

Stormwater Management Report

Shell Canada
Heritage Hills, Ottawa, ON

September, 2019

Quality information

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Executive Summary

AECOM has been retained by Shell Canada Products to design and construct the proposed commercial development on the parcel of land located at the northwest corner of Terry Fox Drive and Kanata Road in the City of Ottawa, Ontario. The Shell site encompasses the east half of the Heritage Hills Plaza. AECOM has completed this storm water management report to support the development application.

The Heritage Hills Plaza is currently draining through a 1200 mm diameter municipal storm sewer located near the intersection of Kanata Avenue and Terry Fox Drive. Pre-development peak runoff rates generated in the 5-year and 100-year storm events were determined to be 68.2 L/s and 146.2 L/s respectively. The post-development runoff rate is required to be controlled to maximum rate equalling the pre-development 5-year storm event rate of 68.2 L/s.

A small landscaped portion of the Shell property will runoff uncontrolled into the City's system at a rate of 4.6 L/s during the 100-year storm event. Removing this flow from the maximum allowable discharge rate provides a maximum discharge rate from the Shell property underground storm system of 63.6 L/s.

A Hydrovex's vortex flow regulator model 200SVHV-2 is proposed to restrict flow to a maximum rate of 63.6 L/s.

The excess stormwater will be retained in the underground storm infrastructure to attenuate the flow rate. The available storage capacity provided is 173.2 cu.m, for the required volume of 171.7 cu.m.

The stormwater quality will be maintained by installing CDS model PMSU3020-6. The PMSU3020-6 will provide 92.5% TSS removal and capture 1,293 L of oil.

Site grading was targeted to capture the stormwater internally and maintain the existing drainage patterns. Erosion and sediment control measures were also proposed during the construction period.

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1. Introduction

AECOM has been retained by Shell Canada Products to design and construct the proposed commercial development on the parcel of land located at the north west corner of Terry Fox Drive and Kanata Road in the City of Ottawa, Ontario. AECOM has completed this storm water management report to support the development application.

The subject parcel of land was part of Heritage Hills Retail Plaza Site being developed by numbered company "7873794 Canada Inc." through their engineers NOVATECH. A Development Servicing Study and Stormwater Management Report (R-2018-158) prepared by NOVATECH addressed the storm drainage from the west half of Heritage Hills Plaza, as shown in the NOVATECH Drawing 118133-SWM (attached in Appendix A - Figures). This report should be reviewed in conjunction with the NOVATECH's report. The stormwater management criteria for the Shell site has been confirmed with the City by NOVATECH and communicated to AECOM through e-mail (copy attached in Appendix C – Correspondence).

2. Pre-Development Runoff

Heritage Hills Plaza is currently draining through a 1200 mm diameter municipal storm sewer located near the intersection of Kanata Avenue and Terry Fox Drive. The pre-development runoff co-efficient was assessed to be 0.2. The pre-development peak runoff rate in a 5-year storm event and 100-year storm event has been calculated based on City of Ottawa IDF. The time of concentration was assumed to be 10 minutes. The runoff results in 5 year and 100-year storm events are shown in the Table 2.1.

Table 2.1: Predevelopment Peak Runoff

Storm		5 Year	100 Year
IDF Coefficients	a)	998.071	1735.688
	b)	6.053	6.014
	c)	0.814	0.82
Tc		10 min	10 min
Area		1.179 Ha	1.179 Ha
Intensity		104.19 mm/hr	178.56 mm/hr
C		0.20	0.25
Peak Runoff		68.2 L/s	146.2 L/s

3. Post Development Runoff

The site has been divided into 9 sub-catchment areas according to their drainage pattern as shown in Figure C104.0 (Appendix A). Two catchments (A-1 and A-2) are in Heritage Hills Plaza which will drain through the Shell property and its drainage system. Eight sub-catchments, Sub-catchments A1 – A8 are controlled and drain through the storm sewer system. Sub-catchment 9 is uncontrolled, draining away from the property. The uncontrolled sub-catchment is the landscaped areas draining to the south and east. The post development runoff coefficients have been calculated for both controlled and uncontrolled areas and are shown in Table 3.1 and Table 3.2 below.

Table 3.1: Post Development Runoff Coefficient Calculation (Controlled Area)

Catchment		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Total
	C	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)
Building Roof	0.90	0	0	220	110	0	0	0	0	330
Hard Surface	0.90	687	463	314	315	340	680	350	996	4145
Landscape	0.25	33	57	76	46	0	0	0	274	485
Total Area		720	520	610	470	340	680	350	1270	4960
Composite C		0.87	0.83	0.82	0.84	0.90	0.90	0.90	0.76	0.84

Table 3.2: Post Development Runoff Coefficient Calculation (Uncontrolled Area)

Catchment		Area 9	Total
	C	(m ²)	(m ²)
Building Roof	0.90	0	0
Hard Surface	0.90	0	0
Landscape	0.25	297	297
Total Area		297	297
Composite C		0.25	0.25

Post Development runoff for the 5 year and 100-year storm events for both controlled and uncontrolled areas were calculated using a 10-minute concentration time. The details are given in Table 3.3 and Table 3.4.

Table 3.3: Post-Development Peak Runoff - Controlled Area

Storm		5 Year	100 Year
IDF Coefficients	a)	998.071	1735.688
	b)	6.053	6.014
	c)	0.814	0.82
Tc		10 min	10 min
Area		0.496 Ha	0.496 Ha
Intensity		104.2 mm/hr	178.6 mm/hr
C		0.84	1.0
Peak Runoff		120.1 L/s	246.0 L/s

Table 3.4: Post-Development Peak Runoff – Uncontrolled Area

Storm		5 Year	100 Year
IDF Coefficients	a)	998.071	1735.688
	b)	6.053	6.014
	c)	0.814	0.82
Tc		10 min	10 min
Area		0.030 Ha	0.030 Ha
Intensity		104.2 mm/hr	178.6 mm/hr
C		0.25	0.31
Peak Runoff		2.2 L/s	4.6 L/s

4. Stormwater discharge

The post-development flow from a 100-year storm event shall not exceed the pre-development runoff for the five (5) year storm event. Since there is one subcatchment that has uncontrolled flow away from site, allowable discharge from the site has been calculated by subtracting 100-year uncontrolled flow from 5-year predevelopment flow and is provided in Table 4.1.

Table 4.1: Allowable Discharge Rate from Controlled Areas

Storm	5 Year
Predevelopment Peak Runoff	68.2 L/s
Post-Development Uncontrolled Flow	4.6 L/s
Allowable Outflow	63.6 L/s

Stormwater discharge rate will be controlled through HYDROVEX SHVH vortex flow regulator. The vortex will be installed on the outlet pipe of CBMH#02. The maximum water elevation upstream of the vortex can rise to an elevation of 96.450 m (Spill elevation). The CBMH#02 outlet invert is 93.569. The design head of 2.881 m is the height difference of maximum water level and the outlet invert level, which is considered a conservative approach. Veolia's design utility was used to design the vortex. The results are attached at appendix B1.

It was determined that a 200SVHV-2 vortex will restrict the discharge rate to a flow close to the desired rate. Table 4.2 shows the Vortex selection parameters and maximum flow.

Table 4.2: Vortex Design

Max Water Level (u/s)	96.450 m
Outlet pipe Invert (d/s)	93.569m
Outlet pipe Diameter	300 mm
Design Head	2.881 m
Design Flow	63.6 L/s

5. Stormwater Detention Storage

The detention storage system is required to attenuate peak flow from controlled areas and release at allowable rates. Stage storage curve was developed to determine the relationship of water elevation (head of water) and storage volume.

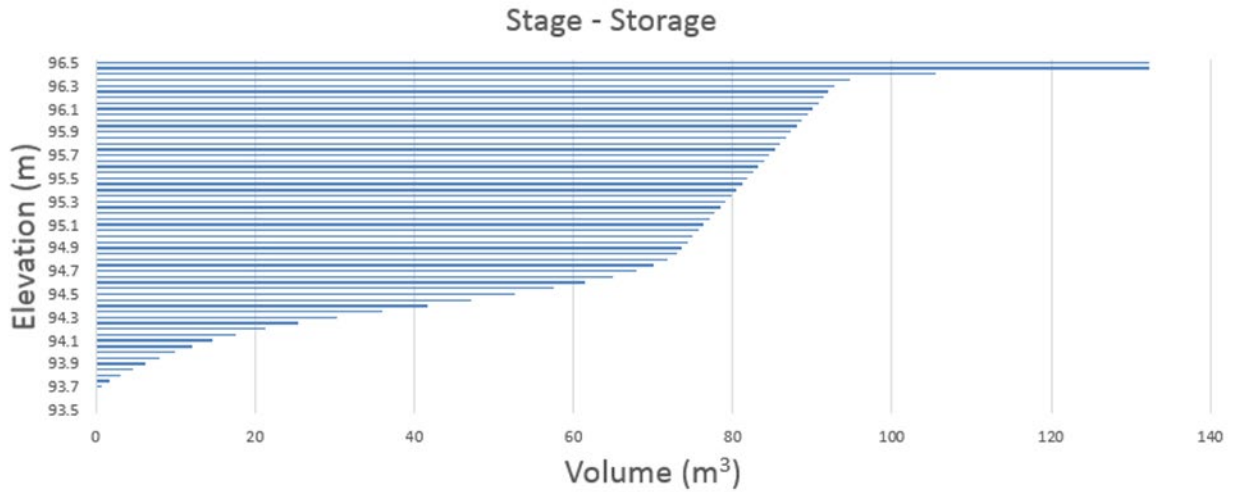


Figure 5.1: Stage Storage Curve

The designed vortex “200SVHV-2 vortex” rating curve was used to determine the release rate during 100-year storm event.

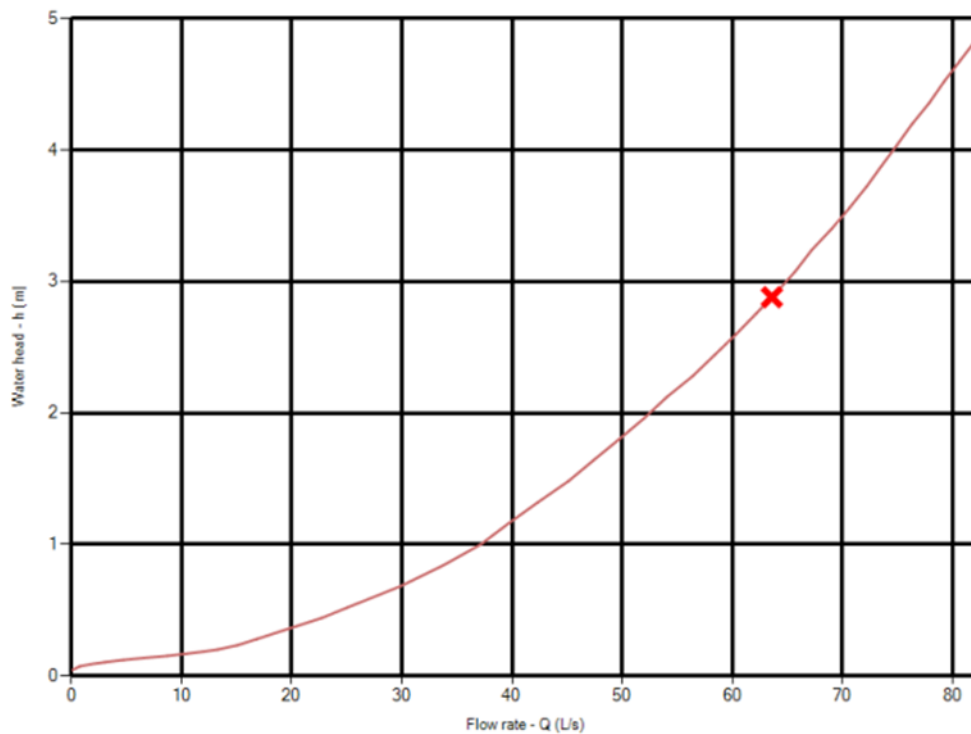


Figure 5.2: Vortex Rating Curve

The storage volume requirement is calculated in Table 5.1 according to section 8.3.10.3 of Ottawa Sewer Design guidelines and reducing the allowable flow by half, as required by the City. Total storage required in 100-year storm event is 171.7 cu.m.

Table 5.1: Post Development 100 Year Storm Flows & Storage Volume

Storm Duration	Storm Intensity	Peak Flow	Release Rate	Storage Rate	Storage Volume
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m ³)
0	0.0	0.0	0.0		0.0
10	178.56	246.01	32	214.01	128.41
20	119.95	165.27	32	133.27	159.92
30	91.87	126.57	32	94.57	170.23
40	75.15	103.53	32	71.53	171.68
50	63.95	88.11	32	56.11	168.34
60	55.89	77.01	32	45.01	162.04
70	49.79	68.60	32	36.60	153.72
80	44.99	61.99	32	29.99	143.94
90	41.11	56.64	32	24.64	133.07
100	37.90	52.22	32	20.22	121.33
110	35.20	48.50	32	16.50	108.91
120	32.89	45.32	32	13.32	95.92
130	30.90	42.57	32	10.57	82.45
140	29.15	40.16	32	8.16	68.59
Total					171.7

The stormwater will be stored in storm sewer pipes, catch basins and catch-basin manholes and surface ponding before discharging into City's storm water system (Drawing 103.0 – Appendix A). The volume of storage provided is given in Table 5.2. The total storage provided is 173.2 cu.m, which is greater than the storage required in 100-year storm event.

Table 5.2: Stormwater Storage Volume Calculations

Description	Number	Length	Width/ Diameter	Area	Depth	Storage Volume
		(m)	(m)	(m ²)	(m)	(m ³)
ExCBMH04	1.0		1.20	1.13	2.40	2.71
ExCBMH05	1.0		1.20	1.13	2.40	2.71
EXSTMMH03	1.0		1.80	2.54	2.57	6.54
CBMH03	1.0		1.20	1.13	2.55	2.88
CBMH01	1.0		1.80	2.54	2.65	6.75
CBMH04	1.0		1.20	1.13	2.40	2.71
CBMH05	1.0		1.20	1.13	2.40	2.71
CBMH06	1.0		1.80	2.54	2.58	6.56
CBMH02	1.0		1.80	2.54	2.73	6.95
900mm Pipe		125.9	0.90	0.64		80.09
600mm Pipe		47.0	0.60	0.28		13.27
Pond-ExCBMH04				143.36	0.15	7.99
Pond-ExCBMH05				198.66	0.15	12.71
Pond-CBMH01				5.77	0.05	0.10
Pond-CBMH04				11.50	0.05	0.19
Pond-CBMH05				92.88	0.15	4.01
Pond-CBMH06				108.51	0.15	5.29
Pond-CBMH02				168.70	0.15	8.95
Total						173.2

6. Stormwater Quality Management

Mississippi Valley Conservation Authority (MVCA) was contacted by NOVATECH for defining water quality requirements for the Shell property. MVCA recommended a Normal Level of treatment for water quality for this site and requested the Owner to demonstrate measures in treating all the runoff from this industrial area on site (copy of e-mail attached in Appendix C).

The design of the onsite storm sewer drainage system will incorporate an OGS to improve the quality of the storm discharge entering the City's system. The OGS sizing is based on a 0.496 ha drainage area with 90% imperviousness. The OGS sizing calculation confirms that a CDS model PMSU3020-6 will provide more than 80% long-term TSS removal efficiency. Refer to Appendix B2 for Annual TSS removal efficiency calculations and sizing of OGS as provided by Echelon Environmental.

Table 6.1 presents the proposed OGS treatment and holding capacities.

Table 6.1: OGS Details

Make	CDS Technologies
Model	PMSU3020-6
Net Annual TSS removal efficiency	92.5%
Sediment capacity (L)	2420
Oil capacity (L)	1293
Total holding capacity (L)	3713
Diameter of outlet pipe (mm)	300
Rated treatment flow rate (L/s)	57

The OGS will tie into municipal storm system as shown on the site servicing plan drawing in Appendix 1.

7. Storm Drainage and Site Grading

The proposed grading will maintain the existing drainage patterns as much as possible as shown in the appended grading drawing (Appendix A: Drawing C-102). The site has been designed to direct the storm runoff into the onsite underground stormwater management system. Controlled flow from the proposed underground system will then be directed to the existing municipal drainage system. The overall site grading ensures that the existing drainage pattern on adjacent properties has not been altered and the major system doesn't directly flow onto adjacent properties and stormwater runoff from the proposed development is self-contained.

8. Erosion and Sediment Control during Construction

As this development requires site grading and excavation, there will be a potential for soil erosion and off site release of sediment during the construction phase. To ensure the quality of stormwater runoff during construction, it is essential that effective erosion and sedimentation controls be in place and maintained throughout the site during all construction activities (see Drawing C-100.0 in Appendix A). Erosion and sediment control measures shall be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987).

All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.

It is recommended that the following be implemented on a temporary basis to assist in achieving acceptable runoff quality during construction:

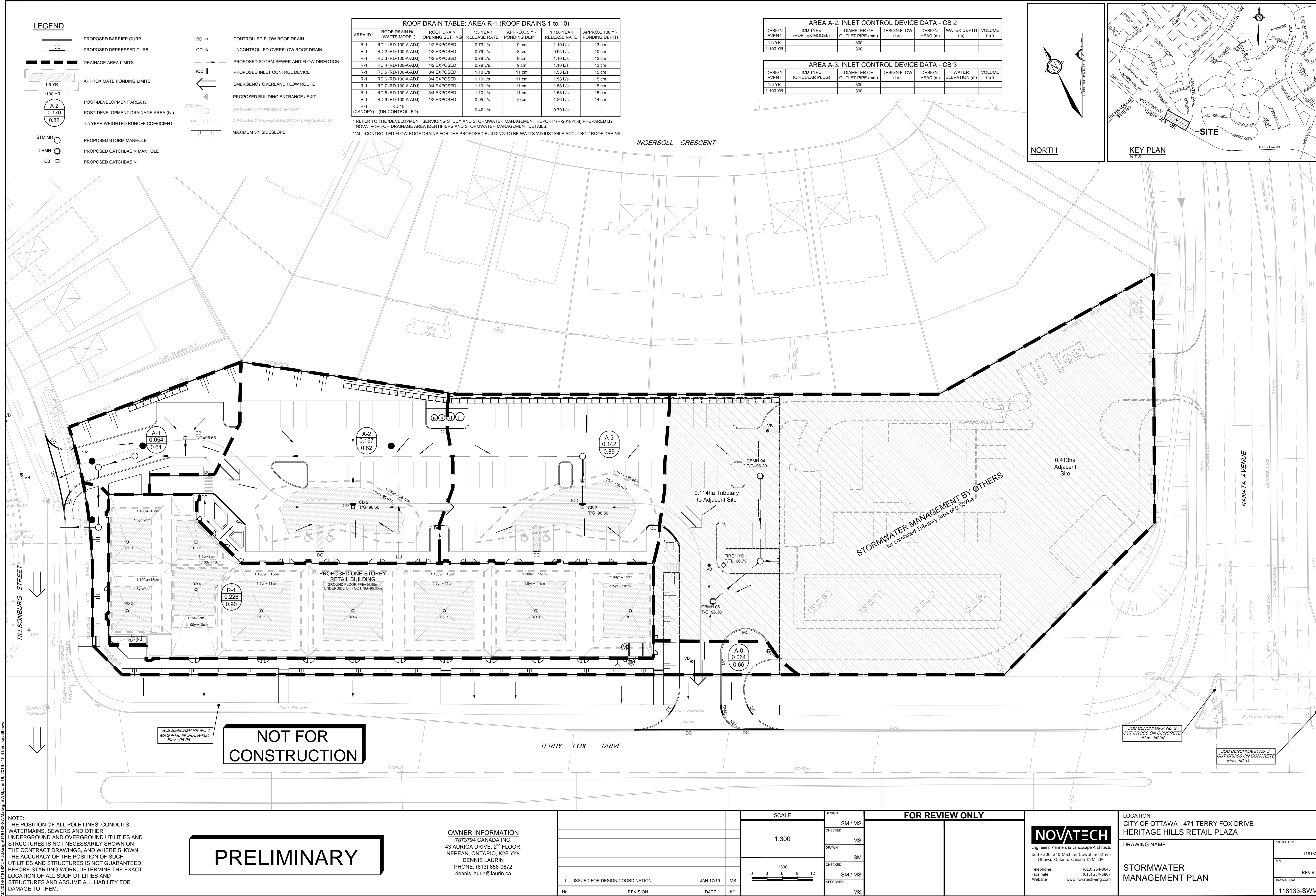
- Installation and maintenance of silt fences around the entire perimeter of the site for the duration of the construction period;
- Provision of a mud mat construction entrance to control the tracking of sediment and debris onto neighboring streets;
- Provision of sediment trap basins and rock flow check dams;
- Installation and maintenance of catch basin sediment barriers throughout the site and during all construction activities to reduce and trap sediment on site. Constant attention will be paid to maintaining them silt free. All catch basin grates shall be covered with geo-textile filter fabric during the period of construction of the proposed works;
- Silt traps and silt fences will be removed only after sodding and paving operations are completed;
- Reduce stormwater drainage velocities where possible;
- All topsoil stockpiles to be surrounded with sediment control fencing.
- Catchbasin inserts are to be placed under the grates of all proposed and existing catchbasins and catchbasin manhole drainage structures during construction.
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.

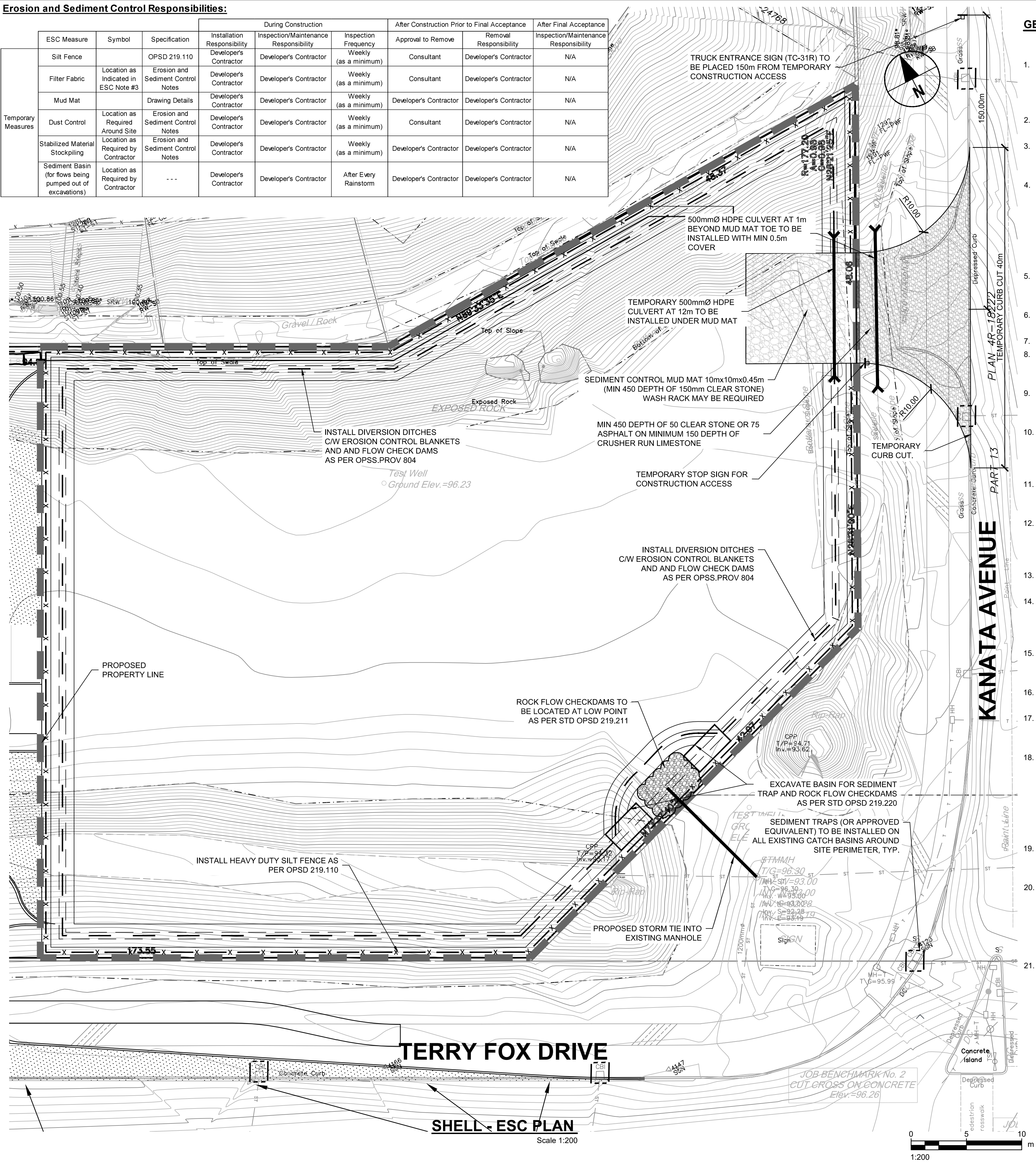


AECOM

Appendix A

Figures





GENERAL NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION, MAINTENANCE, AND REMOVAL OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION AND AS DIRECTED BY THE ENGINEER.
- ADDITIONAL EROSION AND SEDIMENT CONTROL (ESC) MEASURES MAY BE REQUIRED AND SHALL BE DETERMINED BY THE ENGINEER.
- SILT CONTROL FENCING SHALL BE INSTALLED ACCORDING TO THIS DRAWING AND MAINTAINED UNTIL COMPLETION OF THE LANDSCAPING AND SITE STABILIZATION.
- NO CONSTRUCTION ACTIVITY OR MACHINERY SHALL INTRUDE BEYOND THE SILT/SNOW FENCE OR LIMIT OF DEVELOPMENT. ALL CONSTRUCTION VEHICLES SHALL LEAVE THE SITE AT DESIGNATED LOCATIONS AS SHOWN ON THE PLANS. ALL MATERIALS AND EQUIPMENT SHALL BE STORED ON SITE IN A DESIGNATED AREA. NO MATERIAL OR EQUIPMENT SHALL BE STORED ON THE MUNICIPAL RIGHT OF WAY. NO CONSTRUCTION VEHICLES WILL PARK ON THE MUNICIPAL ROADS.
- STOCKPILES SHALL BE SET BACK FROM ANY WATERCOURSE AND STABILIZED AGAINST EROSION AS SOON AS POSSIBLE. A SETBACK OF AT LEAST 15m FROM ANY TOP OF BANK OR WATERCOURSE IS REQUIRED.
- ALL EXPOSED SOILS SHALL BE IMMEDIATELY STABILIZED WITH A SEED AND MULCH APPLICATION AS DIRECTED BY THE ENGINEER.
- SERVICING OF CONSTRUCTION EQUIPMENT ON-SITE IS PROHIBITED.
- CLEANING OF EXISTING ROAD(S) AT SITE ACCESS POINTS SHALL BE DONE DAILY DURING CONSTRUCTION OR AS NECESSARY THROUGH REGULAR INSPECTION OR AS DIRECTED BY THE ENGINEER.
- DUST CONTROL TO BE REVIEWED DAILY. WATER TRUCK TO BE PROVIDED ON-SITE AND ALL HAUL ROAD / WORKING AREAS TO BE SPRAYED WITH WATER AS REQUIRED TO ENSURE DUST IS CONTROLLED ON-SITE.
- ALL RE-GRADED AREAS WITHIN THE SITE WHICH ARE NOT OCCUPIED BY BUILDINGS, ROADWAYS, SIDEWALKS OR DRIVEWAYS SHALL BE TOP-SOILED AND SODDED / SEEDED IMMEDIATELY AFTER COMPLETION OF FINAL GRADING OPERATIONS OR AS DIRECTED BY THE ENGINEER.
- SEDIMENT TRAPS (OR APPROVED EQUIVALENT) ARE TO BE INSTALLED AT ALL CATCHBASINS AND CATCHBASIN MANHOLE LOCATIONS UPON COMPLETION OF SERVICING.
- THE ESC STRATEGIES ON THESE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED / AMENDED AS SITE CONDITION CHANGES TO PREVENT SEDIMENT RELEASE TO THE NATURAL ENVIRONMENT. FAILED ESC MEASURE MUST BE REPAIRED IMMEDIATELY.
- MATERIALS TO REPAIR DAMAGED EROSION AND SEDIMENT CONTROL MEASURES MUST BE KEPT ON-SITE AT ALL TIMES.
- INSPECTION OF THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES WILL OCCUR ON A WEEKLY BASIS, AFTER SIGNIFICANT RAINFALL OR SNOW MELT EVENTS AND DAILY DURING EXTENDED RAIN OR SNOW MELT PERIODS.
- SEDIMENT / SILT SHALL BE REMOVED FROM THE SEDIMENT CONTROL DEVICE AND THE CATCHBASIN BUFFERS AFTER STORM EVENTS AND DISPOSED OF IN AREAS AS APPROVED BY THE ENGINEER.
- ALL LITTER AND DEBRIS SHALL BE MONITORED AND DISPOSED OF DAILY OR AS NECESSARY THROUGH REGULAR INSPECTION.
- ROCK CHECK DAMS ARE TO BE CLEANED OF ALL ACCUMULATED SEDIMENT AS SOON AS SEDIMENT HAS ACCUMULATED TO DEPTH GREATER THAN 50% OF THE UPSTREAM CHECK DAM.
- THE SILT FENCE MUST BE INSPECTED WEEKLY AND IMMEDIATELY AFTER RAINFALL OR SIGNIFICANT SNOW MELT EVENTS FOR RIPS AND TEARS, BROKEN STAKES, BLOW OUTS (STRUCTURAL FAILURE) AND ACCUMULATION OF SEDIMENT. THE SILT FENCE MUST BE FIXED AND / OR REPLACED IMMEDIATELY WHEN DAMAGED. ACCUMULATED SEDIMENT MUST BE REMOVED FROM THE SILT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
- CATCHBASIN INSERTS ARE TO BE PLACED UNDER THE GRATES OF ALL PROPOSED AND EXISTING CATCHBASINS AND CATCHBASIN MANHOLE DRAINAGE STRUCTURES.
- DURING CONSTRUCTION ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER, THE MUNICIPALITY AND THE CONSERVATION AUTHORITY PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND REMAIN PRESENT DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER OR INSPECTOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY DITCH OR SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY AFTER COMPLETE BUILD-OUT, ALL SEWERS ARE TO BE INSPECTED AND CLEANED AND ALL SEDIMENT AND CONSTRUCTION FENCING IS TO BE REMOVED. STREET SWEEPING AND CLEANING WILL BE PERFORMED, AS REQUIRED, TO SUPPRESS DUST AND TO PROVIDE SAFE AND CLEAN ROADWAYS ADJACENT TO THE CONSTRUCTION SITE.

SEDIMENT CONTROL CONSTRUCTION SCHEDULE:

- INSTALL PERIMETER ENVIRONMENTAL FENCE AND CONSTRUCTION VEHICLE ACCESS.
- EXCAVATE PERIMETER SWALES AND INSTALL CHECK DAMS.
- STRIP SITE OF TOPSOIL AND REMOVE OFF SITE.
- INSTALL MINOR STORM SEWER SYSTEM ALONG WITH OTHER SERVICES.
- INSTALL CATCHBASIN FILTRATION ON ALL CATCHBASINS AND CATCHBASIN MANHOLES.
- SEDIMENT CONTROL MEASURES ARE TO BE MAINTAINED UNTIL ALL AREAS OF THE SITE HAVE BEEN STABILIZED WITH SOD OR ASPHALT.

MUD MAT:

STONE SIZE - USE CLEAR CRUSHED 100mm STONE.

THICKNESS - NOT LESS THAN 300mm

LENGTH - AS REQUIRED

WIDTH - 10m MINIMUM, BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.

FILTER CLOTH - NON-WOVEN GEOTEXTILE WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/ OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENTS. ALL SEDIMENTS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

TIRE WASH STATION - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED IT SHALL BE DONE ON A DESIGNATED AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

INSPECTION AND MAINTENANCE - INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED PERIODICALLY AND AFTER SIGNIFICANT RAINFALL AND SNOWMELT.

LEGEND:

- HEAVY DUTY SILT FENCE
- MUD MAT CLEAR STONE
- MUD MAT LIMESTONE
- ULTIMATE PROPERTY LINE



PROJECT

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REGISTRATION

LEGAL DESCRIPTION
BLOCK 170, PLAN 4M-1413

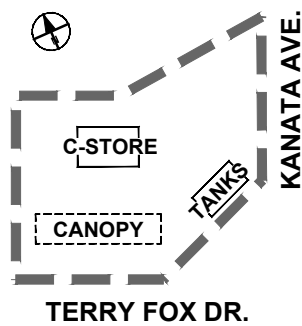
ISSUE/REVISION

H	2019.09.12	RE-ISSUED FOR SPA
G	2019.09.05	ISSUED FOR BP
F	2019.09.05	ISSUED FOR TANK PERMIT
E	2019.06.13	ISSUED FOR BP
D	2019.06.03	ISSUED FOR TENDER
C	2019.05.22	RE-ISSUED FOR SPA
B	2019.01.11	ISSUED FOR SPA
A	2018.12.14	ISSUED FOR REVIEW
I/R	DATE	DESCRIPTION

DRAWN BY

JR

KEY PLAN



PROJECT NUMBER

60546152

SHEET TITLE

SITE EROSION AND
SEDIMENT CONTROL PLAN

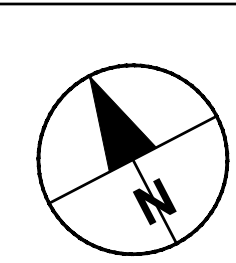
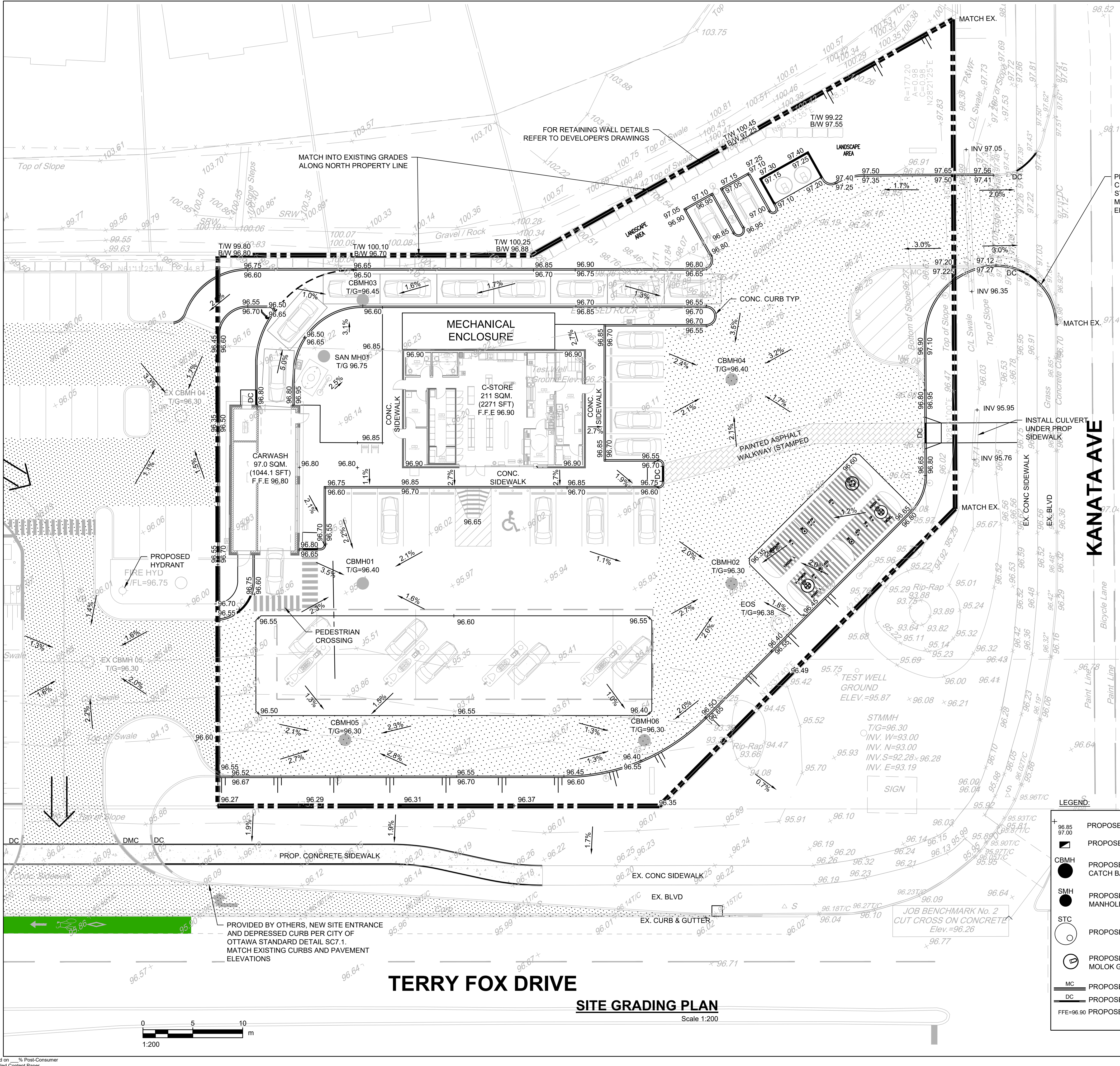
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SHEET NUMBER

C100.0



ANSI D 664mm x 559mm
Approved: _____
Checked: _____
Designer: _____
Project Management Initials: _____
Last saved by: REIDJ2(2019.05.22) Last Plotter: 2019.05.22
Filename: P:\605264400\0-TECHNICALS\PIPELINE\HERITAGE HILLS, KANATA, ON\02 FRONT END DEVELOPMENT\2.2 DESIGN DEVELOPMENT\2.2 SITE GRADING\PLAN.DWG

























PROVIDE NEW SITE ENTRANCE AND DEPRESSED CURB AS REQUIRED PER CITY OF OTTAWA STANDARD DETAIL SC7.1.
MATCH EXISTING CURBS AND PAVEMENT ELEVATIONS

KANATA AVE

PAVEMENT STRUCTURES:

 LIGHT DUTY (NEW PAVEMENT) 50mm HL3 or SUPERPAVE 12.5 150mm GRANULAR "A" 300mm GRANULAR "B" TYPE II ASPHALT GRADE PG 58-34 *INSTALLED PER GEOTECHNICAL REPORT	 HEAVY DUTY (NEW PAVEMENT) 40mm HL3 or SUPERPAVE 12.5 50mm HL8 or SUPERPAVE 19.0 150mm GRANULAR "A" 450mm GRANULAR "B" TYPE II ASPHALT GRADE PG 58-34 *INSTALLED PER GEOTECHNICAL REPORT
---	---

LEGEND:

 PROPOSED SPOT ELEVATION	 PROPOSED LEASE LINE
 PROPOSED CATCH BASIN	 PROPOSED BARRIER CURB
 PROPOSED STORMWATER / CATCH BASIN MANHOLE	 PROPOSED ROAD MARKING
 PROPOSED SANITARY MANHOLE	 MAXIMUM 3:1 SIDESLOPE
 PROPOSED STORMCEPTOR	 PROPOSED HYDRANT AND VALVE
 PROPOSED MOLOK GARBAGE SYSTEM	 EXISTING CONCRETE CURB
 PROPOSED MOUNTABLE CURB (PER SC1.3)	 EXISTING SANITARY MANHOLE
 PROPOSED DEPRESSED CURB (PER SC1.1)	 EXISTING CATCHBASIN / MANHOLE
 PROPOSED FINISHED FLOOR ELEVATION	 EXISTING STORM MANHOLE
	 EXISTING CATCHBASIN
	 EXISTING HYDRANT & VALVE
	 EXISTING TREES / VEGETATION
	 EXISTING UTILITY POLE C/W GUY WIRES
	EXISTING FENCE
	EXISTING LIGHT STANDARD

AECOM

PROJECT

Shell Canada Projects
HERITAGE HILLS
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REGISTRATION

LEGAL DESCRIPTION

BLOCK 170, PLAN 4M-1413

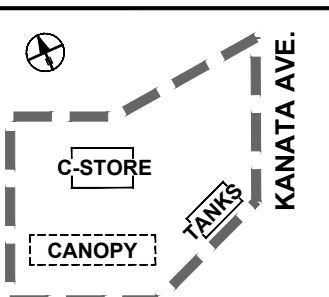
ISSUE/REVISION

C	2019.05.21	RE-ISSUED FOR SPA
B	2019.01.11	ISSUED FOR SPA
A	2018.12.06	ISSUED FOR REVIEW
I/R	DATE	DESCRIPTION

DRAWN BY

JR

KEY PLAN



TERRY FOX DR.

PROJECT NUMBER

60546152

SHEET TITLE

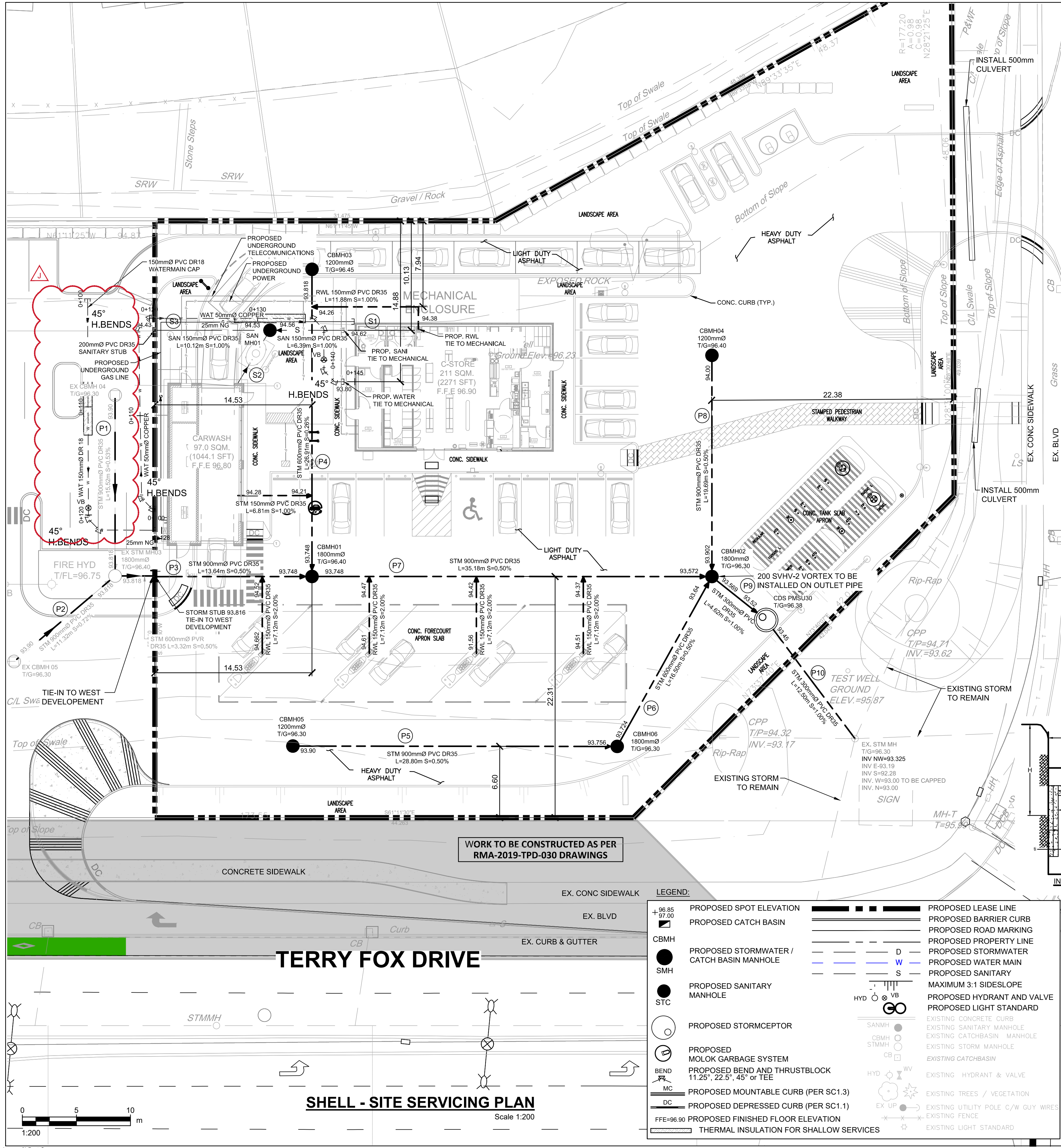
SITE GRADING PLAN

AECOM FILE NAME

C102.0-SGP-HEH

SHEET NUMBER

C102.0



SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:
- | ITEM | SPEC. No. | REFERENCE |
|------------------------------------|-----------|----------------|
| CATCHBASIN (600x600mm) | 705.010 | OPSD |
| STORM / SANITARY MANHOLE (1200mmØ) | 701.010 | OPSD |
| CB, FRAME & COVER | 400.020 | OPSD |
| STORM / SANITARY MH FRAME & COVER | 401.010 | OPSD |
| WATERTIGHT MH FRAME AND COVER | 401.030 | OPSD |
| SEWER TRENCH | S6 | CITY OF OTTAWA |
| STORM SEWER | PVC DR 35 | |
| SANITARY SEWER | PVC DR 35 | |
| CATCHBASIN LEAD | PVC DR 35 | |

GENERAL NOTES

1. THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES, STRUCTURES AND APPURTENANCES IS TO BE CONFIRMED. THE CONTRACTOR SHALL DETERMINE AT THE TIME OF CONSTRUCTION THE POSSIBILITIES OF UTILIZING ALL SUCH UTILITIES, STRUCTURES AND APPURTENANCES. THE CONTRACTOR SHALL INFORM AND SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES, STRUCTURES AND APPURTENANCES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES AND MUNICIPAL SERVICES (WATER, SANITARY & STORM) DURING CONSTRUCTION. ALL EXISTING INVERTS AND ELEVATIONS MUST BE VERIFIED PRIOR TO CONSTRUCTION. ANY DISCREPANCIES MUST BE REPORTED TO AECOM LTD.
3. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
4. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
5. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
6. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
7. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO GEOTECHNICAL REPORT (NO. PG4564-1, REVISION 3, DATED MAY 6, 2019), PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO STORMWATER MANAGEMENT REPORT (SHELL HERITAGE HILL) PREPARED AECOM LTD.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE/PARKING PAINTING.
14. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/W/M ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

AREA A-6: INLET CONTROL DEVICE DATA - CBMH02						
DESIGN EVENT	ICD TYPE (VORTEX MODEL)	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m ³)
1:100 YR	200SVHV-2	300	63.6	2.881	96.45	173.2

INSULATION NOTES:

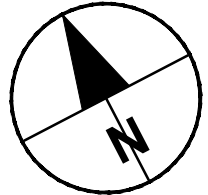
1. THE THICKNESS OF SEWER INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER LESS THAN 1500mm (SEE TABLE)

COVER (mm)	INSULATION THICKNESS (mm)
1500-1200	75
1200-900	100
900-600	125

PROPOSED 150mmØ WATERMAIN TABLE			
STATION	SURFACE ELEVATION	T/W/ELEVATION	COMMENTS
0+100	96.45	94.01	150 X 150 X150 TEE
0+103.0	96.41	93.91	CROSS BELOW SAN (±0.5m CLEARANCE)
0+106 - 0+112	96.30	94.05 **	INSULATE IN PROXIMITY TO CB04
0+119.35	96.47	94.05	150mmØ VALVE AND VALVE BOX
0+120.38	96.49	94.10	45° HORIZONTAL BEND
0+121.80	96.50	94.10	45° HORIZONTAL BEND
0+128.00	96.53	94.10	CAP 1.0m FROM BUILDING FACE

**** PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W23 AND DETAIL W22 WHERE COVER IS LESS THAN 2.4m AND/OR ADJACENT TO OPEN STRUCTURES.**

PROPOSED 50mmØ WATERMAIN TABLE			
STATION	SURFACE ELEVATION	T/W/M ELEVATION	COMMENTS
0+100	96.64	94.05	CAP 1.0m FROM BUILDING FACE
0+100.37	96.49	94.05	45° HORIZONTAL BEND
0+102.37	96.48	94.05	45° HORIZONTAL BEND
0+120.00	96.42	94.05	45° HORIZONTAL BEND
0+118.00	96.43	94.05	45° HORIZONTAL BEND
0+122.95	96.67	94.05	CROSS BELOW TEL (+1.55m CLEARANCE)
0+123.39	96.67	94.05	CROSS BELOW POWER (+1.35m CLEARANCE)
0+128 - 0+134	96.71	94.05 **	INSULATE IN PROXIMITY TO SAN MH01
0+135.13	96.72	94.10	45° HORIZONTAL BEND
0+135.41	96.72	94.10	CROSS BELOW GAS (+1.40m CLEARANCE)
0+137.13	96.72	94.10	45° HORIZONTAL BEND
0+137.24	96.72	94.10	CROSS BELOW SAN (+0.5m CLEARANCE)
0+139.94	96.76	94.30	50mmØ VALVE AND VALVE BOX
0+140.97	96.78	94.30	45° HORIZONTAL BEND
0+142.97	96.80	94.30	45° HORIZONTAL BEND
0+143.83	96.87	94.30	CAP 1.0m FROM BUILDING FACE



KANATA AVE.

AECOM

PROJECT

Shell Canada Projects
HERITAGE HILLS
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REGISTRATION

LEGAL DESCRIPTION

BLOCK 170, PLAN 4M-1413

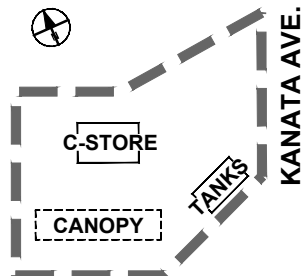
ISSUE/REVISION

J	2019.09.12	RE-ISSUED FOR SPA
H	2019.09.05	ISSUED FOR BP
G	2019.09.05	ISSUED FOR TANK PERMIT
F	2019.06.13	ISSUED FOR BP
E	2019.06.03	ISSUED FOR TENDER
D	2019-05-30	ISSUED FOR TANK PERMIT
C	2019.05.22	RE-ISSUED FOR SPA
B	2019.01.11	ISSUED FOR SPA
A	2018.12.06	ISSUED FOR REVIEW
I/R	DATE	DESCRIPTION

DRAWN BY

JR

KEY PLAN



TERRY FOX DR.

PROJECT NUMBER

60546152

SHEET TITLE

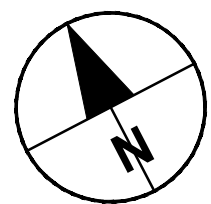
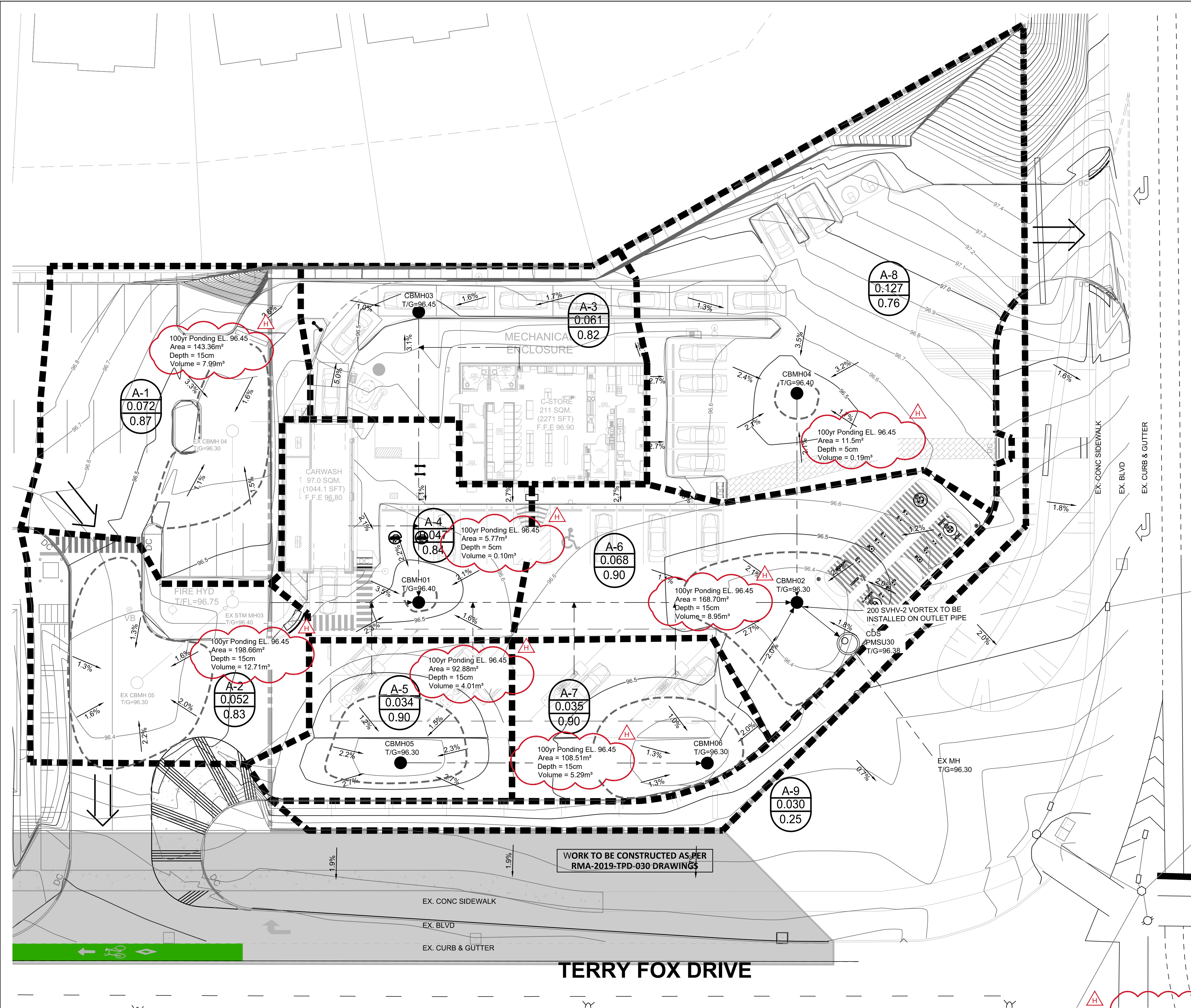
SITE SERVICING PLAN

AECOM FILE NAME

C103.0-SSP-HEH

SHEET NUMBER

C103.0



LEGEND

- 100 YEAR PONDING LIMITS
- PROPOSED BARRIER CURB
- DC PROPOSED DEPRESSED CURB
- MC PROPOSED MOUNTABLE CURB
- DRAINAGE AREA LIMITS
- A-2 0.170 0.82 POST-DEVELOPMENT AREA ID
- 0.82 POST-DEVELOPMENT DRAINAGE AREA (ha)
- 1:5 YEAR WEIGHTED RUNOFF COEFFICIENT
- STM MH PROPOSED STORM MANHOLE
- CBMH PROPOSED CATCHBASIN MANHOLE
- CB PROPOSED CATCHBASIN
- PROPOSED STORM SEWER AND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW ROUTE
- STM MH EXISTING STORM MH & SEWER
- CB EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- MAXIMUM 3:1 SIDESLOPE

STORM WATER MANAGEMENT ANALYSIS SUMMARY

SITE COMPOSITION	
SITE CATCHMENT AREA (HA):	0.528
CONTROLLED AREA (HA):	0.496
UNCONTROLLED AREA (HA):	0.030

STORM FLOWS	
PREDEVELOPMENT SITE RELEASE RATE 5 YEAR STORM(L/SEC):	68.2
POST DEVELOPMENT PEAK FLOW 100 Year (L/SEC)	
CONTROLLED AREA:	246.0
UNCONTROLLED AREA:	4.6
ALLOWABLE SITE RELEASE RATE IN 100 YEAR STORM(L/SEC):	63.6

SITE FLOW CONTROL	
LOCATION:	CBMH02
Vortex (Hydovex)	200 SVHV-2
INVERT ELEVATION: (m)	93.569
DETENTION STORAGE TWL: (m)	96.450
DESIGN HEAD: (m)	2.881
MAXIMUM RELEASE RATE 100 Year (L/SEC):	63.6

DETENTION STORAGE VOLUME CALCULATIONS	
100-YR REQUIRED DETENTION STORAGE VOLUME (CU.M):	171.7
MAXIMUM SITE DETENTION STORAGE AVAILABLE (CU.M):	173.2
DESIGN T.W.L:	96.450
SURFACE PONDING:	39.2
PIPE STORAGE:	93.4
MH/CB STORAGE:	40.5

AREA A-6: INLET CONTROL DEVICE DATA - CBMH02						
DESIGN EVENT	ICD TYPE (VORTEX MODEL)	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m³)
1:100 YR	200SVHV-2	300	63.6	2.881	96.45	173.2

AECOM

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LEGAL DESCRIPTION

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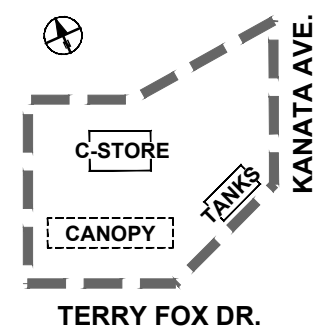
ISSUE/REVISION

H	2019.09.12	RE-ISSUED FOR SPA
G	2019.09.05	ISSUED FOR BP
F	2019.09.05	ISSUED FOR TANK PERMIT
E	2019.06.13	ISSUED FOR BP
D	2019.06.03	ISSUED FOR TENDER
C	2019.05.22	RE-ISSUED FOR SPA
B	2019.01.11	ISSUED FOR SPA
A	2018.12.06	ISSUED FOR REVIEW
I/R	DATE	DESCRIPTION

DRAWN BY

JR

KEY PLAN



PROJECT NUMBER

60546152

SHEET TITLE

STORMWATER MANAGEMENT PLAN

AECOM FILE NAME

C104.0-SWM-HEH

SHEET NUMBER

C104.0

17868

D07-12-19-0017



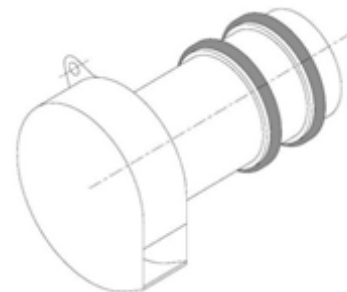
AECOM

Appendix **B1**

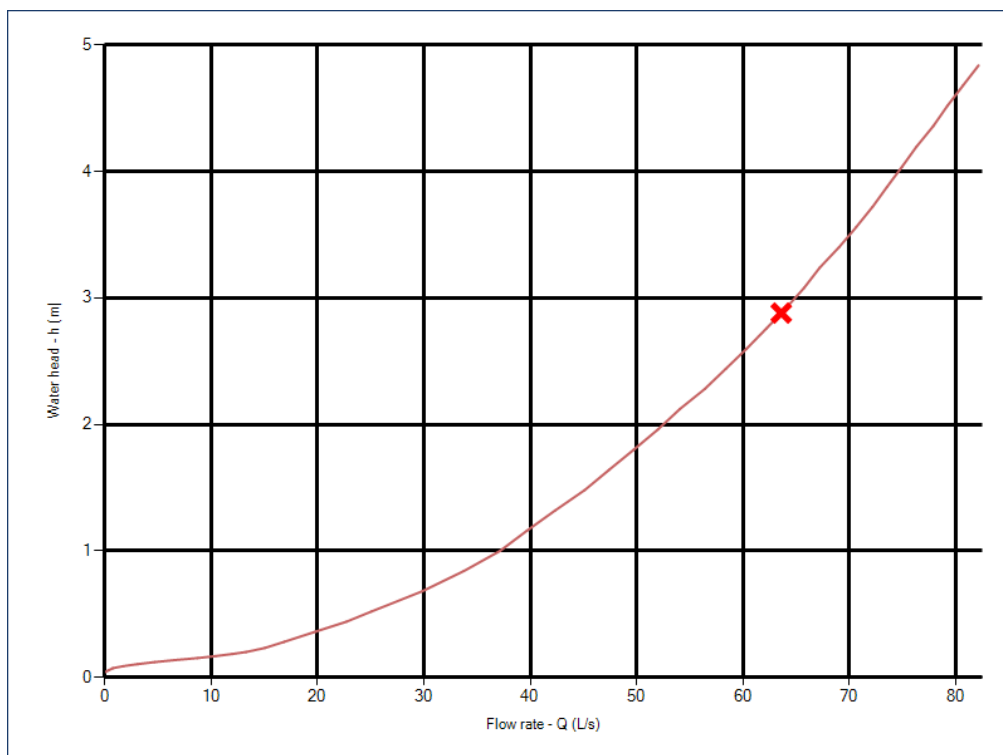
Vortex Design

GENERAL INFORMATION

Application	Stormwater	
Project name	Shell Heritage Hill	
Project number		
Regulator ID		
Design flow (Q)	63.6	L/s
Design head (h)	2.881	m
Outlet pipe diameter (C)	300	mm
Model	200 VHV-2,12,STD,V	
item #	PRIPHY200387	
Quantity	1	
Minimum clearance (H)	300	mm
Minimum manhole diameter (B)	1200	mm

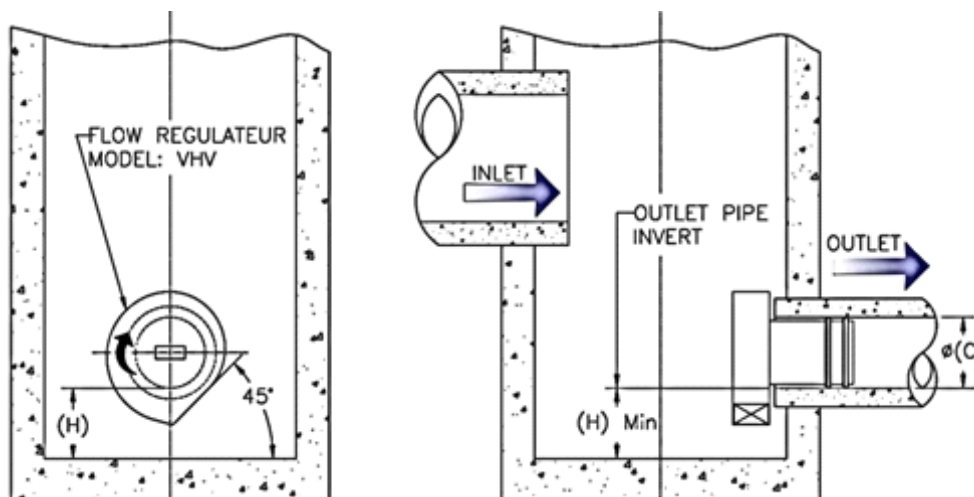


RATING CURVE



Q (L/s)	h (m)
0.000	0.040
1.726	0.088
6.591	0.136
11.967	0.184
16.849	0.280
25.051	0.520
37.159	1.000
45.104	1.480
51.997	1.960
58.376	2.440
64.041	2.920
69.010	3.400
73.550	3.880
77.891	4.360
82.151	4.840
116.187	9.640
118.572	10.040

TYPICAL INSTALLATION



SPECIFICATIONS

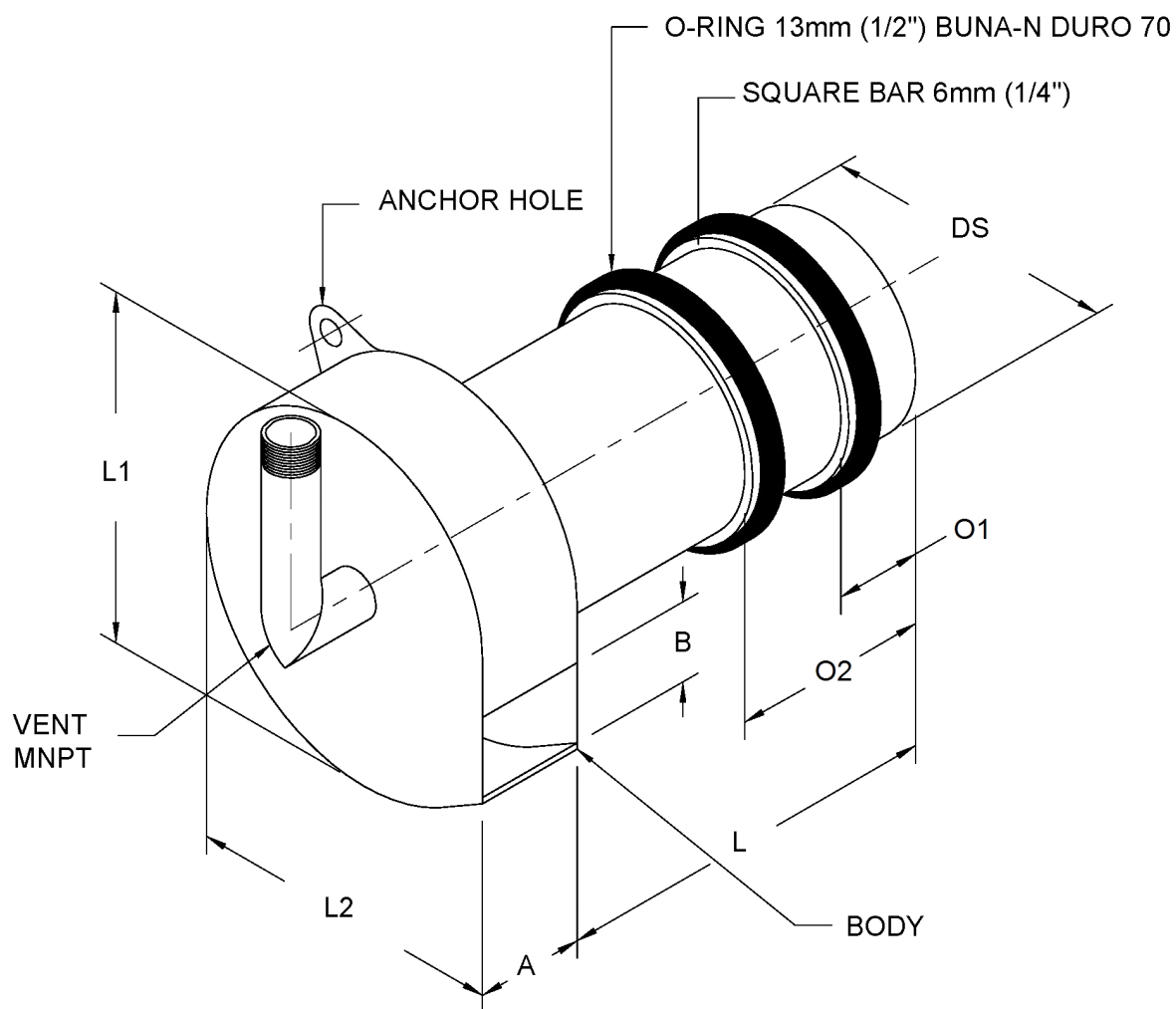
The regulator shall be of the static type and shall operate using vortex principles with no moving parts. The flow will be regulated over the entire head range using only the hydraulic properties of the unit and the fluid flowing through it. The regulator shall be self-activating and shall not require instrumentation or external power.

Each regulator is comprised of a vortex chamber where flow control occurs. An outlet sleeve is welded to the vortex chamber to allow the regulator to be installed into a standard outlet pipe. Water tightness shall be obtained using two Neoprene o-rings located on the outlet sleeve and held in place using welded square bars.

The regulator shall be fabricated entirely of stainless steel type 304 and continuously welded, as manufactured by Veolia Water Technologies Canada Inc. (John Meunier), 514-334-7230, cso@veolia.com.

Project name: Shell Heritage Hill
 Project number:
 Regulator ID:
 Flow rate (Q): 63.6 L/s
 Design head (h): 2.881 m
 Model: 200 VHV-2,12,STD,V
 Item #: PRIPHY200387
 Quantity: 1

Dimensions	
A	200
B	164
L1	525
L2	458
L	250
DS	275
O1	38
O2	100
Ø VENT	50



All dimensions in millimeters unless otherwise specified



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Appendix **B2**

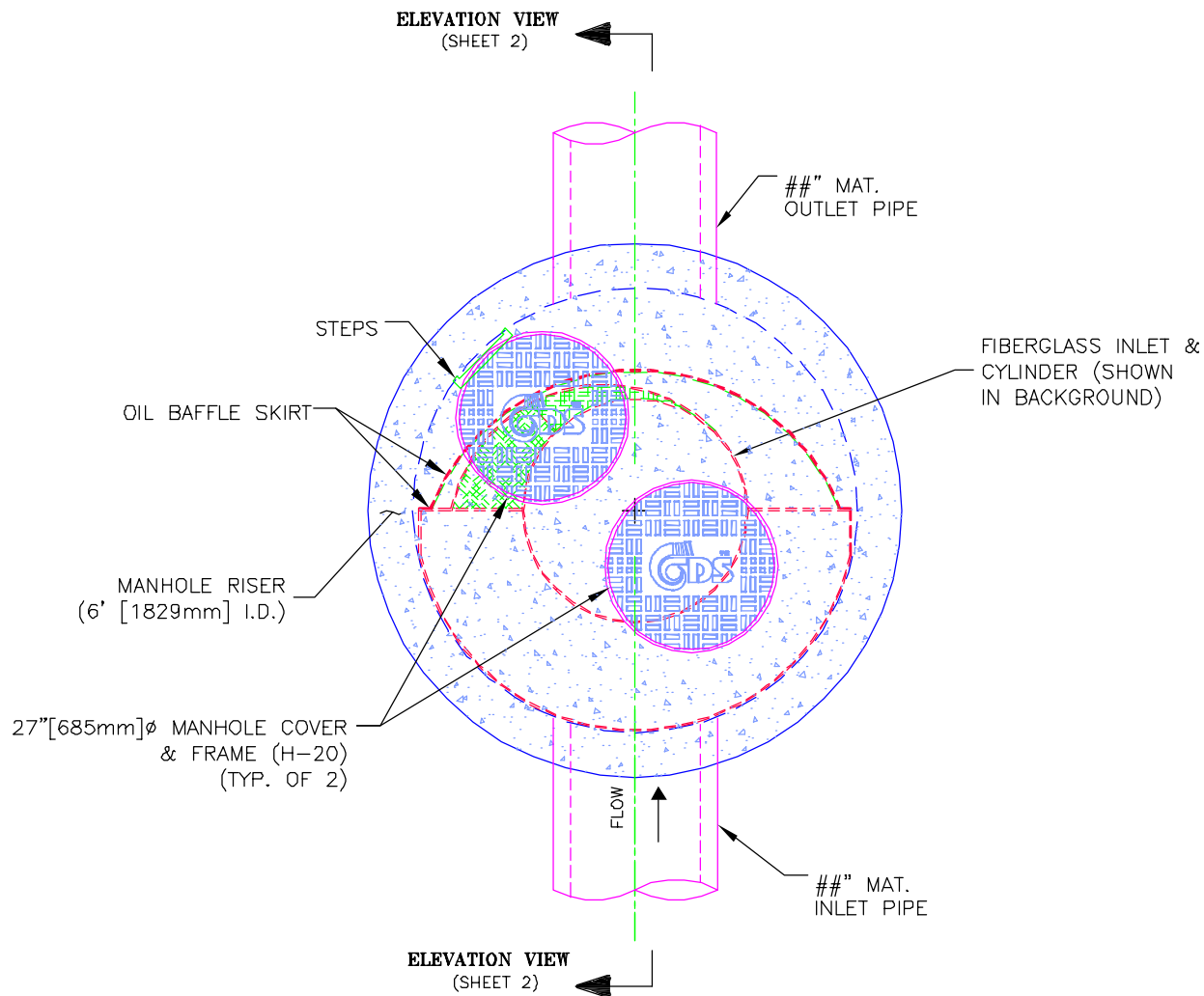
**Detailed OGS Sizing
Report**

CDS Average Annual Efficiency For TSS Removal & Total Annual Volume Treated

Project:	Terry Fox Dr. & Kanata Rd.		
Location:	Ottawa, ON		
Date:	1/22/2019		
By:	GM	Upstream Storage:	92.6 m3
PSD:	FINE	Area:	0.496 ha
CDS Model:	PMSU30_20_6	Impervious Area:	90 %
CDS Design Flow:	57 l/s	IDF Data:	Ottawa, ON

Return	Period	Peak Flow	TSS Percentage Captured	Treated Flow Volume	Total Flow Volume	Annual Exceedance Probability	System Flow	CDS Flow	By-Pass Flow	Volume Percentage Treated
month / yr	Yr	l/s	%	litres	litres	%	l/s	l/s	l/s	%
1-M	0.08	4.68	97.27	9524	9524	100.00	4.68	4.68	0.00	100.00
2-M	0.17	6.68	96.61	13448	13448	99.75	6.68	6.68	0.00	100.00
3-M	0.25	6.95	96.52	13973	13973	98.17	6.95	6.95	0.00	100.00
4-M	0.33	9.01	95.83	18064	18064	95.04	9.01	9.01	0.00	100.00
5-M	0.42	9.82	95.56	19688	19688	90.91	9.82	9.82	0.00	100.00
6-M	0.50	10.64	95.29	21312	21312	86.47	10.64	10.64	0.00	100.00
7-M	0.58	11.26	95.08	22571	22571	82.01	11.26	11.26	0.00	100.00
8-M	0.67	11.88	94.87	23829	23829	77.67	11.88	11.88	0.00	100.00
9-M	0.75	12.50	94.65	25088	25088	73.64	12.50	12.50	0.00	100.00
10-M	0.83	14.74	93.89	29752	29752	69.90	14.74	14.74	0.00	100.00
11-M	0.92	16.98	93.12	34415	34415	66.40	16.98	16.98	0.00	100.00
1-Yr	1	19.22	92.36	39078	39078	63.21	19.22	19.22	0.00	100.00
2-Yr	2	22.61	91.18	46434	46434	39.35	22.61	22.61	0.00	100.00
5-Yr	5	32.67	87.65	69613	69613	18.13	32.67	32.67	0.00	100.00
10-Yr	10	41.83	84.37	92904	92904	9.52	41.83	41.83	0.00	100.00
25-Yr	25	52.06	80.59	122487	122487	3.92	52.06	52.06	0.00	100.00
50-Yr	50	62.03	75.88	153272	156620	1.98	62.03	56.63	5.40	97.86
100-Yr	100	68.54	71.84	171802	183156	1.00	68.54	56.63	11.91	93.80
Average Annual TSS Removal Efficiency [%]:				92.5	Ave. Ann. T. Volume [%]:				99.97%	

PLAN VIEW



CDS MODEL PMSU30_20m, 2 CFS TREATMENT CAPACITY STORM WATER TREATMENT UNIT



PROJECT NAME
CITY, STATE

JOB# CAN-##-###

DATE ##/##/##

DRAWN INITIALS

APPROV.

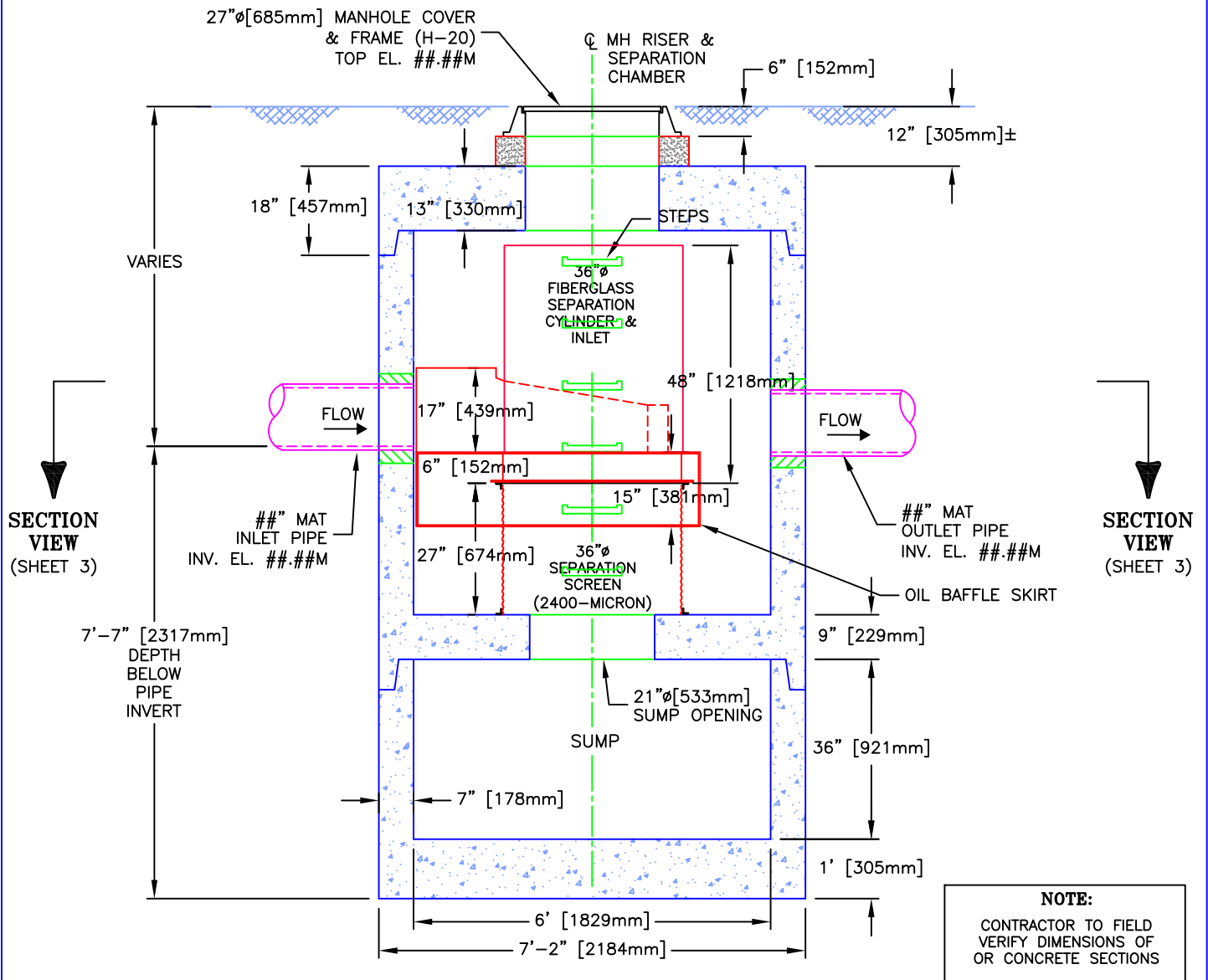
SCALE
1" = 2.5'

SHEET

1



ELEVATION VIEW



CDS MODEL PMSU30_20m, 2 CFS TREATMENT CAPACITY STORM WATER TREATMENT UNIT



PROJECT NAME
CITY, STATE

JOB# CAN-##-###

DATE ##/##/##

DRAWN INITIALS

APPROV.

SCALE
1" = 3'

SHEET

2



AECOM

Appendix C

Correspondence

Shafi, Qasim

From: Reid, Jason
Sent: December-12-18 1:10 PM
To: Shafi, Qasim
Subject: FW: Heritage Hills - Shell SWM Criteria
Attachments: 118133-SWM_coord.pdf; 118133-GR_coord.pdf; 20181211-AECOM-Coord.zip

FYI, more info for Heritage Hills

Regards,

Jason Reid, AScT.

AECOM - Transportation

D: 604.444.6520 Cisco: 366.6520

From: Miro Savic [mailto:m.savic@novatech-eng.com]
Sent: Wednesday, December 12, 2018 5:51 AM
To: Reid, Jason
Cc: Santos, Dexter; Lobanova, Olga; Gord Erskine; 'Dennis Laurin' (dennis.laurin@laurin.ca); Steve Matthews; Conrad Stang
Subject: RE: Heritage Hills - Shell SWM Criteria

Jason,

Following my email below, please find attached the stormwater management and grading plan (PDF and Auto CAD) for coordination. The post-development area tributary to the Shell portion of the site is 0.495 ha. The post-development flow from this 0.495 ha area is to be controlled to 68.3 L/s.

Please contact me should you have any questions.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Miro Savic
Sent: Wednesday, December 12, 2018 8:41 AM
To: 'Reid, Jason' <Jason.Reid@aecom.com>
Cc: 'Santos, Dexter' <Dexter.Santos@aecom.com>; Lobanova, Olga <olga.lobanova@aecom.com>; Gord Erskine <gorderskine@gmail.com>; 'Dennis Laurin' (dennis.laurin@laurin.ca) <dennis.laurin@laurin.ca>; Kuruvilla, Santhosh (Santhosh.Kuruvilla@ottawa.ca) <Santhosh.Kuruvilla@ottawa.ca>; Steve Matthews <S.Matthews@novatech-eng.com>; Conrad Stang <c.stang@novatech-eng.com>
Subject: Heritage Hills - Shell SWM Criteria

Good morning Jason,

The stormwater management criteria for the Shell site has been confirmed with the City of Ottawa as follows:

- The storm outlet for the site is the existing 1200mm diameter municipal storm sewer located near the intersection of Kanata Avenue and Terry Fox Drive
- Control post development flows from the Shell site to the 1:5year pre development level for all storm events up to and including 1:100 year storm.
- The allowable flow is calculated based on the entire 1.179ha site area currently draining to the 1200mm sewer using a runoff coefficient of $C=0.2$ and a time of concentration of $T_c = 10\text{min}$ as follows:
 $Q_{\text{allow}} = 2.78 \times C \times I \times A$
 $Q_{\text{allow}} = 2.78 \times 0.2 \times 104.2 \times 1.179 = 68.3 \text{ L/s}$
- Provide the stormwater quality as per the Mississippi Valley Conservation Authority (MVCA) requirements. See the attached email from the MVCA.

Should you have any questions regarding the above storm criteria please do not hesitate to contact the City's project manager Santhosh Kuruvilla directly. I have copied Santhosh to this email.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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Shafi, Qasim

From: Niall Oddie <NOddie@mvc.on.ca>
Sent: December-07-18 10:46 AM
To: Miro Savic
Subject: FW: Heritage Hills Retail Plaza - Water Quality Requirements

Miro,

Please see below.

Niall Oddie MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, Ontario K7C 3P1
www.mvc.on.ca | t. 613 253 0006 ext. 229 | f. 613 253 0122 | noddie@mvc.on.ca



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From: Sobha Kunjikutty
Sent: Friday, December 7, 2018 8:56 AM
To: Niall Oddie <NOddie@mvc.on.ca>
Subject: RE: Heritage Hills Retail Plaza - Water Quality Requirements

Hi Niall,

We recommend a Normal Level of treatment for water quality for this site. However, the plan should include and demonstrate measures in treating all the runoff from this industrial area on site (e.g stormwater interceptors such as oil/grit).

Let me know if you have any questions.

Thanks,
Sobha

From: Miro Savic [<mailto:m.savic@novatech-eng.com>]
Sent: Monday, December 3, 2018 4:07 PM
To: Niall Oddie <NOddie@mvc.on.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>
Subject: Heritage Hills Retail Plaza - Water Quality Requirements

Good afternoon Niall,

We are working on a commercial development located at 471 Terry Fox Drive. The development proposal is to construct two one-storey multi-unit commercial buildings as well as a Shell gas bar with a car wash and a convenience store. See the attached site plan for details.

The storm runoff from the retail plaza portion of the site (Building 1 and Building 2 with the parking lot) will outlet into the existing municipal storm sewer in Tilsonburg Street. The Tilsonburg storm sewer has a flow splitter to direct runoff from storms up to the 25mm event (water quality) to the existing SWM facility of the west side of Terry Fox Drive. Therefore, the on-site water quality is not required for this portion of the site.

The storm runoff from the Shell gas station will outlet into the existing 1200mm diameter storm sewer near the intersection of Kanata Avenue and Terry Fox Drive. This storm sewer outlets into the ditch which outlets directly into Carp River bypassing the SWM pond (refer to the attached aerial photo). Could you please confirm the water quality requirements for the Shell portion of the site.

Please contact me should you have any questions.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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