

JULY 7, 2024

LOT 31 CLARK STREET STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE REPORT

TOWN OF THE BLUE MOUNTAINS
PROJECT No. 2021-185



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Introduction

CAPES Engineering Ltd. has been retained by Pantone Capital Inc. to prepare a functional servicing and stormwater management report in support of a Site Plan Agreement for the 3.74 ha site located at the intersection of Highway 26, Grey Rd 2 and Clark Street in the Town of The Blue Mountains.

This Operations and Maintenance Manual has been prepared for the Owner to provide a comprehensive maintenance program for the stormwater management pond and other stormwater features proposed for the site.

The stormwater management facility (SWMF) is located in the central part of the site, between the self-storage buildings in the south and the industrial use building in the north. The SWMF has been designed as a dry pond with oil grit separators upstream of the facility to provide the necessary quality and quantity control for the site.

Additional SWM controls are proposed as follows:

- Vegetated swales
- Storm sewer system
- Oil Grit Separators
- Flood bypass culvert

Full details of the SWM design are described in the Stormwater Management Report prepared by CAPES Engineering Ltd. dated December 13, 2023.

This report outlines maintenance responsibilities, inspection, and procedures in accordance with the current Ministry of the Environment (MECP) Stormwater Management Planning and Design Manual (2003) and the Town of the Blue Mountains Engineering Standards (2023).

An Environmental Compliance Approval (ECA) is required from the MECP for the on-site SWM controls as the site is zoned industrial. Once the Environmental Compliance Approval is issued by the MECP they should become a part of this document.

SWM Facility and Infrastructure

The dry pond SWMF will be privately owned and maintained by the owner of the site and is intended to provide:

- An enhanced level of quality control as per the MECP Guidelines
- To assist in the quantity control and conveyance of post development runoff for all storms up to and including the 100-year storm. Conveyance only will be provided for the Regional event through the SWM facility to the Hwy 26 ditch system.

The SWMF pond parameters and operating characteristics are described in the Stormwater Management Report prepared by CAPES Engineering Ltd. A control manhole has been provided for the SWMF which allows inspection and maintenance without entering the pond itself. The control manhole is located within the berm on the east side of the SWMF and can be accessed via the 4.0 m wide maintenance road. The SWMF bottom is set at elevation 184.00 while the top of berm elevation is set at 185.90.

Stormwater runoff is directed into the SWMF via pipes from the north and south and from a vegetated swale from the SW. The flow discharges through two OGS units for the piped flow while flow from the swale discharges directly to the facility.

The SWMF is equipped with a 0.5 m deep micropool area which is intended to collect additional sediment prior to discharging flow from the facility. A 525 mm dia. pipe connects the micropool to the outlet control structure. The control structure consists of a manhole with an internal concrete midwall with a 75 mm dia. circular orifice to control frequent storm events and a trapezoidal weir set above that to control less frequent storm events.

A 300 mm dia. pipe connects the outlet structure to the discharge point set just outside of the MTO 24 m wide setback from the highway. Flow discharges at this point and travels within the existing watercourse/drainage channel to the Hwy. 26 ditch system.

The maximum water surface elevation in the SWMF occurs during the 100 year storm event with a modelled water level of 185.50. The water surface elevation is expected to reach an elevation of 184.42 during the 25 mm storm event and 185.18 during the 5 year storm event. The Regional (Timmins) storm only reaches an elevation of 185.22.

An emergency overflow spillway has been provided in the SWMF for extreme flow events or in the event the outlet structure becomes blocked. The opening of the overflow spillway is set at 185.55 and as such ponded water should not normally discharge over the spillway.

Vegetated Swale

There is a trapezoidal swale with a 0.25 m wide bottom and 3:1 side slopes with a required 0.40 m minimum depth located between the main access road and the self storage building area. The swale drains north to the SWMF and is to be grassed. The grass within the swale can either be mowed or left to grow long as desired by the Owner.

Any trash or debris accumulated in the swale should be removed yearly and sediment should be removed when it exceeds 0.05 m.

Storm Sewer Network

There is a subsurface storm sewer network complete with catchbasins within the asphalt area of both the north and south sites which are intended to collect runoff from storms up to and including the 100 year storm event.

The manhole lids should be lifted in the Spring of each year to check for the amount of accumulated sediment and/or any trash or debris. When the sumps on each storm structure reaches 50% of the capacity the sumps should be cleaned out using a vacuum truck.

Oil Grit Separators

The storm sewer network connects to two Oil Grit Separators (OGS) (CDS Model PMSU2025-5-C and PMSU2015-4-C) located between the SWMF and the edge of the asphalt on both the north and south areas of the site. The OGS units are intended to clean the stormwater runoff prior to discharge to the dry SWMF.

Please refer to the manufacturer's user's manual included in **Appendix E** for the required maintenance activities and details, including frequency and method of filter cleaning/replacement.

Flood Bypass Culvert

There is a 2130 x 860 CSP open bottom arch culvert located in the NW part of the site which is intended to allow flood flows to bypass around the site to the Hwy. 26 ditch system. This culvert needs to be inspected twice per year to ensure that the openings are free of debris and clear. In particular we recommend that the openings of the culvert be cleared of any accumulated snow and ice prior to the yearly spring thaw to ensure the full capacity of the culvert is available.

Erosion and Sediment Control Measures

All maintenance activities during construction of the SWMF and development of the site will be the responsibility of the developer and shall be in accordance with the engineering drawings prepared by CAPES Engineering Ltd. Please refer to **Appendix A** for the ESC drawings.

SWMF & Infrastructure Inspection and Maintenance Program

Frequency of Inspection

The dry pond will require careful monitoring, particularly in the initial years of operation to ensure it is functioning properly and erosion is not occurring. Inspections are an important part of this monitoring program. Regular visual inspections should be conducted:

- After every significant rainfall (> 10 mm) for the first two years of operation.
- Minimum of four visits per year after the first two years of operation (spring, summer, fall and winter).

The vegetated swale will also require regular inspection and maintenance by the Owner. Including removal of trash and debris and removal of accumulated sediment when it reaches 0.05 m deep.

The storm sewer system and associated storm manholes will need to be inspected by the Owner twice per year (Spring and Fall) as part of a regular storm manhole inspection program.

Please refer to **Appendix B** for the SWM related drawings for the site.

Inspection Checklist

An inspection checklist has been included in **Appendix C**. This checklist shall be completed following each site visit. The Town of Saugeen Shores may keep a record of the completed checklists.

Maintenance Tasks

Grass Cutting

Generally, it is recommended that grass-cutting be limited or eliminated around the SWMF since allowing grass to grow tends to enhance water quality and provide other benefits for wet facilities. Short grass around a stormwater facility provides an ideal habitat for nuisance species such as geese. Allowing the grass to grow is an effective means of discouraging geese.

Grass cutting is one maintenance activity which is solely undertaken to enhance the perceived aesthetics of the facility. The frequency of grass cutting depends on surrounding land uses, and local municipal by-laws. Therefore, grass cutting should be done as infrequently as possible, recognizing the aesthetic concerns of nearby residents.

Landscape plans have been prepared for the pond including small shrubs and water tolerant plants, these plants are not to be mowed unless specifically required on the landscape plans.

As a safety precaution, grass cutting should be done parallel to the shoreline with grass clippings being ejected upland to reduce the potential for organic loadings to the pond.

Should the Owner wish to cut the grass around the facility, the following practices should be considered:

- Minimize frequency of cutting.
- Do not cut grass up to edge of the facility (to maintain shading and nutrient uptake).
- Do not blow grass clippings into the facility (to minimize organic loading in basin).

Weed Control

Weeds are generally defined as any kind of vegetation which is unwanted in a particular area. In terms of the SWMF, weeds are generally invasive species which cannot provide the intended function of the planting strategy, or non-native species such as purple loosestrife, the spread of which is undesirable. Weed control may be required annually.

Weed control will be required in the SWMF until the landscaped vegetation has been established. Weed control will not be required beyond these initial requirements immediately following construction and is

not an anticipated or recommended practice for this facility. Weed control is not required for any other SWM controls on the site.

Weeding should be done by hand to prevent the destruction of surrounding vegetation. The use of herbicides and insecticides should be prohibited near the SWMF since they create water quality problems. The use of fertilizer should also be limited to minimize nutrient loadings to the downstream receiving waters.

Plantings

Any replacement plantings required for the SWMF due to disturbance or die-out are to be in accordance with the Landscape Plans (**Appendix D**). Native species should be utilized where possible for all plantings.

Trash/Debris Removal

Trash removal is an integral part of the SWMF maintenance. Generally, a "spring cleanup" is needed to remove trash from the SWMF. Trash removal is then performed as required based on observations during regular inspections.

Accumulated litter and debris within the SWMF can be removed by hand by the Municipality during the regular inspection periods.

The Owner should also remove litter and debris from the swale, culverts and storm sewer structures as part of their regular yard maintenance.

Sediment Removal

In order to maintain the removal efficiency of the SWMF, the accumulated sediment will need to be removed periodically. Any sediment build-up in the micropool, main cell and outlet structure will need to be removed to maintain pond volumes.

Sediment accumulation in storm sewer manholes within the asphalt area should be removed as part of a regular site maintenance program, but at a minimum should be removed when the sump reaches 50% full.

Cleanout Frequency

The accumulated sediments within the SWMF should be excavated once one half of the capacity of the main cell (0.20 m) is reached or every 10 years whichever comes first. A sediment removal frequency calculation is provided in **Appendix E**. As the calculations show a theoretical very long time period to the required sediment accumulation it is proposed the facility will be cleaned out every 10 years.

The storm manholes on the site should be cleaned out when the sumps have reached 50% full or once a year whichever comes first. Cleaning out the manholes is critical to ensuring the long-term performance of the perforated storm sewer and should ideally be completed in the early Spring.

Method of Sediment Removal

The following is a suggested method of sediment removal for the SWMF:

1. Obtain samples of the accumulated sediment and test as per the requirements of the MECP Sediment Testing Guidelines
2. Pump out any water from the pond to the downstream side of the outlet control manhole concrete midwall. Use a silt bag at the end of the pumped effluent and place intake on a hard surface such as a patio stone.
3. Excavate accumulated sediments using an excavator (equipped with long boom) from the pond. Excavated sediment shall be placed immediately in a truck for disposal to minimize disturbance of existing vegetation. During excavation, it will be very important to ensure that the geosynthetic clay liner located 1 m below the bottom of the pond is not disturbed. Laser levels or GIS based systems are to be used, following the as-constructed dimensions of the pond, to ensure that the sediment excavation does not exceed the bottom of the pond and disturb the liner.
4. Restore vegetation as per the Landscape Plans.

Sediment Disposal

Generally, sediment removed from SWMFs will not be contaminated to the point that it would be classified as hazardous waste. However, all sediment which is removed from SWMFs should be tested to determine disposal options. MECP sediment disposal requirements should be consulted for information pertaining to the exact parameters and acceptable levels for different disposal options. Most private laboratories are familiar with the disposal guidelines and can test sediment samples with these in mind.

For example, in order to deposit the sediment on land, it would need to meet inert fill requirements under *Regulation 347*. For landfill disposal, the sediment would have to be classified as non-hazardous, i.e., not leachate toxic according to TCLP leachate test in *Regulation 347* (effective March 31, 2001).

Off-site disposal of the sediment can mean disposal at a sanitary landfill or disposal at another area undergoing filling. The decision of where the material is deposited depends on the quality of the sediments and the availability and distance of the alternative fill areas.

Outlet Control Structure Cleanout

The outlet control structure in the SWMF has been designed with a concrete midwall, and an orifice and weir through the midwall. Upon inspection it must be ensured that the orifice has not been blocked, and that any debris be removed from the orifice. There is also the potential for sediment to build up on the pond side of the midwall. This should be pumped out by a vacuum truck if the sediment is built up from the bottom of the manhole halfway to the orifice.

Winter Operations

There are no special requirements for winter operation. However, periodically through the winter and prior to spring thaw, the small diameter orifice located in the control structure needs to be checked and cleared of any debris. This includes ensuring that any ice buildup or ice blockage in the orifice is cleared away.

Unscheduled/Emergency Maintenance

Failure of any feature impacting the operation of the stormwater facility should be rectified immediately to minimize impacts on the receiving watercourse. In case of pond or storm sewer failure, the following personnel should be notified immediately:

Personnel	Phone Number
Pantone Investment Management	1-647-993-3909

Conclusions

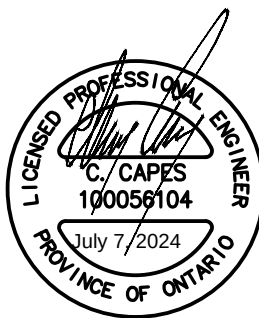
This report has identified the maintenance responsibilities and procedures required to efficiently maintain the Lot 31 Clark Street stormwater management facility and infrastructure.

Report Prepared By:



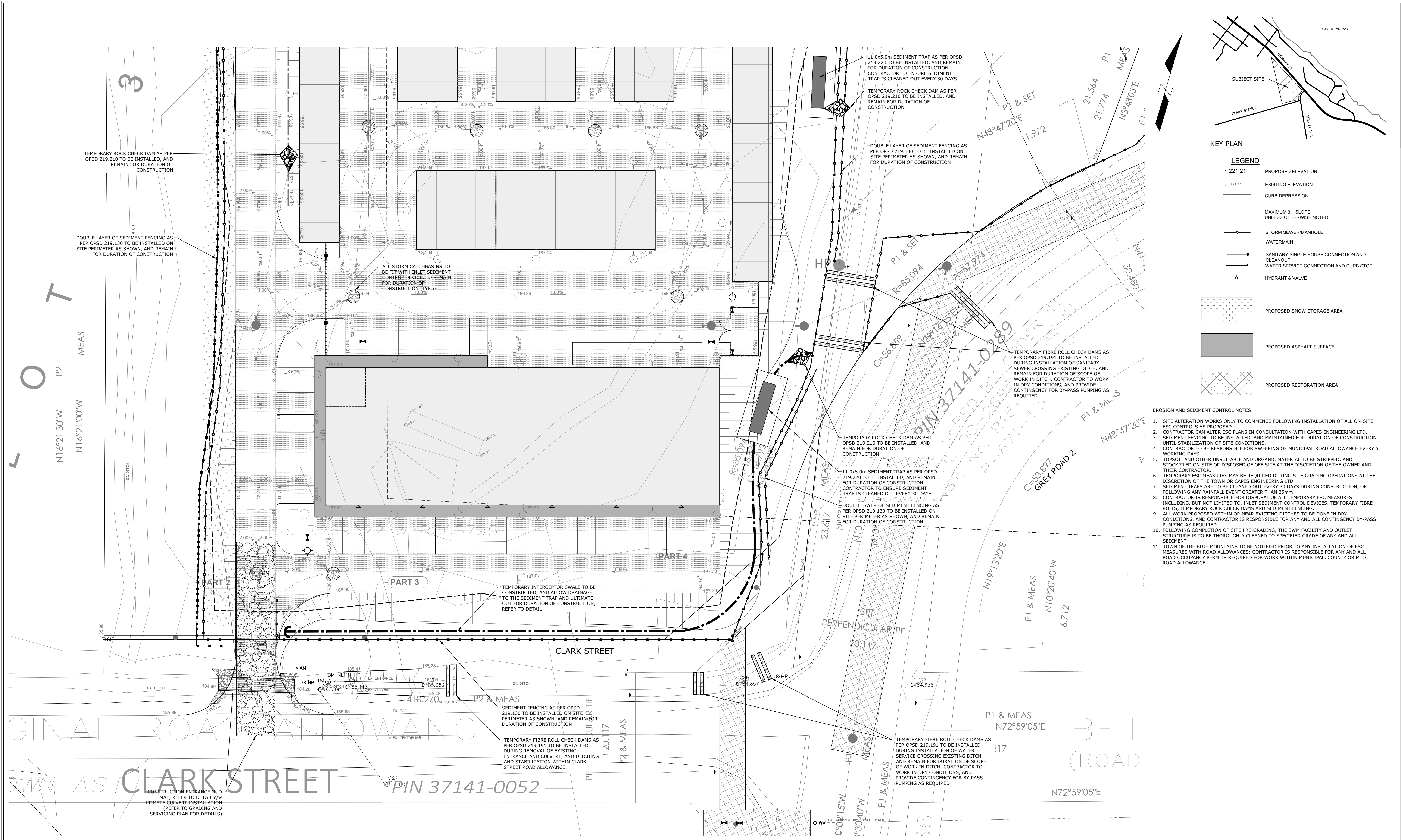
Clayton Capes, MSc. P.Eng.

CAPES Engineering Ltd.

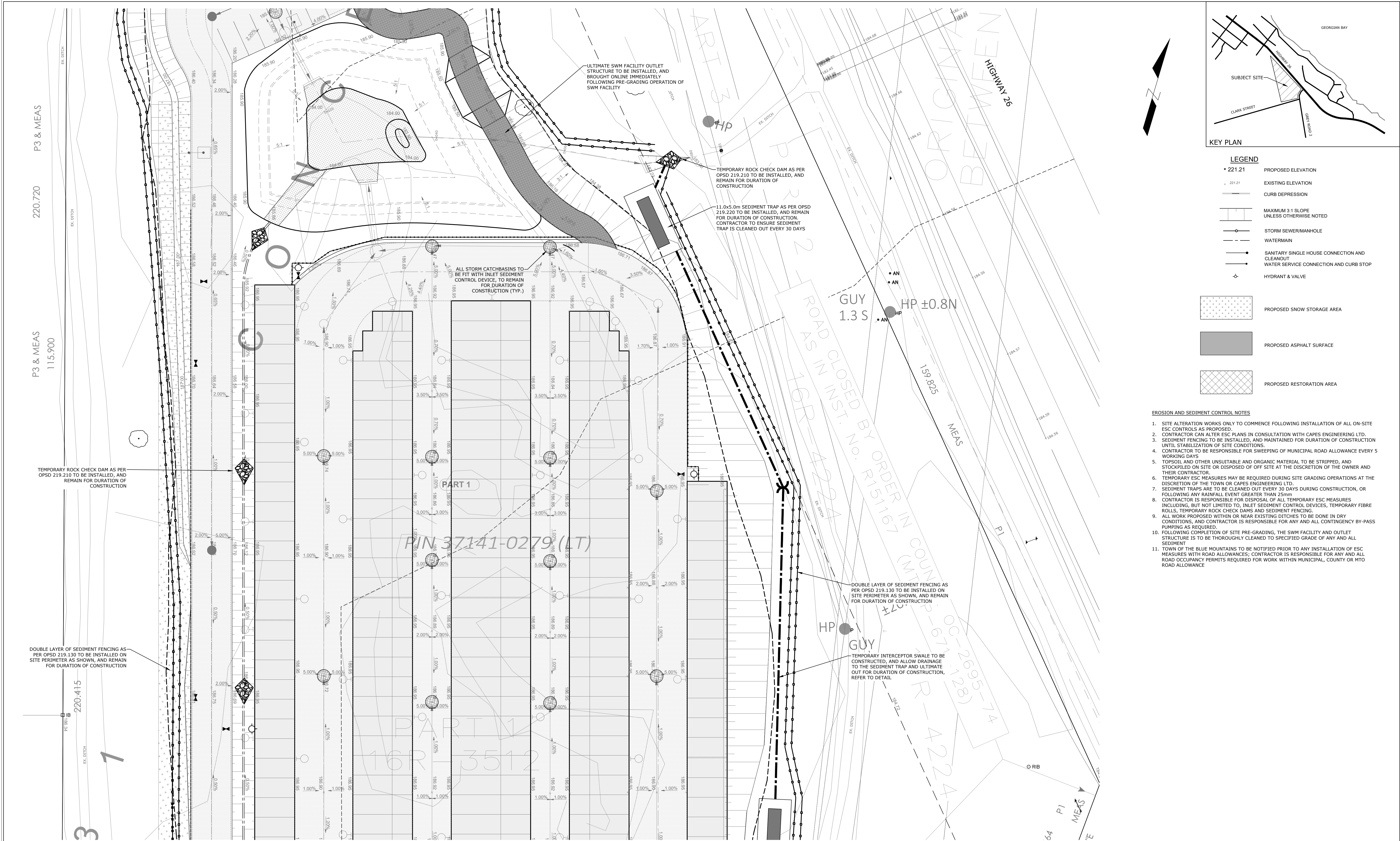


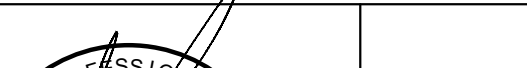
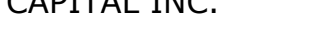
Appendices

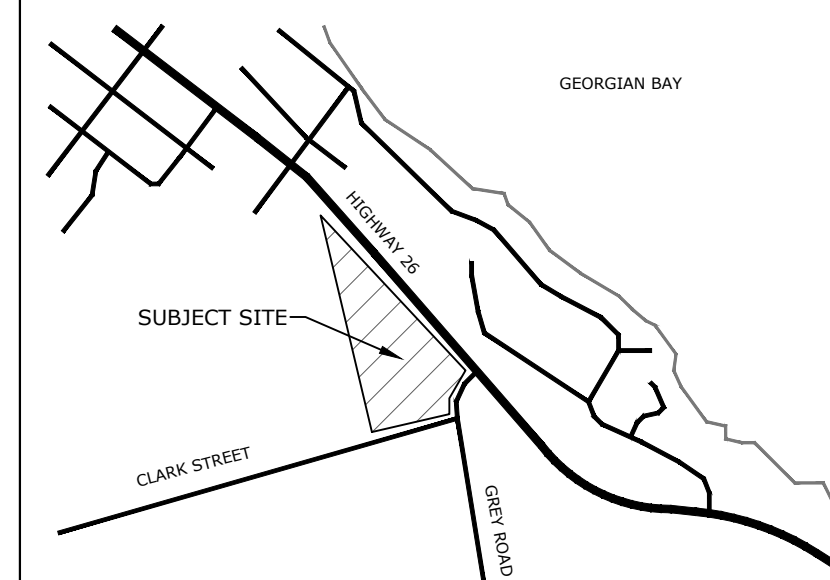
Appendix A – Erosion and Sediment Control Drawings



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	Designed K. GRIFFIN	Checked C. CAPES	Date 22/08/09	Drawing No. C9											
	Project No. 2021-185	Rev No. 3													
	Scale 1:250														



- LEGEND

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* 221.21 | PROPOSED ELEVATION |
| 
* 221.21 | EXISTING ELEVATION |
|  | CURB DEPRESSION |
|  | MAXIMUM 3:1 SLOPE
UNLESS OTHERWISE NOTED |
|  | STORM SEWER/MANHOLE |
|  | WATERMAIN |
|  | SANITARY SINGLE HOUSE CONNECTION AND
CLEANOUT |
|  | WATER SERVICE CONNECTION AND CURB STOP |
|  | HYDRANT & VALVE |

-
- PROPOSED SNOW STORAGE AREA
- PROPOSED ASPHALT SURFACE
- PROPOSED RESTORATION AREA

EROSION AND SEDIMENT CONTROL NOTES

1. SITE ALTERATION WORKS ONLY TO COMMENCE FOLLOWING INSTALLATION OF ALL ON-SITE EROSION CONTROLS AS PROPOSED.
2. CONTRACTOR CAN ALTER EROSION CONTROL PLANS IN CONSULTATION WITH CAPES ENGINEERING LTD.
3. SEDIMENT FENCING TO BE INSTALLED, AND MAINTAINED FOR DURATION OF CONSTRUCTION TO PREVENT SLOTTED SEDIMENT FROM ENTERING ADJACENT AREAS.
4. CONTRACTOR TO BE RESPONSIBLE FOR SWEEPING OF MUNICIPAL ROAD ALLOWANCE EVERY 5 WORKING DAYS
5. TOPSOIL AND OTHER UNSUITABLE AND ORGANIC MATERIAL TO BE STRIPPED, AND STOCKPILED ON SITE OR DISPOSED OF AT SITE AT THE DISCRETION OF THE OWNER AND THEIR CONTRACTOR.
6. TEMPORARY EROSION MEASURES MAY BE REQUIRED DURING SITE GRADING OPERATIONS AT THE DISCRETION OF THE TOWN OR CAPES ENGINEERING LTD.
7. SEDIMENT TRAPS ARE TO BE CLEANED OUT EVERY 30 DAYS DURING CONSTRUCTION, OR FOLLOWING ANY RAINFALL EVENT GREATER THAN 25mm
8. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL TEMPORARY EROSION MEASURES INCLUDING, BUT NOT LIMITED TO, INLET SEDIMENT CONTROL DEVICES, TEMPORARY FIBRE ROLLS, TEMPORARY ROCK CHECK DAMS AND SEDIMENT FENCING.
9. ALL WORK PROPOSED WITHIN OR NEAR EXISTING DITCHES TO BE DONE IN DRY.
10. CONTRACTOR, AND HIS CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL CONTINGENCY BY-PASS PUMPING AS REQUIRED.
11. FOLLOWING COMPLETION OF SITE PRE-GRADING, THE SWM FACILITY AND OUTLET STRUCTURE IS TO BE THOROUGHLY CLEANED TO SPECIFIED GRADE OF ANY AND ALL SEDIMENT.
12. TOWN OF THE BLUE MOUNTAINS TO BE NOTIFIED PRIOR TO ANY INSTALLATION OF EROSION MEASURES WITH ROAD ALLOWANCES; CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL OCCUPANCY PERMITS REQUIRED FOR WORK WITHIN MUNICIPAL, COUNTY OR MTO ROAD ALLOWANCE



Notes:

- NOTES
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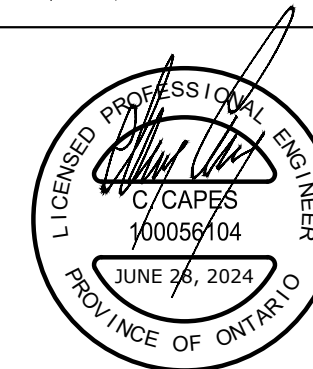
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2	REVISED FOR APPROVALS	23/12/07
3	REVISED FOR APPROVALS	24/06/28

NOTES

TOPOGRAPHIC SURVEY PREPARED BY SMC GEOMATICS. ELEVATIONS SHOWN ARE GEODETIC

BENCHMARK: NAIL IN HYDRO POLE AT SOUTH END OF SUBJECT SITE. ELEVATION 185.39.

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EROSION AND SEDIMENT CONTROL PLAN (3 OF 3)

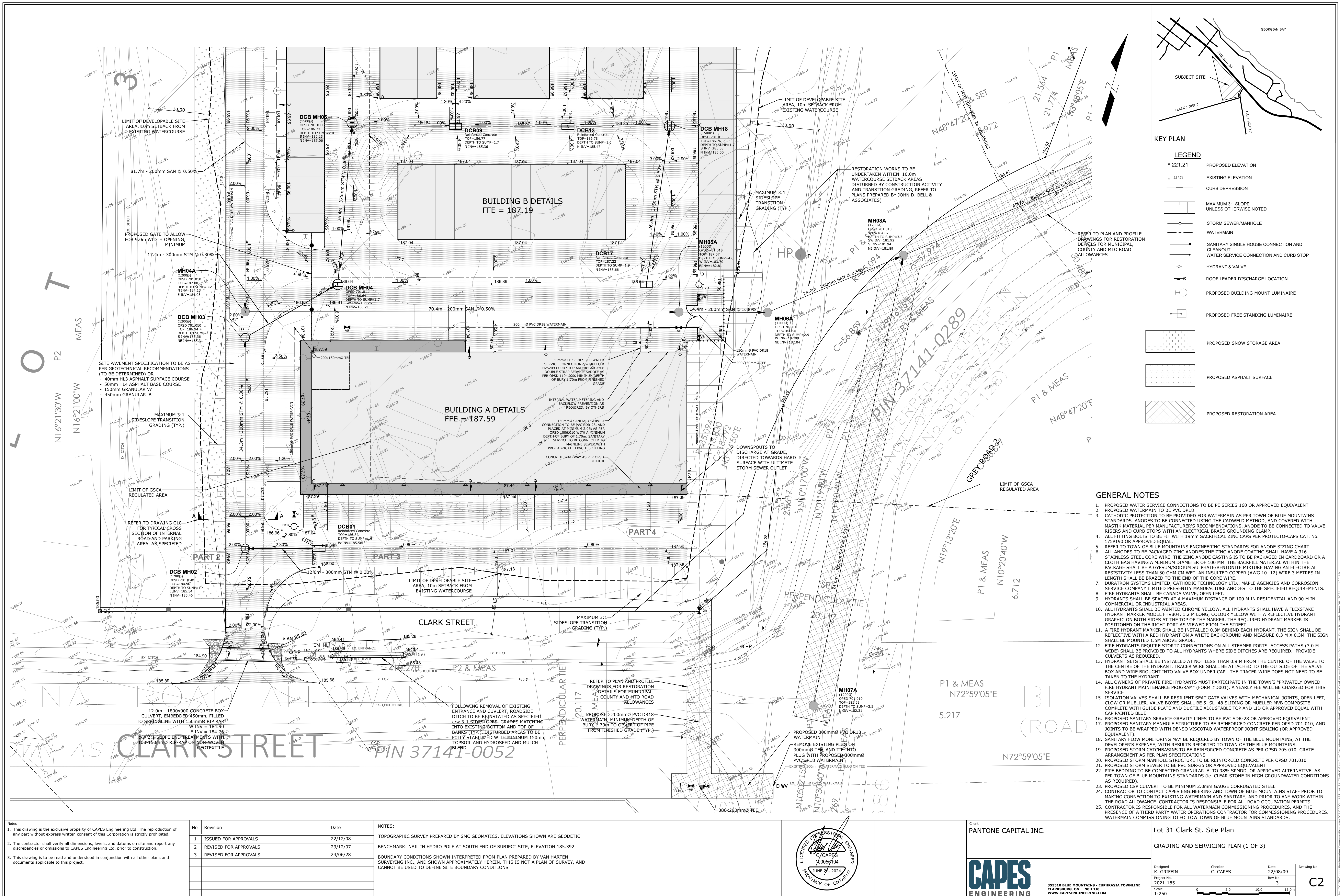
EROSION AND SEDIMENT CONTROL PLAN (3 OF 3)

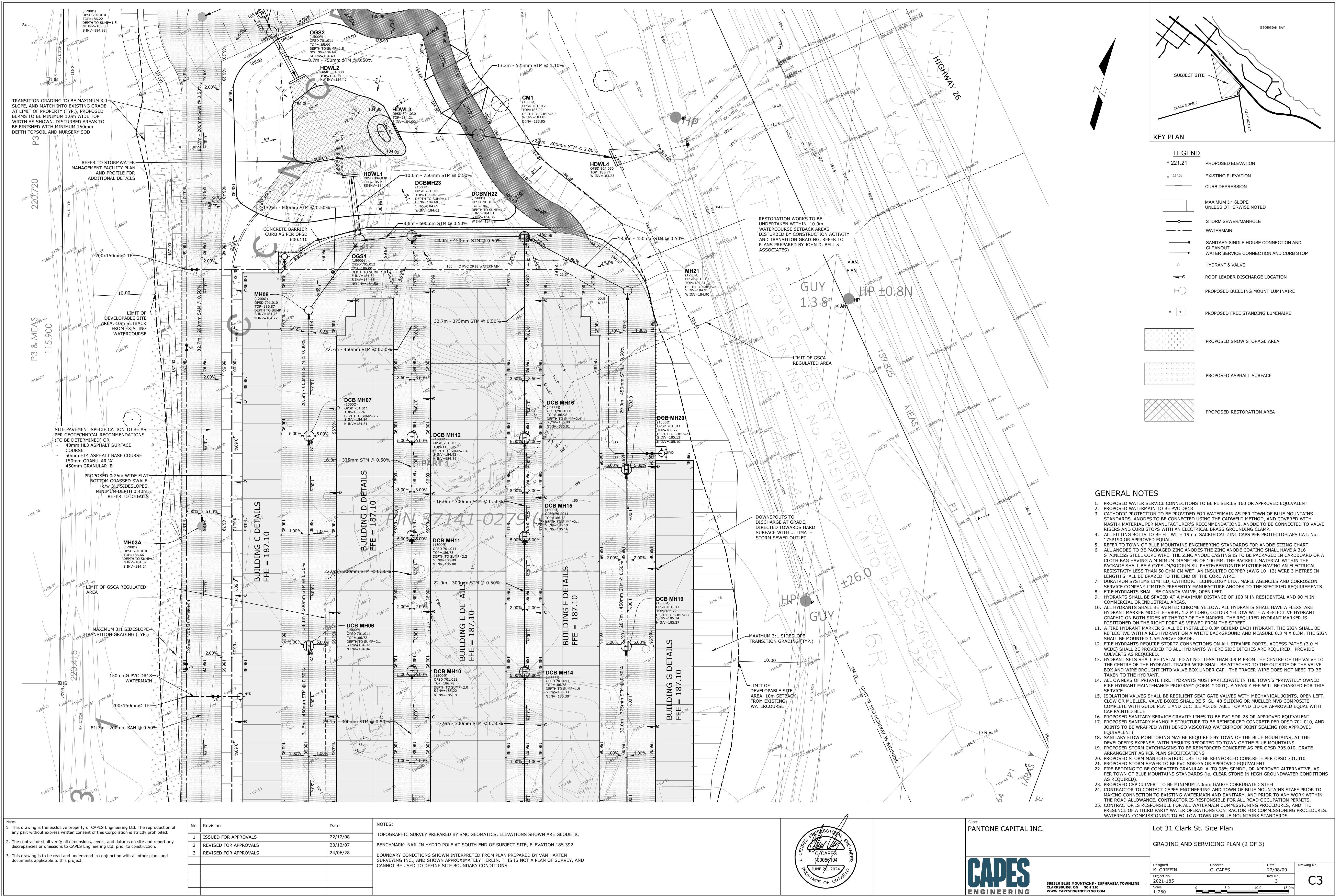
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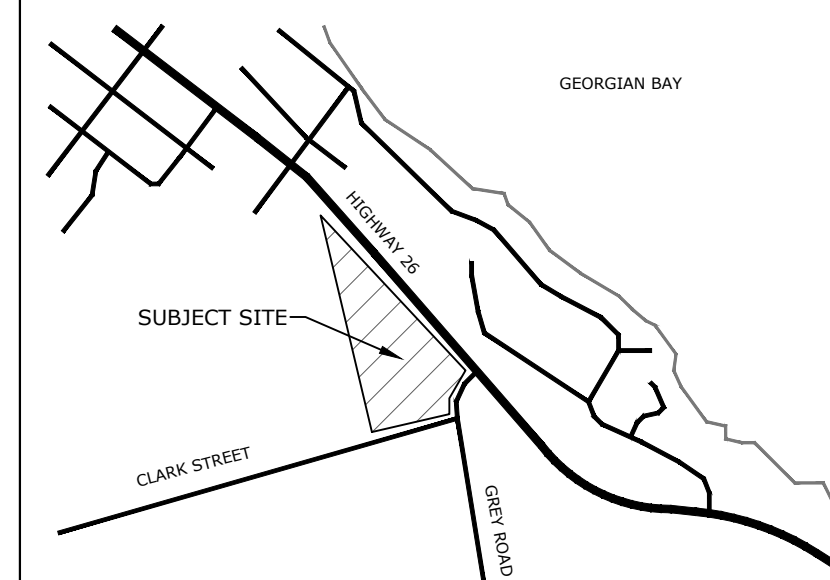
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C10

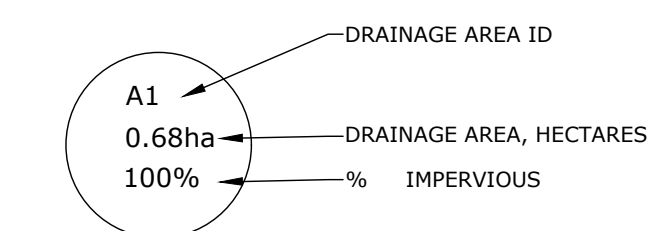
Appendix B – SWM Infrastructure Drawings



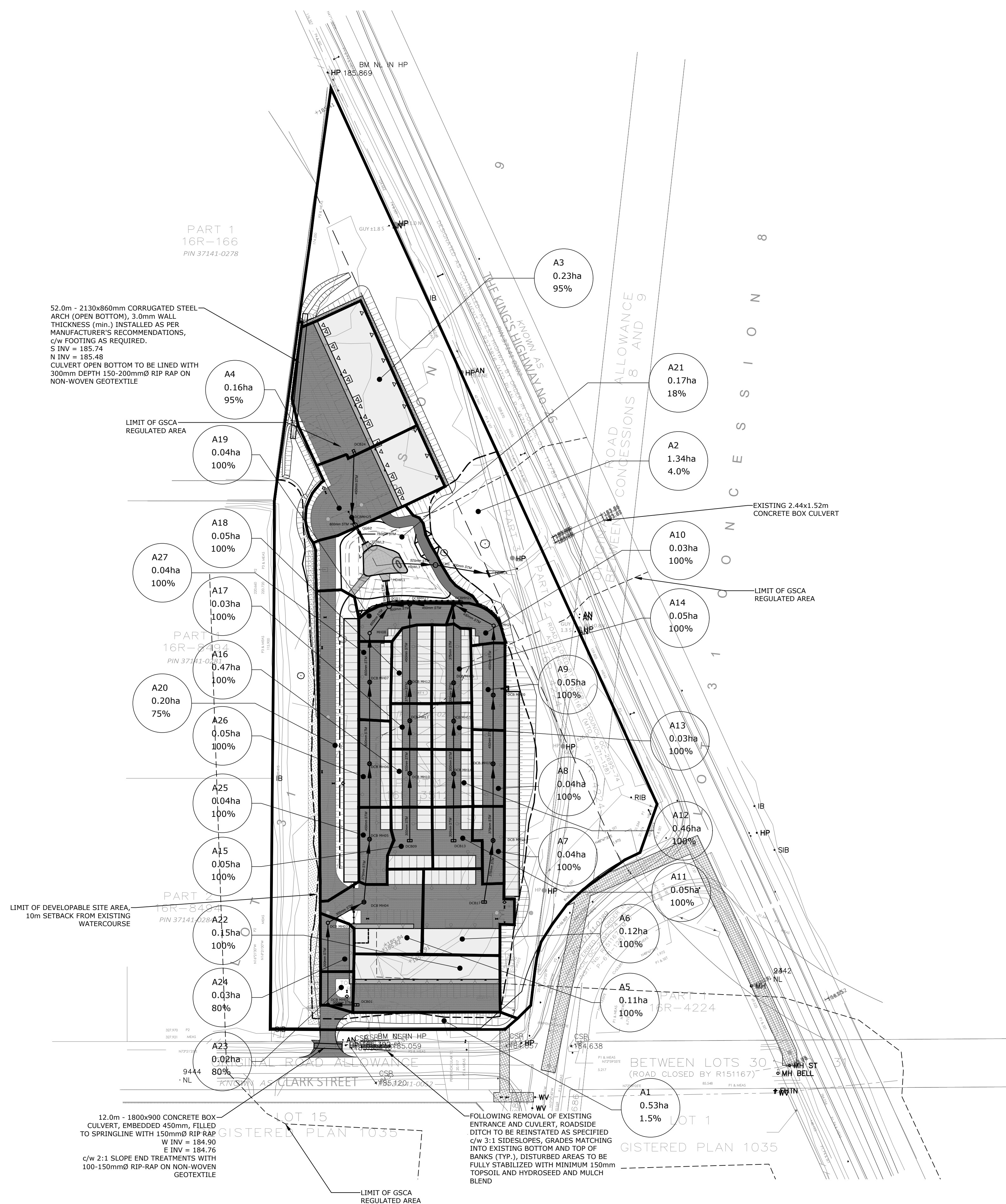




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DRAINAGE AREA BOUNDARY



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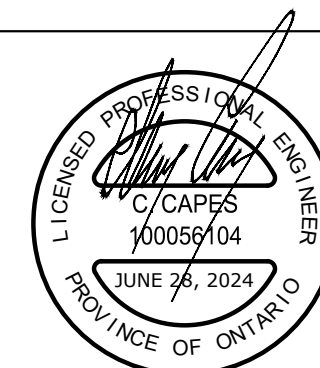
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Client	PANTONE CAPITAL INC.
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Lot 31 Clark St. Site Plan

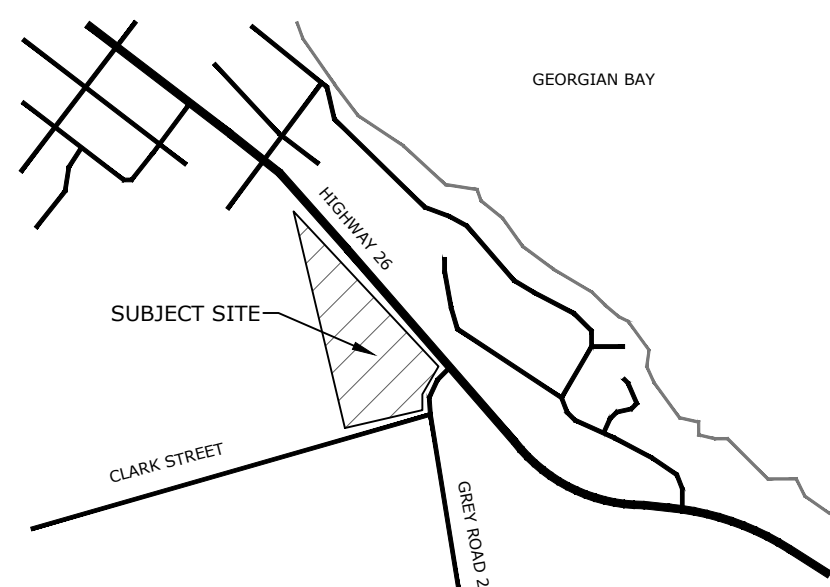
POST DEVELOPMENT DRAINAGE AREA PLAN

Designed K. GRIFFIN	Checked C. CAPES	Date 22/08/09	Drawing No. C
Project No. 2021-185		Rev No. 3	

Scale
1:1,000

A horizontal graphic scale bar with tick marks at 0, 20, 40, and 60 meters. The bar is divided into segments, with the first segment (0 to 20m) shaded grey and the remaining segments (20 to 40m and 40 to 60m) unshaded.

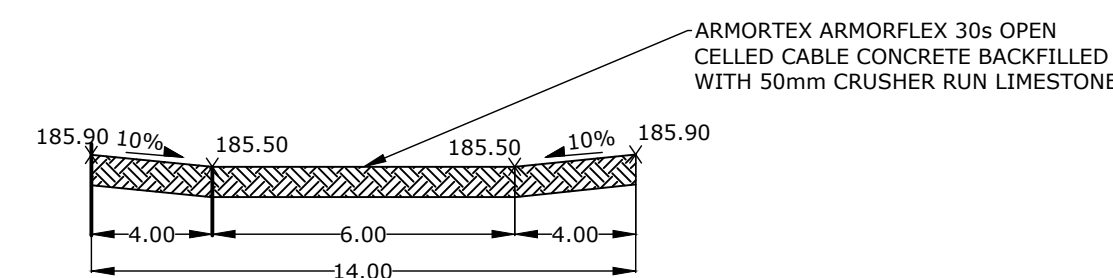
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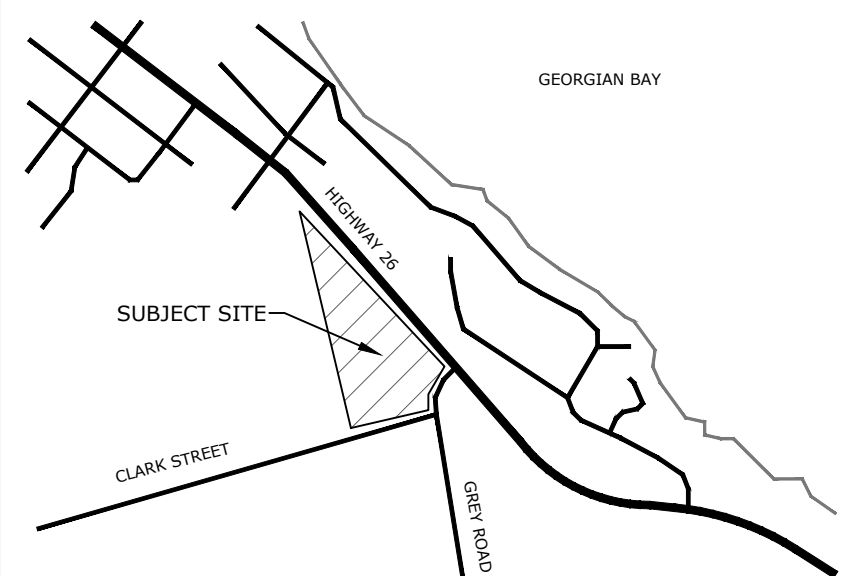
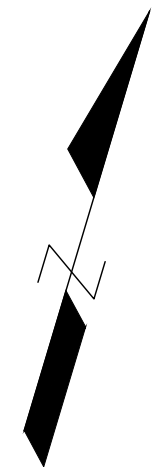
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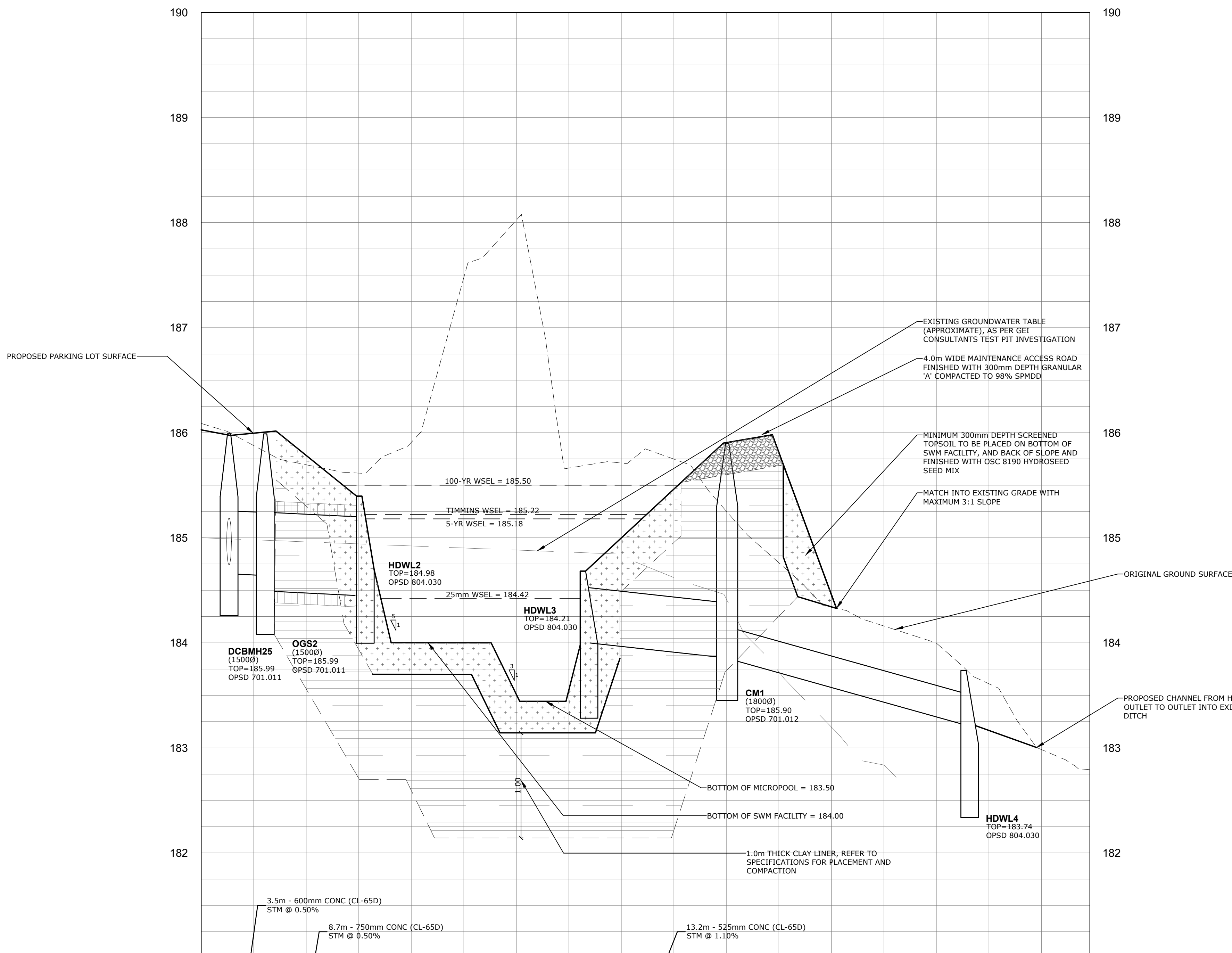
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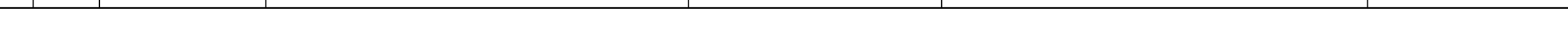


EMERGENCY SPILLWAY WEIR



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|---|--|
|  | PROPOSED ELEVATION |
|  | EXISTING ELEVATION |
|  | CURB DEPRESSION |
|  | MAXIMUM 3:1 SLOPE
UNLESS OTHERWISE NOTED |
|  | STORM SEWER/MANHOLE |
|  | WATERMAIN |
|  | SANITARY SINGLE HOUSE CONNECTION
AND CLEANOUT |
|  | WATER SERVICE CONNECTION AND CURB STOP |
|  | HYDRANT & VALVE |



PROPOSED STORM						PROPOSED STORM
PROPOSED SANITARY						PROPOSED SANITARY
EXIST/PROP CENTERLINE ELEVATION	186.088	185.908	185.711	184.338	182.994	EXIST/PROP CENTERLINE ELEVATION
CHAINAGE	0+000	0+020	0+040	0+060	0+080	CHAINAGE

IMPORTED CLAY LINER DESIGN NOTES

- MATERIAL USED FOR POND LINER TO HAVE BULK PERMEABILITY ON THE ORDER OF 10-9 m/s OR LOWER
- GRAIN SIZE DISTRIBUTION OF THE CLAY LINER MUST CONFORM TO:
 - NO PARTICLE GREATER THAN 100mm DIMENSION
 - NOT GREATER THAN 15% OF THE MATERIAL LARGER THE 4.75mm (No. 4 SIEVE)
 - MINIMUM 35% OF THE MATERIAL FINER THAN 0.075mm (ie. PASSING No. 200 SIEVE)
 - MINIMUM 15% FINER THAN 0.002mm (CLAY SIZE)
 - NOT GREATER THAN 5% ORGANIC CONTENT, NO VISIBLE ROOTS OR TOPSOIL
- LINER MATERIAL TO BE PLACED AT WATER CONTENT ± 2 TO 3 PERCENT WET OF THE OPTIMUM MOISTURE CONTENT
- LINER TO BE CONSTRUCTED IN LIFTS NOT EXCEEDING 150mm THICK, AND BE COMPACTED TO A MINIMUM 95% SPMD UNDER FULL TIME INSPECTION OF A GEOTECHNICAL ENGINEER.

Notes

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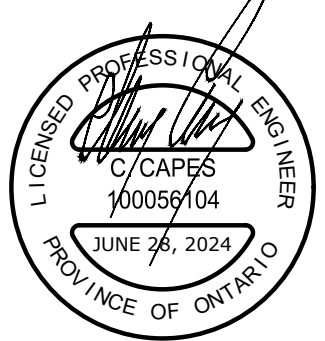
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1	ISSUED FOR APPROVALS	22/12/08
2	REVISED FOR APPROVALS	23/12/07
3	REVISED FOR APPROVALS	24/06/28

NOTES:

TOPOGRAPHIC SURVEY PREPARED BY SMC GEOMATICS, ELEVATIONS SHOWN ARE GEODETIC

BENCHMARK: NAIL IN HYDRO POLE AT SOUTH END OF SUBJECT SITE, ELEVATION 185.392

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Client
PANTONE CAPITAL INC.



355310 BLUE MOUNTAINS - EUPHRASIA TOWNLIN
CLARKSBURG, ON N0H 1J0
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Lot 31 Clark St. Site Plan

STORMWATER MANAGEMENT FACILITY PROFILE

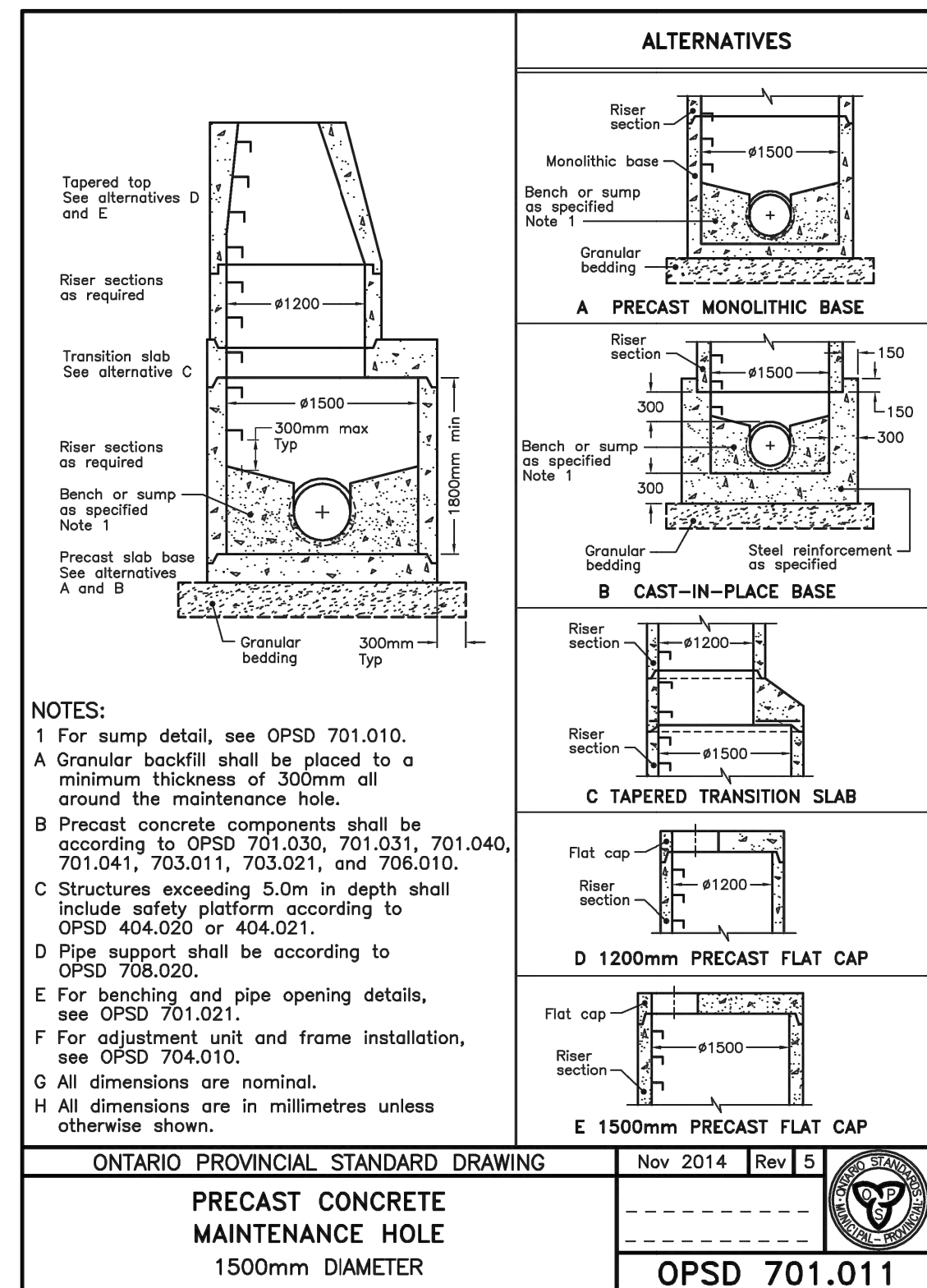
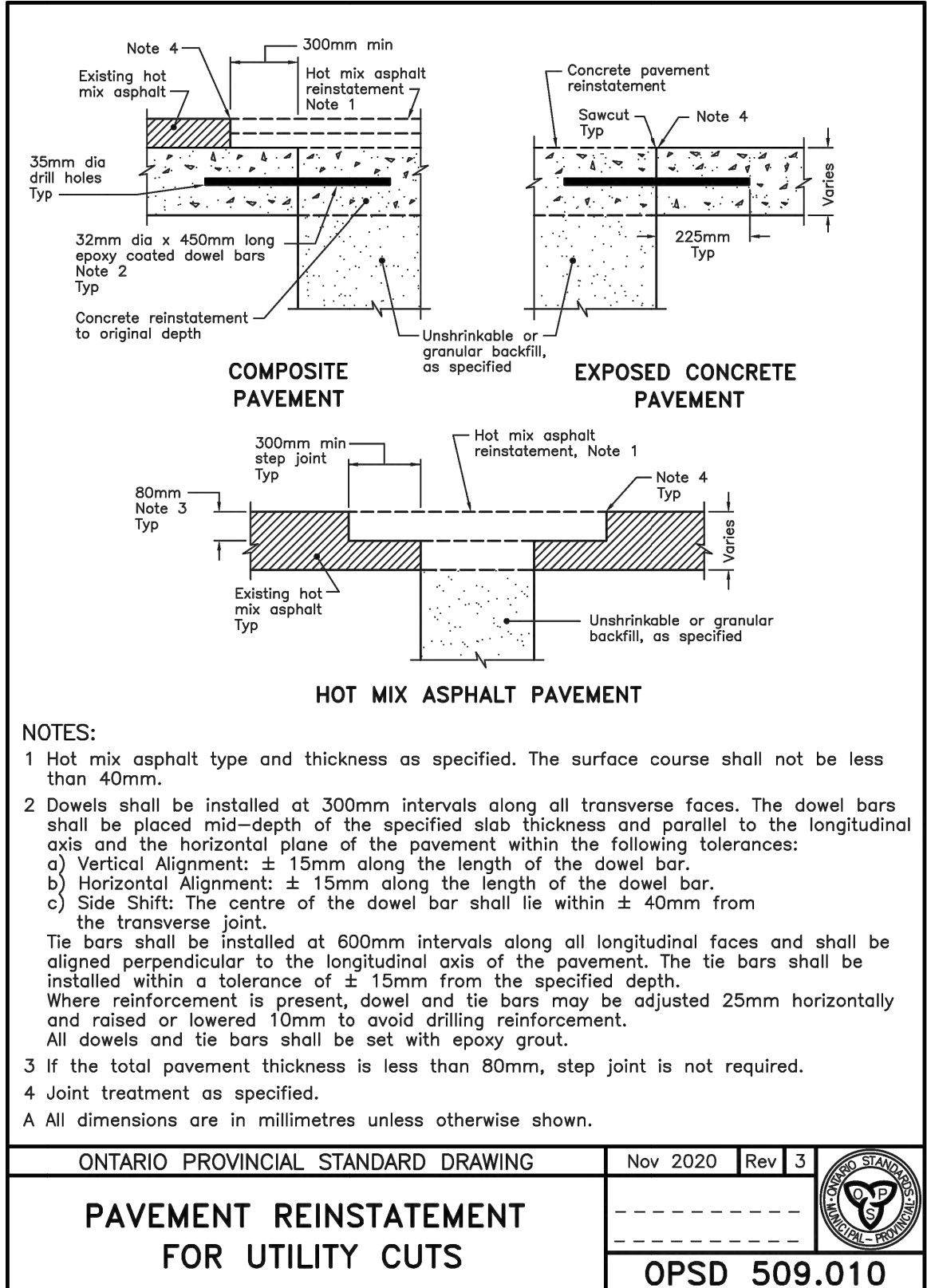
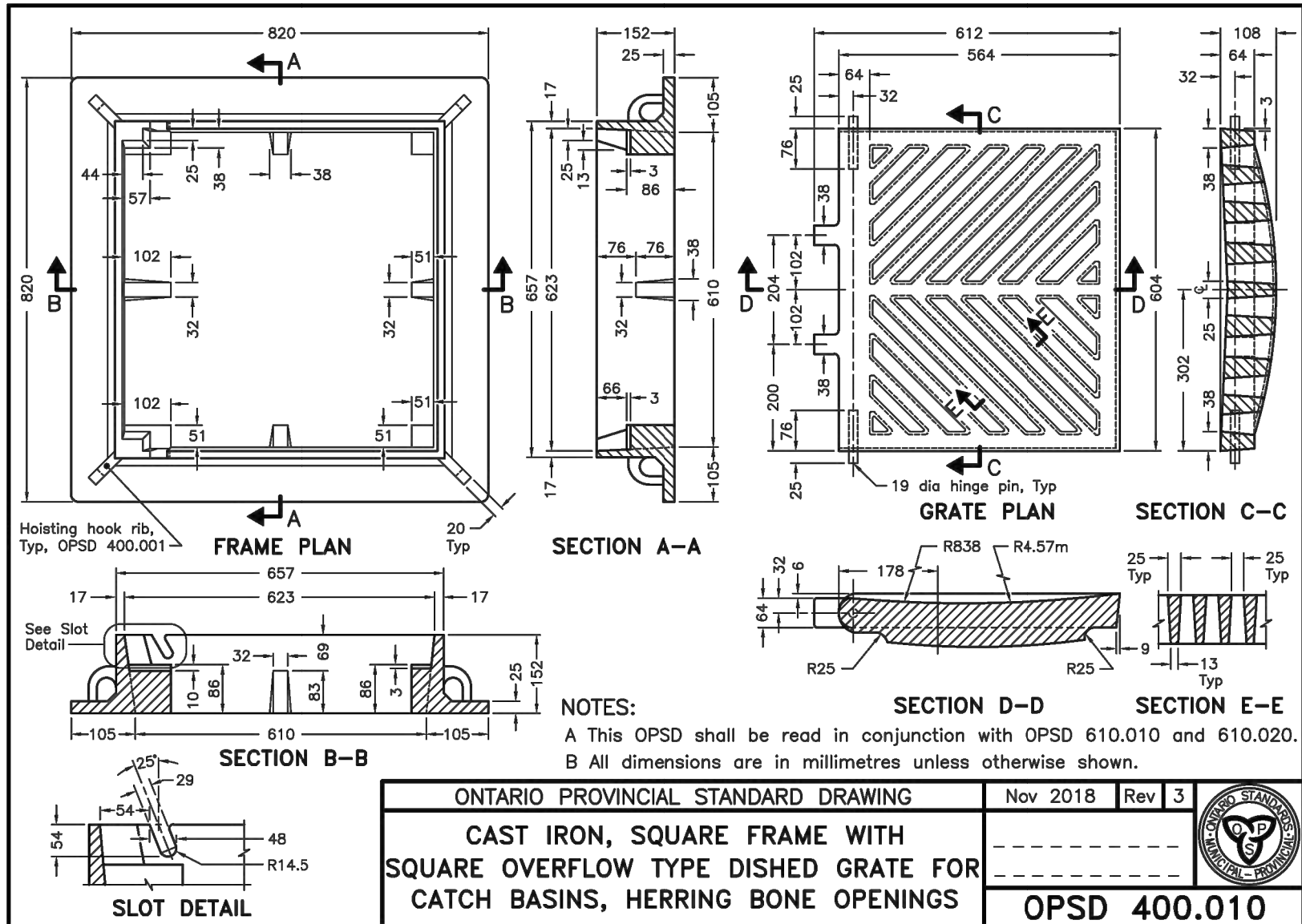
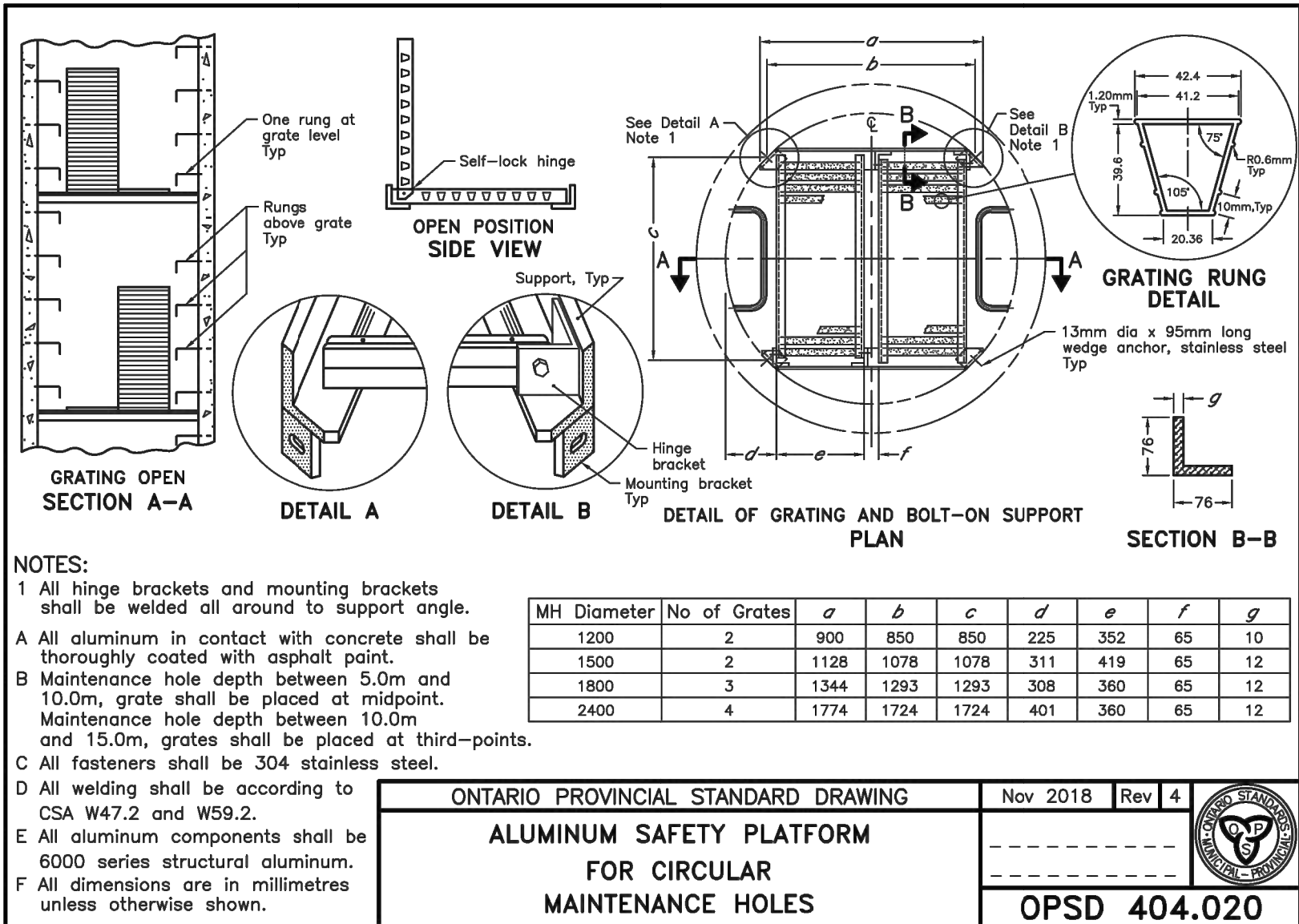
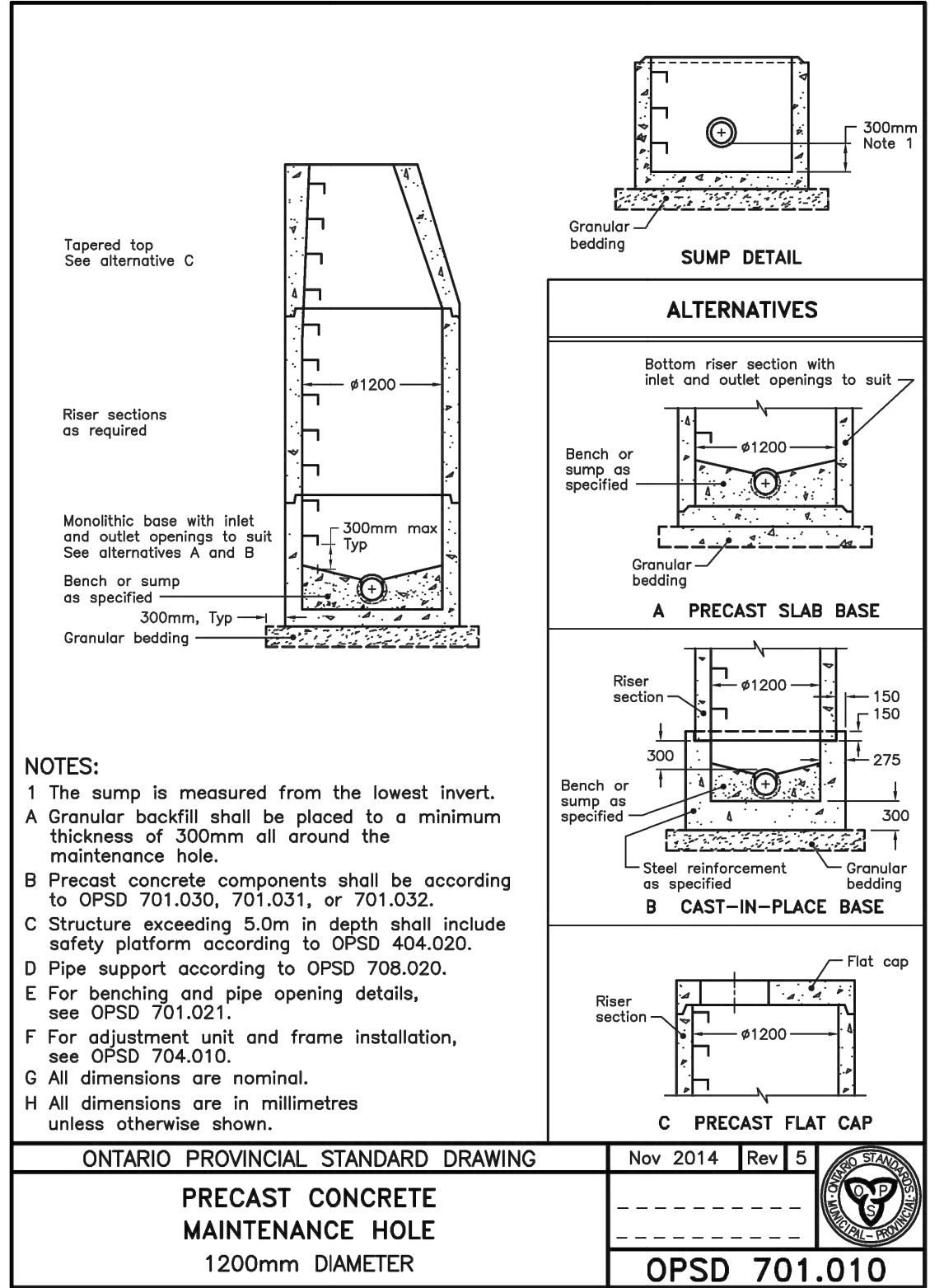
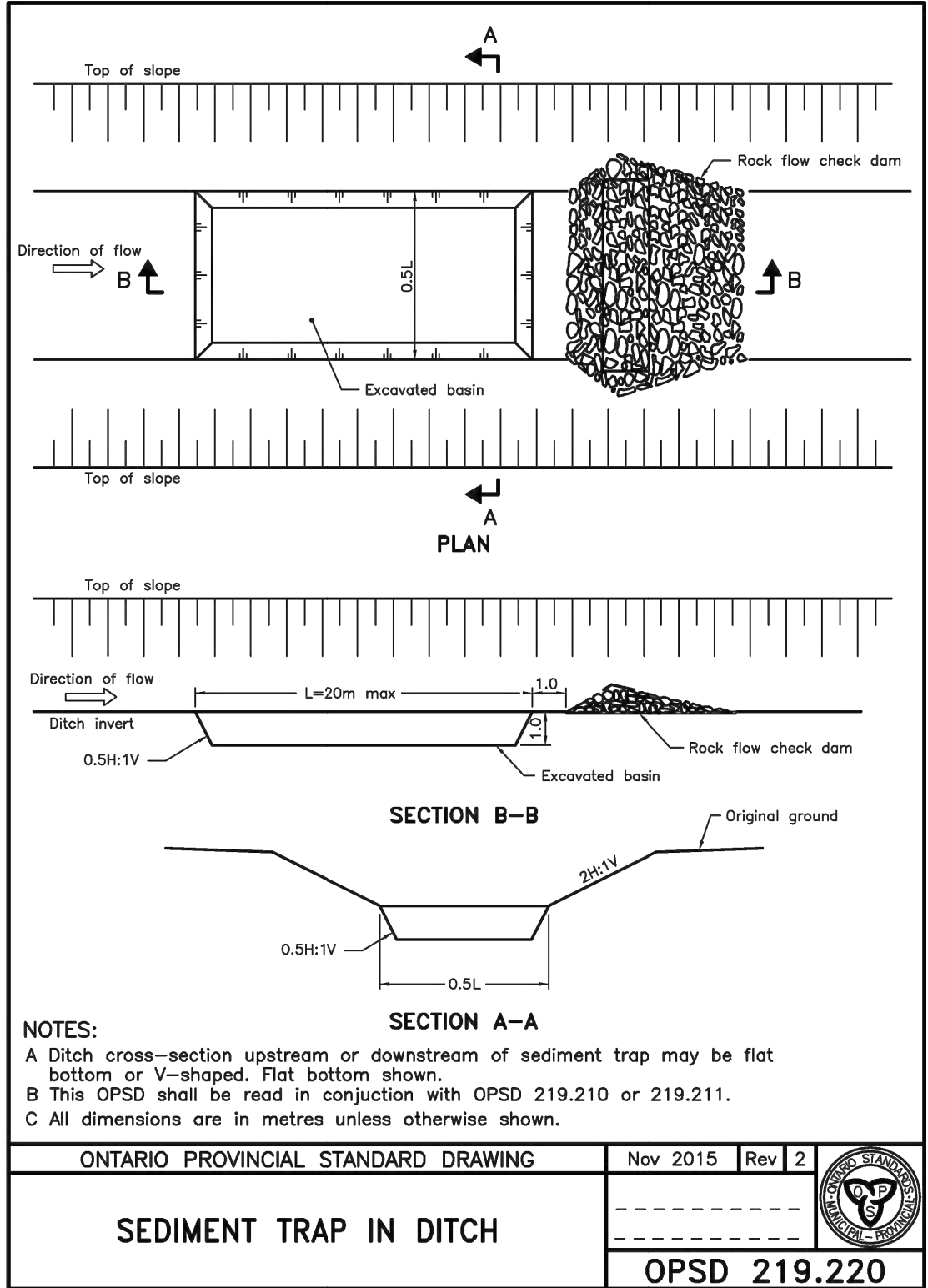
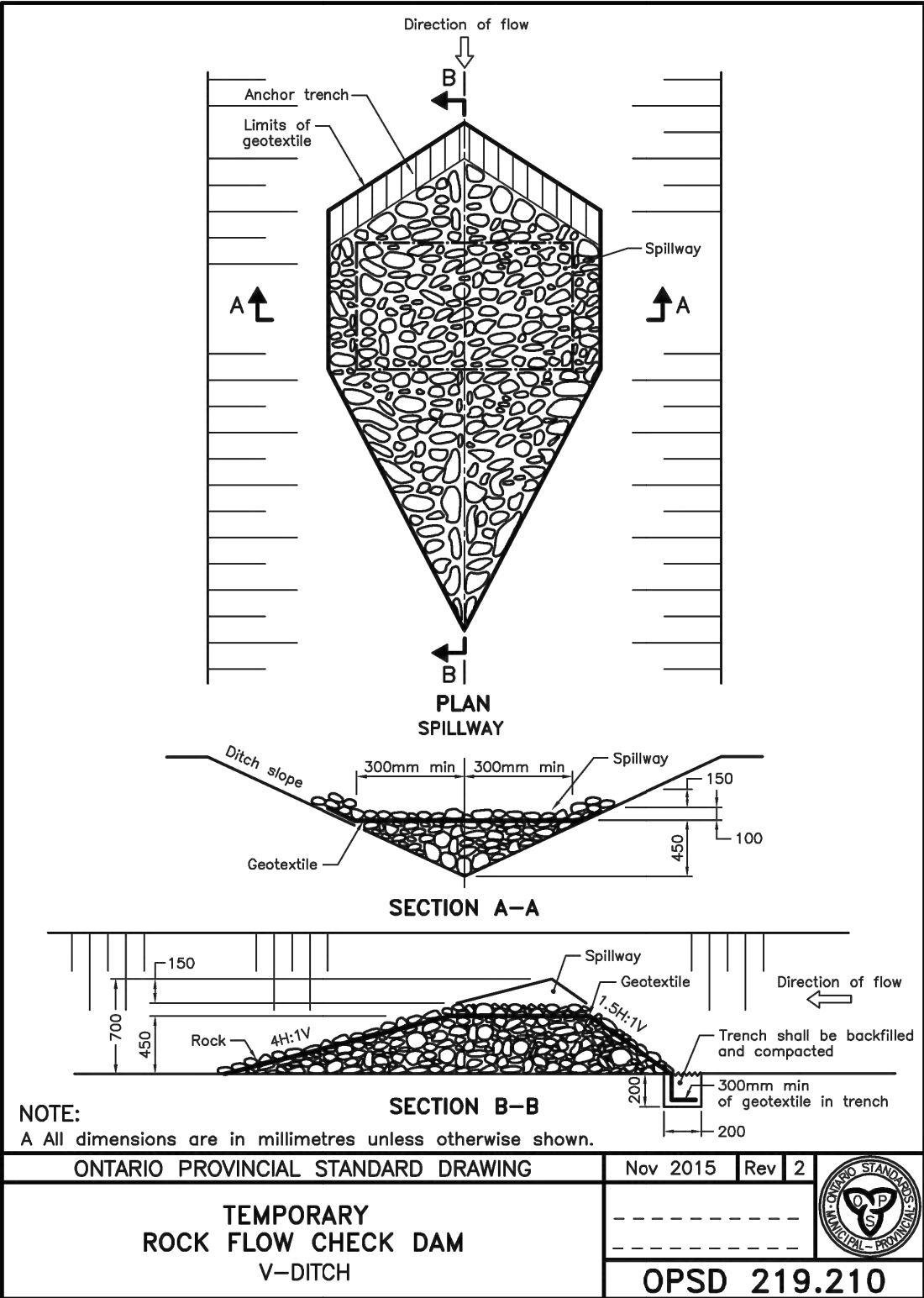
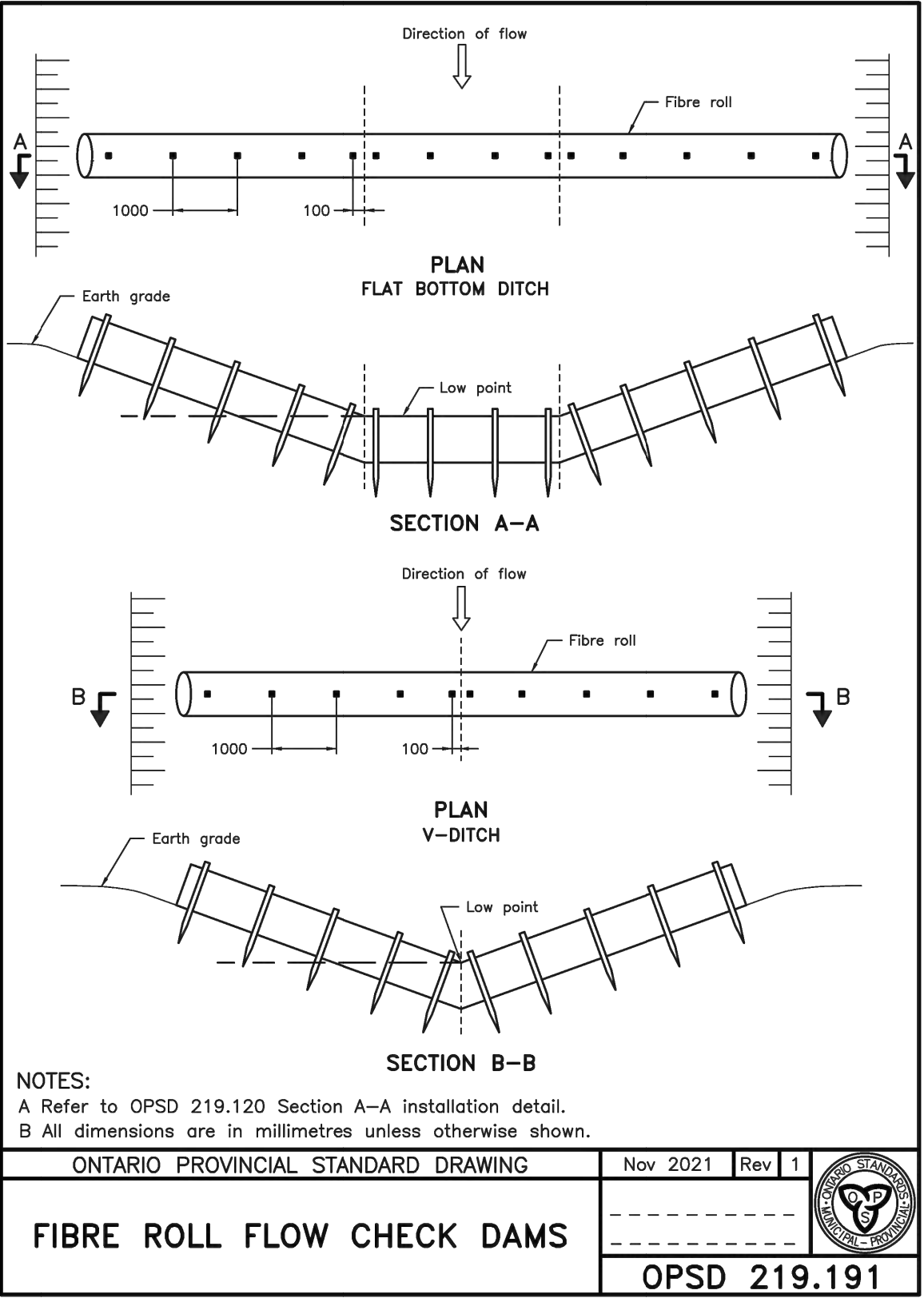
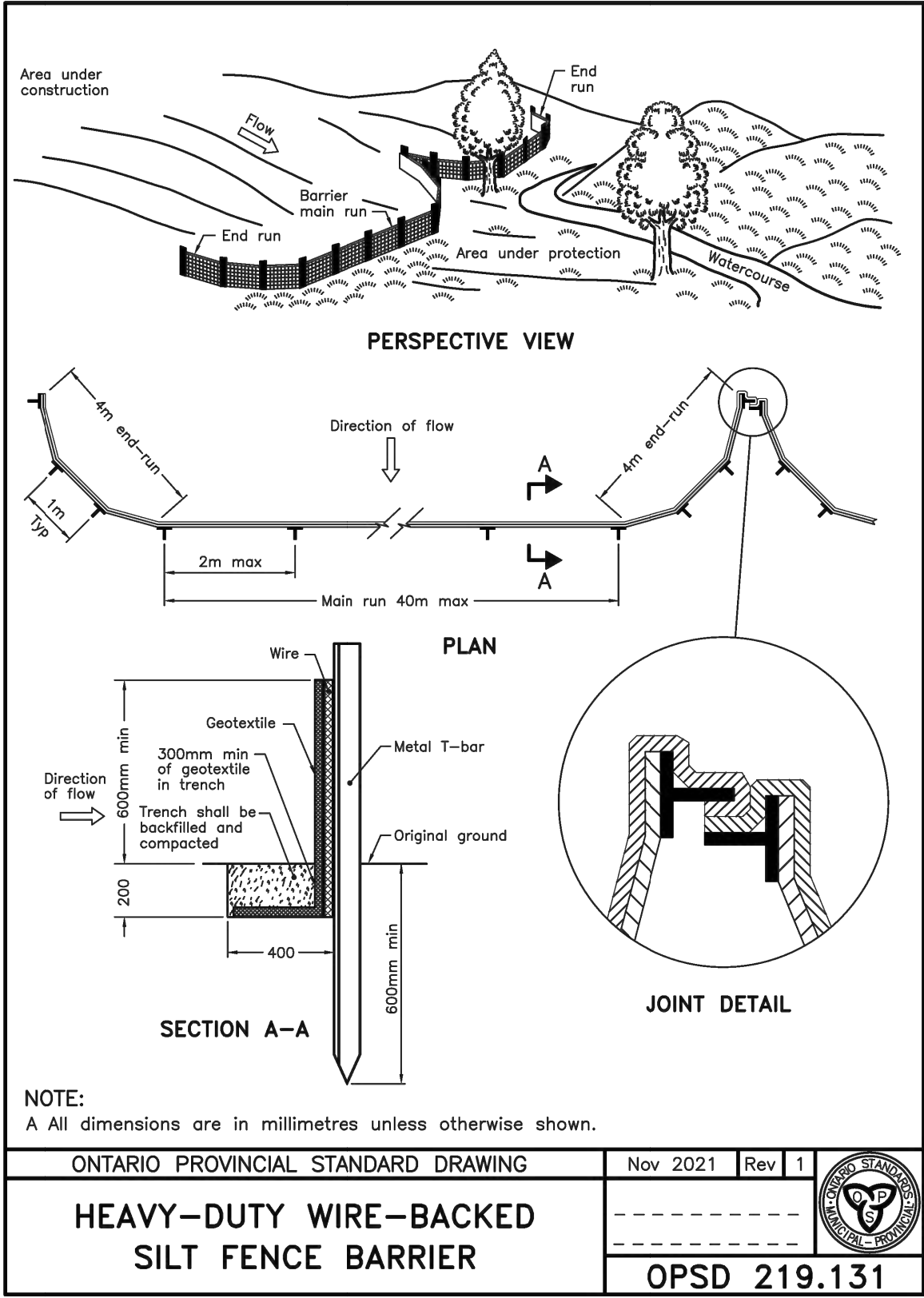
STORMWATER MANAGEMENT FACILITY PROFILE

Designed K. GRIFFIN	Checked C. CAPES	Date 22/08/09
Project No. 2021-185	Rev No. 3	

Scale
H 1:250 V 1:25

A horizontal scale bar with a black and white checkered pattern. It is marked with the values 0, 5.0, 10.0, and 15.0m.

C7



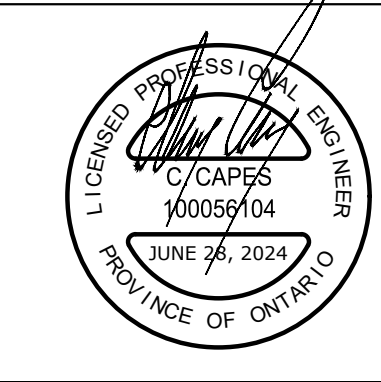
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2	REVISED FOR APPROVALS	23/12/07
3	REVISED FOR APPROVALS	24/06/28

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Client

PANTONE CAPITAL INC.

Designed

K. GRIFFIN

Checked

C. CAPES

Date

22/08/09

Drawing No.

C15

Project No.

2021-185

Rev No.

3

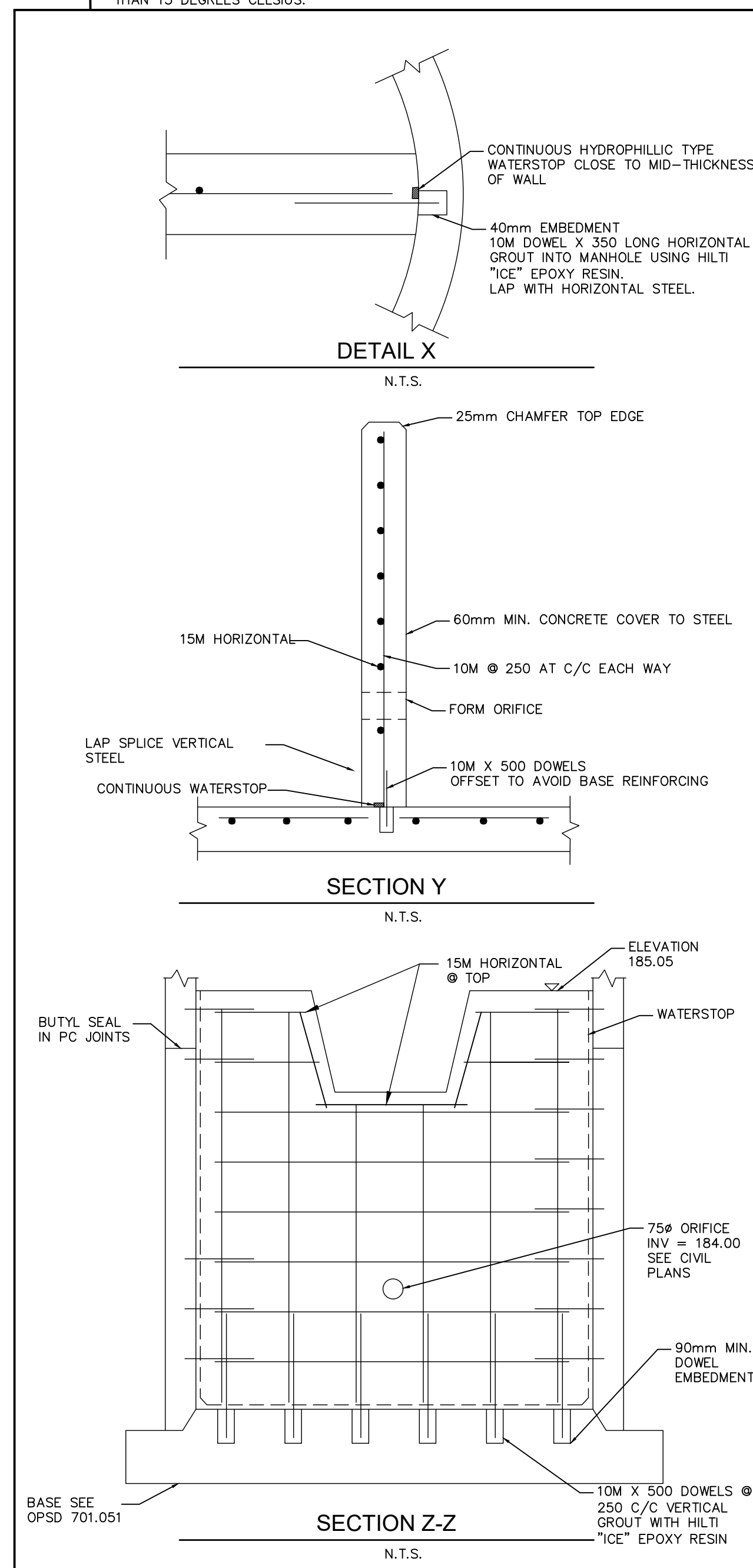
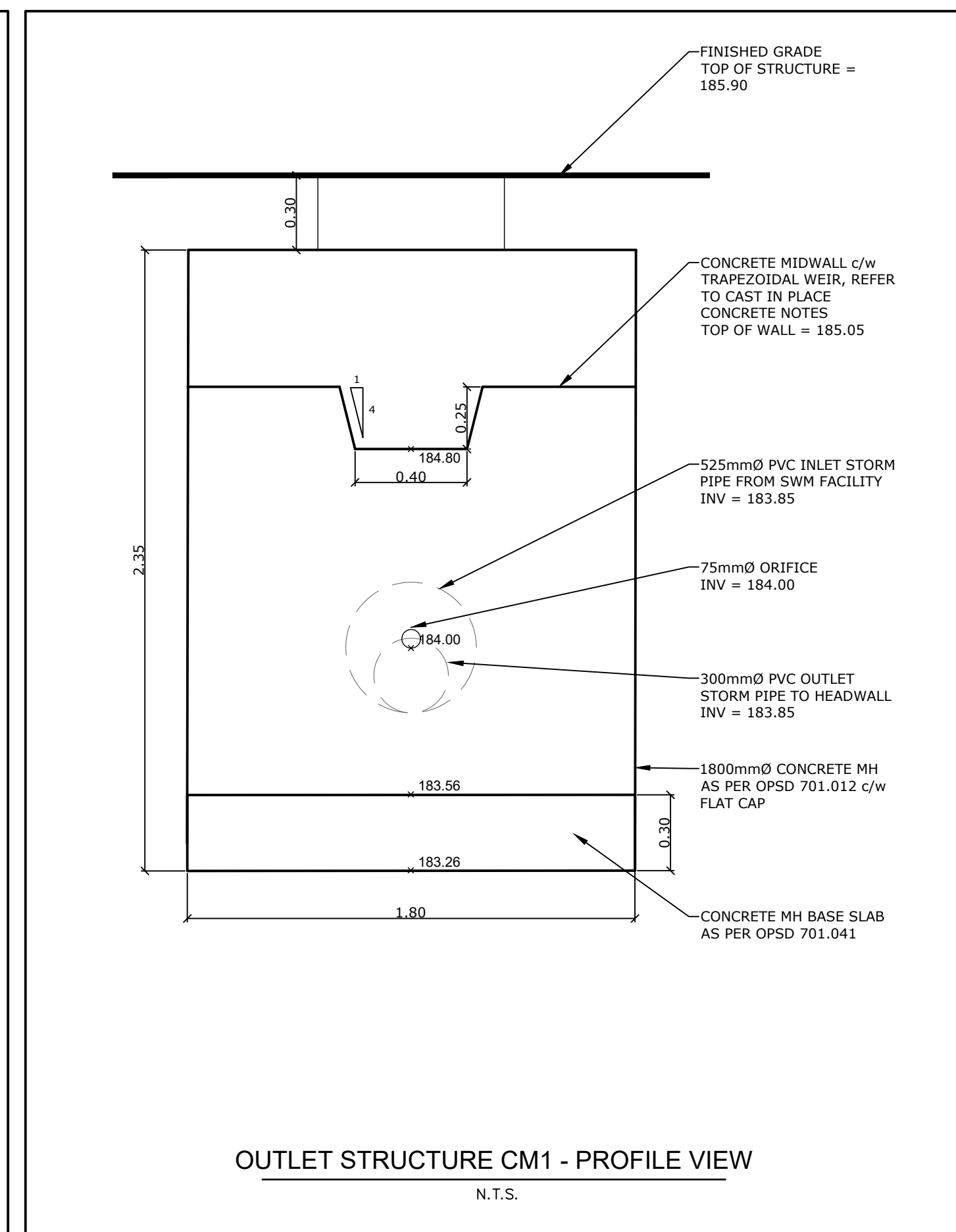
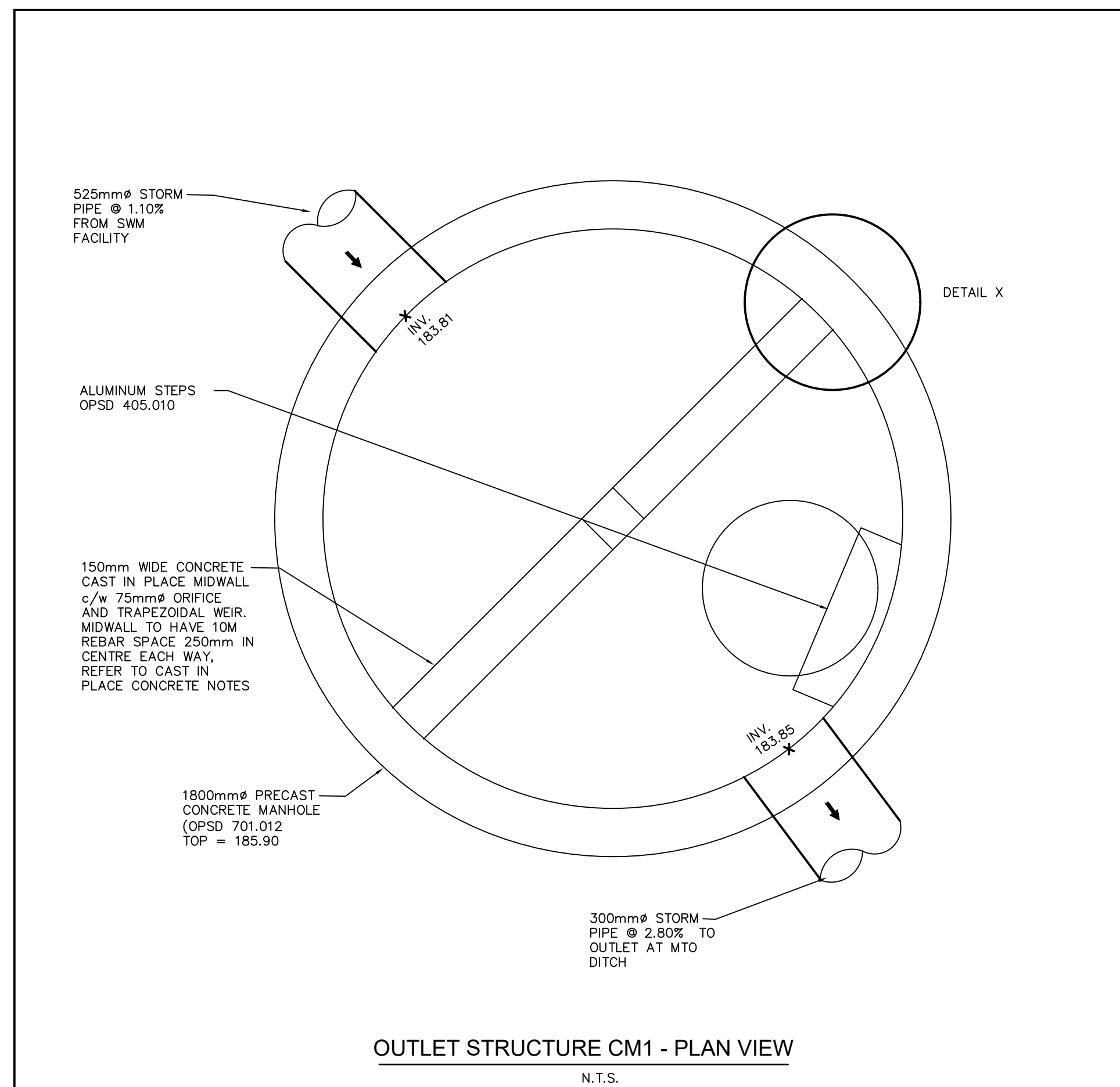
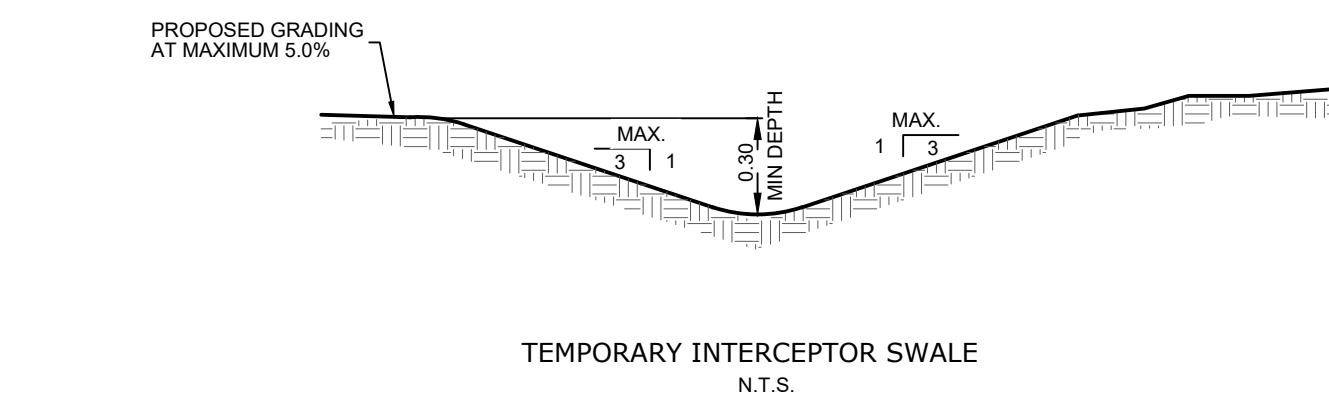
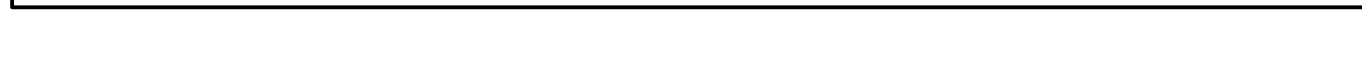
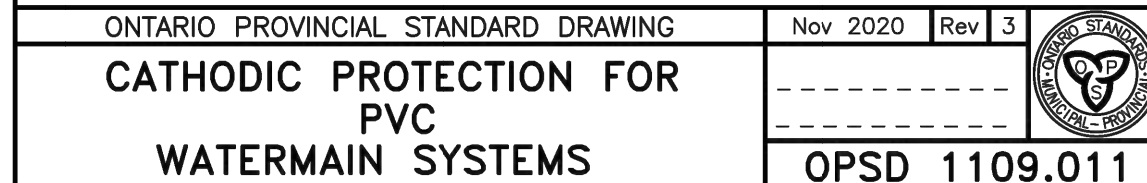
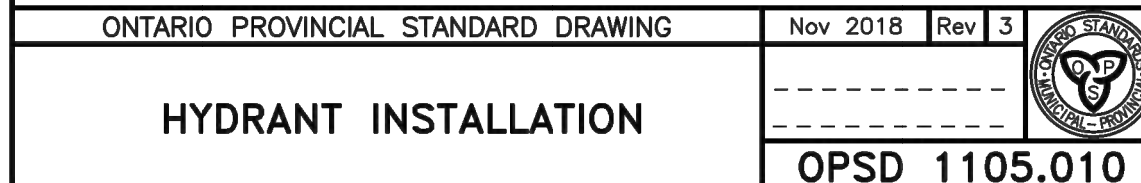
Scale

AS NOTED

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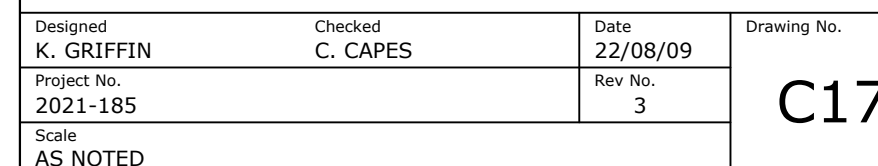
USE VIBRATORS FOR CONSOLIDATION OF CONCRETE.

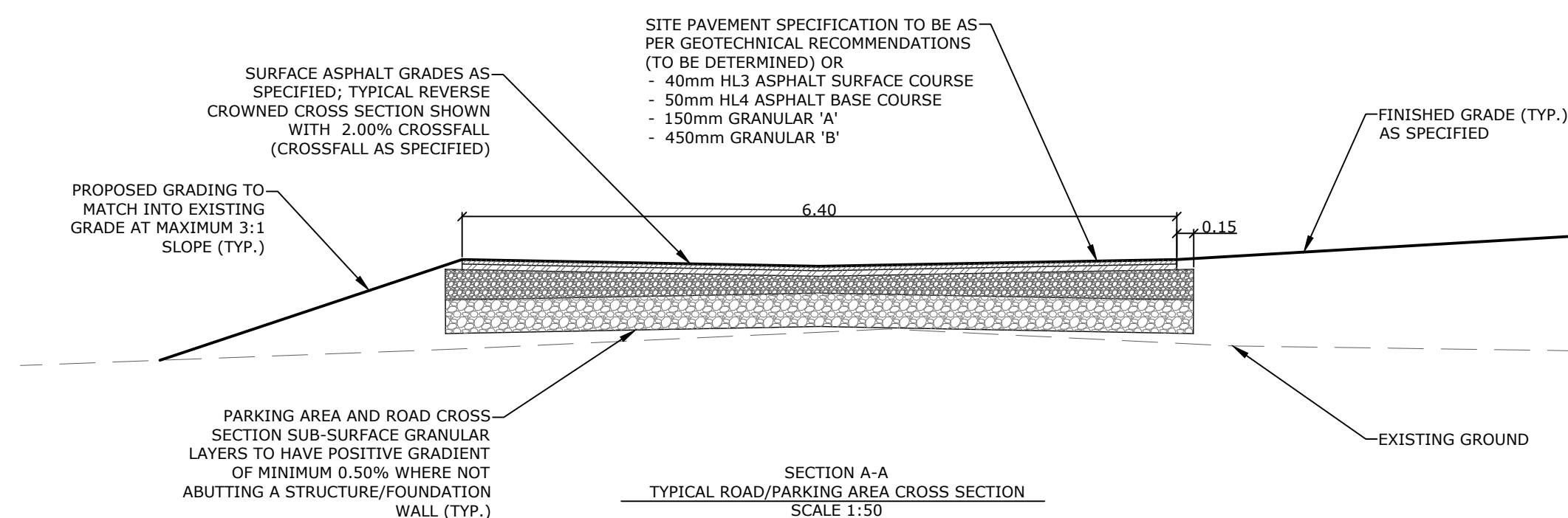
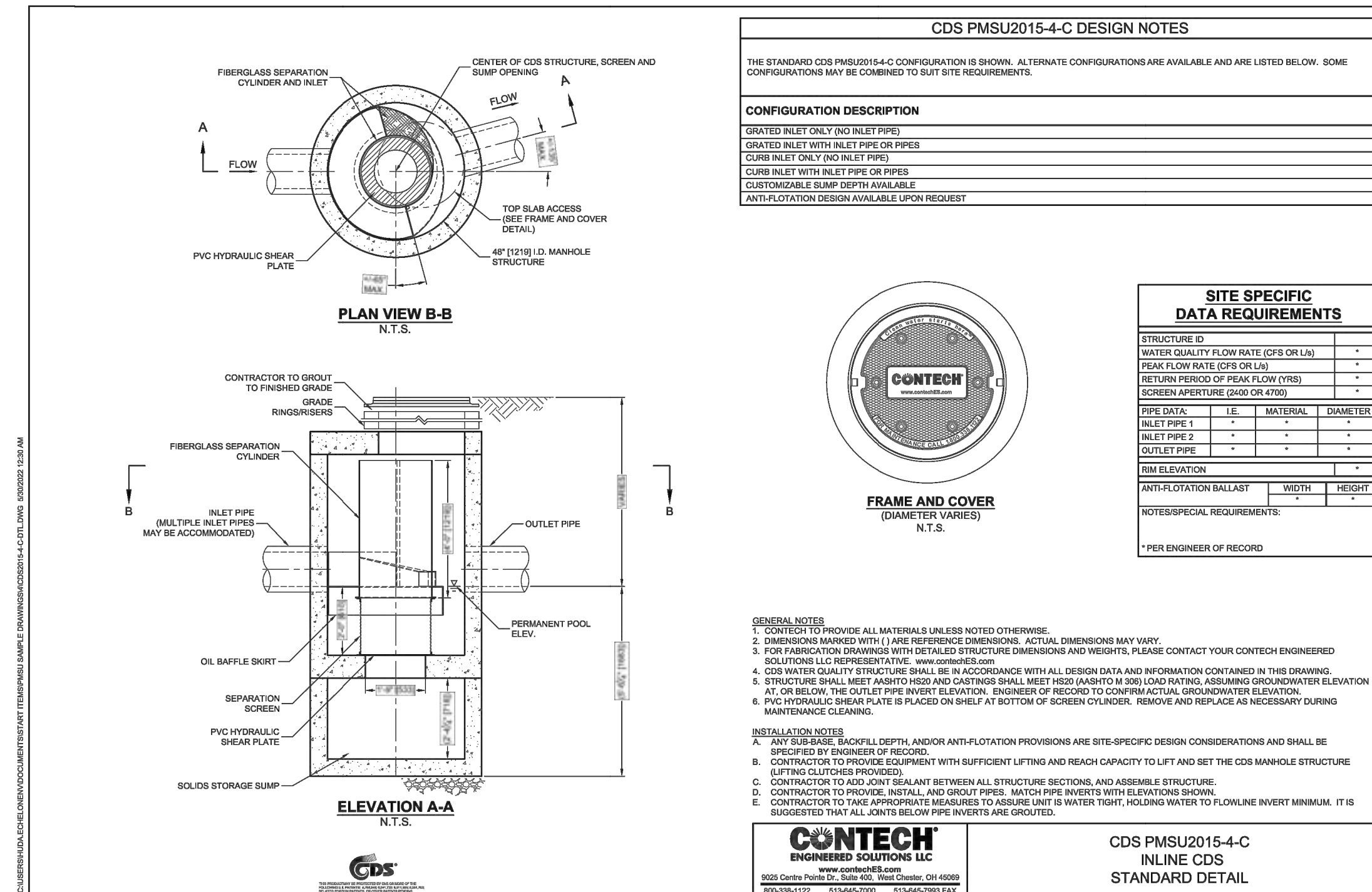
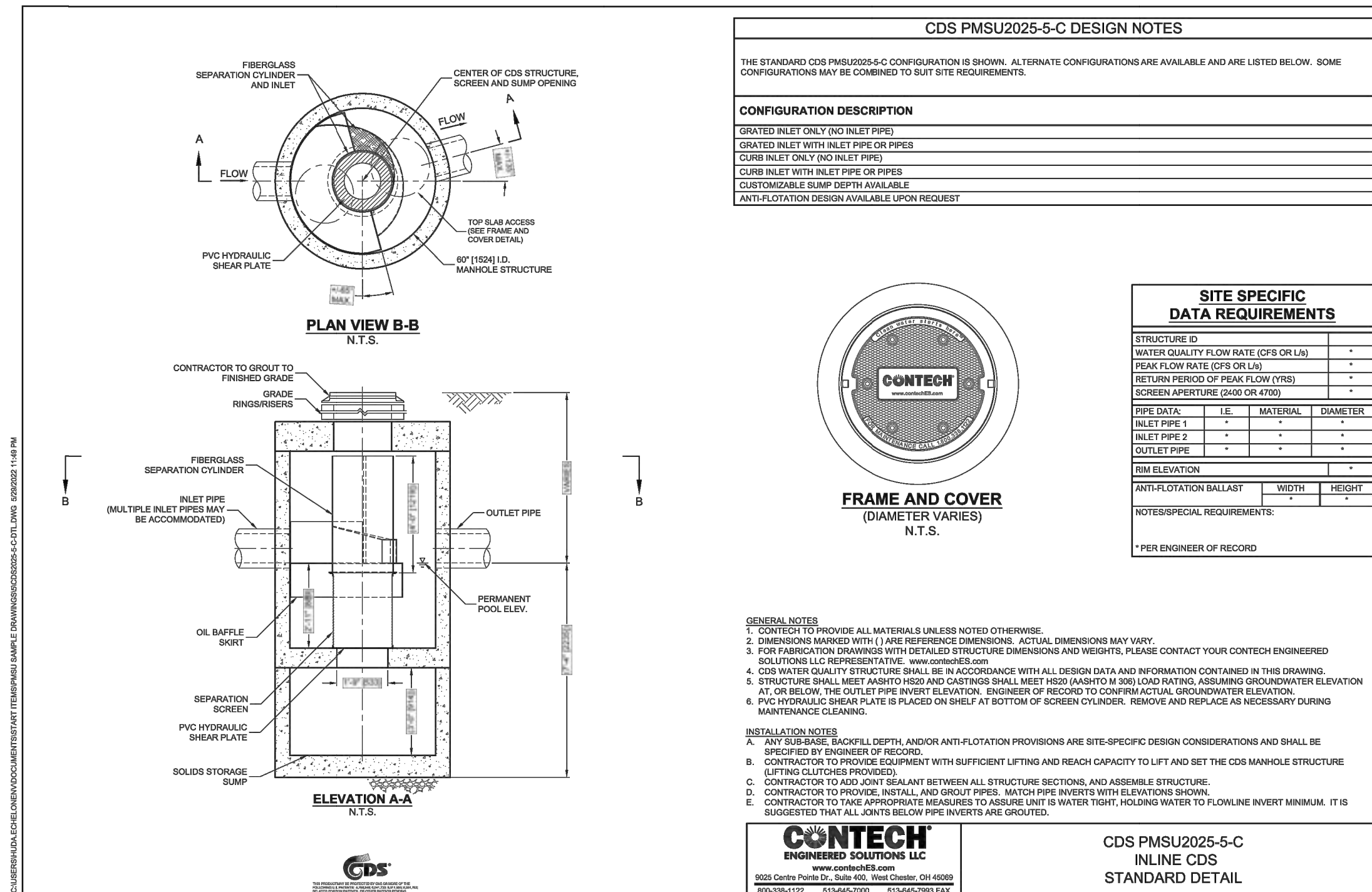
PROVIDE STEEL CHAIRS OR CONCRETE SPACERS TO MAINTAIN SPECIFIED 60mm COVER TO REINFORCING STEEL.

CONCRETE SHALL BE FREE FROM HONEYCOMBING, LOSSES, VOID OF FINS, VISIBLE FLOW LINE AND COLD JOINTS, CHIPS AND SPALLS. PATCH DEFECTS AND THE HOLES.

LAP ALL REINFORCING WITH CLASS 'B' SPLICES U/N ALL STEEL MUST BE ADEQUATELY TIED AND COMPLETELY COVERED WITH PROTECTIVE COATING.

PROTECT FRESH CONCRETE FROM PREMATURE DRYING, SUNSHINE, EXCESSIVELY HOT OR COOL TEMPERATURES AND MECHANICAL INJURY. MAINTAIN AT A RELATIVELY CONSTANT TEMPERATURE FOR PROLONGED PERIOD OF CURE AND PROTECT FROM DRYING AND CURING OF THE CONCRETE. REFER TO CSA A23.1 FOR HOT AND COLD WEATHER CONCRETE PRACTICE. PROTECT FRESH CONCRETE FROM COLD TEMPERATURES BELOW 5 DEGREES CELSIUS. PROVIDE HEAT TO MAINTAIN MINIMUM OF 3 DAYS TO MAINTAIN A TEMPERATURE OF GREATER THAN 15 DEGREES CELSIUS.





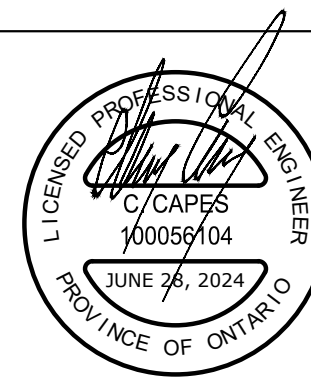
Notes	No	Revision	Date
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Client	PANTONE CAPITAL INC.
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Lot 31 Clark St. Site Plan

STANDARD DETAILS

STANDARD DETAILS

Designed K. GRIFFIN	Checked C. CAPES	Date 22/08/09	Drawing No. C18
Project No. 2021-185	Rev No. 3		
Scale AS NOTED			

Appendix C – Inspection Checklist

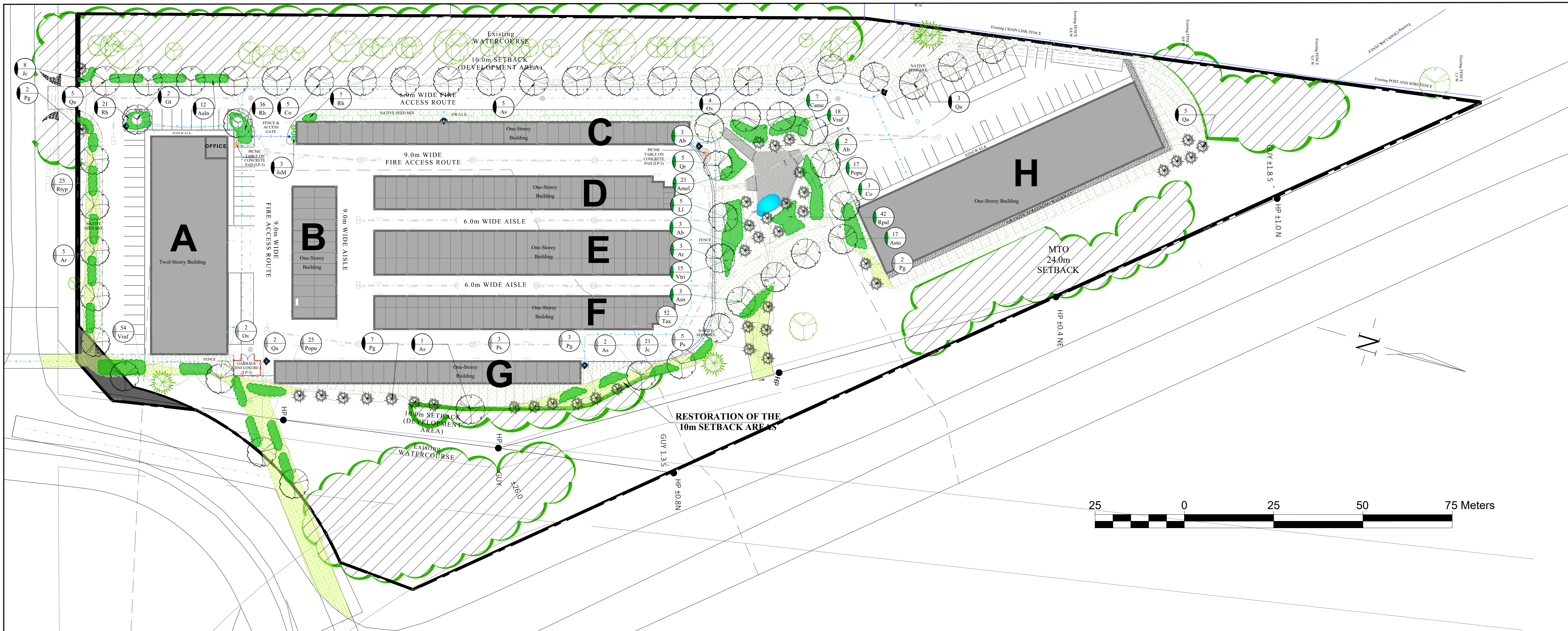
**Lot 31 Clark Street – Town of The Blue Mountains
SWM Monitoring Checklist**

Date:

Item		Maintenance Required (Y/N)	Comments
SWMF			
1.	Outlet Blockage – If the SWMF has not drained down to empty 48 hours after a 25 mm rainfall check & remove any blockages in the control manhole.		
2.	Inlet Blockage - If there is sediment backing up into the basin inlet pipes, it is time to clean out the basin.		
3.	Sediment Depth – If maximum depth of 0.5 m of sediment has collected in main cell, and if sediment is backing up into inlet pipes, the facility will need to be cleaned out.		
4.	Observe SWMF vegetation. If the vegetation is dead/dying remove and replace the vegetation as per landscape plan		
5.	Trash Build-up – Any trash/debris around the headwalls at the inlets and outlets will need to be removed.		
6.	Berm Stability – If there are any signs of cracking or slumping call the Engineer or Geotechnical Consultant		
7.	Outlet Structure – Raise control manhole lid and check for free flow. Remove any blockages that may be prohibiting free flow through orifice or over weir. Pump out sediment built up on pond side of midwall with vacuum truck.		

8.	Downstream of Basin - Any signs of erosion and seepage through the berm may indicate the need to repair an issue. Contact the Engineer or a Geotechnical Engineer		
9.	Maintenance Access – Check to ensure road is in fair condition and restore road as necessary.		
Storm Sewer			
10.	Manholes and Catchbasins – Remove manhole cover, if sediment exceeds half the sump depth, remove sediment with vacuum truck		
11.	Flush Pipe System – Once per year for first 5 years. Beyond first 5 years, if standing water is noted in connecting MHs, flush and use vacuum truck to remove sediments		
Vegetated Swale			
12.	Check for accumulated sediment. If sediment depth exceeds 0.05 m clean out.		
13.	Check for erosion or vegetation dye off. Repair as required.		
OGS Units			
14.	Check sediment and oil storage and pump out as per Manufacturers recommendations		

Appendix D – Landscape Drawings



LANDSCAPE PLAN

1 : 600

CODE	QNTY	COMMON NAME	BOTANICAL NAME	SIZE	FORM	SPACING	DETAIL	NOTES
DECIDUOUS TREES								
As	6	SUGAR MAPLE	Acer saccharum	60 mm	W.B.	9.0 m o/c	D-1	Full Form/ Fall pruning only
Co	5	COMMON HACKBERRY	Celtis occidentalis	60 mm	W.B.	9.0 m o/c	D-1	Full Form
Gt	2	SHADEMASTER HONEYLOCUST	Gleditsia triacanthos var. inermis 'Shademaster'	60 mm	W.B.	9.0 m o/c	D-1	Full Form
Ov	4	IRONWOOD	Ostrya virginiana	60 mm	W.B.	7.0 m o/c	D-1	Full Form/ Spring plant only
Qa	8	WHITE OAK	Quercus alba	60 mm	W.B.	15.0 m o/c	D-1	Spring planting/ Soil pH<7.5

CONIFEROUS TREES								
Pg	12	WHITE SPRUCE	Picea glauca	200cm	w.b.	5m o/c	D-2	Full form / Do not cut leader

SHRUBS								
Aaln	12	SERVICE-BERRY	Amelanchier alnifolia	60 cm	3 gal	1.8m o/c	D-3	Full form / Container grown
Jc	8	CANADIAN JUNIPER	Juniperus communis var. depressa	40cm	3 gal	1.5m o/c	D-2	Full form / Container grown
JsM	3	MOFFET JUNIPER	Juniperus scopulorum 'Moffettii'	150cm	w.b.	1.5 m o/c	D-3	Full form / Container grown

NATIVE PERENNIALS								
Rh	64	BLACK EYED SUSAN	Rudbeckia hirta	1 gal	pot	0.90 m o/c	n/a	Full form / Container grown

SITE PLAN PLANT LIST. REFER TO DETAILS AND NOTES ON LP-2

DECIDUOUS TREES								
Ar	3	RED MAPLE	Acer rubrum	60 mm	W.B.	9.0 m o/c	D-1	Full Form/ Fall pruning only
Asn	3	SILVER MAPLE	Acer saccharinum	60 mm	W.B.	9.0 m o/c	D-1	Full Form/ Fall pruning only
Co	3	COMMON HACKBERRY	Celtis occidentalis	60 mm	W.B.	9.0 m o/c	D-1	Full Form
Qr	5	RED OAK	Quercus rubra	60 mm	W.B.	9.0 m o/c	D-1	Spring planting/ Soil pH<7.5

CONIFEROUS TREES								
Ab	8	BALSAM FIR	Abies balsamea	200cm	w.b.	6m o/c	D-2	Full form / Do not cut leader
LI	5	AMERICAN LARCH	Larix laricina	200cm	w.b.	8.0m o/c	D-2	Full form / Do not cut leader

NATIVE SHRUBS								
Amel	21	BLACK CHOKEBERRY	Aronia melanocarpa	60 cm	3 gal	1.2m o/c	D-3	Full form / Container grown
Asto	17	RUNNING JUNE BERRY	Amelanchier stolonifera	60 cm	3 gal	1.8m o/c	D-3	Full form / Container grown
Came	7	AMERICAN HAZELNUT	Corylus americana	60 cm	3 gal	2.5m o/c	D-3	Full form / Container grown
Popu	17	COMMON NINEBARK	Physocarpus opulifolius	60 cm	3 gal	1.8m o/c	D-3	Full form / Container grown
Rpal	42	SWAMP ROSE	Rosa palustris	60 cm	3 gal	1.0m o/c	D-3	Full form / Container grown
Vraf	18	DOWNY ARROW-WOOD	Viburnum rafinesquianum	60 cm	3 gal	1.5m o/c	D-3	Full form / Container grown
Vtri	15	HIGH BUSH CRANBERRY	Viburnum trilobum	60 cm	3 gal	2.5m o/c	D-3	Full form / Container grown

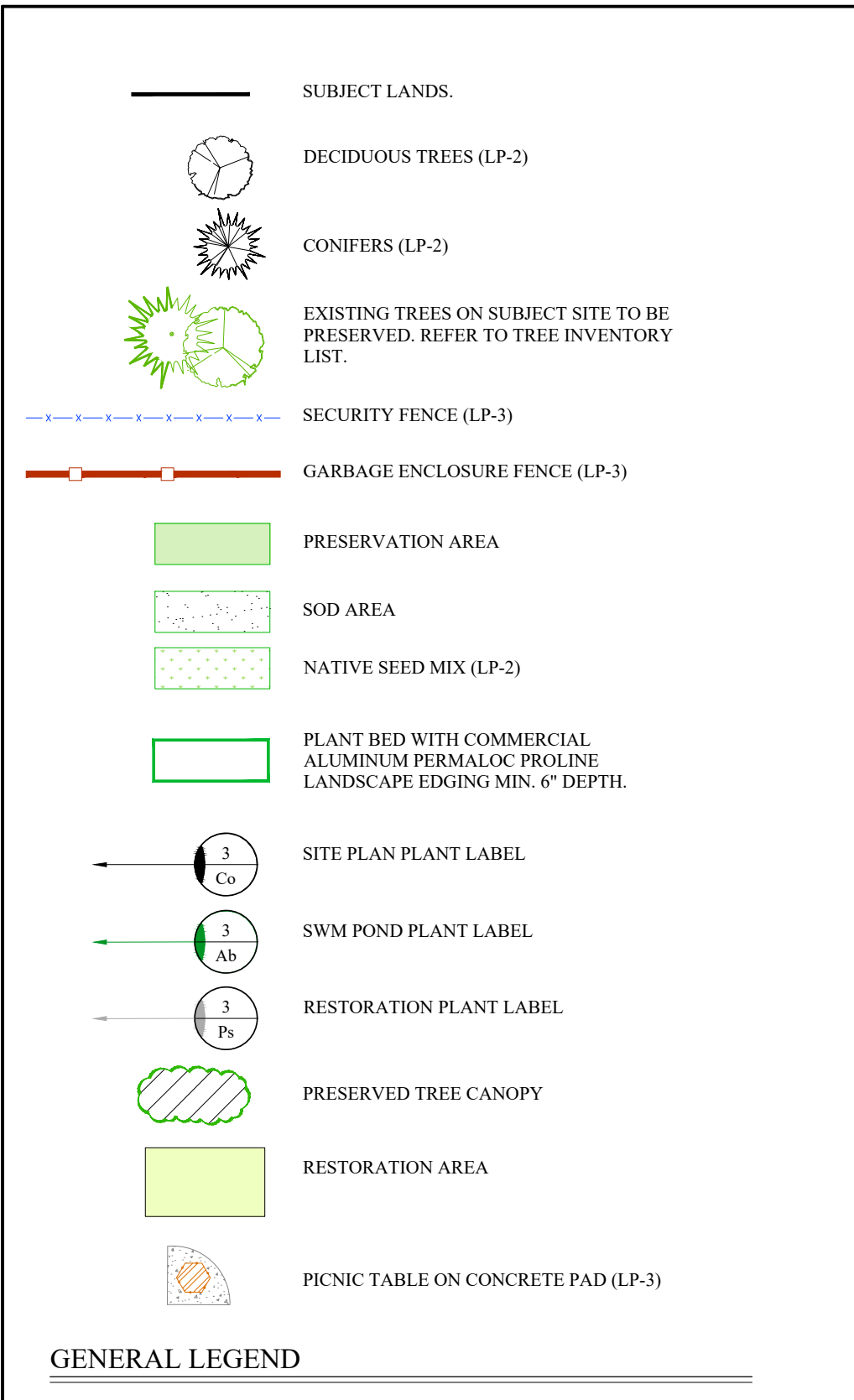
SWM POND PLANT LIST. REFER TO DETAILS AND NOTES ON LP-2

DECIDUOUS TREES								
Ar	5	RED MAPLE	Acer rubrum	45 mm	W.B.	9.0 m o/c	D-1	Full Form/ Fall pruning only
As	2	SUGAR MAPLE	Acer saccharum	45 mm	W.B.	9.0 m o/c	D-1	Full Form/ Fall pruning only
Ov	2	IRONWOOD	Ostrya virginiana	45 mm	W.B.	7.0 m o/c	D-1	Full Form/ Spring plant only
Qa	2	WHITE OAK	Quercus alba	45 mm	W.B.	15.0 m o/c	D-1	Spring planting/ Soil pH<7.5

CONIFEROUS TREES								
Pg	7	WHITE SPRUCE	Picea glauca	150 cm	w.b.	5m o/c	D-2	Full form / Do not cut leader
Ps	8	EASTERN WHITE PINE	Pinus strobus	150 cm	w.b.	6m o/c	D-2	Full form / Do not cut leader

NATIVE SHRUBS								
Jc	21	CANADIAN JUNIPER	Juniperus communis var. depressa	40cm	3 gal	1.5m o/c	D-2	Full form / Container grown
Popu	25	COMMON NINEBARK	Physocarpus opulifolius	50cm	3 gal	1.8m o/c	D-3	Full form / Container grown
Rtyp	25	STAGHORN SUMAC	Rhus typhina	80cm	3 gal	2.5m o/c	D-3	Full form / Container grown
Tax	52	AMERICAN YEW	Taxus canadensis	40cm	2 gal	1.0 m o/c	D-3	Full form / Container grown
Vraf	54	DOWNY ARROW-WOOD	Viburnum rafinesquianum	50 cm	3 gal	1.5m o/c	D-3	Full form / Container grown

RESTORATION PLANT LIST. REFER TO DETAILS AND NOTES ON LP-2



KEY MAP

N.T.S.

GENERAL NOTES

CONTRACTOR IS RESPONSIBLE FOR ALL LOCATES INCLUDING ALL UNDERGROUND SERVICES PRIOR TO ANY EXCAVATION OR INSTALLATIONS. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.

ANY ACCOMPANYING DOCUMENTATION RELATING TO THE LANDSCAPE PLAN AND/OR PRESERVATION PLAN SUCH AS TENDER DOCUMENTS AND CHANGE NOTICES ARE TO BE ENDORSED BY J.D.B. ASSOCIATES LIMITED PRIOR TO THE BEGINNING OF ANY SITE WORKS. IN THE EVENT THAT A DISCREPANCY THE DRAWING SHALL BE ASSUMED CORRECT.

IT IS THE RESPONSIBILITY OF THE PERSON OR PERSONS RESPONSIBLE FOR THE CONSTRUCTED WORKS TO NOTIFY THE LANDSCAPE ARCHITECT WHEN PREPARED FOR ANY REQUIRED INSPECTIONS AND SIGN OFFS.

SCHEDULED MEETINGS SHALL TAKE PLACE AT THE CLOSEST MUTUALLY CONVENIENT TIME.

No.	REVISION	DATE	APRVD.
1.	CLIENT REVIEW	December 6 th , 2022	SET
2.	AS PER TOWN COMMENTS	December 27 th , 2023	SET
2.	AS PER TOWN COMMENTS	May 28 th , 2024	SET

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ACCEPTED BY:	BASE PLAN REVISED: MARCH, 2022
DATE	Client info: IPS INNOVATIVE PLANNING SOLUTIONS 647 Welham Road, Unit 9A, Barrie, ON, L4N 0B7

ACCEPTED BY:	LANDSCAPE ARCHITECTS ASSOCIATION OF ONTARIO
DATE	LANDSCAPE ARCHITECTS STAMP (SEAL AND SIGNATURE MUST BE PRESENT FOR VALIDITY)

JDB ASSOCIATES LTD.	
Urban Designers Landscape Architects Arborists	
274 Burton Ave., Suite 1201 Barrie, Ontario L4N 5W4	Fax: 705-722-5660 Tel: 705-722-6278

LOT 31 CLARK ST Town of the Blue Mountains, ON		
LANDSCAPE/ RESTORATION PLANTING PLAN		
SCALE: 1 : 600	DESIGNED BY: IT	REVIEWED BY: NB
TOWN FILE No.	OUR FILE REF. # 14-22	LP-1

Appendix E – Sediment Removal Calculations

Figure 6.3: Storage Volume vs. Removal Frequency – for 70% Impervious Catchments

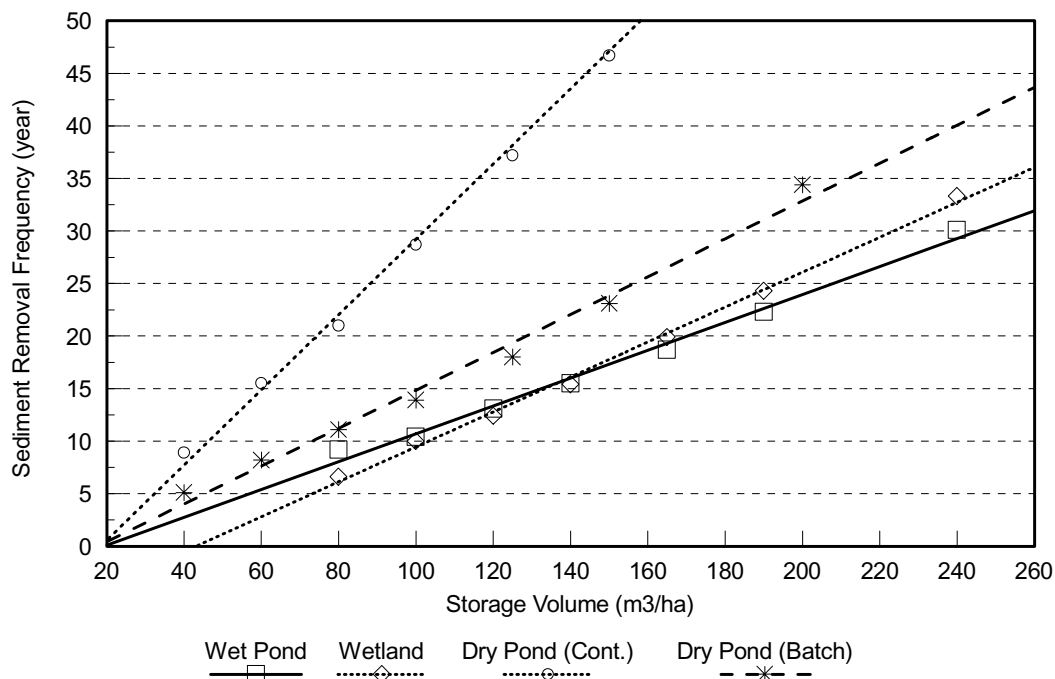
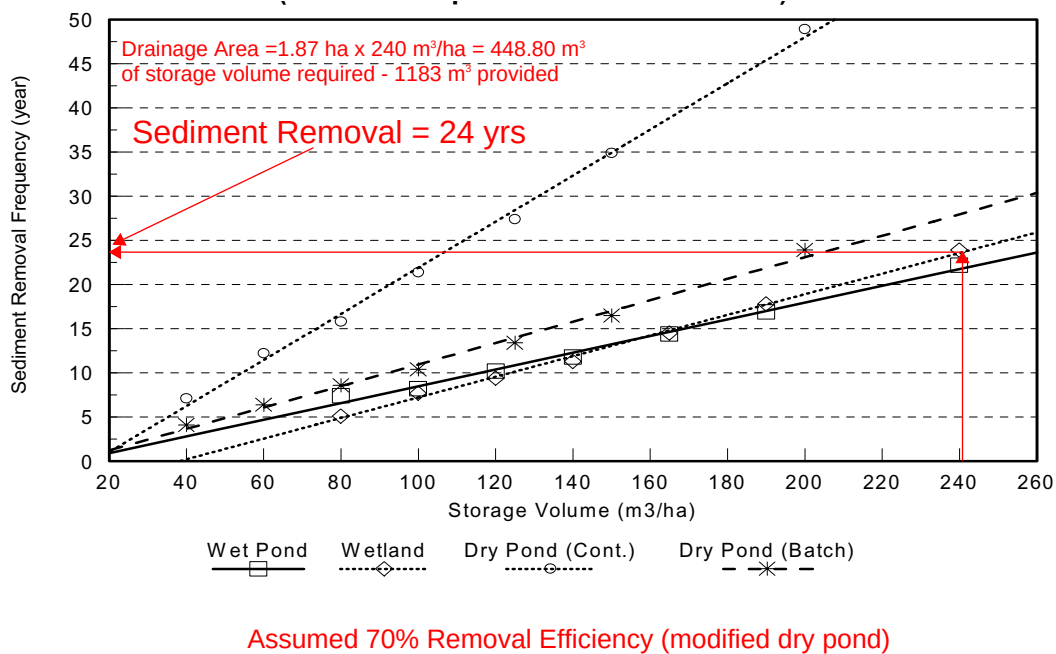


Figure 6.4: Storage Volume vs. Removal Frequency – for 85% Impervious Catchments



Appendix F – OGS Information



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



Project Name: 185 Clark Street
Location: Blue Mountains, ON
OGS #: 1

Engineer: Capes Engineering
Contact: Clayton Capes, P.Eng
Report Date: 15-Aug-22

Area 0.920 ha
Weighted C 0.90
CDS Model 2025

Rainfall Station # 198
Particle Size Distribution FINE
CDS Treatment Capacity 45 l/s

<u>Rainfall Intensity¹</u> <u>(mm/hr)</u>	<u>Percent Rainfall Volume¹</u>	<u>Cumulative Rainfall Volume</u>	<u>Total Flowrate</u> <u>(l/s)</u>	<u>Treated Flowrate (l/s)</u>	<u>Operating Rate (%)</u>	<u>Removal Efficiency (%)</u>	<u>Incremental Removal (%)</u>
1.0	10.8%	21.1%	2.3	2.3	5.1	97.4	10.5
1.5	10.1%	31.2%	3.5	3.5	7.6	96.7	9.7
2.0	8.5%	39.7%	4.6	4.6	10.2	95.9	8.1
2.5	6.7%	46.4%	5.8	5.8	12.7	95.2	6.4
3.0	6.1%	52.4%	6.9	6.9	15.2	94.5	5.7
3.5	4.1%	56.5%	8.1	8.1	17.8	93.8	3.8
4.0	4.2%	60.7%	9.2	9.2	20.3	93.0	3.9
4.5	3.7%	64.4%	10.4	10.4	22.9	92.3	3.4
5.0	3.9%	68.2%	11.5	11.5	25.4	91.6	3.5
6.0	5.3%	73.5%	13.8	13.8	30.5	90.1	4.8
7.0	3.8%	77.4%	16.1	16.1	35.6	88.7	3.4
8.0	2.8%	80.1%	18.4	18.4	40.6	87.2	2.4
9.0	2.5%	82.6%	20.7	20.7	45.7	85.8	2.1
10.0	2.1%	84.7%	23.0	23.0	50.8	84.3	1.8
15.0	5.7%	90.5%	34.5	34.5	76.2	77.0	4.4
20.0	3.4%	93.8%	46.0	45.3	100.0	69.1	2.3
25.0	3.4%	97.2%	57.5	45.3	100.0	55.3	1.9
30.0	0.8%	98.0%	69.1	45.3	100.0	46.1	0.4
35.0	0.9%	98.8%	80.6	45.3	100.0	39.5	0.3
40.0	0.4%	99.3%	92.1	45.3	100.0	34.5	0.1
45.0	0.5%	99.7%	103.6	45.3	100.0	30.7	0.1
50.0	0.3%	100.0%	115.1	45.3	100.0	27.6	0.1

89.4

Removal Efficiency Adjustment² = 6.5%

Predicted Net Annual Load Removal Efficiency = 82.9%

Predicted Annual Rainfall Treated = 96.9%

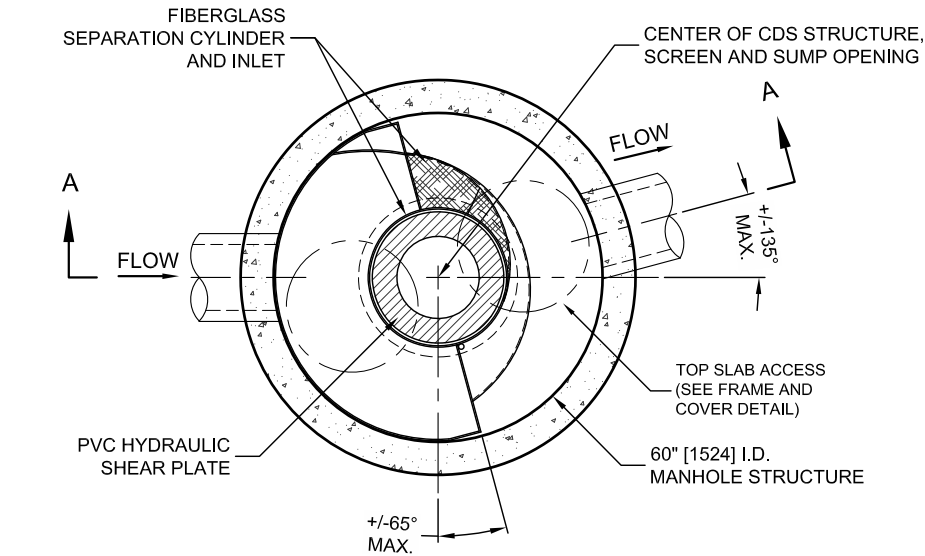
1 - Based on 38 years of hourly rainfall data from Canadian Station 6166132, Owen Sound ON

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

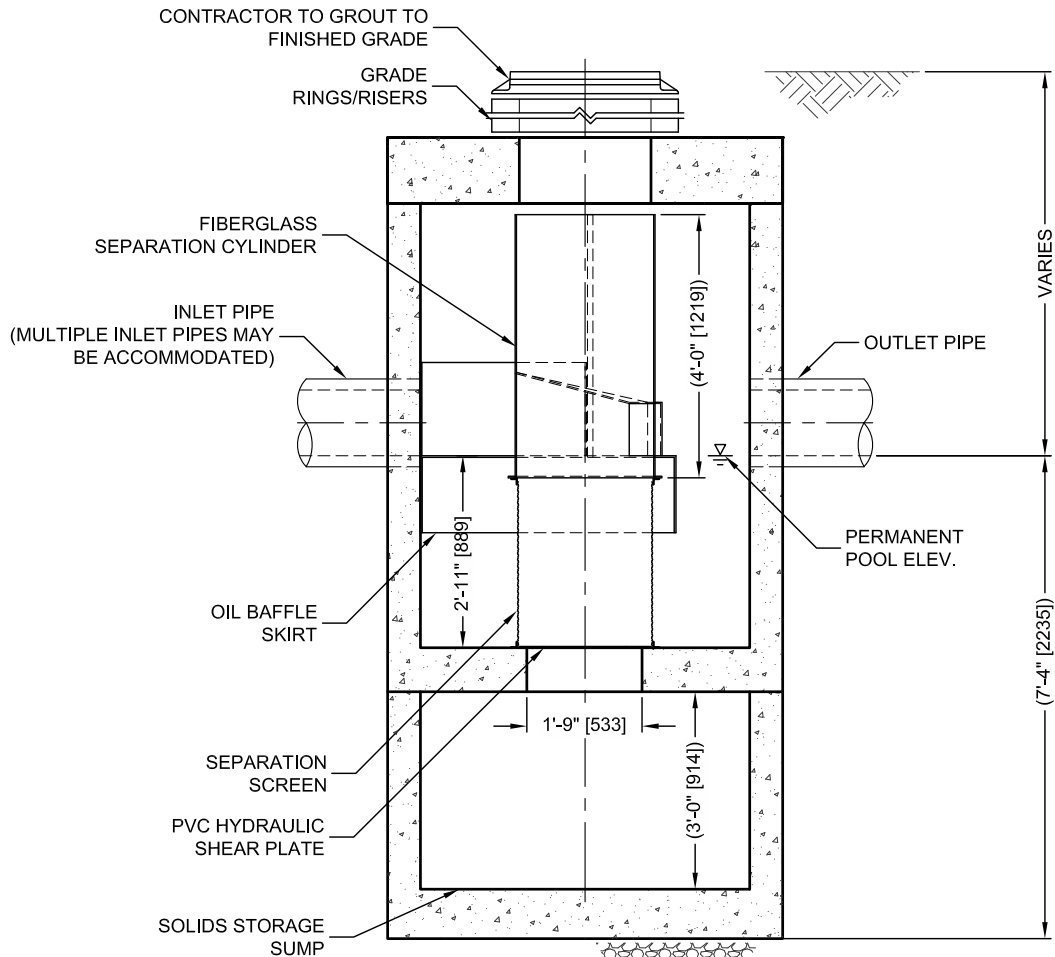
3 - CDS Efficiency based on testing conducted at the University of Central Florida

4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

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PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



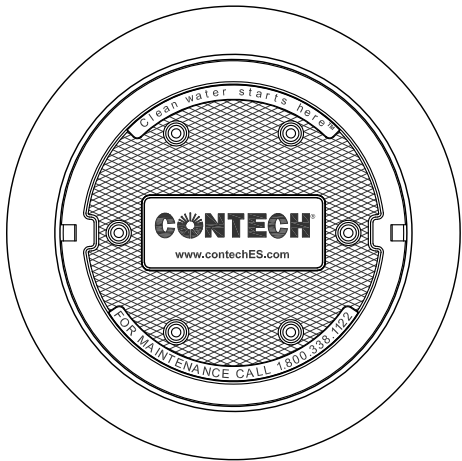
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,768,848; 6,841,722; 6,911,502; 6,981,793; RELATED FOREIGN PATENTS, OR OTHER PATENTS-PENDING.

CDS PMSU2025-5-C DESIGN NOTES

THE STANDARD CDS PMSU2025-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

- GRATED INLET ONLY (NO INLET PIPE)
- GRATED INLET WITH INLET PIPE OR PIPES
- CURB INLET ONLY (NO INLET PIPE)
- CURB INLET WITH INLET PIPE OR PIPES
- CUSTOMIZABLE SUMP DEPTH AVAILABLE
- ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC
DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH
ENGINEERED SOLUTIONS LLC

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CDS PMSU2025-5-C
INLINE CDS
STANDARD DETAIL



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



Project Name: 185 Clark Street
Location: Blue Mountains, ON
OGS #: 2

Engineer: Capes Engineering
Contact: Clayton Capes, P.Eng
Report Date: 15-Aug-22

Area 0.360 ha
Weighted C 0.90
CDS Model 2015

Rainfall Station # 198
Particle Size Distribution FINE
CDS Treatment Capacity 20 l/s

<u>Rainfall Intensity¹</u> <u>(mm/hr)</u>	<u>Percent Rainfall Volume¹</u>	<u>Cumulative Rainfall Volume</u>	<u>Total Flowrate</u> <u>(l/s)</u>	<u>Treated Flowrate (l/s)</u>	<u>Operating Rate (%)</u>	<u>Removal Efficiency (%)</u>	<u>Incremental Removal (%)</u>
1.0	10.8%	21.1%	0.9	0.9	4.5	97.6	10.5
1.5	10.1%	31.2%	1.4	1.4	6.8	96.9	9.8
2.0	8.5%	39.7%	1.8	1.8	9.1	96.3	8.2
2.5	6.7%	46.4%	2.3	2.3	11.4	95.6	6.4
3.0	6.1%	52.4%	2.7	2.7	13.6	94.9	5.7
3.5	4.1%	56.5%	3.2	3.2	15.9	94.3	3.9
4.0	4.2%	60.7%	3.6	3.6	18.2	93.6	3.9
4.5	3.7%	64.4%	4.1	4.1	20.4	93.0	3.4
5.0	3.9%	68.2%	4.5	4.5	22.7	92.3	3.6
6.0	5.3%	73.5%	5.4	5.4	27.3	91.0	4.8
7.0	3.8%	77.4%	6.3	6.3	31.8	89.7	3.4
8.0	2.8%	80.1%	7.2	7.2	36.3	88.4	2.4
9.0	2.5%	82.6%	8.1	8.1	40.9	87.1	2.2
10.0	2.1%	84.7%	9.0	9.0	45.4	85.8	1.8
15.0	5.7%	90.5%	13.5	13.5	68.2	79.3	4.5
20.0	3.4%	93.8%	18.0	18.0	90.9	72.8	2.5
25.0	3.4%	97.2%	22.5	19.8	100.0	61.8	2.1
30.0	0.8%	98.0%	27.0	19.8	100.0	51.5	0.4
35.0	0.9%	98.8%	31.5	19.8	100.0	44.1	0.4
40.0	0.4%	99.3%	36.0	19.8	100.0	38.6	0.2
45.0	0.5%	99.7%	40.5	19.8	100.0	34.3	0.2
50.0	0.3%	100.0%	45.0	19.8	100.0	30.9	0.1

90.5

Removal Efficiency Adjustment² = 6.5%
Predicted Net Annual Load Removal Efficiency = 84.0%
Predicted Annual Rainfall Treated = 97.4%

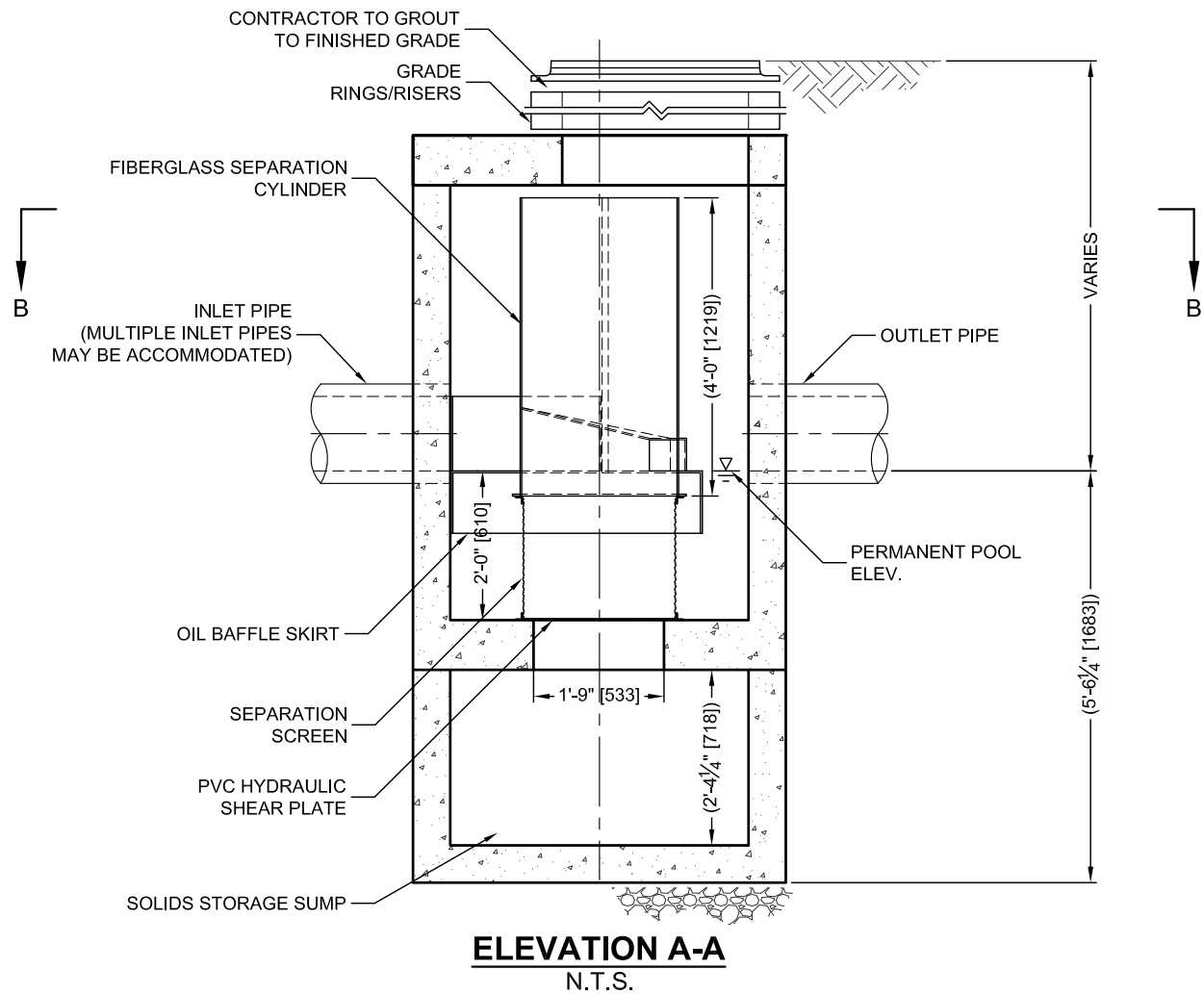
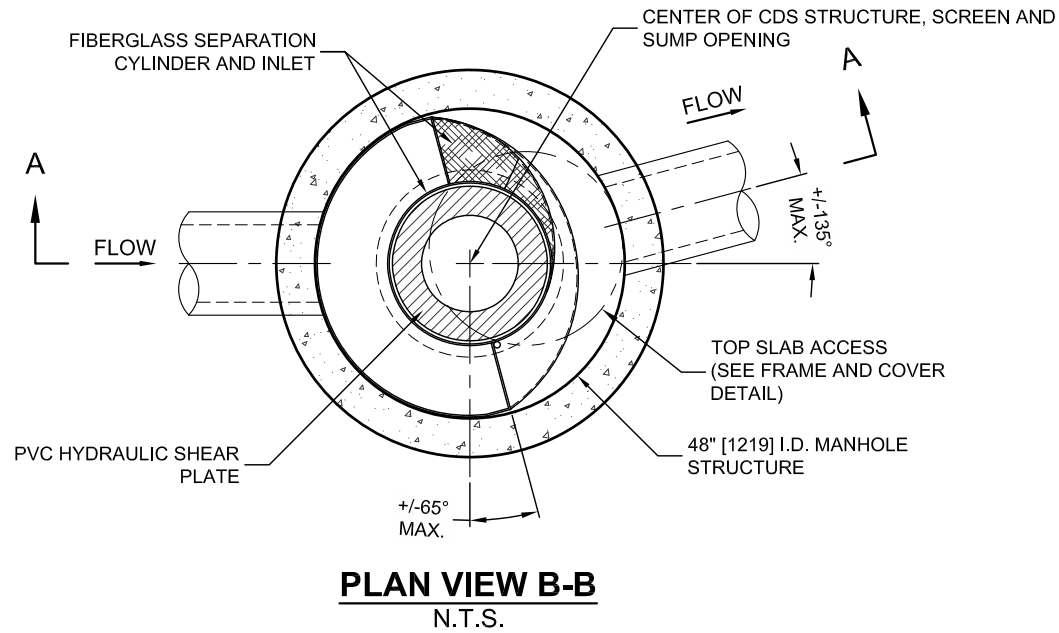
1 - Based on 38 years of hourly rainfall data from Canadian Station 6166132, Owen Sound ON

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

3 - CDS Efficiency based on testing conducted at the University of Central Florida

4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

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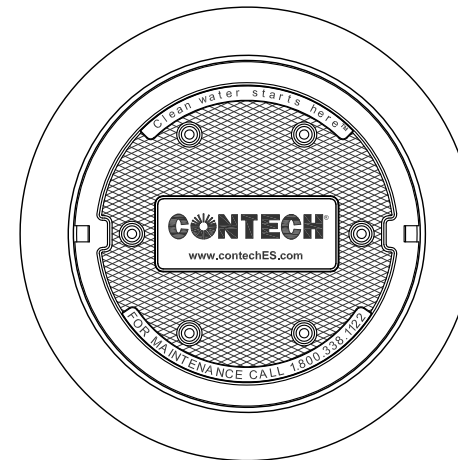


CDS PMSU2015-4-C DESIGN NOTES

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CONFIGURATION DESCRIPTION

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GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
CUSTOMIZABLE SUMP DEPTH AVAILABLE
ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES

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6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

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- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
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CDS® Inspection and Maintenance Guide



Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y ³	m ³
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

[illegible]

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**
2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.