduction		
No. 4	<u>3,318</u> surcharge		
Required Flow:	11,611 L/min		
Rounded to nearest 1000 L/min:	12,000 L/min	or	200.0 L/s 3,170 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5



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Modified Harmon Formula

$$M_e = 0.8 \cdot \left(1 + \frac{14}{4 + \sqrt{Pe}}\right)$$

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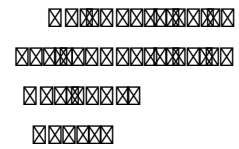
Modified Harmon Formula

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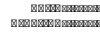
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Year	Number of cases	Number of deaths	Number of cases per 100,000 population	Number of deaths per 100,000 population
1990	1,000	100	10.0	1.0
1991	1,100	110	11.0	1.1
1992	1,200	120	12.0	1.2
1993	1,300	130	13.0	1.3
1994	1,400	140	14.0	1.4
1995	1,500	150	15.0	1.5
1996	1,600	160	16.0	1.6
1997	1,700	170	17.0	1.7
1998	1,800	180	18.0	1.8
1999	1,900	190	19.0	1.9
2000	2,000	200	20.0	2.0
2001	2,100	210	21.0	2.1
2002	2,200	220	22.0	2.2
2003	2,300	230	23.0	2.3
2004	2,400	240	24.0	2.4
2005	2,500	250	25.0	2.5
2006	2,600	260	26.0	2.6
2007	2,700	270	27.0	2.7
2008	2,800	280	28.0	2.8
2009	2,900	290	29.0	2.9
2010	3,000	300	30.0	3.0
2011	3,100	310	31.0	3.1
2012	3,200	320	32.0	3.2
2013	3,300	330	33.0	3.3
2014	3,400	340	34.0	3.4
2015	3,500	350	35.0	3.5
2016	3,600	360	36.0	3.6
2017	3,700	370	37.0	3.7
2018	3,800	380	38.0	3.8
2019	3,900	390	39.0	3.9
2020	4,000	400	40.0	4.0

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The diagram shows a 2D lattice with two rows of sites. The top row has 10 sites, and the bottom row has 10 sites. Sites are represented by squares. Some sites are occupied by particles, represented by small circles. The diagram illustrates the movement of particles between sites and the formation of a domain wall.

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Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	02/08/2017
Project Name	Bronte Village Mall
Project Number	1348-4555
Location	Oakville, ON

Designer Information

Company	CFCA
Contact	HAS/BMP

Notes

N/A

Drainage Area

Total Area (ha)	0.706
Imperviousness (%)	80.6

The Stormceptor System model STC 2000 achieves the water quality objective removing 83% TSS for a Fine (organics, silts and sand) particle size distribution and 96% runoff volume.

Rainfall

Name	TORONTO CENTRAL
State	ON
ID	100
Years of Records	1982 to 1999
Latitude	45°30'N
Longitude	90°30'W

Water Quality Objective

TSS Removal (%)	80
Runoff Volume (%)	90

Upstream Storage

Storage (ha-m)	Discharge (L/s)
0.000	00.000
0.002	175.000

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %	Runoff Volume %
STC 300	69	81
STC 750	78	92
STC 1000	78	92
STC 1500	79	92
STC 2000	83	96
STC 3000	85	96
STC 4000	87	98
STC 5000	88	98
STC 6000	90	99
STC 9000	93	99
STC 10000	93	99
STC 14000	94	100



Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)								
Particle Size	Distribution	Specific Gravity	Settling Velocity		Particle Size	Distribution	Specific Gravity	Settling Velocity
µm	%		m/s		µm	%		m/s
20	20	1.3	0.0004					
60	20	1.8	0.0016					
150	20	2.2	0.0108					
400	20	2.65	0.0647					
2000	20	2.65	0.2870					

Stormceptor Design Notes

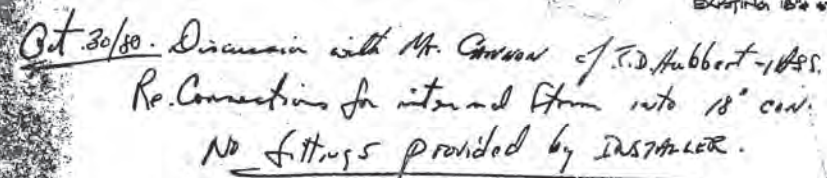
- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor version 1.0
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 300 is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 750 to STC 6000 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 300	STC 750 to STC 6000	STC 9000 to STC 14000
Single inlet pipe	75 mm	25 mm	75 mm
Multiple inlet pipes	75 mm	75 mm	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Imbrium Systems Inc., 1-800-565-4801.





825-0096
George.

STORM DRAINAGE CALCULATIONS			PAVED AREA 0.90	WOODED AREA 0.35
AREA SERVED	PAVED AREA SQ. FT.	WOODED AREA SQ. FT.	C.F.F.	SIZE AND SLOPE OF DRAIN
CATCH BASIN #1	11,400	9,200	1.00	24" @ 1.00%
CATCH BASIN #2	29,225	-	2.4	18" @ 1.00% (DOUB. 12" CORR.)
CATCH BASIN #3	29,225	-	2.4	18" @ 0.85%
CATCH BASIN #4	15,200	4,400	1.24	18" @ 0.35%
CATCH BASIN #5	13,220	-	1.15	18" @ 0.85%
RAIP DRAINAGE	15 RAIP HOPPER	8 HOPPER	0.87	6" @ 1.00%
CATCH BASIN #6	12,600	7,000	1.84	8" @ 1.00%
CONVERSION	STREET CONNECTION	-	0.50	18" @ 0.80% (0.157-1/2")
CATCH BASIN #7	5,700	-	0.75	8" @ 1.00%

$$3.4 \text{ cl}_2 = 0.096 \text{ m}^3/\text{kg}$$
 $0.022\sqrt{L}$

2441 LAKESHORE ROAD W

TRAFALGAR ENGINEERING LTD.

#1-481 Morden Road
Oakville, Ontario
L6K 3W6

FUNCTIONAL SERVICING REPORT

FOR

**BRONTE VILLAGE MALL
REDEVELOPMENT**

**PREPARED FOR
2143111 Ontario Inc.**

**PREPARED BY
TRAFALGAR ENGINEERING LTD.**

Project No. 1369

March 26, 2009

1.0 INTRODUCTION

The subject site is located at 2441 Lakeshore Road West in the Town of Oakville and is currently home of the Bronte Village Mall. The site is located at the north side of Lakeshore Road and is bordered by Jones Street on the east, Sovereign Street on the north and Bronte Road on the west. Adjacent to the south-west corner of the site is a small commercial building, gas station and a small park located at the Lakeshore Road/Bronte Road intersection.

The existing 8,640m² building is located on the 2.41ha site. The existing building is located on the northern half of the site with a large asphalt parking area situated between the building and Lakeshore Road.

The subject site is relatively flat, however, there are some significant grades where the site abuts the boundary roads. Along the south and east boundaries, the parking lot is approximately 0.5m above the adjacent grade of Lakeshore Road and Jones Street.

Along the north edge of the site Sovereign Street rises approximately 2m from the Jones Street intersection to the high point, approximately 40m west of Bronte Road. At this location Sovereign Street is approximately 0.8m above the subject site. Located along the south boulevard of Sovereign Street is an existing berm that varies from being 1.2m higher at Jones Street to 0.3m higher at the west end of the site. Adjacent to the site Bronte Road falls approximately 1.4m from Sovereign Street to the south limit of the site.

The proposed 750,000ft² development will contain a combination of retail, office and residential uses. The proposal is for 451 residential units, 81,200ft² of retail space and 72,400ft² of office space. The majority of the commercial space will be located along the southern part of the site adjacent to Lakeshore Road. The residential units will be located in three buildings on the north part of the site and separated from the commercial uses by the central driveway.

Located central to the Lakeshore Road frontage is an open space "Market Square". Running from Bronte Road to Jones Street through the centre of the site is the Central Driveway. This driveway will provide access to the underground parking area and loading access to the retail space. Under the entire site will be an underground garage to provide parking for both the residential and commercial uses.

The proposed development may be phased over a number of years with the earliest occupancy being late 2011.

2.0 WASTE WATER

Record drawings show that the site is surrounded by existing wastewater sewers. A 300mm diameter sewer is located on Jones Street, a 200mm diameter sewer is located on Sovereign Street, a 250mm diameter sewer is located on Bronte Road and a 200mm diameter sewer located on Lakeshore Road. The existing 8,640m² mall drains to the existing 200mm sewer on Sovereign Street.

The site is tributary to the existing Marine Drive Pumping Station located on East Street and Marine Drive.

The proposed development will generate an equivalent population of approximately 1179 people, and increase the existing sanitary design flows from the site by 12.4 l/s to a flow of 14.8 l/s.

The Region has indicated that there is limited capacity in the downstream sewage pumping station and the South-West Wastewater Treatment Plant. Halton Region Staff Report PPW51-08 indicates there is approximately 0.7 MLD of unused capacity at the plant or equivalent flow for approximately 1,900 people. The Region is currently looking to upgrade the facility to provide an additional 10MLD capacity. This work is proposed to be completed by late 2011. Based on this timing and the Bronte Village redevelopment schedule, the downstream works should be completed prior to the development being completed.

The Region of Halton is currently undertaking the study: “Capital Needs Assessment and Master Plan for the South Halton Sanitary Sewage Pump Stations” to provide a comprehensive review of all South Halton Sanitary Pump Stations in order to determine their existing condition and ability to accommodate the future flows generated from the proposed intensification of South Halton. Due to other development applications currently being processed in the Bronte area and tributary to the Marine Drive pumping station, the Region undertook a separate study and assessment of the Marine Drive Pumping Station to accelerate this process. In the spring of 2008, the Region had retained TSH as a consultant to review the station and prepare a report.

The Region is proposing to upgrade the Marine Drive pump station in two stages. The immediate stage would be to address the current capacity issues and include the development applications that have already been processed for this area. The additional capacity provided is for approximately 588 units. The second stage would include the ultimate design to accommodate the intensification of the area which would be sometime into the future.

The findings of the Consultant are summarized in the Technical Memorandum #1 prepared by AECOM, dated February 2, 2009. The report recommends installation of a third pump at the station and changes to the impeller to increase the station capacity from approximately 144l/s to 225l/s. This increase in pumping capacity will be to address the current wet weather flows and flows from an additional 588 units planned for the Bronte Area. Region of Halton staff have indicated that they don't have funds budgeted for the station upgrade and will not start the design process until a developer agrees to frontend the works and pay for all the development related upgrades.

The development of the Bronte Village Mall site will take place over a number of years and in the best case, occupancy of the initial phase of development will be late 2011. As a result there are a couple of different options to address the capacity issue at the Marine Drive Pumping Station.

- The development could be delayed and timed to coincide with the completion with the Regions next Master Plan and the ultimate upgrade with the pumping station.
- The development could be phased over a number of years to match the available capacity of the downstream system. The upgrades to the Marine Drive Pumping Station allowed for development of 588 residential/condominium units. However, our investigation notes that the number of the units allowed for at least one of the developments is overstated and the second development, the proposed seniors' complex on Lakeshore Road, is not actively advancing and may not proceed. This may free up 175 units of capacity. When combined with current allocated capacity for the existing commercial space, there would be sufficient capacity in the system to allow the initial phases of the development to proceed until such time as the Region is able to complete the required studies to upgrade the station to an ultimate capacity to support the intensification of the Bronte area.
- Request from the Region to increase the planned capacity of the pumping station to allow a portion of the proposed development to proceed immediately. This may require a front-ending of the additional cost by the developer.
- In the event that the development was to proceed prior to the ultimate pumping station upgrades being completed, and sufficient capacity was not found within the system, it would be possible for the development to proceed with the construction of an on-site sewage pumping station. A small below ground station could be located on the north side of the subject lands adjacent to Sovereign Street. A forcemain would be constructed along Sovereign Street easterly to East Street and south to connect to the existing gravity main located at East Street and Lakeshore Road West. The on-site sewer systems would convey the flow from all the buildings to the pumping station. The construction of an on-site pumping station would by-pass the Marine Drive station.

The preferred solution would be for the Region of Halton to undertake the necessary works to the Marine Drive station to address the additional capacity required for the development. In the

event that this is not possible, the development has the option of constructing a pumping station to service the proposed site and bypass the Marine Drive station.

3.0 WATER SUPPLY

The subject site is part of the Oakville Zone 1 water system. Surrounding the site are a 150mm main on Sovereign Street, a 300mm main on Jones Street, a 300mm main on Lakeshore and a 200mm main on Bronte Road, changing to a 150mm main mid-way to Sovereign Street.

Crossing through the existing site is a 200mm watermain connecting to Bronte Road and to Jones Street. The existing building and site hydrants are fed from this main.

Flow tests were taken by Jackson Waterworks from the existing hydrant at the north-east corner of the site off the existing 150mm main on Sovereign Street. This test indicated a static pressure of 70psi and a theoretical fire flow at 20psi of 4031 USGPM.

Based on the proposed use, the Calculated Average Daily Demand is 324m³/day with a Maximum Hourly Demand of 54m³/hr. The increase in flow is 50m³/hr over the existing land use.

In reviewing the flow tests undertaken by Jackson Waterworks, dated December 15, 2008, we note that very little pressure was lost between the static flow and the two measured flows. This indicates there is a good water distribution system to support the proposed development and the water system is relatively insensitive to a small increase in domestic flows.

The flow tests also indicate a good potential flow for fire fighting. The detailed design of the on-site fire system will be reviewed at the time of the detailed building design by an expert in the design of these facilities. However, based on our experience, we do not anticipate problems with water supply for fire fighting purposes.

4.0 STORM DRAINAGE

The existing site is part of two sewer drainage sheds. A small 0.397ha corner of the south-west corner of the site drains to the existing 375mm diameter sewer located along Lakeshore Road. This sewer drains to the west and outlets to Bronte Street at Lakeshore Road. The remaining part of the site drains to the existing 1350mm diameter sewer located on Sovereign Street, east of Jones Street. The majority of the site drains via the 525mm storm sewer on Sovereign Street with a small area draining to Jones Street.

The original site servicing design, as prepared by J. D. Hubbert, indicates that the site was designed with a flow of $0.187\text{m}^3/\text{s}$ to Sovereign Street of which $0.096\text{m}^3/\text{s}$ is conveyed to Jones Street, giving a total flow of $0.283\text{m}^3/\text{s}$ conveyed to Sovereign Street trunk sewer east of Jones Street. This drawing notes that the existing building was fitted with control flow roof drains to reduce the post-development flows.

The J. D. Hubbert drawing also shows a local connection to the Lakeshore Road sewer servicing the local driveway.

Subsequent to the J. D. Hubbert design, a part of an adjacent site was added to the Mall property and the Mall parking lot expanded onto this area. The sewer connection for this area is to the Lakeshore sewer. This added site has an area of 0.274ha with a composite runoff co-efficient of 0.83. The resulting flow is approximately $0.068\text{m}^3/\text{s}$.

The design of the on-site storm water system will be designed to limit the flow to the existing quantity. Flows for the 5-year storm to the Sovereign Street trunk sewer will be limited to $0.283\text{m}^3/\text{s}$. Flows to Lakeshore Road will be limited to $0.068\text{m}^3/\text{s}$.

The proposed development will be divided into two drainage areas. The 0.269ha around the Market Square and the immediate area next to Lakeshore Road will drain directly to the Lakeshore Road sewer system. It is anticipated that approximately 15% of this area will be

landscaped resulting in a combined runoff co-efficient of $C=0.82$. The resulting runoff will be approximately $0.066\text{m}^3/\text{s}$, less than the calculated pre-development rate of $0.068\text{m}^3/\text{s}$.

The remaining 2.142ha of the site will drain to the existing Sovereign Street trunk sewer. At the re-zoning stage, it is difficult to predict the final site layout and the resulting site impervious ratio and corresponding runoff co-efficient. For the purposes of this report, we have assumed a site runoff co-efficient of $C=0.90$ for the main part of the site. We have also assumed there is no opportunity for surface storage or roof top storage and all storage will be provided in an underground storage tank. Based on these assumptions, the required volume of 197m^3 of underground storage is required.

One way of providing the required storage would be the construction of a “super pipe” along the north side of the proposed parking garage. 174m of a 1.2m diameter pipe would provide the appropriate storage. An orifice would be installed on the downstream of the tank to control the flow to the required level.

The site will require stormwater quality control. The area draining towards Lakeshore Road out lets to Bronte Road and will require an “Enhanced” level of control. An oil/grit separator such as a stormceptor STC750 would provide the appropriate control.

The area draining towards the Sovereign Street trunk sewer will require “Normal” level of control. An oil/grit separator such as an STC3000 would provide the appropriate level of control.

The details of the stormwater management facilities will be designed as part of the site plan submission once all the details of the site layout have been established.

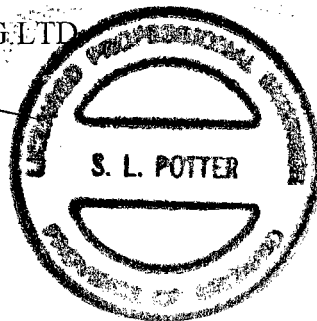
5.0 SUMMARY

1. The rezoning of the subject lands will increase the wastewater flows beyond the capacity of the local pumping station. The Region is planning to upgrade this station in the future. If the proposed development proceeds prior to this station an on-site pumping station maybe required.
2. There is adequate local watermain infrastructure to support the re-zoning of the lands.
3. Re-development of the subject site will require on-site stormwater management controls to ensure there is no drainage impact on the surrounding levels as a result of the re-development.

Prepared by:

TRAFALGAR ENGINEERING LTD.


S. L. Potter, P. Eng.
Consulting Engineer
Principal



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CONSTRUCTION NOTES:

1.0 GENERAL NOTES

- 1.1 THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THESE DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE LOCATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS WITH THE EXISTING UTILITIES.
- 1.2 ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS SHOWN HEREIN SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE PUBLIC WORKS DEPARTMENT AND ADJACENT LANDOWNERS. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 150mm OF TOPSOIL AND No. 1 NURSERY SOD TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE TOWN UNLESS NOTED OTHERWISE.
- 1.3 TOWN OF OAKVILLE AND REGION OF HALTON STANDARD DRAWINGS AND OPSD WITH REGIONAL AMENDMENTS FOR SANITARY SEWERS AND WATERMAINS SHALL CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT. CONTRACTOR TO MAINTAIN CURRENT COPY OF TOWN, REGION AND ONTARIO STANDARDS ON SITE AT ALL TIMES.
- 1.4 ALTERNATIVE MATERIALS MAY BE ACCEPTABLE, PROVIDED APPROVAL HAS FIRST BEEN OBTAINED FROM THE TOWN ENGINEER AND/OR THE REGIONAL COMMISSIONER OF PUBLIC WORKS.
- 1.5 NO BLASTING IS PERMITTED.
- 1.6 MANHOLE AND VALVE CHAMBER COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT.
- 1.7 ALL TRENCHES WITHIN EXISTING R.O.W. ARE TO BE BACKFILLED IN ACCORDANCE WITH TOWN OF OAKVILLE REQUIREMENTS.
- 1.8 ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON THE SITE PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER BEFORE PROCEEDING.
- 1.9 CONTRACTOR TO PROVIDE SHOP DRAWINGS OF ALL MATERIALS AND PRODUCTS FOR REVIEW BY THE ENGINEER PRIOR TO INSTALLATION.
- 1.10 REFER TO TOWN AND REGION STANDARDS AND SPECIFICATIONS FOR LIST OF APPROVED MANUFACTURERS AND MATERIALS.
- 1.11 ENCROACHMENT ONTO ADJACENT PROPERTIES IS NOT PERMITTED UNLESS OTHERWISE NOTED AND INSTRUCTED BY THE ENGINEER.
- 1.12 THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM OBTAINING AND PAYING FOR PERMITS.
- 1.13 THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SITE PLAN, LANDSCAPE PLAN, SITE ELECTRICAL PLANS, AND ANY OTHER PLANS OR DRAWINGS WHICH DEPICT WORKS THAT ARE PROPOSED FOR THIS SITE.
- 1.14 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS FOR THE TOWN AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR ONTARIO.
- 1.15 THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING ABOVE AND BELOW GROUND UTILITIES PRIOR TO AND DURING CONSTRUCTION.
- 1.16 ANY UTILITY RELOCATIONS DUE TO THIS DEVELOPMENT TO BE UNDERTAKEN AT THE EXPENSE OF THE OWNER.
- 1.17 ALL CONSTRUCTION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTIONS PROJECTS.
- 1.18 CONSTRUCTION ACCESS SHALL BE CONSTRUCTED PER DETAIL ON THIS PLAN, AND AS PER TOWN ENTRANCE PERMIT.
- 1.19 ALL EXISTING SEWERS ARE TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION INCLUDING SEWER INVERTS, MATERIAL TYPE, AND SIZE. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
- 1.20 CONTRACTOR SHALL PROVIDE A DIGITAL AS-BUILT SURVEY OF ALL UNDERGROUND AND ABOVEGROUND WORKS TO THE SATISFACTION OF THE ENGINEER.
- 1.21 CONTRACTOR TO INSTALL A SNOW FENCE ON THE PERIMETER OF THE PROPERTY AND AT LOCATIONS DETERMINED BY THE MANAGER, DEVELOPMENT ENGINEERING, TOWN OF OAKVILLE, PRIOR TO COMMENCEMENT OF ANY WORKS ON THE SITE. SNOW FENCE TO REMAIN IN PLACE FOR THE DURATION OF THE CONTRACT OR AS DIRECTED BY THE MANAGER, DEVELOPMENT ENGINEERING, TOWN OF OAKVILLE.
- 1.22 PRIOR TO COMMENCEMENT OF ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE, THE OWNER IS RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS FROM THE ENGINEERING SERVICES DEPARTMENT, TOWN OF OAKVILLE, FOR THE PURPOSES OF VEHICULAR ACCESS TO THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING EXCAVATIONS, (ROAD OCCUPANCY PERMIT), WITHIN THE MUNICIPAL RIGHT OF ALLOWANCE.

2.0 STORM SEWERS

- 2.1 ALL STORM SEWERS 450mmø AND SMALLER TO BE PVC SDR-35.
- 2.2 ALL STORM SEWERS 525mmø AND LARGER TO BE HDPE PER OPSD 1840.
- 2.3 BEDDING AND COVER FOR PVC SEWERS (FLEXIBLE PIPE) AS PER OPSD 802.010.
- 2.4 BEDDING AND COVER FOR CONCRETE SEWERS (RIGID PIPE) AS PER OPSD 802.030.
- 2.5 ALL STORM SERVICES TO BUILDINGS SHALL BE AT A MINIMUM SLOPE OF 2.0% (UNLESS NOTED OTHERWISE). ALL SERVICES TO TERMINATE 1.0m FROM BUILDING AND PLUGGED AND CAPPED WITH MANUFACTURER'S APPROVED PRODUCT.
- 2.6 STORM MANHOLES SHALL BE AS PER OPSD AS SPECIFIED. BENCHING TO SPRINGLINE OF PIPE AS PER OPSD 701.021. FRAME & COVER AS PER OPSD 401.010 TYPE "A". COVERS TO BE EMBOSSED WITH THE WORD "STORM", LETTERS 75mm HIGH.
- 2.7 CATCH BASIN FRAMES AND GRATES LOCATED IN ROADWAY AS PER OPSD 400.110.
- 2.8 CATCH BASINS LOCATED IN REAR-YARDS OR IN GRASSED AREAS SHALL BE SUMPLESS C/W "BEE-HIVE" STYLE GRATE
- 2.9 ALL MANHOLE AND CATCH BASIN ADJUSTMENTS SHALL BE AS PER OPSD 704.010. MAXIMUM OF THREE (3) UNITS AND 300mm HIGH, WHERE EXCEEDED CAST-IN-PLACE OR PRE-CAST RISER SECTIONS SHALL BE PROVIDED.
- 2.10 ALL SAFETY GRATES AS PER OPSD 404.020 FOR MANHOLES WHERE DEPTHS EXCEED 5.0m.
- 2.11 EXISTING STORM MANHOLE(S) TO BE RE-BENCHED AND PARGED AS REQUIRED.
- 2.12 ALL CATCH BASIN CONNECTIONS SHALL BE AS PER OPSD 708.010 (RIGID PIPE) AND OPSD 708.030 (FLEXIBLE PIPE).
- 2.13 ALL SEWER SERVICE CONNECTIONS FOR FLEXIBLE PIPE SHALL BE AS PER OPSD 1006.020.
- 2.14 ALL TESTING OF STORM SERVICES TO BE IN ACCORDANCE WITH ONTARIO PROVINCIAL STANDARD SPECIFICATIONS.
- 2.15 ALL CATCH BASIN LEADS TO BE 300mmø UNLESS NOTED OTHERWISE.

3.0 SANITARY SEWERS

- 3.1 SANITARY MANHOLES AS PER O.P.S.D 701.010 WITH FRAMES AND COVERS AS PER OPSD 401.010 TYPE 'A' UNLESS OTHERWISE NOTED ON THE DRAWINGS. COVERS TO BE EMBOSSED WITH THE WORD "SANITARY", LETTERS 75mm HIGH.
- 3.2 BENCHING IN MANHOLES TO BE AS PER OPSD 701.021 AS AMENDED BY THE REGION OF HALTON. BENCHING IN SANITARY MANHOLES TO BE TO THE OVERTOP OF THE PIPE.
- 3.3 SAFETY PLATFORMS AS PER OPSD 404.020 TO BE INSTALLED ONLY IN MANHOLES WHERE DEPTHS EXCEED 10.0m AS DIRECTED BY THE REGION AND AS INDICATED ON THE PROFILE DRAWINGS.
- 3.4 ALL SANITARY SERVICES TO BUILDINGS TO BE PVC SDR 28 IN ACCORDANCE WITH CSA-B182.2, ASTM D-3034 OR LATEST REVISIONS, RUBBER GASKET.
- 3.5 ALL SANITARY SERVICES TO BUILDINGS SHALL BE AT A MINIMUM SLOPE OF 1.0% (UNLESS NOTED OTHERWISE). ALL SERVICES TO TERMINATE 1.0m FROM BUILDING AND PLUGGED AND CAPPED WITH MANUFACTURER'S APPROVED PRODUCT.
- 3.6 SERVICES TO BE MIN. 2.15m AND MAX. 2.75m DEEP AT PROPERTY LINE. RISERS SHALL BE USED WHERE NOTED AS PER OPSD 1006.01.
- 3.7 CLASS "B" BEDDING ON ALL SEWERS AND CONNECTIONS AS PER THE REGION OF HALTON, UNLESS NOTED OTHERWISE.
- 3.8 GRANULAR BACKFILL AROUND MANHOLES SHALL BE COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% SPD.
- 3.9 ALL TESTING OF SANITARY SERVICES TO BE IN ACCORDANCE WITH OPSS.
- 3.10 EXISTING SANITARY MANHOLE(S) TO BE RE-BENCHED AND PARGED AS REQUIRED.

EROSION & SEDIMENT CONTROL NOTES:

1. ALL SILT FENCING AND EROSION CONTROL MEASURES TO BE INSTALLED PRIOR TO COMMENCEMENT OF ANY WORK AND REMAIN IN PLACE UNTIL THE SITE HAS STABILIZED (ie. PAVED, VEGETATION OR OTHER COVER) AND ANY ACCUMULATED SEDIMENT REMOVED.
2. CONTRACTOR SHALL ENDEAVOR TO PREVENT MUD TRACKING ONTO ADJACENT LANDS AND EXISTING ROADS AND SHALL PROVIDE FOR CLEANUP AT OWN EXPENSE AS DIRECTED BY THE TOWN AND ENGINEER. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO CONTROL DUST ON THE PROJECT AND HE SHALL PROVIDE AT OWN EXPENSE DUST CONTROLLING MEASURES AS DIRECTED.
3. SEDIMENT CONTROL PROTECTION SHALL BE PLACED AS DETAILED AND TO BE PROVIDED AROUND ALL SANITARY AND STORM MAINTENANCE HOLES AND CATCHBASINS.
4. EROSION & SEDIMENT CONTROLS MUST BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN FALL EVENT, AND MUST BE MAINTAINED AND REPAIRED IN A TIMELY MANNER TO PREVENT SEDIMENT FROM LEAVING THE SITE.
5. EXISTING AND PROPOSED CATCHBASINS ARE TO BE PROTECTED WITH FILTER CLOTH AND 150mm OF 50mm STONE COVER DURING CONSTRUCTION.
6. IT IS REQUIRED TO STABILIZE ALL AREAS THAT WILL REMAIN DISTURBED FOR MORE THAN 30 DAYS.
7. SEDIMENT MUST BE REMOVED FROM SILT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
8. SILT REMOVAL MUST BE UNDERTAKEN WITH CARE TO MINIMIZE OFF-SITE SEDIMENTATION.
9. EROSION CONTROL MEASURES ARE TO BE MONITORED REGULARLY TO ENSURE FENCING IS INSTALLED AND MAINTENANCE IS PERFORMED TO TOWN REQUIREMENTS AND ANY DAMAGE TO THE MEASURES IS REPAIRED IMMEDIATELY.
10. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ANY ADJACENT MUNICIPAL ROADWAYS AND SIDEWALKS ARE CLEANED OF ALL MUD, DIRT AND DEBRIS AT ALL TIMES AND MUST BE CLEANED AT A MINIMUM OF TWO TIMES PER WEEK, AS REQUIRED OR AT THE DIRECTION OF THE TOWN.
11. SEDIMENT AND EROSION CONTROL PLAN IS A DYNAMIC DOCUMENT, WHICH MAY BE SUBJECT TO CHANGE OR MODIFICATIONS AS A RESULT OF SITE DEVELOPMENTS OR CHANGES ON SITE.
12. ADDITIONAL SEDIMENT CONTROL MEASURES MAY BE REQUIRED AS DETERMINED BY THE TOWN. THE CONTRACTOR IS TO PROVIDE ALL ADDITIONAL EROSION CONTROL MEASURES.
13. AN AFTER HOURS CONTACT NUMBER IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES.
14. IF SITE CONSTRUCTION ACTIVITIES ARE INTERRUPTED AND/OR INACTIVITY EXCEEDS 30 DAYS, ALL STRIPPED AND/OR BARE SOIL AREAS ARE TO BE STABILIZED BY SODDING/SEEDING/MULCHING OR OTHER APPROVED METHODS TO THE APPROVAL OF THE SITE ENGINEER.

4.0 WATERMAIN

- 4.1 WATERMAINS TO BE PVC CL150 (DR-18) WITH GASKETED JOINTS.
- 4.2 A MIN. HORIZONTAL SEPARATION OF 2.5m MUST BE MAINTAINED BETWEEN WATERMAINS AND SANITARY OR STORM SEWERS, INCLUDING SERVICE LATERALS.
- 4.3 A MIN. VERTICAL SEPARATION OF 0.5m BETWEEN WATERMAINS AND SEWERS MUST BE MAINTAINED.
- 4.4 CLASS "B" BEDDING ON ALL WATERMAINS AS PER THE REGION OF HALTON, UNLESS NOTED OTHERWISE.
- 4.5 ALL HYDRANTS AS PER OPSD 1105.01 TO HAVE STEAMER CONNECTIONS. HYDRANTS TO BE SUPPLIED WITH:
TWO (2) 63.5mm (2½") WITH CSA STANDARD THREAD, 63.5mm I.D., 79.4mm O.D., 5 THREADS PER 25mm, 31.75mm SQUARE OPERATING NUT; AND ONE (1) 100mm (4") STORZ PUMPER CONNECTION AS PER CAN/ULC #S-520, 31.75mm SQUARE OPERATING NUT, AND STORZ CAP PAINTED GLOSS BLACK.
- 4.6 HYDRANTS SHALL BE INSTALLED SUCH THAT THE ROD STEM LENGTH SHALL NOT EXCEED 1.7m MEASURED FROM THE BREAK-OFF FLANGE. IF HYDRANT BARREL LENGTH EXCEEDS 1.7m THEN A HYDRANT THAT CAN BE RAISED FROM THE BOTTOM WITHOUT INCREASING ROD LENGTH IS TO BE USED.
- 4.7 ALL METALLIC WATERMAINS, FITTINGS, HYDRANTS AND RESTRAINERS TO HAVE CATHODIC PROTECTION IN ACCORDANCE WITH REGION OF HALTON STANDARD DRAWINGS RH 420.010 AND RH 420.020.
- 4.8 ALL SACRIFICIAL ANODES SHALL CONFORM TO A.S.T.M. B-418 TYPE II AND SHALL BE MADE OF HIGH GRADE ELECTROLYTIC ZINC, 99.99% PURE.
- 4.9 ANODE INSTALLATION IS NOT REQUIRED WITHIN VALVE-CHAMBERS, DRAIN CHAMBERS OR AIR RELEASE CHAMBERS.
- 4.10 ALL WELD CONNECTIONS TO BE COATED WITH "TC MASTIC" OR APPROVED EQUIVALENT.
- 4.11 FOR ALL ANODES CONNECTED TO NEW PIPE, FITTINGS OR TO EXISTING METALLIC WATERMAINS, A CADWELDER AND CA-15 OR EQUIVALENT CARTRIDGE SHALL BE USED. ANODE INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 4.12 WHERE NEW PIPE IS TO BE CONNECTED TO EXISTING DUCTILE IRON OR CAST IRON PIPE A 14.5kg MAGNESIUM ANODE IS TO BE CONNECTED TO THE FIRST LENGTH OF EXISTING PIPE, AS PER REGION OF HALTON STANDARD DRAWING RH 420.010.
- 4.13 ALL VALVES TO OPEN LEFT (COUNTER-CLOCKWISE) AND SHALL HAVE 50mm SQUARE STANDARD AWWA OPERATING NUT.
- 4.14 ALL PLUGS, CAPS, TEES, AND BENDS SHALL BE MECHANICALLY RESTRAINED AS PER MANUFACTURER'S SPECIFICATIONS. RESTRAINTS SHALL MEET UNI-B-13-92.
- 4.15 WHERE WATERMAIN IS PLACED IN FILL OR IN PREVIOUSLY DISTURBED GROUND ALL JOINTS TO BE MECHANICALLY RESTRAINED.
- 4.16 MINIMUM DEPTH OF COVER OVER WATERMAIN SHALL BE 1.7m
- 4.17 THE DEPTH OF WATER SERVICES AT PROPERTY LINE SHOULD BE A MINIMUM OF 1.7m AND A MAXIMUM OF 2.0m. THE DISTANCE BETWEEN THE GROUND ELEVATION AND THE TOP OF THE ROD SHOULD BE BETWEEN 0.5m AND 1.0m.
- 4.18 WATER SERVICES CROSSING THE STORM SEWER TO HAVE MIN. 1.7m OF COVER. WHERE THIS CANNOT BE ACHIEVED, WATER SERVICE IS TO CROSS UNDER STORM SEWER.
- 4.19 GATE VALVES CONFORMING TO AWWA C500 STANDARDS ARE REQUIRED ON WATERMAINS 300mm AND UNDER. LINE GATE VALVES SHALL HAVE AUGER OF SCREW TYPE VALVE BOXES.
- 4.20 ALL WATERMAIN FITTINGS SHALL HAVE MECHANICAL JOINTS.
- 4.21 VERTICAL AND HORIZONTAL ALIGNMENT OF WATERMAIN TO BE ACHIEVED BY DEFLECTION OF JOINTS AS PER MANUFACTURER'S SPECIFICATIONS. DEFLECTION IN THE BARREL IS NOT PERMITTED.
- 4.22 TRACER WIRE IS TO BE INSTALLED ON ALL NEW INSTALLATIONS OF PVC WATERMAIN PIPE FOR LOCATING PURPOSES. A SOLID 10 GAUGE TWJ COPPER WIRE IS TO BE INSTALLED ALONG THE PIPE, STRAPPED TO THE PIPE AT 6m INTERVALS. JOINTS IN THE WIRE BETWEEN VALVES ARE NOT PERMITTED.
- 4.23 THE INSPECTOR MAY TEST THE TRACING WIRE FOR CONDUCTIVITY. IF THE TRACING WIRE IS NOT CONTINUOUS FROM VALVE TO VALVE, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, REPLACE OR REPAIR THE WIRE.
- 4.24 ALL WATER CUSTOMERS SUPPLIED BY A WATERMAIN TO BE SHUT DOWN SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 72 HOURS IN ADVANCE OF THE SHUT DOWN AS PER REGION OF HALTON SPECIFICATIONS. NOTIFICATION SHALL TAKE PLACE UNDER THE ENGINEER'S DIRECTION.
- 4.25 OPERATION OF EXISTING WATERMAINS SHALL BE BY REGION OF HALTON STAFF ONLY.
- 4.26 WATERMAIN TESTING PROCEDURES TO MEET CRITERIA OF REGION OF HALTON, UNLESS OTHERWISE SPECIFIED.
- 4.27 SERVICE CONNECTIONS FROM REGIONAL WATERMAIN TO BE ISOLATED DURING TESTING PROCEDURES, TO THE SATISFACTION OF THE REGION OF HALTON.
- 4.28 MODEL OF POST INDICATING VALVES TO MEET CRITERIA OF TOWN OF OAKVILLE AND FIRE DESIGN CONSULTANT.
- 4.29 MODEL OF CHECK VALVES TO MEET CRITERIA OF REGION OF HALTON AND FIRE DESIGN CONSULTANT.

5.0 ROADWORKS

- 5.1 SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR MATERIAL.
- 5.2 ASPHALTIC CONCRETE AND GRANULAR 'A' & 'B' BASE TO BE CONSTRUCTED PER PAVEMENT STRUCTURE DETAIL (DWG. C 03).
- 5.3 HL3 AND HL8 TO BE COMPACTED TO 97% MARSHALL DENSITY, OR AS DIRECTED BY GEOTECHNICAL ENGINEER.
- 5.4 GRANULAR 'A' & 'B' BASE TO BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY, ASTM-D698, OR AS DIRECTED BY GEOTECHNICAL ENGINEER.
- 5.5 ALL GRANULAR AND ASPHALT MATERIAL PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 & OPSS 310.
- 5.6 ALL CONCRETE CURB AND SIDEWALK TO BE CONSTRUCTED IN ACCORDANCE WITH TOWN OF MILTON STANDARDS.
- 5.7 ALL CURB AND RETAINING WALL SUBDRAINS TO BE CONSTRUCTED TO TOWN OF MILTON STANDARDS, OR AS DIRECTED BY GEOTECHNICAL CONSULTANT.
- 5.8 SUBDRAINS TO BE PROVIDED IN ALL PARKING AREAS, EXTENDING FROM AND BETWEEN ALL CATCHBASINS. SUBDRAINS TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.
- 5.9 ALL PAVEMENT REINSTATEMENT SHALL BE AS PER OPSD 509.010, FOR UTILITY CUTS, BACKFILL AS PER TOWN STD.

6.0 VIDEO & AS-CONSTRUCTED

- 6.1 CONTRACTOR SHALL FLUSH AND VIDEO STORM AND SANITARY SEWERS UPON INSTALLATION AND PROVIDE VIDEO TO ENGINEER. UPON COMPLETION OF LANDSCAPING, CONTRACTOR SHALL RE-FLUSH AND RE-VIDEO STORM AND SANITARY SEWERS AND PROVIDE SECOND VIDEO TO THE ENGINEER.
- 6.2 CONTRACTOR SHALL PROVIDE A DIGITAL CAD AS-BUILT SURVEY OF ALL UNDERGROUND AND ABOVEGROUND WORKS TO THE SATISFACTION OF THE ENGINEER.



NOT FOR CONSTRUCTION

FOR REVIEW

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							NOTES					
							Drawn	S.T.T.	Design	B.M.P.	Project No.	1348-4555
							Check	B.M.P.	Check	A.S.	Scale	1:400
							Dwg.					C 06