Functional Servicing Report for 1242, 1250, 1260 & 1270 Gordon Street and 9 Valley Road – Guelph ON

June 8, 2022

Prepared for:

Tricar Developments Inc.

Prepared by:

Stantec Consulting Ltd.
600-171 Queens Avenue
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Approved by _____

(signature)

Chris Hendriksen, P.Eng.

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1.0 INTRODUCTION AND BACKGROUND

1.1 OVERVIEW

This Functional Servicing Report has been prepared in support of the Zoning and Official Plan amendment and the Site Plan Application for the proposed development located at 1242, 1250, 1260 & 1270 Gordon Street and 9 Valley Road (Site) in the City of Guelph (City). The subject property is approximately 3.323 ha in size and is bounded to the northwest by existing residential subdivision, to the northeast by protected woodlot, to the southwest by Gordon Street, and to the southeast existing high-density development.

The conceptual site plan for the proposed development that forms the basis of this servicing assessment includes two 10 story apartment buildings consisting of 325 units. The bulk of site parking will be achieved through underground and at/above grade enclosed parking.

This report outlines how the proposed development can be supplied with adequate services, including sanitary, domestic water, storm drainage and includes the preliminary design of the infiltration and water quality facilities proposed to provide the required water quality and quantity controls and the preliminary erosion and sediment control strategy to be implemented during construction.

1.2 BACKGROUND INFORMATION

A variety of sources have been referenced during the preparation of this report, and the following should be read in conjunction with this Report:

- Geotechnical Engineering Report, Two 12-Storey Apartment Buildings 1242, 1250, 1260 Gordon Street, Guelph, Ontario (CMT Engineering Inc, April 2018)
- Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation Authority and Toronto and Region Conservation Authority, 2010)
- Erosion & Sediment Control Guideline for Urban Construction, (Greater Golden Horseshoe Area Conservation Authorities, December 2006)
- Stormwater Management Planning and Design Manual (SWMPD Manual), (Ontario Ministry of the Environment, March 2003)
- Development Engineering Manual, City of Guelph (City of Guelph Engineering and Transportation Services, January 2019)
- Groundwater Flow, Figure 14 of 1242, 1250, 1260 Gordon Street and 9 Valley Road Hydrogeological Assessment (Stantec Consulting Ltd., March 2020)

- Hanlon Creek Watershed Plan (Marshal Macklin Monaghan Ltd., LGL Ltd., October 1993)
- Torrance Creek Subwatershed Study- Management Strategy (Totten Sims Hubicki Associates, et al, September 1998)

1.3 EXISTING INFRASTRUCTURE

A summary of the municipal infrastructure that currently exists near the Site is as follows:

- A 200mm sanitary sewer located on Gordon Street.
- A 400mm watermain on Gordon.
- A 575mm storm sewer on Gordon Street.

Fully constructed municipal roads include Gordon Street to the west and Valley Road to the north.

2.0 OVERALL GRADING AND DRAINAGE

2.1 DESIGN CONSTRAINTS AND PROCEDURES

Using existing topographic information provided by BSR&D limited (dated November 2014), the proposed Site grading will be designed to generally meet the following criteria:

- Match existing grades at all site boundaries.
- Match existing grades at existing tree driplines wherever possible to facilitate tree retention.
- Extension of Edinburgh Road and Valley Road to municipal standards and match into existing road grades of Gordon Street and Valley Road.
- Account for future urbanization of adjacent lands.
- Have consideration for future pedestrian connections north of the site towards Valley Road.
- Provide adequate cover over underground services.
- Ensure all building openings are protected from flooding.
- Comply with Municipal standards for minimum and maximum grades.
- Provide major overland flow routes for flows exceeding the storm sewer capacity.
- Maintain drainage from Gordon Street right-of-way and neighboring properties to the north and south.

2.2 PROPOSED ROAD PROFILES AND OVERALL SITE GRADING

Road profiles within the subject site were established based on the proposed street pattern to satisfy the constraints outlined in the previous Section 2.1. The road profiles have been designed to accommodate the constraints set out by the site layout and underground parking limits with grades ranging from 0.5% to 8.0% with 3:1 and 4:1 transition slopes or retaining walls utilized to accommodate the various grade changes within the site and at various perimeter locations. The proposed centerline road elevations for the extension Landsdown Drive and Edinburgh Road and lot grades are illustrated on the Grading plan as well as the plan and profile provided for these extensions (Drawing No. 5 of 8 and 4 of 8 respectively) included in Appendix A. Existing grades and cross sections of Gordon Street and Valley Road have been considered fixed constraints in the development of the preliminary grading. The extension of Landsdown Drive and Edinburgh Road will be 8.4m back of curb to back of curb as per City of Guelph's Linear Infrastructure Standard drawing SD-48a. Internal roads, consisting of 6.7m wide asphalt as the building has structured parking not subject to the standard 7.0m minimum width drive aisle.

3.0 SANITARY SERVICING

The City of Guelph is currently completing the Gordon Street Improvements EA and an overall Master Wastewater Servicing Plan that is considering an upgrade to the sanitary service capacity within Gordon Street fronting the site. Through correspondence with the City in 2019 through 2022, the proposed development will be incorporated in the design of the sanitary sewer upgrades. Confirmation of this has been received from Ike Umar via email on March 15, 2022 (see email correspondence attached in Appendix C). Staff have recommended that an H be applied to the property until such time as the sewer has been installed and the outlet is available however timing of the two projects may alleviate this requirement.

A 200mm extension of the municipal sanitary sewer east on the Edinburgh Road extension proposed as part of this redevelopment to provide service to the site. Sewers will be designed in accordance with the requirements of the Ontario Building Code and the City of Guelph. An illustration of the sanitary sewer layout can be found in the Sanitary Area Plan (Sheet No. 3 of 8) included in Appendix A.

4.0 WATER DISTRIBUTION

The existing water distribution system near the Site includes a 400mm watermain on Gordon Street. The primary source for the proposed development will be the Gordon Street watermain. It is anticipated that the following work to the existing municipal infrastructure will be made:

- Tapping sleeve and valve connection to the 400mm Gordon Street watermain (200mm connection).
- Extension of the municipal watermain along the Edinburgh Road extension to provide service to the Site.

Please refer to the Preliminary Servicing plan (Drawing No. 1 of 8) for an illustration of the watermain layout.

Based on building information currently available, a conservative fire flow requirement for the site is 150 L/s, based on typical OBC calculations as provided in Appendix B.

A 200 mm diameter watermain is proposed for the development with 200mm connections provided to each building. They are positioned as illustrated on the Preliminary Servicing plan (Drawing No. 1 of 8).

Fire protection will be provided via onsite hydrants, adequately spaced to ensure proper coverage to all buildings, in conjunction with standpipe connections for building sprinkler systems. The City of Guelph will confirm the pipe sizing proposed provides adequate pressure to meet MOE design criteria. No backflow prevention or pressure reducing valves (PRV) have been proposed for this development.

The City has advised that sufficient and adequate capacity is available in the City's existing water supply and distribution system to accommodate the proposed development and there are no water capacity constraints expected for most demand scenarios. However, there is potential for marginal water supply pressures in proposed development under certain conditions such as peak hour demand scenario at locations with elevation greater than 346 m height above mean sea level (AMSL) and average day demand scenario at locations with elevation greater than 339 m height AMSL in the existing water system.

5.0 STORMWATER MANAGEMENT (SWM) STRATEGY

5.1 STORMWATER MANAGEMENT CRITERIA

This site is covered by criteria from different documents. The documents and site criteria are discussed below.

5.1.1 Hanlon Creek Watershed Plan (HCWP)

The HCWP states that for upper Hanlon Creek development no urban drainage will be permitted to the headwaters of Tributary E or F, except for lands that already have drainage outlets. All stormwater generated from the area must either infiltrate into the ground or evaporate (100-year infiltration and zero runoff). There is no discussion in the report on requirements for redeveloping lands within the existing development areas where this project is located.

5.1.2 Torrance Creek Subwatershed Study (TCSS)

The TCSS states that for Zone 2, where this site is located, the requirement is to detain the post-development flow to pre-development ratees for the 2- to 100-year events and to infiltrate 150 mm/yr.

5.1.3 City of Guelph Development Engineering Manual

The specific SWM Criteria for the Site from the City of Guelph Development Engineering Manual (January 2019) is outlined below.

Water Quantity Control

- Based on City Guidelines, on-site stormwater control should be sized to attenuate post-development peaks flows to the pre-development (existing) peak flows. This 'post-to-pre' control should be provided for the 2-year through to the 100-year storm events.

Water Quality Control

- Based on City guidelines, the feasibility of on-site infiltration should be investigated. All developments are required to provide a minimum of Enhanced water quality level protection (i.e., 80% TSS removal). It is recommended for small development sites (approximately 2 ha) a treatment train approach be followed.

5.1.4 Criteria for the Site

The HCWP appears to be more applicable to development in the upper Hanlon Creek areas, with drainage to Tributaries E and F. The project site is located in the 'existing development' area within the study and is not specifically addressed within the plan and drains to Tributary D.

Additionally, the GRCA mapping for the site shows a recharge of 122-199 mm/year and runoff of 118-207 mm/year while sites within the Upper Hanlon Creek area have a recharge of 315-371 mm/year and a runoff of 0 mm/year, showing that the flow regime for the two areas is obviously different.

Based on the above information, it was decided that applying the TCSS criteria to the site was a reasonable approach based on the information available. The SWM criteria for the site are as follows:

- Attenuate post-development peak flows to pre-development rates for the 2-year though 100-year storm events
- Maintain infiltration balance
- Minimum of Enhanced Water Quality Protection.

5.2 SOILS INFORMATION

Site soil properties were confirmed using the Geotechnical Investigation Report (XCG Consulting Ltd., April 2018), which outlined soil conditions for the site as per tested boreholes. It was confirmed that site soils can be expected to be sand – silt with traces of clay, with overall good drainage properties. For this analysis, site soils were classified as BC, which was deemed to be a conservative estimate.

Infiltration rates for the site were determined to be approximately 23 mm/hr for the south portion of the site and 32 mm/hr for the east portion of the site. These design rates were calculated by Stantec Consulting Ltd. (Stantec) based on test pit and infiltration testing completed in June 2021.

A hydrogeologic assessment of the Site was completed by Stantec, and is documented in the Hydrogeological Report, 1242, 1250, 1260 Gordon Street, and 9 Valley Road, City of Guelph (Stantec, 2020 and as amended). In the Site monitoring well MW5 – 18S a high water table elevation of 340.3 m was recorded. The groundwater flow follows a similar divide as surface water, with a portion flowing east as part of the Torrance Creek Watershed, and another portion flowing west as part of the Hanlon Creek Watershed.

5.3 HYDROLOGIC MODELING

A hydrologic model was prepared to simulate drainage conditions for the subject development. MIDUSS was used to predict flows for the existing and proposed development conditions and to design the SWM system to ensure the previously mentioned criteria were achieved.

To address the criteria, existing and post-development conditions were modeled for the 2 year, 5 year and 100 year 3-hour Chicago design storms, derived using the City of Guelph parameters as provided in Table 1.

Table 1: City of Guelph – Chicago Storm Parameters

Storm Event	a	b	c	Duration (hrs.)	Depth (mm)
2-year	743	6	0.798	3	34
5-year	1593	11	0.879		47
100-year	4688	17	0.925		87

5.4 EXISTING CONDITIONS

The proposed development encompasses 3.323 ha and 5 residential properties however this infill project is unique with a portion of the site being dedicated as municipal right-of-way with different controls and so for the purposes of the proposed site SWM design, the existing site is defined by lands outside the municipal right-of-way being 3.05 ha including 4 residential properties with gravel/asphalt driveways. A large portion of the site is a woodlot area, associated with the Torrance Creek Swamp (Provincially Significant Wetland), and generally has steep slopes (approximately 5 %). A portion of the properties drain to an existing storm sewer on Gordon Street. The drainage catchments are shown on Figure 1, attached, and are summarized below.

- **Catchment 101** – A 1.33 ha area that includes residential homes, with storm water out-letting to Gordon Street to the west.
- **Catchment 102** – A 1.72 ha undeveloped area, which discharges as shallow overland flow to the woodlot to the east, part of the Torrance Creek Swamp

5.5 PROPOSED CONDITIONS

The proposed site plan includes two 10-storey apartment buildings, with two levels of underground parking. The proposed drainage catchments are summarized in detail below and shown in Figure 2, attached. Generally, the proposed conditions will increase the area out-letting to Gordon Street to the west and will reduce the area out-letting to the Torrance watershed to the east. The development will also increase the impervious area and will produce an increase in stormwater flows to the downstream Gordon Street storm sewer.

- **Catchment 201** – A 0.09 ha building/landscaped area that will drain uncontrolled to Gordon Street to the west.
- **Catchment 202** – A 0.24 ha roof top area. Runoff from this area will be attenuated by a roof-top control system (Zurn Z105 Control-Flo Roof Drain, or approved equivalent), controlling 100-year storm event runoff to a rate of 42L/s/ha (industry standard). The first 25 mm of runoff will be directed to an infiltration chamber (StormTech® SC-310) while overflows will be directed to a subsurface stormwater detention facility (StormTech® M-3500) and ultimately the Gordon Street storm sewer.
- **Catchment 203** – A 0.24 ha rooftop area. Runoff from this area will be attenuated by a roof-top control system (Zurn Z105 Control-Flo Roof Drain, or approved equivalent), controlling 100-year storm event runoff to a rate of 42L/s/ha (industry standard). Rooftop runoff will discharge to a clearstone infiltration gallery designed to infiltrate the runoff from a 25 mm event, with overflows discharging overland the Torrance Creek Swamp.
- **Catchment 204** – A 0.51 ha area, including the parking area, lane-way and small portions of landscape. Runoff will be collected by catchbasins and conveyed via a storm sewer system to a StormTech® infiltration chamber. Prior to discharging to the chamber, flows will be treated with an oil/grit-separator and StormTech® Isolator Row Plus, to minimize the potential for clogging. Flows exceeding that capacity of the infiltration chamber will discharge to an underground StormTech® stormwater detention facility (StormTech® M-3500) and ultimately the Gordon Street storm sewer.
- **Catchment 205** – A 0.23 ha designated park area draining uncontrolled east to the Torrance Watershed.
- **Catchment 206** – A 1.41 ha undeveloped woodlot area draining uncontrolled east to the Torrance Watershed.
- **Catchment 207** – A 0.15 ha landscaped area that will outlet to the StormTech® subsurface stormwater detention facility.
- **Catchment 208** – A 0.06 ha amenity area, which will flow uncontrolled to the Gordon Street storm sewer.
- **Catchment 209** – A 0.12 ha parking area, with minor flows (up to the 5-year storm event) collected via parking lot structure roof drains and conveyed south to the StormTech® infiltration chamber (StormTech® SC-310) while overflows will be directed to a subsurface stormwater detention facility (StormTech® M-3500) and ultimately the Gordon Street storm sewer. Major flows (larger than the 5-year storm event) will outlet via overland flow to Street A and ultimately the Gordon Street storm sewer.

- **Catchment 210** – 0.11 ha of Street A right-of-way. Street A is a proposed municipal right-of-way not part of the proposed development. Based on discussions with the City of Guelph water quantity controls are not required for this portion of the site, and therefore has only been included in figures for completeness.

5.6 STORMWATER MANAGEMENT

5.6.1 Water Quantity Controls

Water Quantity controls for the subject site will be provided through the use of rooftop flow controls, infiltration chambers/galleries and a subsurface stormwater management facility.

5.6.2 Infiltration Augmentation

Two infiltration facilities have been provided augment infiltration of site runoff.

The east infiltration gallery is a 7.5 m (W) x 10 m (L) x 1 m (D) clearstone infiltration gallery designed to infiltrate the runoff from Building 2 (easternmost building, Catchment 203) under the 25 mm storm event. Overflows from the gallery will discharge overland to the Torrance Creek Swamp east of the site. An infiltration rate of 32 mm/hr was assumed based on the Hydrogeological Report (Stantec, 2020 and as amended)

The south infiltration gallery has been designed to infiltrate the runoff from Catchment 202, 204 and 209 under the 25 mm storm event. The volume of the proposed chamber is 116 m³ and is comprised of StormTech® SC-310 units (drawings attached). Overflows will discharge to a subsurface stormwater detention facility, prior to discharging to the Gordon Street Storm Sewer. An overflow weir with an elevation equal to the obvert of the infiltration chamber has been provided in MH6 direct flows to the gallery prior to overflow discharge to the downstream system. An infiltration rate of 23 mm/hr was assumed based on the Hydrogeological Report (Stantec, 2020 and as amended)

5.6.3 StormTech® Subsurface SWM Facility

A StormTech® M-3500 subsurface SWM facility has been proposed in the southwest portion of the property to provide water quantity controls for runoff draining to Gordon Street. The proposed facility is 553 m³ with outflows controlled through the use of a 75 mm diameter orifice provided in CBMH1.

5.6.4 Hydrologic Modeling Results

Table 2 summarizes the pre- and post-development modeling results for the site.

Storm Event	Existing Flow Rates to Outlet (m^3/s)	
	Gordon Street (101)	Torrance Creek Watershed (102)
2-yr	0.03	0.02
5-yr	0.04	0.04

100-yr	0.19	0.25
Storm Event	**Proposed Flow Rates to Outlet (m^3/s)**	
	Gordon Street (201, 202, 204, 207, 208, 209)	**Torrance Creek Watershed (203,205, 206)**
2-yr	0.03	0.02
5-yr	0.04	0.05
100-yr	0.13	0.28

Torrance Creek Watershed

As shown in Table 2, post-development flows to the Torrance Creek watershed are proposed to have a minor increase over the pre-development flow rates during the modeled storm events. Based on the hydrologic modeling the increase in flows is primarily a result of uncontrolled runoff from Catchments 205 (Future Park Block) and 206 (landscaped area on the east portion of the site) and the result of shorter flow paths than under pre-development conditions. It is noted that the Torrance Creek Swamp adjacent to the site is significantly larger than the subject site with an even larger contributing watershed. It is not expected that this minor increase in flows (30 L/s in the 100-year storm event) will have significant impact on the downstream Torrance Creek Swamp or downstream infrastructure (which will be buffered by the Torrance Creek Swamp).

Gordon Street

As shown in Table 2, the proposed SWM controls satisfy water quantity targets to Gordon Street.

5.6.5 Water Quality Controls

Torrance Creek

Catchments contributing to the Torrance Creek watershed consist of rooftop runoff (Catchment 203), Park Block (Catchment 205) and Landscaped Area (Catchment 206). Runoff from these areas can be considered clean, and no additional water quantity controls are required.

Gordon Street / Infiltration Chamber

Water quality controls for the parking lot and driveway areas conveyed to the infiltration chamber and subsurface stormwater detention facility will be provided through a treatment train approach. An OGS (ADS FD-4HC or approved equivalent) has been sized to provide an enhanced level of water quality control upstream of the infiltration chamber. In addition, a StormTech Isolator Row Plus ® has been provided at the inlet of the chamber to filter out suspended solids prior to distribution throughout the facility, and alone exceeds the requirement TSS removal to provide an enhanced level of water quality control. Uncontrolled areas fronting Gordon Street are landscaped areas and can be considered clean.

Water quality calculations have been attached for reference.

Street A

An OGS (ADS FD-4HC or approved equivalent) has been provided for Street A, prior to discharging to the Gordon Street storm sewer. The OGS has been sized to provide an enhanced level of water quality treatment for the Street A right-of-way. Calculations have been attached for reference.

5.7 SALT MANAGEMENT

In order to meet water balance criteria, the infiltration of treated parking lot runoff was necessary. In order to mitigate the discharge of chloride laden water into the groundwater system, it is recommended that salt application for winter maintenance is prohibited and that site owners employ non-chloride salt alternatives.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the preceding report, the following conclusions can be drawn:

- Sanitary service is provided by the proposed upgrade to the municipal system located on Gordon Street just west of the site access.
- Water service is provided from the existing 400mm watermain on Gordon Street fronting this site.
- Enhanced (Level 1) water quality control will be provided for the parking lot and driveway runoff through the use of an OGS and Stormtech Isolator Row Plus® treatment train
- The proposed rooftop storage, infiltration chamber and subsurface stormwater detention facility provide water quantity controls prior to discharge to Gordon Street.

APPENDIX A – PRELIMINARY CIVIL DRAWING PACKAGE

STORM STRUCTURES			
STRUCTURE ID	T/G ELEV	SPECIFICATIONS	INVERTS
CB1	341.92	600x600	
CB2	341.92	600x600	
CB3	338.69	600x600	
CB4	338.72	600x600	
CB7	342.67	600x600	341.472SE
CBMH1	339.00	600x600 600x600	336.620SW 336.620NE
CBMH2	336.81	1 600x600	332.762SW 333.661NE
CBMH4	342.03	600x600 1200mmø	341.127SE 341.127NW
HW1	342.26	???mmø	341.508SW
MH1	337.68	1200mmø	335.754SE 336.369NE 335.754NW
MH2 (OGS)	339.45	1800mmø	336.671NE 336.621SW
MH3	341.66	1200mmø	338.320SW
MH4	335.90	1200mmø	331.950NE
MH5 (OGS)	342.31	1200mmø	341.074NW 341.074SW
MH6	342.32	1200mmø	341.040NE 341.040SW
MH7	342.22	1200mmø	340.482NE 339.172S
STM1	339.80	200mmø	336.810SE
STM2	[illegible]	[illegible]	341.395NW
STM4	[illegible]	[illegible]	341.149SE
STM6	[illegible]	[illegible]	341.500SW
STM7	[illegible]	[illegible]	341.536NE

SANITARY STRUCTURES			
STRUCTURE ID	T/G ELEV	SPECIFICATIONS	INVERTS
MH1A	338.17	1200mmø	332.173SE 334.270NE 332.173NW
MH2A	339.35	1200mmø	335.464NE 335.464SE 335.415W
MH3A	341.55	1200mmø	337.518SE 337.468SW
SAN1			338.103NW
SAN2			336.298NW

VALLEY ROAD

STREET 'A'

RESIDENTIAL

EDINBURGH ROAD SOUTH

GORDON STREET

POSSIBLE FUTURE ROAD WIDENING

NOTE: CB5 & CB7 TO HAVE CB SHIELD INSTALLED, SEE SHEET SSP-5 FOR DETAIL

BUILDING 1
FFE=342.40

BUILDING 2
FFE=342.40

APARTMENT BUILDING

APARTMENT BUILDING

3.5m HIGH ACOUSTIC BARRIER - REFER TO NOISE REPORT

BUFFER

WOODLOT

WOODLAND BOUNDARY TREE DRIP LINE

WOODLAND BOUNDARY BUFFER AREA

DRIPLINE FLAGGED BY NRSI JANUARY 24, 2020

PROPOSED CITY TRAIL

BUFFER

INFILTRATION GALLERY
75sq.m (7.5m x 10m)
- 0.20m PERFORATED PIPE
- 1.00m DEEP CLEAR STONE (0.40 POROSITY) BELOW PERFORATED PIPE

SEE DETAIL SHEET SSP-5

OPEN SPACE BLOCK 3
1.049ha

WOODLOT

BUFFER

30m BUFFER

NRSI WETLAND GRCA WETLAND OCTOBI

150-300mmø ANGULAR RIP-RAP 400mm THICK UNDERLAID WITH GEOTEXTILE

1.5-300 STM-6.96%

7.3-300 STM-0.50%

2.2-450 STM-1.00% INSULATED

5.3-450 STM-1.00% INSULATED

3.4-450 STM-1.00%

5.6-450 STM-10.00% INSULATED

2.5-250 STM-3.11%

13.7-200 SAN-4.27%

WTM CONNECTION INV.= 338.60m

9.4-600 STM-10.00%

MH6 TO BE BENCHED WITH A OUTLET WEIR ON THE SW INVERT INV.=341.60

ADS-FD-4HC OR APPROVED EQUIVALENT

21.5-200 SAN-5.32%

36.7-200 SAN-5.46%

36.8-300 STM-4.48%

41.6-300 STM-0.75%

15.2-200 SAN-5.48%

25.1-300 STM-11.77%

19.0-300 STM-0.93%

29.4-300 STM-2.76%

75mm ORIFICE PLATE
SW INV.=336.807m
SEE SHEET SSP-6 FOR DETAIL

INFILTRATION GALLERY (STORMTECH SC-310 CHAMBERS)
302.7sq.m/0.705m DEEP
(SEE ADS SHOP DRAWINGS AND SSP-6 FOR DETAILS)

UNDERGROUND STORAGE (STORMTECH MC-3500 CHAMBERS)
540.7sq.m/1.670m DEEP
(SEE ADS SHOP DRAWINGS AND SSP-6 FOR DETAILS)

DEWATERING NOTES:

1. PUMPED GROUNDWATER WILL BE DIRECTED OFFSITE VIA SWALE AND/OR TEMPORARY PIPE TO GORDON STREET, WHERE THE WATER WILL BE DISCHARGED TO EITHER THE STORM OR SANITARY SEWER SYSTEM.
2. DISCHARGE TO THE STORM AND/OR SANITARY SEWER SYSTEM MUST ADHERE TO THE QUALITY REQUIREMENTS AS PER CITY OF GUELPH BY-LAW NUMBER (1996)-15202.
3. DEWATERING TO FOLLOW BEST MANAGEMENT PRACTICES PER EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN CONSTRUCTION (2006), INCLUDING INSPECTIONS AND PERFORMANCE MONITORING TO ENABLE ADAPTIVE MANAGEMENT.

Stantec
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Notes

1. CITY OF GUELPH BENCHMARK 225
ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER

Legend

- SITE LIMIT
- EX. STORM SEWER
- PROPOSED STORM SEWER
- EX. SANITARY SEWER
- PROPOSED SANITARY SEWER
- S2 — PROPOSED SANITARY MANHOLE
- R2 — PROPOSED STORM MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
- CB or CICB — PROPOSED CATCHBASIN
- EX. MH — EX. MANHOLE
- EX. CB — EX. CATCHBASIN
- PROPOSED WATERMAIN
- EX. WATERMAIN
- PROPOSED 3-WAY FIRE HYDRANT C/W STORZ CONNECTION
- EX. FIRE HYDRANT
- PROPOSED WATER VALVE
- EX. WATER VALVE
- M — BULK WATER METER

1.	PER CITY COMMENTS	JAC	CJH	22.05.31
Revision		By	Appd.	YY.MM.DD
2.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24
Issued		By	Appd.	YY.MM.DD
File Name: 161413684_c-db		JAC	CJH	JAC 21.07.23
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

Client/Project

TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET & 9 VALLEY ROAD
GUELPH, ON

Title

SERVICING PLAN

Project No.	Scale	Sheet	Revision
161413684	1:500 (0 5 15 25m)	1 of 8	1

Drawing No.

SSP-1

STORM STRUCTURES			
STRUCTURE ID	T/G ELEV	SPECIFICATIONS	INVERTS
CB1	341.92	600x600	
CB2	341.92	600x600	
CB3	338.69	600x600	
CB4	338.72	600x600	
CB7	342.67	600x600	341.472SE
CBMH1	339.00	600x600 600x600	336.620SW 336.620NE
CBMH2	336.81	1 600x600	332.762SW 333.661NE
CBMH4	342.03	600x600 1200mmø	341.127SE 341.127NW
HW1	342.26	???mmø	341.508SW
MH1	337.68	1200mmø	335.754SE 336.369NE 335.754NW
MH2 (OGS)	339.45	1800mmø	336.671NE 336.621SW
MH3	341.66	1200mmø	338.320SW
MH4	335.90	1200mmø	331.950NE
MH5 (OGS)	342.31	1200mmø	341.074NW 341.074SW
MH6	342.32	1200mmø	341.040NE 341.040SW
MH7	342.22	1200mmø	340.482NE 339.172S
STM1	339.80	200mmø	336.810SE
STM2	[illegible]	[illegible]	341.395NW
STM4	[illegible]	[illegible]	341.149SE
STM6	[illegible]	[illegible]	341.500SW
STM7	[illegible]	[illegible]	341.536NE

Stantec

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600-171 Queens Avenue
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Liability Note:

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Notes

1. CITY OF GUELPH BENCHMARK 225 ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER

Legend

A1 A=0.23ha. C=0.25	AREA ID CONTRIBUTING AREA (ha) RUNOFF COEFFICIENT
	MAJOR OVERLAND FLOW ROUTE
	DRAINAGE BOUNDARY

No.	Revision	By	Appd.	YY.MM.DD
1.	PER CITY COMMENTS	JAC	CJH	22.05.31

No.	Issued	By	Appd.	YY.MM.DD
2.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24

File Name: 161413684_c-sd	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	JAC	CJH	JAC	21.07.23

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

Client/Project

TRICAR DEVELOPMENTS INC.

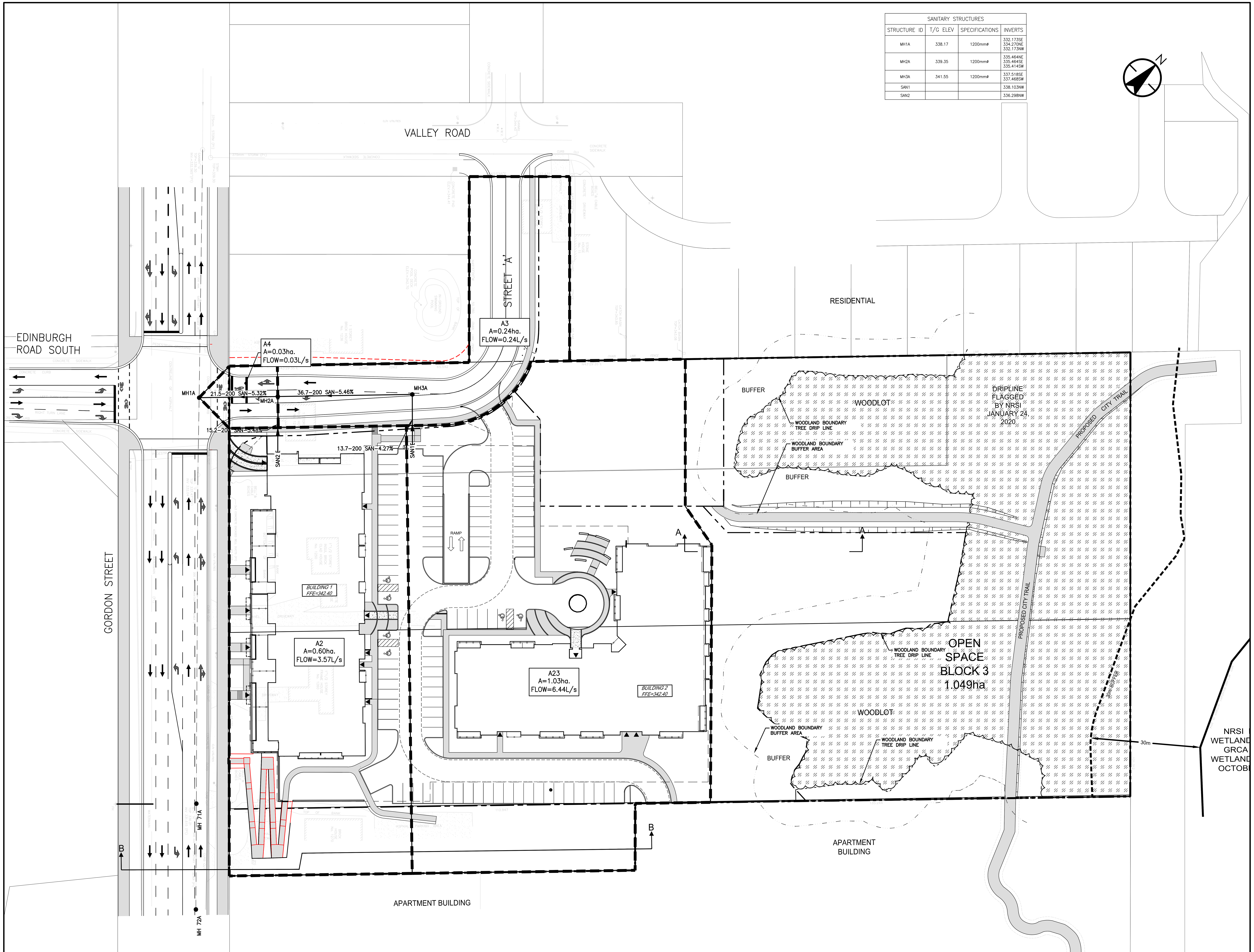
1242, 1250, 1260 GORDON STREET & 9 VALLEY ROAD
GUELPH, ON

Title

STORM DRAINAGE AREA PLAN

Project No.	Scale	Revision
161413684	1:400 (0, 4, 12, 20m)	
Drawing No.	Sheet	
SSP-2	2 of 8	1

ORIGINAL SHEET - ANSI D



SANITARY STRUCTURES			
STRUCTURE ID	T/G ELEV	SPECIFICATIONS	INVERTS
MH1A	338.17	1200mmø	332.173SE 334.270NE 332.173NW
MH2A	339.35	1200mmø	335.464NE 335.464SE 335.414SW
MH3A	341.55	1200mmø	337.518SE 337.468SW
SAN1			338.103NW
SAN2			336.298NW

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2022-6-1 10:05 AM By: Childs, Jason

ORIGINAL SHEET - ANSI D

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Notes

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Legend

A1	AREA ID
A=0.92ha.	CONTRIBUTING AREA (ha)
FLOW=6.44L/s	FLOW RATE (7L/s/ha. APARTMENTS-1L/s/ha. RESIDENTIAL)
— — —	DRAINAGE BOUNDARY

Revision	By	Appd.	YY.MM.DD
1. PER CITY COMMENTS	JAC	CJH	22.05.31

Issued	By	Appd.	YY.MM.DD
2. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
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File Name: 161413684_c-ss	JAC	CJH	JAC	21.07.23
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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May 31/22
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Client/Project

TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET
& 9 VALLEY ROAD
GUELPH, ON

Title

SANITARY DRAINAGE AREA PLAN

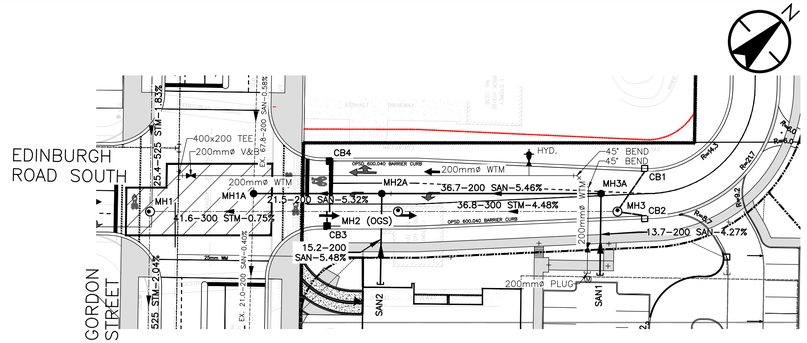
Project No. 161413684

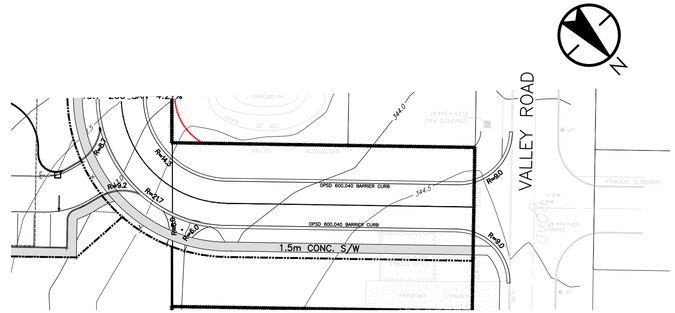
Scale 1:500 (0 5 15 25m)

Drawing No. SSP-3

Sheet 3 of 8

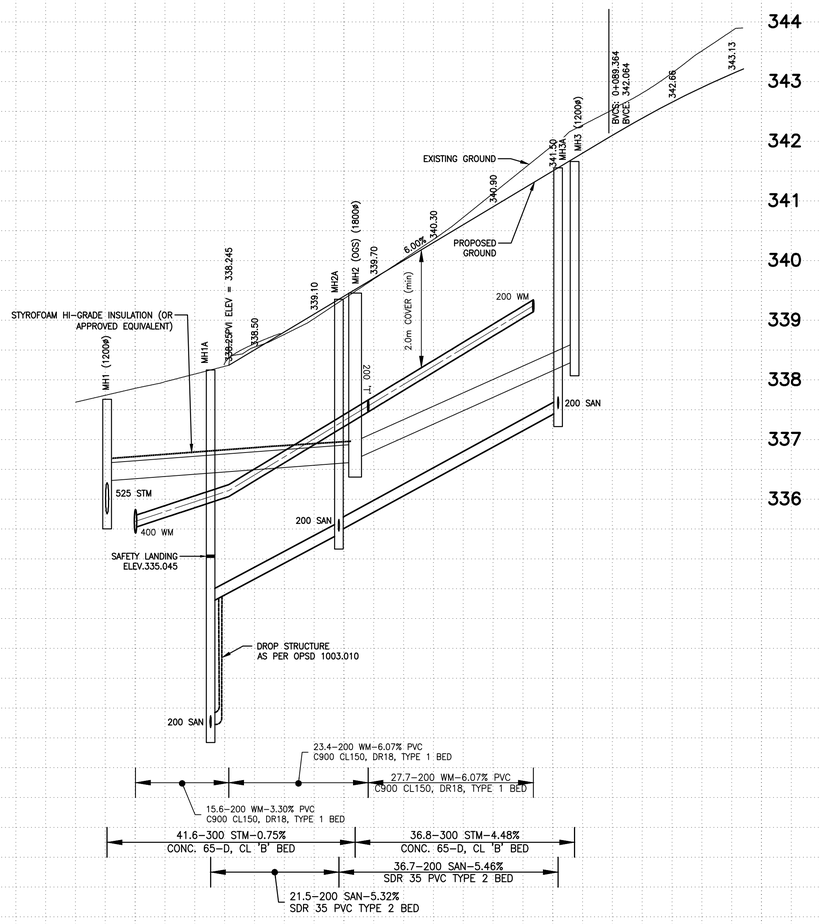
Revision 1

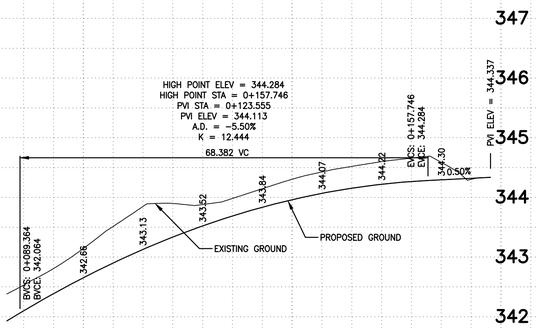


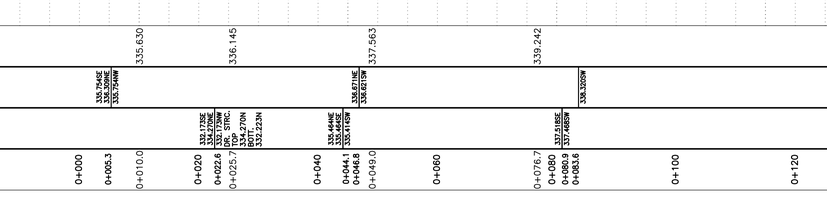


STREET 'A'

OPSD 600.040 CONCRETE BARRIED CURB WITH STANDARD GUTTER







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Notes

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Legend

- SITE LIMIT
- EX. STORM SEWER
- PROPOSED STORM SEWER
- EX. SANITARY SEWER
- PROPOSED SANITARY SEWER
- S2 — PROPOSED SANITARY MANHOLE
- R2 — PROPOSED STORM MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
- CB or CICB — PROPOSED CATCHBASIN
- EX. MH — EX. MANHOLE
- EX. CB — EX. CATCHBASIN
- PROPOSED WATERMAIN
- EX. WATERMAIN
- PROPOSED 3–WAY FIRE HYDRANT C/W STORZ CONNECTION
- EX. FIRE HYDRANT
- PROPOSED WATER VALVE
- EX. WATER VALVE
- RESTORATION LIMITS WITH LAP JOINT PER 509.010

1. PER CITY COMMENTS	JAC	CJH	22.05.31
Revision	By	Appd.	YY.MM.DD
2. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24
Issued	By	Appd.	YY.MM.DD
File Name: 161413684_c-st	JAC	CJH	JAC	21.07.23
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

Client/Project

TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET & 9 VALLEY ROAD

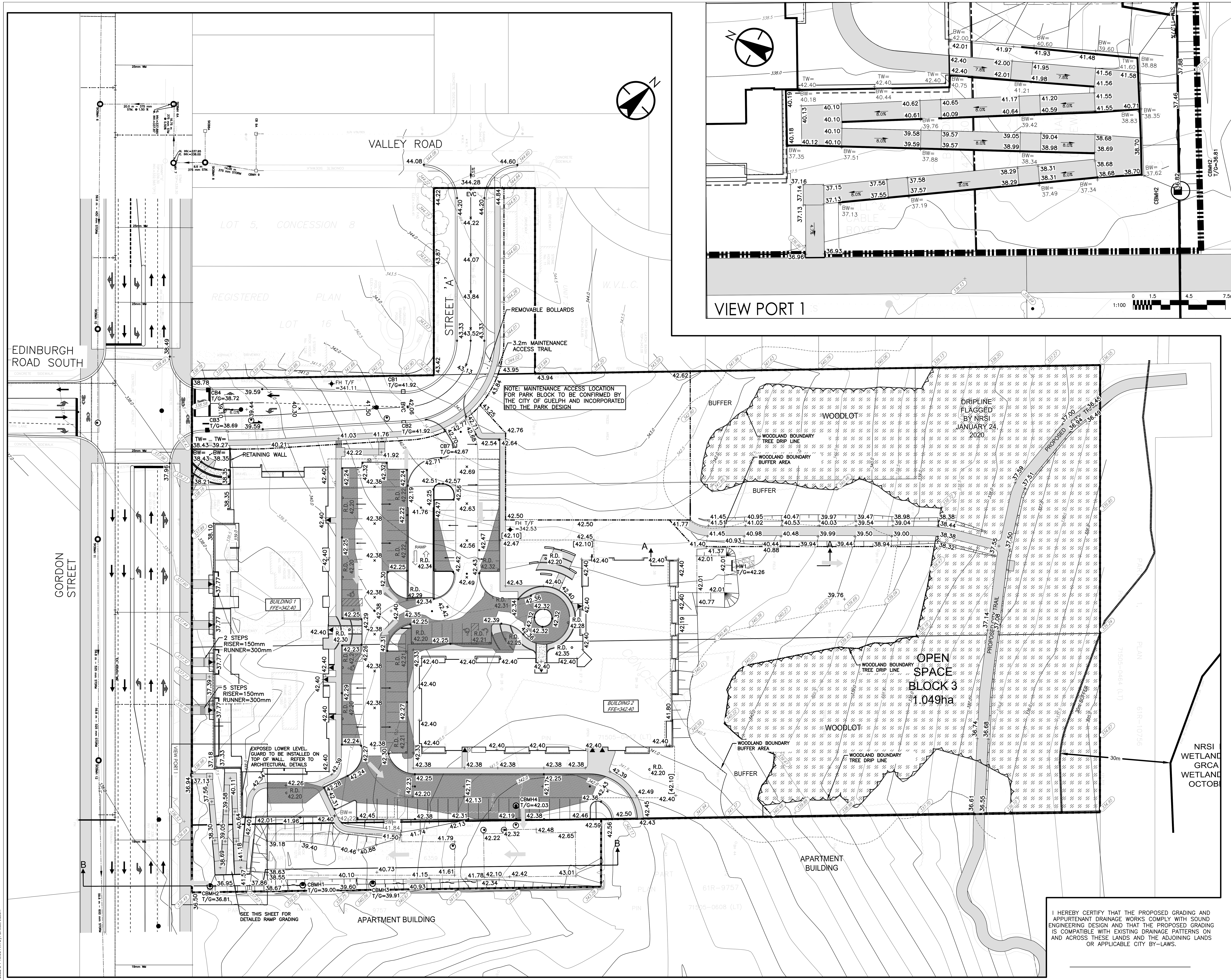
GUELPH, ON

Title

STREET 'A'
PLAN & PROFILE

Project No.	Scale				
161413684	1:500	0	5	15	25m
Drawing No.	Sheet		Revision		
SSP-4	4 of 8		1		

ORIGINAL SHEET - ANSI D



I HEREBY CERTIFY THAT THE PROPOSED GRADING AND APPURTENANT DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING DESIGN AND THAT THE PROPOSED GRADING IS COMPATIBLE WITH EXISTING DRAINAGE PATTERNS ON AND ACROSS THESE LANDS AND THE ADJOINING LANDS OR APPLICABLE CITY BY-LAWS.

Stantec

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Notes

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Legend

- PROPOSED SWALE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN MANHOLE
- PROPOSED SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- PROPOSED CATCH BASIN
- EX. CATCH BASIN
- 75.95 PROPOSED GRADES
- 75.95 (SP) PROPOSED OVERLAND FLOW SPILL POINT
- 75.95 EXISTING GRADES
- MAJOR OVERLAND FLOW ROUTE
- SITE BOUNDARY
- 71.77 (SW) PROPOSED SWALE GRADE
- 180.5 EXISTING CONTOURS
- FLOW DIRECTION
- HYDRANTS

1. PER CITY COMMENTS	JAC	CJH	22.05.31
Revision	By	Appd.	YY.MM.DD

2. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24
Issued	By	Appd.	YY.MM.DD

File Name: 161413684_c-fb	JAC	CJH	JAC	21.07.23
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

Client/Project

TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET
& 9 VALLEY ROAD

GUELPH, ON

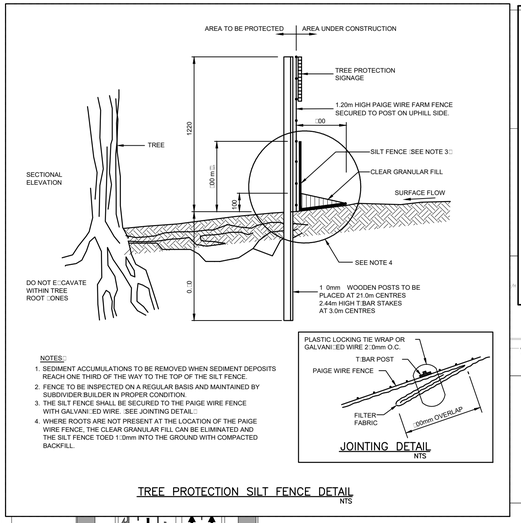
Title

GRADING PLAN

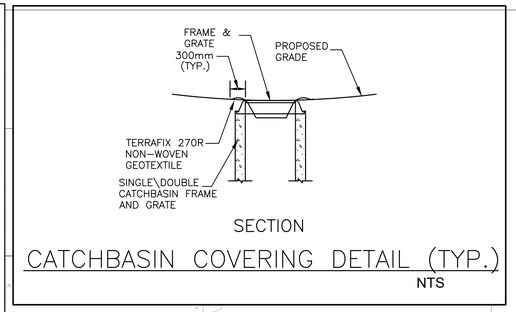
Project No.	Scale
161413684	1:500

Drawing No.	Sheet	Revision
GP-1	5 of 8	1

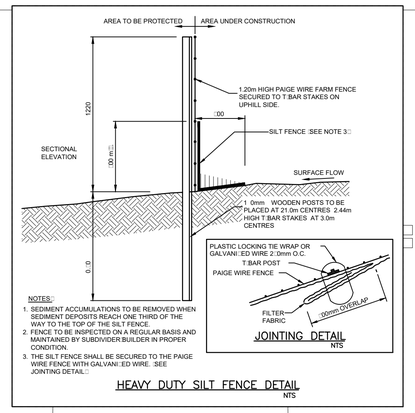
ORIGINAL SHEET - ANSI D



TREE PROTECTION SILT FENCE DETAIL
NTS



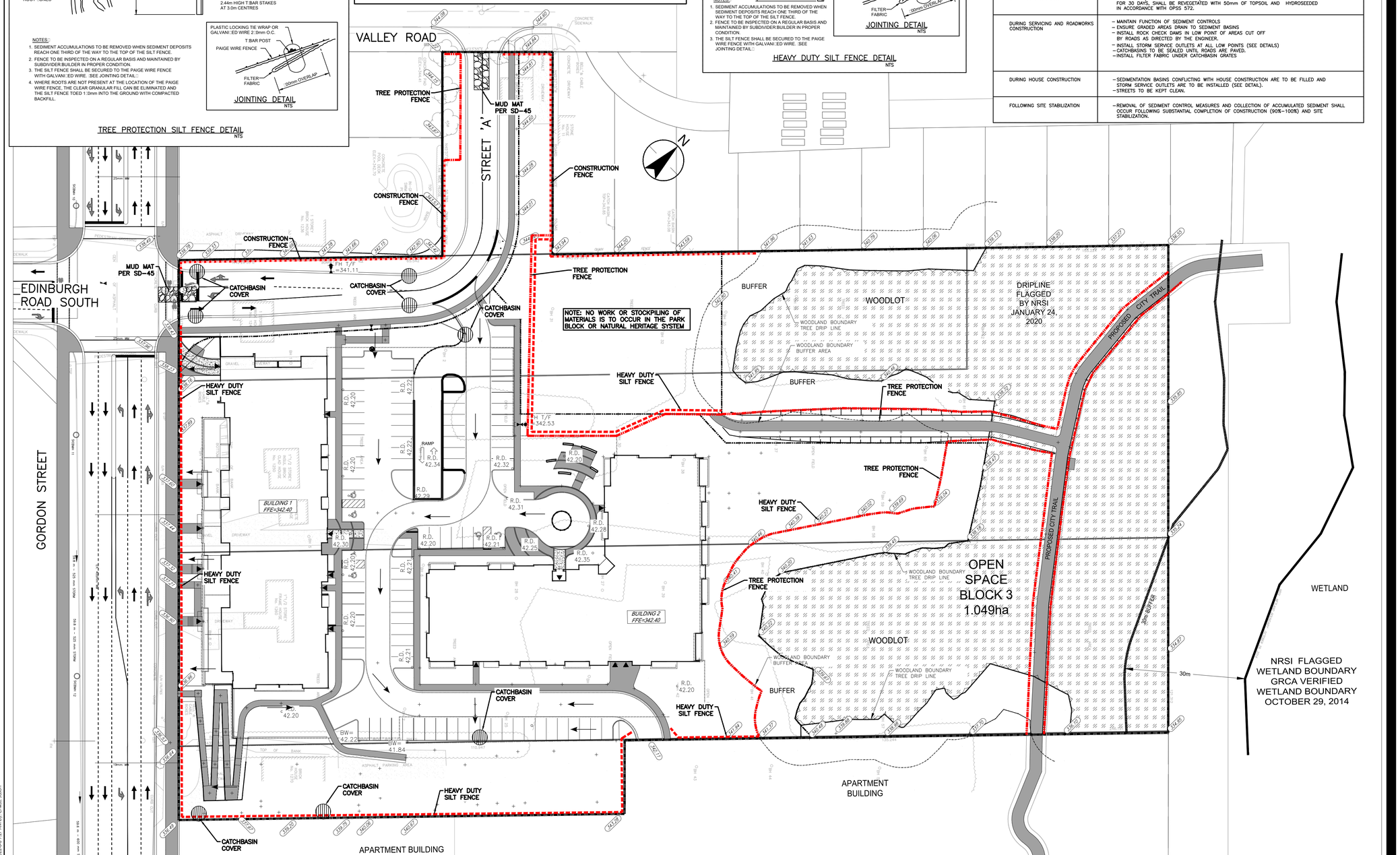
CATCHBASIN COVERING DETAIL (TYP.)
NTS



HEAVY DUTY SILT FENCE DETAIL
NTS

IMPLEMENTATION SCHEDULE AND DETAILS FOR EROSION AND SEDIMENTATION CONTROL MEASURES

PRIOR TO ANY SITE WORKS	– INSTALL ALL SILT FENCE AND PROTECTIVE FENCING AS SHOWN ON THE PLANS AND MAINTAIN DURING CONSTRUCTION. – MONTHLY EROSION AND SEDIMENT CONTROL REPORTS (QUARTERLY DURING PERIODS OF INACTIVITY OR HOUSE CONSTRUCTION) ARE TO BE SUBMITTED TO THE AUTHORITY UNTIL THE SITE HAS BEEN BUILT OUT (90%–100%) AND STABILIZED. REPORTS TO BE BASED ON FREQUENT INSPECTIONS PARTICULARLY AFTER SIGNIFICANT EVENTS.
DURING TOPSOIL STRIPPING	– CONSTRUCT TEMPORARY SEDIMENT CONTROL BASINS, DIVERSION SWALES & BERMS – CONSTRUCT TEMPORARY DIVERSION BERMS/SWALES/ROCK CHECK DAMS – SURPLUS TOPSOIL IS BE STOCKPILED IN LOCATIONS SHOWN
DURING AREA GRADING	– ALL DIVERSION BERMS/SWALES TO BE CHECKED REGULARLY AND AFTER EACH SIGNIFICANT RAINFALL AS GRADING PROCEEDS. DIVERSION BERMS/SWALES TO BE RECONSTRUCTED/RELOCATED AS NECESSARY TO ENSURE THAT THEY DIRECT FLOWS INTO BASINS. – SILT FENCE TO BE CHECKED REGULARLY AND AFTER EACH RAINFALL FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES ONE THIRD OF THE WAY TO THE TOP OF THE BARRIER. – SEDIMENT CONTROL BASINS TO BE CHECKED REGULARLY AND AFTER EACH RAINFALL AND CLEANED OUT WHEN THE LEVEL OF SEDIMENT BUILDUP HAS REDUCED THE VOLUME OF THE DEAD STORAGE BY ONE HALF.
AFTER AREA GRADING	– ALL AREAS (INCLUDING STOCKPILES) WHERE ACTIVE CONSTRUCTION IS NOT EXPECTED FOR 30 DAYS, SHALL BE REVEGETATED WITH 50mm OF TOPSOIL AND HYDROSEEDED IN ACCORDANCE WITH OPSS 572.
DURING SERVICING AND ROADWORKS CONSTRUCTION	– MAINTAIN FUNCTION OF SEDIMENT CONTROLS – ENSURE GRADED AREAS DRAIN TO SEDIMENT BASINS – INSTALL ROCK CHECK DAMS IN LOW POINT OF AREAS CUT OFF BY ROADS AS DIRECTED BY THE ENGINEER. – INSTALL STORM SERVICE OUTLETS AT ALL LOW POINTS (SEE DETAILS) – CATCHBASINS TO BE SEALED UNTIL ROADS ARE PAVED. – INSTALL FILTER FABRIC UNDER CATCHBASIN GRATES
DURING HOUSE CONSTRUCTION	– SEDIMENTATION BASINS CONFLICTING WITH HOUSE CONSTRUCTION ARE TO BE FILLED AND STORM SERVICE OUTLETS ARE TO BE INSTALLED (SEE DETAIL). – STREETS TO BE KEPT CLEAN.
FOLLOWING SITE STABILIZATION	– REMOVAL OF SEDIMENT CONTROL MEASURES AND COLLECTION OF ACCUMULATED SEDIMENT SHALL OCCUR FOLLOWING SUBSTANTIAL COMPLETION OF CONSTRUCTION (90%–100%) AND SITE STABILIZATION.



Notes

1. CITY OF GUELPH BENCHMARK 225 ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
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Legend

- SILT FENCE (SD–74B)
- CONSTRUCTION FENCE
- TREE PROTECTION FENCE (SD–90A)
- SURFACE FLOW DIRECTION
- CATCHBASIN COVERING

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Revision	By	Appd.	YY.MM.DD
1. PER CITY COMMENTS	JAC	CJH	22.05.31
Issued			
2. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24
File Name: 161413684_c-esc	JAC	CJH	21.07.23
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET & 9 VALLEY ROAD
GUELPH, ON

Title
EROSION & SEDIMENT CONTROL PLAN

Project No.	Scale	Revision
161413684	1:400 (0, 4, 12, 20m)	
Drawing No.	Sheet	
GP-2	6 of 8	1

NOTES AND SPECIFICATIONS:

A. GENERAL:

1. BUILDINGS ARE NOT TO BE SITED WITH THIS DRAWING. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE SITE SERVICING PLANS (SSP SERIES) & THE GRADING PLAN (GP SERIES) PREPARED BY STANTEC CONSULTING.
2. THESE PLANS FOR CONSTRUCTION ONLY WHEN APPROVED BY THE CITY OF GUELPH AND SEALED BY THE ENGINEER.
3. THE CONTRACTOR MUST CHECK AND VERIFY DIMENSIONS; OBTAIN ALL UTILITY LOCATES AND OBTAIN ALL REQUIRED PERMITS/LICENSES AND VERIFY ELEVATIONS OF EXISTING SERVICES BEFORE PROCEEDING WITH ANY WORK.
4. ALL WORK WITHIN THE RIGHTS-OF-WAY OR CITY EASEMENTS ARE TO BE INSTALLED BY CITY OF GUELPH AT THE OWNER'S EXPENSE UNLESS OTHERWISE NOTED.
5. ANY PROPOSED CHANGES SHALL BE APPROVED BY THE ENGINEER AND CITY OF GUELPH.
6. ALL UNDERGROUND SERVICING TO BE INSPECTED BY STANTEC CONSULTING LTD. AND CERTIFIED FOR THE CITY OF GUELPH. CONTRACTOR SHALL COORDINATE WITH STANTEC AND SHALL CONTACT SAME AT LEAST 48 HOURS PRIOR TO INSTALLATION OF SERVICES.
7. CONTRACTOR SHALL COORDINATE WITH STANTEC AND SHALL CONTACT SAME AT LEAST 48 HOURS PRIOR TO INSTALLATION OF SERVICES.
8. ALL CONSTRUCTION WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS (LATEST EDITION).
9. THE PROPERTY OWNER IS RESPONSIBLE FOR RESTORATION OF ALL DAMAGED AND/OR DISTURBED PROPERTY WITHIN THE MUNICIPAL RIGHT-OF-WAY TO CITY OF GUELPH STANDARDS.
10. IF, FOR UNFORESEEN REASONS, THE OWNER AND/OR HIS/HER REPRESENTATIVE MUST ENCROACH ONTO PRIVATE LANDS TO UNDERTAKE ANY WORKS, HE/SHE MUST OBTAIN WRITTEN PERMISSION FROM THE ADJACENT PROPERTY OWNERS PRIOR TO ENTERING UPON THE PRIVATE PROPERTY TO PERFORM ANY WORKS. COPIES OF THESE LETTERS OF CONSENT MUST BE SUBMITTED TO THE DEVELOPMENT & TECHNICAL SERVICES – ENGINEERING DEVELOPMENT DIVISION, PRIOR TO ANY WORK BEING PERFORMED. FAILURE TO COMPLY WITH THE ABOVE IS AT THE PROPERTY OWNERS OWN RISK.

B. UNDERGROUND SERVICES:

1. CONTRACTOR SHALL VERIFY ELEVATION AND LOCATION OF EXISTING SANITARY AND STORM SEWERS AND WATERMAINS PRIOR TO COMMENCING SITE WORK AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES.
2. THE CONTRACTOR TO MAKE CONNECTIONS TO SERVICES AT STUB LOCATION FOR SANITARY, STORM SEWERS, WATERMAIN AND TO RESTORE ALL OFF-SITE AFFECTED PROPERTY TO ORIGINAL CONDITION.
3. ON-SITE SERVICING SHALL NOT BE UNDERTAKEN PRIOR TO COMPLETION OF SERVICE CONNECTIONS WITHIN THE ROAD R.O.W.'S.
4. ALL UNDERGROUND SERVICES TO BE IN COMPLIANCE WITH THE LATEST REVISED BUILDING CODE, CITY OF GUELPH ENGINEERING STANDARDS, ONTARIO PROVINCIAL STANDARDS (OPSS, OPSD) AND WITH THE LATEST REGULATIONS OF THE ONTARIO PLUMBING CODE AND SUPPLEMENT SPECIFICATION FOR MUNICIPAL SERVICES (DGSSMS) AND INSPECTED BY CITY STAFF/CONSULTANT PRIOR TO BACKFILLING.
5. UNDERGROUND SERVICES TO TERMINATE 1.5m FROM BUILDING LINE, PLUGGED OR CAPPED C/W MARKER EXTENDING FROM INVERT TO 1.0M ABOVE FINISHED GRADE.
6. ALL BEDDING TO BE AS NOTED BELOW. TRENCH BACKFILL TO BE APPROVED NATIVE MATERIAL COMPACTED IN 200mm MAX. LIFTS TO 95% STANDARD PROCTOR DENSITY.
7. ALL SERVICES SHALL BE TESTED AS SPECIFIED IN THE APPLICABLE OPSS (OPSS 410 & 441).
8. ALL SERVICES, UTILITIES AND CATCHBASIN LEADS ARE TO BE SUPPORTED AS PER OPSD 1007.01 DURING TRENCHING ACTIVITIES. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION. LOCATION OF EXISTING UTILITIES TO BE VERIFIED IN THE FIELD.
9. ANY UTILITY RELOCATION DUE TO THIS DEVELOPMENT TO BE UNDERTAKEN AT THE EXPENSE OF THE OWNER/DEVELOPER.

C. SEWERS/APPURTENANCES:

4. STORM SEWERS:
   - LESS THAN 200mmø – PVC DR-28
   - 200mmø TO 375mmø – PVC DR-35
     - PVC RIBBED PIPE (ULTRA-RIB OR EQUIVALENT)
     - CL-3 CONCRETE
   - 450mmø TO 600mmø – PVC RIBBED PIPE (ULTRA-RIB OR EQUIVALENT)
     - 65D CONCRETE
   - 450mmø TO 600mmø – 65D CONCRETE
5. SANITARY SEWERS:
   - LESS THAN 200mmø – PVC DR-28
   - 200mmø OR LARGER – PVC DR-35
   - 2.5m MINIMUM COVER FOR SANITARY SEWERS.
3. SEWER BEDDING:
   - CITY OF GUELPH SD-29
   - 150mm (MIN) GRAN 'A' TO 98% S.P.D.
4. STORM MANHOLES:
   - OPSD 701.010 (1200mmø)
   - OPSD 701.011 (1500mmø)
   - OPSD 701.012 (1800mmø)
   - OPSD 701.013 (2400mmø)
   - OPSD 701.014 (3000mmø)
6. SANITARY MAINTENANCE HOLE:
   - OPSD 701.010 (1200mmø)
7. MAINTENANCE HOLE BENCHING:
   - CITY OF GUELPH SD-44
   - CBMH'S WITH AN OUTLET PIPE GREATER THAN 450mmø SHOULD BE BENCHED. 450mmø OR LESS SHALL BE PROVIDED WITH A 600mm SUMP.
8. CATCHBASINS/CATCHBASIN LEADS:
   - OPSD 705.01 (SINGLE)
   - OPSD 705.02 (DOUBLE)
   - OPSD 705.03 (DITCH INLET – 3:1 SLOPE)
   - MINIMUM LEAD DIAMETER. 200mmø FOR SINGLE, 300mmø FOR DOUBLE CATCHBASINS.
9. FRAMES AND GRATES/COVERS:
   - OPSD 400.10 (CB'S & CBMH'S)
   - OPSD 401.01 TYPE 'A' (SANITARY AND STORM MH'S)
   - CITY OF GUELPH SD-15 (RLCB'S)
   - CITY OF GUELPH SD-16 (DICB'S)
   - CITY OF GUELPH SD-9 (SAFETY GRATE FOR MH'S)
   - ALL FRAMES ON STRUCTURES TO BE SET USING PRECAST CONCRETE ADJUSTMENT UNITS

D. WATER SERVICES/APPURTENANCES:

1. WATERMAIN
   - 100mmø TO 300mmø – AWWA C-900 PVC SDR-18
   - 350mmø TO 600mmø – AWWA C905 PVC SDR-25
   - 2.0m MINIMUM COVER
   - FITTINGS TO AWWA C-907
   - WHERE CONFLICT ARISES AT WATERMAIN/SERVICE CROSSING OTHER UNDERGROUND SERVICES, WATERMAIN/SERVICES SHALL BE LOWERED TO MAINTAIN 0.50m VERTICAL SEPARATION.
2. PIPE BEDDING:
   - CITY OF GUELPH SD-29
   - 150mm (MIN) GRANULAR 'A' 98% S.P.D.
3. THRUST BLOCKING:
   - CITY OF GUELPH SD-27
4. TRACER WIRE:
   - CITY OF GUELPH SD-54A
5. HYDRANTS:
   - CITY OF GUELPH SD-25A (OPEN RIGHT)
6. VALVES:
   - ALL VALVES TO OPEN COUNTER-CLOCKWISE AND COMPLY WITH A.W.W.A. SPEC.
   - CITY OF GUELPH SD-24
7. WATER SERVICES
   - 25mmø TYPE K COPPER PIPING WET TAPPED TO PVC WATERMAIN WITH APPROVED SADDLE
   - CITY OF GUELPH SD-54B
8. WATER METERS:
   - BUILDING UNITS TO HAVE INDIVIDUAL WATER METERS TO THE SATISFACTION OF CITY OF GUELPH WATERWORKS DEPARTMENT
9. MAINTAIN SPATIAL SEPARATION FOR SITE SERVICES PER BUILDING CODE PART 7.3.5.6
10. ALL NEW WATER PIPING INSTALLATIONS AS PER AWWA C651-05
11. CATHODIC PROTECTION IN ACCORDANCE WITH CITY OF GUELPH STANDARDS.
12. A WATERMAIN COMMISSIONING PLAN IN ACCORDANCE WITH DGSSMS WILL BE REQUIRED.

E. GRADING:

1. COMPLETE ALL EXCAVATION, GRADING, TRIMMING AND COMPACTION AS REQUIRED TO FACILITATE THE WORK, ALL SUBGRADE AREAS SHALL BE PROOF ROLLED TO 98% S.D.P. PRIOR TO GRANULAR SUBBASE PLACEMENT.
2. DISPOSE OF ALL SURPLUS AND UNSUITABLE MATERIAL OFFSITE.
3. SAWCUT ASPHALT IN NEAT LINES AT ALL MATCH LINES.
4. MATCH EXISTING GRADES AT ADJACENT PROPERTY LINES.
5. TRANSITION SLOPES TO BE MAXIMUM 3:1 (HORIZONTAL TO VERTICAL) UNLESS OTHERWISE NOTED.

F. SURFACE WORKS:

1. CURBS:
   - OPSD 600.040 (CONCRETE BARRIER CURB WITH STANDARD GUTTER)
   - OPSD 600.070 (CONCRETE BARRIER CURB WITH STANDARD GUTTER, TWO STAGE CONSTRUCTION)
   - OPSD 600.080 (CONCRETE BARRIER CURB WITH NARROW GUTTER)
   - OPSD 600.110 (CONCRETE BARRIER CURB)
2. ASPHALT PAVEMENT: (PARKING AREA)
   - 40mm HL 3 (SURFACE ASPHALT) 97% MARSHALL
   - 50mm HL4 (BASE ASPHALT) 97% S.P.D.
   - 150mm GRANULAR 'A' BASE 100% S.P.D.
   - 300mm GRANULAR 'B' SUB-BASE 100% S.P.D.
3. ASPHALT PAVEMENT: (ABOVE PARKING GARAGE)
   - CONCRETE DECK
   - ROOFING MEMBRANE
   - PROTECTION BOARD
   - 40MM HL 3 (SURFACE ASPHALT) 97% MARSHALL
   - 50MM HL4 (BASE ASPHALT) 97% S.P.D.
4. PAVEMENT: (HEAVY DUTY/FIRE ROUTE)
   - 50mm HL-3 SURFACE ASPHALT 97% MARSHALL – (WHERE IN PLACE)
   - 60mm HL-4 BASE ASPHALT 97% MARSHALL
   - 150mm GRANULAR 'A' 100% S.P.D.
   - 400mm GRANULAR 'B' 100% S.P.D.
   - SAW CUT CLEAN EDGES AT ALL MATCH LINES AND APPLY TACK COAT.
5. CONCRETE SIDEWALKS:
   - CITY OF GUELPH SD-2, 1.5m WIDE (CONCRETE SIDEWALK)
   - CITY OF GUELPH SD-4 (SIDEWALK RAMPS)
6. SITE AREAS DISTURBED BY CONSTRUCTION AND NOT INDICATED FOR REMOVAL TO BE RESTORED TO ORIGINAL CONDITIONS.

G. EROSION CONTROL:

1. ALL SILT FENCING TO BE INSTALLED PRIOR TO COMMENCEMENT OF ANY AREA GRADING, EXCAVATION OR DEMOLITION.
2. EROSION CONTROL FENCE TO BE PLACED AROUND THE BASE OF ALL STOCKPILES. ALL STOCKPILES TO BE KEPT A MINIMUM OF 2.5m FROM ALL PROPERTY LINES.
3. P-250 FILTER FABRIC UNDERLYING CONSTRUCTION VEHICLE ENTRANCE TO CONSIST OF CLEANED OR REPLACED 200mm THICK, 50mmø STONE. STONE TO BE TAKEN UP AND WHEN ACCUMULATIONS COVER 50% OF TOP OF STONE (SEE DETAIL).
4. EROSION PROTECTION TO BE PROVIDED AROUND ALL STORM AND SANITARY MANHOLES AND/OR CATCHBASINS.
5. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED AS SITE DEVELOPMENT PROGRESSES. CONTRACTOR TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRUCTURES.
6. EROSION CONTROL STRUCTURES TO BE MONITORED REGULARLY BY STANTEC CONSULTING LTD. AND ANY DAMAGE REPAIRED IMMEDIATELY. SEDIMENTS TO BE REMOVED WHEN ACCUMULATIONS REACH A MAXIMUM OF ONE THIRD (1/3) THE HEIGHT OF THE SILT FENCE.
7. ALL EROSION CONTROL STRUCTURES TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN RE-STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
8. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY STANTEC CONSULTING LTD. AND THE CITY OF GUELPH'S WORKS DEPARTMENT
9. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SEDIMENTS FROM THE MUNICIPAL ROAD AND SIDEWALKS AT THE END OF EACH WORK DAY.
10. MUD MATS TO BE PROVIDED ON SITE AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES EXIT THE SITE. MUD MATS SHALL BE A MINIMUM OF 3.0m WIDE, 15.0m LONG (LENGTH MAY VARY DEPENDING ON SITE LAYOUT) AND 0.3m DEEP AND SHALL CONSIST OF 20mm CLEAR STONE MATERIAL OR APPROVED EQUIVALENT. CONTRACTOR TO ENSURE ALL VEHICLES LEAVE THE SITE VIA THE MUD MAT AND THAT THE MAT IS MAINTAINED IN A MANNER TO MAXIMIZE ITS EFFECTIVENESS AT ALL TIMES.
11. STANTEC CONSULTING LTD. TO MONITOR THE SITE DEVELOPMENT TO ENSURE ALL EROSION CONTROLS ARE INSTALLED AND MAINTAINED TO CITY REQUIREMENTS. CONTRACTOR TO COMPLY WITH THE ENGINEER'S INSTRUCTIONS TO INSTALL, MODIFY, OR MAINTAIN EROSION CONTROL WORKS.

H. RETAINING WALLS:

1. RETAINING WALL TO BE CONSTRUCTED AS DESIGNED BY OTHERS. APPROPRIATE CONSTRUCTION DETAILS SHALL BE PROVIDED FOR RETAINING WALLS HIGHER THAN 0.80m. DETAILS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER UPON APPROVAL. GUARD RAIL IS REQUIRED WHEN HEIGHT EXCEEDS 0.80m.
2. CONTRACTOR TO CONTACT GEOTECHNICAL ENGINEER 48 HOURS PRIOR TO CONSTRUCTION OF RETAINING WALL TO ALLOW FOR INSPECTION OF SOIL CONDITIONS.
3. ANY CHANGES IN WALL HEIGHT MUST BE APPROVED BY THE ENGINEER.
4. BUILDING PERMIT MUST BE OBTAINED FOR RETAINING WALL

I. DEWATERING NOTES:

1. PUMPED GROUNDWATER WILL BE DIRECTED OFFSITE VIA SWALE AND/OR TEMPORARY PIPE TO POPPY DRIVE EAST, WHERE THE WATER WILL BE DISCHARGED TO EITHER THE STORM OR SANITARY SEWER SYSTEM.
2. DISCHARGE TO THE STORM AND/OR SANITARY SEWER SYSTEM MUST ADHERE TO THE QUALITY REQUIREMENTS AS PER CITY OF GUELPH BY-LAW NUMBER (1996)-15202.

J. MISCELLANEOUS:

1. WHERE COVER OVER SEWERS IS LESS THAN 1.2m IN PAVED AREAS, OR LESS THAN 0.90m IN GRASSED AREAS INSTALL INSULATION AS PER DETAIL. INSULATION TO BE 60mm THICK x 1800mm WIDE UNLESS OTHERWISE NOTED. INSTALL LONGITUDINALLY OVER CENTERLINE OF PIPE WITH OVERLAPPING JOINTS.
2. IT IS THE SITE OWNERS' RESPONSIBILITY TO ENSURE THAT ALL SEDIMENT CONTROLS ARE IMPLEMENTED AND MAINTAINED IN ACCORDANCE WITH THE ABOVE CRITERIA.

UNDERGROUND STORAGE AND INFILTRATION TRENCHES

1 PRIOR TO INSTALLATION

- EFFORTS SHOULD BE MADE TO AVOID COMPACTION BY NOT USING THE FACILITY LOCATION AS:
- LAYDOWN OR STOCKPILE LOCATIONS;
- EQUIPMENT STORAGE;
- TRAFFIC FLOW OR SITE ACCESS.
- MATERIAL TO BE USED IN THE CONSTRUCTION OF THE FACILITY SHOULD NOT BE BROUGHT ON SITE PRIOR TO IT BEING NEEDED. IF THIS MATERIAL IS ON SITE PRIOR TO FINAL PLACEMENT, IT SHALL BE STOCKPILED SEPARATELY FROM ANY OTHER CONSTRUCTION MATERIALS AND ADEQUATELY PROTECTED (AS DIRECTED BY THE LID INSPECTOR).

2 INSTALLATION

- TRENCH FLOOR TO BE SCARIFIED TO A DEPTH OF 0.15M UNLESS THE LID INSPECTOR DIRECTS GREATER DEPTHS OF SCARIFICATION.
- ONCE THE AREA IS SCARIFIED, AT LEAST 2 LOCATIONS IN EACH FACILITY ARE TO BE TESTED FOR IN-SITU INFILTRATION RATE. ADDITIONAL SCARIFICATION MAY BE REQUIRED FOLLOWING THESE TESTS, AFTER WHICH THE TESTS SHOULD BE COMPLETED AGAIN IN OTHER LOCATIONS.
- SHOULD THE TRENCH WORK BE COMPLETED IN ADVANCE ON THE INSTALLATION OF THE GEOTEXTILE AND STONE, THE TRENCH SHOULD BE PROTECTED IN THE EVENT OF RAIN.
- THE OVERLAP ON THE GEOTEXTILE SHALL BE A MINIMUM OF 0.3M. THE GEOTEXTILE SHALL BE WRAPPED OVERTOP OF THE STONE STORAGE AT THE MINIMUM OVERLAP.
- ALL STONE INSTALLED IS TO BE TRIPLE WASHED TO PREVENT DUST FROM CLOGGING THE FABRIC AND SOIL PORES. STONE IS TO BE INSTALLED IN LIFTS OF 0.3M MAXIMUM. THESE LIFTS SHOULD BE LIGHTLY WORKED TO SETTLE THE STONE BUT MECHANICAL COMPACTION IS NOT TO BE USED.
- ALL UNDERDRAIN PIPES ARE TO BE WRAPPED IN A SEDIMENT SOCK.
- IF THE FACILITY IS COMPLETED PRIOR TO SITE STABILIZATION, RUNOFF SHOULD BE DIRECTED AWAY FROM THE FACILITY TO PREVENT HEAVY SEDIMENTATION. EROSION CONTROLS SHOULD BE INSTALLED AS PER THE DIRECTION OF THE LID INSPECTOR.

3 MAINTENANCE

- REMOVE ANY DEBRIS, GARBAGE, LEAVES, STICKS, OR OTHER ITEMS FROM THE FACILITY INLETS. THIS SHOULD BE DONE BIANNUALLY WITH SPECIAL ATTENTION IN FALL TO REMOVE FALLEN LEAVES;
- REMOVE ACCUMULATED SEDIMENT FROM THE BOTTOM OF THE FACILITY AS NEEDED BY FLUSHING;
- MONITOR PERFORMANCE; OBSERVE WATER DEPTHS IN THE FACILITY DURING RAIN EVENTS BIANNUALLY.

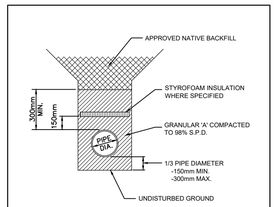
OIL GRIT SEPARATOR

1 INSTALLATION

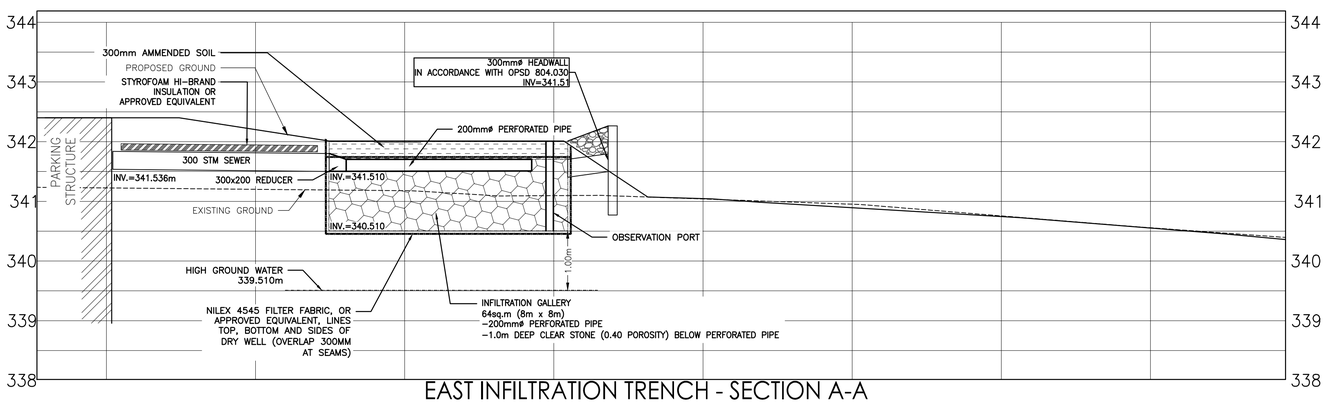
- ONCE INSTALLED, THE INLET TO THE OGS SHOULD BE SURROUNDED BY A FILTER SOCK RING TO REMOVE THE HEAVIEST SEDIMENT LOADS. THE OGS SHOULD BE INSPECTED BIWEEKLY DURING CONSTRUCTION AND CLEANED BY VACUUM TRUCK WHEN THE SUMP IS 50% FULL OF SILT.
- WHEN CONSTRUCTION IS COMPLETE, THE OGS SHOULD BE CLEANED OF ANY SEDIMENT.

2 MAINTENANCE

- INSPECTION SHOULD BE DONE BIANNUALLY;
- REMOVE ACCUMULATED SEDIMENT FROM THE BOTTOM OF THE FACILITY WHEN 50% FULL BY VACUUM TRUCK;
- REMOVAL OF ANY OILS OR FLOATABLES AS NEEDED, WITH SPECIAL ATTENTION PAID IN THE EVENT OF A DELETERIOUS SPILL.



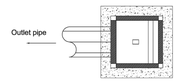
TYP. PIPE BEDDING DETAIL NTS



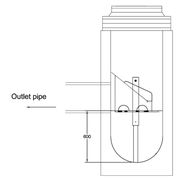
EAST INFILTRATION TRENCH - SECTION A-A

VERT - 1:50 HORZ - 1:100

Notes
1. CB Shield can be installed at any time. In a non frozen condition.
2. The frame and cover should be well aligned with the catchbasin for proper installation
3. The catchbasin sump must be clean before installation
4. The grate should be at the same level as the standing water in the sump.



Top view



Profile view

CB Shield (600mm Sump)

Stantec
600-171 Queens Avenue
London ON N6A 5J7
Tel. 519-645-2007
www.stantec.com

Notes

1. CITY OF GUELPH BENCHMARK 225 ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER

Legend

No.	Revision	By	Appd.	YY.MM.DD
1.	PER CITY COMMENTS	JAC	CJH	22.05.31
2.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1.	ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24

Issued

	Dwn.	Chkd.	Dsgn.	YY.MM.DD
File Name: 161413684_c-dt	JAC	CJH	JAC	21.07.23

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

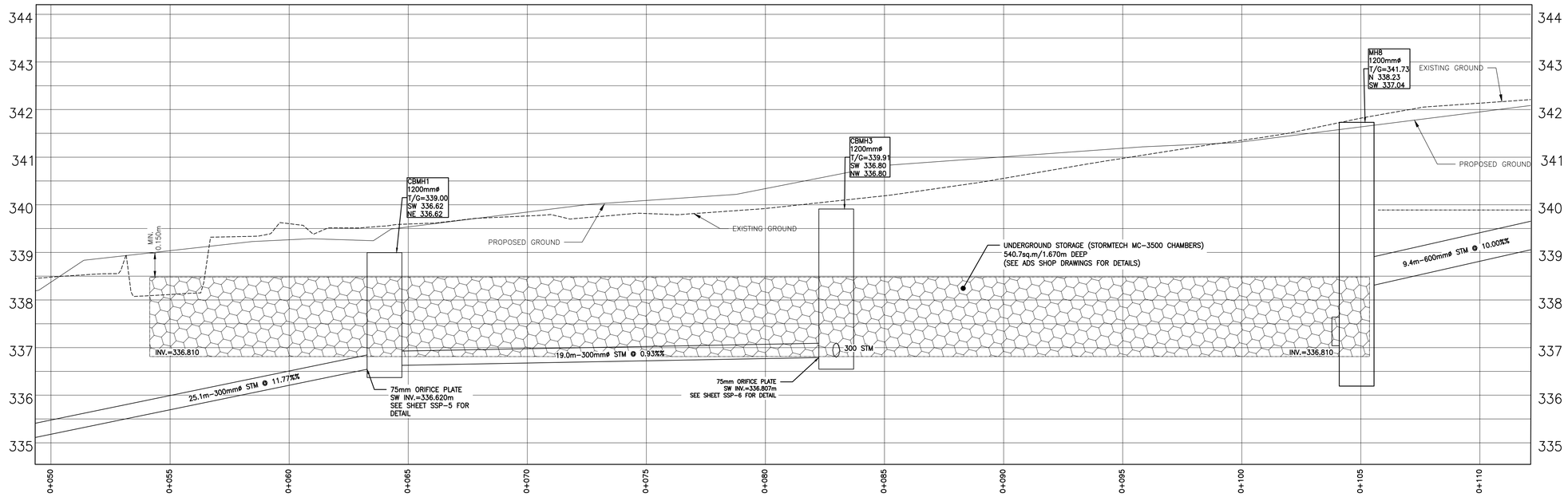
Client/Project
TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET & 9 VALLEY ROAD
GUELPH, ON

Title
NOTES & DETAILS

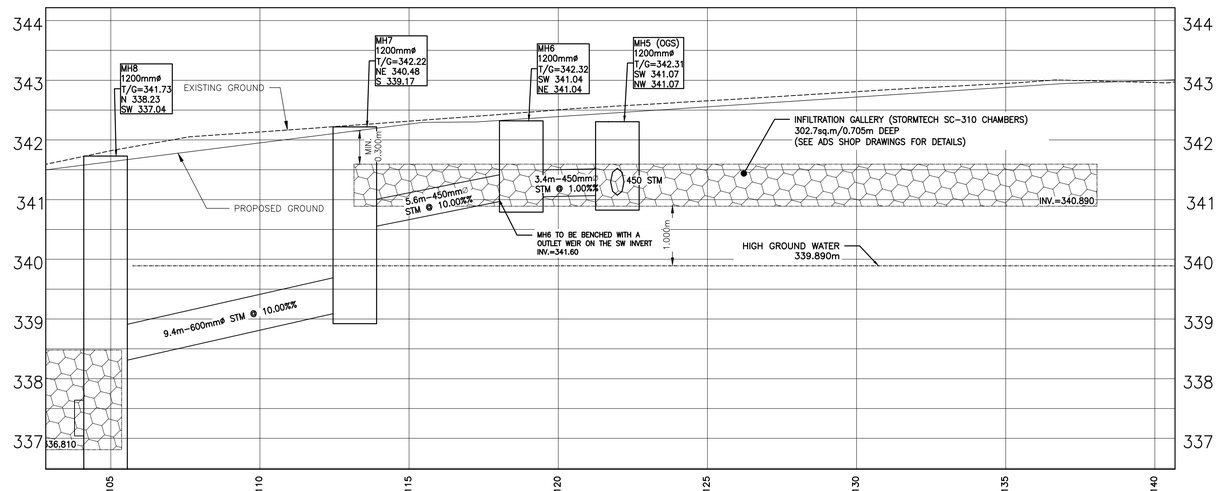
Project No.	Scale	Sheet	Revision
161413684	1:100 (0 1 3 5m)	7 of 8	1
Drawing No. SSP-5			

ORIGINAL SHEET - ANSI D



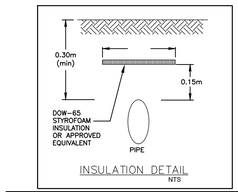
SOUTH INFILTRATION TRENCH - SECTION B-B - PART 1

VERT - 1:50 HORZ - 1:100

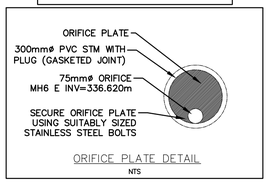


SOUTH INFILTRATION TRENCH - SECTION B-B - PART 2

VERT - 1:50 HORZ - 1:100



INSULATION DETAIL
NTS



ORIFICE PLATE DETAIL
NTS

Stantec
600-171 Queens Avenue
London ON N6A 5J7
Tel. 519-645-2007
www.stantec.com

Liability Note:

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Notes

1. CITY OF GUELPH BENCHMARK 225
   ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER

Legend

1. PER CITY COMMENTS	JAC	CJH	22.05.31
Revision	By	Appd.	YY.MM.DD
2. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	22.05.31
1. ISSUED FOR DRAFT PLAN APPROVAL	JAC	CJH	21.08.24
Issued	By	Appd.	YY.MM.DD
File Name: 161413684_c-dt	JAC	CJH	JAC	21.07.23
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
C. J. HENDRIKSEN
100125181
May 31/22
PROVINCE OF ONTARIO

Client/Project

TRICAR DEVELOPMENTS INC.

1242, 1250, 1260 GORDON STREET
& 9 VALLEY ROAD
GUELPH, ON

Title

NOTES & DETAILS

Project No.	Scale	Revision
161413684	1:100 (0 1 3 5m)	
Drawing No.	Sheet	
SSP-6	8 of 8	1

ORIGINAL SHEET - ANSI D

APPENDIX B – DESIGN SHEETS

Stantec

Tricar Development

1242, 1250, 1260 Gordon Street & 9 Valley Road

DATE: May 19, 2022

DESIGNED BY: JC

CHECKED BY: CH

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T-

DESIGN PARAMETERS

DESIGN STORM 1 IN 5 Years

I = a / ((tc + b) ^c)

a= 0.00	MANNING'S n =	0.000	
b= 0.00	MINIMUM COVER:	48.000	m
c= 0.0000	TIME OF ENTRY	10	min

LOCATION			DRAINAGE AREA								PIPE SELECTION											
Street	U/S	D/S	Area ID	5-Year Area Design (ha)	Runoff Coeff. Design	A x R	Accum. A x R	U/S T_C (min)	Rainfall Intensity (mm/hr)	Total Flow (m^3/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (m^3/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Time of Flow (min)	5-Year Q_A/Q_C (%)	Fall in Sewer (m)	Upper Inv. (m)	Lower Inv. (m)	Drop (m)
Street A	MH3	MH2	A26	0.27	0.90	0.24	0.24	10.00	109.68	0.074	36.80	300	4.48	0.205	2.90	2.63	0.23	36.2%	1.65	338.320	336.67	0.05
Street A	MH2	MH1	A27	0.03	0.90	0.03	0.27	10.23	108.62	0.081	41.60	300	0.75	0.084	1.18	1.37	0.50	97.3%	0.31	336.621	336.31	

1250 Gordon Street

161413684

Jun 8, 2022

FIRE FLOW CALCULATIONS AS PER OBC REQUIREMENTS

ONTARIO BUILDING CODE CLAUSE A-3.2.5.7.

$$Q = K\,x\,V\,x\,S_{Tot}$$

Q = MINIMUM SUPPLY OF WATER (L)
K = WATER SUPPLY COEFFICIENT
V = BUILDING VOLUME (m^3)
S_{Tot} = TOTAL OF SPATIAL COEFFICIENT VALUES FROM PROPERTY LINE EXPOSURES ON ALL SIDES AS OBTAINED FROM THE FORMULA
where:

$$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + \cdots etc)$$

values are obtained from Figure 1 A-3.2.5.7, OBC, as modified by Sections 6.3 (e) and 6.3 (f) of this guideline, and

$$S_{Tot} = need\ not\ exceed\ 2.0$$

As per Table 2, Section A-3.2.5.7, OBC

OBC Part 3 Buildings under Building Code	**Required Minimum Water Supply Flow Rate (L/min)**
One-storey building with area ≤ 600 m2	1800
All other buildings	2700 (if Q ≤ 108,000 L)
	3600 (if Q >108,000 L and ≤ 135,000 L)
	4500 (if Q >135,000 L and ≤ 162,000 L)
	5400 (if Q >162,000 L and ≤ 190,000 L)
	6300 (if Q >190,000 L and ≤ 270,000 L)
	9000 (if Q >270,000 L)

Major Occupancy Classification

Group C	Residential Occupancies

Water Supply Coefficient - K

As per Table 1, Section A-3.2.5.7, OBC	K= 10

Total Building Volume

Bldg	Area (m^2)	Flr Height (m)	Volume (m^3)
2	23900	3.2	76480
			0
			0
Total			76480

**Assuming single 10 storey Building #2 apartment is critical*

Exposures

		Separation (m)	Spatial Coeff
North		50	0.00
South		50	0.00
East		50	0.00
West		24	0.00
S_{tot}			1.00

***above separation distances conservative estimates.*

Minimum Water Supply

$$Q = K\,x\,V\,x\,S_{Tot}$$

Q = 10 x 76480 x 1.00 = 764,800 L

since Q > 270,000 L

Required Fire Flow (from Table 2 above) = 9000 L/min

= 150 L/s

APPENDIX C – EMAIL CORRESPONDENCE

From:	Ike Umar
To:	Hendriksen, Chris (Vancouver)
Subject:	RE: Gordon Street Sanitary Sewer upgrades
Date:	Tuesday, March 15, 2022 6:12:37 AM

Good Morning Chris, We will be retaining consultant in Q2. We will be reviewing the 1242-1270 Gordon Street development during the design of Gordon St.

Thanks.

Ike Umar, C.E.T. | Project Manager
Engineering and Transportation Services | **Infrastructure, Development and Enterprise**
City of Guelph

T 519-822-1260 X2242
E ike.umar@guelph.ca

From: Hendriksen, Chris (Vancouver) <Chris.Hendriksen@stantec.com>
Sent: Friday, March 11, 2022 9:51 AM
To: Ike Umar <Ike.Umar@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Good morning Ike. I wanted to follow up on the design progression of this work and to confirm that the design contributions from the proposed development at 1242-1270 Gordon Street and 9 Valley Road are being incorporated. Can you please provide an update?

Thanks

Chris

From: Ike Umar <Ike.Umar@guelph.ca>
Sent: Tuesday, August 10, 2021 8:01 AM
To: Rice, Derrick <Derrick.Rice@stantec.com>
Cc: Hendriksen, Chris (Vancouver) <Chris.Hendriksen@stantec.com>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Good Morning Derrick, As per email below from Reg I do not have anything to add. We would know better once we have a schedule of construction in 2023.

Thanks

Ike Umar, C.E.T. | Project Manager
Engineering and Transportation Services | **Infrastructure, Development and Enterprise**
City of Guelph

T 519-822-1260 X2242
E ike.umar@guelph.ca

From: Rice, Derrick <Derrick.Rice@stantec.com>

Sent: Thursday, August 5, 2021 4:47 PM
To: Ike Umar <Ike.Umar@guelph.ca>
Cc: Hendriksen, Chris (Vancouver) <Chris.Hendriksen@stantec.com>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Good afternoon Ike,

I am reaching out regarding the Gordon Street Sanitary Sewer works as per the correspondence below. We would like to confirm that the proposed sanitary sewer fronting the 1250 Gordon Street proposed development will be available as part of the construction work noted below which notes availability late 2023 to early 2024? Do you have any insight on anticipated Construction staging to better understand when the sewer servicing the 1250 site will be available? Any information on this would be greatly appreciated.

Thanks,

Derrick Rice P. Eng
Project Engineer, Community Development

Direct: 519-675-6644
Cell: 519-630-3627
Derrick.Rice@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Reg Russwurm <Reg.Russwurm@guelph.ca>
Sent: Wednesday, July 21, 2021 5:01 PM
To: Rice, Derrick <Derrick.Rice@stantec.com>
Cc: Hendriksen, Chris (Vancouver) <Chris.Hendriksen@stantec.com>; Ike Umar <Ike.Umar@guelph.ca>; Mary Angelo <Mary.Angelo@guelph.ca>; Colleen Gammie <Colleen.Gammie@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Derrick,

The Gordon St EA has been completed so we're moving ahead with implementation. The City is currently preparing a RFP to retain an engineering firm to undertake final design starting later this year and construction in 2023. The sewers will be available earliest as late 2023 or more likely in 2024. We'll know better once the final design is completed and staging of works is better understood.

Ike Umar (cc'd) is the City's PM for the works.

- Reg

From: Rice, Derrick <Derrick.Rice@stantec.com>

Sent: July 21, 2021 8:31 AM
To: Reg Russwurm <Reg.Russwurm@guelph.ca>
Cc: Hendriksen, Chris (Vancouver) <Chris.Hendriksen@stantec.com>; Arun Hindupur <arun.hindupur@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Good morning Reg,

I reached out to you last year regarding the Gordon Street sanitary sewer upgrades and our client was hoping we could get an update on the work. I see from the links you provided me that design is scheduled for 2021 and construction 2023, could you give any further insight on progress for the project and if there is an anticipated date of when the new sewers will be in service?

Thanks,

Derrick Rice P. Eng
Project Engineer, Community Development

Direct: 519-675-6644
Cell: 519-630-3627
Derrick.Rice@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Reg Russwurm <Reg.Russwurm@guelph.ca>
Sent: Wednesday, March 4, 2020 3:54 PM
To: Rice, Derrick <Derrick.Rice@stantec.com>
Cc: Hendriksen, Chris <Chris.Hendriksen@stantec.com>; Arun Hindupur <arun.hindupur@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Derrick,

I can't commit to keep you current on the status of works. Please monitor the City's webpages concerning the EA's and get added to the circulation list.

https://guelph.ca/city-hall/planning-and-development/community-plans-studies/environment-planning/environmental-assessments/gordon-street-improvements/

https://guelph.ca/plans-and-strategies/water-and-wastewater-servicing-master-plan/

- Reg

From: Rice, Derrick <Derrick.Rice@stantec.com>
Sent: March 4, 2020 3:22 PM
To: Reg Russwurm <Reg.Russwurm@guelph.ca>
Cc: Hendriksen, Chris <Chris.Hendriksen@stantec.com>; Arun Hindupur <Arun.Hindupur@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Thanks for the quick response Reg,

If you could keep us in the loop as things progress it would be greatly appreciated.

Thanks,

Derrick Rice EIT
Engineering Intern, Community Development

Direct: 519-675-6644
Cell: 519-630-3627
Derrick.Rice@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Reg Russwurm <Reg.Russwurm@guelph.ca>
Sent: Wednesday, March 4, 2020 2:50 PM
To: Rice, Derrick <Derrick.Rice@stantec.com>
Cc: Hendriksen, Chris <Chris.Hendriksen@stantec.com>; Arun Hindupur <arun.hindupur@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Derrick,

The sizing of the sanitary system along Gordon Street is being considered within the overall Master Wastewater Servicing Plan currently underway. Sizing takes into account future growth including this development.

Funding is allocated in the capital budget for design to commence later this year, but I would not want to say construction will be completed in 2021. There is a large scope of work to complete plus two EA's to wrap up. We'll know much better when the new sewer will be in service once the road related EA and the Wastewater Servicing Master Plan EA are complete.

Reg Russwurm, MBA, P.Eng, **Manager, Design and Construction**
Engineering and Transportation Services, **Infrastructure, Development and Enterprise**
City of Guelph
519-822-1260 extension 2765

reg.russwurm@guelph.ca

guelph.ca
facebook.com/cityofguelph
@cityofguelph

- Reg

From: Rice, Derrick <Derrick.Rice@stantec.com>
Sent: March 4, 2020 11:44 AM
To: Reg Russwurm <Reg.Russwurm@guelph.ca>
Cc: Hendriksen, Chris <Chris.Hendriksen@stantec.com>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Hi Reg,

We had previously corresponded with Daryush Esmaili about the Gordon Street Sanitary Sewer upgrades to ensure that our development at 1250 Gordon Street (encompasses 9 Valley, 1242, 1250 and 1260 Gordon) would be considered in the sanitary sewer upgrade planned on Gordon Street. He had confirmed our development would be accommodated in the sizing of the planned upgrade back in June of 2019. I just wanted to contact you to find out if there are any updates on this project that you can provide?

If you have any questions please feel free to contact me.

Thanks,

Derrick Rice EIT
Engineering Intern, Community Development

Direct: 519-675-6644
Cell: 519-630-3627
Derrick.Rice@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Engineering General Delivery <Engineering@guelph.ca>
Sent: Wednesday, March 4, 2020 11:33 AM
To: Rice, Derrick <Derrick.Rice@stantec.com>
Cc: Reg Russwurm <Reg.Russwurm@guelph.ca>
Subject: RE: Gordon Street Sanitary Sewer upgrades

Good morning Mr. Rice,

Unfortunately Daryush Esmaili is no longer with the City of Guelph. Reg Russwurm is now the Manager of Design and Construction with Engineering and Transportation Services.

I have cc'ed him on this email in the hopes he can help provide the information you require.

Thank you,

Steve Wark, Clerical Assistant II
Engineering and Transportation Services, **Infrastructure, Development and Enterprise**
City of Guelph
519-822-1260 extension 2338
steve.wark@guelph.ca

From: Rice, Derrick <Derrick.Rice@stantec.com>
Sent: March 4, 2020 10:07 AM
To: Engineering General Delivery <Engineering@guelph.ca>
Subject: Gordon Street Sanitary Sewer upgrades

Hi,

I am trying to contact Daryush Esmaili regarding the Gordon Street Sanitary Sewer upgrades but seem to be getting a bounce back email from guelph.ca, could you please forward my contact information along to Daryush or let me know what I need to do to fix the issue?

Thanks,

Derrick Rice EIT
Engineering Intern, Community Development

Direct: 519-675-6644
Cell: 519-630-3627
Derrick.Rice@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

APPENDIX D – SWM FIGURES, MODELS & SUPPORTING DATA

Stantec
600-171 Queens Avenue
London ON N6A 5J7
Tel. 519-645-2007
www.stantec.com

Notes

1. CITY OF GUELPH BENCHMARK 225 ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER
4. SITE PLAN PREPARED BY STANTEC, DATED JANUARY, 2020.

101 / A=1.73 — AREA ID / CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

1. SITE PLAN REVISIONS	JAC	CJH	21.05.14
Revision	By	Appd.	YY.MM.DD
2. FOR SITE PLAN APPROVAL	JAC	CJH	21.05.14
1. FOR SITE PLAN APPROVAL	JAC	CJH	20.03.24
Issued	By	Appd.	YY.MM.DD
File Name: 161413684_c-sd_ex	JAC	CJH	JAC	19.05.31
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
TRICAR DEVELOPMENTS INC.

1250 GORDON STREET

GUELPH, ON

Title
EXISTING STORM DRAINAGE CONDITIONS

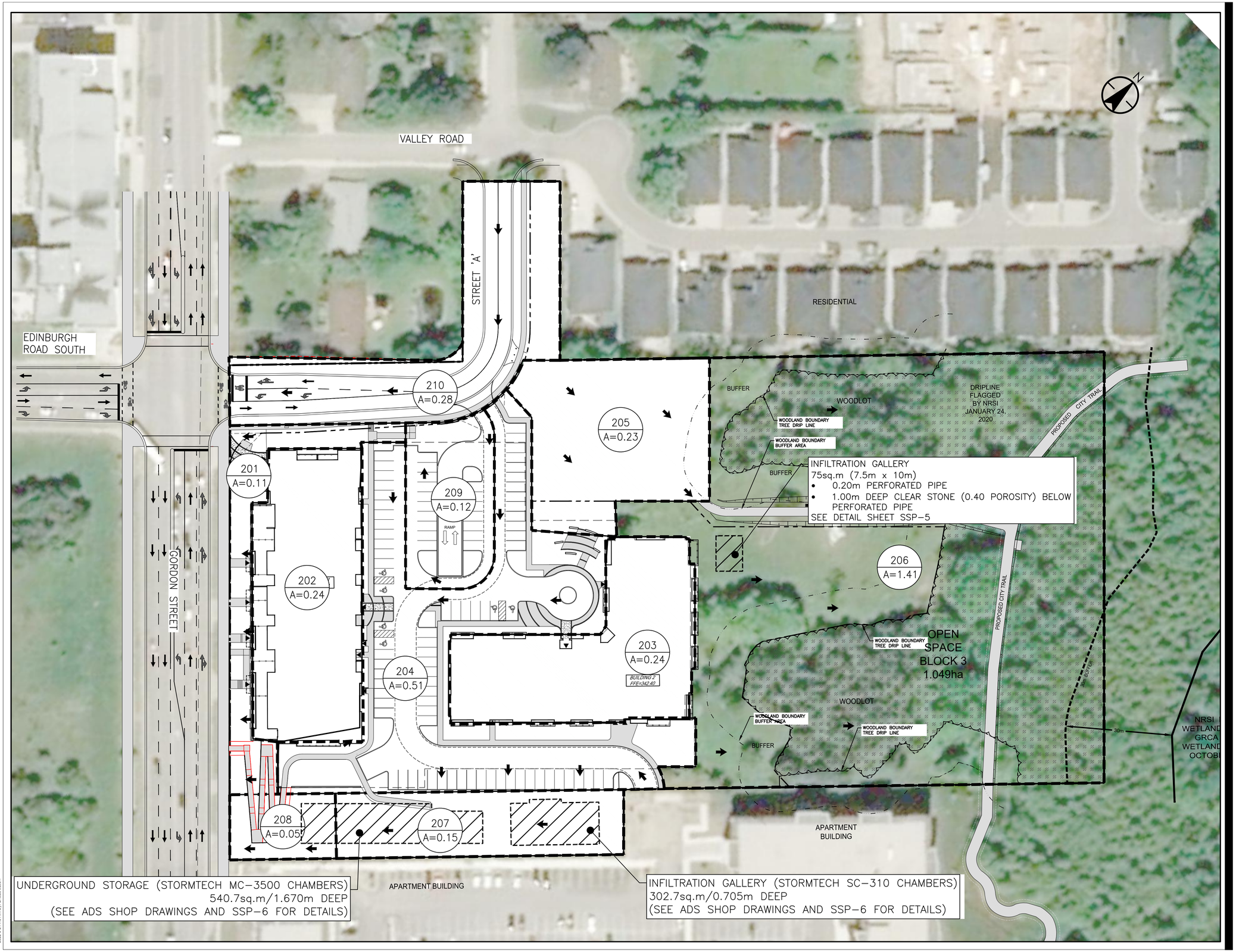
Project No. 161413684

Scale 1:400 (0, 4, 12, 20m)

Drawing No. 1

Sheet 1 of 2

Revision 1



Stantec
600-171 Queens Avenue
London ON N6A 5J7
Tel. 519-645-2007
www.stantec.com

Notes

1. CITY OF GUELPH BENCHMARK 225
ELEVATION 338.665 LOCATION: 1221 GORDON STREET
2. EXISTING SURVEY COMPLETED BY BSR&D (NOVEMBER, 4 2014)
3. THE CONTRACTOR IS TO VERIFY ALL EXISTING ELEVATIONS AND EXISTING CONDITIONS AND TO REPORT ANY DISCREPANCIES TO THE CONSULTING ENGINEER
4. SITE PLAN PREPARED BY STANTEC, DATED JANUARY, 2020.

Legend

201 / A=0.12 — AREA ID / CONTRIBUTING AREA (ha)

MAJOR OVERLAND FLOOD ROUTE

DRAINAGE BOUNDARY

Revision	By	Appd.	YY.MM.DD
2. SWM DESIGN REVISIONS	JAC	DW	22.05.31
2. SITE PLAN REVISIONS	JAC	CJH	21.07.30
1. SITE PLAN REVISIONS	JAC	CJH	21.05.14

File Name: 161413684_c-sd_prop	JAC	CJH	JAC	19.05.31
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
TRICAR DEVELOPMENTS INC.

1250 GORDON STREET

GUELPH, ON

Title
PROPOSED STORM DRAINAGE CONDITIONS

Project No.	Scale
161413684	1:400 (0, 4, 12, 20m)

Drawing No.	Sheet	Revision
2	2 of 2	2

HYDROLOGIC MODELING INPUTS

Subject: MIDUSS Parameters
Project: 1242-1260 Gordon and 9 Valley
Project No.: 161413684
Client: Tricar
Date: June 6, 2022

Table 1: CN Values									Source
Land Use		Hydrologic Soil Type							
		A	AB	B	BC	C	CD	D	
Meadow	"Good"	30	44	58	65	71	75	78	USDA
Woodlot	"Fair"	36	48	60	67	73	76	79	USDA
Lawns	"Good"	39	50	61	68	74	77	80	USDA
Pasture/Range		49	55	60	70	79	82	84	USDA
Crop		64	70	74	79	81	84	85	USDA
Gravel		76	81	85	87	89	90	91	USDA
Bare Soil (Fallow)		77	82	86	89	91	93	94	USDA
Impervious		98	98	98	98	98	98	98	USDA

USDA - United States Department of Agriculture (2004), National Engineering Handbook, Part 630 Hydrology,

Table 2: Pre-Development Parameters

Area Description	Catchment Number	Area (ha)	Flow Path Length (m)	CN	Slope (%)	Impervious Coverage (%)
To Gordon Street	101	1.33	70.00	67	2.50	10
To Torrance Watershed	102	1.72	150.00	67	5.00	1
TOTAL AREA		**3.05**				

Table 3: Post-Development Parameters

Area Description	Catchment Number	Area (ha)	Flow Path Length (m)	CN	Slope (%)	Imperviousness (%)
Uncontrolled to Gordon	201	0.11	6	68	2.0	70
West Building (Building 1)	202	0.24	15	68	0.5	99
East Buidling (Building 2)	203	0.24	15	68	0.5	99
Parking	204	0.51	10	68	2.0	90
Future Park	205	0.23	50	68	2.0	10
Uncontrolled to Torrance	206	1.41	120	68	5.0	0
Landscaped Area to Storage	207	0.15	75	68	3.0	50
Uncontrolled Landscape Area	208	0.05	35	68	25.0	70
Parking (Minor to Storage)	209	0.12	10	68	2.0	99
Street A (outside site limits)	210	0.28	-	-		
TOTAL AREA		**3.34**				

Notes:
Slope measure from topographic contours and pre-development drainage plan
Imperviousness estimated from development plan (existing buildings imperviouness estimated to be 99%)
Street A is not included within the hydrologic model as it is outside the site boundaries

Stantec

Project: 1242-1260 Gordon and 9 Valley
Project Number: 161413684
Project Location: Guelph
Designer: DW
Date: 6/6/2022
Pond Name: Subsurface Storage

Stormwater Management Facility Design Calculations

	Rating Curve			Estimated Detention Time (hrs)	Volume Estimation			Outlet Structure Controls		
			Storage			Active Storage			Parameters	
	Elevation (m)	Discharge (m^3/s)	Active (m^3)		Elevation (m)	Depth (m)	Elevation (m)	Orifice #1 (m^3/s)		
Orifice Invert	336.62				336.62		336.6		Orifice #1 Elev (m)	Orifice Coeff.
Stone Invert	336.81	0.0047			336.81	0.19	336.8	0.005	336.62	0.620
	336.84	0.0051	5.49	0.3	336.84	0.2	336.8	0.005	Orifice #1-Midpoint (mm)	Perimeter (m)
	336.86	0.0055	10.98	0.6	336.86	0.2	336.9	0.005	336.66	0.236
	336.89	0.0058	16.47	0.9	336.89	0.3	336.9	0.006	Orifice Diameter (mm)	Area (m^2)
	336.91	0.0061	21.96	1.1	336.91	0.3	336.9	0.006	75	0.004
	336.94	0.0064	27.45	1.4	336.94	0.32	336.9	0.006	Weir Coeff. (Semi-Circular)	Orientation
	336.96	0.0067	32.94	1.6	336.96	0.34	337.0	0.007	1.62	Vertical
	336.99	0.0070	38.44	1.8	336.99	0.37	337.0	0.007		
	337.01	0.0072	43.93	2.0	337.01	0.39	337.0	0.007		
Base of Chamber	337.04	0.0075	49.42	2.2	337.04	0.42	337.0	0.007		
	337.06	0.0077	61.00	2.7	337.06	0.44	337.1	0.008		
	337.09	0.0080	72.54	3.1	337.09	0.47	337.1	0.008		
	337.11	0.0082	84.03	3.5	337.11	0.49	337.1	0.008		
	337.14	0.0084	95.49	3.9	337.14	0.52	337.1	0.008		
	337.17	0.0086	106.91	4.2	337.17	0.55	337.2	0.009		
	337.19	0.0089	118.29	4.6	337.19	0.57	337.2	0.009		
	337.22	0.0091	129.63	4.9	337.22	0.60	337.2	0.009		
	337.24	0.0093	140.93	5.3	337.24	0.62	337.2	0.009		
	337.27	0.0095	152.18	5.6	337.27	0.65	337.3	0.009		
	337.29	0.0097	163.37	5.9	337.29	0.67	337.3	0.010		
	337.32	0.0099	174.52	6.3	337.32	0.70	337.3	0.010		
	337.34	0.0100	185.62	6.6	337.34	0.72	337.3	0.010		
	337.37	0.0102	196.66	6.9	337.37	0.75	337.4	0.010		
	337.39	0.0104	207.64	7.2	337.39	0.77	337.4	0.010		
	337.42	0.0106	218.55	7.5	337.42	0.80	337.4	0.011		
	337.45	0.0108	229.40	7.7	337.45	0.83	337.4	0.011		
	337.47	0.0109	240.19	8.0	337.47	0.85	337.5	0.011		
	337.50	0.0111	250.89	8.3	337.50	0.88	337.5	0.011		
	337.52	0.0113	261.53	8.5	337.52	0.90	337.5	0.011		
	337.55	0.0114	272.08	8.8	337.55	0.93	337.5	0.011		
	337.57	0.0116	282.55	9.1	337.57	0.95	337.6	0.012		
	337.60	0.0118	292.93	9.3	337.60	0.98	337.6	0.012		
	337.62	0.0119	303.21	9.5	337.62	1.00	337.6	0.012		
	337.65	0.0121	313.40	9.8	337.65	1.03	337.6	0.012		
	337.67	0.0122	323.48	10.0	337.67	1.05	337.7	0.012		
	337.70	0.0124	333.46	10.2	337.70	1.08	337.7	0.012		
	337.72	0.0125	343.31	10.5	337.72	1.10	337.7	0.013		
	337.75	0.0127	353.05	10.7	337.75	1.13	337.7	0.013		
	337.78	0.0128	362.66	10.9	337.78	1.16	337.8	0.013		
	337.80	0.0130	372.14	11.1	337.80	1.18	337.8	0.013		
	337.83	0.0131	381.46	11.3	337.83	1.21	337.8	0.013		
	337.85	0.0133	390.64	11.5	337.85	1.23	337.9	0.013		
	337.88	0.0134	399.65	11.7	337.88	1.26	337.9	0.013		
	337.90	0.0135	408.48	11.8	337.90	1.28	337.9	0.014		
	337.93	0.0137	417.12	12.0	337.93	1.31	337.9	0.014		
	337.95	0.0138	425.55	12.2	337.95	1.33	338.0	0.014		
	337.98	0.0139	433.75	12.4	337.98	1.36	338.0	0.014		
	338.00	0.0141	441.69	12.5	338.00	1.38	338.0	0.014		
	338.03	0.0142	449.32	12.7	338.03	1.41	338.0	0.014		
	338.05	0.0143	456.58	12.8	338.05	1.43	338.1	0.014		
	338.08	0.0145	463.26	12.9	338.08	1.46	338.1	0.014		
	338.11	0.0146	469.45	13.0	338.11	1.49	338.1	0.015		
	338.13	0.0147	475.45	13.2	338.13	1.51	338.1	0.015		
	338.16	0.0149	481.27	13.3	338.16	1.54	338.2	0.015		
Top of Chamber	338.18	0.0150	486.86	13.4	338.18	1.56	338.2	0.015		
	338.21	0.0151	492.35	13.5	338.21	1.59	338.2	0.015		
	338.23	0.0152	497.84	13.6	338.23	1.61	338.2	0.015		
	338.26	0.0153	503.33	13.7	338.26	1.64	338.3	0.015		
	338.28	0.0155	508.82	13.8	338.28	1.66	338.3	0.015		
	338.31	0.0156	514.31	13.9	338.31	1.69	338.3	0.016		
	338.33	0.0157	519.81	14.0	338.33	1.71	338.3	0.016		
	338.36	0.0158	525.30	14.1	338.36	1.74	338.4	0.016		
	338.38	0.0159	530.79	14.2	338.38	1.76	338.4	0.016		
	338.41	0.0161	536.28	14.3	338.41	1.79	338.4	0.016		
	338.44	0.0162	541.77	14.4	338.44	1.82	338.4	0.016		
	338.46	0.0163	547.26	14.4	338.46	1.84	338.5	0.016		
Top of Stone	338.49	0.0164	552.75	14.5	338.49	1.87	338.5	0.016		
	339.00	0.0204	552.75	14.5	339.49	2.38	339.5	0.020		

Drawdown Time Calculations

Greater than 0.1 m above Orifice 1 Invert

$T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Q_1=ending flow

From 0.0 to 0.1 m above Orifice 1 invert

$T=[v_2-v_1]/[(Q_{2)}]/3600$

where

T=drawdown time in hours

v_2=starting pond volume

v_2=ending pond volume

Q_2=starting flow

Orifice Flow Calculations:

Orifice flow equation

$Q = C*A*(2*g*H)^{0.5}$

where

C = orifice coefficient

A = area of orifice

g = acceleration due to gravity

H = head above centre line of orifice

Note: used when water elevation is above 3/4 of the orifice diameter

Sharp crested semi-circular weir equation

$Q=C*D^{2.5}*(H/D)^{1.88}$

where

C = sharp crested semi-circular weir coefficient

D = diameter of orifice

H = head above orifice invert

Note: used when water elevation is below 3/4 of the orifice diameter

Subject: **Rooftop Storage Calculations**
Project: **1242-1260 Gordon and 9 Valley**
Project No. **161413684**
Client: **Tricar**
Date: **June 6, 2022**

Rating Curve for 1 ha

Q (m3/s)	Storage (ha-m)	Depth (m)
0.0226	0.023	0.023
0.0275	0.031	0.031
0.034	0.045	0.045
0.042	0.061	0.061
0.208	0.0625	0.0625

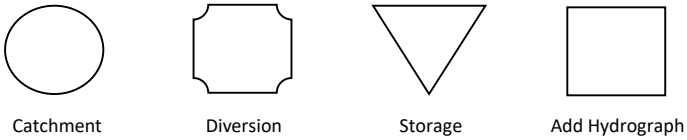
.

Catchment 202/203
Site Ara 0.24

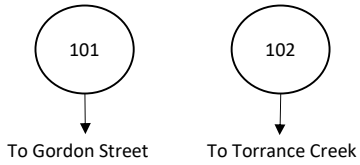
Q (m3/s)	Storage (ha-m)	Depth (m)
0.0054	0.0055	0.023
0.0066	0.0074	0.031
0.0082	0.0108	0.045
0.0101	0.0146	0.061
0.0499	0.0150	0.063

Subject: MIDUSS Schematic
Project: 1242-1260 Gordon and 9 Valley
Project No.: 161413684
Client: Tricar
Date: June 6, 2022

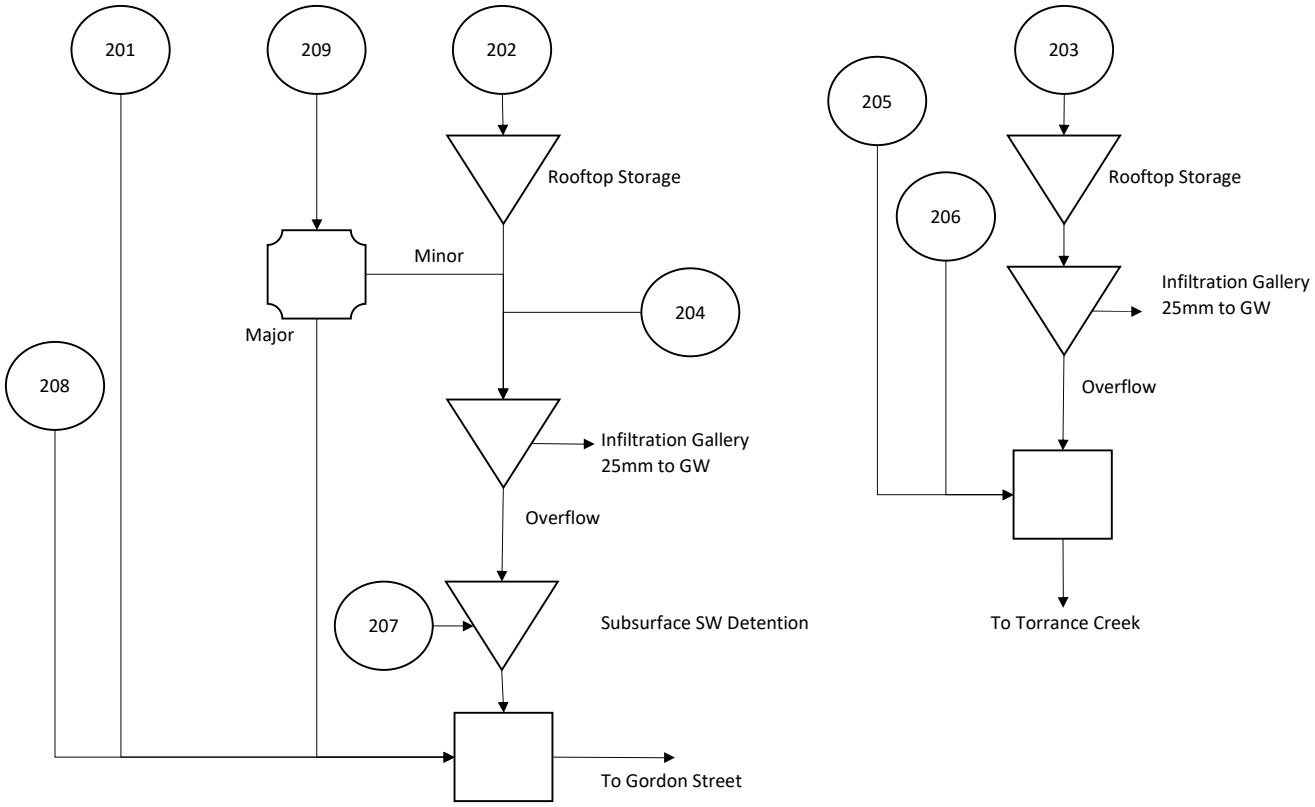
Legend



Existing Conditions



Proposed Conditions



MIDUSS FILES

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       Units used are defined by G =    9.810
          300   600     5.000        are MAXDT MAXHYD & DTMIN values
       Licensee: Paragon Engineering Limited
35     COMMENT
      5     line(s) of comment
       ******************************
       1242-1260 Gordon Street and 9 Valley - 1614-13684
       Stormwater Management Modelling
       May 2022 - D. Williams
       ******************************
14     START
      1     1=Zero; 2=Define
35     COMMENT
      7     line(s) of comment
       **********************


       25-mm STORM


       **********************
 2     STORM
          1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
     509.000     Coefficient  a
       6.000     Constant  b    (min)
        .799     Exponent  c
        .400     Fraction to peak  r
     240.000     Duration ó 1500 min
                25.028 mm     Total depth
 3     IMPERVIOUS
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
      98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
      1     1=Zero; 2=Define
35     COMMENT
      3     line(s) of comment
       ****************************
       Catchment 101 - Existing to Gordon
       ****************************
 4     CATCHMENT
     101.000     ID No.ó 99999
       1.330     Area in hectares
     110.000     Length (PERV) metres
       2.500     Gradient (%)
      10.000     Per cent Impervious
      70.000     Length (IMPERV)
```

```
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .018       .000       .000       .000 c.m/s
              .110       .736       .173     C perv/imperv/total
15     ADD RUNOFF
              .018       .018       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        *******************************
        Catchment 102 - Existing to Torrence
        ***************************
 4     CATCHMENT
     102.000     ID No.ó 99999
        1.720     Area in hectares
     150.000     Length (PERV) metres
        5.000     Gradient (%)
        1.000     Per cent Impervious
        1.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .005       .000       .000       .000 c.m/s
              .110       .650       .116     C perv/imperv/total
15     ADD RUNOFF
              .005       .005       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       7     line(s) of comment
        **********************


        2-Year STORM


        **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
     743.000     Coefficient  a
```

```
       6.000     Constant  b    (min)
        .798     Exponent  c
        .400     Fraction to peak  r
     180.000     Duration ó 1500 min
                34.438 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
      98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ***************************
        Catchment 101 - Existing to Gordon
        ***************************
 4     CATCHMENT
     101.000     ID No.ó 99999
       1.330     Area in hectares
     110.000     Length (PERV) metres
       2.500     Gradient (%)
      10.000     Per cent Impervious
      70.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .027       .000       .000       .000 c.m/s
              .163       .799       .226     C perv/imperv/total
15     ADD RUNOFF
              .027       .027       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        *******************************
        Catchment 102 - Existing to Torrence
        ***************************
 4     CATCHMENT
     102.000     ID No.ó 99999
       1.720     Area in hectares
     150.000     Length (PERV) metres
       5.000     Gradient (%)
       1.000     Per cent Impervious
       1.000     Length (IMPERV)
```

```
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .015       .000       .000       .000 c.m/s
              .163       .698       .168     C perv/imperv/total
15     ADD RUNOFF
              .015       .015       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       7     line(s) of comment
        **********************


        5-Year STORM


        **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
    1593.000     Coefficient  a
      11.000     Constant  b    (min)
        .879     Exponent  c
        .400     Fraction to peak  r
     180.000     Duration ó 1500 min
                47.240 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
       98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ****************************
        Catchment 101 - Existing to Gordon
        ****************************
 4     CATCHMENT
     101.000     ID No.ó 99999
       1.330     Area in hectares
     110.000     Length (PERV) metres
       2.500     Gradient (%)
      10.000     Per cent Impervious
      70.000     Length (IMPERV)
```

```
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .040       .000       .000       .000 c.m/s
              .226       .841       .287     C perv/imperv/total
15     ADD RUNOFF
              .040       .040       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        *******************************
        Catchment 102 - Existing to Torrence
        ***************************
 4     CATCHMENT
     102.000     ID No.ó 99999
        1.720     Area in hectares
     150.000     Length (PERV) metres
        5.000     Gradient (%)
        1.000     Per cent Impervious
        1.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .038       .000       .000       .000 c.m/s
              .226       .739       .231     C perv/imperv/total
15     ADD RUNOFF
              .038       .038       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       7     line(s) of comment
        **********************


        100-Year STORM


        **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
    4688.000     Coefficient  a
```

```
      17.000     Constant  b    (min)
        .925     Exponent  c
        .400     Fraction to peak  r
     180.000     Duration ó 1500 min
              106.103 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
       98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ***************************
        Catchment 101 - Existing to Gordon
        ***************************
 4     CATCHMENT
     101.000     ID No.ó 99999
        1.330     Area in hectares
     110.000     Length (PERV) metres
        2.500     Gradient (%)
       10.000     Per cent Impervious
       70.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
       67.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .191       .000       .000       .000 c.m/s
              .426       .920       .475     C perv/imperv/total
15     ADD RUNOFF
              .191       .191       .000       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        *******************************
        Catchment 102 - Existing to Torrence
        ***************************
 4     CATCHMENT
     102.000     ID No.ó 99999
        1.720     Area in hectares
     150.000     Length (PERV) metres
        5.000     Gradient (%)
        1.000     Per cent Impervious
        1.000     Length (IMPERV)
```

```
          .000     %Imp. with Zero Dpth
             1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
          .250     Manning "n"
        67.000     SCS Curve No or C
          .100     Ia/S Coefficient
         5.000     Initial Abstraction
             1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
                .251       .000       .000       .000 c.m/s
                .425       .808       .429     C perv/imperv/total
15     ADD RUNOFF
                .251       .251       .000       .000 c.m/s
20     MANUAL
```

```
       Output File (4.7) GOR.out      opened 2022-06-06  21:05
       Units used are defined by G =    9.810
          300   600     5.000        are MAXDT MAXHYD & DTMIN values
       Licensee: Paragon Engineering Limited
35     COMMENT
      5     line(s) of comment
       ******************************
       1242-1260 Gordon Street and 9 Valley - 1614-13684
       Stormwater Management Modelling
       May 2022 - D. Williams
       ******************************
14     START
      1     1=Zero; 2=Define
35     COMMENT
      7     line(s) of comment
       **********************


       25-mm STORM


       **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
     509.000     Coefficient  a
       6.000     Constant  b    (min)
        .799     Exponent  c
        .400     Fraction to peak  r
     240.000     Duration ó 1500 min
                25.028 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
      98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
      1     1=Zero; 2=Define
35     COMMENT
      3     line(s) of comment
       ****************************
       Catchment 202 - RFTOP
       ****************************
 4     CATCHMENT
     202.000     ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
      99.000     Per cent Impervious
      15.000     Length (IMPERV)
```

```
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .031       .000       .000       .000 c.m/s
              .114       .740       .733     C perv/imperv/total
15     ADD RUNOFF
              .031       .031       .000       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ********************************
       West Building - Rooftop Control
       ********************************
10     POND
       6 Depth - Discharge - Volume sets
          .000        .000          .0
          .023      .00540        55.2
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .003 c.m/s
       Maximum Depth   =      .012 metres
       Maximum Storage =       28. c.m
              .031       .031       .003       .000 c.m/s
16     NEXT LINK
              .031       .003       .003       .000 c.m/s
17     COMBINE
     500     Junction Node No.
              .031       .003       .003       .003 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 209 - Min to Storage - Maj Uncontrolled
       ***************************
 4     CATCHMENT
     209.000     ID No.ó 99999
        .120     Area in hectares
       5.000     Length (PERV) metres
       2.000     Gradient (%)
      99.000     Per cent Impervious
      10.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
```

```
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .018       .000       .003       .003 c.m/s
              .115       .736       .729     C perv/imperv/total
15     ADD RUNOFF
              .018       .018       .003       .003 c.m/s
12     DIVERT
           1     U/S Node No.ó 99999
         .038     Threshold Discharge
         .038     Max. Outflow reqd.
             Qmax & Vol.Diverted =      .000 c.m/s          .0 c.m
             No flow diverted
              .018       .018       .018       .003 c.m/s
16     NEXT LINK
              .018       .018       .018       .003 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 204
       ***************************
 4     CATCHMENT
     204.000     ID No.ó 99999
        .510     Area in hectares
       4.000     Length (PERV) metres
       2.000     Gradient (%)
      90.000     Per cent Impervious
      10.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .068       .018       .018       .003 c.m/s
              .115       .736       .674     C perv/imperv/total
15     ADD RUNOFF
              .068       .085       .018       .003 c.m/s
 9     ROUTE
         .000     Conduit Length
         .000     No Conduit defined
         .000     Zero lag
         .000     Beta weighting factor
         .000     Routing timestep
           0     No. of sub-reaches
              .068       .085       .085       .003 c.m/s
17     COMBINE
     500     Junction Node No.
```

```
              .068       .085       .085       .086 c.m/s
18     CONFLUENCE
    500     Junction Node No.
              .068       .086       .085       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *******************************
       Infiltration Chamber
       *******************************
10     POND
       4 Depth - Discharge - Volume sets
          .000        .000          .0
          .178      .00180          .1
          .711      .00190       116.2
          .712        .400       117.0
       Peak Outflow    =      .002 c.m/s
       Maximum Depth   =      .685 metres
       Maximum Storage =      111. c.m
              .068       .086       .002       .000 c.m/s
16     NEXT LINK
              .068       .002       .002       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 207
       ***************************
 4     CATCHMENT
     207.000     ID No.ó 99999
        .150     Area in hectares
      75.000     Length (PERV) metres
       3.000     Gradient (%)
      50.000     Per cent Impervious
      35.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .010       .002       .002       .000 c.m/s
              .115       .740       .427     C perv/imperv/total
15     ADD RUNOFF
              .010       .012       .002       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *******************************
       Storage
       *******************************
10     POND
```

```
      9 Depth - Discharge - Volume sets
          .000        .000          .0
          .190      .00470          .1
          .420      .00750         49.4
          .880       .0111       250.9
         1.380       .0141       441.7
         1.560       .0150       486.9
         1.870       .0164       552.8
         2.380       .0204       553.0
         2.390        .200       553.1
       Peak Outflow    =      .005 c.m/s
       Maximum Depth   =      .209 metres
       Maximum Storage =        4. c.m
              .010       .012       .005       .000 c.m/s
17     COMBINE
    500     Junction Node No.
              .010       .012       .005       .005 c.m/s
22     FILE HYDROGRAPH
       1     1=READ: 2=WRITE
       1     D                     is Filename
       3     1=Overland: 2=Inflow: 3=Outflow: 4=Temp'ary
              .010       .012       .000       .005 c.m/s
17     COMBINE
    500     Junction Node No.
              .010       .012       .000       .005 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       **********************************
       Uncontrolled Flow to Gordon Street
       **********************************
 4     CATCHMENT
     201.000     ID No.ó 99999
        .110     Area in hectares
       6.000     Length (PERV) metres
       2.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .012       .000       .000       .005 c.m/s
              .115       .722       .540     C perv/imperv/total
15     ADD RUNOFF
              .012       .012       .000       .005 c.m/s
```

```
35     COMMENT
       3     line(s) of comment
       *********************************
       Uncontrolled Flow to Gordon Street
       *********************************
 4     CATCHMENT
     208.000     ID No.ó 99999
        .050     Area in hectares
      35.000     Length (PERV) metres
      25.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .005       .012       .000       .005 c.m/s
              .115       .675       .507     C perv/imperv/total
15     ADD RUNOFF
              .005       .017       .000       .005 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
           0     No. of sub-reaches
              .005       .017       .017       .005 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       TOTAL FLOW TO GORDON
       *********************************
17     COMBINE
    500     Junction Node No.
              .005       .017       .017       .022 c.m/s
18     CONFLUENCE
    500     Junction Node No.
              .005       .022       .017       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       *****************************
       Catchment 203 - RFTOP
       *************************
 4     CATCHMENT
```

```
     203.000     ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
      99.000     Per cent Impervious
      15.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .031       .000       .017       .000 c.m/s
              .114       .740       .733     C perv/imperv/total
15     ADD RUNOFF
              .031       .031       .017       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       East Building - Rooftop Control
       *********************************
10     POND
       6 Depth - Discharge - Volume sets
          .000        .000          .0
          .023      .00540        55.2
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .003 c.m/s
       Maximum Depth   =      .012 metres
       Maximum Storage =       28. c.m
              .031       .031       .003       .000 c.m/s
16     NEXT LINK
              .031       .003       .003       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       EAST LID
       *********************************
10     POND
       3 Depth - Discharge - Volume sets
          .000        .000          .0
         1.000     .000700        30.0
         1.001       .0500        31.0
       Peak Outflow    =      .001 c.m/s
       Maximum Depth   =      .929 metres
       Maximum Storage =       28. c.m
              .031       .003       .001       .000 c.m/s
```

```
16     NEXT LINK
              .031       .001       .001       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ******************************
       Catchment 206 - Uncontrolled To Torrence
       **************************
 4     CATCHMENT
      206.000     ID No.ó 99999
        1.410     Area in hectares
      120.000     Length (PERV) metres
        5.000     Gradient (%)
        1.000     Per cent Impervious
        5.000     Length (IMPERV)
         .000     %Imp. with Zero Dpth
           1      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
         .250     Manning "n"
       68.000     SCS Curve No or C
         .100     Ia/S Coefficient
        5.000     Initial Abstraction
           1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .005       .001       .001       .000 c.m/s
              .115       .700       .121     C perv/imperv/total
15     ADD RUNOFF
              .005       .005       .001       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ******************************
       Catchment 205 - Park Block - Uncontrolled to Torrence
       **************************
 4     CATCHMENT
      205.000     ID No.ó 99999
         .230     Area in hectares
       50.000     Length (PERV) metres
        2.000     Gradient (%)
       10.000     Per cent Impervious
        5.000     Length (IMPERV)
         .000     %Imp. with Zero Dpth
           1      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
         .250     Manning "n"
       68.000     SCS Curve No or C
         .100     Ia/S Coefficient
        5.000     Initial Abstraction
           1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .004       .005       .001       .000 c.m/s
              .115       .716       .175     C perv/imperv/total
15     ADD RUNOFF
              .004       .006       .001       .000 c.m/s
14     START
       1     1=Zero; 2=Define
```

```
35     COMMENT
       7     line(s) of comment
        **********************


        2 Year STORM


        **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
     743.000     Coefficient  a
       6.000     Constant  b    (min)
        .798     Exponent  c
        .400     Fraction to peak  r
     180.000     Duration ó 1500 min
                34.438 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
      98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ***************************
        Catchment 202 - RFTOP
        ***************************
 4     CATCHMENT
     202.000     ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
      99.000     Per cent Impervious
      15.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .051       .000       .000       .000 c.m/s
              .168       .801       .794     C perv/imperv/total
15     ADD RUNOFF
              .051       .051       .001       .000 c.m/s
35     COMMENT
       3     line(s) of comment
```

```
      ********************************
      West Building - Rooftop Control
      ********************************
10    POND
     6 Depth - Discharge - Volume sets
        .000        .000          .0
        .023      .00540        55.2
        .031      .00660        74.4
        .045      .00820       108.0
        .061       .0101       146.4
        .063       .0499       150.0
      Peak Outflow    =      .004 c.m/s
      Maximum Depth   =      .019 metres
      Maximum Storage =       45. c.m
              .051       .051       .004       .000 c.m/s
16    NEXT LINK
              .051       .004       .004       .000 c.m/s
17    COMBINE
   500    Junction Node No.
              .051       .004       .004       .004 c.m/s
14    START
      1    1=Zero; 2=Define
35    COMMENT
      3    line(s) of comment
      ***************************
      Catchment 209 - Min to Storage - Maj Uncontrolled
      ***************************
 4    CATCHMENT
    209.000    ID No.ó 99999
       .120    Area in hectares
      5.000    Length (PERV) metres
      2.000    Gradient (%)
     99.000    Per cent Impervious
     10.000    Length (IMPERV)
       .000    %Imp. with Zero Dpth
          1    Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
       .250    Manning "n"
     68.000    SCS Curve No or C
       .100    Ia/S Coefficient
      5.000    Initial Abstraction
          1    Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .028       .000       .004       .004 c.m/s
             .168       .787       .781     C perv/imperv/total
15    ADD RUNOFF
             .028       .028       .004       .004 c.m/s
12    DIVERT
          1    U/S Node No.ó 99999
        .038    Threshold Discharge
        .038    Max. Outflow reqd.
            Qmax & Vol.Diverted =      .000 c.m/s          .0 c.m
```

```
            No flow diverted
              .028       .028       .028       .004 c.m/s
16     NEXT LINK
              .028       .028       .028       .004 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 204
       ***************************
 4     CATCHMENT
     204.000     ID No.ó 99999
        .510     Area in hectares
       4.000     Length (PERV) metres
       2.000     Gradient (%)
      90.000     Per cent Impervious
      10.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .108       .028       .028       .004 c.m/s
              .168       .787       .725     C perv/imperv/total
15     ADD RUNOFF
              .108       .136       .028       .004 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
           0     No. of sub-reaches
              .108       .136       .136       .004 c.m/s
17     COMBINE
    500     Junction Node No.
              .108       .136       .136       .137 c.m/s
18     CONFLUENCE
    500     Junction Node No.
              .108       .137       .136       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *******************************
       Infiltration Chamber
       *******************************
10     POND
       4 Depth - Discharge - Volume sets
           .000        .000          .0
           .178      .00180          .1
```

```
          .711      .00190       116.2
          .712        .400       117.0
       Peak Outflow    =      .022 c.m/s
       Maximum Depth   =      .711 metres
       Maximum Storage =      116. c.m
              .108       .137       .022       .000 c.m/s
16     NEXT LINK
              .108       .022       .022       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 207
       ***************************
 4     CATCHMENT
      207.000     ID No.ó 99999
        .150     Area in hectares
       75.000     Length (PERV) metres
        3.000     Gradient (%)
       50.000     Per cent Impervious
       35.000     Length (IMPERV)
         .000     %Imp. with Zero Dpth
            1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
         .250     Manning "n"
       68.000     SCS Curve No or C
         .100     Ia/S Coefficient
        5.000     Initial Abstraction
            1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .016       .022       .022       .000 c.m/s
              .169       .801       .485     C perv/imperv/total
15     ADD RUNOFF
              .016       .025       .022       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *******************************
       Storage
       *******************************
10     POND
       9 Depth - Discharge - Volume sets
          .000        .000          .0
          .190      .00470          .1
          .420      .00750         49.4
          .880       .0111       250.9
         1.380       .0141       441.7
         1.560       .0150       486.9
         1.870       .0164       552.8
         2.380       .0204       553.0
         2.390        .200       553.1
       Peak Outflow    =      .007 c.m/s
       Maximum Depth   =      .396 metres
       Maximum Storage =       44. c.m
```

```
              .016       .025       .007       .000 c.m/s
17     COMBINE
    500     Junction Node No.
              .016       .025       .007       .007 c.m/s
22     FILE HYDROGRAPH
       1     1=READ: 2=WRITE
       1     D                     is Filename
       3     1=Overland: 2=Inflow: 3=Outflow: 4=Temp'ary
              .016       .025       .000       .007 c.m/s
17     COMBINE
    500     Junction Node No.
              .016       .025       .000       .007 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        **********************************
        Uncontrolled Flow to Gordon Street
        **********************************
 4     CATCHMENT
     201.000     ID No.ó 99999
        .110     Area in hectares
       6.000     Length (PERV) metres
       2.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .019       .000       .000       .007 c.m/s
              .168       .770       .590     C perv/imperv/total
15     ADD RUNOFF
              .019       .019       .000       .007 c.m/s
35     COMMENT
       3     line(s) of comment
        **********************************
        Uncontrolled Flow to Gordon Street
        **********************************
 4     CATCHMENT
     208.000     ID No.ó 99999
        .050     Area in hectares
      35.000     Length (PERV) metres
      25.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
```

```
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
       .250     Manning "n"
     68.000     SCS Curve No or C
       .100     Ia/S Coefficient
      5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .008       .019       .000       .007 c.m/s
             .168       .715       .551     C perv/imperv/total
15    ADD RUNOFF
             .008       .027       .000       .007 c.m/s
 9    ROUTE
       .000     Conduit Length
       .000     No Conduit defined
       .000     Zero lag
       .000     Beta weighting factor
       .000     Routing timestep
          0     No. of sub-reaches
             .008       .027       .027       .007 c.m/s
35    COMMENT
      3     line(s) of comment
       *********************************
       TOTAL FLOW TO GORDON
       *********************************
17    COMBINE
    500     Junction Node No.
             .008       .027       .027       .032 c.m/s
18    CONFLUENCE
    500     Junction Node No.
             .008       .032       .027       .000 c.m/s
14    START
      1     1=Zero; 2=Define
35    COMMENT
      3     line(s) of comment
       *****************************
       Catchment 203 - RFTOP
       *************************
 4    CATCHMENT
     203.000     ID No.ó 99999
       .240     Area in hectares
      1.000     Length (PERV) metres
       .500     Gradient (%)
     99.000     Per cent Impervious
     15.000     Length (IMPERV)
       .000     %Imp. with Zero Dpth
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
       .250     Manning "n"
     68.000     SCS Curve No or C
       .100     Ia/S Coefficient
      5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
```

```
              .051       .000       .027       .000 c.m/s
              .168       .801       .794     C perv/imperv/total
15     ADD RUNOFF
              .051       .051       .027       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       East Building - Rooftop Control
       *********************************
10     POND
       6 Depth - Discharge - Volume sets
          .000        .000          .0
          .023      .00540        55.2
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .004 c.m/s
       Maximum Depth   =      .019 metres
       Maximum Storage =       45. c.m
              .051       .051       .004       .000 c.m/s
16     NEXT LINK
              .051       .004       .004       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       EAST LID
       *********************************
10     POND
       3 Depth - Discharge - Volume sets
          .000        .000          .0
         1.000     .000700        30.0
         1.001       .0500        31.0
       Peak Outflow    =      .003 c.m/s
       Maximum Depth   =     1.000 metres
       Maximum Storage =       30. c.m
              .051       .004       .003       .000 c.m/s
16     NEXT LINK
              .051       .003       .003       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       Catchment 206 - Uncontrolled To Torrence
       ***************************
 4     CATCHMENT
      206.000     ID No.ó 99999
        1.410     Area in hectares
      120.000     Length (PERV) metres
        5.000     Gradient (%)
        1.000     Per cent Impervious
```

```
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .014       .003       .003       .000 c.m/s
              .169       .738       .175     C perv/imperv/total
15     ADD RUNOFF
              .014       .015       .003       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ******************************
       Catchment 205 - Park Block - Uncontrolled to Torrence
       ***************************
 4     CATCHMENT
     205.000     ID No.ó 99999
        .230     Area in hectares
      50.000     Length (PERV) metres
       2.000     Gradient (%)
      10.000     Per cent Impervious
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .006       .015       .003       .000 c.m/s
              .169       .763       .228     C perv/imperv/total
15     ADD RUNOFF
              .006       .017       .003       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       7     line(s) of comment
       *********************


       5 Year STORM


       *********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
    1593.000     Coefficient  a
      11.000     Constant  b    (min)
```

```
        .879     Exponent  c
        .400     Fraction to peak  r
      240.000    Duration ó 1500 min
                 49.540 mm     Total depth
 3     IMPERVIOUS
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
       98.000    SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 202 - RFTOP
       ***************************
 4     CATCHMENT
      202.000    ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
       99.000    Per cent Impervious
       15.000    Length (IMPERV)
        .000     %Imp. with Zero Dpth
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
       68.000    SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .072       .000       .003       .000 c.m/s
             .239       .854       .847     C perv/imperv/total
15     ADD RUNOFF
             .072       .072       .003       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       West Building - Rooftop Control
       *********************************
10     POND
       6 Depth - Discharge - Volume sets
          .000        .000          .0
          .023      .00540        55.2
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .006 c.m/s
       Maximum Depth   =      .029 metres
```

```
       Maximum Storage =       69. c.m
              .072       .072       .006       .000 c.m/s
16     NEXT LINK
              .072       .006       .006       .000 c.m/s
17     COMBINE
    500     Junction Node No.
              .072       .006       .006       .006 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 209 - Min to Storage - Maj Uncontrolled
       ***************************
 4     CATCHMENT
     209.000     ID No.ó 99999
        .120     Area in hectares
       5.000     Length (PERV) metres
       2.000     Gradient (%)
      99.000     Per cent Impervious
      10.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .038       .000       .006       .006 c.m/s
              .242       .833       .828     C perv/imperv/total
15     ADD RUNOFF
              .038       .038       .006       .006 c.m/s
12     DIVERT
           1     U/S Node No.ó 99999
         .038     Threshold Discharge
         .038     Max. Outflow reqd.
              Qmax & Vol.Diverted =      .000 c.m/s          .0 c.m
              Majors From 209
              .038       .038       .038       .006 c.m/s
16     NEXT LINK
              .038       .038       .038       .006 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 204
       ***************************
 4     CATCHMENT
     204.000     ID No.ó 99999
        .510     Area in hectares
       4.000     Length (PERV) metres
```

```
       2.000     Gradient (%)
      90.000     Per cent Impervious
      10.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .149       .038       .038       .006 c.m/s
             .242       .833       .774     C perv/imperv/total
15     ADD RUNOFF
             .149       .187       .038       .006 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
          0     No. of sub-reaches
             .149       .187       .187       .006 c.m/s
17     COMBINE
    500     Junction Node No.
             .149       .187       .187       .190 c.m/s
18     CONFLUENCE
    500     Junction Node No.
             .149       .190       .187       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *******************************
       Infiltration Chamber
       *******************************
10     POND
       4 Depth - Discharge - Volume sets
          .000        .000          .0
          .178      .00180          .1
          .711      .00190       116.2
          .712        .400       117.0
       Peak Outflow    =      .121 c.m/s
       Maximum Depth   =      .711 metres
       Maximum Storage =      116. c.m
             .149       .190       .121       .000 c.m/s
16     NEXT LINK
             .149       .121       .121       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 207
       ***************************
```

```
 4     CATCHMENT
     207.000     ID No.ó 99999
        .150     Area in hectares
       75.000     Length (PERV) metres
        3.000     Gradient (%)
       50.000     Per cent Impervious
       35.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
       68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .023       .121       .121       .000 c.m/s
              .244       .854       .549     C perv/imperv/total
15     ADD RUNOFF
              .023       .140       .121       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ********************************
       Storage
       ********************************
10     POND
       9 Depth - Discharge - Volume sets
           .000        .000          .0
           .190      .00470          .1
           .420      .00750         49.4
           .880       .0111       250.9
          1.380       .0141       441.7
          1.560       .0150       486.9
          1.870       .0164       552.8
          2.380       .0204       553.0
          2.390        .200       553.1
       Peak Outflow    =      .009 c.m/s
       Maximum Depth   =      .651 metres
       Maximum Storage =      150. c.m
              .023       .140       .009       .000 c.m/s
17     COMBINE
     500     Junction Node No.
               .023       .140       .009       .009 c.m/s
22     FILE HYDROGRAPH
       1     1=READ: 2=WRITE
       1     D                    is Filename
       3     1=Overland: 2=Inflow: 3=Outflow: 4=Temp'ary
               .023       .140       .000       .009 c.m/s
17     COMBINE
     500     Junction Node No.
               .023       .140       .000       .009 c.m/s
14     START
```

```
      1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        **********************************
        Uncontrolled Flow to Gordon Street
        **********************************
 4     CATCHMENT
     201.000     ID No.ó 99999
        .110     Area in hectares
       6.000     Length (PERV) metres
       2.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .025       .000       .000       .009 c.m/s
              .243       .810       .639     C perv/imperv/total
15     ADD RUNOFF
              .025       .025       .000       .009 c.m/s
35     COMMENT
       3     line(s) of comment
        **********************************
        Uncontrolled Flow to Gordon Street
        **********************************
 4     CATCHMENT
     208.000     ID No.ó 99999
        .050     Area in hectares
      35.000     Length (PERV) metres
      25.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .011       .025       .000       .009 c.m/s
              .243       .756       .602     C perv/imperv/total
15     ADD RUNOFF
              .011       .036       .000       .009 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
```

```
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
           0     No. of sub-reaches
              .011       .036       .036       .009 c.m/s
35     COMMENT
       3     line(s) of comment
        **********************************
        TOTAL FLOW TO GORDON
        **********************************
17     COMBINE
     500     Junction Node No.
               .011       .036       .036       .041 c.m/s
18     CONFLUENCE
     500     Junction Node No.
               .011       .041       .036       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ******************************
        Catchment 203 - RFTOP
        **************************
 4     CATCHMENT
      203.000     ID No.ó 99999
         .240     Area in hectares
        1.000     Length (PERV) metres
         .500     Gradient (%)
       99.000     Per cent Impervious
       15.000     Length (IMPERV)
         .000     %Imp. with Zero Dpth
            1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
         .250     Manning "n"
       68.000     SCS Curve No or C
         .100     Ia/S Coefficient
        5.000     Initial Abstraction
            1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .072       .000       .036       .000 c.m/s
              .239       .854       .847     C perv/imperv/total
15     ADD RUNOFF
              .072       .072       .036       .000 c.m/s
35     COMMENT
       3     line(s) of comment
        ********************************
        East Building - Rooftop Control
        ********************************
10     POND
       6 Depth - Discharge - Volume sets
           .000        .000          .0
           .023      .00540        55.2
```

```
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .006 c.m/s
       Maximum Depth   =      .029 metres
       Maximum Storage =       69. c.m
              .072       .072       .006       .000 c.m/s
16     NEXT LINK
              .072       .006       .006       .000 c.m/s
35     COMMENT
      3     line(s) of comment
       *******************************
       EAST LID
       *******************************
10     POND
      3 Depth - Discharge - Volume sets
          .000        .000          .0
         1.000     .000700        30.0
         1.001       .0500        31.0
       Peak Outflow    =      .006 c.m/s
       Maximum Depth   =     1.000 metres
       Maximum Storage =       30. c.m
              .072       .006       .006       .000 c.m/s
16     NEXT LINK
              .072       .006       .006       .000 c.m/s
35     COMMENT
      3     line(s) of comment
       *******************************
       Catchment 206 - Uncontrolled To Torrence
       ***************************
 4     CATCHMENT
     206.000     ID No.ó 99999
       1.410     Area in hectares
     120.000     Length (PERV) metres
       5.000     Gradient (%)
       1.000     Per cent Impervious
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .038       .006       .006       .000 c.m/s
              .244       .776       .249     C perv/imperv/total
15     ADD RUNOFF
              .038       .039       .006       .000 c.m/s
35     COMMENT
```

```
      3     line(s) of comment
       ******************************
       Catchment 205 - Park Block - Uncontrolled to Torrence
       ***************************
 4     CATCHMENT
     205.000     ID No.ó 99999
        .230     Area in hectares
      50.000     Length (PERV) metres
       2.000     Gradient (%)
      10.000     Per cent Impervious
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .008       .039       .006       .000 c.m/s
              .244       .800       .300     C perv/imperv/total
15     ADD RUNOFF
              .008       .046       .006       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       7     line(s) of comment
       **********************


        100 Year STORM


       **********************
 2     STORM
           1     1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
    4688.000     Coefficient  a
      17.000     Constant  b    (min)
        .925     Exponent  c
        .400     Fraction to peak  r
     180.000     Duration ó 1500 min
              106.103 mm     Total depth
 3     IMPERVIOUS
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .013     Manning "n"
      98.000     SCS Curve No or C
        .100     Ia/S Coefficient
       2.000     Initial Abstraction
14     START
       1     1=Zero; 2=Define
35     COMMENT
```

```
      3     line(s) of comment
       ***************************
       Catchment 202 - RFTOP
       ***************************
 4     CATCHMENT
     202.000     ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
      99.000     Per cent Impervious
      15.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .155       .000       .006       .000 c.m/s
              .429       .920       .915     C perv/imperv/total
15     ADD RUNOFF
              .155       .155       .006       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       ********************************
       West Building - Rooftop Control
       ********************************
10     POND
       6 Depth - Discharge - Volume sets
          .000        .000          .0
          .023      .00540        55.2
          .031      .00660        74.4
          .045      .00820       108.0
          .061       .0101       146.4
          .063       .0499       150.0
       Peak Outflow    =      .049 c.m/s
       Maximum Depth   =      .062 metres
       Maximum Storage =      150. c.m
              .155       .155       .049       .000 c.m/s
16     NEXT LINK
              .155       .049       .049       .000 c.m/s
17     COMBINE
     500     Junction Node No.
              .155       .049       .049       .049 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       ***************************
       Catchment 209 - Min to Storage - Maj Uncontrolled
```

```
      **************************
 4    CATCHMENT
    209.000     ID No.ó 99999
       .120     Area in hectares
      5.000     Length (PERV) metres
      2.000     Gradient (%)
     99.000     Per cent Impervious
     10.000     Length (IMPERV)
       .000     %Imp. with Zero Dpth
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
       .250     Manning "n"
     68.000     SCS Curve No or C
       .100     Ia/S Coefficient
      5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .077       .000       .049       .049 c.m/s
             .429       .876       .872     C perv/imperv/total
15    ADD RUNOFF
             .077       .077       .049       .049 c.m/s
12    DIVERT
          1     U/S Node No.ó 99999
        .038     Threshold Discharge
        .038     Max. Outflow reqd.
           Qmax & Vol.Diverted =      .039 c.m/s        14.9 c.m
           Majors From 209
             .077       .077       .038       .049 c.m/s
16    NEXT LINK
             .077       .038       .038       .049 c.m/s
35    COMMENT
      3     line(s) of comment
      **************************
      Catchment 204
      **************************
 4    CATCHMENT
    204.000     ID No.ó 99999
       .510     Area in hectares
      4.000     Length (PERV) metres
      2.000     Gradient (%)
     90.000     Per cent Impervious
     10.000     Length (IMPERV)
       .000     %Imp. with Zero Dpth
          1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
       .250     Manning "n"
     68.000     SCS Curve No or C
       .100     Ia/S Coefficient
      5.000     Initial Abstraction
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .307       .038       .038       .049 c.m/s
             .427       .876       .831     C perv/imperv/total
15    ADD RUNOFF
```

```
              .307       .345       .038       .049 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
           0     No. of sub-reaches
              .307       .345       .345       .049 c.m/s
17     COMBINE
    500     Junction Node No.
              .307       .345       .345       .352 c.m/s
18     CONFLUENCE
    500     Junction Node No.
              .307       .352       .345       .000 c.m/s
35     COMMENT
       3     line(s) of comment
        *******************************
        Infiltration Chamber
        *******************************
10     POND
       4 Depth - Discharge - Volume sets
           .000        .000          .0
           .178      .00180          .1
           .711      .00190       116.2
           .712        .400       117.0
        Peak Outflow    =      .351 c.m/s
        Maximum Depth   =      .712 metres
        Maximum Storage =      117. c.m
              .307       .352       .351       .000 c.m/s
16     NEXT LINK
              .307       .351       .351       .000 c.m/s
35     COMMENT
       3     line(s) of comment
        ***************************
        Catchment 207
        ***************************
 4     CATCHMENT
     207.000     ID No.ó 99999
        .150     Area in hectares
      75.000     Length (PERV) metres
       3.000     Gradient (%)
      50.000     Per cent Impervious
      35.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
```

```
          1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
             .051       .351       .351       .000 c.m/s
             .436       .919       .678     C perv/imperv/total
15     ADD RUNOFF
             .051       .402       .351       .000 c.m/s
35     COMMENT
       3     line(s) of comment
       *********************************
       Storage
       *********************************
10     POND
       9 Depth - Discharge - Volume sets
          .000        .000          .0
          .190      .00470          .1
          .420      .00750         49.4
          .880       .0111       250.9
         1.380       .0141       441.7
         1.560       .0150       486.9
         1.870       .0164       552.8
         2.380       .0204       553.0
         2.390        .200       553.1
       Peak Outflow    =      .016 c.m/s
       Maximum Depth   =     1.677 metres
       Maximum Storage =      512. c.m
             .051       .402       .016       .000 c.m/s
17     COMBINE
     500     Junction Node No.
             .051       .402       .016       .016 c.m/s
22     FILE HYDROGRAPH
       1     1=READ: 2=WRITE
       1     D                    is Filename
       3     1=Overland: 2=Inflow: 3=Outflow: 4=Temp'ary
             .051       .402       .039       .016 c.m/s
17     COMBINE
     500     Junction Node No.
             .051       .402       .039       .047 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
       *********************************
       Uncontrolled Flow to Gordon Street
       *********************************
 4     CATCHMENT
      201.000     ID No.ó 99999
        .110     Area in hectares
       6.000     Length (PERV) metres
       2.000     Gradient (%)
      70.000     Per cent Impervious
       6.000     Length (IMPERV)
```

```
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .055       .000       .039       .047 c.m/s
              .432       .841       .718     C perv/imperv/total
15     ADD RUNOFF
              .055       .055       .039       .047 c.m/s
35     COMMENT
       3     line(s) of comment
        **********************************
        Uncontrolled Flow to Gordon Street
        **********************************
 4     CATCHMENT
     208.000     ID No.ó 99999
        .050     Area in hectares
       35.000     Length (PERV) metres
       25.000     Gradient (%)
       70.000     Per cent Impervious
        6.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
       68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .024       .055       .039       .047 c.m/s
              .433       .803       .692     C perv/imperv/total
15     ADD RUNOFF
              .024       .080       .039       .047 c.m/s
 9     ROUTE
        .000     Conduit Length
        .000     No Conduit defined
        .000     Zero lag
        .000     Beta weighting factor
        .000     Routing timestep
           0     No. of sub-reaches
              .024       .080       .080       .047 c.m/s
35     COMMENT
       3     line(s) of comment
        **********************************
        TOTAL FLOW TO GORDON
        **********************************
17     COMBINE
     500     Junction Node No.
              .024       .080       .080       .127 c.m/s
```

```
18     CONFLUENCE
    500     Junction Node No.
              .024       .127       .080       .000 c.m/s
14     START
       1     1=Zero; 2=Define
35     COMMENT
       3     line(s) of comment
        ******************************
        Catchment 203 - RFTOP
        **************************
 4     CATCHMENT
     203.000     ID No.ó 99999
        .240     Area in hectares
       1.000     Length (PERV) metres
        .500     Gradient (%)
      99.000     Per cent Impervious
      15.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .155       .000       .080       .000 c.m/s
              .429       .920       .915     C perv/imperv/total
15     ADD RUNOFF
              .155       .155       .080       .000 c.m/s
35     COMMENT
       3     line(s) of comment
        ********************************
        East Building - Rooftop Control
        ********************************
10     POND
       6 Depth - Discharge - Volume sets
           .000        .000          .0
           .023      .00540        55.2
           .031      .00660        74.4
           .045      .00820       108.0
           .061       .0101       146.4
           .063       .0499       150.0
        Peak Outflow    =      .049 c.m/s
        Maximum Depth   =      .062 metres
        Maximum Storage =      150. c.m
              .155       .155       .049       .000 c.m/s
16     NEXT LINK
              .155       .049       .049       .000 c.m/s
35     COMMENT
       3     line(s) of comment
        ********************************
```

```
       EAST LID
       ********************************
10     POND
      3 Depth - Discharge - Volume sets
         .000        .000          .0
        1.000     .000700        30.0
        1.001       .0500        31.0
       Peak Outflow    =      .030 c.m/s
       Maximum Depth   =     1.001 metres
       Maximum Storage =       31. c.m
              .155       .049       .030       .000 c.m/s
16     NEXT LINK
              .155       .030       .030       .000 c.m/s
35     COMMENT
      3     line(s) of comment
       ********************************
       Catchment 206 - Uncontrolled To Torrence
       ***************************
 4     CATCHMENT
     206.000     ID No.ó 99999
       1.410     Area in hectares
     120.000     Length (PERV) metres
       5.000     Gradient (%)
       1.000     Per cent Impervious
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
        .250     Manning "n"
      68.000     SCS Curve No or C
        .100     Ia/S Coefficient
       5.000     Initial Abstraction
           1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
              .229       .030       .030       .000 c.m/s
              .436       .813       .440     C perv/imperv/total
15     ADD RUNOFF
              .229       .245       .030       .000 c.m/s
35     COMMENT
      3     line(s) of comment
       ********************************
       Catchment 205 - Park Block - Uncontrolled to Torrence
       ***************************
 4     CATCHMENT
     205.000     ID No.ó 99999
        .230     Area in hectares
      50.000     Length (PERV) metres
       2.000     Gradient (%)
      10.000     Per cent Impervious
       5.000     Length (IMPERV)
        .000     %Imp. with Zero Dpth
           1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
```

```
         .250     Manning "n"
       68.000     SCS Curve No or C
         .100     Ia/S Coefficient
        5.000     Initial Abstraction
            1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
               .043       .245       .030       .000 c.m/s
               .436       .831       .476     C perv/imperv/total
15     ADD RUNOFF
               .043       .283       .030       .000 c.m/s
20     MANUAL
```

INFILTRATION GALLERY PARAMETERS

Subject: **Infiltration Information**
Project: **1242-1260 Gordon and 9 Valley**
Project No.: **161413684**
Client: **Tricar**
Date: **June 6, 2022**

East Infiltration Gallery - Stone Gallery		
Infiltration Rate	32	mm/hr
Void Ratio	0.4	
Depth	1	m
Footprint Provided	75	m^2
Volume	30	m^3
Outflow Rate	0.0007	m^3/s
Drawdown	12.5	hr

South Infiltration Gallery - StormTech®		
Infiltration Rate	23	mm/hr
Max Depth	0.705	m
Footprint Provided	302.7	m^2
Voume	116.2	m^3
Outflow Rate	0.0019	m^3/s
Drawdown	16.7	hr

WATER QUALITY

ADS OGS Sizing Summary

Project Name: 1242-1260 Gordon St.

Consulting Engineer: Stantec

Location: Guelph, ON

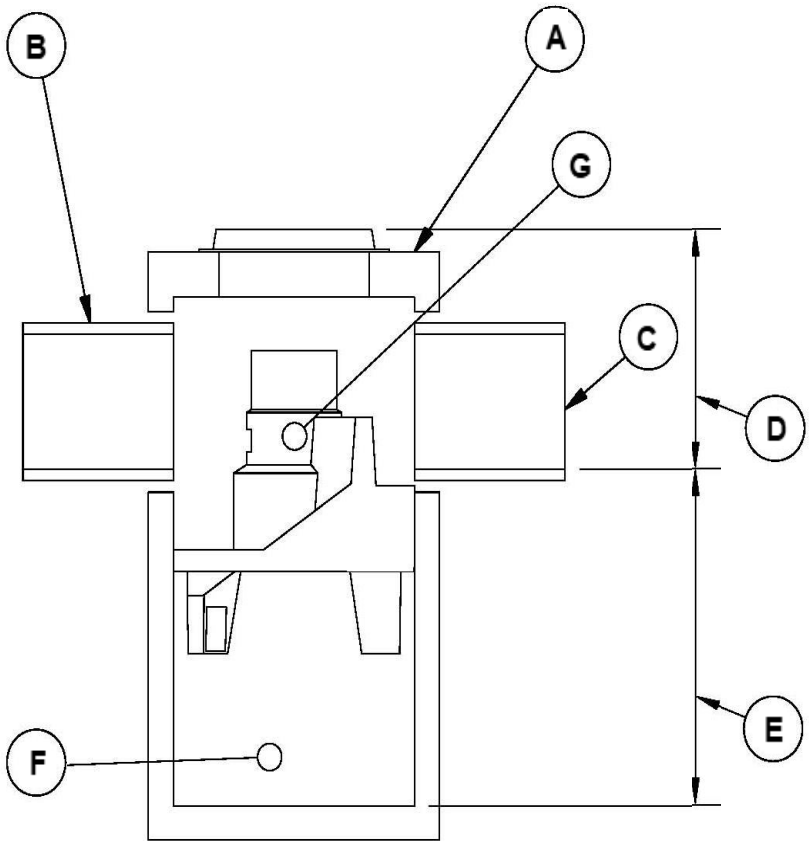
Sizing Completed By: C. Neath **Email:** cody.neath@ads-pipe.com

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

Site Details	
Site Area:	0.87 ha
% Impervious:	95%
Rational C:	0.87
Rainfall Station:	Waterloo_Wellington
Particle Size Distribution:	Fine
Peak Flowrate:	---

Summary of Results		
Model	**TSS Removal**	**Volume Treated**
FD-4HC	87.0%	>90%
FD-5HC	91.0%	>90%
FD-6HC	93.0%	>90%
FD-8HC	95.0%	>90%
FD-10HC	97.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	450 mm
Outlet Pipe Diameter (C):	450 mm
Height, T/G to Outlet Invert (D):	1630 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s



Site Elevations:	
Rim Elevation:	342.53
Inlet Pipe Elevation:	340.90
Outlet Pipe Elevation:	340.90

Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.

Project Name:	1242-1260 Gordon St.
Consulting Engineer:	Stantec
Location:	Guelph, ON

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity[1]	Fraction of Rainfall[1]	FD-4HC Removal Efficiency[2]	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.3%	100.0%	0.3%
1.00	27.0%	97.0%	26.2%
1.50	3.2%	93.5%	3.0%
2.00	13.6%	91.0%	12.4%
2.50	7.2%	89.1%	6.4%
3.00	1.8%	87.6%	1.6%
3.50	6.7%	86.4%	5.8%
4.00	3.7%	85.3%	3.2%
4.50	1.5%	84.4%	1.3%
5.00	4.8%	83.6%	4.0%
6.00	3.3%	82.1%	2.7%
7.00	4.7%	81.0%	3.8%
8.00	2.8%	80.0%	2.2%
9.00	2.0%	79.1%	1.6%
10.00	2.5%	78.3%	2.0%
20.00	9.0%	73.4%	6.6%
30.00	3.1%	70.7%	2.2%
40.00	1.0%	68.9%	0.7%
50.00	0.8%	67.4%	0.5%
100.00	0.9%	63.2%	0.6%
150.00	0.1%	60.9%	0.1%
200.00	0.0%	59.3%	0.0%
		Total Net Annual Removal Efficiency:	87.0%
		Total Runoff Volume Treated:	99.9%

Notes:

(1) Rainfall Data: 1981:2007,HLY03 6149387, Waterloo/Wellingotn Airport, ON

(2) Based on third party verified data and appoximating the removal of a PSD similar to the STC Fine distribution

(3) Rainfall adjusted to 5 min peak intensity based on hourly average.

ADS OGS Sizing Summary

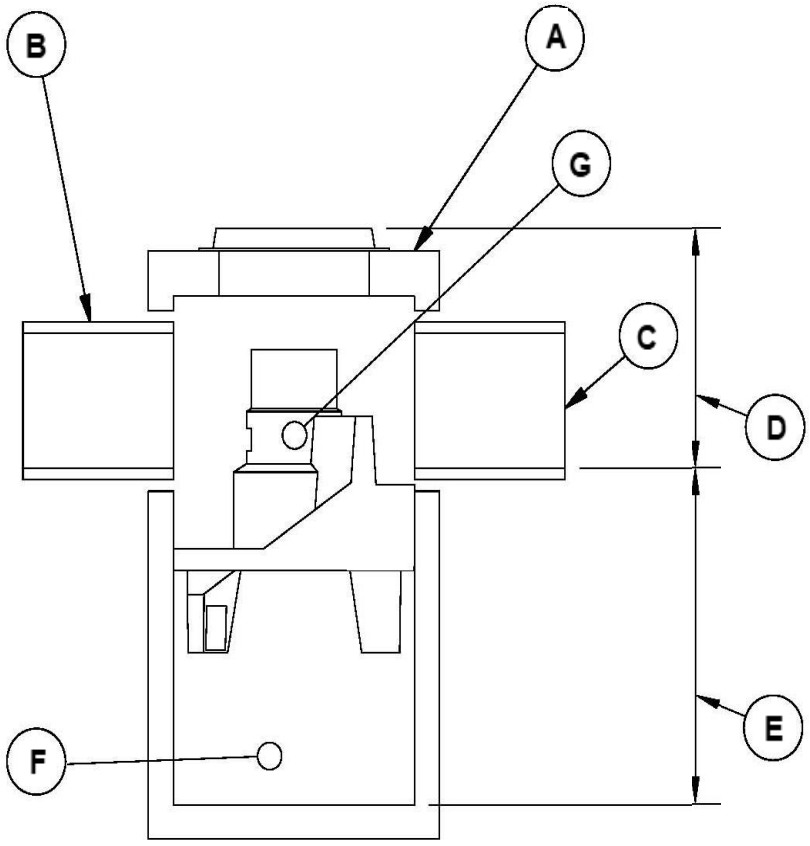
Project Name:	1250 Gordon St. A
Consulting Engineer:	Stantec
Location:	Guelph, ON
Sizing Completed By:	C. Neath
Email:	cody.neath@ads-pipe.com

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

Site Details	
Site Area:	0.3 ha
% Impervious:	90%
Rational C:	0.84
Rainfall Station:	Waterloo_Wellington
Particle Size Distribution:	NJDEP / ETV
Peak Flowrate:	---

Summary of Results		
Model	**TSS Removal**	**Volume Treated**
FD-4HC	82.0%	>90%
FD-5HC	83.0%	>90%
FD-6HC	86.0%	>90%
FD-8HC	91.0%	>90%
FD-10HC	94.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	300 mm
Outlet Pipe Diameter (C):	300 mm
Height, T/G to Outlet Invert (D):	2000 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s



Site Elevations:	
Rim Elevation:	100.00
Inlet Pipe Elevation:	98.00
Outlet Pipe Elevation:	98.00

Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.

Project Name: 1250 Gordon St. A
Consulting Engineer: Stantec
Location: Guelph, ON

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity[1]	Fraction of Rainfall[1]	FD-4HC Removal Efficiency[2]	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.3%	105.5%	0.3%
1.00	27.0%	96.9%	26.1%
1.50	3.2%	91.9%	3.0%
2.00	13.6%	88.3%	12.0%
2.50	7.2%	85.6%	6.1%
3.00	1.8%	83.3%	1.5%
3.50	6.7%	81.4%	5.5%
4.00	3.7%	79.7%	2.9%
4.50	1.5%	78.3%	1.2%
5.00	4.8%	77.0%	3.7%
6.00	3.3%	74.7%	2.5%
7.00	4.7%	72.8%	3.4%
8.00	2.8%	71.1%	2.0%
9.00	2.0%	69.7%	1.4%
10.00	2.5%	68.4%	1.7%
20.00	9.0%	59.8%	5.4%
30.00	3.1%	54.7%	1.7%
40.00	1.0%	51.2%	0.5%
50.00	0.8%	48.4%	0.4%
100.00	0.9%	39.8%	0.4%
150.00	0.1%	0.0%	0.0%
200.00	0.0%	0.0%	0.0%
		Total Net Annual Removal Efficiency:	82.0%
		Total Runoff Volume Treated:	99.9%

Notes:

(1) Rainfall Data: 1981:2007,HLY03 6149387, Waterloo/Wellingotn Airport, ON

(2) Based in NJDEP / ETV PSD, NJDEP Test Protocols 2013.

(3) Rainfall adjusted to 5 min peak intensity based on hourly average.

STORMTECH DESIGN

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

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1242 - 1260 GORDON ST.

GUELPH, CANADA

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC 310.
2. CHAMBERS SHALL BE ARCH SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B1 4, "POLYMERIC SUB SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE RE UIREMENTS OF ASTM F2922 POLETHYLENE OR ASTM F241 POLYPROPYLENE , "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION RE UIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR 1 LONG DURATION DEAD LOADS AND 2 SHORT DURATION LIVE LOADS, BASED ON THE CSA S CL 2 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2 , "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE 1 INSTANTANEOUS 1 MIN AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2 MA IMUM PERMANENT YR COVER LOAD AND 3 ALLOWABLE COVER WITH PARKED 1 WEEK AASHTO DESIGN TRUCK.
. RE UIREMENTS FOR HANDLING AND INSTALLATION
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 0 mm 2 .
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION .2. OF ASTM F2922 SHALL BE GREATER THAN OR E UAL TO 400 LBS FT . AND TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES ABOVE 23 C 3 F , CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON RE UEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR E UAL TO 1.9 FOR DEAD LOAD AND 1. FOR LIVE LOAD, THE MINIMUM RE UIRED BY ASTM F2 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN E CEPT THAT IT SHALL BE THE YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC 310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER S REPRESENTATIVE HAS COMPLETED A PRE CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC 310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC 310 SC 40 DC 0 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DO ER OR AN E CAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN E CAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE E CAVATION USING A LONG BOOM HOE OR E CAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
. MAINTAIN MINIMUM 1 0 mm " SPACING BETWEEN THE CHAMBER ROWS.
. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 20 0 mm 3 4 2" .
. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLE STORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC 310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC 310 SC 40 DC 0 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION E UIPMENT OVER SC 310 SC 40 CHAMBERS IS LIMITED
   - NO E UIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR E CAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC 310 SC 40 DC 0 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION E UIPMENT CAN BE FOUND IN THE "STORMTECH SC 310 SC 40 DC 0 CONSTRUCTION GUIDE".
3. FULL 900 mm 3 " OF STABILI ED COVER MATERIALS OVER THE CHAMBERS IS RE UIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1 92 2 94 WITH ANY UESTIONS ON INSTALLATION RE UIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION E UIPMENT.

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GUELPH, CANADA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC 3 00.
2. CHAMBERS SHALL BE ARCH SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B1 4, "POLYMERIC SUB SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE RE UIREMENTS OF ASTM F241 , "STANDARD SPECIFICATION FOR POLYPROPYLENE PP CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 4 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.

. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION RE UIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR 1 LONG DURATION DEAD LOADS AND 2 SHORT DURATION LIVE LOADS, BASED ON THE CSA S CL 2 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.

. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2 , "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE 1 INSTANTANEOUS 1 MIN AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2 MA IMUM PERMANENT YR COVER LOAD AND 3 ALLOWABLE COVER WITH PARKED 1 WEEK AASHTO DESIGN TRUCK.

. RE UIREMENTS FOR HANDLING AND INSTALLATION
- TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
- TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN mm 3 .
- TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION .2. OF ASTM F241 SHALL BE GREATER THAN OR E UAL TO 4 0 LBS FT . AND TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES ABOVE 23 C 3 F , CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON RE UEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS
- THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
- THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR E UAL TO 1.9 FOR DEAD LOAD AND 1. FOR LIVE LOAD, THE MINIMUM RE UIRED BY ASTM F2 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
- THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F241 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN E CEPT THAT IT SHALL BE THE YEAR MODULUS USED FOR DESIGN.

9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC 3 00 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER S REPRESENTATIVE HAS COMPLETED A PRE CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC 3 00 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC 3 00 MC 4 00 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DO ER OR AN E CAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN E CAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE E CAVATION USING A LONG BOOM HOE OR E CAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.

. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.

. MAINTAIN MINIMUM 1 0 mm " SPACING BETWEEN THE CHAMBER ROWS.

. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm 12" INTO CHAMBER END CAPS.

. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" 20 0 mm ..

9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLE STORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC 3 00 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC 3 00 MC 4 00 CONSTRUCTION GUIDE".
2. THE USE OF E UIPMENT OVER MC 3 00 CHAMBERS IS LIMITED
   - NO E UIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR E CAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC 3 00 MC 4 00 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION E UIPMENT CAN BE FOUND IN THE "STORMTECH MC 3 00 MC 4 00 CONSTRUCTION GUIDE".
3. FULL 900 mm 3 " OF STABILI ED COVER MATERIALS OVER THE CHAMBERS IS RE UIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

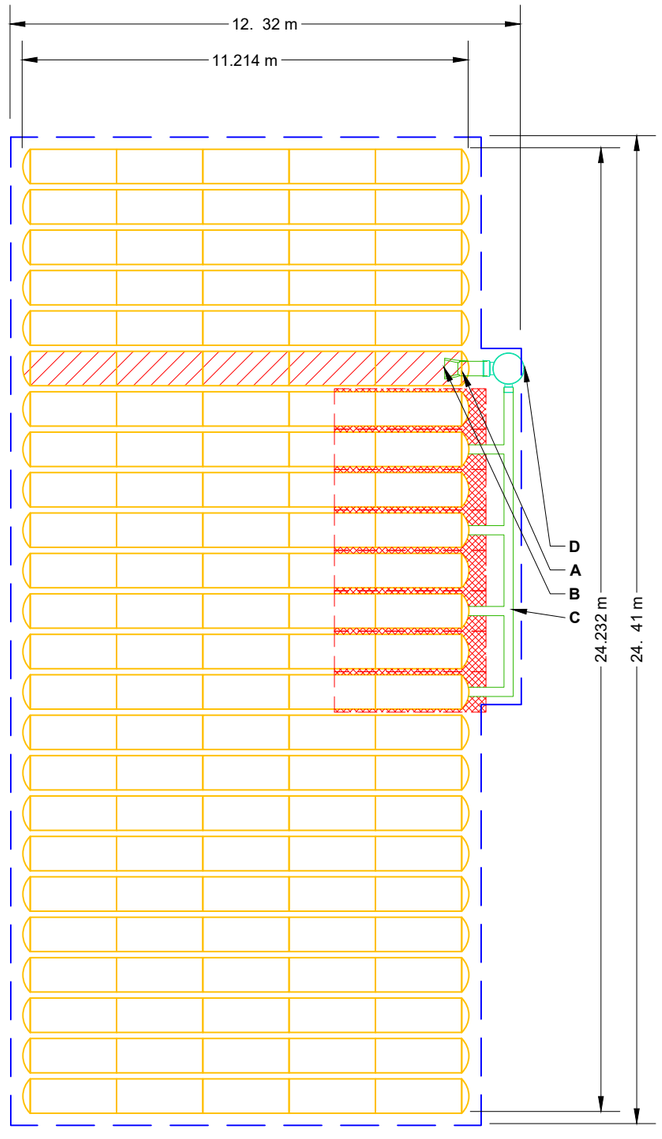
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1 92 2 94 WITH ANY UESTIONS ON INSTALLATION RE UIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION E UIPMENT.

PROPOSED LAYOUT: INFILTRAT		PROPOSED ELEVATIONS: INFILTRAT	
120	STORMTECH SC 310 CHAMBERS	MA IMUM ALLOWABLE GRADE TOP OF PAVEMENT UNPAVED	343. 24
4	STORMTECH SC 310 END CAPS	MINIMUM ALLOWABLE GRADE UNPAVED WITH TRAFFIC	341. 9
1 2	STONE ABOVE mm	MINIMUM ALLOWABLE GRADE UNPAVED NO TRAFFIC	341. 43
1 2	STONE BELOW mm	MINIMUM ALLOWABLE GRADE TOP OF RIGID CONCRETE PAVEMENT	341. 43
40	STONE VOID	MINIMUM ALLOWABLE GRADE BASE OF FLE IBLE PAVEMENT	341. 43
11 .2	INSTALLED SYSTEM VOLUME m³ PERIMETER STONE INCLUDED COVER STONE INCLUDED BASE STONE INCLUDED	TOP OF STONE	341.43
		TOP OF SC 310 CHAMBER	341.2
		200 mm 200 mm TOP MANIFOLD INVERT	340.9
		300 mm ISOLATOR ROW PLUS INVERT	340.902
302.	SYSTEM AREA m²	BOTTOM OF SC 310 CHAMBER	340. 9
.3	SYSTEM PERIMETER m	BOTTOM OF STONE	340. 2

INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED E END CAP	A	300 mm BOTTOM PREFABRICATED E END CAP, PART SC310ECE TYP OF ALL 300 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	23 mm	
FLAMP	B	INSTALL FLAMP ON 300 mm ACCESS PIPE PART SC31012RAMP		
MANIFOLD	C	200 mm 200 mm TOP MANIFOLD, MOLDED FITTINGS	9 mm	
NYLOPLAST INLET W ISO PLUS ROW	D	0 mm DIAMETER 10 mm SUMP MIN		L IN



ISOLATOR ROW PLUS SEE DETAIL

PLACE MINIMUM 3. 10 m OF ADSPLUS12 WOVEN GEOTE TILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

MANIFOLD SI E TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE .32 FOR MANIFOLD SI ING GUIDANCE.

DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER RE UIREMENTS ARE MET.

THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.

NOT FOR CONSTRUCTION: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT THE RE UIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

1242 12 0 GORDON ST.
GUELPH, CANADA

DATE	PROJECT
DRAWN CN	CHECKED N A

DATE	DRW	CHK	DESCRIPTION

4 40 TRUEMAN BLVD
HILLIARD, OH 4302
1 00 33 4 3

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PROPOSED LAYOUT: STORAGE SYSTEM

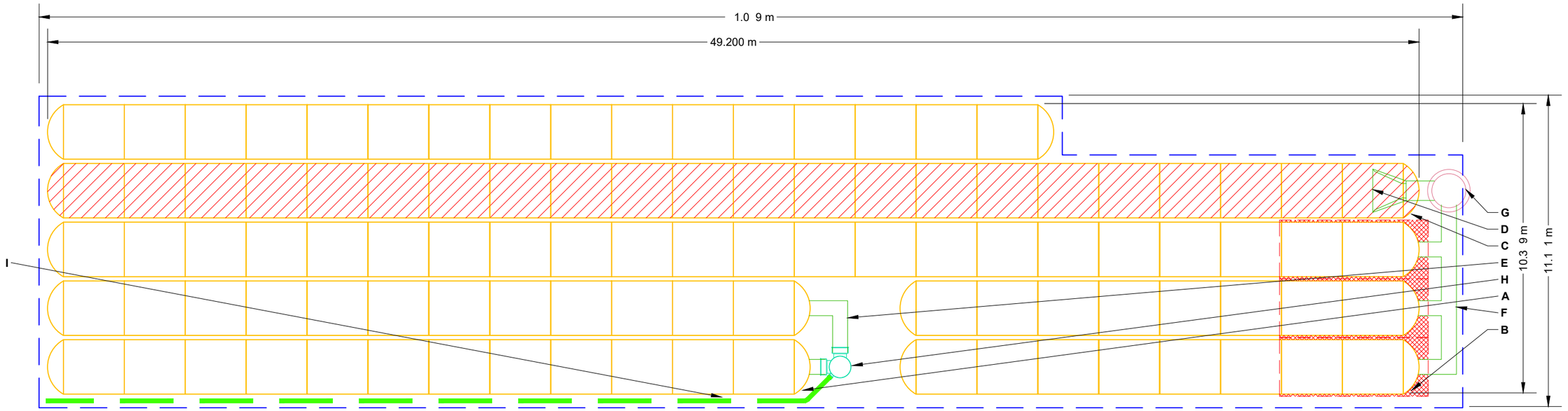
100	STORMTECH MC 3 00 CHAMBERS
14	STORMTECH MC 3 00 END CAPS
30	STONE ABOVE mm
229	STONE BELOW mm
40	STONE VOID
2.9	INSTALLED SYSTEM VOLUME m³ PERIMETER STONE INCLUDED COVER STONE INCLUDED BASE STONE INCLUDED
40.	SYSTEM AREA m²
124.	SYSTEM PERIMETER m

PROPOSED ELEVATIONS: STORAGE SYSTEM

MA IMUM ALLOWABLE GRADE TOP OF PAVEMENT UNPAVED	340. 20
MINIMUM ALLOWABLE GRADE UNPAVED WITH TRAFFIC	33 . 91
MINIMUM ALLOWABLE GRADE UNPAVED NO TRAFFIC	33 . 39
MINIMUM ALLOWABLE GRADE TOP OF RIGID CONCRETE PAVEMENT	33 . 39
MINIMUM ALLOWABLE GRADE BASE OF FLE IBLE PAVEMENT	33 . 39
TOP OF STONE	33 .4
TOP OF MC 3 00 CHAMBER	33 .1 2
4 0 mm 4 0 mm TOP MANIFOLD INVERT	33 . 4
00 mm ISOLATOR ROW PLUS INVERT	33 .091
4 0 mm 4 0 mm BOTTOM MANIFOLD INVERT	33 .0 4
4 0 mm BOTTOM CONNECTION INVERT	33 .0 4
BOTTOM OF MC 3 00 CHAMBER	33 .039
UNDERDRAIN INVERT	33 . 10
BOTTOM OF STONE	33 . 10

INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	4 0 mm BOTTOM CORED END CAP, PART MC3 00IEPP1 BC TYP OF ALL 4 0 mm BOTTOM CONNECTIONS	4 mm	
PREFABRICATED END CAP	B	4 0 mm TOP CORED END CAP, PART MC3 00IEPP1 TC TYP OF ALL 4 0 mm TOP CONNECTIONS	09 mm	
PREFABRICATED END CAP	C	00 mm BOTTOM CORED END CAP, PART MC3 00IEPP24BC TYP OF ALL 00 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2 mm	
FLAMP	D	INSTALL FLAMP ON 00 mm ACCESS PIPE PART MC3 0024RAMP		
MANIFOLD	E	4 0 mm 4 0 mm BOTTOM MANIFOLD, ADS N 12	4 mm	
MANIFOLD	F	4 0 mm 4 0 mm TOP MANIFOLD, ADS N 12	09 mm	
CONCRETE STRUCTURE	G	DESIGN BY ENGINEER PROVIDED BY OTHERS		4 0 L IN
NYLOPLAST OUTLET	H	0 mm DIAMETER DESIGN BY ENGINEER		22 L OUT
UNDERDRAIN	I	1 0 mm ADS N 12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS
SEE DETAIL

PLACE MINIMUM .334 m OF ADSPLUS1 WOVEN GEOTE TILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

MANIFOLD SI E TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE .32 FOR MANIFOLD SI ING GUIDANCE.

DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER RE UIREMENTS ARE MET.

THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.

NOT FOR CONSTRUCTION: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT THE RE UIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

1242 12 0 GORDON ST.
GUELPH, CANADA
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HILLIARD, OH 4302
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SCALE = 1 1 0

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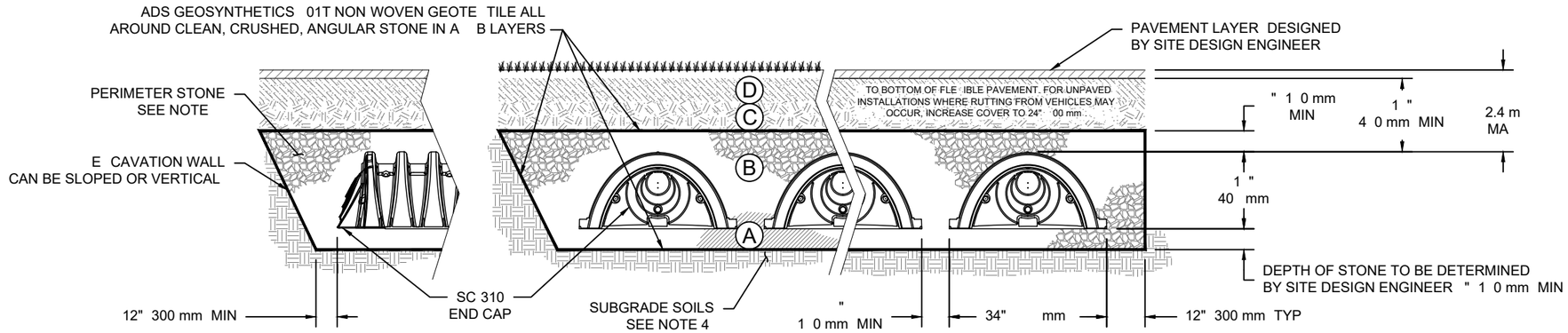
4 OF 11

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION DENSITY RE UIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER D STARTS FROM THE TOP OF THE C LAYER TO THE BOTTOM OF FLE IBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE D LAYER.	ANY SOIL ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE RE UIREMENTS.	N A	PREPARE PER SITE DESIGN ENGINEER S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION RE UIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER C STARTS FROM THE TOP OF THE EMBEDMENT STONE B LAYER TO 1 " 4 0 mm ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE C LAYER.	GRANULAR WELL GRADED SOIL AGGREGATE MI TURES, 3 FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M14 [1] A 1, A 2 4, A 3 OR AASHTO M43[1] 3, 3 , 4, 4 , , , , , , , , , , 9, 9, 10	BEGIN COMPACTIONS AFTER 12" 300 mm OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN " 1 0 mm MA LIFTS TO A MIN. 9 PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 9 RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO E CEED 12,000 3 N . DYNAMIC FORCE NOT TO E CEED 20,000 9 N .
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE A LAYER TO THE C LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 3 , 4, 4 , , ,	NO COMPACTION RE UIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT BOTTOM OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 3 , 4, 4 , , ,	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR E AMPLE, A SPECIFICATION FOR 4 STONE WOULD STATE "CLEAN, CRUSHED, ANGULAR NO. 4 AASHTO M43 STONE".
2. STORMTECH COMPACTION RE UIREMENTS ARE MET FOR A LOCATION MATERIALS WHEN PLACED AND COMPACTED IN " 1 0 mm MA LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION E UIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION RE UIREMENTS.
4. ONCE LAYER C IS PLACED, ANY SOIL MATERIAL CAN BE PLACED IN LAYER D UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL RE UIREMENTS OF LAYER C OR D AT THE SITE DESIGN ENGINEER S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE RE UIREMENTS OF ASTM F2922 POLETHYLENE OR ASTM F241 POLYPROPYLENE , "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC 310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE ALLOWABLE BEARING CAPACITY OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF E PECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE E TENDED HORI ONTALLY TO THE E CAVATION WALL FOR BOTH VERTICAL AND SLOPED E CAVATION WALLS.

. RE UIREMENTS FOR HANDLING AND INSTALLATION
- TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
- TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2 .
- TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR E UAL TO 400 LBS FT . THE ASC IS DEFINED IN SECTION .2. OF ASTM F241 . AND TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES ABOVE 3 F 23 C , CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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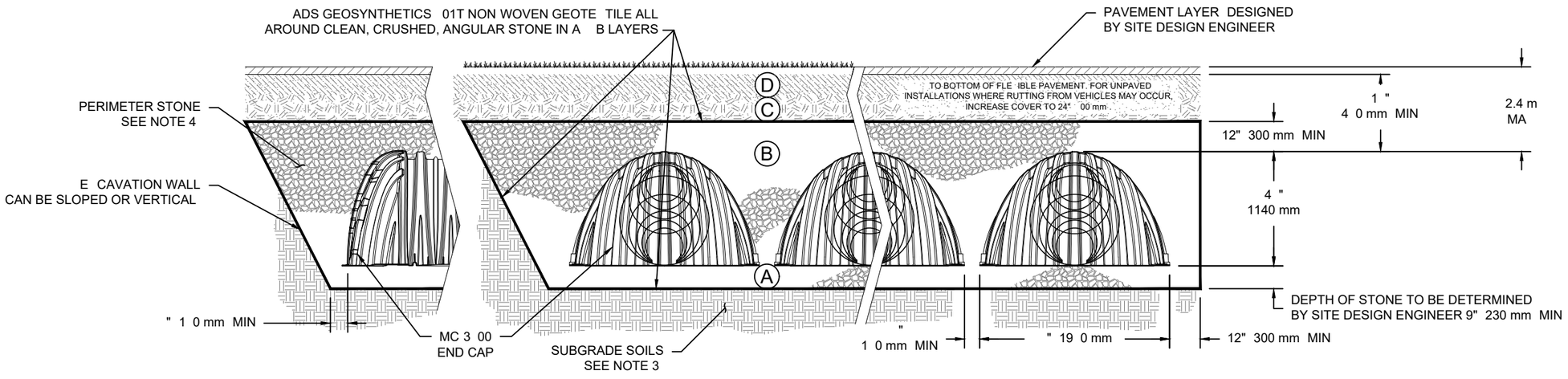
SHEET
OF 11

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION DENSITY RE UIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER D STARTS FROM THE TOP OF THE C LAYER TO THE BOTTOM OF FLE IBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE D LAYER	ANY SOIL ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE RE UIREMENTS.	N A	PREPARE PER SITE DESIGN ENGINEER S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION RE UIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER C STARTS FROM THE TOP OF THE EMBEDMENT STONE B LAYER TO 24" 00 mm ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE C LAYER.	GRANULAR WELL GRADED SOIL AGGREGATE MI TURES, 3 FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M14 [1] A 1, A 2 4, A 3 OR AASHTO M43[1] 3, 3 , 4, 4 , , , , , , , , , , 9, 9, 10	BEGIN COMPACTIONS AFTER 24" 00 mm OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" 300 mm MA LIFTS TO A MIN. 9 PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 9 RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE A LAYER TO THE C LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION RE UIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT BOTTOM OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR E AMPLE, A SPECIFICATION FOR 4 STONE WOULD STATE "CLEAN, CRUSHED, ANGULAR NO. 4 AASHTO M43 STONE".
2. STORMTECH COMPACTION RE UIREMENTS ARE MET FOR A LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" 230 mm MA LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION E UIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION RE UIREMENTS.
4. ONCE LAYER C IS PLACED, ANY SOIL MATERIAL CAN BE PLACED IN LAYER D UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL RE UIREMENTS OF LAYER C OR D AT THE SITE DESIGN ENGINEER S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE RE UIREMENTS OF ASTM F241 , "STANDARD SPECIFICATION FOR POLYPROPYLENE PP CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 4 DESIGNATION SS.
2. MC 3 00 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE ALLOWABLE BEARING CAPACITY OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF E PECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE E TENDED HORI ONTALLY TO THE E CAVATION WALL FOR BOTH VERTICAL AND SLOPED E CAVATION WALLS.
. RE UIREMENTS FOR HANDLING AND INSTALLATION
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3 .
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR E UAL TO 4 0 LBS FT . THE ASC IS DEFINED IN SECTION .2. OF ASTM F241 . AND TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES ABOVE 3 F 23 C , CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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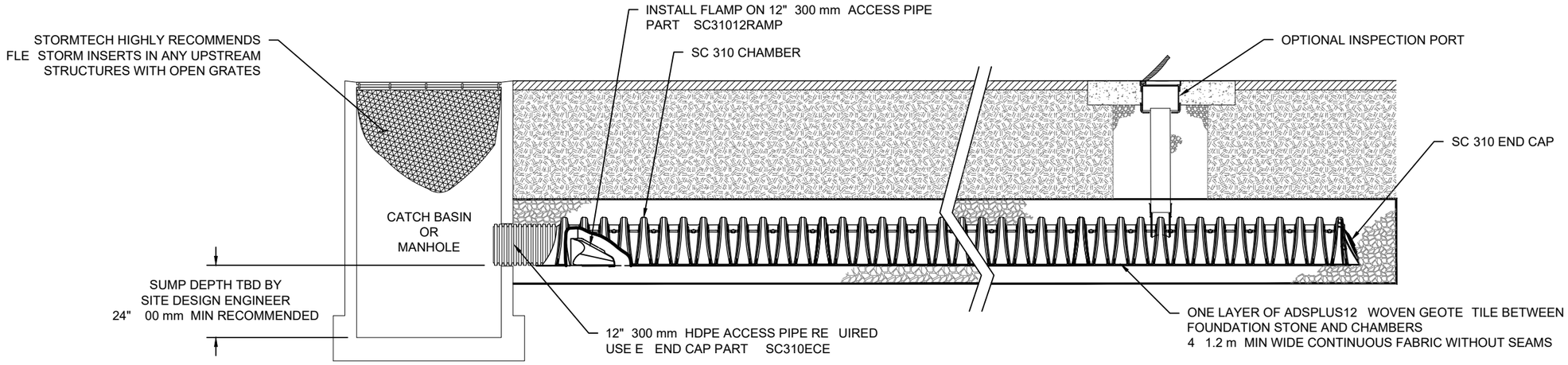

SC-310 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1 INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS IF PRESENT
  - A.1. REMOVE OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLE STORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS OPTIONAL
  - A. . IF SEDIMENT IS AT, OR ABOVE, 3" 0 mm PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" 0 mm PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2 CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FI ED CULVERT CLEANING NO LE WITH REAR FACING SPREAD OF 4 " 1.1 m OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS RE UIRED

STEP 3 REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS RECORD OBSERVATIONS AND ACTIONS.

STEP 4 INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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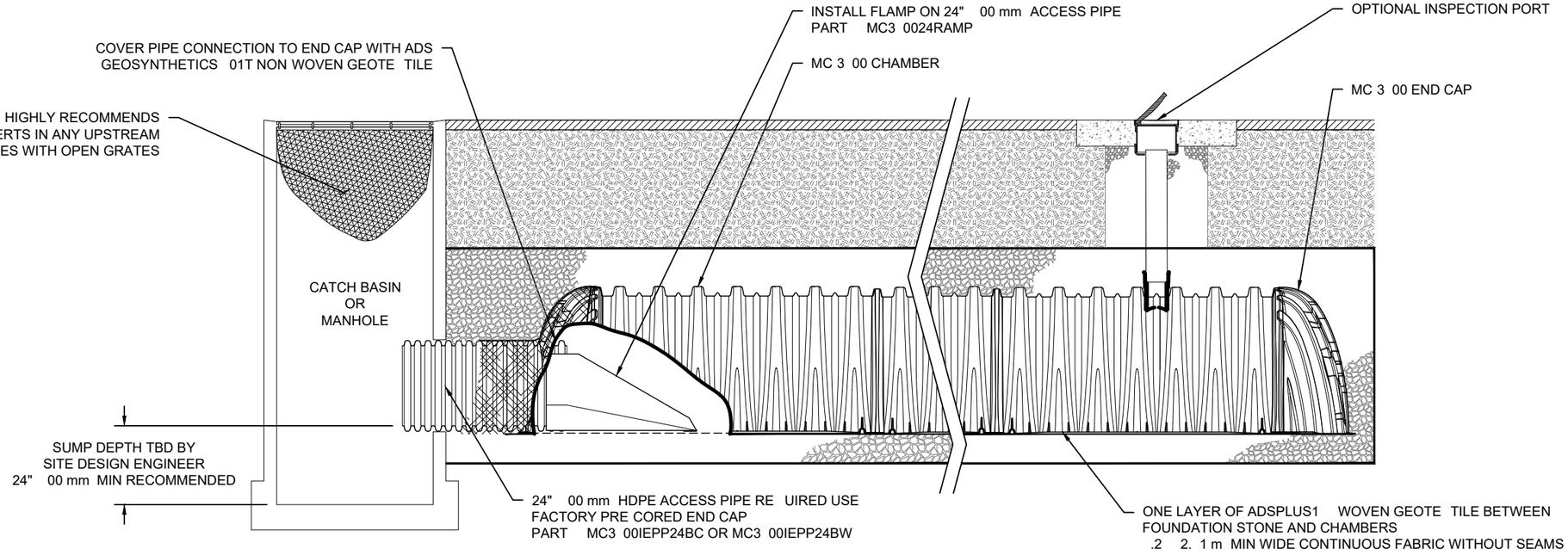

MC-3500 ISOLATOR ROW PLUS DETAIL

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SC-310 TECHNICAL SPECIFICATION

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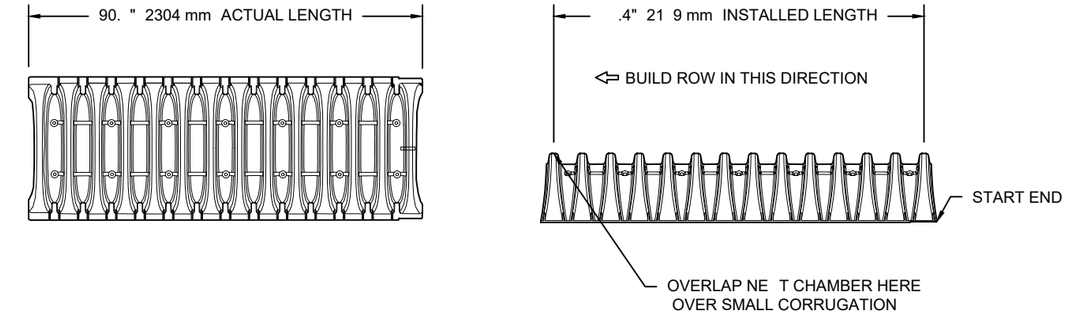
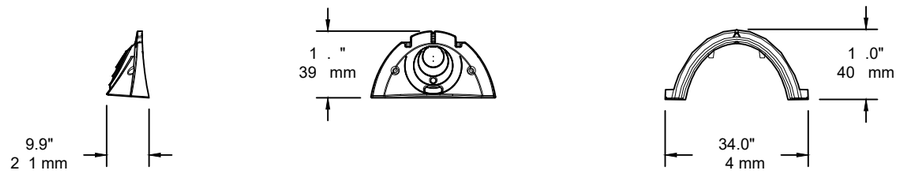
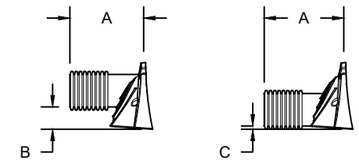




NOMINAL CHAMBER SPECIFICATIONS

SI E W H INSTALLED LENGTH	34.0" 1 .0" .4"	4 mm 40 mm 21 9 mm
CHAMBER STORAGE	14. CUBIC FEET	0.42 m³
MINIMUM INSTALLED STORAGE	31.0 CUBIC FEET	0. m³
WEIGHT	3 .0 .	1 .

ASSUMES " 1 2 mm ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE0 T SC310EPE0 TPC	" 1 0 mm	9. " 244 mm	. " 14 mm	
SC310EPE0 B SC310EPE0 BPC				0. " 13 mm
SC310EPE0 T SC310EPE0 TPC	" 200 mm	11.9" 302 mm	3. " 9 mm	
SC310EPE0 B SC310EPE0 BPC				0. " 1 mm
SC310EPE10T SC310EPE10TPC	10" 2 0 mm	12. " 323 mm	1.4" 3 mm	
SC310EPE10B SC310EPE10BPC				0. " 1 mm
SC310ECE	12" 300 mm	13. " 343 mm		0.9" 23 mm

ALL STUBS, E CEPT FOR THE SC310ECE ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1 92 2 94.

FOR THE SC310ECE THE 12" 300 mm STUB LIES BELOW THE BOTTOM OF THE END CAP APPRO IMATELY 0.2 " mm . BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N 12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE ALL DIMENSIONS ARE NOMINAL

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NYLOPLAST DRAIN BASIN

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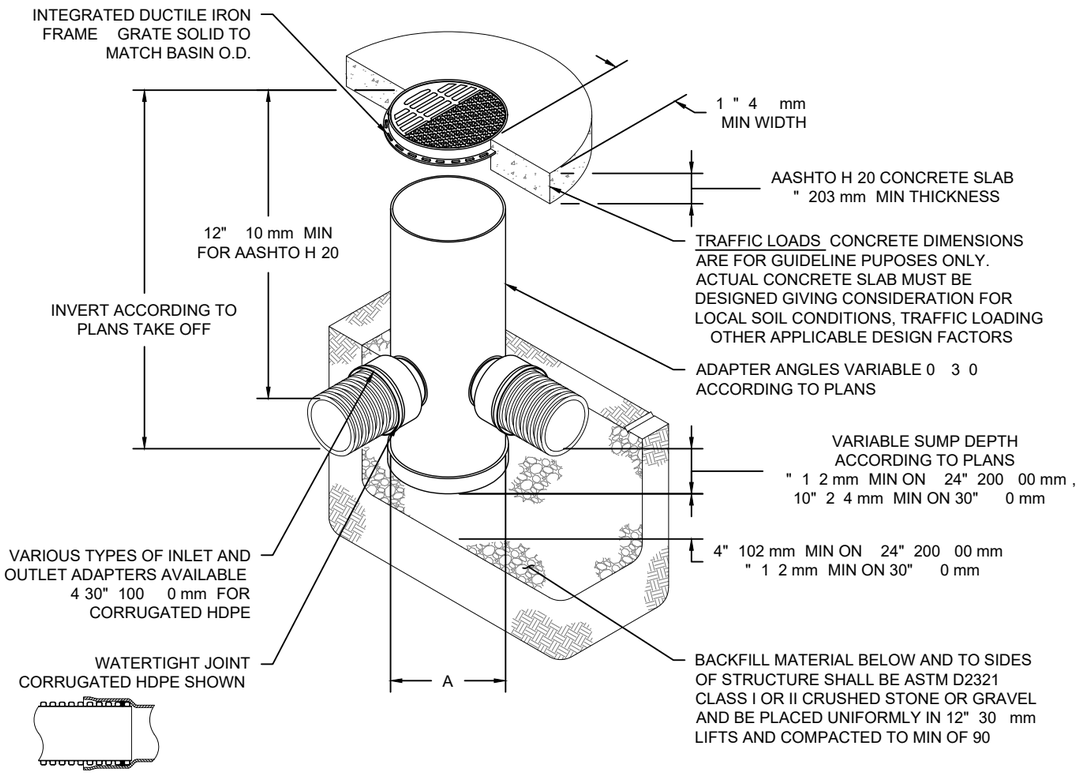

NOTES

1. 30" 200 0 mm GRATES SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A 3 GRADE 0 0 0
2. 12 30" 300 0 mm FRAMES SHALL BE DUCTILE IRON PER ASTM A 3 GRADE 0 0 0
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE ADS HANCOR DUAL WALL SDR 3 PVC
. FOR COMPLETE DESIGN AND PRODUCT INFORMATION **WWW.NYLOPLAST-US.COM**
. TO ORDER CALL **800-821-6710**

A	PART	GRATE SOLID COVER OPTIONS		
" 200 mm	2 0 AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" 2 0 mm	2 10AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" 300 mm	2 12AG	PEDESTRIAN AASHTO H 10	STANDARD AASHTO H 20	SOLID AASHTO H 20
1 " 3 mm	2 1 AG	PEDESTRIAN AASHTO H 10	STANDARD AASHTO H 20	SOLID AASHTO H 20
1 " 4 0 mm	2 1 AG	PEDESTRIAN AASHTO H 10	STANDARD AASHTO H 20	SOLID AASHTO H 20
24" 00 mm	2 24AG	PEDESTRIAN AASHTO H 10	STANDARD AASHTO H 20	SOLID AASHTO H 20
30" 0 mm	2 30AG	PEDESTRIAN AASHTO H 20	STANDARD AASHTO H 20	SOLID AASHTO H 20

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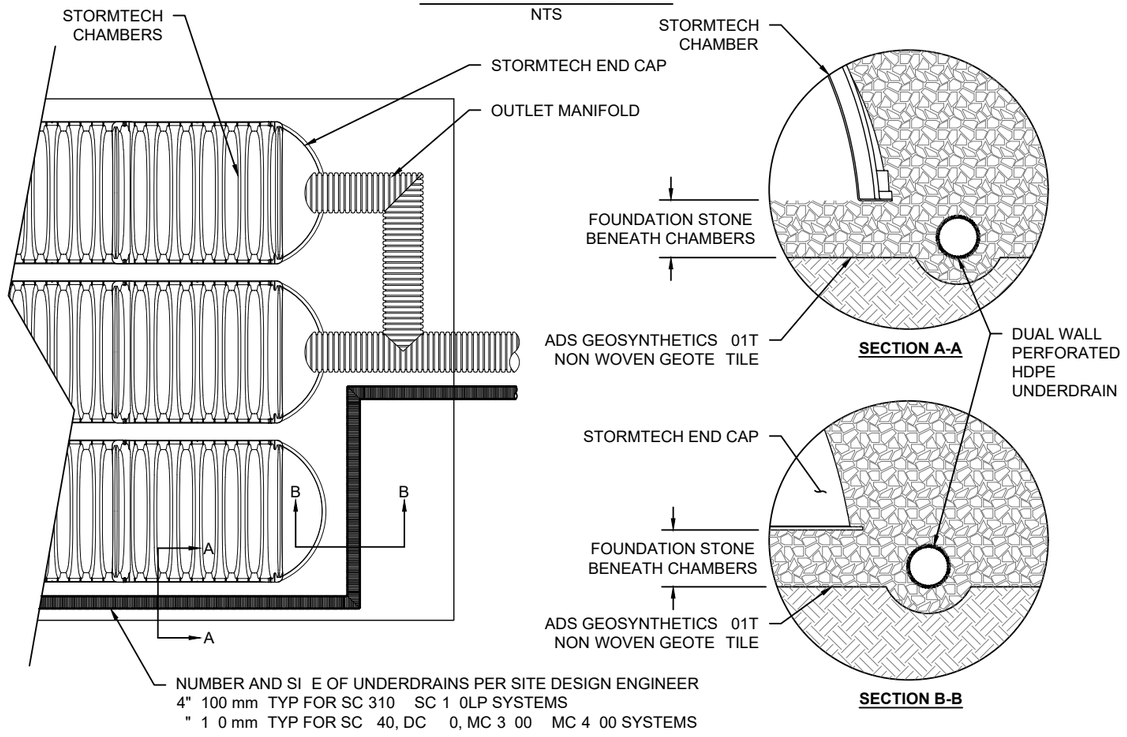

MC-SERIES END CAP INSERTION DETAIL

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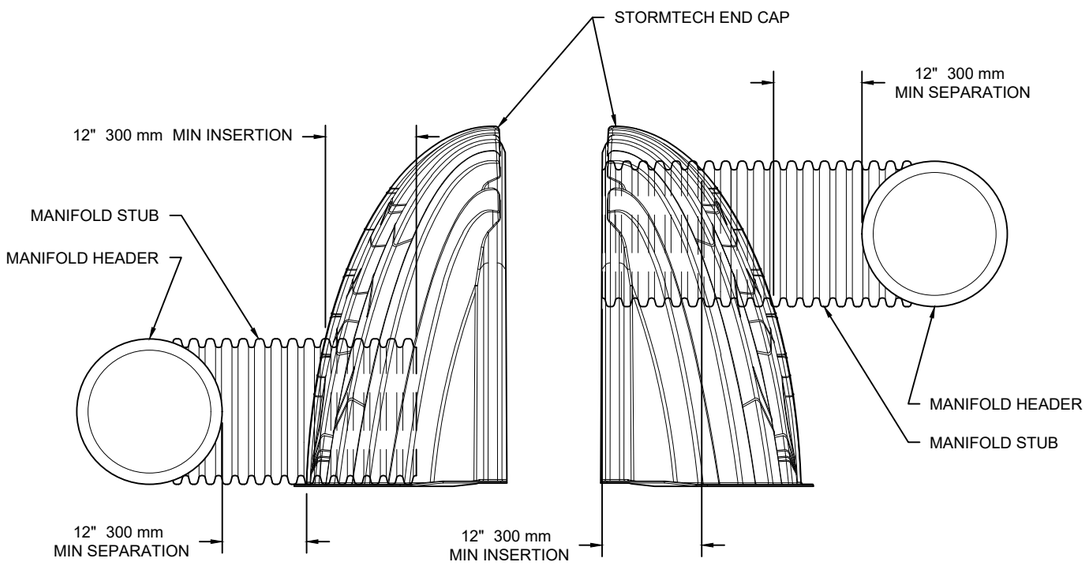

NOTE MANIFOLD STUB MUST BE LAID HORI ONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-3500 TECHNICAL SPECIFICATION

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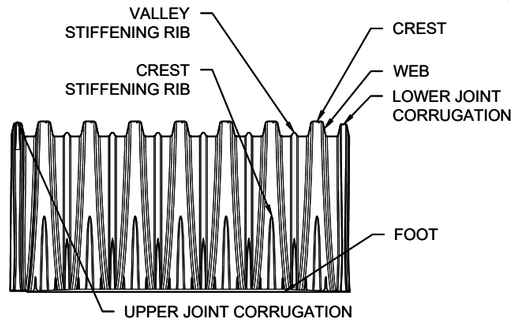
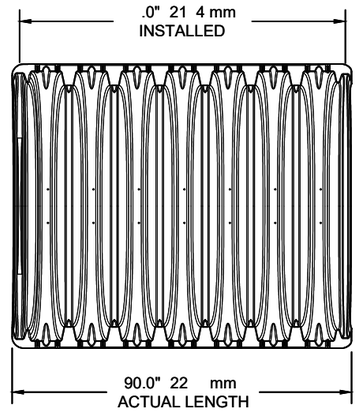
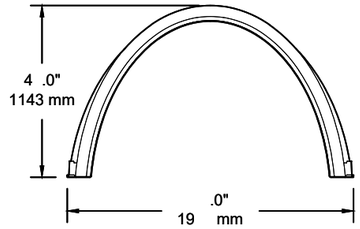
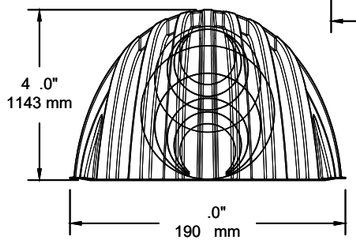
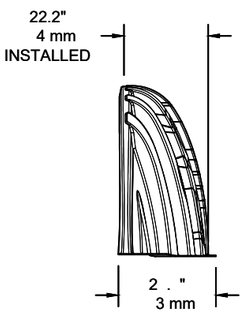










NOMINAL CHAMBER SPECIFICATIONS

SI E W H INSTALLED LENGTH	.0" 4 .0" .0"	19 mm 1143 mm 21 4 mm
CHAMBER STORAGE	109.9 CUBIC FEET	3.11 m³
MINIMUM INSTALLED STORAGE	1 .0 CUBIC FEET	4.9 m³
WEIGHT	134 .	0.

NOMINAL END CAP SPECIFICATIONS

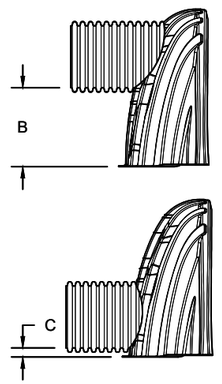
SI E W H INSTALLED LENGTH	.0" 4 .0" 22.2"	190 mm 1143 mm 4 mm
END CAP STORAGE	14.9 CUBIC FEET	0.42 m³
MINIMUM INSTALLED STORAGE	4 .1 CUBIC FEET	1.2 m³
WEIGHT	49 .	22.2

ASSUMES 12" 30 mm STONE ABOVE, 9" 229 mm STONE FOUNDATION, " SPACING BETWEEN CHAMBERS, " 1 2 mm STONE PERIMETER IN FRONT OF END CAPS AND 40 STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3 00IEPP0 T	" 1 0 mm	33.21" 44 mm	
MC3 00IEPP0 B			0. " 1 mm
MC3 00IEPP0 T	" 200 mm	31.1 " 91 mm	
MC3 00IEPP0 B			0. 1" 21 mm
MC3 00IEPP10T	10" 2 0 mm	29.04" 3 mm	
MC3 00IEPP10B			0.93" 24 mm
MC3 00IEPP12T	12" 300 mm	2 .3 " 0 mm	
MC3 00IEPP12B			1.3 " 34 mm
MC3 00IEPP1 T	1 " 3 mm	23.39" 94 mm	
MC3 00IEPP1 B			1. 0" 3 mm
MC3 00IEPP1 TC	1 " 4 0 mm	20.03" 09 mm	
MC3 00IEPP1 TW			
MC3 00IEPP1 BC			1. " 4 mm
MC3 00IEPP1 BW			
MC3 00IEPP24TC	24" 00 mm	14.4 " 3 mm	
MC3 00IEPP24TW			
MC3 00IEPP24BC			2.0 " 2 mm
MC3 00IEPP24BW			
MC3 00IEPP30BC	30" 0 mm		2. " 0 mm

NOTE ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON RE UEST. INVENTORIED MANIFOLDS INCLUDE 12 24" 300 00 mm SI E ON SI E AND 1 4 " 3 1200 mm ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC 3 00 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SI ES GREATER THAN 10" 2 0 mm . THE INVERT LOCATION IN COLUMN B ARE THE HIGHEST POSSIBLE FOR THE PIPE SI E.

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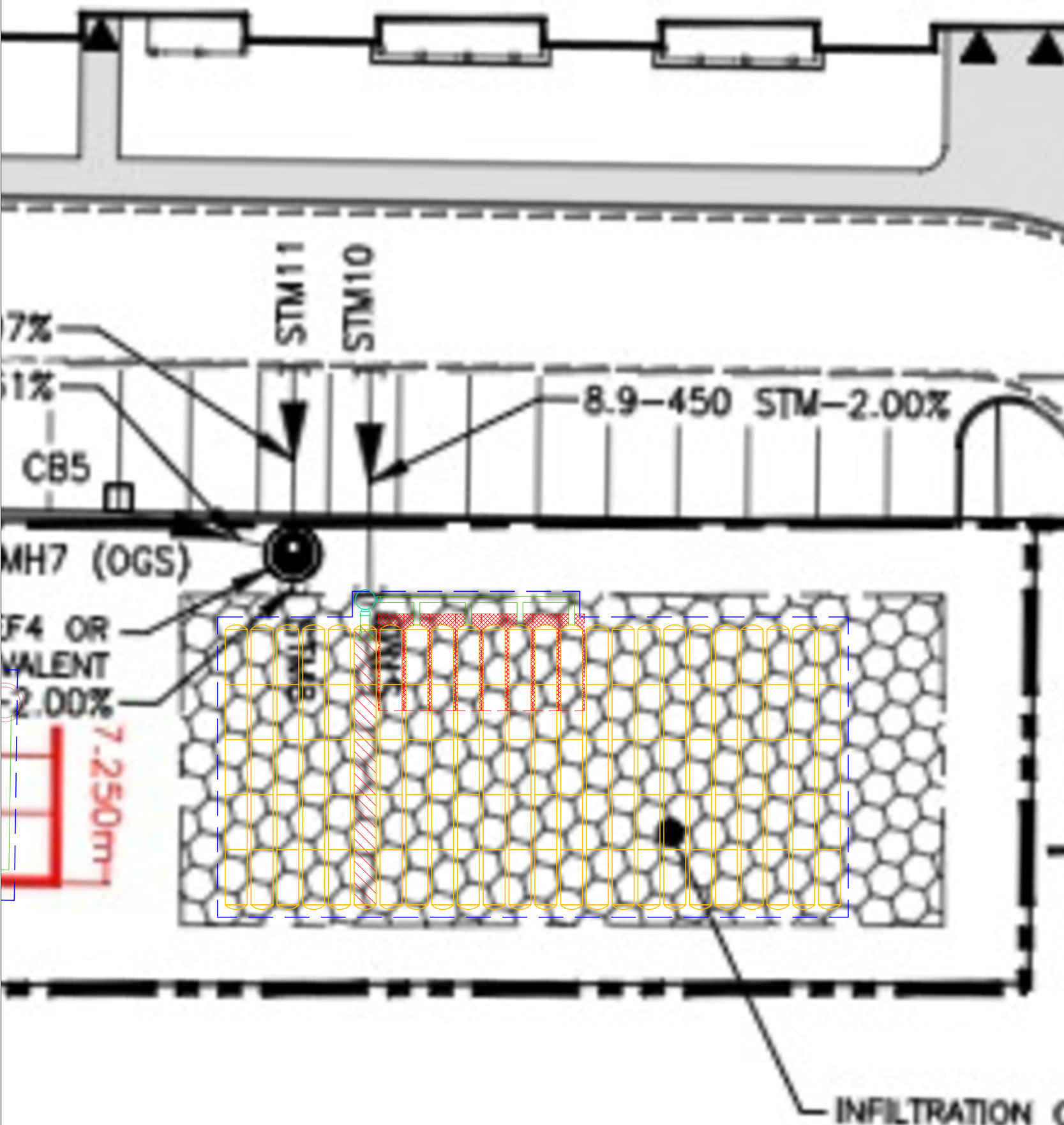

STM11
STM10
7%
1%
CB5
8.9–450 STM–2.00%
MH7 (OGS)
F4 OR
VALENT
2.00%
7.250m
INFILTRATION
390sq.m (30m
SEE DETAIL SH
INV.=340.89m

R.D.
42.20

7.3–450 STM–1.97%

7.1–300 STM–0.61%

CB5

MH7 (OGS)

19.750m

STORMCEPTOR EF4 OR
APPROVED EQUIVALENT

1.6–450 STM–2.00%

35.000m

7.250m

54.750m

STM

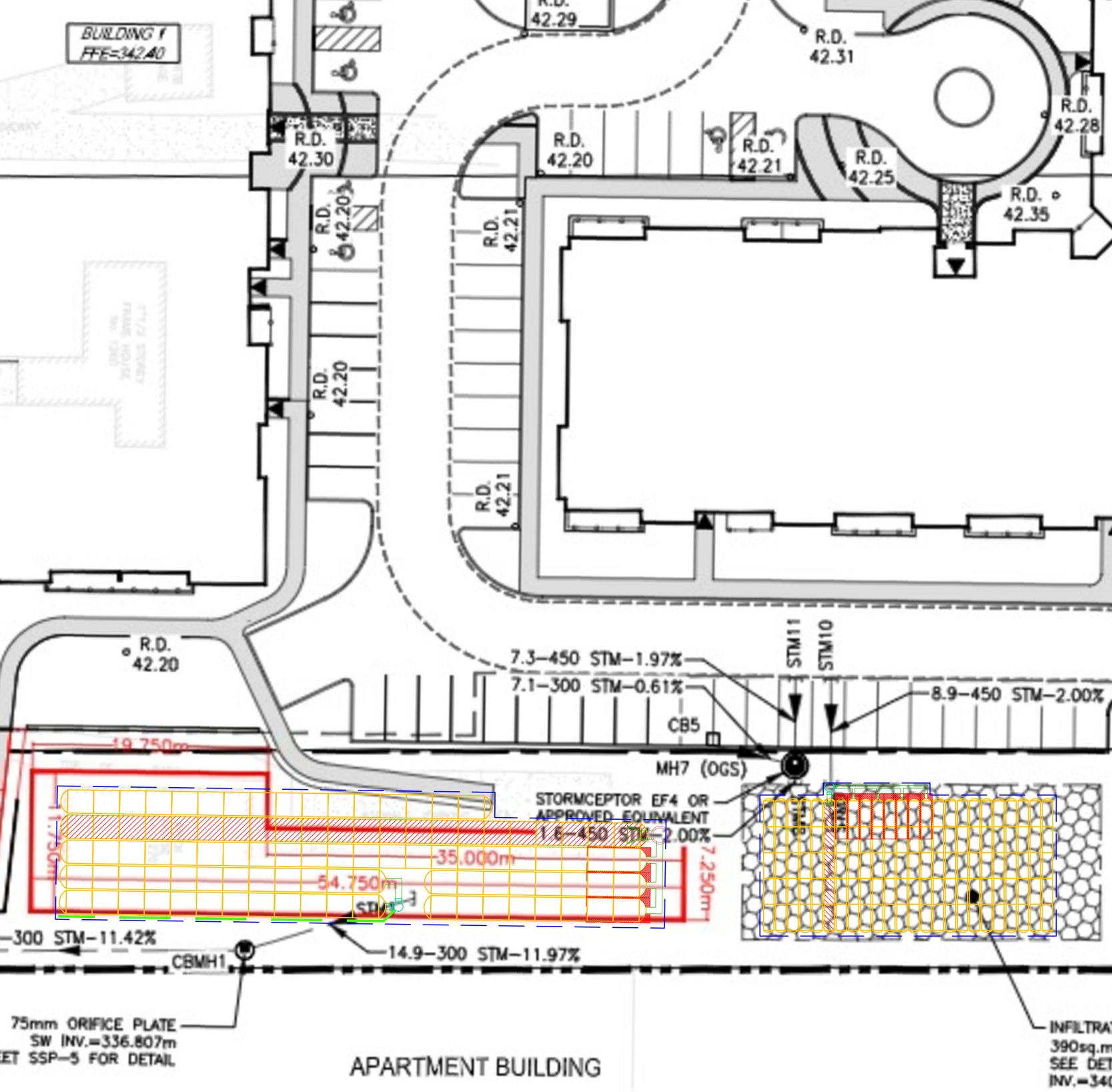
1.0–300 STM–11.42%

CBMH1

14.9–300 STM–11.97%

75mm ORIFICE PLATE
SW INV.=336.807m
SHEET SSP–5 FOR DETAIL

APARTMENT BUILDING


BUILDING 1
FFE=342.40
R.D. 42.29
R.D. 42.31
R.D. 42.28
R.D. 42.30
R.D. 42.20
R.D. 42.21
R.D. 42.25
R.D. 42.35
R.D. 42.20
R.D. 42.21
R.D. 42.20
R.D. 42.21
R.D. 42.20
7.3-450 STM-1.97%
7.1-300 STM-0.61%
STM11
STM10
8.9-450 STM-2.00%
CB5
MH7 (OGS)
STORMCEPTOR EF4 OR APPROVED EQUIVALENT
1.6-450 STM-2.00%
19.750m
35.000m
54.750m
7.250m
-300 STM-11.42%
CBMH1
14.9-300 STM-11.97%
75mm ORIFICE PLATE
SW INV.=336.807m
ET SSP-5 FOR DETAIL
APARTMENT BUILDING