CONDELAND

CONSULTING ENGINEERS & PROJECT MANAGERS

FUNCTIONAL SERVICING and STORMWATER MANAGEMENT REPORT

IN SUPPORT OF

SITE PLAN DEVELOPMENT

CITY PARK HOMES (MAIN STREET) INC.

WYNDHAM STREET & MAIN STREET

CITY OF MISSISSAUGA

REGIONAL MUNICIPALITY OF PEEL

Revised: October 28, 2019

C.E. FILE: 017-018

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A.0. – INTRODUCTION

The property is located at the north western quadrant of the Main Street and Wyndham Street intersection, City of Mississauga. The municipal address of the subject site is 36, 38, 40, 44, 46 Main Street and is approximately 0.8108 ha in total area. It is located within a residential area of the old Streetsville and Credit River watershed. Refer to Appendix 'A' for the Key Map of the proposed site, and Appendix 'B' for the CVC Watersheds & Sub-watersheds Map.

City Park Homes proposes to develop a total of five Blocks (three common elements and two freeholds) of Townhouses on approximately 0.5365 ha of the subject lands. The valley of the Credit River runs along the rear of the property and the valley lands consisting of natural feature and 10 m buffer area will remain undisturbed. The size of the natural feature and 10 m buffer area is 2857.0 sq.m or 0.7060 ac.

In support of the proposed development, we provide this report to identify the methodology of the municipal servicing. More specifically, the report will substantiate the ability to provide municipal sanitary, water servicing, and provide a conceptual resolution for storm water management.

B.0. – EXISTING TOPOGRAPHICAL CHARACTERISTICS

The subject land is partially treed and contains one existing house and gravel driveways that will be removed as part of the development. Based on the existing topography, the overland drainage pattern is directed to 3 different outlets; Main Street, Wyndham Street and the rear valleylands. Refer to 'Pre-Development Storm Tributary Plan" on Dwg# 17-018-04 Appendix 'F'. There are four existing DICB's within the Main Street boulevard area that provide drainage for the overland flows that drain easterly. The existing grading of the site is comprised of gently to

moderate slopes, with an average of 1.0% gradient and the highest elevation of approximately 152.78 m at the northeast corner and lowest elevation of approximately 149.41 m at the northwest corner.

C.0. – SANITARY SERVICING DESIGN

The proposed condominium development is comprised of 3 townhouse blocks containing a total of 19 units. In addition there are 2 freehold townhouse blocks consisting of 7 units that will have direct connection to the existing 250 mm Dia. Sanitary sewer on Wyndham Street. Note that the undisturbed and 10 m buffer area of 0.2812 ha is excluded from the sanitary drainage calculation for infiltration. The size of common element townhouses and freehold townhouses used for the sanitary sewer design are 0.378 ha and 0.146 ha respectively. Based on Region of Peel's "Sanitary Sewer Design Criteria Manual – Section " criteria, the peak sanitary flow from the proposed development is calculated as follows:

COMMON ELEMENT TOWNHOUSES

<u>Residential population estimation</u> (Based on 50 persons per hectare)

= 175 persons/hectare x 0.378 ha = 67 persons

<u>Average daily flow (Based on 302.8 litres / capita / day)</u>

= 67 persons x 302.8 / (24x60x60) = 0.2348 litres / second

<u>Peaking Factor</u> (Based on the Harmon formula)

$K = 1 + 14/(4 + P^{½})$, where P is population in thousands

$K = 1 + 14/(4 + (67/1000)^{½}) = 4.29$

Since the peaking factor is limited to the range of 2 to 4, the peaking factor is adjusted to 4.00

Use K = 4

Maximum Sanitary Flow (Based on Avg. daily flow times the Peaking factor)

Max. Sanitary Flow = 0.2348 litres / second x 4.00 = 0.939 litres / second

Infiltration Calculation (Based on Wet Weather Condition)

Area (0.2 litres / second / gross hectare) = 0.2 x 0.378 = 0.07 litres / second

Manhole (0.28 litres / second / manhole) = 0.28 x 6 = 1.68 litres / second

Sewer (0.028 litres / second / meter) = 0.028 x 69.55 = 1.95 litres / second

Total = 0.07 + 1.68 + 1.95 = 3.70 litres / second

Total Design Sanitary Flow (Based on Max. Sanitary flow + Infiltration)

Total Design Sanitary Flow = 0.94 + 3.70 = 4.64 litres / second

FREEHOLD TOWNHOUSES

Residential population estimation (Based on 50 persons per hectare)

= 175 persons/hectare x 0.146 ha = 26 persons

Average daily flow (Based on 302.8 litres / capita / day)

= 26 persons x 302.8 / (24 x 60 x 60) = 0.0911 litres / second

Peaking Factor (Based on the Harmon Formula)

$K = 1 + 14/(4 + P^{1/2})$, where P is population in thousands

$K = 1 + 14/(4 + (26/1000)^{1/2}) = 4.36$

Since the peaking factor is limited to the range of 2 to 4, the peaking factor is adjusted to 4.00
Use K = 4

Maximum Sanitary flow (Based on Avg. daily flow times the Peaking Factor)

Max. Sanitary flow = 0.0911 litres / second x 4.00 = 0.364 litres / second

Infiltration Calculation (Based on Wet Weather Condition)

Area (0.2 litres / second / gross hectare) = 0.2 x 0.146 = 0.03 litres / second

Manhole (0.28 litres / second / manhole) = 0.28 x 0 = 0.00 litres / second

Sewer (0.028 litres / second / meter) = 0.028 x 0.00 = 0.00 litres / second

Total = 0.03 litres / second

Total Design Sanitary Flow (Based on Max. Sanitary Flow + Infiltration)

Total Design Sanitary Flow = 0.36 + 0.03 = 0.39 litres / second

As shown on 'Conceptual Servicing Plan" on Dwg# 17-018-02 Appendix 'F', conveyance for sanitary sewage from the proposed development will be addressed via outlet to the existing sewers on Wyndham Street and Main Street. The sanitary sewage from the freehold units will be discharged to the existing sanitary sewer 250 mm diameter on Wyndham St. The existing 300 mm diameter sanitary sewer located on Main Street will provide an outlet for common element units. The proposed internal sanitary system consists of approximately 70 meters of 200 mm diameter mainline sanitary sewer at minimum 1.00% gradient with lateral service connections for all 19 common element units. Based on the lot grading design, the sewer depth of the proposed site is sufficient to ensure gravity flow for all proposed house sanitary connections. Refer to 'Conceptual Servicing Plan' on Dwg# 17-018-02 Appendix 'F' for details of the proposed connection.

D.0. – STORMWATER QUALTY AND EROSION CONTROL MEASURES

D.1. – PROPOSED QUALITY CONTROL MEASURES

To address quality of stormwater run-off for the development site, quality controls must be implemented for the post-development storm discharge to the existing municipal storm sewer.

In accordance with Credit Valley Conservation (CVC) requirements, storm quality control must meet the M.OE. Enhanced Protection Level for long-term 80% annual S.S. (suspended solids) removal.

Oil / Grit Separator (OGS)

The total drainage area that will be treated by the proposed Oil / Grit separators is the **controlled** drainage area of 0.3271 ha. This drainage area is split based on the road high-point of the private roadway and is tributary to the two (2) Oil / Grit separators located near both ends of the roadway. The balance of the subject lands (0.4997 ha) which includes the natural feature and 10 m buffer area along the Credit River valley lands; will drain uncontrolled from the Site. Given that these **uncontrolled** areas are predominately comprised of soft landscaping they are considered clean and free of pollutants, and therefore do not require quality control treatment.

The two OGS units are proposed upstream of each Cultec storage / infiltration system for longevity and sediment protection. As noted on the Site Servicing Plan, two "CDS Model PMSU20_15_4m" Stormwater Treatment Units have been sized with a TSS removal efficiencies of 90.3% and 88.5% for CDS(1) and CDS(2) respectively. The CDS units have been sized according to the tributary site drainage area for level 1 (Enhanced Protection) quality control (min. 80% TSS removal), as required by the Credit Valley Conservation (CVC). The sizing calculation and cross-sectional details from the manufacturer for the selected CDS units can be found attached in Appendix 'D'.

It should also be noted that implementation of infiltration galleries (below Cultec chamber) contribute to the annual TSS removal for the Development providing a "treatment train" effect when combined with the Oil / Grit separator manholes.

D.2. – EROSION CONTROLS

Prior to the Building Construction Program, the installation of a siltation control fence will be in place surrounding the disturbed area of the site with allowance for construction access. This will control the quality of runoff and localize the areas of intense erosion and sedimentation. Regular maintenance and all necessary repairs shall be performed, including the safe disposal of all sediment material. Maintenance, which in most cases will require the removal of sediment and the installation of a new device, shall be conducted when the level of performance of the implemented control device is reduced to less than 50% of its initial capacity based on the Engineer's observation.

E.0. – STORMWATER QUANTITY CONTROL

City of Mississauga stormwater management criteria requires that post-development flows up to the 100-year storm event must be limited to a 2-year storm pre-development flow level for direct connection to municipal storm sewers.

Under pre-development conditions, the overall site drainage splits into three patterns. The majority of the proposed site, approximately 45% or 0.3739 ha naturally drains northerly to adjacent Credit River. The balance of the Site drains towards the municipal roads and ultimately collected by the existing DICB's located along the Main St. boulevard and/or by the existing double catchbasins along Wyndham Street. Approximately 0.1571 ha drains to the Main St. storm sewer while 0.2959 ha drains to the Wyndham St. storm sewer. The three drainage outlets as described above have been referenced in this report as follows:

Main Street: Outlet A1,

Wyndham Street: Outlet A2

Credit River valley: Outlet A3

The proposed <u>controlled</u> outlet for the Condominium development is the existing 450 mm storm sewer on Main St. therefore; the site discharge must be limited to the 2-year pre-development flow rate to the Main St. sewer, during the 100-year storm event.

<u>Outlet A1, Main St. Storm Sewer</u>

The 2-year pre-development flow rate to the Main St. storm sewer is calculated to be **11.72 litres per second** based on a drainage area of 0.1571 ha and runoff coefficient of 0.45. Please find within Appendix 'E' the Stormwater Management Quantity Analysis (using the Modified Rational Method) with the applicable calculations. Refer to these calculations for details of on-site storage and control design for the proposed storm drainage system. The proposed storm sewer layout is indicated on the 'Servicing Plan DWG 17-018-02' in Appendix 'F'.

As noted, the maximum Site discharge to the existing storm sewer located on the Main St., must be limited to **11.72 lps** and further reduced to **9.32 lps** to account for uncontrolled drainage from front landscaped areas of the proposed fronting townhouse units. Under post-development conditions; the maximum storage required during the 100-year storm event is **114.59 cubic metres.**

To meet the required storage volume requirement, two separate Cultec underground storage systems (model 150XLHD & 330XLHD) are proposed at opposite ends of the private roadway. Based on a maximum top of water level (TWL) of 151.62 m during the 100-year storm event, the storage provided by the two Cultec units and storm sewer pipes totals **115.19 cubic metres;** thereby meeting the volume. A Contech Vortex Valve, Model FC12 (with 102mm outlet) is proposed on the upstream side of the Storm Control Manhole to limit Site discharge to **9.32 lps.** The Vortex Valve proposed restricts discharge based on a design head of 1.448 m;

representative TWL elevation of 151.62 metres. The maximum TWL is just below the proposed road low-point grade of 151.82 m (west of Main St.) ensuring sufficient "free-board" is provided from emergency spill elevation.

Outlet A2,Wyndham St. and Outlet A3, Credit River valley

Reference Section D of the Stormwater Management Quantity Analysis in Appendix 'E' for confirmation that uncontrolled overland flow directed to Wyndham St. and the Credit River valley (at the rear) is substantially less than the 2-year pre-development flow rates under post-development conditions. It should also be noted that the Freehold units drain to Wyndham Street and Main Street to be separate from the Condominium development as per City criteria. The results as summarized as follows:

OUTLET A2: WYNDHAM STREET (UNCONTROLLED AREA)

MAXIMUM SITE DISCHARGE = 11.36 LPS < 17.75 LPS (2yr Pre-dev.)
(2-YR POST-DEVELOPMENT FLOW)

OUTLET A3: CREDIT RIVER (UNCONTROLLED AREA)

MAXIMUM SITE DISCHARGE = 15.50 LPS < 15.55 LPS (2yr Pre-dev.)
(2-YR POST-DEVELOPMENT FLOW)

Downstream Analysis (Main St. storm sewer)

Condeland Engineering Ltd. has contacted the City of Mississauga and Region of Peel to secure sewer atlas, design charts and plan & profile drawings. The downstream storm sewer analysis indicates that under the pre-development conditions the existing storm pipes are surcharging from Ex. MH02 (located just upstream of the proposed development) to the Credit River outfall under the 10-yr storm condition. By over-controlling the site discharge, the proposed development's storm system will improve the existing capacity issue by reducing the

percentage utilization by approximately seven (7) percent between Ex MH02 and Ex. MH03 when compared to existing , therefore a significant improvement. Refer to Design Chart analysis in Appendix 'E' of existing Main St. storm sewer system under pre-development and post-development conditions. In addition a hydraulic grade line (HGL) calculation was prepared and confirmed the HGL ranges from 1.14 m to 1.50 m below roadway under pre-development and improves to 1.41 m to 2.16 m under post-development conditions.

F.0. – WATER BALANCE

In accordance with CVC requirements, the minimum water balance for the subject development is to retain 5mm daily rainfall volumes. Rainwater Barrels or Cisterns are proposed to collect drainage from the house roof-top surfaces for Condominium lots 1 to 19 and Freehold lots 1 to 7, given available rear-yard space and due to shallow bed-rock levels. The run-off from the roof is relatively clean, thus it does not require pre-treatment. In addition, a large infiltration gallery is proposed immediately below the southern Cultec facility and receives all storm drainage directed to the storm system south of the proposed roadway high-point (lots 1,2,18 and 19). A proposed Oil /Grit separator manhole is provided to intercept and pre-treat stormwater before entering the infiltration bed. Again, due to shallow bed-rock levels it was not feasible to implement an infiltration gallery at the bottom of the northerly Cultec facility. Infiltration can be a highly effective water retention technique however, it is dependent that the in-situ soils have adequate percolation rates; the minimum recommended Ministry of Environment (MOE) level is 15 mm/hour. Field percolation rate testing of the native soils are shown on "Terraprobe Geotechnical & Slope Stability – February 13, 2015, Section 5.12, pp 30 ". Refer to Appendix 'E' for the Rainwater Barrel / Cistern sizing design and infiltration bed sizing calculations.

Water Balance Target / Measurement

To confirm that the Water Balance target for retention of runoff from a small design rainfall event (typically 5 mm) is achieved, the City of Toronto Water Balance Initial Abstraction Chart is used. As described above, the Infiltration Facilities have been sized to provide minimum 5mm daily rainfall retention. For our analysis illustrated in Appendix 'E', the total volume to be retained on site based on a daily rainfall of 5mm is **41.34 cu.m.** Based on the characteristics of various surface areas (initial abstraction), roof drainage capture (via rain barrels) and subsurface infiltration trench below the Cultec system pit capacity, a total daily retained volume of **45.72 cu.m.** is achieved for these lots. Therefore**, 110.6 % (45.72 / 41.34)** of the average daily rainfall, which corresponds to **5.5 mm,** will be retained on-site. **The minimum on-site water retention target of 5 mm will be achieved under post-development conditions.** Refer to Appendix 'F' for the detailed Water Balance calculation / spreadsheet.

G.0. – WATER SUPPLY AND DISTRIBUTION

The water supply capacity must be confirmed to ensure the proposed site plan development can be adequately serviced. Water servicing for the subject development will be provided by a proposed 150mm diameter watermain located within the proposed development road area, which will be connected / looped to the existing 150mm diameter watermain on Wyndham Street and existing 400mm diameter watermain on Main Street.

In addition, two private fire hydrants are proposed; fire hydrant spacing meets the requirements for coverage as per the Region's design criteria. The proposed watermain layout is presented on the 'Conceptual Servicing Plan' on Dwg# 17-018-02 Appendix 'F'

H.0 – CONCLUSIONS AND RECOMMENDATIONS

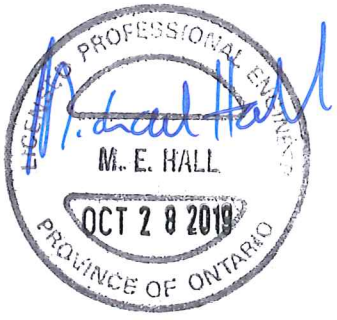
In summary, the existing municipal services are such that they can support the subject development. On a basis of our investigation and examination, we provided the conclusion:

- Adequate storm drainage and storm water management facilities for both quantitative and qualitative can be provided within the subject development area to neutralize the impact of urbanized runoff.
- The proposed sanitary sewer can sufficiently convey flows to the downstream sanitary sewer system for the subject development. Preliminary analysis of the existing system indicates it has a conveyance capacity.
- Water servicing for the subject development will be provided by a proposed 150mm diameter watermain located within the proposed development road area, which will be connected / looped to the existing 150mm diameter watermain on Wyndham Street and existing 400mm diameter watermain on Main Street.

In summary, the existing municipal services are such that they can support the subject development.

Respectfully Submitted:

CONDELAND ENGINEERING LIMITED
Consulting Engineers & Project Managers

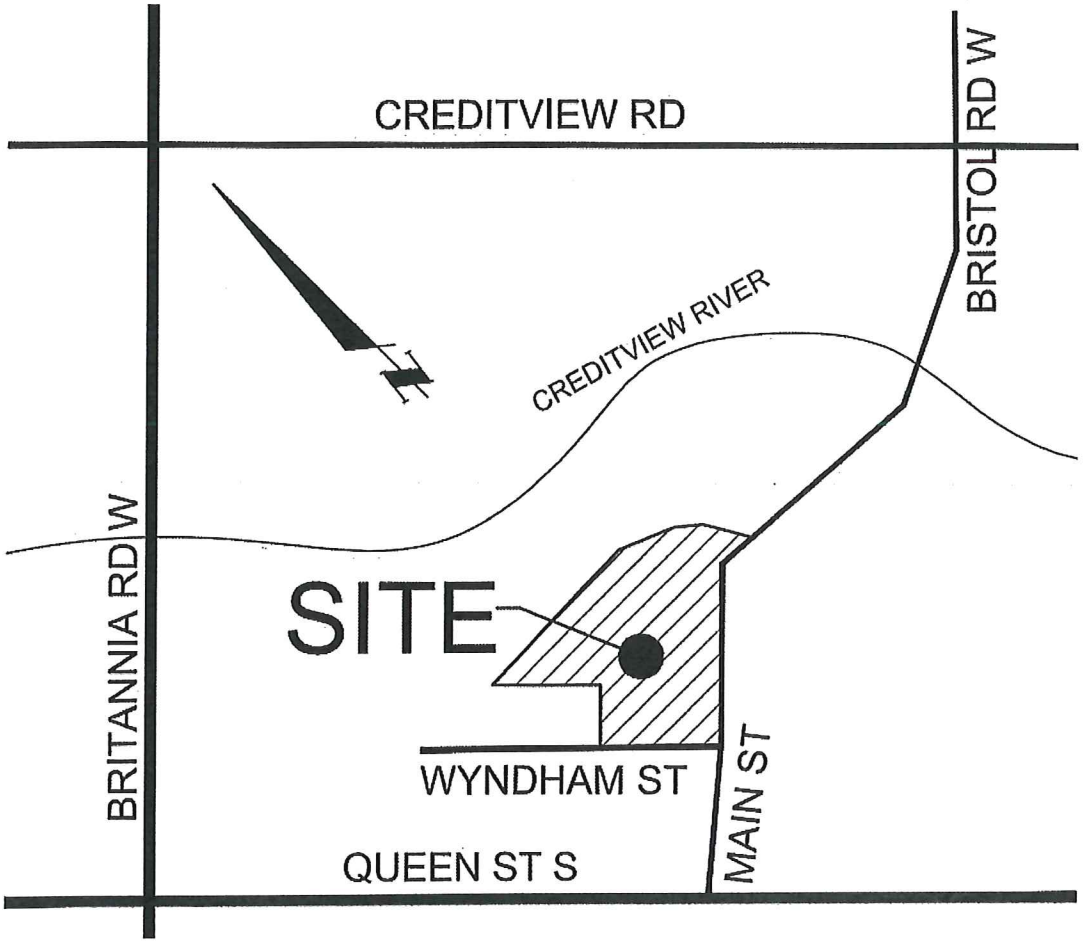


Dennis Mayo
Design Engineer

Mike Hall, P.Eng.
Senior Designer

APPENDIX 'A'

Key Map

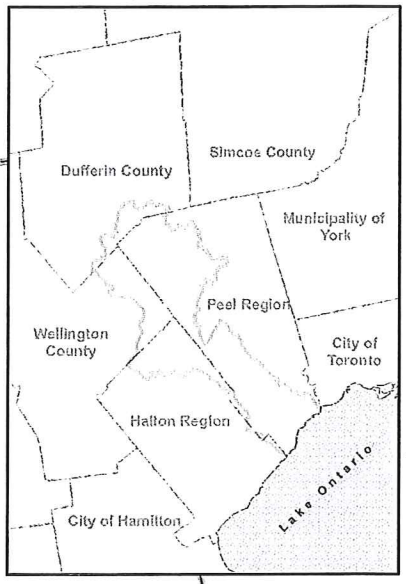

CREDITVIEW RD
BRISTOL RD W
CREDITVIEW RIVER
BRITANNIA RD W
SITE
WYNDHAM ST
MAIN ST
QUEEN ST S

KEY MAP (N.T.S)

APPENDIX 'B'

CVC Watersheds & Sub-watersheds Map

Credit Valley Conservation Watershed



WHO WE ARE

The Credit River watershed is comprised of 1,000 square kilometers of land, drained by the Credit River and its 1,500 kilometers of tributaries. It is located in one of the most rapidly urbanizing parts of Canada, within the Greater Toronto area. The river's headwaters are located above the Niagara Escarpment. This area is the source of four rivers: the Credit, Humber, Etobicoke and Nottawasaga. A small part of the Oak Ridges Moraine, as well as a number of other moraines are located within the watershed's boundary.

WHAT IS A WATERSHED?

A watershed is an area of land that drains into a river or a lake. The boundary of a watershed is based on the elevation of a landscape. A drop of water that lands anywhere inside this boundary will eventually end up at the Credit River, before emptying into Lake Ontario. This determination of oundaries is based on the natural shape of the land and therefore the watershed falls across many municipal boundaries. Credit Valley Conservation helps to manage the natural resources found in the Credit River watershed.

SUBJECT SITE

WHAT IS A SUBWATERSHED?

A smaller basin within a larger drainage area where all of runoff or base flow drains to a central point of the larger watershed is called subwatershed. Fletcher Creek drains runoff and baseflow from surrounding areas and brings into the central point of the watershed or the Credit River.

0 1 2 4 6 8 Km

- CVC Boundary
- Subwatersheds
- Lakes and Ponds
- Rivers and Streams

Major Transportation Network

- Highway
- Major road
- Railroad

APPENDIX 'C'

Sanitary Sewer Design Chart

PROPOSED SANITARY SEWER DESIGN CHART

LOCATION						POPULATION				FLOW								SEWER DESIGN					
(1)	(2)		(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
						RESIDENTIAL							INDUSTRIAL										
STREET NAME	FROM MH #	UPPER END INVERT (m)	TO MH #	LOWER END INVERT (m)	AREA (ha)	P.P.U.	POPULATION	ACCUMULATED POPULATION	PEAKING FACTOR	PEAK DESIGN FLOW (L/s)	SECTION AREA (ha)	ACCUMULATED RESIDENTIAL AREA (ha)	TOTAL ACCUMULATED AREA (ha)	INFILTRATION (L/s)	TOTAL ACCUMULATED INFILTRATION (L/S)	TOTAL FLOW = (9) + (14) (L/s)	PIPE LENGTH (m)	PIPE DIAMETER (mm)	SLOPE (%)	FULL FLOW CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	PERCENTAGE UTILIZATION (%)	COMMENTS
CITY PARK MAIN STREET, CITY OF MISSISSAUGA																							
FREEHOLD TOWNHOUSE BLOCK																							
Wyndham Street	EX. MH 1797829	150.77	EX. MH 1797828	150.39	8.1228	50.0	406	406	**4.00**	5.692	8.123	8.123	8.123	**3.935**	**3.935**	9.627	72.52	250	0.51%	44.3	0.86	21.7%	
Wyndham Street					0.146	175.0	26	26	**4.00**	0.364	0.146	0.146	0.146	**0.029**	**0.029**	0.393							
NEW SERVICE CONNECTIONS				*** ADDING 0.393 L/S TO THE EXISTNG SANITARY SEWER RESULTS IN ONLY 0.9% INCREASE IN PIPE UTILIZATION PERCENTAGE**																			
Wyndham Street	EX. MH 1797828	150.36	EX. MH 6539483	150	0.2192	50.0	11	443	**4.00**	6.210	0.219	8.488	8.488	**2.382**	**6.347**	12.557	73.52	250	0.50%	43.8	0.86	28.7%	
			(EX.SAN MH 107)																				
COMMUNITY TOWNHOUSE BLOCK																							
Private Road	**MH1A**	**150.60**	**MH2A**	**150.40**	**0.203**	**175.0**	**36**	**36**	**4.00**	**0.505**	**0.203**	**0.203**	**0.203**	**0.878**	**0.878**	1.383	19.92	200	1.00%	34.2	1.04	4.0%	
Private Road	**MH2A**	**150.37**	**MH3A**	**150.11**	**0.038**	**175.0**	**7**	**43**	**4.00**	**0.603**	**0.038**	**0.241**	**0.241**	**0.512**	**1.391**	1.993	8.02	200	3.24%	61.5	1.88	3.2%	
Private Road	**MH3A**	**150.08**	**MH4A**	**149.71**	**0.044**	**175.0**	**8**	**51**	**4.00**	**0.715**	**0.044**	**0.285**	**0.285**	**0.491**	**1.882**	2.597	7.23	200	5.12%	77.3	2.36	3.4%	
Private Road	**MH4A**	**149.68**	**MH5A**	**149.20**	**0.093**	**175.0**	**16**	**67**	**4.00**	**0.939**	**0.093**	**0.378**	**0.378**	**0.822**	**2.704**	3.643	18.69	200	2.57%	54.8	1.67	6.6%	
Private Road	**MH5A**	**149.17**	**MH6A**	**148.92**	**0**	**175.0**	**0**	**67**	**4.00**	**0.939**	**0.000**	**0.378**	**0.378**	**0.999**	**3.703**	4.642	15.69	200	1.59%	43.1	1.32	10.8%	
Main Street	EX.SANMH107	**149.87**	**MH06A**	**148.87**			**0**	**443**	**4.00**	**6.210**	**0.000**	**8.488**	**8.488**	**0.000**	**1.698**	7.908	69.35	300	1.38%	118.4	1.61	6.7%	
Main Street	**MH06A**	**148.82**	EX.SANMH109	**148.54**			**68**	**511**	**3.97**	**7.109**	**0.386**	**8.874**	**8.874**	**0.999**	**3.705**	10.814	20.65	300	1.38%	118.4	1.61	9.1%	
Main Street	EX.SANMH109	**148.52**	EX.SANMH110	**148.28**			**0**	**511**	**3.97**	**7.109**	**0.000**	**8.874**	**8.874**	**0.999**	**3.705**	10.814	4.10	300	5.90%	244.8	3.32	4.4%	
Main Street	EX.SANMH110	**147.50**					**0**	**511**	**3.97**	**7.109**	**0.000**	**8.874**	**8.874**	**0.999**	**3.705**	10.814	28.70	300	9.30%	307.4	4.17	3.5%	

REGION OF PEEL DESIGN CRITERIA:

Single Detached = 50 persons / ha

Dom. Sewage Flows = 302.8 L/cap/day

WET WEATHER INFILTRATION

(area)	(manhole)	(sewer)
0.200 L/s/ha	0.280 L/s/ha	0.028 L/s/ha

PROJECT: CITY PARK MAIN STREET CONDOMINIUM

CONTRACT NO: 17-018

LOCATION: MAIN STREET AND WYNDHAM STREET INTERSECTION

MISSISSAUGA, ONTARIO

CALCS BY : D.L.M.

CHECKED BY: M.E.H. P.ENG.

DATE: 10/28/19

CITY OF MISSISSAUGA

SANITARY SEWER DESIGN

CONSULTANT: CONDELAND ENGINEERING LIMITED

POPULATION EQUIVALENTS:

Single family (greater than 10 m lots) =	50.0 persons/hectares	Industrials=	70.0 persons/hectares
Single family (less than 10 m lots) =	70.0 persons/hectares	Commercials=	50.0 persons/hectares
Semi-detached =	70.0 persons/hectares	Institutionals=	50.0 persons/hectares
Row dwellings/Townhouses =	175.0 persons/hectares	Parks and Recreational=	50.0 persons/hectares

APPENDIX 'D'

Oil-Grit Separator Sizing Calculation – CDS PMSU 2015

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name: 36-46 Main St
Location: Mississauga, ON
OGS #: CDS 1

Engineer: Condeland Engineering Ltd
Contact: Dennis Mayo
Report Date: 16-Oct-19

Area	0.1144	ha	**Rainfall Station #**	204	
Weighted C	0.80		**Particle Size Distribution**	FINE	
CDS Model	2015-4		**CDS Treatment Capacity**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	11.0%	20.4%	0.3	0.3	1.3	98.5	10.8
1.5	10.1%	30.5%	0.4	0.4	1.9	98.3	9.9
2.0	9.6%	40.1%	0.5	0.5	2.6	98.1	9.4
2.5	7.9%	48.0%	0.6	0.6	3.2	97.9	7.8
3.0	6.4%	54.4%	0.8	0.8	3.9	97.8	6.2
3.5	4.4%	58.8%	0.9	0.9	4.5	97.6	4.3
4.0	4.2%	63.0%	1.0	1.0	5.1	97.4	4.1
4.5	3.7%	66.7%	1.1	1.1	5.8	97.2	3.6
5.0	3.3%	70.0%	1.3	1.3	6.4	97.0	3.2
6.0	5.6%	75.6%	1.5	1.5	7.7	96.6	5.4
7.0	4.0%	79.6%	1.8	1.8	9.0	96.3	3.9
8.0	3.5%	83.1%	2.0	2.0	10.3	95.9	3.3
9.0	2.2%	85.3%	2.3	2.3	11.6	95.5	2.1
10.0	1.7%	87.0%	2.5	2.5	12.8	95.2	1.6
15.0	6.3%	93.3%	3.8	3.8	19.3	93.3	5.9
20.0	2.3%	95.6%	5.1	5.1	25.7	91.5	2.1
25.0	1.8%	97.3%	6.4	6.4	32.1	89.7	1.6
30.0	0.8%	98.2%	7.6	7.6	38.5	87.8	0.7
35.0	0.9%	99.0%	8.9	8.9	44.9	86.0	0.7
40.0	0.3%	99.3%	10.2	10.2	51.3	84.1	0.2
45.0	0.5%	99.8%	11.4	11.4	57.8	82.3	0.4
50.0	0.2%	100.0%	12.7	12.7	64.2	80.5	0.1
							96.8

Removal Efficiency Adjustment[2] = 6.5%

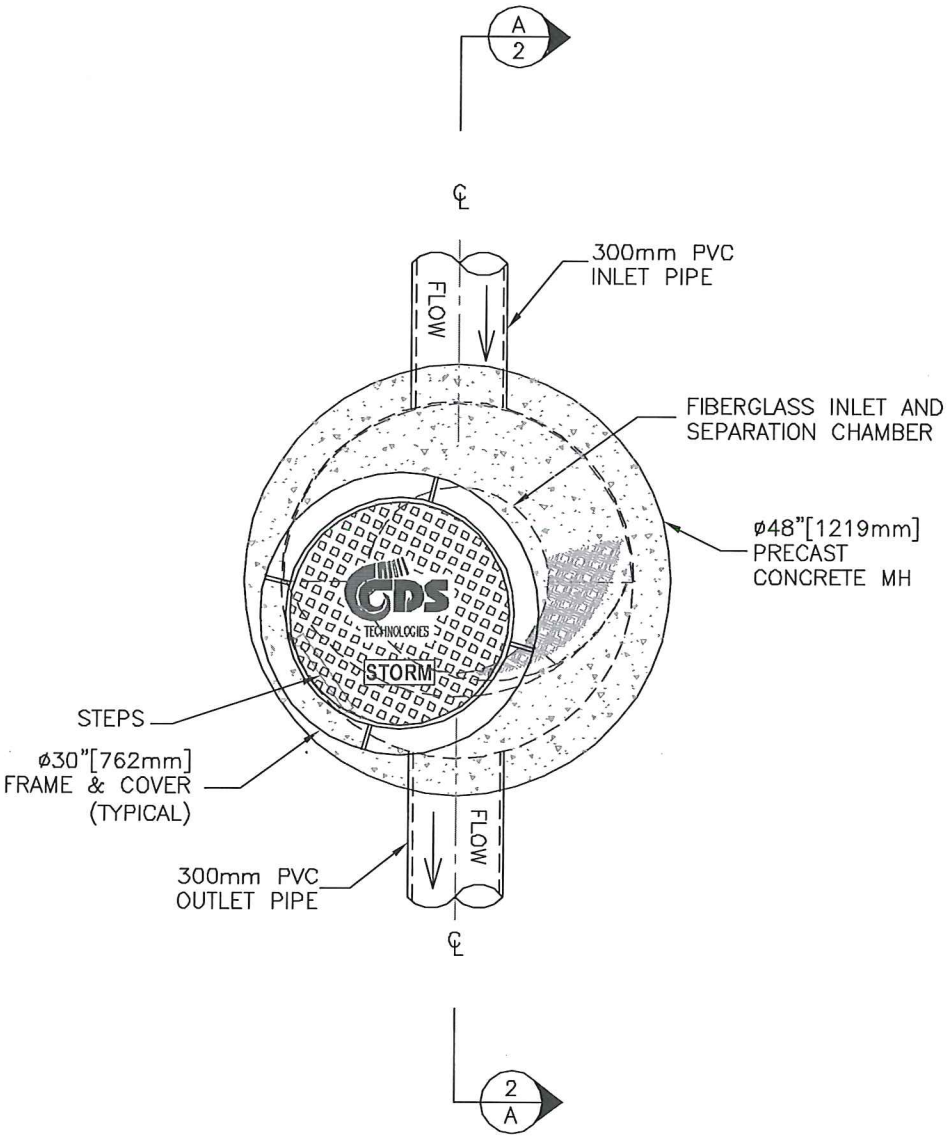
Predicted Net Annual Load Removal Efficiency = 90.3%

Predicted Annual Rainfall Treated = 98.2%

1 - Based on 44 years of hourly rainfall data from Canadian Station 6158733, Toronto ON (Airport)

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

PLAN VIEW

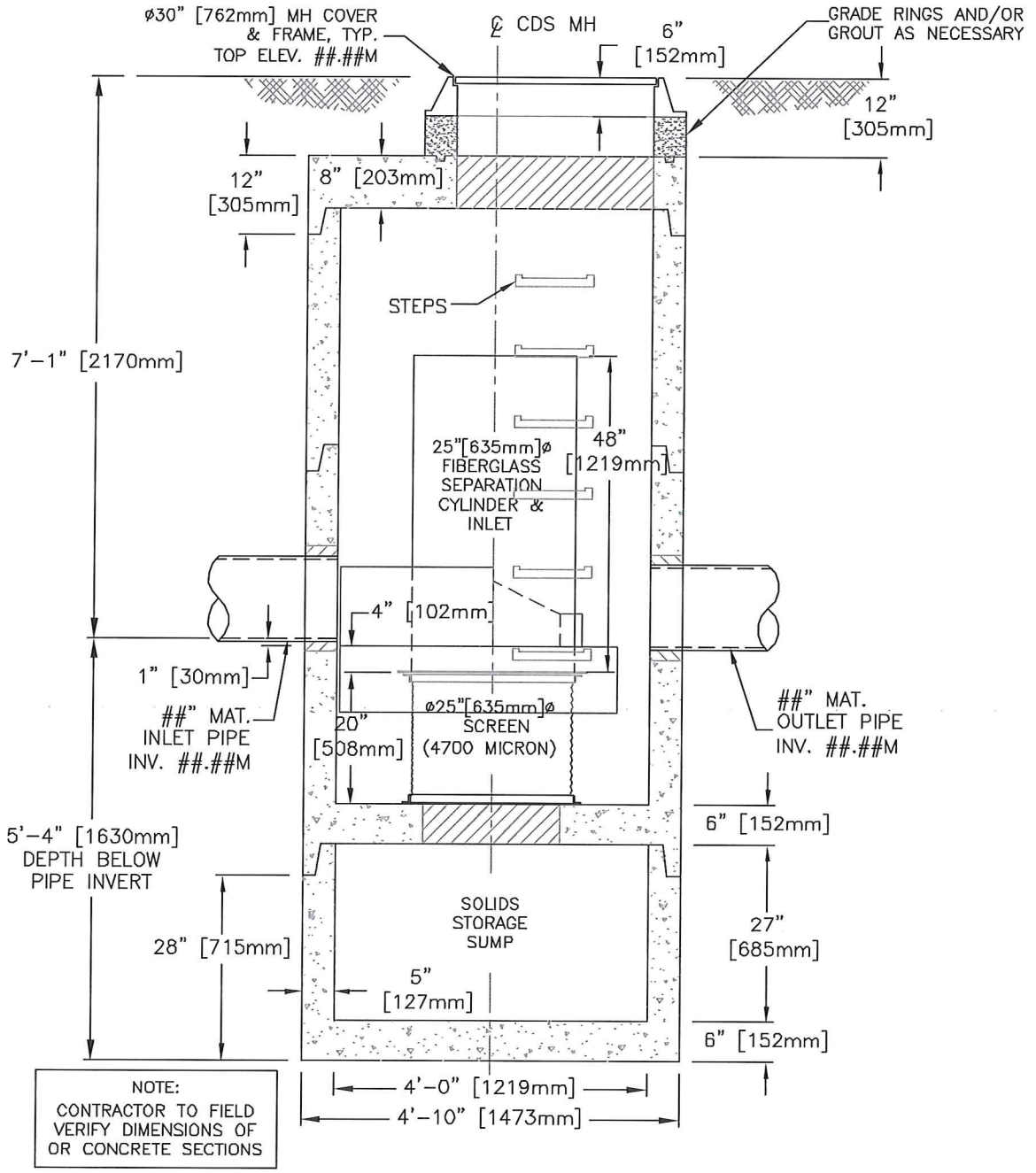


CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX-##-###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 1
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9955

SECTION A–A
ELEVATION VIEW



NOTE:
CONTRACTOR TO FIELD VERIFY DIMENSIONS OF OR CONCRETE SECTIONS

CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX-##-###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 2
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9955

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name: 36-46 Main St
Location: Mississauga, ON
OGS #: CDS 2

Engineer: Condeland Engineering Ltd
Contact: Dennis Mayo
Report Date: 16-Oct-19

Area	0.2128	ha	**Rainfall Station #**	204	
Weighted C	0.80		**Particle Size Distribution**	FINE	
CDS Model	2015-4		**CDS Treatment Capacity**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	11.0%	20.4%	0.5	0.5	2.4	98.2	10.8
1.5	10.1%	30.5%	0.7	0.7	3.6	97.8	9.9
2.0	9.6%	40.1%	0.9	0.9	4.8	97.5	9.4
2.5	7.9%	48.0%	1.2	1.2	6.0	97.1	7.7
3.0	6.4%	54.4%	1.4	1.4	7.2	96.8	6.2
3.5	4.4%	58.8%	1.7	1.7	8.4	96.5	4.2
4.0	4.2%	63.0%	1.9	1.9	9.5	96.1	4.1
4.5	3.7%	66.7%	2.1	2.1	10.7	95.8	3.6
5.0	3.3%	70.0%	2.4	2.4	11.9	95.4	3.2
6.0	5.6%	75.6%	2.8	2.8	14.3	94.8	5.3
7.0	4.0%	79.6%	3.3	3.3	16.7	94.1	3.8
8.0	3.5%	83.1%	3.8	3.8	19.1	93.4	3.3
9.0	2.2%	85.3%	4.3	4.3	21.5	92.7	2.0
10.0	1.7%	87.0%	4.7	4.7	23.9	92.0	1.5
15.0	6.3%	93.3%	7.1	7.1	35.8	88.6	5.6
20.0	2.3%	95.6%	9.5	9.5	47.7	85.2	1.9
25.0	1.8%	97.3%	11.8	11.8	59.7	81.7	1.5
30.0	0.8%	98.2%	14.2	14.2	71.6	78.3	0.7
35.0	0.9%	99.0%	16.6	16.6	83.6	74.9	0.6
40.0	0.3%	99.3%	18.9	18.9	95.5	71.5	0.2
45.0	0.5%	99.8%	21.3	19.8	100.0	65.3	0.3
50.0	0.2%	100.0%	23.7	19.8	100.0	58.8	0.1
							95.0

Removal Efficiency Adjustment[2] = 6.5%

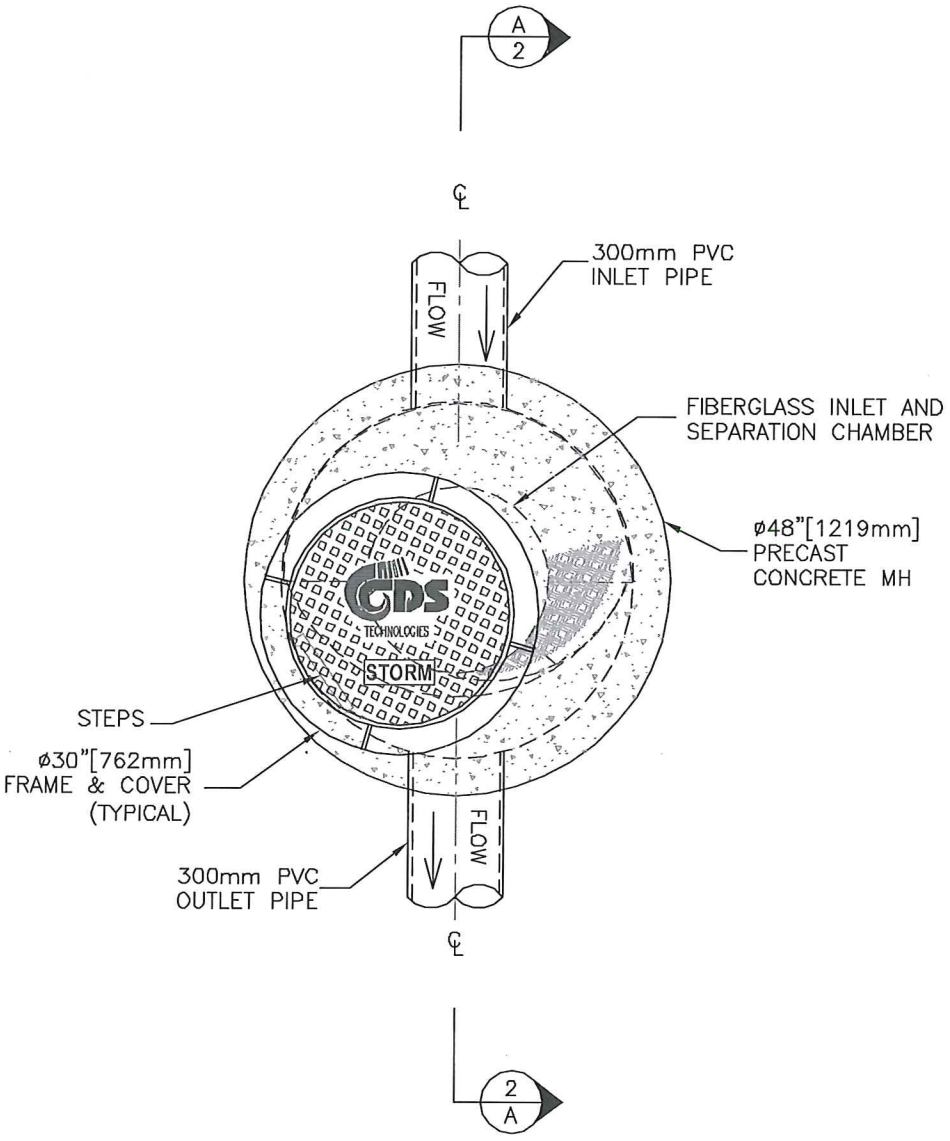
Predicted Net Annual Load Removal Efficiency = 88.5%

Predicted Annual Rainfall Treated = 98.2%

1 - Based on 44 years of hourly rainfall data from Canadian Station 6158733, Toronto ON (Airport)

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

PLAN VIEW



CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX-##-###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 1
		DRAWN INITIALS	
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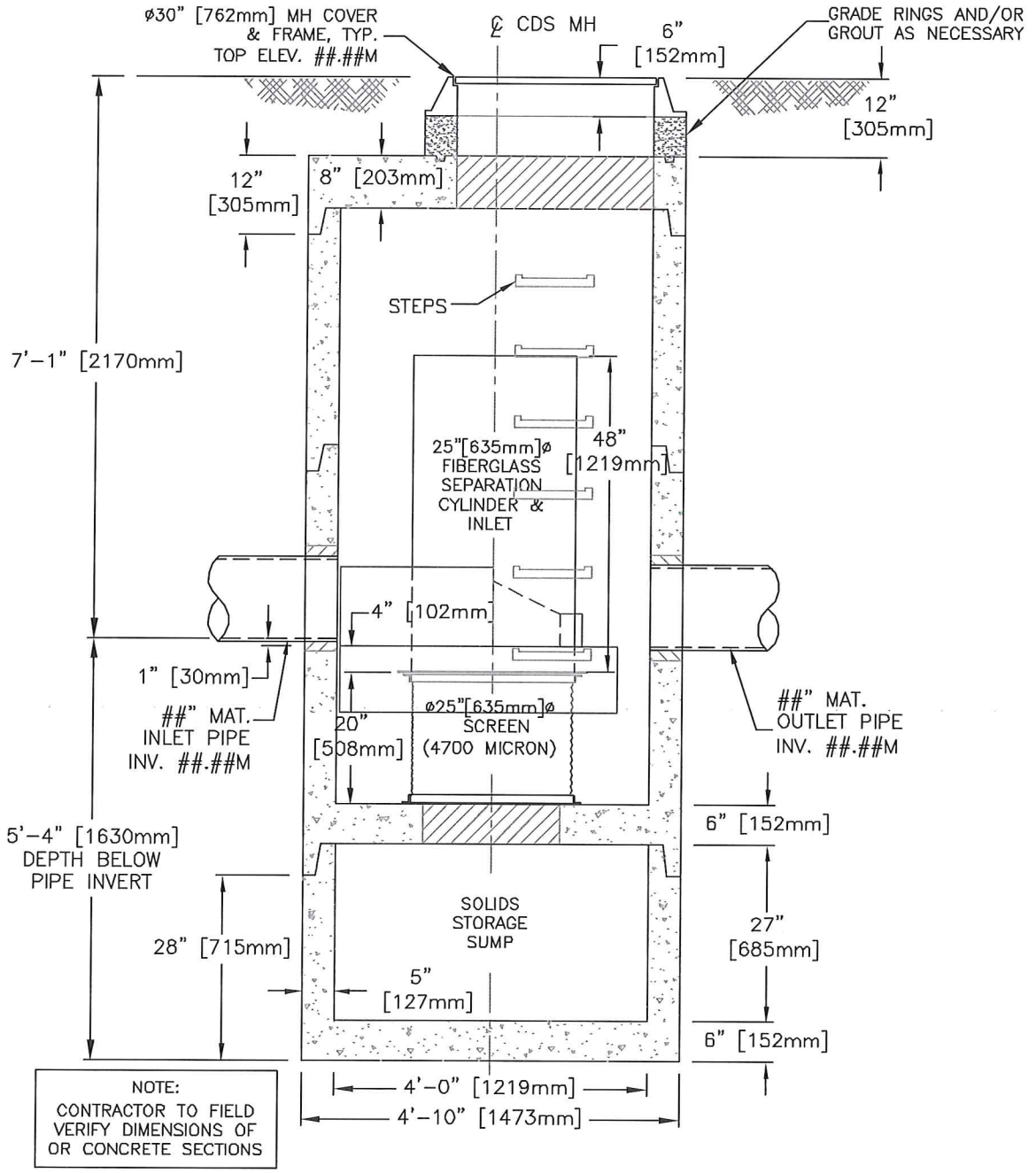

NOTE:
CONTRACTOR TO FIELD VERIFY DIMENSIONS OF OR CONCRETE SECTIONS

CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX-##-###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 2
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9955

APPENDIX 'E'

Stormwater Quantity Control Analysis

Cultec Storage System Sizing Calculation Sheets

Vortex Valve Head-Discharge Curve Sheet

Main Street Downstream Existing Storm Design Chart Analysis

- *10-yr Storm Pre-development*
- *10-yr Storm Post-development*

Main Street Downstream Existing Storm Design HGL Analysis

- *10-yr Storm Pre-development*
- *10-yr Storm Post-development*

Main St. and Wyndham St. City Plan and Profile Sheets for Reference

Water Balance Calculation Sheet

Infiltration Trench Calculations (Cultec)

Rainwater Barrel / Cistern Sizing Calculation Sheet

City of Toronto Water Balance Initial Abstraction Chart for Reference

Geotechnical Report Sections on Groundwater Elevations and In-Situ Percolation Rate for Reference

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CONDELAND ENGINEERING LIMITED
TECHNICAL DIVSION
SITE PLAN STORM WATER MANAGEMENT

****

PROJECT NUMBER: 17-018

PROJECT LOCATION: CITY PARK HOMES (36-46 Main St.)
CITY OF MISSISSAUGA

CLIENT: **CITY PARK HOMES INC.** Date: **October 28, 2019**

****

A. SITE CRITERIA

TOTAL DEVELOPABLE SITE AREA: 8268.63 SQ.M.

EXISTING CONDITIONS

Tributary to:	**Site Area** 8113.63 SQ.M.	**External Area** 155.00 SQ.M.	**Total Area** **8268.63 SQ.M.**	Runoff Coefficient **0.33**	
MAIN ST. (A1)					
ABANDONED HOUSE FOUNDATIONS & DRIVEWAYS	1570.75 SQ.M.	0.00 SQ.M.	1570.75 SQ.M.	0.45	
EXISTING CONDITIONS COMPOSITE RUNOFF COEFF.			RUNOFF COEFFICIENT		
GRAVEL DRIVEWAY AREA:		479.34 SQ.M.	0.90		
SOFT LANDSCAPED / GRASSED AREA:		1091.41 SQ.M.	0.25		
		1570.75 SQ.M.			
COMPOSITE RUNOFF COEFF.=		0.4484			
WYNDHAM ST. (A2)					
EXISTING SINGLE DETACHED HOUSE	2804.17 SQ.M.	155.00 SQ.M.	2959.17 SQ.M.	0.36	
EXISTING CONDITIONS COMPOSITE RUNOFF COEFF.			RUNOFF COEFFICIENT		
HARD SURFACE / DRIVEWAY AREA		503.04 SQ.M.	0.90		
SOFT LANDSCAPED / GRASSED AREA:		2456.13 SQ.M.	0.25		
		2959.17 SQ.M.			
COMPOSITE RUNOFF COEFF.=		0.3605			
CREDIT RIVER (A3)					
SOFT AREA	3738.71 SQ.M.	0.00 SQ.M.	3738.71 SQ.M.	0.25	*(external area is portion of rear yard of adjacent residential lot: #193 Wyndham St.)*
EXISTING CONDITIONS COMPOSITE RUNOFF COEFF.			RUNOFF COEFFICIENT		
ROOF / HARD SURFACE		0.00 SQ.M.	0.90		
SOFT LANDSCAPED / GRASSED AREA:		3738.71 SQ.M.	0.25		
		3738.71 SQ.M.			

COMPOSITE RUNOFF COEFF.= 0.2500

PROPOSED CONDITIONS

	Controlled Area	Uncontrolled Area	Total Area	Runoff Coefficient
MAIN ST. - EX. 450mm STM SEWER (A1)	3271.23 SQ.M.	347.14 SQ.M.	3618.37 SQ.M.	**0.75**
BUILDING AREA:	1520.81 SQ.M.	38.13 SQ.M.	1558.94 SQ.M.	0.90
PAVEMENT & CONCRETE AREA:	1219.31 SQ.M.	18.37 SQ.M.	1237.68 SQ.M.	0.90
SOFT LANDSCAPE	531.11 SQ.M.	290.64 SQ.M.	821.75 SQ.M.	0.25
WYNDHAM ST. - UNCONTROLLED (A2)	0.00 SQ.M.	1039.62 SQ.M.	1039.62 SQ.M.	**0.66**
BUILDING / DRIVEWAY / WALKWAY AREA:	0.00 SQ.M.	650.33 SQ.M.	650.33 SQ.M.	0.90
SOFT LANDSCAPE	0.00 SQ.M.	389.29 SQ.M.	389.29 SQ.M.	0.25
CREDIT RIVER - UNCONTROLLED (A3)	0.00 SQ.M.	3610.64 SQ.M.	3610.64 SQ.M.	**0.26**
BUILDING AREA:	0.00 SQ.M.	44.74 SQ.M.	44.74 SQ.M.	0.90
SOFT LANDSCAPE	0.00 SQ.M.	712.45 SQ.M.	712.45 SQ.M.	0.25
UNDISTURBED & 10m BUFFER AREA:	0.00 SQ.M.	2853.45 SQ.M.	2853.45 SQ.M.	0.25 *UNDISTURBED
		TOTAL:	**8268.63 SQ.M.**	

B. **SITE CONTROL REQUIREMENTS**

(NO ROOF TOP CONTROLS HAVE BEEN IMPLEMENTED, THEREFORE BUILDING AND PAVEMENT AREAS WILL BE COMBINED BELOW:)

MAX ALLLOWABLE SITE DISCHARGE (BASED ON 2YRS, 15min.TC, 0.45 runoff coeff.) = (1570.75x 0.45) x (2.778*(610*(15+4.6)^(-0.78))/10000)
(A1: 2-YR PRE-DEVELOPMENT FLOW TO MAIN ST.) **11.72 LPS**

MAX ALLLOWABLE SITE DISCHARGE (BASED ON 2YRS, 15min.TC, 0.36 runoff coeff.) = (2959.17x 0.36) x (2.778*(610*(15+4.6)^(-0.78))/10000)
(A2: 2-YR PRE-DEVELOPMENT FLOW TO WYNDHAM ST.) **17.75 LPS**

MAX ALLLOWABLE SITE DISCHARGE (BASED ON 2YRS, 15min.TC, 0.25 runoff coeff.) = (3738.71x 0.25) x (2.778*(610*(15+4.6)^(-0.78))/10000)
(A3: 2-YR PRE-DEVELOPMENT FLOW TO CREDIT RIVER) **15.55 LPS**

TOTAL SITE DISCHARGE (BASED ON 2YRS.) = **TOTAL: 45.02 LPS**

C. **A1: OUTLET TO MAIN ST. STORM SEWER**

C.1 CONTROLLED AND UNCONTROLLED RUNOFF AREA

	CONTROLLED AREA	**UN-CONTROLLED AREA**	**100 yr-Runoff Coefficient**
BUILDING AREA:	1520.81 SQ.M.	38.13 SQ.M.	0.90
PAVE/CONC. AREA:	1219.31 SQ.M.	18.37 SQ.M.	0.90
SOFT LANDSCAPE	531.11 SQ.M.	290.64 SQ.M.	0.31
TOTAL AREA=	3271.23 SQ.M.	347.14 SQ.M.	

C.2 EQUIVALENT RUNOFF COEFFICIENT FOR P&B&L AREAS

R(100YR)= 0.8046 CONTROLLED

R(100YR)= 0.4081 UNCONTROLLED

C.3 STORAGE REQUIREMENTS FOR P&B&L AREAS

100-YR STORM CONTROL

RAN (CONTROLLED) = 0.7312

RAN (UNCONTROLLED) = 0.0394
(overland to Main St.)

Quncontrolled = 2.36 LPS

The maximum Controlled discharge is the maximum allowable Site discharge less the Uncontrolled discharge = 11.72 - 2.36

Qctrl-discharge = 9.36 LPS

HOWEVER FOR VORTEX VALVE ORIFICE (SECT C.5.) WITH HEAD
1.45 M MAXIMUM CONTROLLED DISCHARGE IS =

Qctrl-discharge = 9.32 LPS

TIME (min)	INTENSITY mm/hr	Qcontrolled lps	Qtotal lps	Qctrl-discharge lps	change in flow lps	storage volume cu.m.
15.00	140.69	102.87	102.87	9.32	93.55	84.19
20.00	118.12	86.37	86.37	9.32	77.05	92.46
25.00	102.41	74.88	74.88	9.32	65.56	98.34
30.00	90.77	66.37	66.37	9.32	57.05	102.69
35.00	81.77	59.79	59.79	9.32	50.47	105.99
40.00	74.58	54.53	54.53	9.32	45.21	108.50
45.00	68.68	50.22	50.22	9.32	40.90	110.43
50.00	63.75	46.62	46.62	9.32	37.29	111.88
55.00	59.56	43.55	43.55	9.32	34.23	112.96
60.00	55.95	40.91	40.91	9.32	31.59	113.72
65.00	52.81	38.61	38.61	9.32	29.29	114.23
70.00	50.03	36.59	36.59	9.32	27.26	114.50
75.00	**47.58**	**34.79**	**34.79**	**9.32**	**25.46**	**114.59**
80.00	45.38	33.18	33.18	9.32	23.86	114.51
85.00	43.39	31.73	31.73	9.32	22.41	114.28
90.00	41.60	30.42	30.42	9.32	21.10	113.92

therefore total storage required= **114.59 CU.M.**
during the the 100 yr storm

C.4 STORAGE PROVIDED

TOTAL UNDER GROUND STORAGE @ MAX. TOP OF WATER LEVEL (T.W.L.) = 151.62 M

Storm Sewer Pipe Volume

LENGTH (M)		DIA (M)	Elliptical Pipe (Waterway Area M^2)	VOLUME (CU.M)	
Cultec#1 150XLHD	(Bed Area = 3.43m x 19.58m)			25.14	CU.M.
2.09	*circular pipe*	0.375		0.23	CU.M.
21.36	*circular pipe*	0.450		3.40	CU.M.
13.50	*circular pipe*	0.600		3.82	CU.M.
11.42	*circular pipe*	0.900		7.27	CU.M.
4.91	*circular pipe*	1.200		5.56	CU.M.
7.23	*circular pipe*	0.600		2.05	CU.M.
Cultec#2 330XLDHD)	(Bed Area = 4.88m x 22.40m)			67.71	CU.M.

TOTAL STORAGE PROVIDED = 115.19 CU.M. > 114.59 (VERIFIED)

C.5 ORIFICE DESIGN

MAX. PIPE OUTFLOW= 9.322 LPS

UNCONT. OUTFLOW = 2.36 LPS (Overland flow to Main Street)

TOTAL SITE MAX. OUTFLOW (Overcontrolled)= **11.68** LPS **<=** 2yr pre-develop = **11.72 LPS**

MAX. STORAGE LEVEL

MAX. T.W.L.= 151.62 m
PIPE INVERT = 150.17 m
HEAD = 1.45 m

STORAGE REQ. = 114.59 CU.M.
STORAGE PROV. = 115.19 CU.M.

Therefore Vortex Valve Model FC12 with 102mm outlet is proposed.
See attached discharge table and curves from the supplier.

D. **A2 & A3: UNCONTROLLED OVERLAND FLOW OUTLETS TO WYNDHAM STREET AND CREDIT RIVER**

A2: WYNDHAM STREET (UNCONTROLLED AREA)

MAXIMUM SITE DISCHARGE (BASED ON 2YRS, 15min.TC, 0.66 runoff coeff.) = (1039.62x 0.66) x (2.778*(610*(15+4.6)^(-0.78))/10000)

(2-YR POST-DEVELOPMENT FLOW TO WYNDHAM ST.) **11.36 LPS** **<** **17.75 LPS**

PRE-2 YR

A3: CREDIT RIVER (UNCONTROLLED AREA)

MAXIMUM SITE DISCHARGE (BASED ON 2YRS, 15min.TC, 0.26 runoff coeff.) = (3610.64x 0.26) x (2.778*(610*(15+4.6)^(-0.78))/10000)

(2-YR POST-DEVELOPMENT FLOW TO CREDIT RIVER) **15.50 LPS** **<** **15.55 LPS**

PRE-2 YR

prepared by,
CONDELAND ENGINEERING LIMITED

Dennis Mayo
Intermediate Designer

Mike Hall, P.Eng.

CULTEC

Stormwater and Septic Solutions

Since 1986

1-800-4-CULTEC

Manufactured at ISO 9001:2000 certified facilities

Prepared For:	
Name	CHAMBER #1
Company Name	
Street Address	
City	
State	Zip
Phone	
Fax	
Email	

Project Information:		
City Park (Main St.)		
36-46 Main St.		
Mississauga		
State	ON	Zip

Date: October 28, 2019

Engineer:		
Name	D.M.	
Condeland Engineering Ltd.		
350 Creditstone Rd. Unit 200		
City	Vaughan	
State	ON	CA
Phone	905-695-2096	
Fax		
Email		

Calculations Performed By:		
City	Vaughan	
State	ON	Zip
Phone		
Fax		

Input Given Parameters

Unit of Measure	Metric	
Select Model	Recharger 150XLHD	
Stone Porosity	40.0%	
Number of Header Systems	1 Header	
Stone Depth **Above** Chamber	152	mm
Stone Depth **Below** Chamber	0	mm
Workable Bed Depth	1.50	meters
Max. Bed Width	4.00	meters
Storage Volume Required	25.00	cu. meters

Image for visual reference only.May not reflect selected model.

Chamber Specifications

Height	470.0	mm
Width	838.00	mm
Length	3.35	meters
Installed Length	3.12	meters
Bare Chamber Volume	0.77	cu. meters
Installed Chamber Volume	1.23	cu. meters
Bed Depth	0.90	meters
Bed Width	3.43	meters
Storage Volume Provided	25.14	cu. meters

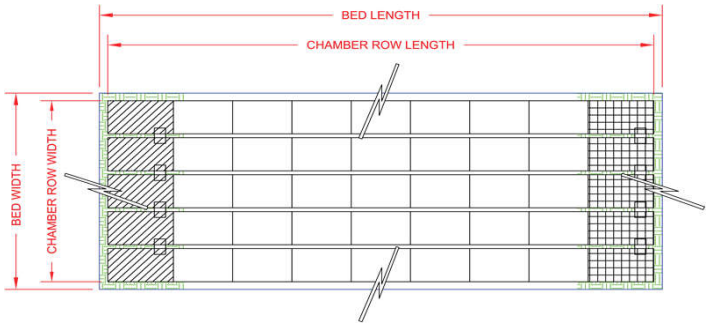
Materials List

Recharger 150XLHD Stormwater System by CULTEC, Inc.

Approx. Unit Count - not for construction	20	pieces
Actual Number of Chambers Required	18	pieces
Starter Chambers	3	pieces
Intermediate Chambers	12	pieces
End Chambers	3	pieces

HVLV FC-24	2	pieces
CULTEC No. 410™ Filter Fabric	179.23	sq. meters
CULTEC No. 20L Polyethylene Liner	3.43	meters
Stone	27.73	cu. meters
Volume of Excavation	60.55	cu. meters

Bed Detail



Number of Rows Wide	3	pieces
Number of Chambers Long	6	pieces
Chamber Row Width	2.82	meters
Chamber Row Length	18.97	meters
Bed Width	3.43	meters
Bed Length	19.58	meters
Bed Area Required	67.15	sq. meters

Bed detail for reference only. Not project specific. Not to scale. Use CULTEC StormGenie to output project specific detail.

CULTEC, Inc.
P.O. Box 280, Brookfield, CT 06804 USA
Phone: 203-775-4416 - Fax: 203-775-1462 - **www.cultec.com**

CULTEC

Stormwater and Septic Solutions

Since 1986

1-800-4-CULTEC

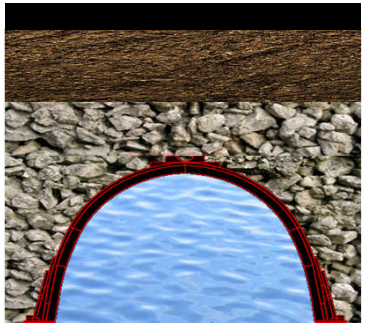
Manufactured at ISO 9001:2000 certified facilities

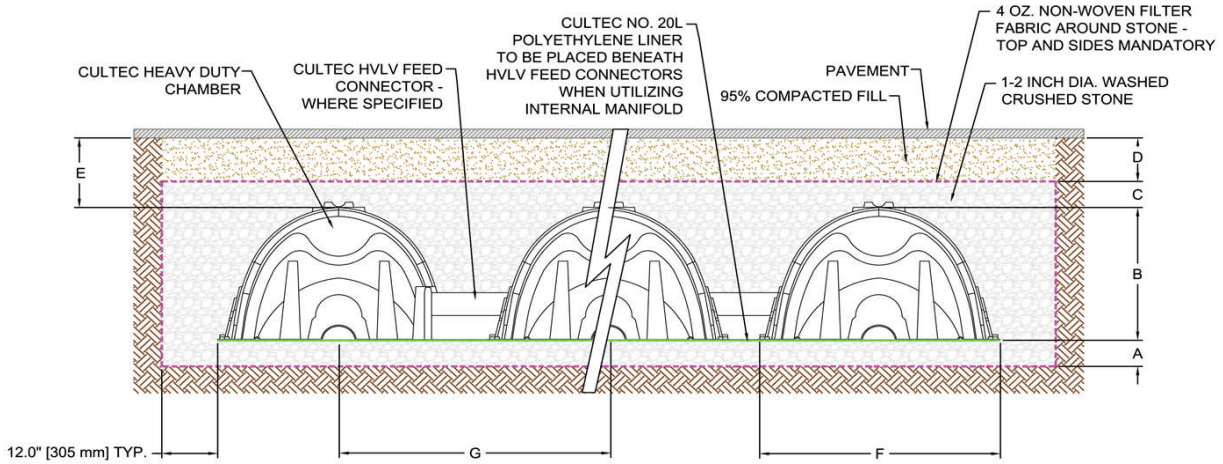
Project Name: City Park (Main St.) **Date:** October 28, 2019

Cross Section Detail

Conceptual graphic only. Not job specific.

Recharger 150XLHD		
Pavement	**76**	mm
95% Compacted Fill	**203**	mm
Stone Above	**152**	mm
Chamber Height	**469.9**	mm
Stone Below	**0**	mm
Effective Depth	**622.0**	mm
Bed Depth	**901.7**	mm





A	Depth of Stone Base	**0.0**	mm
B	Chamber Height	**470.0**	mm
C	Depth of Stone Above Units	**152.0**	mm
D	Depth of 95% Compacted Fill	**203.0**	mm
E	Max. Depth of Cover Allowed Above Crown of Chamber	**4.3**	meters
F	Chamber Width	**838.0**	mm
G	Center to Center Spacing	**0.99**	meters

Breakdown of Storage Provided by Recharger 150XLHD	Stormwater System	
Chambers	**14.02**	cu. meters
Feed Connectors	**0.03**	cu. meters
Stone	**11.09**	cu. meters
Total Storage Provided	**25.14**	cu. meters

CULTEC, Inc.
P.O. Box 280, Brookfield, CT 06804 USA
Phone: 203-775-4416 - Fax: 203-775-1462 - **www.cultec.com**

CULTEC

Stormwater and Septic Solutions

Since 1986

1-800-4-CULTEC

Manufactured at ISO 9001:2000 certified facilities

Prepared For:	
Name	CHAMBER #2
Company Name	
Street Address	
City	
State	Zip
Phone	
Fax	
Email	

Project Information:		
City Park (Main St.)		
36-46 Main St.		
Mississauga		
State	ON	Zip

Date: October 28, 2019

Engineer:		
Name	D.M.	
Condeland Engineering Ltd.		
350 Creditstone Rd. Unit 200		
City	Vaughan	
State	ON	CA
Phone	905-695-2096	
Fax		
Email		

Calculations Performed By:		
City	Vaughan	
State	ON	Zip
Phone		
Fax		

Input Given Parameters

Unit of Measure	Metric	
Select Model	Recharger 330XLHD	
Stone Porosity	40.0%	
Number of Header Systems	1 Header	
Stone Depth **Above** Chamber	152	mm
Stone Depth **Below** Chamber	0	mm
Workable Bed Depth	1.50	meters
Max. Bed Width	5.00	meters
Storage Volume Required	65.00	cu. meters

Image for visual reference only.May not reflect selected model.

Chamber Specifications

Height	775.0	mm
Width	1321.00	mm
Length	2.59	meters
Installed Length	2.13	meters
Bare Chamber Volume	1.48	cu. meters
Installed Chamber Volume	2.05	cu. meters
Bed Depth	1.26	meters
Bed Width	4.88	meters
Storage Volume Provided	67.71	cu. meters

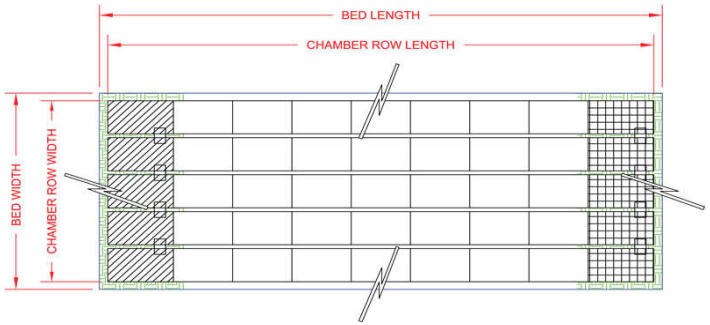
Materials List

Recharger 330XLHD Stormwater System by CULTEC, Inc.

Approx. Unit Count - not for construction	31	pieces
Actual Number of Chambers Required	30	pieces
Starter Chambers	3	pieces
Intermediate Chambers	24	pieces
End Chambers	3	pieces

HVLV FC-24	2	pieces
CULTEC No. 410™ Filter Fabric	295.98	sq. meters
CULTEC No. 20L Polyethylene Liner	4.88	meters
Stone	55.93	cu. meters
Volume of Excavation	137.37	cu. meters

Bed Detail



Number of Rows Wide	3	pieces
Number of Chambers Long	10	pieces
Chamber Row Width	4.27	meters
Chamber Row Length	21.79	meters
Bed Width	4.88	meters
Bed Length	22.40	meters
Bed Area Required	109.25	sq. meters

Bed detail for reference only. Not project specific. Not to scale. Use CULTEC StormGenie to output project specific detail.

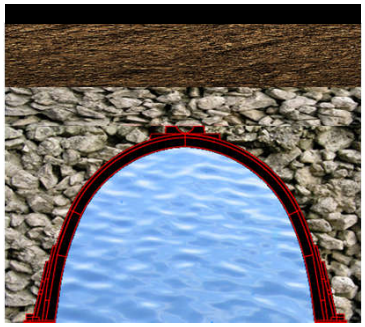
CULTEC, Inc.
P.O. Box 280, Brookfield, CT 06804 USA
Phone: 203-775-4416 - Fax: 203-775-1462 - **www.cultec.com**

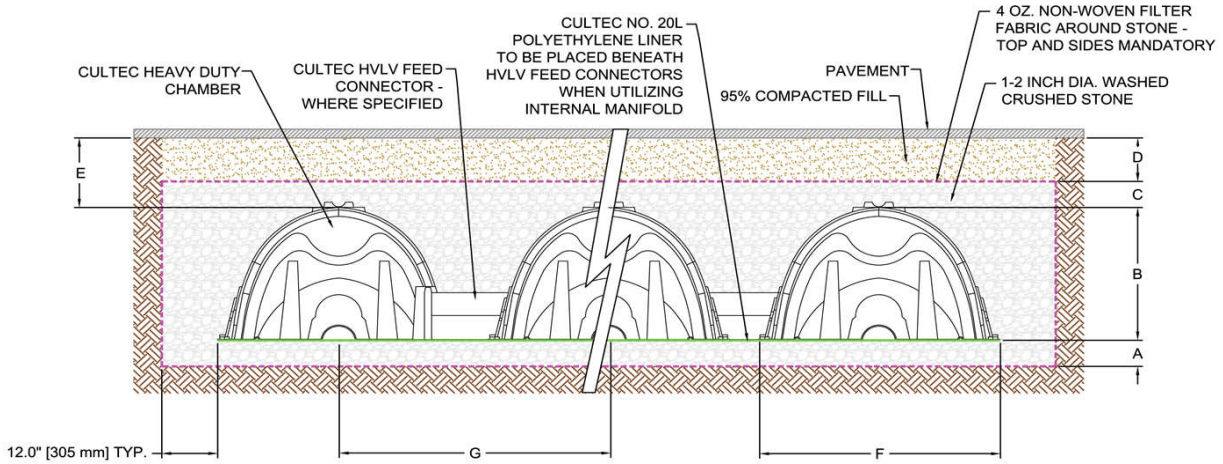
Project Name: City Park (Main St.) **Date:** October 28, 2019

Cross Section Detail

Conceptual graphic only. Not job specific.

Recharger 330XLHD		
Pavement	**76**	mm
95% Compacted Fill	**254**	mm
Stone Above	**152**	mm
Chamber Height	**774.7**	mm
Stone Below	**0**	mm
Effective Depth	**926.8**	mm
Bed Depth	**1257.3**	mm





A	Depth of Stone Base	**0.0**	mm
B	Chamber Height	**775.0**	mm
C	Depth of Stone Above Units	**152.0**	mm
D	Depth of 95% Compacted Fill	**254.0**	mm
E	Max. Depth of Cover Allowed Above Crown of Chamber	**3.7**	meters
F	Chamber Width	**1321.0**	mm
G	Center to Center Spacing	**1.47**	meters

Breakdown of Storage Provided by Recharger 330XLHD	Stormwater System	
Chambers	**45.31**	cu. meters
Feed Connectors	**0.03**	cu. meters
Stone	**22.37**	cu. meters
Total Storage Provided	**67.71**	cu. meters

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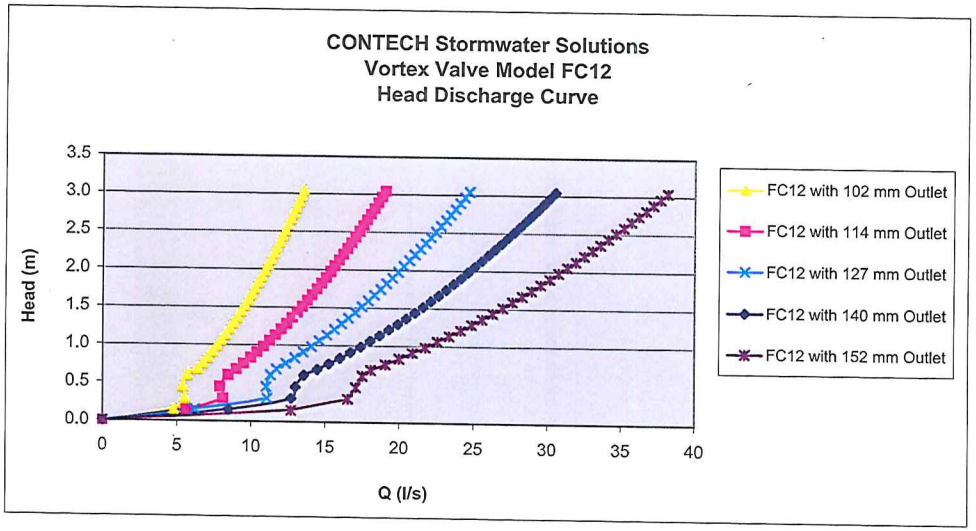
Conversions: l/s cfs 0.035315
m inches 39.370079

Head (m)	Head (in)	FC12 with 102 mm Outlet Flow (l/s)	FC12 with 114 mm Outlet Flow (l/s)	FC12 with 127 mm Outlet Flow (l/s)	FC12 with 140 mm Outlet Flow (l/s)	FC12 with 152 mm Outlet Flow (l/s)
0.000	0	0.000	0.000	0.000	0.000	0.000
0.152	6	4.813	5.662	6.228	8.493	12.740
0.305	12	5.500	8.125	11.100	12.740	16.569
0.457	18	5.400	7.927	11.041	13.023	17.100
0.610	24	5.700	8.493	11.324	13.589	17.550
0.686	27	6.416	9.042	11.731	14.498	18.121
0.762	30	6.763	9.531	12.366	15.282	19.101
0.838	33	7.093	9.997	12.969	16.028	20.033
0.914	36	7.408	10.441	13.546	16.741	20.924
0.991	39	7.711	10.867	14.099	17.424	21.779
1.067	42	8.002	11.278	14.631	18.082	22.601
1.143	45	8.283	11.674	15.145	18.717	23.394
1.219	48	8.554	12.056	15.641	19.331	24.161
1.295	51	8.817	12.427	16.123	19.925	24.905
1.372	54	9.073	12.788	16.590	20.503	25.627
1.448	57	9.322	13.138	17.045	21.065	26.329
1.524	60	9.564	13.479	17.488	21.612	27.013
1.600	63	9.800	13.812	17.920	22.146	27.680
1.676	66	10.031	14.137	18.341	22.667	28.331
1.753	69	10.256	14.455	18.753	23.177	28.968
1.829	72	10.477	14.766	19.157	23.675	29.591
1.905	75	10.693	15.070	19.552	24.163	30.201
1.981	78	10.904	15.369	19.939	24.642	30.800
2.057	81	11.112	15.662	20.319	25.111	31.386
2.134	84	11.316	15.949	20.692	25.572	31.962
2.210	87	11.516	16.231	21.058	26.025	32.528
2.286	90	11.713	16.509	21.418	26.469	33.084
2.362	93	11.907	16.782	21.772	26.907	33.631
2.438	96	12.097	17.050	22.120	27.338	34.169
2.515	99	12.285	17.315	22.463	27.761	34.699
2.591	102	12.470	17.575	22.801	28.179	35.221
2.667	105	12.652	17.832	23.134	28.590	35.735
2.743	108	12.831	18.085	23.462	28.996	36.242
2.819	111	13.008	18.334	23.786	29.396	36.742
2.896	114	13.183	18.580	24.105	29.790	37.235
2.972	117	13.355	18.823	24.420	30.180	37.722
3.048	120	13.525	19.063	24.731	30.564	38.202



CITY OF MISSISSAUGA
Transportation and Works

Existing Main Street Storm Sewer Analysis
Pre-Development Condition
10-Year Storm

Development: **City Park (Main St.) Homes Inc.**
Consultant: **Condeland Engineering Limited**
Major Drainage area:

SHEET: 1 of 1
DESIGNED BY : DLM
CHECKED BY: M.E.H., P.Eng.

DATE: **10/25/19**

LOCATION OF SITE	FROM UPSTREAM	TO DOWNSTREAM	ADJACENT CONTRIBUTARY AREA	RUNOFF COEFFICIENT	AREA TIMES RUNOFF COEFFICIENT	ACCUMULATED AREA DRAINED BY SECTION	ACCUMULATED AREA TIMES RUNOFF COEFFICIENT FOR SECTION	FLOW TIME TO SECTION FROM EXTREME UPSTREAM INLET	INITIAL TIME OF CONCENTRATION AT EXTREME UPSTREAM INLET	TIME OF CONCENTRATION UPSTREAM END OF SECTION	INTENSITY OF RAINFALL	QUANTITY OF FLOW TO BE ACCOMMODATED IN SECTION	TYPE OF PIPE	MANNING'S ROUGHNESS COEFFICIENT	SLOPE	DIAMETER	LENGTH OF SECTION	VELOCITY OF FLOW WITH PIPE FLOWING FULL	CAPACITY OF PIPE FLOWING FULL	PIPE INVERT AT UPSTREAM MANHOLE	PIPE INVERT AT DOWNSTREAM MANHOLE	TIME OF FLOW IN SECTION	% Utilization
	MH#	MH#	A_A	C_A	$A_A \times C_A$	Sum A_A	Sum $A_A \times C_A$	tc_f	tc_i	$tc = tc_f + tc_i$	i			n	s	D	L	V	Q				
			(ha)			(ha)		(min)	(min)	(min)	(min/hr)	(liter/sec)			(%)	(mm)	(m)	(m/sec)	(m^3/sec)	(m)	(m)	(min)	(m)
Main Street	Ex. MH 1	Ex. MH 2	1.640	0.40	0.656	1.640	0.656		10.00	10.00	124.77	227.39	RCP	0.013	7.00%	300	105.00	3.62	0.256	158.75	151.40	0.48	88.95%
Wyndham St.		Ex. MH 2	0.980	0.40	0.392	0.980	0.392																
Main Street	Ex. MH 2	Ex. MH 3	0.880	0.40	0.352	3.500	1.400			10.63	120.73	469.55	RCP	0.013	2.50%	450	107.00	2.83	0.450	151.18	148.50	0.63	104.24%
Mill Street		Ex. MH 3	0.560	0.40	0.224	0.560	0.224																
Main Street	Ex. MH 3	Ex. MH 5	0.210	0.40	0.084	4.270	1.708			11.01	118.45	562.04	RCP	0.013	2.50%	450	64.00	2.83	0.450	148.05	146.45	0.38	124.77%
Main St. / Creek	Ex. MH 5	OUTFALL	0.000	0.40	0.000	4.270	1.708			11.13	117.74	558.65	RCP	0.013	1.00%	525	14.50	1.99	0.430	145.80	145.65	0.12	129.99%

CITY OF MISSISSAUGA
Transportation and Works

Existing Main Street Storm Sewer Analysis
Post-Development Condition
10-Year Storm

Development: **City Park (Main St.) Homes Inc.**
Consultant: **Condeland Engineering Limited**
Major Drainage area:

SHEET: 1 of 1
DESIGNED BY : DLM
CHECKED BY: M.E.H., P.Eng.

DATE: **10/28/19**

LOCATION OF SITE	FROM UPSTREAM	TO DOWNSTREAM	ADJACENT CONTRIBUTARY AREA	RUNOFF COEFFICIENT	AREA TIMES RUNOFF COEFFICIENT	ACCUMULATED AREA DRAINED BY SECTION	ACCUMULATED AREA TIMES RUNOFF COEFFICIENT FOR SECTION	FLOW TIME TO SECTION FROM EXTREME UPSTREAM INLET	INITIAL TIME OF CONCENTRATION AT EXTREME UPSTREAM INLET	TIME OF CONCENTRATION UPSTREAM END OF SECTION	INTENSITY OF RAINFALL	QUANTITY OF FLOW TO BE ACCOMMODATED IN SECTION	TYPE OF PIPE	MANNING'S ROUGHNESS COEFFICIENT	SLOPE	EXISTING PIPE DIAMETER	LENGTH OF SECTION	VELOCITY OF FLOW WITH PIPE FLOWING FULL	CAPACITY OF PIPE FLOWING FULL	PIPE INVERT AT UPSTREAM MANHOLE	PIPE INVERT AT DOWNSTREAM MANHOLE	TIME OF FLOW IN SECTION	% Utilization
	MH#	MH#	A_A	C_A	$A_A \times C_A$	Sum A_A	Sum $A_A \times C_A$	tc_f	tc_i	$tc = tc_f + tc_i$	i			n	s	D	L	V	Q				
			(ha)			(ha)		(min)	(min)	(min)	(min/hr)	(liter/sec)			(%)	(mm)	(m)	(m/sec)	(m^3/sec)	(m)	(m)	(min)	(m)
Main Street	Ex. MH 1	Ex. MH 2	1.640	0.40	0.656	1.640	0.656		10.00	10.00	124.77	227.39	RCP	0.013	7.00%	300	105.00	3.62	0.256	158.75	151.40	0.48	88.95%
Wyndham St.	Entry	Ex. MH 2	0.980	0.40	0.392	0.980	0.392																
Site Connection			0.327	0.80	0.262							11.68											
			*Controlled area from the proposed development = 11.68 lps																				
Main Street	Ex. MH 2	Ex. MH 3	0.553	0.40	0.221	3.500	1.269			10.63	120.73	437.36	RCP	0.013	2.50%	450	107.00	2.83	0.450	151.18	148.50	0.63	97.09%
Mill Street		Ex. MH 3	0.560	0.40	0.224	0.560	0.224																
Main Street	Ex. MH 3	Ex. MH 5	0.210	0.40	0.084	4.270	1.577			11.01	118.45	530.68	RCP	0.013	2.50%	450	64.00	2.83	0.450	148.05	146.45	0.38	117.81%
Main St. / Creek	Ex. MH 5	OUTFALL	0.000	0.40	0.000	4.270	1.577			11.13	117.74	527.54	RCP	0.013	1.00%	525	14.50	1.99	0.430	145.80	145.65	0.12	122.75%

CONDELAND ENGINEERING LIMITED
MUNICIPAL DESIGN DIVISION - HYDRAULIC CALCULATIONS

PROJECT NO: 17-018 STORM SEWER ANALYSIS - SITE PLAN DEVELOPMENT
PROJECT LOCATION: Main St Existing Storm Sewer (EX MH1 to OUTFALL) **CALCS BY:** DM **CHECKED BY:** MEH
CLIENT: 2576954 ONTARIO INC.
DATE: 10/29/19

PRE- DEVELOPMENT HYDRAULIC GRADE LINE OF EXISTING STORM SEWER

	10-YR FLOW RATES	LOCATION
OUTFALL TO EX MH5	0.5587 cms	MAIN ST. @ OUTFALL
EX MH5 TO EX MH3	0.5620 cms	MAIN ST. @ MILL ST
EX MH3 TO PR. SITE CONN.	0.4696 cms	MAIN ST. @ PROJECT CONNECTION (EX CB 5)
PR. SITE CONN..TO EX MH2	0.4696 cms	MAIN ST. @ WYNDHAM ST
EX MH2 TO EX MH1	0.2274 cms	MAIN ST. @ CHURCH ST.

COEFFICIENT

FRICTION LOSS

$K = 2gn^2 = 2*9.814*(0.013)^2$
$= 0.0033$

HGL @ EX. OUTFALL DOWNSTREAM = 146.175 (BASED FROM THE OUTFALL PIPE OBVERT)

STATION	PIPE DIAMETER	DEPTH OF FLOW	AREA	WETTED PERIMETER	HYDRAULIC RADIUS	R4/3	V(VELOCITY)	VELOCITY HEAD	COEFFICIENT FRICTION LOSS	FRICTION SLOPE(Sf)	AVG Sf	LENGTH DOWNSTREAM PIPE	FRICTION HEAD LOSS	MH / BEND LOSS	TOTAL HEAD LOSS	INVERT OF STORM SEWER	NORMAL DEPTH ELV.	OBVERT OF STORM SEWER	HYDRAULIC GRADE LINE ELEVATION	COMMENT
EX OUTFALL UPSTREAM	0.525	0.525												0.0000	0.0000	145.65	146.18	146.18	146.18	HGL at Pipe Obvert
EX MH5 DNSTREAM	0.525	0.525	0.2164	1.6485	0.1313	0.06675	2.5822	0.3398	0.0033	0.0168	0.0168	14.50	0.2436		0.2436	145.80	146.33	146.33	146.42	Surcharge Condition
EX MH5 UPSTREAM	0.450													0.0170	0.0170	146.45	146.90	146.90	146.90	Surcharge Condition
EX MH3 DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	3.5354	0.6371	0.0033	0.0387	0.0387	64.00	2.4757		2.4757	148.05	148.50	148.50	149.38	Surcharge Condition
EX MH3 UPSTREAM	0.450													0.0319	0.0319	148.50	148.95	148.95	149.41	Surcharge Condition
PR. SITE CONNEC. DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	2.9542	0.4448	0.0033	0.0270	0.0270	35.80	0.9669		0.9669	149.50	149.95	149.95	150.37	Surcharge Condition
PR. SITE CONNEC. UPSTREAM	0.450														0.0000	149.50	149.95	149.95	150.37	Surcharge Condition
EX MH2 DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	2.9542	0.4448	0.0033	0.0270	0.0270	71.20	1.9230		1.9230	151.18	151.63	151.63	152.30	Surcharge Condition
EX MH2 UPSTREAM	0.300													0.0222	0.0222	151.40	151.62	151.70	152.32	Surcharge Condition
EX MH1 DNSTREAM	0.300	0.300	0.0707	0.9420	0.0750	0.03166	3.2187	0.5280	0.0033	0.0550	0.0550	105.00	5.7797		5.7797	158.75	158.97	159.05	158.10	No Surcharge Condition

HGL IS ABOVE SEWER, OBVERT, SURCHARGE CONDITION

THEORETICAL HGL IS BELOW OBVERT NO SURCHARGE - HGL BASED ON GRAVITY FLOW LEVEL WITHIN PIPE

CONDELAND ENGINEERING LIMITED
MUNICIPAL DESIGN DIVISION - HYDRAULIC CALCULATIONS

PROJECT NO: 17-018 STORM SEWER ANALYSIS - SITE PLAN DEVELOPMENT
PROJECT LOCATION: Main St Existing Storm Sewer (EX MH1 to OUTFALL) **CALCS BY:** DM **CHECKED BY:** MEH
CLIENT: 2576954 ONTARIO INC.
DATE: 10/29/19

POST- DEVELOPMENT HYDRAULIC GRADE LINE OF EXISTING STORM SEWER

	10-YR FLOW RATES	LOCATION
OUTFALL TO EX MH5	0.5275 cms	MAIN ST. @ OUTFALL
EX MH5 TO EX MH3	0.5307 cms	MAIN ST. @ MILL ST
EX MH3 TO PR. SITE CONN.	0.4374 cms	MAIN ST. @ PROJECT CONNECTION (EX CB 5)
PR. SITE CONN..TO EX MH2	0.4374 cms	MAIN ST. @ WYNDHAM ST
EX MH2 TO EX MH1	0.2274 cms	MAIN ST. @ CHURCH ST.

COEFFICIENT

FRICTION LOSS

$K = 2gn^2 = 2*9.814*(0.013)^2$
$= 0.0033$

HGL @ EX. OUTFALL DOWNSTREAM = 146.175 (BASED FROM THE OUTFALL PIPE OBVERT)

STATION	PIPE DIAMETER	DEPTH OF FLOW	AREA	WETTED PERIMETER	HYDRAULIC RADIUS	R4/3	V(VELOCITY)	VELOCITY HEAD	COEFFICIENT FRICTION LOSS	FRICTION SLOPE(Sf)	AVG Sf	LENGTH DOWNSTREAM PIPE	FRICTION HEAD LOSS	MH / BEND LOSS	TOTAL HEAD LOSS	INVERT OF STORM SEWER	NORMAL DEPTH ELV.	OBVERT OF STORM SEWER	HYDRAULIC GRADE LINE ELEVATION	COMMENT
EX OUTFALL UPSTREAM	0.525	0.525												0.0000	0.0000	145.65	146.18	146.18	146.18	HGL at Pipe Obvert
EX MH5 DNSTREAM	0.525	0.525	0.2164	1.6485	0.1313	0.06675	2.4380	0.3029	0.0033	0.0150	0.0150	14.50	0.2172		0.2172	145.80	146.33	146.33	146.39	Surcharge Condition
EX MH5 UPSTREAM	0.450													0.0151	0.0151	146.45	146.90	146.90	146.90	Surcharge Condition
EX MH3 DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	3.3385	0.5681	0.0033	0.0345	0.0345	64.00	2.2076		2.2076	148.05	148.50	148.50	149.11	Surcharge Condition
EX MH3 UPSTREAM	0.450													0.0284	0.0284	148.50	148.86	148.95	149.14	Surcharge Condition
PR. SITE CONNEC. DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	2.7516	0.3859	0.0033	0.0234	0.0234	35.80	0.8388		0.8388	149.50	149.86	149.95	149.97	Surcharge Condition
PR. SITE CONNEC. UPSTREAM	0.450														0.0000	149.50	149.86	149.95	149.97	Surcharge Condition
EX MH2 DNSTREAM	0.450	0.450	0.1590	1.4130	0.1125	0.05435	2.7516	0.3859	0.0033	0.0234	0.0234	71.20	1.6683		1.6683	151.18	151.54	151.63	151.64	Surcharge Condition
EX MH2 UPSTREAM	0.300													0.0193	0.0193	151.40	151.62	151.70	151.66	No Surcharge Condition
EX MH1 DNSTREAM	0.300	0.300	0.0707	0.9420	0.0750	0.03166	3.2187	0.5280	0.0033	0.0550	0.0550	105.00	5.7797		5.7797	158.75	158.97	159.05	158.97	No Surcharge Condition

HGL IS ABOVE SEWER, OBVERT, SURCHARGE CONDITION

THEORETICAL HGL IS BELOW OBVERT NO SURCHARGE - HGL BASED ON GRAVITY FLOW LEVEL WITHIN PIPE

12-012
12-018

STA. 0+025 — FULL DEPTH RECONSTRUCTION FOR WIDENING, ASPHALT PADDING ON EXISTING — STA. 0+070 — PADDING WITH GRAN. 'A' AND ASPHALT — STA. 0+140 — FULL DEPTH RECONSTRUCTION FOR WIDENING, ASPHALT PADDING ON EXISTING — STA. 0+170

MAIN STREET

CHURCH STREET

WYNDHAM STREET

MILL ST.

FULL DEPTH RECONSTRUCTION

BORN TO MATCH

2.0 C.S.W.

R. SWALE

SWALE

CB1 CB2 CB3 CB4 CB5 CB6 CB7

M.H. 1 O.P.S.D. 701.05

M.H. 2 O.P.S.D. 701.03

M.H. 3 O.P.S.D. 701.03

M.H. 4 O.P.S.D. 701.03
N. INV 148.30
S. INV 148.40

ILLUMINATED SIGN REMOVED AND REINSTATED BY OTHERS

20m - 300 Ø E.S. CONC STM. SEW @ 0.5%

REFER TO C-21858

REFER TO C-21792

REMOVE EXIST. M.H., STM. SEW. AND HEADWALL

EX. 300 STM. SEW.

MATCH EXIST ELEV STA. 0+020

8.0%

B.V.C. STA. 0+047.931 ELEV. 157.366

EXIST 450 SAN SEW

105m - 300 Ø E.S. CONC. STM. SEW @ 3.0%

E. INV. 158.75

FINAL ℄ ROAD GRADE

EXIST ℄ RD. GR.

M.H. 2 O.P.S.D. 701.03

W. INV. 151.40
N. INV. 151.96
E. INV. 152.26
S. INV. 151.26

107m - 450 Ø CL III CONC STM SEW @ 2.5%

EX. 300 SAN SEW.

64m - 450 Ø CL III CONC STM SEW @ 2.5%

EX. 300 SAN SEW

W. INV. 149.50
N. INV. 149.06
E. INV. 149.20
S.

V.C. DATA
L.V.I. 100.00
P.V.I. STA. 0+097.931
P.V.I. ELEV. 153.366

E.V.C. STA. 0+147.931 ELEV. 152.266
B.V.C. STA. 0+147.931 ELEV. 152.266

V.C. DATA
L.V.I. 24.138
P.V.I. STA. 160.00
P.V.I. ELEV. 152.00

E.V.C. STA. 0+172.069 ELEV. 151.634

3.0%

B.V.C. STA. 0+213.081 ELEV. 150.408

287° 600 E 4 826 700 N — 287° 700 E 4 826 600 N — 287° 750 E 4 826 650 N — 287° 900 E 4 826 800 N

	159.600	158.000	156.443	155.099	153.987	153.107	152.459	151.976	151.400	150.800	150.214	149.800	FINAL ℄ RD. GR.
161.00	159.61	157.88	156.18	154.69	153.56	152.76	152.33	151.89	151.50	150.74	149.68	148.72	EXIST ℄ RD. GR.
0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		

REVISIONS

DATE	DETAILS	INIT
JULY 11/86	C.B.'S ON WYNDHAM ST.	DN

DITCH INLET C.B. DETAILS

No.	INLET ELEV.	INVERT ELEV	O.P.S.D. TYPE	
1.	154.00	152.90	705.01	
2.	152.20	151.30	705.02	TYPE 'A'
3.	152.00	151.00	705.02	TYPE 'A'
4.	151.90	150.70	705.02	TYPE 'A'
5.	151.30	150.10	705.02	TYPE 'A'
6.	150.80	149.90	705.01	
7.	153.80	152.80	705.01	

"LIFE LIGHT" INSTALLATION DETAILS

START STA.	STOP STA.	SPACING	QUAINTITY
0+032	0+086	18m	4
0+120	0+156	9m	5
0+160	0+240	5m	17
0+250	0+332	9m	9

MARKERS TO BE STINSONITE MODEL No. 96 L.P.A.Y. (TWO WAY YELLOW) DOUBLE YELLOW, TO BE INSTALLED IN ACCORDANCE WITH MANUFACTER'S INSTRUCTIONS UNDER THE GUIDANCE OF ENGINEERING, TRAFFIC SECTION

▲ DENOTES "LIFE LIGHT" MARKER

GENERAL NOTES

- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN FIELD.
- ● DENOTES BUILDING – NOT LOCATED.
- ⊏ DENOTES BUILDING – LOCATED.
- T.T.B.M. No. ELEV.
- TEMP BENCH MARK ELEV. DESCRIPTION.

REGISTERED PROFESSIONAL ENGINEER — CIVIL — L. G. TENUTE — PROVINCE OF ONTARIO

DESIGNED BY L. G. Tenuta — CHKD. — CHKD. BY

CITY OF MISSISSAUGA
ENGINEERING AND WORKS DEPARTMENT

MAIN STREET
CREDIT RIVER BRIDGE TO CHURCH STREET

STN. 0+000 TO STN. 0+240

SCALE HOR. 1:800 VERT. 1:80	AREA Z-38	PROJECT No. 85-184
DRAWN BY DN	CHECKED BY PJD	PLAN No. C-21791
DATE APRIL/86	SHEET 1 OF 4	

C-21791

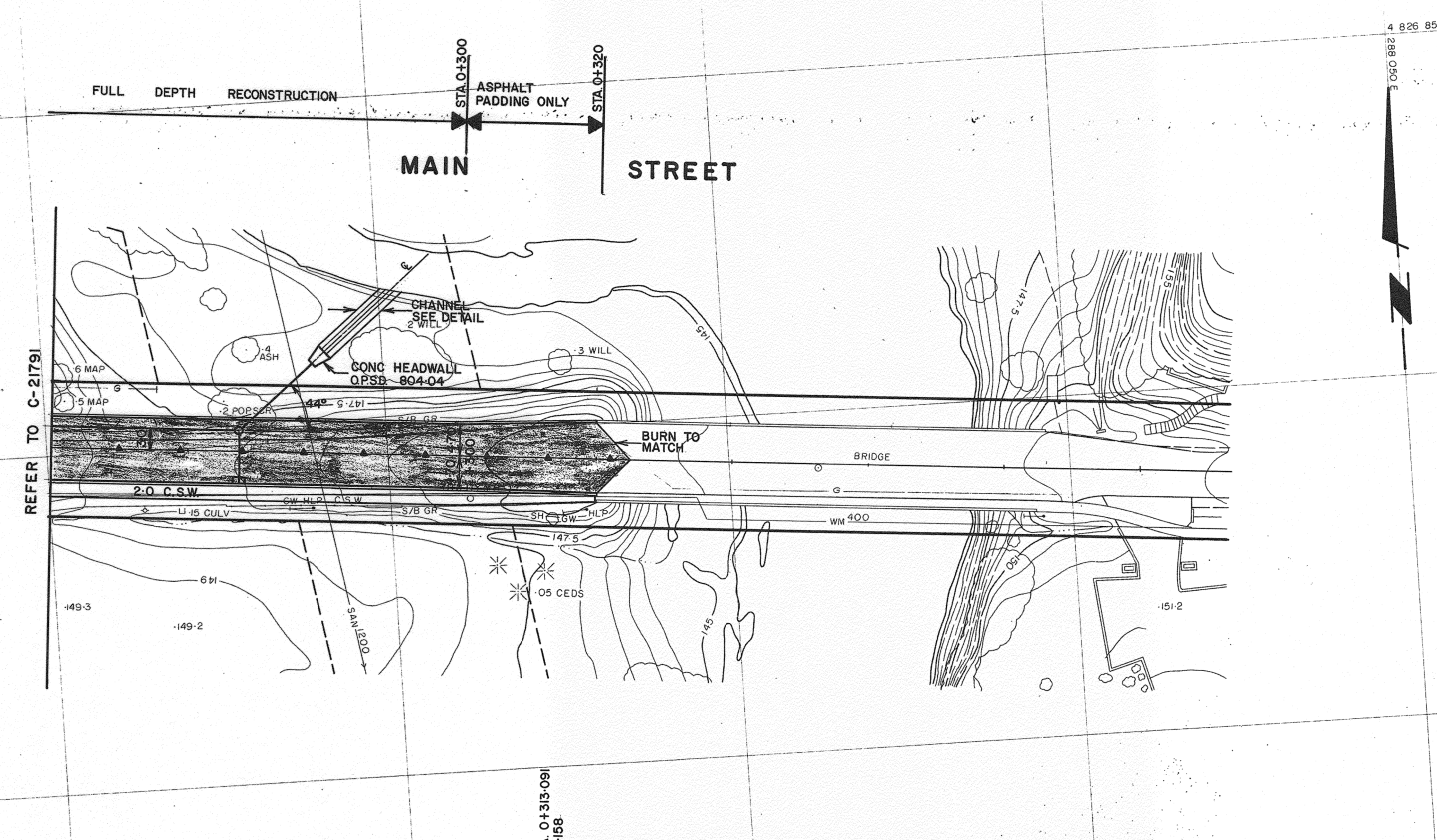
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		

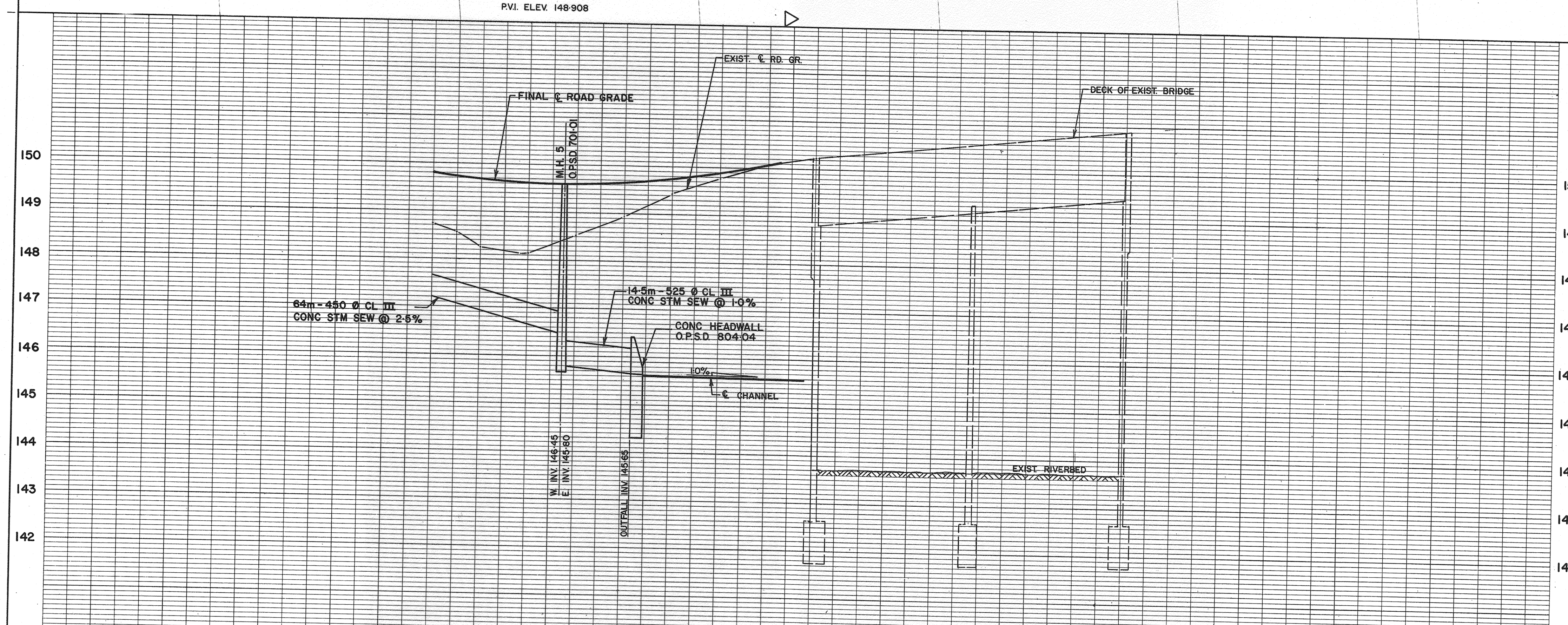
REVISIONS

DATE	DETAILS	INIT.

Disclaimer
These records are provided "as is", without any warranties and are based on available and unverified information and may prove to be inaccurate. The City of Mississauga disclaims and is released from any responsibility and liability should these records be relied upon to be detriment of any person.



V. C. DATA
L.V.I. 100·00
P.V.I. STA. 0+267·636
P.V.I. ELEV. 148·908



	0+240	0+260	0+280	0+300	0+320
FINAL ℄ RD. GR.	149·800	149·606	149·632	149·878	
EXIST. ℄ RD. GR.	148.72	148.14	148.93	149.78	150.25
CHAINAGE	0+240	0+260	0+280	0+300	0+320

GENERAL NOTES

- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN FIELD.
- ● DENOTES BUILDING - NOT LOCATED.
- ⊏ DENOTES BUILDING - LOCATED.
- T.T.B.M. No. ELEV.
- TEMP BENCH MARK ELEV. DESCRIPTION.

REGISTERED PROFESSIONAL ENGINEER — CIVIL — L. G. TENUTE — PROVINCE OF ONTARIO

DESIGNED BY L.G. Tenute

APPROVED

CITY OF MISSISSAUGA
ENGINEERING AND WORKS DEPARTMENT

MAIN STREET
CREDIT RIVER BRIDGE TO CHURCH STREET

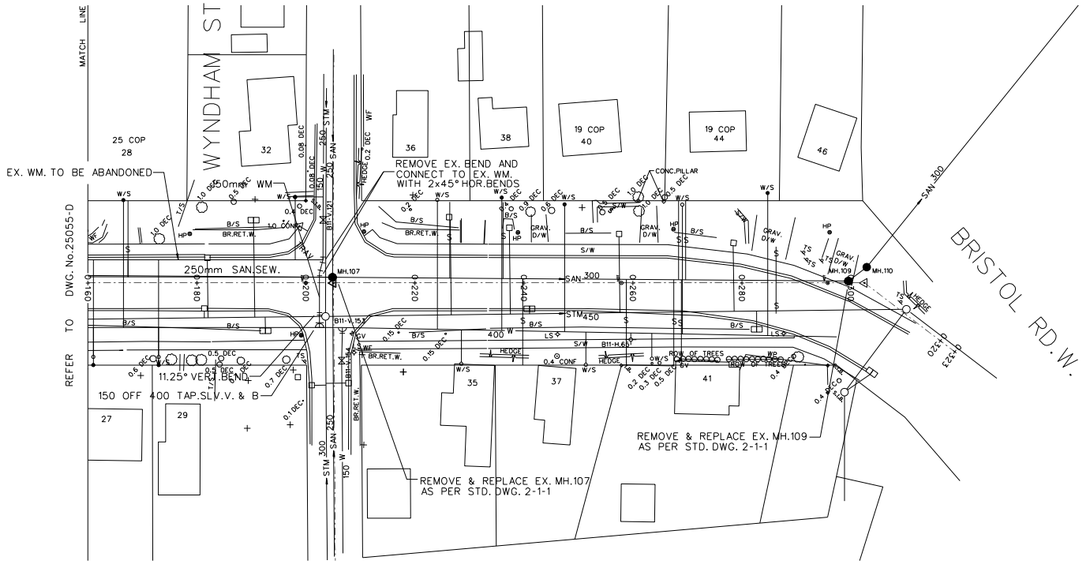
STN.0+240 TO STN. 0+320

SCALE HOR. 1 : 500 VERT. 1 : 50	AREA Z·38	PROJECT No. 85-184
DRAWN BY DN	CHECKED BY	PLAN No.
DATE APRIL /86	SHEET 2 OF 4	C-21792

C-21792

MAIN STREET

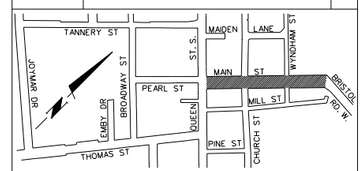
REFER TO DWG. No.20915-D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

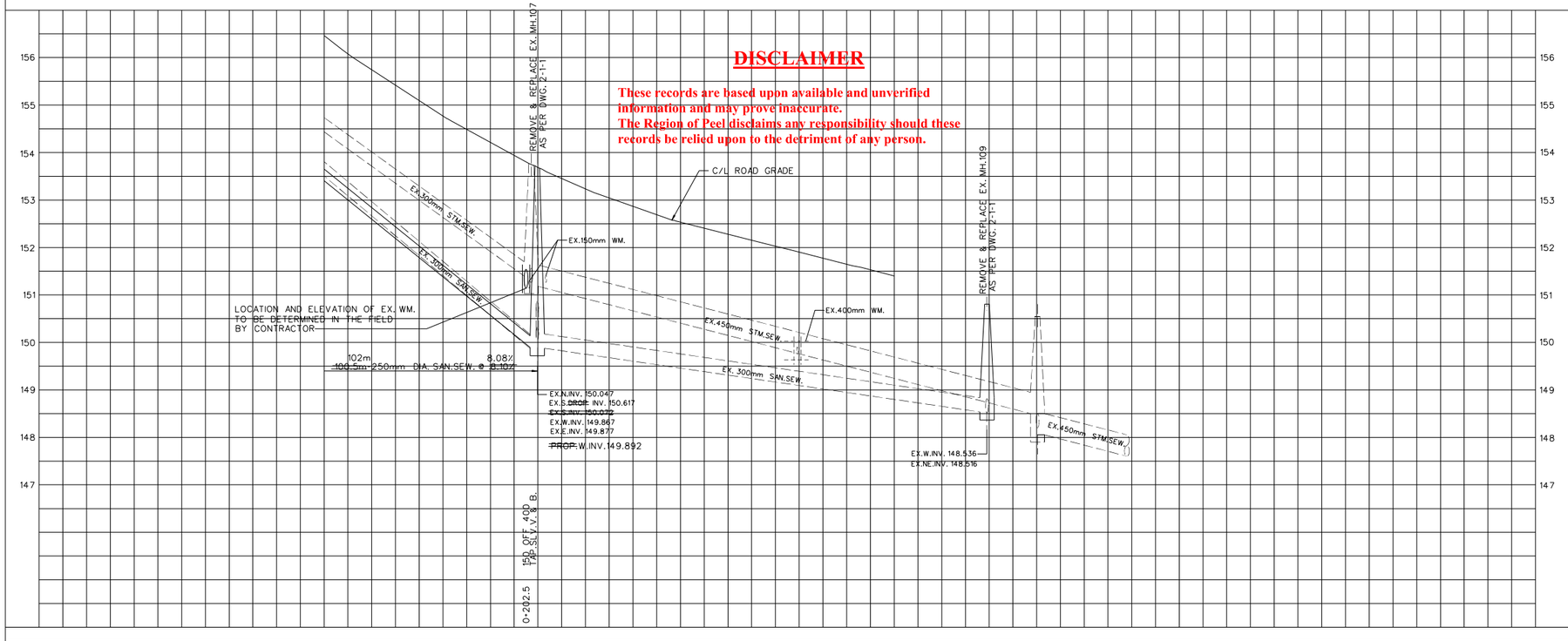
REVISIONS

DATE	DETAILS	INIT.
JULY 17, 2000	AS CONSTRUCTED	Y.C.



KEY PLAN
N.T.S.

NOTE: FOR LEGEND, GENERAL NOTES, REINSTATEMENT DETAIL AND BEDDING AND BACKFILL DETAIL SEE DWG. No.24861-D



~~DISCLAIMER~~

These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.

General Notes

- All Driveways ASPHALT Unless Otherwise Noted.
- All Service Locations Are Approximate And Must Be Located Accurately In The Field
- Denotes Building - Not Located
- Denotes Building Located
- Type 'B' Bedding Unless Otherwise Noted (SAN)

B.M. No. Elev.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only. To Be Verified In Field By Contractor.

Designed by

Approved by

Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Public Works

MAIN STREET

(FROM QUEEN ST.S. TO BRISTOL RD.W.)

150mm WATERMAIN
250mm SANITARY SEWER

Sta. 0+160 **To Sta.** 0+300

Lots	Area Z-39	Project No.	99-1700 99-2365
Checked by	Drawn by Y.C.		
Date JUNE 16, 99	Sheet 2 of 2	Plan No.	25056-D

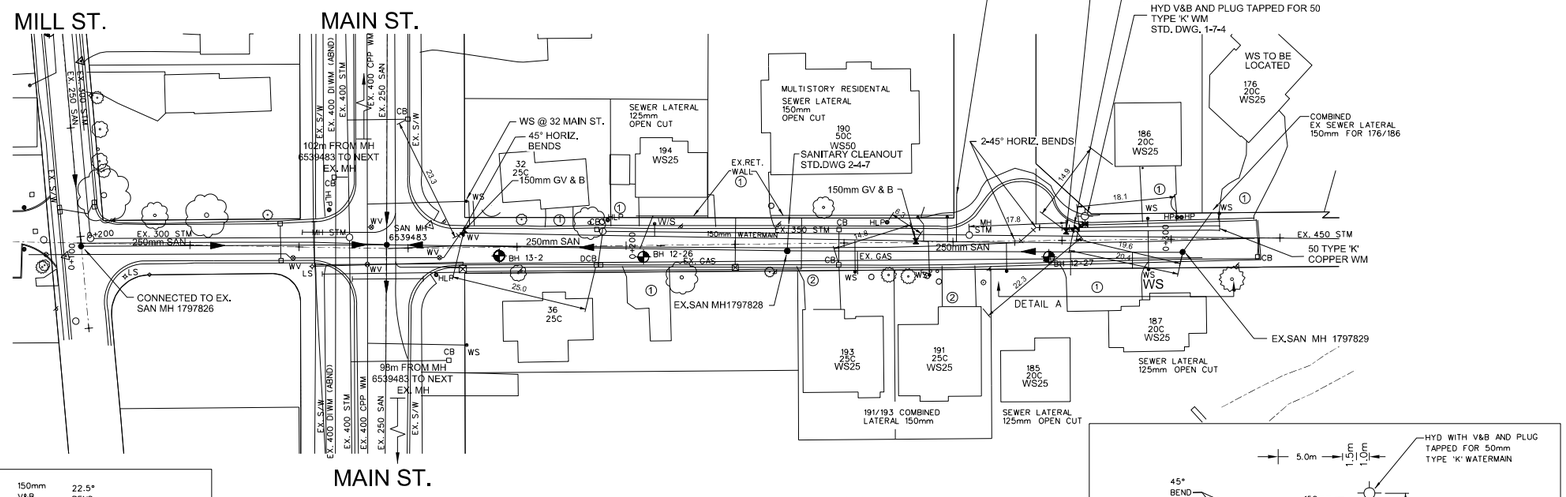
NOTE 1:
THE EXISTING SANITARY SEWER WAS REMOVED AND REPLACED WITH NEW SANITARY SEWER ON THE EXISTING ALIGNMENT.

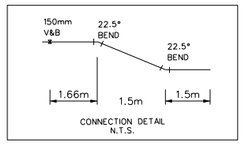
NOTE 2:
HOUSE # 186 AND 176 EX. COMBINED SEWER LATERRALS ARE CONNECTED TO THE EX.MH, NOT REPLACED.

As Constructed Drawings

Contractor: RAYMALI
Date: October 6, 2015
Inspector: Fidel Sannella
Asad Rafif

WYNDHAM STREET





NOTE:
SPECIFICATION FOR HYDRANTS, MAINLINE VALVES AND CURB STOPS.
1. FIRE HYDRANTS – AVK MODEL #2700 SERIES 27
2. MAINLINE VALVES – AVK SERIES 25
3. CURB STOPS – CAMBRIDGE BRASS 311NL–A3H3, A4H4, A5H5, A6H6, A7H7

DISCLAIMER

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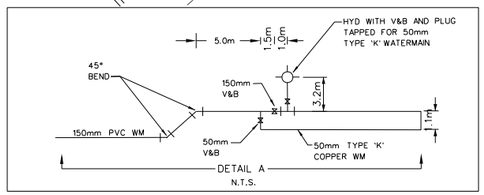
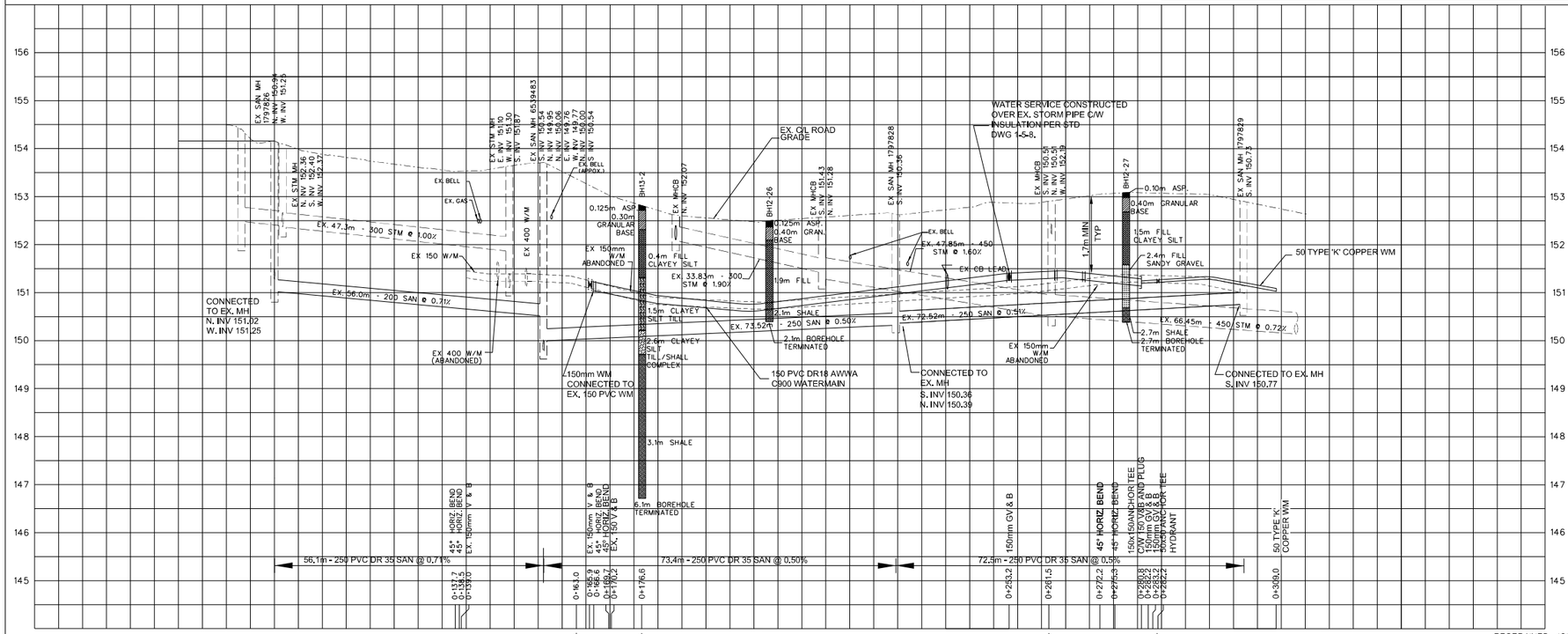
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



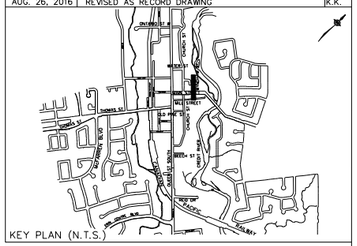


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
ENBRIDGE	13.12.2011	E.L.	GROUP TELECOM	05.12.2011	E.L.
STORM SEWERS	00.00.2011	X.X.	BELL U/G CABLE	15.12.2011	E.L.
WATERMAINS	00.00.2011	X.X.	HYDRO U/G CABLE	01.12.2011	E.L.
TRANSIT	00.00.2011	X.X.	HYDRO ONE	17.11.2011	E.L.
PARKS & REC.	00.00.2011	X.X.	CITY OF MISSISSAUGA	29.11.2011	E.L.
ONT. CLEAN WATER	17.11.2011	E.L.	ROGERS COMMUNIC.	28.03.2012	E.L.

REVISIONS

DATE	DETAILS	INIT.
NOV 29, 2013	ISSUED FOR TENDER	H.I.
FEB 03, 2015	ISSUED FOR CONSTRUCTION	H.I.
AUG. 26, 2016	REVISED AS RECORD DRAWING	K.K.



ALL UTILITY CROSSINGS ARE SHOWN IN APPROXIMATE LOCATION AND ELEVATION. CONTRACTOR TO CONFIRM ALL UTILITY CROSSINGS AND PROVIDE MIN. CLEARANCE PER REGION OF PEEL'S STANDARDS

FOR NOTES, DETAILS AND LEGEND SEE PLAN No. 46862-D AND 46863-D.

THIS DRAWING TO BE USED FOR WATERMAIN AND SANITARY SEWER CONSTRUCTION ONLY.

CONTRACTOR TO MAINTAIN WASTEWATER FLOW FROM ALL BUILDINGS DURING CONSTRUCTION OF THE PROPOSED SANITARY SEWER.

CONTRACTOR TO MAINTAIN WATER TO ALL BUILDINGS DURING CONSTRUCTION OF THE PROPOSED WATERMAIN PER TEMPORARY WATER PLAN.

General Notes

All Service Locations Are Approximate And Must Be Located Accurately In The Field

- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCHBASIN
- EXISTING DOUBLE CATCHBASIN
- EXISTING WATER SERVICE
- EXISTING WATER VALVE AND BOX
- EXISTING ELECTRICAL TRANSFORMER
- EXISTING STREET LIGHT
- EXISTING STREET SIGN
- EXISTING TREE

(1) ASPHALT DRIVEWAY SURFACE
(2) INTERLOCK DRIVEWAY SURFACE
(3) PATTERNED CONCRETE DRIVEWAY
(4) CONCRETE DRIVEWAY SURFACE
(5) GRAVEL DRIVEWAY SURFACE

100X2 CONCRETE ENCASED ELECTRICAL DUCTS (SIZE AND QUANTITY SHOWN ON PLANS)

B.M. No.	Elev.	Desc.
63-4	163.422	On the North face at the West corner of the Toronto-Dominion Bank on the Northeast side of Queen St. Opposite Tannery St.
257	161.959	On the South face, 0.61m West of the East corner of the Nova Scotia Bank Building at the Northwest corner of Thomas St. and Queen St.
773	163.532	On the West fact at the North end of the red brick Royal Canadian Legion building on the East side of Church St. 91.4m South of Ontario St.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

BURNSIDE
R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga, Ontario, L5N 8R9
telephone (905) 821-1800
fax (905) 821-1809
www.rjburnside.com
MTB17149

Designed by
Approved by
Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

WYNDHAM STREET

(FROM MAIN STREET TO NORTH OF MAIDEN LANE)
150mm WATERMAIN
250mm SANITARY SEWER
STA. 0+100 TO STA. 0+320

CAD Area		Area	Z-38
Checked by	H.I.	Drawn by	B.Y.
Date	APR 8, 2014	Sheet	1 of 1

Project No. 11-2305 12-1345
Plan No. 46856-D

WATER BALANCE CALCULATION

PROJECT: **CITY PARK (MAIN ST) INC.** **Date:** October 28, 2019

Total Site Area = 8268.63 cu.m.

Based on daily rainfall target depth of 5.0 mm
Average Rainfall Vol. for the Site = 8268.63 sq.m x 0.005 m = 41.34 cu.m.

Drainage Catchment Area (sq.m.)		Initial Abstraction / Capture	Daily Volume Retained (cu.m.)	
Hard/ Soft Area directed to Cultec1 =	1143.59	-	-	9.40
Hard Surface Controlled (road, d/w, s/w) =	791.87	1.0 mm	791.87 x 0.001	0.79
Soft Landscaped Controlled=	386.20	5.0 mm	386.20 x 0.005	1.93
Hard Surface Uncontrolled(road, d/w, s/w) =	222.10	1.0 mm	222.10 x 0.001	0.22
Soft Landscaped/ Undisturbed Uncontrolled=	4245.83	5.0 mm	4245.83 x 0.005	21.23
*Condo Roof Areas (Rain Barrels / Cistern) =	949.57	5.0 mm	949.57 x 0.005	4.75
*Freehold Roof Areas (Rain Barrels / Cistern) =	529.47	5.0 mm	529.47 x 0.005	7.40
	8268.63		**Total =**	**45.72 cu.m.**
			% = 45.72 / 41.34	**110.6%**
			Calculated Runoff Retention	**5.5 mm**

* Refer to Rainwater Barrel and Infiltration Bed Design Calculations for More Details
Infiltration for Condo Lots 1,2, 18 and 19 are directed to Cultec 1.

Therefore the minimum water balance target of 5 mm has been achieved.

SUB-SURFACE INFILTRATION TRENCH DESIGN BELOW CULTEC SYSTEM (Chamber #1)

Percolation Rate Used = *15.0 (mm/Hr)

** In-situ Percolation Rate for the site not available yet.*
The minimum percolation rate is 15 mm/hr required for infiltration is used.

Trench Design
Calculate Trench Bottom Area Using Equation = 4.3 (MOE SWM Manual)

A = 1000 V/ PnT
Where
A = Trench Bottom Area (sq.m)
V = Runoff Volume to be infiltrated
P = Percolation rate in mm/hr
n = Porosity of the Storage Media (Clear Stone = 0.4)
T= Retention Time in hours

Calculating Runoff Volume to be infiltrated

Post-development Drainage Area captured by CULTEC System = 1143.59 sq.m.
100 Yr Coefficient = 0.80
Impervious Area = 914.87 sq.m.

To contribute to the overall Site Water Balance runoff
from a 5 mm storm event must be retained, therefore: 5.00 mm 24 hr rainfall

Total site Runoff volume to be infiltrated = 4.57 cu.m.

Calculating Required Trench Bottom Area

V (runoff) cu.m	P (percolation rate mm/h)	n = Porosity of storage media (clear stone)	Retention Time (T) hrs	Required Trench Bottom Area (sq.m)
4.57	15.00	0.40	24.00	31.77

Calculating Depth of Storage Media (Trench Depth)
Using Equation 4.2 (MOE SWM Manual)

D = PT/1000

Where
D = Depth of Storage Media (m)
P = Percolation Rate (mm/hr) = 15.00
T = Drawdown Time (hrs) = 24.00

Depth (m)= D = 0.360 Use Depth(m) = 0.35

Percolation Rate Over Trench Area, or Qinfiltration

P (percolation rate mm/h)	P (percolation rate m/h)	Total Trench Bottom Area (sq.m.)	Qinfiltration (m^3/h)	Qinfiltration (lps)
15.00	0.015	31.77	0.19	**0.05**

Checking Storage availability

Trench Bottom Area (sq.m)	Trench Depth (m)	Trench Volume (cu.m)	n, porosity of Storage Media (clear stone)	Storage Media Volume (cu.m)
67.16	0.35	23.51	0.40	**9.40**

Infiltration Trench #1 - CULTEC 150XLHD = 3.43m x 19.58m = 67.16 sq.m.

RAINWATER BARREL / CISTERN SIZING CALCULATION (CONDO LOTS)

PROJECT: **CITY PARK (MAIN ST) INC.**

Date: 10/28/2019

Residential Roof Area =	949.57 sq.m.
Imperviousness % =	90%
Impervious Area =	854.61 sq.m.
Water Balance Target calculation, runoff from a 10mm storm event must be retained on-site, therefore:	5.0 mm 24hr rainfall
Total site Runoff Volume to be Retained On-site =	**4.27 cu.m.**
Total Number of Lots =	**15**
***Required Rainwater Barrel Capacity per Lot =**	**0.28 cu.m.**

*** Rain Barrel size is readily available.**

]

RAINWATER BARREL / CISTERN SIZING CALCULATION (FREEHOLD LOTS)

PROJECT: **CITY PARK (MAIN ST) INC.**

Date: 10/29/2019

Residential Roof Area =	529.47 sq.m.
Imperviousness % =	90%
Impervious Area =	476.52 sq.m.
Water Balance Target calculation, runoff from a 10mm storm event must be retained on-site, therefore:	5.0 mm 24hr rainfall
Total site Runoff Volume to be Retained On-site =	**2.38 cu.m.**
Total Number of Lots =	**7**
***Required Rainwater Barrel Capacity per Lot =**	**0.34 cu.m.**

*** Rain Barrel size is readily available.**

City of Toronto - Water Balance Initial Abstraction Chart

Surface Type	Initial Abstraction	TSS Removal	Runoff Coefficient
Impervious roof	1mm	80%	0.90
Asphalt pavement	1mm	0%	0.90
Landscape	5mm	80%	0.25
Green Roof	7mm max for intensive roofs otherwise 5mm	80%	0.45-0.5
Permeable Pavers	5mm	80% with storage bed otherwise 50%	0.40
Concrete pavers	1mm	0%	0.9
Grassed swale	5mm	50% for a min length of 16m	0.25

Terraprobe
Consulting Geotechnical & Environmental Engineering
Construction Materials Inspection & Testing

GEOTECHNICAL INVESTIGATION
AND
SLOPE STABILITY STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
190 WYNDHAM STREET
MISSISSAUGA, ONTARIO

Prepared for: Wyndham Holdings Inc.
c/o ABA Architects Inc.
564 Weber Street N, Unit #5
Waterloo, Ontario
N2L 5C6

Attention: Ms. Carrie Curtis, P. Eng.

File No. 11-14-4109
February 13, 2015

Distribution:

4 Copies	-	ABA Architects Inc.
1 Copy	-	Wyndham Holdings Inc.
1 Copy	-	Terraprobe Inc., Brampton

Borehole No.	Sample No.	Depth	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Description (MIT)
3	2	1.0 m BG	6	15	45	34	CLAYEY SILT some sand, trace gravel
4	3	1.8 m BG	4	14	53	29	CLAYEY SILT some sand, trace gravel
5	3	1.8 m BG	4	10	42	44	CLAY AND SILT some sand, trace gravel
6	2	1.0 m BG	8	33	40	19	SANDY SILT some clay, trace gravel
7	2	1.0 m BG	28	42	30		SILTY, GRAVELLY SAND
9	2	1.0 m BG	37	44	19		GRAVELLY SAND some silt

BG = Below Grade

The results of the Atterberg Limits tests were plotted on A-Line Graph (refer to enclosed figures, Atterberg Limits Test Results). The following table presents a summary of the results of the Atterberg Limit tests:

Borehole No., Sample No.	Depth	Liquid Limit (W_L)	Plastic Limit (W_P)	Plasticity Index (I_P)	Natural Water Content (W_N)	Plasticity
BH 3, Sa. 2	1.0 m BG	36	19	17	16	Medium Plastic
BH 4, Sa. 3	1.8 m BG	33	20	13	13	Slightly Plastic
BH 5, Sa. 3	1.8 m BG	45	24	20	19	Medium Plastic

The results of the Atterberg Limits Tests classify the cohesive soil samples having a Slightly to Medium plasticity.

4.6 Ground Water

Observations pertaining to caving and ground water levels were made in the boreholes upon completion of drilling. Water levels were also measured on October 7, 2014 in the standpipe piezometers which were installed in selected boreholes at the time of drilling. The results of these observations are summarized as follows:

Borehole No.	Depth of Boring	Depth to Cave	Water Level Depth / Elevation at the time of drilling	Water Level Depth / Elevation on October 7, 2014
1	3.9 m BG	open	dry	3.2 m BG / 148.9 m
2	5.3 m BG	open	4.4 m BG / 147.6 m	NP
3	4.1 m BG	open	dry	NP

Borehole No.	Depth of Boring	Depth to Cave	Water Level Depth / Elevation at the time of drilling	Water Level Depth / Elevation on October 7, 2014
4	4.7 m BG	open	dry	3.4 m BG / 147.5 m
5	3.1 m BG	open	dry	NP
6	3.7 m BG	open	dry	dry
7	6.2 m BG	open	dry	NP
8	6.2 m BG	open	dry	4.2 m BG / 148.2 m
9	4.6 m BG	open	dry	NP

BG = Below Grade
NP = Piezometer not installed

It should be noted that the ground water levels indicated above may fluctuate seasonally depending on the amount of precipitation and surface runoff.

It is recommended that the final site grading plans should be reviewed by Terraprobe to ensure that they are consistent with the above recommendations.

5.12 In-Situ Infiltration Test

The in-situ permeability of the site soils was determined at two selected locations using Guelph Permeameter on September 18, 2014. The test locations (identified as Test holes TH1 and TH2) were specified by ABA Architects Inc., as shown on Figure 2. The tests were performed using a Guelph Permeameter (Model 2800). The test results are summarized below.

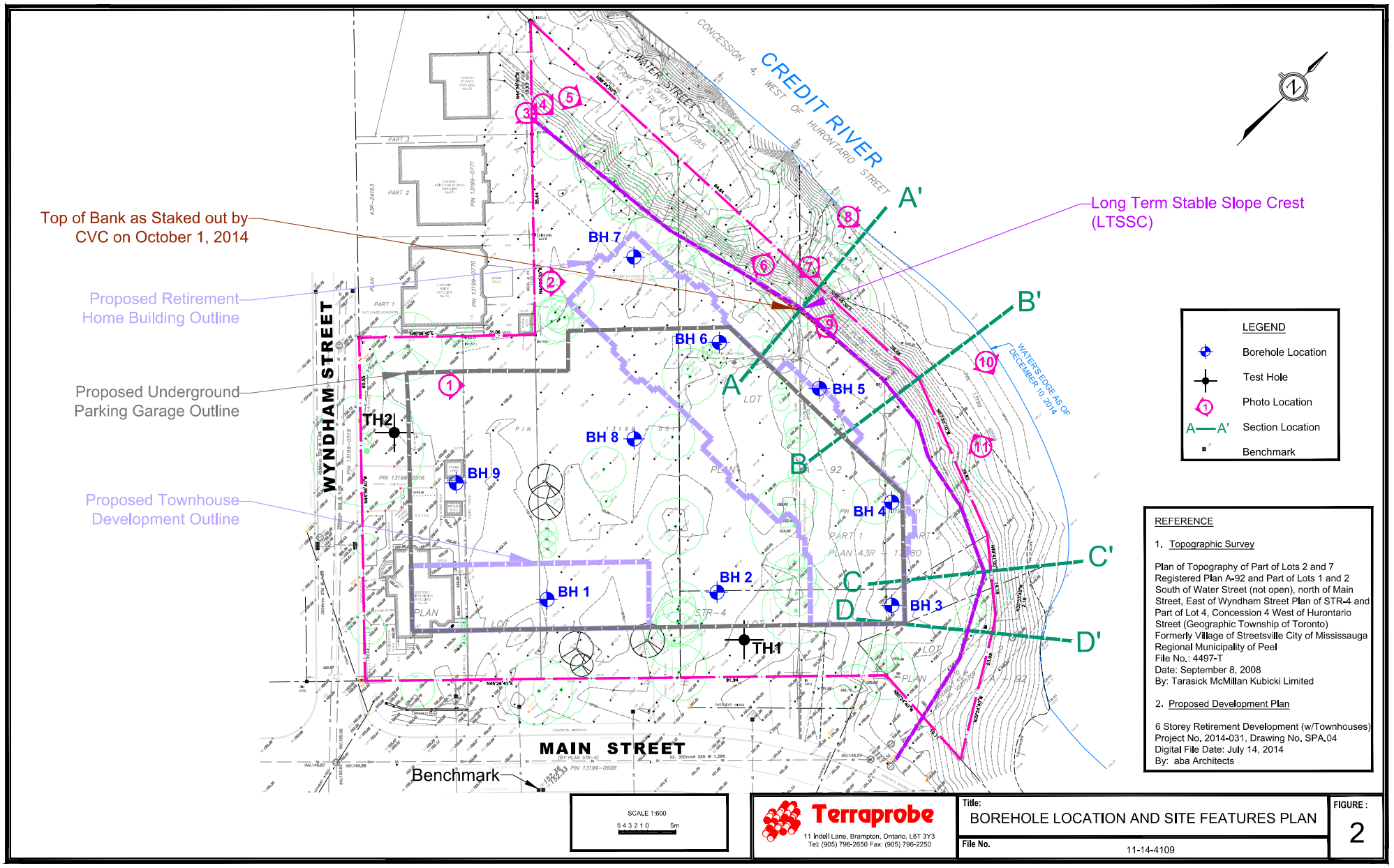
Test Location	Test Depth (m)	Field Permeability (cm/sec)	Approximate Percolation Rate	Soil Types
TH 1	0.6	3.92×10^{-4}	12 mins/cm	Sandy Silt, trace gravel
TH 2	0.45	3.48×10^{-4}	12 mins/cm	Sandy Silt, trace gravel

It should be noted that the soil percolation rates/permeability as noted above are estimated values based on the composition of the soil samples tested. It should be noted that the soil conditions may vary between and beyond the boreholes. Terraprobe does not present the estimated percolation rate/permeability given in this report as a warranty of performance for the soils tested. The client or any other party using this information as a basis for the design assumes all risks associated with their evaluation of this information and all other pertinent criteria used in the design.

Terraprobe Inc. assumes no responsibility for the application of the above-noted soil percolation rate/ permeability for use in the intended design. The site design must be conducted by a qualified professional with due regard to site-specific conditions and other design considerations. Further, Terraprobe Inc. does not present the estimated percolation rates and soil permeability values given in this report as a warranty of performance for the soils tested.

6. LIMITATIONS AND USE OF REPORT

It must be recognized that there are special risks whenever engineering or related disciplines are applied to identify subsurface conditions. A comprehensive sampling and testing programme implemented in strict accordance with the most stringent level of care may fail to detect certain conditions. Terraprobe has assumed for the purposes of providing advice, that the conditions that exist between sampling points are similar to those found at the sample locations. The conditions that Terraprobe has interpreted to exist between sampling points can differ from those that actually exist.



Terraprobe
11 Indell Lane, Brampton, Ontario, L6T 3Y3
Tel: (905) 796-2650 Fax: (905) 796-2250

Title: BOREHOLE LOCATION AND SITE FEATURES PLAN

File No. 11-14-4109

FIGURE : 2

Z:\Project Files\11-Geo\2014\11-14-4109A Dwgs, Logs\AutoCAD\11-14-4109 FIG 2_updated.dwg, sandys

APPENDIX 'F'

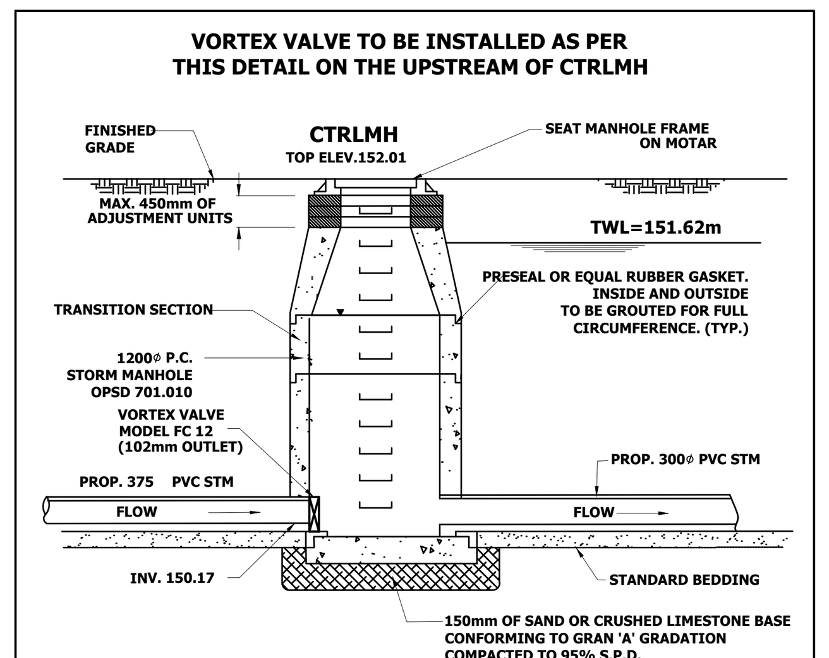
Conceptual Servicing Plan, Dwg #17-018-02

Conceptual Grading Plan, Dwg #17-018-03

Pre-Storm Tributary Plan, Dwg #17-018-04

Post-Storm Tributary Plan, Dwg #17-018-05

Sanitary Tributary Plan, Dwg #17-018-06



FOR CONTROL MH (CTRLMH) DETAIL
N.T.S.

EXCAVATION AND RESTORATION WORKS WITHIN MAIN STREET AND WYNDHAM STREET

VERTICAL TRENCH CONSTRUCTION AND RESTORATION FOR SANITARY/STORM SERVICES AND SEWERS, WATER SERVICES AND WATERMAIN. CONTRACTOR TO SAWCUT EXISTING ASPHALT AND REMOVE EXISTING CURB OFFSITE. CONTRACTOR TO BACKFILL EXCAVATION WITHIN MAIN STREET AND WYNDHAM STREET WITH APPROVED GRANULAR BACKFILL AND UNSHRINKABLE FILL AS SPECIFIED BY CITY OF MISSISSAUGA OPERATIONS DEPT. ASPHALT SURFACE AND CURB TO BE RESTORED TO EXISTING OR BETTER CONDITION. ALL RESTORATION WORK IS TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.

NOTE:
ROAD OCCUPANCY PERMITS TO BE OBTAINED BY CONTRACTOR FOR MAIN ST. AND WYNDHAM ST. CONSTRUCTION WORKS

NOTE:
ENTIRE ROOF DRAINAGE FROM BLOCKS 1,2,3 (UNITS 1-19) & BLOCKS 4,5(UNITS 1-7) SHALL BE DIRECTED TO PRIVATE ROADWAY

NOTE:
EXISTING SERVICE CONNECTIONS TO BE REMOVED AND CAPPED AT MAINS

DOUBLE CATCHBASINS (DCB) DATA * C/W INSULATION

No.	LENGTH	SLOPE	DIA	TOP	OUT INV	INV @ MH
DCB1	3.80m *	1.00%	250mmø	152.28	151.26	151.22
DCB2	0.80m *	5.00%	250mmø	152.28	151.26	151.22
DCB3	5.67m *	1.00%	250mmø	151.82	150.46	150.40
DCB4	4.13m	1.00%	250mmø	151.82	150.34	150.30

SANITARY MANHOLE DATA

No.	TYPE	TOP	IN INV	OUT INV
MH1A	(1200mmø)	153.37		150.44
MH2A	(1200mmø)	152.96	149.84	149.81
MH3A	(1200mmø)	152.53	149.57	149.54
MH4A	(1200mmø)	152.13	149.31	149.28
MH5A	(1200mmø)	152.01	149.12	149.09
MH6A	(1200mmø)	151.55	148.91	

STORAGE DATA

STORAGE #1	S INV=151.14 N INV=151.14 E INV=151.24 (RLCB1)
STORAGE #2	S INV=150.20 N INV=150.20

CROSSING INFORMATION

CROSSING #1	STM INV=150.26 SAN OBV=149.44 CLEARANCE=0.82m
CROSSING #2	STM INV=150.18 SAN OBV=149.27 CLEARANCE=0.91m

ROCK BREAKING NOTE:
PROPOSED STORM AND SANITARY SEWERS FOUNDED IN SHALE BEDROCK WILL REQUIRE ROCK BREAKING. SEWER BEDDING REQUIREMENTS WITHIN BEDROCK TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.

STORM MANHOLE DATA

No.	TYPE	TOP	IN INV	OUT INV
CDSMH1	PMSU20_15_4m	152.32		151.09
MH1	(1200mmø)	153.23	151.05	150.97
MH2	(1200mmø)	153.09	150.86	150.71
MH3	(1500mmø)	152.46	150.64	150.41
MH4	(1800mmø)	151.96	150.35	150.27
CDSMH2	PMSU20_15_4m	151.91	150.25	150.22
CTRLMH	(1200mmø)	152.01	150.17	150.14
MH5	(1200mmø)	151.84	150.10	

REAR LOT CATCHBASINS (RLCB) DATA * C/W INSULATION

No.	LENGTH	SLOPE	DIA	TOP	OUT INV	INV @ MAIN
RLCB1	30.72m*	0.50%	250mmø	152.35	151.44	151.29
RLCB2	30.50m*	0.50%	250mmø	152.35	151.49	151.34

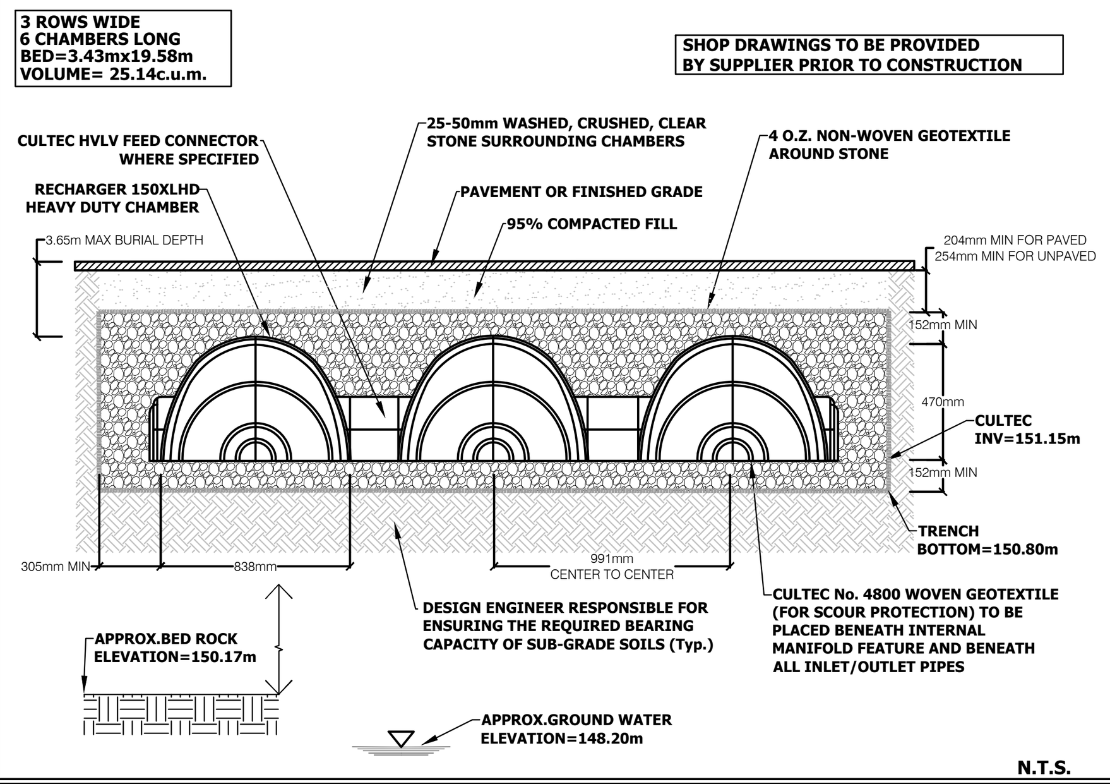
MAIN STREET MEDIAN CATCHBASINS DATA

No.	LENGTH	SLOPE	DIA	TOP	OUT INV	INV @ MAIN
CB5	2.55m	18.43%	250mmø	151.42	149.87	149.40
CB6	4.88m	11.27%	250mmø	151.81	150.26	149.71

CULTEC CHAMBER #1 (150XLHD / INFILTRATION TRENCH)
TYPICAL DETAIL

3 ROWS WIDE
6 CHAMBERS LONG
BED=3.43mx19.58m
VOLUME= 25.14c.u.m.

SHOP DRAWINGS TO BE PROVIDED BY SUPPLIER PRIOR TO CONSTRUCTION

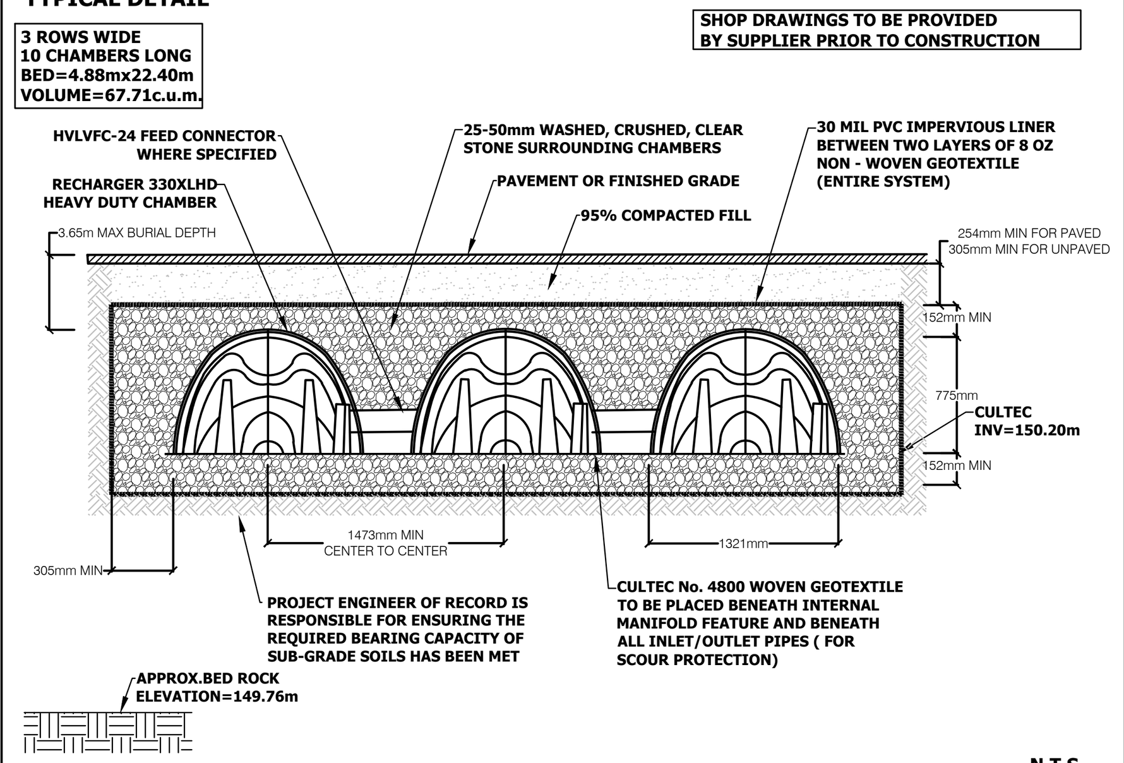


N.T.S.

CULTEC CHAMBER #2 (330XLHD)
TYPICAL DETAIL

3 ROWS WIDE
10 CHAMBERS LONG
BED=4.88mx22.40m
VOLUME=67.71c.u.m.

SHOP DRAWINGS TO BE PROVIDED BY SUPPLIER PRIOR TO CONSTRUCTION



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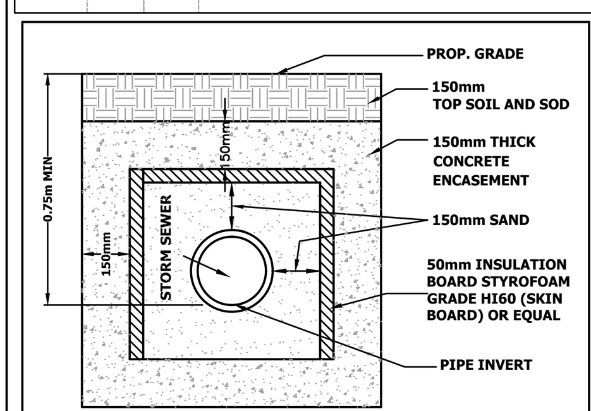
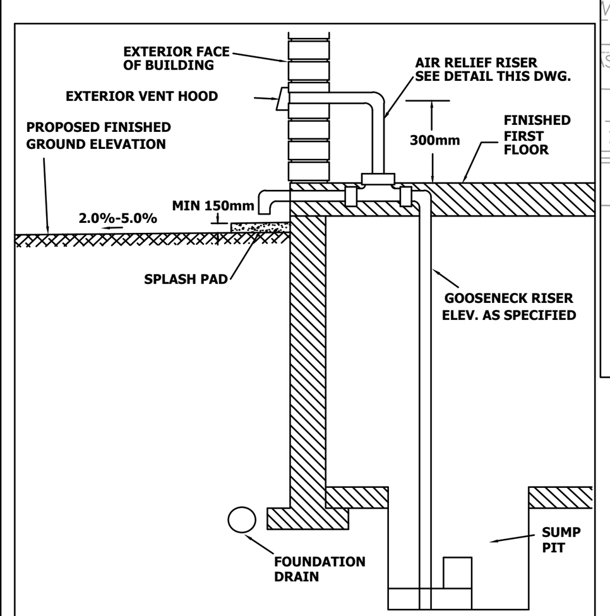
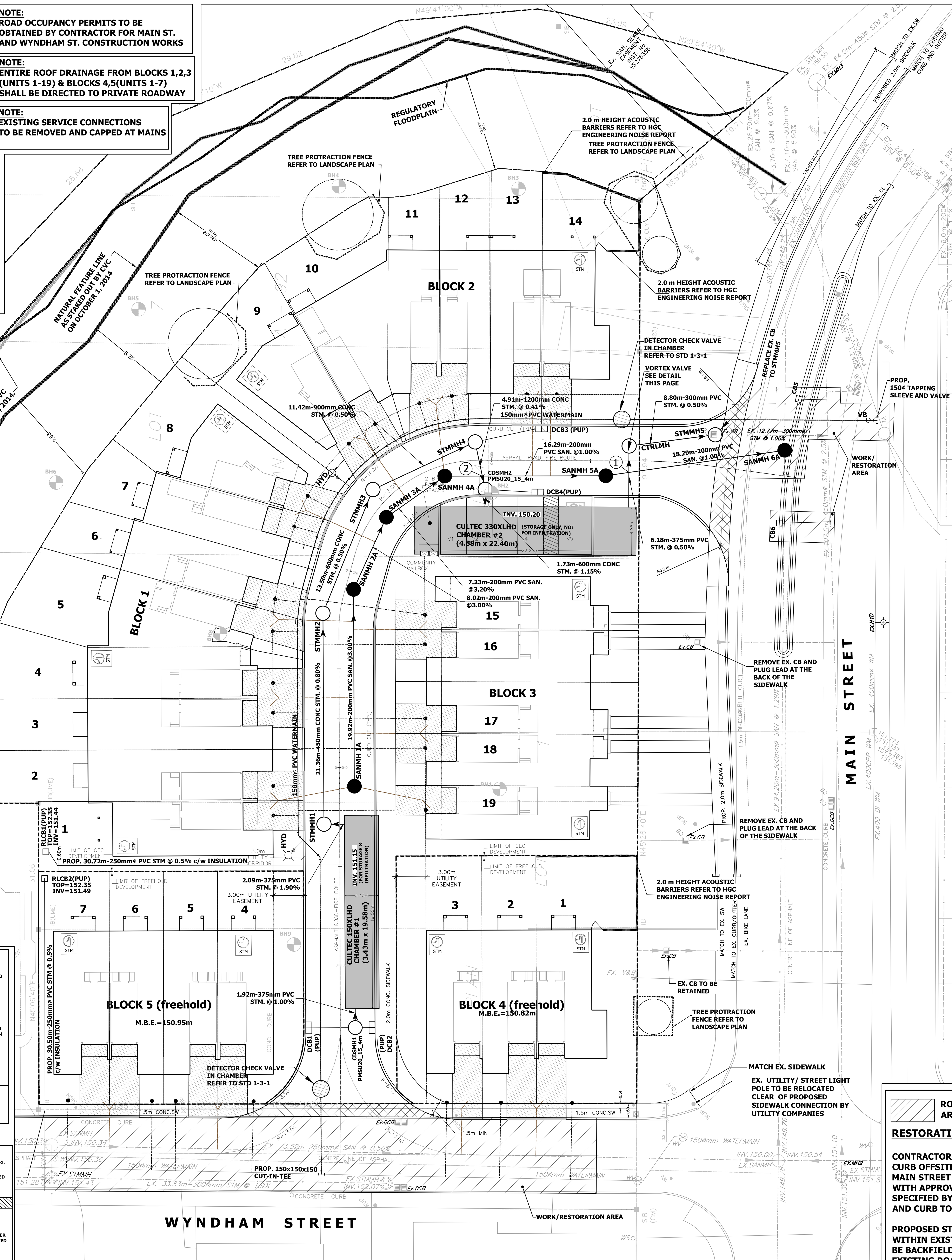


STORM SEWER PIPE TYPICAL INSULATION AND CONCRETE ENCASEMENT DETAIL
(N.T.S.)



STORM SUMP PUMP (DISCHARGE TO SURFACE)
N.T.S



NOTE:
RESTORATION ON WYNHAM STREET TO BE GRIND 0.040m TO ALLOW FOR TOP ASPHALT REPLACEMENT

STORM WATER CTRMH ANALYSIS SUMMARY
(MAIN STREET OUTLET)

ALLOWABLE SITE RELEASE RATE (L/SEC): 11.48L/S

SITE COMPOSITION

SITE CATCHMENT AREA (ha): 0.3834 ha
ROOF AREA (ha): 0.1213 ha

CONTROLLED PAVEMENT AREA (ha): 0.1282 ha
UNCONTROLLED PAVEMENT AREA (ha): 0.0024 ha
CONTROLLED LANDSCAPE AREA (ha): 0.1029 ha
UNCONTROLLED LANDSCAPE AREA (ha): 0.0286 ha

CONTROL

LOCATION: CTRMH
CONTROL DEVICE: VORTEX VALVE FC 12 (102mm)
INVERT ELEVATION: 150.17 m
CENTER-LINE ELEV.: 151.80 m
DOWNSTREAM HGL: N/A
DETENTION STORAGE TWL: 151.62 m
DESIGN HEAD: 1.448 m
DESIGN PEAK: N/A
Q-REL (L/SEC): 11.45 L/S (include uncontrolled)

STORM WATER MANAGEMENT ANALYSIS

PART A- DETENTION VOLUME REQUIREMENT
100-YR REQ.D DETENTION STORAGE VOLUME: 109.70 cu.m.
VALVE RELEASE RATE AT (L/SEC): 9.32 L/S

MAXIMUM SITE DETENTION STORAGE AVAILABLE:

DESIGN T.W.L.: 151.62 m
SURFACE PONDING: N/A
STRUCTURE STORAGE: 110.36 cu.m.
(CULTEC)

ROAD RE-CONSTRUCTION/ RESTORATION AREA (AS PER ROAD OCCUPANCY PERMIT)

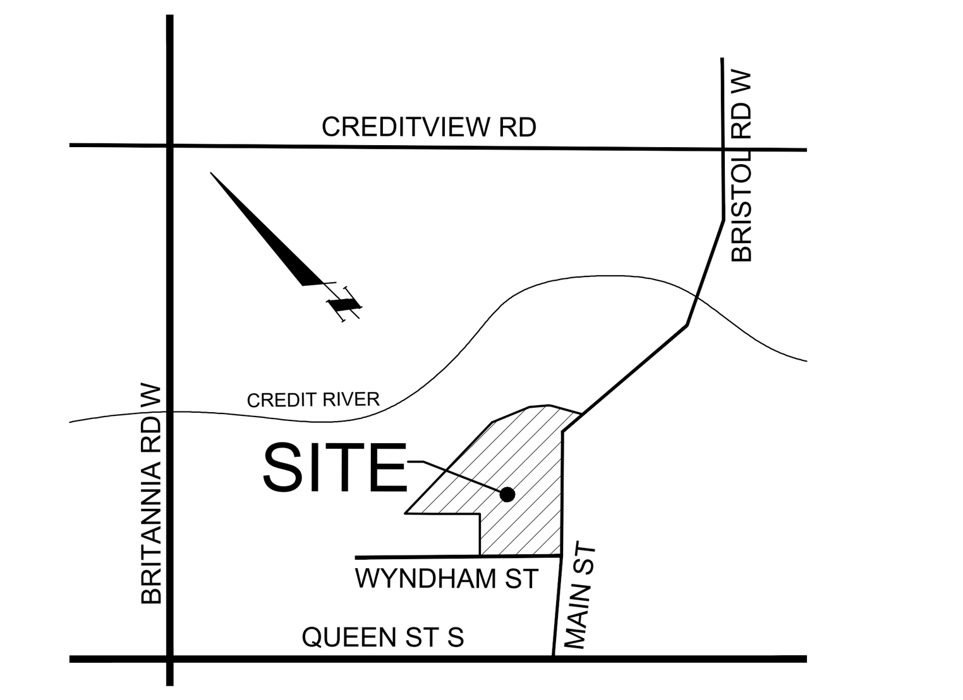
RESTORATION NOTE:

CONTRACTOR TO SAWCUT EXISTING ASPHALT AND REMOVE EXISTING CURB OFFSITE. CONTRACTOR TO BACKFILL EXCAVATION WITHIN MAIN STREET AND WYNDHAM STREET WITH APPROVED GRANULAR BACKFILL AND UNSHRINKABLE FILL AS SPECIFIED BY CITY OF MISSISSAUGA. ASPHALT SURFACE AND CURB TO BE RESTORED TO EXISTING OR BETTER CONDITION.

PROPOSED STORM, SANITARY AND WATER BUILDING CONNECTIONS WITHIN EXISTING MUNICIPAL R.O.W.S. ARE TO BE BACKFIELD WITH UNSHRINKABLE FILL UP TO THE BASE OF EXISTING ROAD GRANULAR. EXISTING ROAD GRANULAR AND ASPHALT TO BE MATCHED WITH MINIMUM THICKNESSES IN ACCORDANCE WITH CITY STANDARD 2220.03.

TRENCH CONSTRUCTION/RESTORATION SHALL BE IN ACCORDANCE WITH CITY STANDARDS 2220.03, 2220.031 AND 2220.032.

ALL RESTORATION WORK IS TO THE SATISFACTION OF THE CITY OF MISSISSAUGA DEVELOPMENT CONSTRUCTION SERVICES DEPARTMENT.



KEY PLAN N.T.S.

PART OF LOTS 2 AND 7 REGISTERED PLAN A-92 AND PART OF LOTS 1 AND 2
SOUTH OF WATER STREET (NOT OPEN), NORTH OF MAIN STREET, EAST OF WYNDHAM STREET
PLAN STR-4 AND PART OF LOT 4, CONCESSION 4.WEST OF HURONTARIO STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO) FORMERLY VILLAGE OF STREETSVILLE
CITY OF MISSISSAUGA,

LEGEND

- PROPOSED STM MANHOLE
- PROPOSED SAN MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- EX. STM MANHOLE
- EX. FIRE HYDRANT
- PROP. FIRE HYDRANT
- VB PROP. VALVE AND BOX
- VC PROP. VALVE AND CHAMBER
- RESTORATION AREA
- TREE PROTECTION FENCE
- ACOUSTIC WOOD FENCE
- SUMP PUMP
- 130.00 DENOTES EXISTING CONTOUR ELEVATION
- 227.40EX EXISTING ELEVATIONS
- DENOTES PROPOSED SWALE
- REGULATORY FLOOD PLAIN
- LONG TERM STABLE SLOPE CREST (LTSSC)
- TOP OF BANK AS STAKED OUT BY CVC ON OCTOBER 1, 2014
- NATURAL FEATURE LINE AS STAKED OUT BY CVC ON OCTOBER 1, 2014
- PROPERTY BOUNDARY

BENCHMARK NOTE
ELEVATIONS ARE REFERRED TO CITY OF MISSISSAUGA DATUM AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 63-4, HAVING A PUBLISHED ELEVATION OF 163.543 metres.
BEARING NOTE
BEARINGS ARE GRID, UTM ZONE 17, NAD83 (ORIGINAL), DERIVED FROM
SCP 075760396 NORTH 4826065.692 EAST 604009.682
SCP 075760397 NORTH 4826254.278 EAST 603818.766
COORDINATES ARE UTM ZONE 17, NAD83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999713. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED. PIPE SIZES ARE IN MILLIMETRES.

2.	REVISED AS PER CITY COMMENTS	OCT.28/2019	M.E.H.
1.	REVISED AS PER CITY COMMENTS	AUG./13/2018	D.OH.
REVISION BLOCK		DATE	APPR. BY

2576954 ONTARIO INC. PROPOSED CONDOMINIUM TOWNHOUSE DEVELOPMENT

LICENSED PROFESSIONAL ENGINEER
M.E.HALL
OCT.28/2019
PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING

DATE:

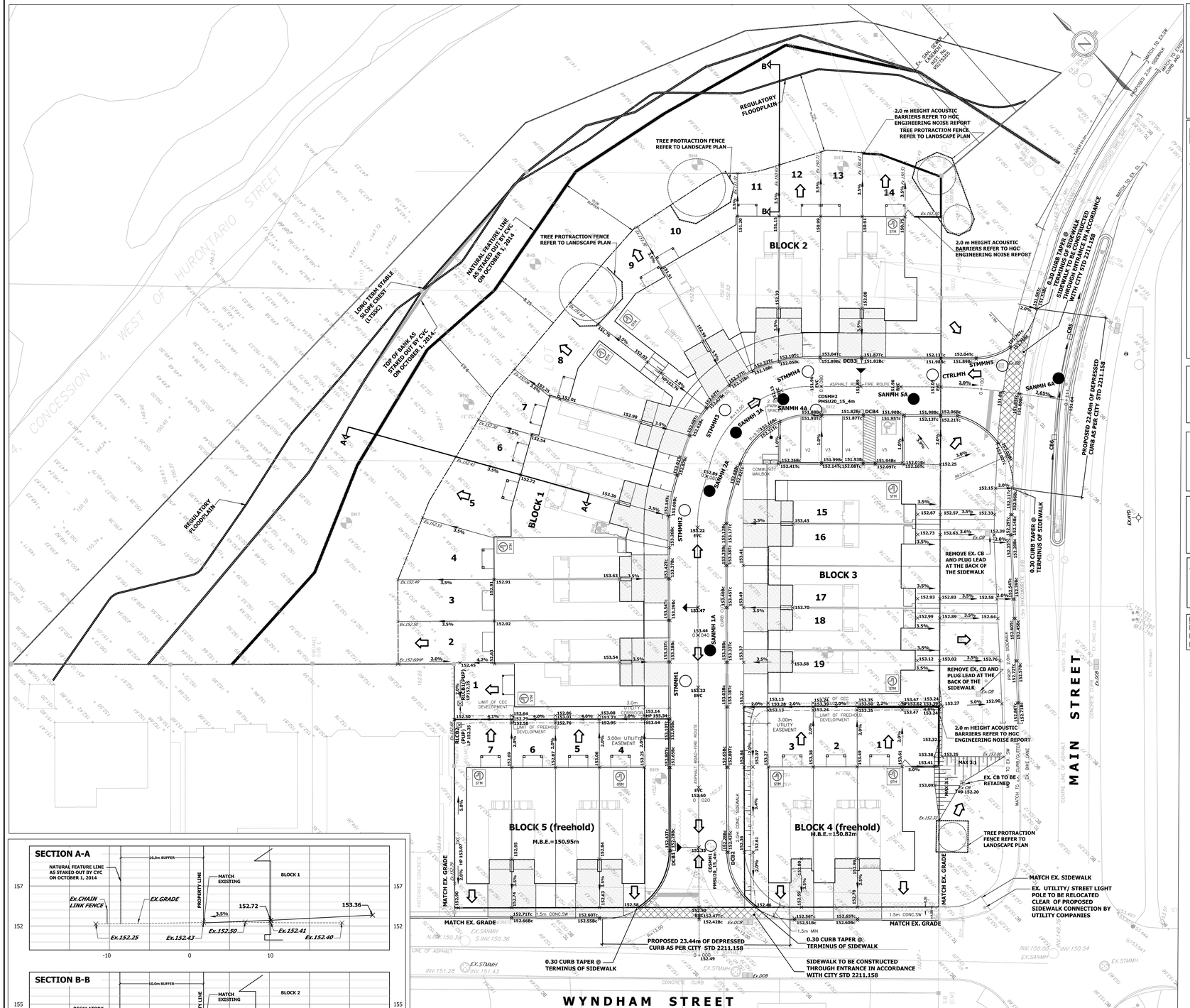
CONDELAND
CONSULTING ENGINEERS & PROJECT MANAGERS
350 Creditstone Road, Unit 200
Concord, Ontario L4K 3Z2
P: (905) 695-2096
F: (905) 695-2099

MISSISSAUGA

Region of Peel
Working for you

CONCEPTUAL SERVICING PLAN

DESIGNED BY: D.M.	DATE: OCTOBER 2019	CHECKED BY: M.E.H.
DRAWN BY: M.A./G.M.	DRAWING NO. 17-018-02	
SCALE: 1:250	Sheet: 02 of 10	CITY FILE



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ROAD RE-CONSTRUCTION/ RESTORATION AREA (AS PER ROAD OCCUPANCY PERMIT)

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TRENCH CONSTRUCTION / RESTORATION SHALL BE IN ACCORDANCE WITH CITY STANDARDS 2220.03, 2220.031, AND 2220.032.

ALL RESTORATION WORK IS TO THE SATISFACTION OF THE CITY OF MISSISSAUGA DEVELOPMENT CONSTRUCTION SERVICES DEPARTMENT.

NOTE:

THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL SIGNAGE, CURB CUTS AND PAVEMENT MARKINGS AS SHOWN ON THE APPROVED PAVEMENT MARKING AND SIGNAGE DRAWINGS.

RESTORATION NOTES:

ALL AREAS DISTURBED BY CONSTRUCTION OF STORM AND/OR GRADING SHALL BE RESTORED TO EXISTING CONDITION OR BETTER USING 150mm TOP SOIL AND NO.1 GRADE NURSERY SOD ALL TO THE SATISFACTION OF THE ENGINEER.

1. **THE PORTIONS OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD WILL BE PAVED BY THE APPLICANT.**
2. **ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE SITE.**
3. **THE EXISTING DRAINAGE PATTERN WILL BE MAINTAINED.**

NOTE:

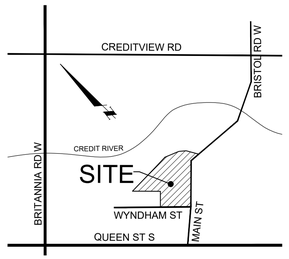
ROAD OCCUPANCY PERMITS TO BE OBTAINED BY CONTRACTOR FOR MAIN STREET AND WYNDHAM STREET CONSTRUCTION WORKS

NOTE:

ENTIRE ROOF DRAINAGE FROM BLOCKS 1,2,3 (UNITS 1-19) & BLOCKS 4,5(UNITS 1-7) SHALL BE DIRECTED TO PRIVATE ROADWAY

NOTE:

RESTORATION ON WYNHAM STREET TO BE GRIND 0.040m TO ALLOW FOR TOP ASPHALT REPLACEMENT



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(GEOGRAPHIC TOWNSHIP OF TORONTO) FORMERLY VILLAGE OF STREETSVILLE
CITY OF MISSISSAUGA, REGIONAL MUNICIPALITY OF PEEL

LEGEND

- PROPOSED STM MANHOLE
- PROPOSED SAN MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- EX. STM MANHOLE
- EX. FIRE HYDRANT
- PROP. FIRE HYDRANT
- CURB CUT
- PROPOSED GRADE (+128.56)
- DRAINAGE GRADIENT (2.0%)
- DENOTES OVERLAND FLOW DIRECTION
- RESTORATION AREA
- TREE PROTECTION FENCE
- ACOUSTIC WOOD FENCE
- SUMP PUMP
- DENOTES EXISTING CONTOUR ELEVATION (130.00)
- EXISTING ELEVATIONS (227.40EX)
- DENOTES PROPOSED SWALE
- REGULATORY FLOOD PLAIN
- LONG TERM STABLE SLOPE CREST (LTSSC)
- TOP OF BANK AS STAKED OUT BY CVC ON OCTOBER 1, 2014
- NATURAL FEATURE LINE AS STAKED OUT BY CVC ON OCTOBER 1, 2014
- PROPERTY BOUNDARY
- CROSS SECTION (B B)

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SCP 075760387 NORTH 4826264.278 EAST 603818.766
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REVISION BLOCK		DATE	APPR. BY
2.	REVISED AS PER CITY COMMENTS	OCT.28/2019	M.E.H.
1.	REVISED AS PER CITY COMMENTS	AUG./13/2018	D.OH.

2576954 ONTARIO INC. PROPOSED CONDOMINIUM TOWNHOUSE DEVELOPMENT

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

PROFESSIONAL ENGINEER — M.E.HALL — OCT.28/2019 — PROVINCE OF ONTARIO

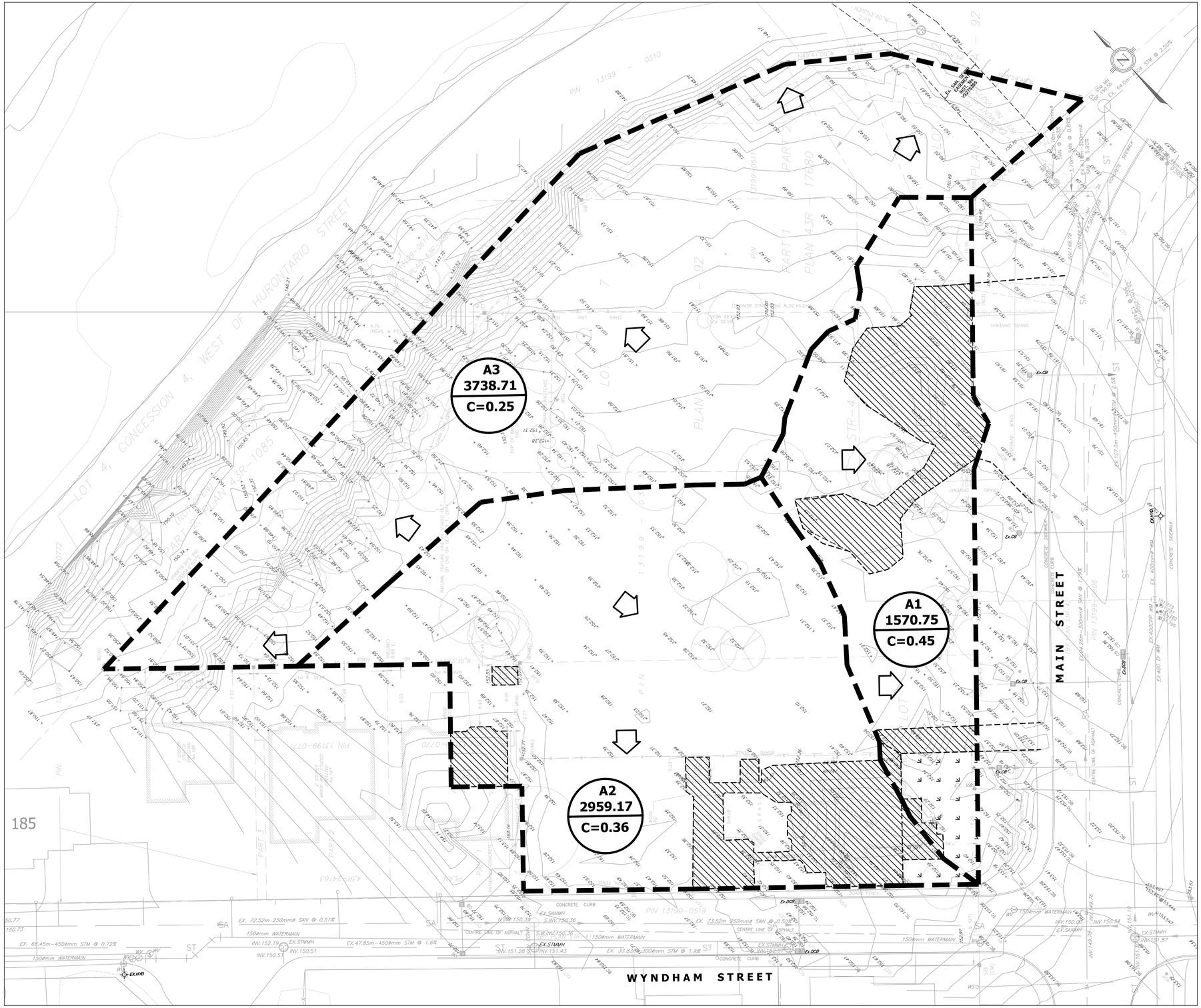
DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING
DATE:

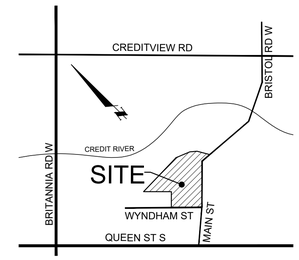
CONDELAND
CONSULTING ENGINEERS & PROJECT MANAGERS
350 Creditstone Road, Unit 200 P: (905) 695-2096
Concord, Ontario L4K 3Z2 F: (905) 695-2099

MISSISSAUGA — Region of Peel Working for you

CONCEPTUAL GRADING PLAN

DESIGNED BY: D.M.	DATE: OCTOBER 2019	CHECKED BY: M.E.H.
DRAWN BY: M.A./G.M.	DRAWING NO. 17-018-03	
SCALE: 1:250	Sheet: 03 of 10	CITY FILE





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SOUTH OF WATER STREET (NOT OPEN), NORTH OF MAIN STREET, EAST OF WYNDHAM STREET
PLAN STR-4 AND PART OF LOT 4, CONCESSION 4.WEST OF HURONTARIO STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO) FORMERLY VILLAGE OF STREETSVILLE
CITY OF MISSISSAUGA, REGIONAL MUNICIPALITY OF PEEL

LEGEND

- A1 / 1000sq.m / C=0.95 — DRAINAGE AREA
- RUNOFF COEFICIENT
- OVERLAND FLOW DIRECTION
- HARD SURFACE C=0.90
- SODDED AREA C=0.25

BENCHMARK NOTE
ELEVATIONS ARE REFERRED TO CITY OF MISSISSAUGA DATUM AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 63-4, HAVING A PUBLISHED ELEVATION OF 163.543 metres.
BEARING NOTE
BEARINGS ARE GRID, UTM ZONE 17, NAD83 (ORIGINAL), DERIVED FROM
SCP 07576035 NORTH 4828065.692 EAST 604009.852
SCP 07576097 NORTH 4826254.278 EAST 603818.766
COORDINATES ARE UTM ZONE 17, NAD83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999713. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED. PIPE SIZES ARE IN MILLIMETRES.

REVISION	BLOCK	DATE	APPR. BY
2.	REVISED AS PER CITY COMMENTS	OCT.28/2019	M.E.H.
1.	REVISED AS PER CITY COMMENTS	AUG./13/2018	D.OH.

2576954 ONTARIO INC. PROPOSED CONDOMINIUM TOWNHOUSE DEVELOPMENT

PROFESSIONAL ENGINEER — M.E.HALL — OCT.28/2019 — PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

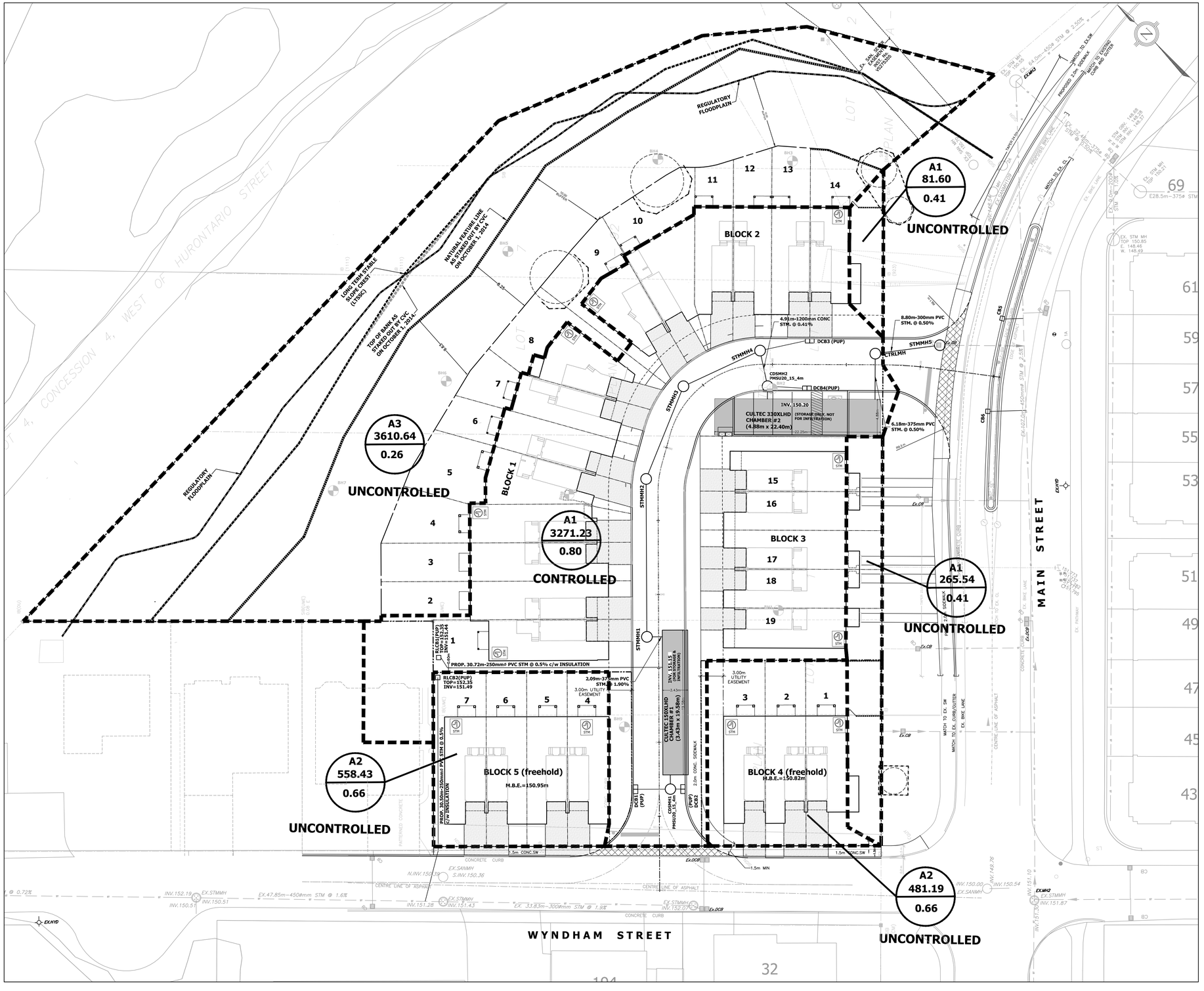
DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING
DATE: _____

CONDELAND
CONSULTING ENGINEERS & PROJECT MANAGERS
350 Creditstone Road, Unit 200 Concord, Ontario L4K 3Z2
P: (905) 695-2096 F: (905) 695-2099

MISSISSAUGA — Region of Peel Working for you

PRE-DEVELOPMENT STORM TRIBUTARY PLAN

DESIGNED BY: D.M.	DATE: OCTOBER 2019	CHECKED BY: M.E.H.	
DRAWN BY: M.A./G.M.	DRAWING NO. 17-018-04		
SCALE: 1:250	Sheet: 04 of 10	CITY FILE	



KEY PLAN N.T.S.

PART OF LOTS 2 AND 7 REGISTERED PLAN A-92 AND PART OF LOTS 1 AND 2
SOUTH OF WATER STREET (NOT OPEN), NORTH OF MAIN STREET, EAST OF WYNDHAM STREET
PLAN STR-4 AND PART OF LOT 4, CONCESSION 4.WEST OF HURONTARIO STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO) FORMERLY VILLAGE OF STREETSVILLE
CITY OF MISSISSAUGA, REGIONAL MUNICIPALITY OF PEEL

LEGEND

STORM DRAINAGE AREA

238sqm / 0.75 — AREA IN sq.m / RUN–OFF COEFFICIENT

BENCHMARK NOTE
ELEVATIONS ARE REFERRED TO CITY OF MISSISSAUGA DATUM AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 63-4, HAVING A PUBLISHED ELEVATION OF 183.543 metres.
BEARING NOTE
BEARINGS ARE GRID, UTM ZONE 17, NAD83 (ORIGINAL), DERIVED FROM
SCP 075760396 NORTH 4826065.692 EAST 604009.682
SCP 075760397 NORTH 4826254.278 EAST 603818.766
COORDINATES ARE UTM ZONE 17, NAD83 (ORIGINAL), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.
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2.	REVISED AS PER CITY COMMENTS	OCT.28/2019	M.E.H.
1.	REVISED AS PER CITY COMMENTS	AUG./13/2018	D.OH.

2576954 ONTARIO INC. PROPOSED CONDOMINIUM TOWNHOUSE DEVELOPMENT

PROFESSIONAL ENGINEER — M.E.HALL — OCT.28/2019 — PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

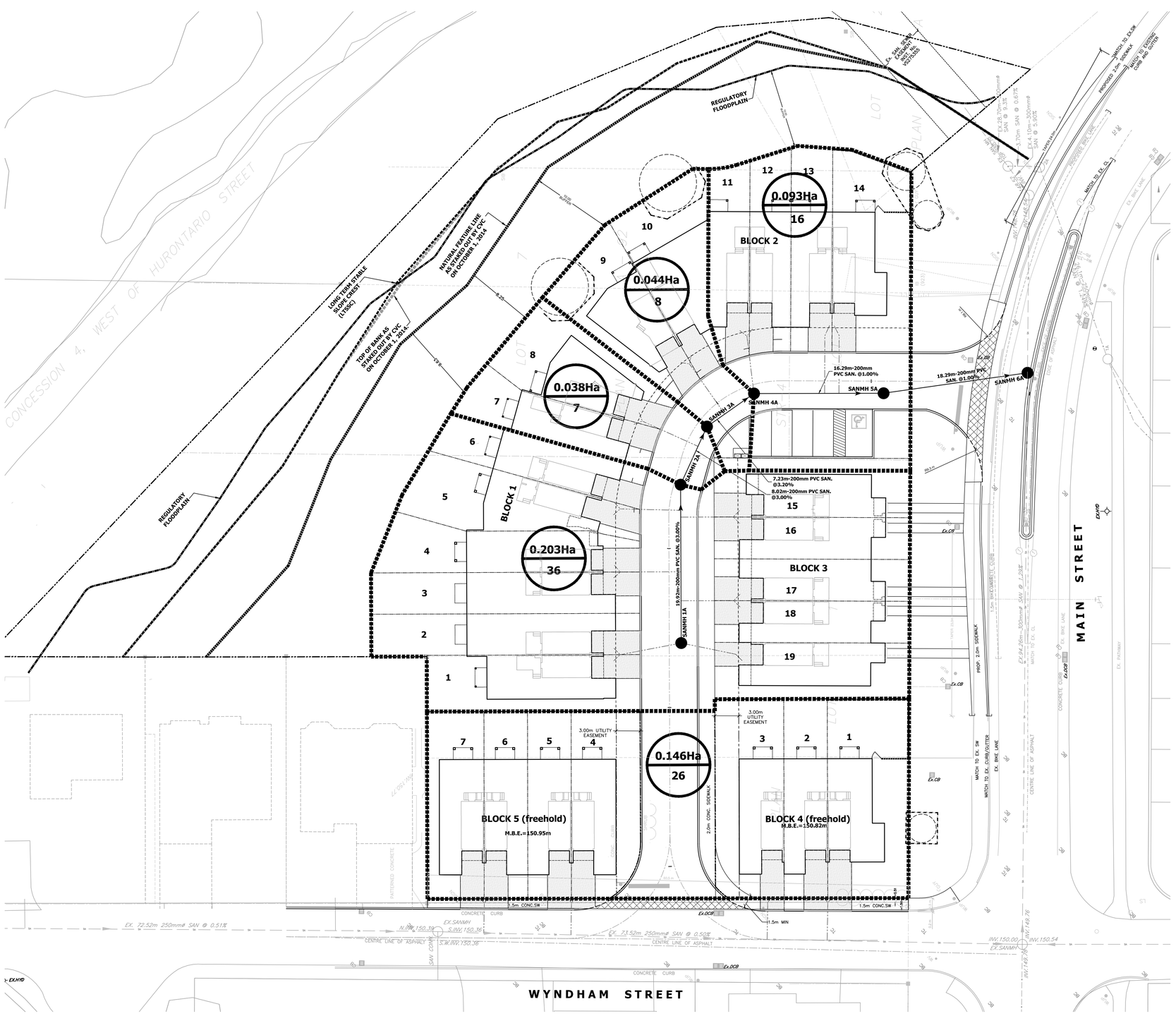
DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING
DATE: _____

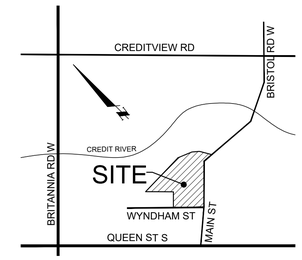
CONDELAND
CONSULTING ENGINEERS & PROJECT MANAGERS
350 Creditstone Road, Unit 200 P: (905) 695-2096
Concord, Ontario L4K 3Z2 F: (905) 695-2099

MISSISSAUGA — Region of Peel Working for you

POST DEVELOPMENT STORM TRIBUTARY PLAN

DESIGNED BY: D.M.	DATE: OCTOBER 2019	CHECKED BY: M.E.H.	
DRAWN BY: M.A./G.M.	DRAWING NO. 17-018-05		
SCALE: 1:250	Sheet: 05 of 10	CITY FILE	





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CITY OF MISSISSAUGA, REGIONAL MUNICIPALITY OF PEEL

LEGEND

SANITARY DRAINAGE AREA

0.132 — AREA IN HECTARES
25 — POPULATION

BENCHMARK NOTE
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REVISION BLOCK		DATE	APPR. BY
2.	REVISED AS PER CITY COMMENTS	OCT.28/2019	M.E.H.
1.	REVISED AS PER CITY COMMENTS	AUG./13/2018	D.OH.

2576954 ONTARIO INC. PROPOSED CONDOMINIUM TOWNHOUSE DEVELOPMENT

LICENSED PROFESSIONAL ENGINEER M.E.HALL OCT.28/2019 PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING
DATE:

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350 Creditstone Road, Unit 200 P: (905) 695-2096
Concord, Ontario L4K 3Z2 F: (905) 695-2099

MISSISSAUGA
Region of Peel Working for you

SANITARY TRIBUTARY PLAN

DESIGNED BY: D.M.	DATE: OCTOBER 2019	CHECKED BY: M.E.H.	
DRAWN BY: M.A./G.M.	DRAWING NO. 17-018-06		
SCALE: 1:250	Sheet: 06 of 10	CITY FILE	